

Environmental Assessment

May 2012

Renovations and Improvements at Terminals B & C/E at Boston Logan International Airport

East Boston, Massachusetts



PREPARED FOR
Massachusetts Port Authority



PREPARED BY
 *Vanasse Hangen Brustlin, Inc.*

IN ASSOCIATION WITH
AECOM



May 11, 2012

Richard Doucette
Federal Aviation Administration
New England Region, ANE-600
12 New England Executive Park
Burlington, MA 01803

Re: **Renovations and Improvements at Terminal B, Pier A and Terminal C/E**
Boston-Logan International Airport, East Boston, Massachusetts

Dear Mr. Doucette:

The Massachusetts Port Authority (Massport) is pleased to submit this *Environmental Assessment* (EA) for proposed renovations and improvements at Terminal B, Pier A and Terminal C/E at Boston-Logan International Airport. The proposed action consists of two key components: (1) upgrading the facilities at Terminal B, Pier A to accommodate a recent airline merger and provide a post-security connection between both sides of Terminal B, Piers A and B (Terminal B, Pier A Improvements); and (2) improving connectivity to Terminal C, including a post-security connection airside between Terminals C and E (Terminal C-E Connector). While the Terminal B, Pier A Improvements are completely independent of the proposed Terminal C-E Connector, because of their common goals, proximity, and similar timing, they are being considered as a single action from an environmental review perspective.

Project Overview and Background

Terminal B, Pier A currently is Logan's home to American Airlines and Virgin America. US Airways, Air Canada, Frontier Airlines and Spirit Airlines currently operate from Terminal B, Pier B. The proposed Project would renovate approximately 78,800 square feet of existing internal terminal space and increase Pier A by approximately 84,000 square feet of new building area to accommodate the relocation of the newly merged United Airlines and Continental Airlines (United/Continental). United currently operates both from its Terminal C space and from the Terminal A space where the former Continental operated. Neither Terminal C nor Terminal A can accommodate the combined operations of United/Continental.

Due to reduced operations by tenants in Terminal B, Pier A in conjunction with the proposed renovations and improvements, United/Continental could be accommodated in Terminal B, Pier A with added customer service and flexibility for future industry changes and airline realignments. The Terminal B, Pier A improvements will also include new ticket counter positions, a renovated security checkpoint with additional lanes, concession space, and baggage handling systems. Although eight existing gates at the end of Pier A will be reconfigured, the proposed Project will not increase the number of gates at Terminal B or at Logan Airport.

The Terminal C-E Connector is intended to facilitate joint operations of AirTran (in Terminal C) and Southwest Airlines (in Terminal E). The work in Terminal C will involve interior renovation and a new connector to Terminal E totaling approximately 3,500 square feet of new building area. The Terminal C-E connector will also facilitate international connections between Japan Airlines (operating from Terminal E) and its new code share partner jetBlue Airways (Terminal C). This code share relationship is an important component of the financial viability of the BOS-Tokyo service.

The recent airline mergers and realignments present an opportunity for Massport to provide revamped terminal facilities that are flexible and can better respond to changing airline needs. The changes also present Massport with an opportunity to more seamlessly link the terminals post-security allowing greater connectivity between the terminals and providing greater adaptability to changes in the airline industry.

Construction of the terminal modifications are planned to commence in Summer 2012 with a number of enabling projects such as asbestos abatement, utility upgrades and demolition of exiting interior spaces, particularly at the end of Pier A which was recently closed when American Eagle ceased operations at Logan Airport. Both project elements are expected to be completed by the end of 2013. The construction in both locations will be conducted in previously developed terminal or aircraft apron areas.

Previous Environmental Review for Proposed Terminal B Improvements

In 2001, American Airlines and Massport received clearances from FAA under the National Environmental Policy Act (NEPA) and under the Massachusetts Environmental Policy Act (MEPA) (EOEA #12235) for a then-planned major expansion of Terminal B, Pier A. That project proposed the complete rebuilding of Pier A including construction of approximately 340,000 square feet of new terminal space and approximately 200,000 square feet of new Federal Inspectional Service (FIS) space to accommodate a mix of fourteen domestic and three international departure gates. Based on the MEPA Environmental Notification Form (ENF), the FAA determined that the project was Categorically Excluded from further review under NEPA. Because of minimal environmental impacts and very few comments on the Draft EIR, the MEPA Office allowed Massport to re-circulate the Draft EIR as the Final EIR.

That project, like many airport projects world-wide, was never constructed and airline expansions were abandoned after the events of September 11, 2001. As a result, the utilization of the gates dropped from the originally planned wide and narrow body aircraft to a mix of smaller regional jets and narrow body aircraft. The new project will simply return gate utilization to planned pre-September 11, 2001 levels.

NEPA Review for the Proposed Improvements

The proposed building additions will need to be reflected on Logan's official Airport Layout Plan (ALP). Modifications to the ALP require review by the FAA under NEPA. Based on our initial discussions regarding the proposed terminal improvements, FAA has determined the need for preparation of an EA. The EA describes the proposed Project, identifies alternatives considered, and documents the potential environmental effects associated with the construction and operation of proposed terminal improvements at Logan Airport. The Project is not expected to result in any significant environmental impacts, such as increased vehicle traffic, noise, air emissions or new land disturbance/impervious surface area. A draft Finding of No Significant Impact (FONSI) is included as an EA attachment.

Although there is no mandatory public meeting for an EA, FAA has recommended that Massport conduct a public meeting to facilitate community involvement during the 30-day EA public comment period. As described below, notice of that meeting will be published in the East Boston Times – Free Press and an interpreter will be available, if requested.

Please note that this action does not meet any applicable MEPA ENF review thresholds and, therefore, is not subject to MEPA review. Massport has, however, notified the MEPA Office of the project and has included them in the EA distribution.

Key Project Environmental Considerations

The proposed terminal renovations and improvements will not induce new passenger or vehicular traffic and do not include the construction of new parking spaces in the terminal area or elsewhere on the Airport. The purpose of the Project is to increase terminal flexibility through a reconfiguration of the passenger handling areas and relocation of eight aircraft gates to accommodate increased gate hold and support space, though not an expansion of capacity. No new gates will be added and thus no significant changes in passenger levels should be experienced during peak periods.

In consideration of Massport's goals to reduce greenhouse gas emissions, the project is not expected to result in a significant amount of Carbon Dioxide (CO₂) emissions. Compared to future no-build conditions, the proposed Project would not result in any new vehicle traffic, or mobile source CO₂ emissions. The new and renovated terminal and connector spaces will include upgraded (more efficient) fixtures and building systems requiring equal or reduced energy loads compared to current conditions.

The proposed Project will be designed in accordance with Massport's *Logan Airport Sustainable Design Standards and Guidelines*.¹ The standards apply to both new construction and rehabilitation projects (building and non-building) of any square footage or monetary value and may also be used on tenant alterations or development projects on Massport property. The standards incorporate sustainable design principles as they relate to the project site design, materials, energy efficiency, water use and management, air emissions, and indoor air quality, and are based off of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) Green Building Rating System.

Compared to a facility constructed with conventional/less efficient mechanical systems, the proposed Project will be constructed as an improved and more energy-efficient facility. At 30 percent design, energy modeling analysis will be conducted and will continue throughout the design phase to identify measures to reduce energy use by at least 20 percent compared to a baseline standard. Some measures being considered to conserve energy include: new, high efficiency mechanical systems (for both renovated and new building space); a new chilled water line from the Central Plant to provide air conditioning systems; a new high-temperature hot water line from Terminal A; metal panel and high efficiency wall systems; window glazing with appropriate coatings for energy efficiency; and alternative passive and active solar shading systems.

Based on these findings, the proposed Project is not expected to result in significant impacts on the environment. Overall, the terminal improvements will provide facilities that are flexible and able to accommodate evolving airline configurations and enhance passenger convenience.

Massport will hold a **public meeting** on the project during the 30-day public comment period. The meeting will be held at the **Logan Office Center at One Harborside Drive in East Boston at 6:30 PM on Tuesday, June 5th, 2012**. Interpreters will be available upon request. Notification of the meeting will be publicly advertised in advance in English and Spanish in the East Boston Times – Free Press and on Massport's website at www.massport.com.

The EA **30-day public comment period will commence on May 17th and close on June 15th**. All comments will be directed to your attention at the above address. As always, we would be pleased to answer any questions you may have on the project. I can be reached at 617-568-3524 or via email at sdalzell@massport.com.

Very truly yours,

Massachusetts Port Authority



Stewart Dalzell, Deputy Director
Environmental Planning and Permitting


cc: B. Desrosiers, R. McNulty, I. Wallach/Massport
M. Bartlett, A. Canaday/MEPA
M. Ricci/FAA
C. Lurie, L. DeVoe/VHB

¹ Massachusetts Port Authority. *Logan Airport Sustainable Design Standards and Guidelines – Version 1*, June 2009.

*Renovations and Improvements at
Terminals B and C/E at
Boston-Logan International Airport*

East Boston,
Massachusetts

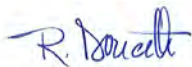
Prepared for **Massachusetts Port Authority**

Prepared by  **Vanasse Hangen Brustlin, Inc.**

In association with **AECOM**

May 2012

This environmental assessment becomes a Federal document when evaluated, signed, and dated by the Responsible FAA Official.



Responsible FAA Official

May 11, 2012

Date

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Acronyms

ACI-NA	Airport Council International-North America
ACRP	Airport Cooperative Research Program
AFV	Alternative Fuel Vehicle
ALP	Airport Layout Plan
APU	auxiliary power unit
AST	Above-ground Storage Tank
ATO	airport ticket office
AWDT	average annual weekday daily traffic
CAA	Clean Air Act
CBIS	Checked Baggage Inspection System
CEQ	Council on Environmental Quality
CHP	Central Heating Plant
CNG	Compressed Natural Gas
CO	carbon monoxide
ConRAC	Consolidated Rental Car
dba	A-weighted Decibel
EIR	Environmental Impact Report
DEP	Massachusetts Department of Environmental Protection
DHS	Department of Homeland Security
EA	Environmental Assessment
EDR	Environmental Data Report
EEA	Executive Office of Energy and Environmental Affairs
EIR	Environmental Impact Report
ENF	Environmental Notification Form
EO	Executive Order
ESPR	Environmental Status and Planning Report
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FIS	Federal Inspection Services
FONSI	Finding Of No Significant Impact
GA	General Aviation
GHG	Greenhouse Gas
GSE	Ground Service Equipment
GTU	Ground Transportation Unit

Renovations and Improvements at Terminals B and C/E

Boston-Logan International Airport

East Boston, Massachusetts

HOV	high occupancy vehicle
Hz	Hertz
I-90	Interstate 90
I-93	Interstate 93
ITS	intelligent transportation system
kWhs	kilowatt-hours
LCC	low cost carrier
LED	Light-Emitting-Diode
LEED	Leadership in Energy and Environmental Design
LOS	Level of Service
MACRIS	Massachusetts Cultural Resource Information System
MassDOT	Massachusetts Department of Transportation
MHC	Massachusetts Historical Commission
MBTA	Massachusetts Bay Transportation Authority
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
MWRA	Massachusetts Water Resources Authority
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NHESP	Massachusetts Natural Heritage and Endangered Species Program
NO ₂	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
O ₃	Ozone
O&D	Origin & Destination
O&M	Operations and Maintenance
Pb	Lead
PCA	pre-conditioned air
PH	Peak Hour
PHADPM	Peak Hour Average Day Peak Month
PM	Particulate Matter
QATAR	Quick Analysis Tool for Airport Roadways
QTA	Quick Turn-Around
RCRA	Resource Conservation and Recovery Act
RCNM	Roadway Construction Noise Model
RJ	Regional Jet
RSIP	Residential Sound Insulation Program
RTN	Release Tracking Number
SDSG	Sustainable Design Standards and Guidelines

Renovations and Improvements at Terminals B and C/E

Boston-Logan International Airport

East Boston, Massachusetts

SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
SWPPP	Stormwater Pollution Prevention Plan
SWSA	South West Service Area
TAF	Terminal Area Forecast
TMA	Transportation Management Association
TRB	Transportation Research Board
TSA	Transportation Security Administration
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
VMT	vehicle miles travelled
VOC	Volatile Organic Compounds

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1

Project Overview and Background

1.1 Introduction

Over the past decade, both economic and market conditions have forced airlines to restructure. Part of this restructuring has included airline mergers that have changed the face of the airline industry. Airline industry experts anticipate that the airlines will continue to realign and restructure. Airports will consequently have to provide greater flexibility to accommodate the evolving airline configurations and to enhance passenger convenience, specifically connectivity on the airside between terminals. In an ongoing effort to adjust to changing airline business models, the Massachusetts Port Authority (Massport) continues to respond by modifying and upgrading facilities to meet the airlines' needs while providing facilities that improve and simplify the passenger's traveling experience. As part of this ongoing process, Massport is proposing to renovate and improve Terminal B, Pier A and provide an enhanced connection between Terminals C and E at Boston-Logan International Airport (Logan Airport, or Airport).

The proposed terminal renovations and improvements will not increase airport operations, passenger numbers, or ground transportation volumes. There will be no increase in the number of gates, although eight existing gates will be repositioned. The project will not affect any natural resources and will not have an adverse effect on noise or air quality. The existing passenger terminal curbs will be reorganized and managed to maintain or improve vehicle flows.

1.1.1 Logan Airport Overview

Figure 1.1 shows the location and context of Logan Airport, New England's primary domestic and international airport. Logan Airport plays a key role in the metropolitan Boston and New England passenger and freight transportation networks and is a significant contributor to the regional economy. The Airport employs a total of approximately 12,000 people and, including airport-related activities, contributes an average of \$19 million a day into the local economy.¹ In 2010, Logan Airport was the 21st busiest commercial airport in North America ranked as by aircraft operations, and the 20th busiest in North America ranked by number of passengers.²

¹ *Economic Impact Report 2006*, Massachusetts Port Authority, 2006.

² *ACI-NA Airport Traffic Reports 2010* at www.aci-na.org/stats/stats_traffic accessed March 2012.



Source(s): MassGIS

Legend

 Project Area Boundary



Figure 1.1

Aerial Photograph of Logan Airport

RENOVATIONS AND IMPROVEMENTS
 AT TERMINALS B AND C/E
*Boston-Logan International Airport
 East Boston, Massachusetts*

Renovations and Improvements at Terminals B and C/E

Boston-Logan International Airport

East Boston, Massachusetts

The increase in passenger and operations volumes in the last decade as well as changes in airlines composition have increased pressure on existing terminal facilities that were designed and constructed to operate under an outdated airline operational model. Continuing airline industry changes have further demonstrated the need for more efficient and flexible facilities for the Airport to ensure acceptable levels of customer service.

The Airport consists of four airline terminals (Terminals A, B, C, and E). Each terminal is essentially isolated from the others on the airside. The separated terminals prevent the flexibility required for gate allocation among the individual terminals.

The recent Airport airline mergers and realignments, including the cessation of American Eagle service, the reduction in American Airlines operations, the merger of Southwest Airlines and AirTran Airlines, and the expansion of jetBlue Airlines (all of which is described more fully in Chapter 2, *Purpose and Need*) present a need for Massport to modify terminal facilities to create terminals that are more flexible and can respond to changing airline needs. The changes in operations also present Massport with an opportunity to link the terminals beyond the passenger checkpoints (post-security); thereby, allowing greater connectivity between the terminals and providing greater adaptability to changes in the airline industry.

1.1.2 NEPA Compliance Overview

The Federal Aviation Administration (FAA) has determined that the Project, identified by Massport (the Sponsor), requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) due to changes to the Airport Layout Plan (ALP) that would result necessarily from project implementation. This EA describes the proposed Project, identifies alternatives considered, and documents the potential environmental effects associated with the construction and operation of the proposed terminal improvements at Logan Airport. The Project is not expected to result in significant environmental impacts, such as increased vehicle traffic, noise, air emissions or new land disturbance/ impervious surface area. The FAA is expected to issue a Finding of No Significant Impact (FONSI) for the proposed Project. If, based on its review of the comments on the EA, additional information is needed to make a determination, FAA could require additional analysis or documentation. A draft FONSI is included as Appendix A.

1.2 Project Overview and Evolution

The consolidation of the airline industry and merger of airlines has accelerated in recent years. This has necessitated the physical reconfiguration of airports. The proposed Renovations and Improvements at Terminals B and C/E evolved out of an airside and terminal analysis that explored opportunities for providing flexible facilities for airlines and improved connectivity primarily in response to this current trend and in anticipation of future major airline mergers. The recent United/Continental merger specifically presented Massport with a major operational challenge. Neither Terminal C (United) nor Terminal A (Continental), where the individual airlines operate, can accommodate the volume of their combined operations. At the same time, a reduction of American Airlines passenger activity, along with the sale of subsidiary American Eagle has reduced operations at Terminal B, Pier A. The relocation of Spirit Airlines to Terminal B, Pier B has also resulted in available terminal space at Pier A. Consequently, Massport commissioned studies for the planning and programming of Airport space to accommodate United/Continental in Terminal B, Pier A.

Renovations and Improvements at Terminals B and C/E

Boston-Logan International Airport

East Boston, Massachusetts

The Project consists of two key components: (1) upgrading and reconfiguring the facilities at Terminal B, Pier A to accommodate the recent airline merger and provide a post-security connection between both sides of Terminal B, Piers A and B (the “Terminal B, Pier A Improvements”); and (2) improving connectivity to Terminal C, including a post-security connection airside between Terminals C and E (the “Terminal C-E Connector”). Each component is shown on Figure 1.2 and described more fully below. In addition to connecting Pier A and Pier B of Terminal B, the Project will include new ticket counter positions, a redesigned TSA security checkpoint with additional lanes, concession space, and baggage handling systems. The post-security connection between Terminals E and C will have a glass wall overlooking the airfield from the Southwest Airlines gate area to the concourse in Terminal C that now is used primarily by United. When completed, the Project will provide a new home for United/Continental in Terminal B, and allow backfill of the former United space in Terminal C. The Project will also provide enhanced customer service with new post-security connections between the two sides of Terminal B, and between Terminals C and E.

While the Terminal B, Pier A Improvements are completely independent of the proposed Terminal C-E Connector, they are being considered as a single action from an environmental review perspective because of their common goals, proximity, and similar timing.

1.2.1 Project Goals and Objectives

The overall goals of the Project are to provide flexible and efficient facilities for the changing airline industry, and to enhance passenger convenience by improving connectivity among the terminals. The key objective of the Terminal B, Pier A Improvements component is to reconfigure and renovate Pier A to provide combined facilities to accommodate the recent merger of United Airlines and Continental Airlines. The key objective of the Terminal C-E Connector is to facilitate the combination of Southwest Airlines and AirTran Airlines (Southwest/ AirTran) operations through the enhancement of passenger connectivity between Terminals C and E. The relocation of United operations in conjunction with the relocation of AirTran, both from Terminal C, will relieve some congestion at Terminal C. This connector would also provide jetBlue customers access to their partners in Terminal E. All new and renovated building area will be designed and constructed in accordance with the *Logan Airport Sustainable Design Standards and Guidelines* (SDSG).³

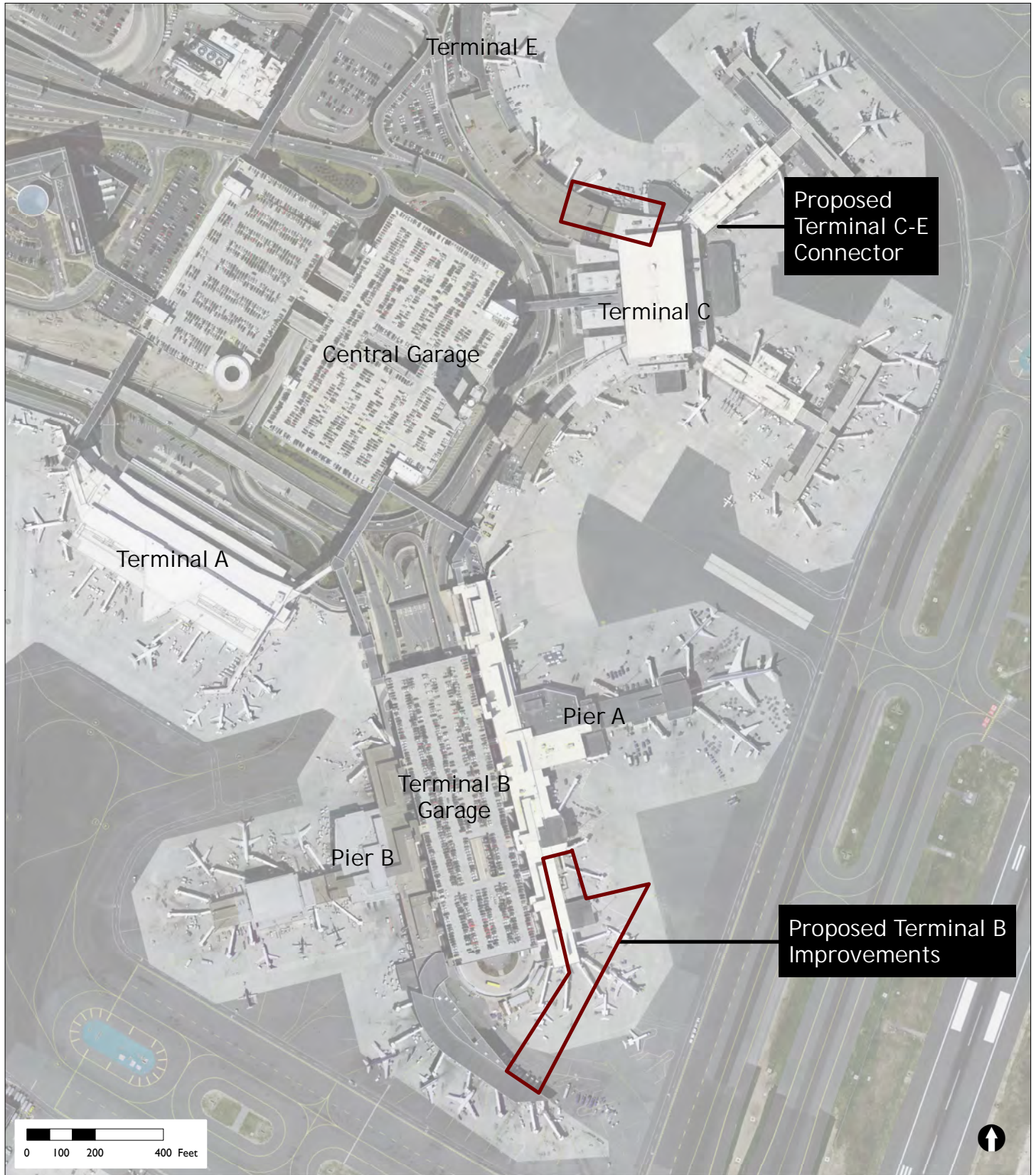
1.2.2 Description of Project Components

The following sections describe the two key components of the Project.

1.2.2.1 Terminal B, Pier A Improvements

Designed in 1972 and 1973, construction of Terminal B, Pier B was completed for US Airways in 1974 and Pier A for American Airlines in 1975. Terminal B remained largely unchanged until the US Airways expanded its operations at Logan Airport in 1979 and improvements to Terminal B were constructed in 1980. From 1980 until 2000, numerous small projects including passenger seating area improvements, concessions expansions, and passenger lounges were completed at both piers.

³ Massachusetts Port Authority. *Logan Airport Sustainable Design Standards and Guidelines – Version 1*, June 2009.



Source(s): MassGIS 2008 15cm Aerial

Legend

 Project Area Boundary



Figure 1.2

Project Components

RENOVATIONS AND IMPROVEMENTS
AT TERMINALS B AND C/E
Boston-Logan International Airport
East Boston, Massachusetts

Renovations and Improvements at Terminals B and C/E

Boston-Logan International Airport

East Boston, Massachusetts

Figure 1.3 shows the existing Terminal B, Piers A and B and gates as well as the Terminal B Garage. The existing Terminal B, Pier A is approximately 330,000 square feet. The Terminal B Improvements include renovation of approximately 78,800 square feet of existing internal terminal space and increase Pier A by approximately 84,000 square feet. With the proposed renovations and improvements, United/Continental could be accommodated in Terminal B, Pier A with added flexibility for future industry changes and airline realignments.

On the Departures Level (upper level), the Terminal B, Pier A Improvements include modifying existing space to accommodate a consolidated airline ticketing area, an expanded Security Checkpoint, new and improved gate hold areas, an airline passenger lounge, secure public circulation areas, concessions and associated support spaces, and public restrooms. The proposed post-security concourse will connect the main concourse of Terminal B, Pier A to Gates 37 and 38 eliminating a secondary security checkpoint and underutilized ticket counters. On the Arrivals Level (lower level), the modified building footprint will include reconfigured baggage handling areas, and a new Transportation Security Administration (TSA) Checked Baggage Inspection System (CBIS) for compliance with newly updated TSA baggage screening guidelines, airlines operations offices and support, and access to an infield area for the parking of electric and other Ground Service Equipment (GSE). The new CBIS is being funded under a separate project being developed jointly by Massport and the TSA.

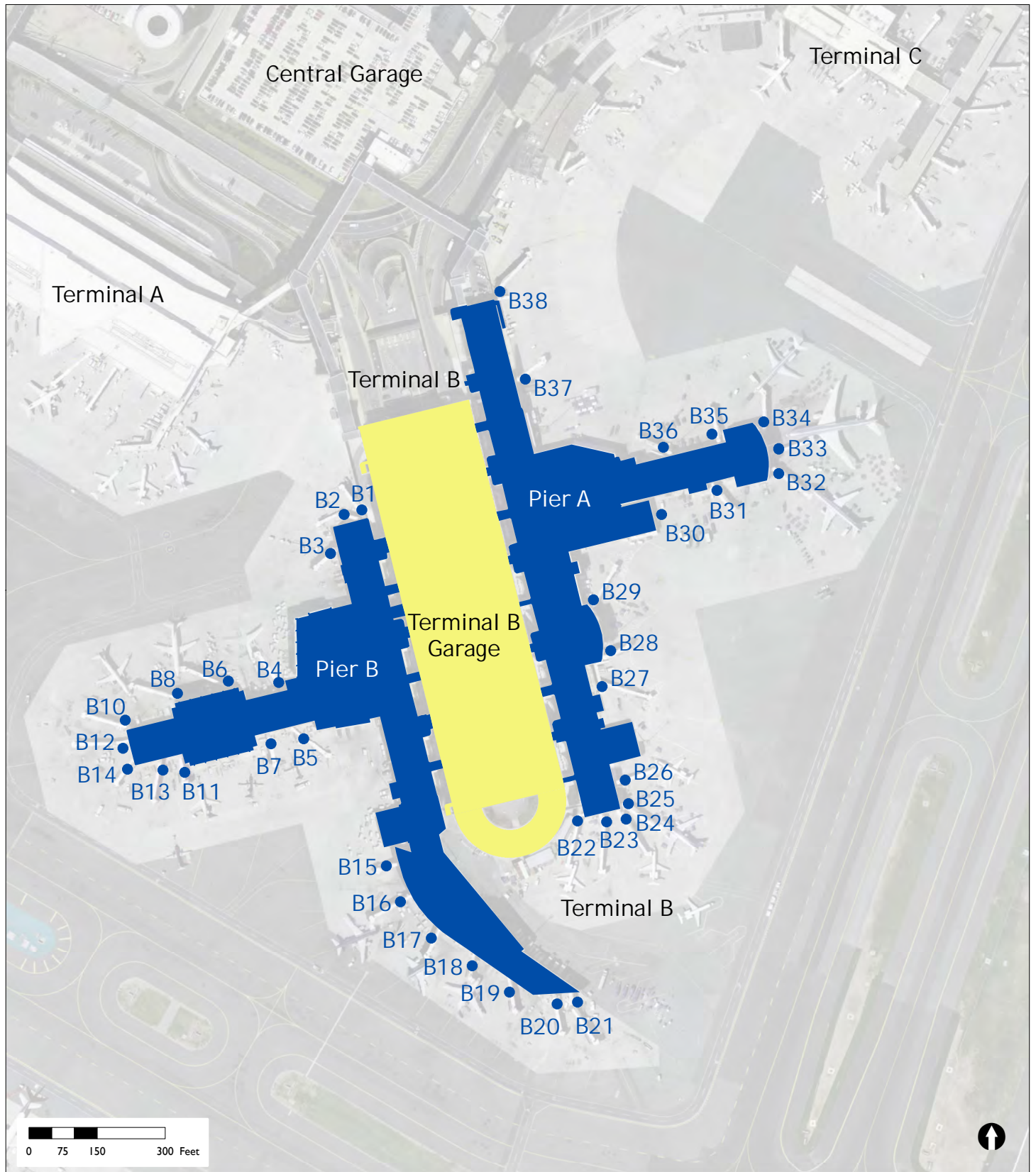
At Terminal B, Pier A, there are currently a total of 16 gates (Figure 1.3). The proposed Project is in the vicinity of eight existing gates (Gates B22 through B29) at the south end of Pier A, including four gates made available by American Airlines' reduced schedule and four gates recently vacated by American Eagle. These eight gates will be reconfigured to accommodate the United/Continental fleet that is currently operating out of Terminals C and A. No new gates are proposed; rather, the Project will reallocate flight operations among terminals. The terminal and landside facilities reconfiguration and reallocation of the gates, as part of the Terminal B Improvements, aims to return aircraft accommodation to peak utilization levels for which the terminal was redesigned in 2000 to 2002, but never constructed.

1.2.2.2 Terminal C-E Connector

The Terminal C-E Connector will provide a new post-security connection between Terminals C and E on the Departures Level running roughly parallel to the existing non-secure terminal space. This will be accomplished primarily through approximately 18,900 square feet of interior renovations to the existing building, with limited (approximately 3,500 square feet) new exterior construction. The new connector will provide jetBlue customers with a new access way to Terminal E and will include concessions, public toilets, and reconfigured office space. The Terminal C-E Connector will facilitate the Southwest/AirTran merger by allowing flexible use of the adjacent terminal spaces in Terminals C and E.

1.2.3 2001 American Airlines Terminal B, Pier A Improvements Project

Terminal B, Pier A has been the subject of several improvement project studies. The following sections describe the previously proposed projects at Terminal B, Pier A, some of which were completed and others that were not implemented.



Source(s): MassGIS 2008 15cm Aerial



Figure 1.3

Terminal B
Existing Conditions

RENOVATIONS AND IMPROVEMENTS
AT TERMINALS B AND C/E
Boston-Logan International Airport
East Boston, Massachusetts

Renovations and Improvements at Terminals B and C/E

Boston-Logan International Airport

East Boston, Massachusetts

From 1998 until 2001, Massport engaged in feasibility planning to upgrade and expand existing Terminal B, Pier A for American Airlines –the so-called American Airlines Terminal B, Pier A Improvements project. In 2001, American Airlines and Massport received clearances under NEPA from the FAA, and the Massachusetts Environmental Policy Act (MEPA) for a major expansion of Terminal B, Pier A.^{4,5} The project is no longer under consideration.

1.2.4 Post-September 11, 2001 Terminal Improvements

In response to the events of September 11, 2001, the U.S. Department of Homeland Security, along with Massport, implemented an Airport-wide hold baggage screening project to enhance hold baggage screening capabilities for outbound passengers on both international and domestic flights. Baggage screening enhancements were constructed at Terminal B as part of this initiative and were completed in 2002.

Since the American Airlines terminal expansion project was terminated, numerous terminal upgrades have been implemented at Terminal B, Pier A. These projects include:

- Terminal B connector and American Eagle gate hold renovation;
- Post-security and landside concessions improvements and public space improvements;
- Terminal B checkpoint consolidation;
- Restrooms upgrade;
- Concessions upgrade ; and
- Interior finishes and terrazzo flooring upgrade.

1.2.5 Terminal B Garage Renovation Project

In 2009, Massport began a four-year rehabilitation of the Terminal B parking garage (the “Terminal B Garage”) which is located between Piers B and A and is comprised of four levels. The project consists of completing routine maintenance and structural repairs and installing solar panels on the top parking deck and high efficiency Light-Emitting-Diode (LED) lighting throughout the structure. The installation of efficient lighting and solar panels on the roof is already reducing energy consumption and improving air quality. Construction is expected to be complete in 2015.

During 2010, the energy-related upgrades were completed. The motion-detecting LED fixtures use approximately 50 percent less electricity than the existing lighting. Additionally, the installation of 16 solar panel trees is expected to produce 2.5 percent of the total garage annual consumption. Each solar panel is a single structure design with a stem and steel frame that uses solar panels as a roof over parked cars. Each solar array is mounted on an air ventilation unit on the roof of the garage and does not affect parking operations or the number or spaces available to travelers.

⁴ Federal Aviation Administration, Categorical Exclusion determination letter dated August 24, 2000.

⁵ Certificate of the Secretary of Environmental Affairs on the Final Impact Report, Terminal B, Pier A Improvements/Satellite FIS Facility, August 17, 2001.

2

Purpose and Need

2.1 Introduction

This chapter describes the purpose and need for renovations and improvements at Terminals B and C/E (the Project). As described in Chapter 1, *Project Overview and Background*, airlines are restructuring and are forming new alliances to respond to changing economic circumstances. As a result, airports need to provide facilities that are flexible and able to accommodate evolving airline configurations, and enhance passenger convenience. In an ongoing effort to adjust to changing airline business models, Massport continues to respond by modifying and upgrading Logan Airport to meet the airlines' needs while providing facilities that improve and simplify the passenger's traveling experience. As part of this ongoing process, Massport is proposing to renovate and improve Terminal B, Pier A and provide an enhanced connection between Terminals C and E at Logan Airport.

The Project is designed to respond to recent mergers of United Airlines and Continental Airlines, and of Southwest Airlines and AirTran Airlines. While the Project is motivated by these two mergers, the Project is also part of Massport's overall goal of being able to respond to current and future changes in the airline industry. To accommodate the United/Continental combined operations, Massport proposes to modify and reconfigure Terminal B, Pier A without increasing the number of aircraft gates. The Project also includes a post-security passenger connection between Terminals C and E to better serve Southwest/AirTran through the enhancement of passenger connectivity between the terminals.

2.2 Purpose of the Project

The overall purpose of the Project is to:

- Improve passenger service and convenience.
- Improve terminal flexibility and efficiency for the airlines and Massport.
- Improve passenger connectivity between terminals.
- Reduce the number of repeat passenger screenings by the Transportation Security Administration (TSA).

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The Project includes two key elements:

- The Terminal B, Pier A Improvements; and
- The Terminal C-E Connector.

Refer to Figure 1.2 for the location of the project components within the Airport footprint. Chapter 3, *Alternatives* provides a more detailed description of the proposed renovations and improvements.

2.2.1 Proposed Terminal B, Pier A Improvements

The project will increase flexibility of the terminal through a reconfiguration of aircraft gates. The reconfiguration will accommodate increased gate hold and support space. As noted above, the existing aircraft gate count will not increase. Rather, the reallocation of airlines among terminals will make more efficient use of currently underutilized gates. The Project will return gate aircraft accommodation to utilization levels for which the terminal was redesigned and for which a determination of no significant impact was made by FAA.¹ Additionally, the proposed terminal modifications are designed, to the extent feasible, to be consistent with the terminal and gate design criteria contained in the FAA Airport Design Advisory Circular.²

The proposed Project also is designed to enhance customer service and convenience by providing a post-security terminal connection from the south end of Terminal B, Pier A to the US Airways Shuttle Concourse at Terminal B, Pier B and a post-security connection for Gates 37 and 38 at the north end of Terminal B to the main Pier A terminal near the concessions food court. These connections will provide a post-security concourse enabling passengers to circulate throughout all of Terminal B without having to go through security twice, thereby reducing the pressure on the TSA security checkpoints. Today, a passenger must leave the secure area of Pier A, cross an active roadway, circulate through the Terminal B Garage, and re-enter through security at Pier B.

2.2.2 Terminal C-E Connector

The Terminal C-E Connector will link Terminals C and E on the post-security side of the terminals to improve passenger service and convenience and more efficiently accommodate the merger of AirTran (previously located in Terminal C) with Southwest (located in Terminal E). The new connector will run almost parallel to the existing terminal and be confined to the Departures Level. The only change to the Arrivals Level is an additional structure to support the new connector above, the relocation of existing mechanical systems adjacent to an existing outbound baggage room, and vertical circulation. The new connector will provide improved passenger circulation within the post-security concourse(s), additional hold room space at Terminal E, reconfigured office space, concessions and concessions support, and a new consolidated location for escalators and stairs.

¹ As per the Federal Aviation Administration Categorical Exclusion determination letter dated August 24, 2000, no further NEPA review was required.

² United States Department of Transportation, Federal Aviation Administration, *Advisory Circular (AC) 150/5300-13, Airport Design, Changes 1 through 15*, December 31, 2009.

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2.3 Airline Industry Trends

The airline industry is in a state of flux with consolidations, new entrants, and different service models, and Massport's goal is to provide the terminal and landside facilities that are flexible enough to accommodate these changes. While the Project was developed by Massport in response to the recent airline mergers (United/Continental and Southwest/AirTran), the project will provide more flexible, connected and efficient airside facilities that will be able to accommodate other airlines tenants with diverse business requirements.

Since early 2010, several major airline mergers and an airline bankruptcy continue to affect operations at Logan Airport. The merger of Delta and Northwest, which was approved by federal regulators in October 2008, led to capacity reductions throughout the new Delta Air Lines service network. At Logan, Delta reduced scheduled seat capacity by 12.2 percent in 2009 and passengers for the combined carrier fell by 13.8 percent. However, over the same period, Logan gained two new low-cost carriers (LCC) entrants: Southwest and Virgin America. Two other LCCs, Southwest and jetBlue in particular, have sought to expand in markets like Boston, backfilling routes where legacy carriers have been scaling back capacity. Both jetBlue and Southwest aggressively expanded services at Logan in 2010. A merger agreement between United Airlines and Continental was announced in May 2010 and has resulted in Massport having to accommodate this combined airline in a convenient location. The acquisition of Air Tran by Southwest Airlines has also initiated the need to provide co-located facilities for the airlines. In addition, the recent bankruptcy filing of American Airlines will also have, as yet, uncertain ramifications for terminal use and gate utilization at Logan Airport.

The following section describes the historical terminal development of Logan Airport as a context for understanding the current and anticipated changes in the airline industry that will have to be accommodated by Massport at Logan Airport in general, and Terminal B, Pier A in particular.

2.4 Passengers and Operation Activity Levels

Massport has tracked and reported on historical passenger and aircraft operation activity levels at an airport-wide basis in the annual Logan Airport Environmental Data Reports (EDRs) and Environmental Status and Planning Reports (ESPRs), under the Massachusetts Environmental Policy Act (MEPA), for over two decades. The EDRs and ESPRs assess the impact(s) of passengers and aircraft operations on ground access, noise, and air quality conditions at the Airport. In addition, Massport plans for future airport activities by developing passenger and operations forecasts. Massport assesses terminal-specific conditions for internal planning purposes to ensure that the Airport and its facilities are functioning efficiently and effectively. The following section describes the historical passenger and operations at Logan Airport in general and at Terminal B. It also describes the configuration and use of aircraft gates.

2.4.1 Airport Passenger and Operations Activity Levels

The *Logan Airport 2010 EDR* reported on annual activity at Logan Airport in 2010, including air passengers, aircraft operations, aircraft fleet mix and cargo volumes compared to 2009 levels.³ In 2010, improvements in economic conditions led to a modest recovery in passenger levels at airports across the country. While

³ Massachusetts Port Authority, *2010 Environmental Data Report (EDR) Boston-Logan International Airport* (EEA # 3247), October 2011.

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passenger demand began to strengthen, U.S. air carriers continued to implement careful capacity management strategies. Carriers introduced service reductions through the year, eliminating less profitable routes and reducing frequencies in smaller markets. Logan Airport saw an overall increase in passengers and aircraft operations in 2010, which was due to the aggressive expansion of the LCCs, such as jetBlue Airways and Southwest Airlines; however, both passenger and aircraft operations were below the historic high levels experienced in 2006 and 2007. While the number of operations increased for the LCCs, many legacy carriers reduced services at Logan Airport.⁴ The mergers of Delta/Northwest, United/Continental, and Southwest/AirTran airlines continue to alter the operating landscape at Logan Airport.

Figure 2.1 illustrates the passenger activity levels at Logan Airport from 2005 to 2010. Significant changes in activity at Logan Airport over the past few years include the following:

- The total number of air passengers at Logan Airport increased by 7.5 percent to 27.4 million in 2010, compared to 25.5 million in 2009 and by 5.5 percent from 2010 to 28.9 million in 2011. In comparison, between 2008 and 2009 the number of air passengers using Logan Airport declined by 2.3 percent. These totals are below the historic peak reached in 2007.
- The total number of aircraft operations⁵ grew from approximately 345,310 in 2009 to 352,640 in 2010 (an increase of 2.1 percent), and to 368,987 in 2011 (an increase of 4.6 percent). This is well below the historic peak achieved in 1998. Passenger aircraft operations decreased by 1.6 percent in 2010 compared to 2009 levels.
- Compared to a decline of 48.6 percent in 2009, general aviation (GA)⁶ operations increased by 19.9 percent in 2010 and 92.3 percent in 2011, particularly as businesses increased their travel and use of GA transportation as the economy transitioned. GA accounted for 4.2 percent and 7.6 percent of aircraft activity at Logan Airport in 2010 and 2011, respectively, compared to the previous years.
- Dedicated air cargo operations decreased by 5.8 percent and 3.1 percent in 2010 and 2011, respectively, compared to the previous years.
- The number of air passengers per aircraft operation continued to increase, climbing from an average of 73.9 passengers per aircraft operation in 2009 to an average of 77.8 passengers per aircraft operation in 2010, reflecting great efficiency. Airlines at Logan are improving aircraft utilization with load factors increasing substantially.
- While legacy air carriers continued to reduce the number of aircraft operations at Logan Airport, LCC operations increased by approximately 40 percent in 2010. The increase in operations by LCCs, primarily jetBlue Airways and Southwest Airlines, accounted for nearly all of this growth.

⁴ Low-cost carriers (LCCs) serving Logan Airport in 2010 included AirTran, Frontier, JetBlue, Southwest, Spirit Airlines, Sun Country Airlines, and Virgin America.

⁵ An aircraft operation is defined as one arrival or one departure.

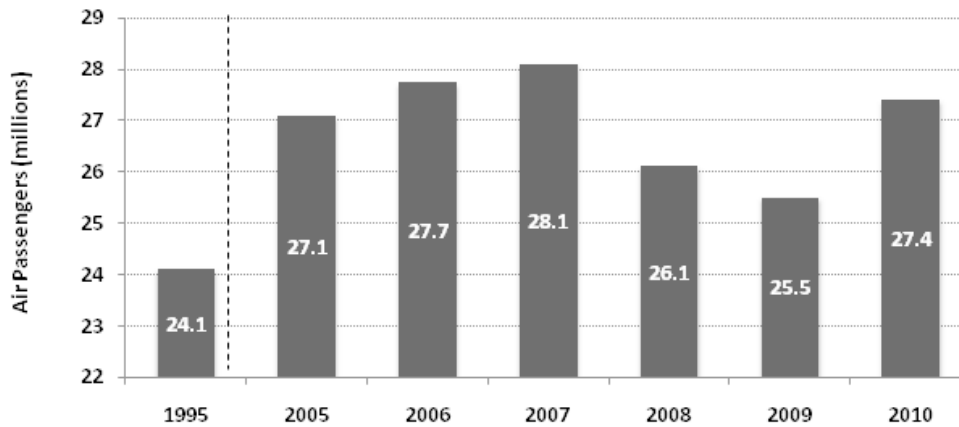
⁶ General Aviation (GA) is defined as all aviation activity other than commercial airline and military operations.

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- Air cargo volumes continued to decrease in 2011 to 529 million pounds, compared to 546 million pounds in 2010 representing a 3.1 percent decrease.

Figure 2.1 Passenger Activity Levels at Logan Airport



Source Massport and individual airport data reports.

2.4.2 Terminal Passenger and Operations Activity Levels

The following section describes the passenger and operations activity levels by terminal and provides an overview of the changing aircraft gate configuration and usage over the last decade.

2.4.2.1 All Terminal Passenger and Operations Activity Levels and Gate Configurations

In 2000, Logan Airport had five active terminals serving over 27.4 million annual passengers from 90 aircraft gates. Terminal B, with 36 jet gates, had the most gates. At that time, Terminal B accommodated operations of US Airways, American Airlines and America West. The total number of aircraft operations in 2000 was 494,800, 52 percent of which were passenger jets, two percent of which were regional jets, and the remaining 36 percent were non-jet aircraft transporting passengers.

In 2005, Logan Airport served 26.8 million air passengers. The opening of the replacement Delta Air Lines' Terminal A on March 16, 2005 changed the face of Logan Airport. The Airport now has a total of 98 contact gates compared to 90 before the redevelopment of Terminal A. Terminal A has a total of 22 contact gates,⁷ seventeen of which are leased to Delta and five of which are now leased to United/Continental Airlines.

Terminal B has a total of 36 gates in two piers. US Airways currently leases 20 contact gates at Terminal B, Pier B, the largest block of gates leased to a single airline at Logan. All of US Airways' services, including the US Airways Shuttle, operate from Terminal B. US Airways currently subleases four of its Terminal B gates to other airlines; one to Midwest and three to Air Canada. There are 16 gates at Terminal B, Pier A serving American Airlines and Virgin America.

⁷ Contact gates are those gates directly connected to the terminal via a jet bridge. The gate totals do not include hard stand positions for aircraft that parked remotely on the apron without access to jet bridges that require passengers to either walk or be transferred to the aircraft in the hard stand positions,

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Terminal C is the second largest terminal at Logan with 27 contact gates. The current leaseholders in Terminal C include United, jetBlue, and CapeAir. The former Terminal D has been integrated into Terminal C operations. Terminal E, which primarily handles international arriving flights that require federal inspection services, has a total of 13 gates serving international carriers in addition to Southwest/AirTran (previously in Terminal C).

Since the opening of new Terminal A in 2005, passengers have been accommodated at the four airport terminal. Terminal B accommodates over one-third of the passengers, followed by Terminal C with just under one-third of all Logan Airport passengers. At its peak in 2005, Terminal B served over 10 million passengers annually. Historical passenger activity levels at the terminals are shown in Table 2-1.

Table 2-1 Historical Passenger Activity Levels by Terminal

	2005	2006	2007	2008	2009	2010	2011
Terminal A	4,590,088	4,890,222	4,587,303	5,110,573	5,150,470	5,744,807	5,603,871
Terminal B	10,361,138	9,218,586	9,537,432	9,579,653	8,792,849	8,825,280	8,583,014
Terminal C	8,441,522	9,228,234	9,719,828	8,641,654	7,616,936	8,322,048	9,803,114
Terminal E	3,473,423	3,828,040	3,955,309	3,983,947	3,394,609	3,366,710	4,349,141
Total	26,866,171	27,165,082	27,799,872	27,315,827	24,954,864	26,258,845	28,339,140

Source: Massport; excludes GA and non-scheduled passengers

Terminal B, Pier A Historical Passengers and Operations Activity Levels and Gate Configurations

Reflecting nationwide trends, Logan Airport handled approximately the same passenger volume in 2010 as in 2000, but with 135,000 fewer aircraft operations. Since 2000, at Terminal B, Pier A passengers have been accommodated with increasing efficiency. Even as air passengers have increased, the number of flights has decreased due to the use of larger aircraft and more efficient passenger handling techniques. As shown in Table 2-2, in 2000, at Terminal B, Pier A there were approximately 99 passengers per flight; this increased to 111 passengers per operation in 2011 reflecting higher aircraft load factors and airline efficiencies. During the last decade the 16 gates at Pier A accommodated almost 3,000 annual operations per gate in 2000, rising to over 3,500 operations per gate in 2007 and dipping to 2,200 operations per gate in 2011. In 2007, at the peak, over 4.9 million annual passengers were served at Pier A.

Table 2-2 Terminal B, Pier A Passengers and Operations

Year	Peak Month, August			Annual			Gates
	Passengers	Operations	Passengers/ Operation	Passengers	Operations	Passengers/ Operation	
2000	445,729	7,026	63	4,421,874	44,690	99	16
2007	444,306	4,860	91	4,899,731	57,035	86	16
2011	358,749	3,040	118	3,980,343	35,760	111	16

Source: Massport

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2.4.3 Airport-wide Forecast Passenger and Operations Activity Levels

Massport is in the process of updating its passenger and operations forecast through 2030. The key trends taken into consideration in the forecasting are airline consolidations, low cost carriers driving domestic growth, a sluggish economy and high fuel prices, and the pressure of airline financial performance. The factors suggest that there will be rising aircraft load factors and a reduced role for small regional jets at Logan Airport. Massport has developed three forecast scenarios. In the Moderate Scenario, assumptions include: modest economic growth; higher fuel prices than today; and some increase in airfares. Under this scenario, Logan's passenger traffic is forecast to reach 30 million annual passengers by the end of 2012 and nearly 40 million annual passengers in 2030. These forecasts are substantially lower than those developed in 1990, when it was anticipated that by 2010 Logan airport would be serving between 37.5 million and 45.0 million air passengers. The effects of September 11, 2001 and the downturn of the economy were key factors in the revised forecast. Massport has not yet developed individual forecasts for all the terminals, but the overall forecast assumes that the air passengers could be adequately accommodated at the Airport's existing gates by relocating airlines among the terminals and making highly efficient use of gates and other facilities.

The proposed Terminal B, Pier A Improvements and the Terminal C-E Connector are part of providing the necessary facilities and infrastructure to allow for airline relocation among terminals. No new gates are proposed at any terminal; rather, airlines will be reallocated to achieve better gate utilization by their airline fleets and to facilitate more efficient passenger processing in more convenient locations.

2.4.4 Terminal B Forecast Passenger and Operations Activity Levels

As part of planning for the United/Continental merger, Massport analyzed various options for accommodating the two airlines. Consideration was given to providing co-located facilities. However, neither Terminal C (where United is located) nor Terminal A (where Continental is located) has sufficient space to meet the needs of the combined operations. The eight gates at the south end of Terminal B, Pier A are underutilized following the closure of American Eagle operations at Logan and there is an opportunity to serve United/Continental from those gates once reconfigured. The following paragraphs outlines the passenger and operations assumptions used for determining future space needs and anticipated passenger and operations activity levels at Pier A.

Based on the existing flight schedules of United and Continental, as of summer of 2011, a combined flight schedule was prepared by Massport to assist in establishing a basis for programming of terminal functions for 2013 (projected terminal opening) and 2018 (5-year milestone). This flight schedule represents passenger airline flight activity for an average day in the peak month (ADPM), and the resulting passenger numbers were further distilled to represent peak hour (PH) passenger activities. This schedule contained all of the existing flights for the two individual airlines throughout the day and, after a review of overlapping flights and the upsizing of aircraft serving the combined markets, a combined fleet mix and a corresponding peak demand period was generated. These numbers represent the maximum number of people that would travel through the United/Continental portion of the terminal during the Airport's average peak (busiest) period, and serves as the basis for the detailed terminal facility requirements. The peak period demand for the future milestone years were applied to various terminal functions in order to assess the need for additional space within Terminal B. Also, existing terminal spaces were evaluated and used to identify the need for additional space in critical areas.

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Facility requirements for the United/Continental relocation to Terminal B were developed based upon schedule-based passenger activity anticipated for the airline. These facility requirements were developed using standard planning metrics for Peak Hour Average Day Peak Month (PHADPM) passenger numbers extracted from the 2012 August (peak month) schedule. The projected 2012 August (a typically high passenger-activity month at the Airport) schedule is used to approximate the 2013 schedule for the constructed project. To account for future growth, an anticipated growth rate of 1.5 percent per year, consistent with the FAA Terminal Area Forecasts, is extended out to a design year of 2018.

The Terminal B, Pier A facility requirements include the following functions:

- Aircraft Gates
- Airline Ticketing/Baggage Handling
- Passenger Holdrooms
- Airline Club
- Baggage Claim
- Passenger Security Checkpoint
- Baggage Screening
- Public Space
- Concessions
- Other, including mechanical/electrical/utility space, non-public circulation area, janitorial/storage area, and airport maintenance/administration area.

Gate requirements were programmed based upon an aircraft fleet mix developed by United Airlines (for both United and Continental) and shared with Massport and the design team. The fleet mix was laid out on the existing and expanded apron available for improvements to the terminal southerly toward the US Airways shuttle terminal. Chapter 3, *Alternatives*, describes the design criteria and industry standards upon which alternative design concepts for the proposed improvements are based. Table 2-3 shows the anticipated peak and annual passenger and operations levels for the Project in 2013 and the design year 2018. The table shows that the proposed consolidation of facilities could be accommodated at the existing gates; however, as described in the following section, improvements to the gates and internal terminal facilities will have to be made to Pier A.

Table 2-3 Terminal B, Pier A Forecast Passengers and Operations (with the Project)

Year	Peak Month, August			Annual			Gates
	Passengers	Operations	Passengers/ Operation	Passengers	Operations	Passengers/ Operation	
2000	445,729	7,026	63	4,421,874	44,690	99	16
2007	444,306	4,860	91	4,899,731	57,035	86	16
2011	358,749	3,040	118	3,980,343	35,760	111	16
2013	703,500	5,460	129	7,793,845	60,417	129	16
2018	790,680	6,129	129	8,759,682	67,905	129	16

Source: Massport; forecast derived from 2012 peak day schedule of combined United/Continental fleet, plus 2012 American Airlines schedule.

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Table 2-3 shows the anticipated peak month and annual passenger and operations levels for 2013 and for the design year 2018, including combined United/Continental operations. From a planning perspective, the key timeframe to consider is the peak period. During the peak month of August, there are actually fewer predicted aircraft operations in 2013 and 2018 than were recorded in 2000. This is due to the near elimination of regional jets in the fleet and the additional narrow-body aircraft in the United/Continental fleet. Table 2-3 also shows that the proposed consolidated flight operations could be accommodated at the existing gates at peak times, but, due to higher load factors and the more efficient use of planes, more passengers will have to be accommodated in fewer aircraft operations at the same number of gates. Therefore, as described in the following section, improvements to the terminal facilities and the curbs will have to be made to enhance the functioning of Pier A in terms of passenger processing and handling.

2.5 Need for the Project

Massport must continue to provide flexible and convenient facilities for its tenants and users. Based on an understanding of the changing airline industry and specific terminal configurations at Logan Airport, the following section describes the need for the proposed action. The Terminal B Improvements and the Terminal C-E Connector projects began with an airside and terminal analysis undertaken to explore opportunities for flexibility and connectivity, primarily in response to the major airline mergers. Logan Airport consists of four airline terminals essentially isolated from each other on the airside. This arrangement is an impediment to flexibility of gate allocation at any of the individual terminals, a flexibility required by the commercial airlines in today's aviation market. These airline mergers present Massport with the need to connect the terminals, thus allowing flexibility for growth beyond the borders currently existing between terminals.

2.5.1 Need for the Terminal B, Pier A Improvements

United Airlines currently operates from Terminal C and the former Continental Airlines (now branded as United) currently operates from Terminal A. Neither Terminal C nor Terminal A can accommodate the combined operations of United/Continental. Due to reduced operations by existing tenants (American Airlines) in Terminal B, Pier A, and with the proposed renovations and improvements, United/Continental could be accommodated in Terminal B, Pier A. The relocation of United/Continental to Terminal B will require reconfiguration of Pier A toward Pier B to accommodate passenger processing and enhancing utilization of existing gates. The existing gate placement and hold room limitations will simply not accommodate the airline relocation of the United /Continental Airline merger.

While the existing terminal has eight available gates at the south end of Pier A, they have been most recently used for smaller Regional Jets, operated by American Eagle. United/Continental operates predominantly narrow-body aircraft (A-320s and B-737-900s) and large narrow-body aircraft (B-757s) out of Logan Airport. To accommodate these aircraft, the existing gate areas must be reconfigured to provide larger passenger holdrooms, expanded baggage handling facilities, and more airline operations space than is currently available at Terminal B, Pier A. The Terminal B, Pier A Improvements project includes renovation of approximately 78,800 square feet and expansion of Pier A by approximately 84,000 square feet of new construction.

Since the completion of the Logan Modernization Program in 2005, Logan Airport has continued to experience strong growth, providing mounting pressure on terminal facilities that were designed and constructed to

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operate under a now-outdated airline operational model. As the Airport has moved into the 21st century, airline industry changes have demonstrated the need for a cohesive post-security facility. Currently there is no post-security-side connectivity between the two piers of Terminal B. Today, the passenger must leave the secure area of Pier A, cross an active roadway, circulate through a parking garage and re-enter through security at Pier B. A passenger must also leave the secure area of Pier A and re-enter through a secondary security checkpoint to access Gates 37 and 38 at the north end of Pier A. The Project would allow for connectivity on the airside between both piers at Terminal B.

In addition, as described in Chapter 3, *Alternatives*, the existing layout of the terminal has not keep pace with the most current industry standards for new terminal design and sizing. The Project would respond to a need to bring the terminal facilities up-to-date. While these improvements would accommodate the specific needs of United/Continental Airlines, they would also provide added flexibility to accommodate future industry changes and airline realignments.

2.5.2 Need for the Terminal C-E Connector

With the recent merger of AirTran (previously located in Terminal C) and Southwest (located in Terminal E) there is a need to provide more convenient facilities on the post-security side of the terminals to improve passenger service and convenience. The Connector will also support the new Japan Airlines codesharing agreement with jetBlue in Terminal B.

2.6 Conclusion

The Project is intended to provide greater flexibility in terminal facility usage and enhanced passenger experience to accommodate current and future changes in the airline industry. The relocation of United/Continental to Terminal B will require reconfiguration of Pier A toward Pier B, and enhanced passenger handling facilities. Similarly, the Southwest/Airtran merger and expansion will require more conveniently located post-security facilities. These mergers will transform terminal operations, providing needed post-security airside connectors between Terminal B, Piers A and B, and between Terminals C and E.

The terminal and landside facilities reconfiguration and gate reallocation, as part of the Terminal B Improvements, aims to return aircraft accommodation to peak utilization levels for which the terminal was redesigned in 2000 to 2002, but never constructed.

3

Alternatives

3.1 Introduction

As required by the National Environmental Policy Act (NEPA), this chapter describes the process undertaken by Massport to identify reasonable and feasible alternatives evaluated for the Project and summarizes these alternatives, including the No-Build/No-Action Alternative. The previous chapters describe the need for the project to provide flexibility and connectivity in the terminal area to accommodate changing airline needs. Two groups of alternatives are presented for the Terminal B, Pier A Improvements and Terminal C-E Connector components.

While flexibility and connectivity are the over-arching goals of the project, one key near-term need is to accommodate the recent merger of United/Continental and facilitate their joint operations. This relocation will shift aircraft that currently operate at Terminals A and C to Terminal B, Pier A. Existing Terminal B, Pier A has a total of 16 gates; the proposed project focuses on the eight gates at the south end of Pier A. These gates have most recently handled narrow-body aircraft (Airbus-320s and Boeing 737-900s) and smaller regional jets. United/Continental operates predominantly narrow-body and large narrow-body aircraft (B-757s) that require larger passenger holdrooms, expanded baggage handling facilities, and more airline operations space than is currently available at Terminal B.

In the fall of 2010, Massport initiated a feasibility study that analyzed the existing facilities and building systems, including the evaluation of several alternative concepts for accommodating United/Continental. All alternatives studied provide new passenger holdrooms and an extended public concourse, located in space connecting the existing Pier A to the US Airways shuttle terminal, and post-security-side connections between the two piers of Terminal B. The key differences among the Terminal B, Pier A alternatives relate to the internal and external layout, the ability to accommodate passengers, and the cost. First, Massport evaluated a set of preliminary alternatives that have common features and programming, and all of which adequately met the functional needs of the United/Continental operations, but were deemed too high in cost. The high cost estimates of the preliminary alternative schemes led to the development of Alternative 2, which included a significant reduction in cost, but did not work functionally or meet the design criteria. Alternative 3, the Proposed Action, was developed as a way to meet all functional and budget requirements. All alternatives affect previously developed land within the Airport boundary and, therefore, have very similar and minimal

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environmental impacts. From a potential environmental impact perspective, there is very little difference across all of the alternatives; eliminating alternatives due to cost does not increase impacts.

The Terminal C-E Connector alternatives examined different configurations for linking the two terminals to allow for maximum flexibility in the use of the airside facilities. Both alternatives affect only previously developed airside apron area.

3.2 Planning Metrics, Facility Requirements, and Design Assumptions

This section provides an overview of the planning standards and requirements that guide the development of the proposed terminal improvements. Consideration is given to Federal Aviation Administration (FAA), Transportation Security Administration (TSA), and Department of Homeland Security (DHS) guidance, industry best practices, Massport's internal requirements, airline needs, and Project-specific parameters. The alternatives were evaluated according to the ability to meet the project purpose and need (i.e., functionality) as well as practical considerations, such as cost, implementability, and constructability. The purpose of the Project is to:

- Improve passenger service and convenience.
- Improve terminal flexibility and efficiency for the airlines and Massport.
- Improve passenger connectivity between terminals.
- Reduce the number of repeat passenger screenings by the TSA.

3.2.1 Planning Metrics

Over the past several decades, specific planning metrics have evolved within the airline planning community and the FAA and TSA that define various terminal functions (i.e., number of ticketing positions and queuing, throughput rates and passenger screening requirements at security checkpoints, the loading factor of gated aircraft and their impact on the size of the gate hold areas and number of seats provided, baggage claim frontage and queuing, and various other terminal support spaces). Airlines have also developed their own specific planning metrics based on their business models. Specifically, the FAA Advisory Circular 150/5360-7, *Planning and Design Considerations for Airport Terminal Building Development* provides guidance in the design of airport terminals, primarily non-hub, or Origin & Destination (O&D) airports (such as Logan Airport), given their uniform characteristics.¹ As the guidelines for O&D airports are general in nature, the principles still apply to terminal development and are utilized for general planning parameters in the proposed Terminal B Improvements.

In 2000, Massport also adopted its own terminal planning guidelines that were utilized for the design and construction of the new Terminal A for Delta Airlines. These guidelines, in conjunction with standard industry practices and airline standards, have guided terminal planning at Logan since their adoption.

¹ Federal Aviation Administration, Advisory Circular 150/5360-7, *Planning and Design Considerations for Airport Terminal Building Development*, April 22, 1988.

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3.2.1.1 Sustainability Standards and Guidelines

In June 2009, Massport developed the Logan Airport Sustainable Design Standards and Guidelines for projects in Massport's Capital Program.² These guidelines are one component of Massport's overall sustainability program, which include diverse sustainability initiatives ranging from facilities maintenance to innovative partnerships and public incentives. The standards are tailored to Massport's operations, facilities, and geography, and are intended to be used by architects, engineers, and planners working on capital projects for Massport. The standards apply to both new construction and rehabilitation projects (building and non-building) of any square footage or monetary value and may also be used on tenant alterations or development projects on Massport property.

3.2.2 Facility Requirements

The following sections discuss the facility requirements to accommodate airline mergers and ongoing changes at Logan Airport.

3.2.2.1 Passenger Terminal Facility Requirements

Terminal space programming was undertaken to establish gross size requirements for various functional components of the terminal facilities necessary for efficient future airport operations. While specific terminal facility requirements have not yet been finalized, the conceptual layouts undertaken to date have been based on a set of requirements sufficient to assess alternatives.

As discussed in Chapter 2, *Purpose and Need*, for planning purposes a combined flight schedule was prepared based on the existing schedules of United/Continental to assist in establishing a basis for programming of terminal functions for 2013 (estimated project completion) and 2018 (design year). These numbers represent the maximum number of people traveling through the reconfigured portion of Terminal B during the Airport's average peak (busiest) period, and serves as the basis for the detailed terminal program requirements.

Space requirements for Terminal B are a function of variables unique to Logan Airport as an O&D airport. Generally, Logan Airport and Terminal B have heavy peaking activities during the early and mid-morning period and again during the late afternoon and evening periods. Airline schedules and operating characteristics, peaking characteristics, and airport supporting activities are all important factors used to determine space requirements. Peak hour passenger activities, however, play the key role in determining most of the minimum space requirements. Departure peaks affect the needed size of critical passenger processing areas such as ticketing, checkpoints, outbound bag rooms, passenger holdrooms, and most concessions areas – especially secure-side concessions; while arrival peaks determine the needed size of bag claim areas, and even impact toilet room fixture counts. TSA baggage screening areas are required to be designed in accordance with DHS guidelines and design standards, including *Recommended Security Guidelines for Airport Planning, Design, and Construction* and *Security Checkpoint Layout Design/Reconfiguration Guide*.^{3,4}

² Massachusetts Port Authority. *Logan Airport Sustainable Design Standards and Guidelines – Version 1*, June 2009.

³ Transportation Security Administration, *Recommended Security Guidelines for Airport Planning, Design, and Construction*, May 1, 2011.

⁴ Transportation Security Administration, *Security Checkpoint Layout Design/Reconfiguration Guide*, March 10, 2011.

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Passenger waiting areas, or holdrooms, are based on the different aircraft types at the terminal gates and average seating capacity of aircraft serving each gate. The holdroom area was calculated for planning purposes based on observed behavior of passengers at the Logan domestic terminals. This approach yields somewhat smaller, but more efficient holdrooms than typically planned for domestic terminals (accommodating 80 percent of the capacity of the largest aircraft type to serve each gate). For the Project, it was assumed that 60 percent of the passengers are provided with seating, with 20 percent standing room assuming that the remaining 20 percent will be elsewhere in the terminal, typically at a food court or concessions near or adjacent the holdroom. Table 3-1 summarizes the key aircraft gate and passenger terminal area facility program requirements compared to what currently exists in Terminal B.

Table 3-1 Terminal B, Pier A Improvements Project Space Program Facility Requirements¹

Building Use	Existing	Required
Aircraft Gates ²	8 gates	8 gates
Airline Processor Areas ³	9,837 sf	22,520 sf
Baggage Make-up Area	5,624 sf	18,000 sf
Passenger Holdroom	16,300 sf	23,600 sf
Baggage Claim Area	9,362 sf	10,515 sf
Passenger Security Checkpoint	6,000 sf	13,600 sf
Baggage Screening	5,100 sf	14,500 sf
Concessions	4,375 sf	6,400 sf
Public Space ⁵	31,250 sf	46,880 sf
Other ⁶	13,355 sf	35,855 sf
Total Building Area	101,203 sf	191,870 sf

sf Square Feet

1 Based on industry standards

2 Includes Gates B23 through B30; Gates 37 and 38 are part of the connectivity element of the Improvement Project.

3 Areas in which airline personnel work to conduct airline passenger and support functions.

4 Require reconfiguration for additional flexibility

5 Include public seating areas (located near the ticket lobby, baggage claim, concessions areas, and public corridors, all in non-secure areas of the terminal), restrooms (non-secure and secure), public space (non-revenue producing areas).

6 Includes mechanical/electrical/utility space, non-public circulation area, janitorial/storage area, and airport maintenance/administration area.

3.2.2.2 Gate Requirements

There are currently eight existing gates (B22 through B29) at the south end of Pier A, which will be reconfigured to accommodate the United/Continental aircraft fleet that is currently operating out of Terminals C and A. The downsizing of four gates by American Airlines in conjunction with the vacated American Eagle terminal space consisting of four gates provides a total of eight gates for use by the combined United/Continental operations. No new gates are proposed as part of the Project. Using the assumed aircraft gate and parking positions, Massport analyzed multiple scenarios attempting to optimize aircraft combinations on the available space and provide flexibility for future operational conditions.

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Four alternate layouts for the eight reconfigured gates were explored, and a favored layout was selected as the preferred option for holdroom plan development. The first step in identifying the gate programming (aircraft gate allocation and parking position layouts) is the determination of an aircraft fleet mix and the total number of aircraft that will be required to be serviced concurrently. In order to determine the fleet mix and total number of aircraft, the combined airline schedule for United/Continental (for the peak demand period) was reviewed. In addition, Massport evaluated the inclusion of Boeing 787 aircraft. The peak period used for the analysis corresponded with the eight late arrivals that remain overnight at the gates for morning departure. This peak period includes three B-737, two B-757, and three A-320 aircraft. Using these aircraft and incorporating B-787 aircraft, airplane parking scenarios were developed. For all of the Project alternatives, the following assumptions were used:

- The existing number of gate locations are retained, but are repositioned to better accommodate operations.
- Assumed A320-200 series, B757-300 series, B737-900 series aircraft all with winglets.
- Aircraft noses are no closer than 40 feet to the terminal face and wingtips are no closer than 20 feet.
- All ground service equipment (GSE) equipment was included for each specific plane.
- Three vehicle service roads were provided for baggage movement.

In addition to analyzing aircraft parking positions adjacent to the terminal, the parking positions were evaluated in relation to the various FAA surfaces to determine if any aircraft components, specifically the tail height, penetrated these surfaces.

3.2.2.3 Fueling Systems

Logan Airport currently utilizes an aircraft hydrant fueling system that provides Jet-A fuel to the majority of aircraft parking gates through the use of fueling hydrants. Based on the location of the existing hydrants versus the proposed parking positions, several of the repositioned gates will require new hydrants to be constructed. The final location of fuel hydrants will be determined during final design and will be located to serve multiple aircraft if possible.

3.3 Project Alternatives

The following sections describe the build alternatives for each Project component – the Terminal B, Pier A Improvements and Terminal C-E Connector – and the No-Action/No-Build Alternative. Both the Terminal B, Pier A alternatives and the Terminal C-E Connector alternatives are located in areas previously developed for airport purposes that are fully paved with impervious cover either by buildings or the apron area. Each of the alternatives include a portion of internal renovation and external construction that converts airside pavement/apron area to the terminal footprint. All the Terminal B, Pier A alternatives retain the existing door locations on the curb and, thus, have the same curbside passenger loading and curbside operations. In addition, all of the alternatives have the same aircraft use/gate configurations. The key differences among the Terminal B, Pier A alternatives relate to the internal and external layout, ability to accommodate passengers and cost. Common to all of the alternatives evaluated, a new Checked Bag Inspection Services (CBIS) is proposed at the southerly end of the terminal. There are essentially no environmental differences between the alternatives that would affect the overall environmental consequences of the project.

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3.3.1 No-Action/No-Build Alternative

The following describes the 2013 No-Action/No-Build Alternative for each Project component.

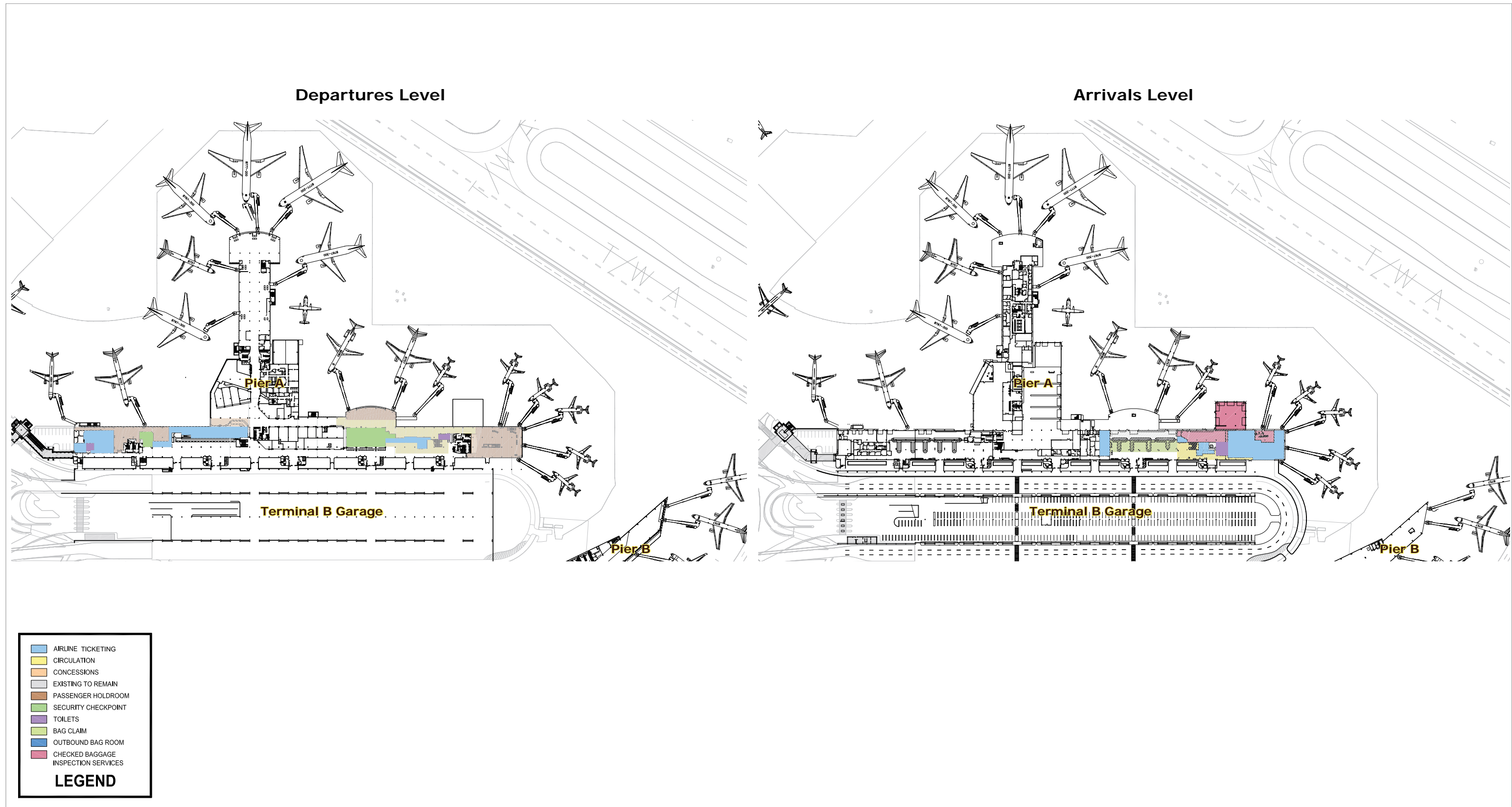
3.3.1.1 Terminal B, Pier A Improvements

Terminal B is currently comprised of two individual piers (Pier A constructed in 1975 and Pier B constructed in 1974), which are separated by the shared Terminal B Garage. Refer to Figure 3.1 for the existing Terminal B, Pier A departures and arrivals levels. The terminal has remained largely unchanged until the US Airways expansion, which was constructed in 1980. From 1980 until 2000, numerous small projects including gate hold improvements, concessions expansions, and passenger lounges were completed at both piers.

The 2013 No-Action/No-Build Alternative would essentially leave Terminal B, Pier A as it currently exists and may include cosmetic upgrades to the terminal or energy-related upgrades as part of Massport's ongoing sustainability initiatives. Additionally, internal renovations/modifications, such as improving connectivity of Terminals B and C as part of Massport's ongoing maintenance and facility upgrades of all terminals, may take place. There would be no significant gate changes under the No-Action/No-Build Condition.

Independent of this project, a key change to airport-wide vehicular circulation is the pending implementation of the Unified Bus System as part of the completion of the Consolidated Rental Car (ConRAC) facility in the Southwest Service Area (SWSA). The Unified Bus System consists of a consolidated rental car shuttle bus fleet combined with some existing Massport bus routes and the utilization of clean diesel-electric hybrid vehicles. Implementation of the Unified Bus System will reduce trips from the individual rental car shuttle bus fleets and Massport bus routes thus improving curbside traffic at all terminals. No other ongoing projects are currently anticipated as part of a future No-Action/No-Build Alternative.

The No-Action/No-Build Alternative for the Terminal B, Pier A Improvements does not address the Project goals and objectives as discussed in Chapter 1, *Project Overview and Background*, or the Project purpose and need presented in Chapter 2, *Purpose and Need*. The No-Action/No-Build Alternative would not allow for the combined operations of United and Continental in a single location; the airline operations would be separated unless American moved elsewhere. Massport has determined that the relocation of three airline operations (United, Continental, and American) versus two (United and Continental) would be too disruptive to airline operations and the passengers and is too costly. The No-Action/No-Build Alternative would result in inefficient operations, passenger inconvenience, and additional crowding at Terminals B and C. Under the future No-Action/No-Build Alternative, the combined United/Continental operations would not be possible. With American Eagle service ending and American Airlines reducing flights, if United/Continental did not relocate to Terminal B, Pier A, the terminal would be underutilized and, ultimately, would likely be re-occupied by some other airline operation in the future. Without renovation and expansion of Terminal B, Pier A, gate reconfiguration, and passenger connection improvements, the Airport could not efficiently accommodate the recent airline mergers and various changes in operations now or in the future.



Source(s): AECOM



Figure 3.1
Terminal B, Pier A Existing Conditions

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Renovations and Improvements at Terminals B and C/E

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3.3.1.2 Terminal C-E Connector

Under the future No-Action/No-Build Alternative for the Terminal C-E Connector, the terminals would not be linked post-security and, thus, recently merged airlines and airlines that merge in the future would have flexibility in baggage and passenger handling. Figure 3.2 shows the current configuration of Terminals C and E. Therefore, the No-Action/No-Build Alternative for the Terminal C-E Connector does not address the Project goals and objectives as discussed in Chapter 1, *Project Overview and Background*, or the purpose and need presented in Chapter 2, *Purpose and Need*.

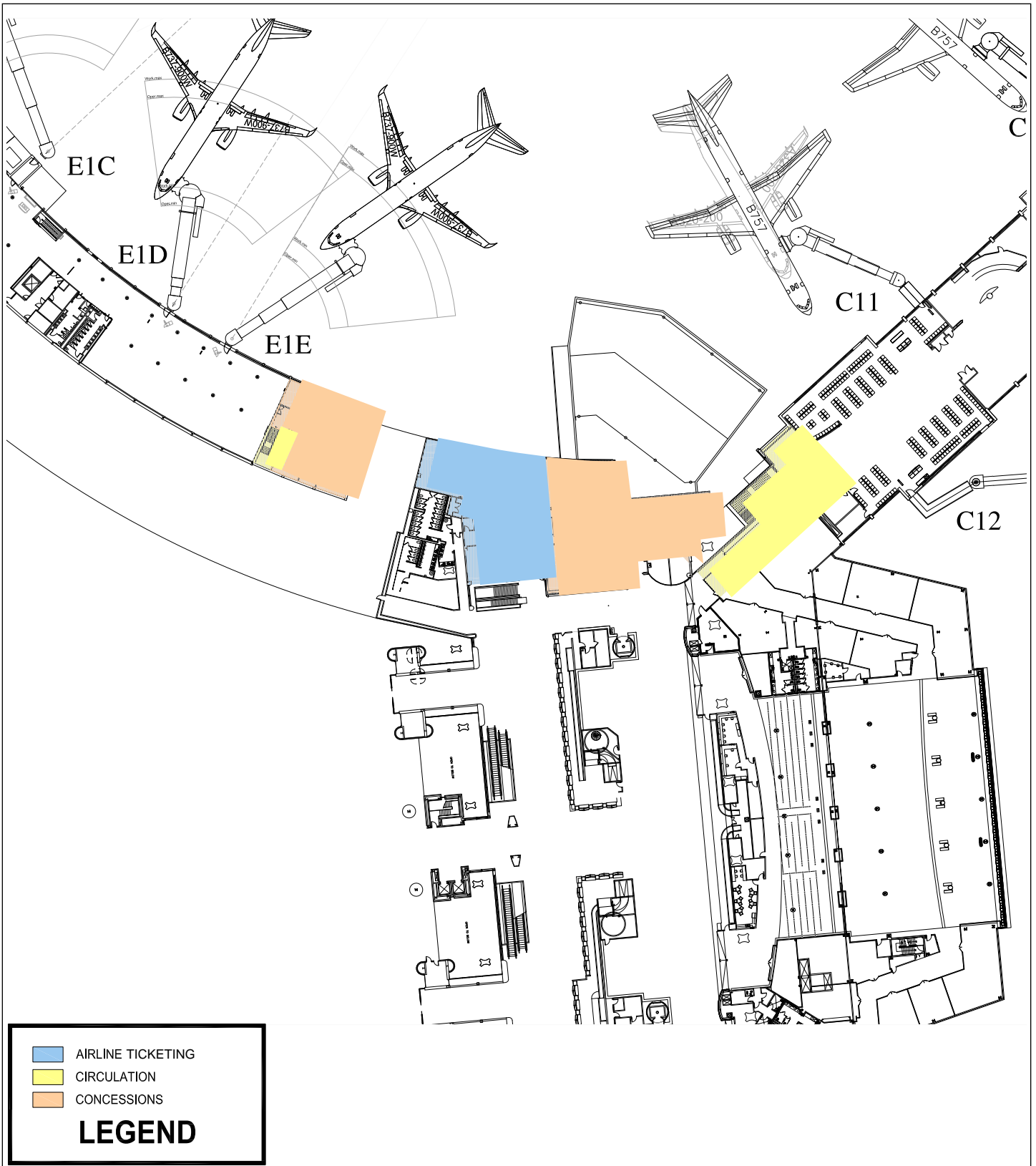
3.3.2 Terminal B, Pier A Improvements Alternatives

Initially, three preliminary options for the terminal improvements were developed. Financial constraints rendered all of the Alternative 1 schemes infeasible, leading to a much lower cost option (Alternative 2). Alternative 2 represents a radical departure from previous schemes due to the reduced cost, but it does not adequately meet Massport's programmatic needs. Alternative 3, the Proposed Action, was ultimately developed and addresses identified shortcomings of Alternative 2. Refer to Figure 3.3 for the project alternatives flow diagram. From a potential environmental impact perspective, there is very little difference across all of the alternatives; eliminating alternatives due to cost does not increase environmental impacts.

3.3.2.1 Terminal B, Pier A Preliminary Build Alternatives (Alternatives 1A, 1B and 1C)

The preliminary alternatives 1A, 1B, and 1C are shown in Figures 3.4A, 3.4B, and 3.4C, respectively. These alternatives resemble one another in overall plan form, but differ in small, incremental improvements concerning placement and adequacy of circulation behind the passenger checkpoint, airline ticket office depth behind ticketing, location of vertical circulation cores, reuse of existing public restrooms, location and configuration of retail and concessions spaces, and costs. Generally, these three options represent improvements in circulation, efficiency, and passenger convenience, which lead to the development of Alternative 1C, which initially was a preferred option for advancing the terminal design. Table 3-2 compares the preliminary build alternatives and discusses the rationale for dismissal of the each alternative.

While it was determined that the preliminary Alternatives 1A, 1B, and 1C met the stated program requirements, a cost estimate based on the conceptual plan of approximately \$128 million was deemed not financially viable. Therefore, these alternatives were dismissed from further consideration.



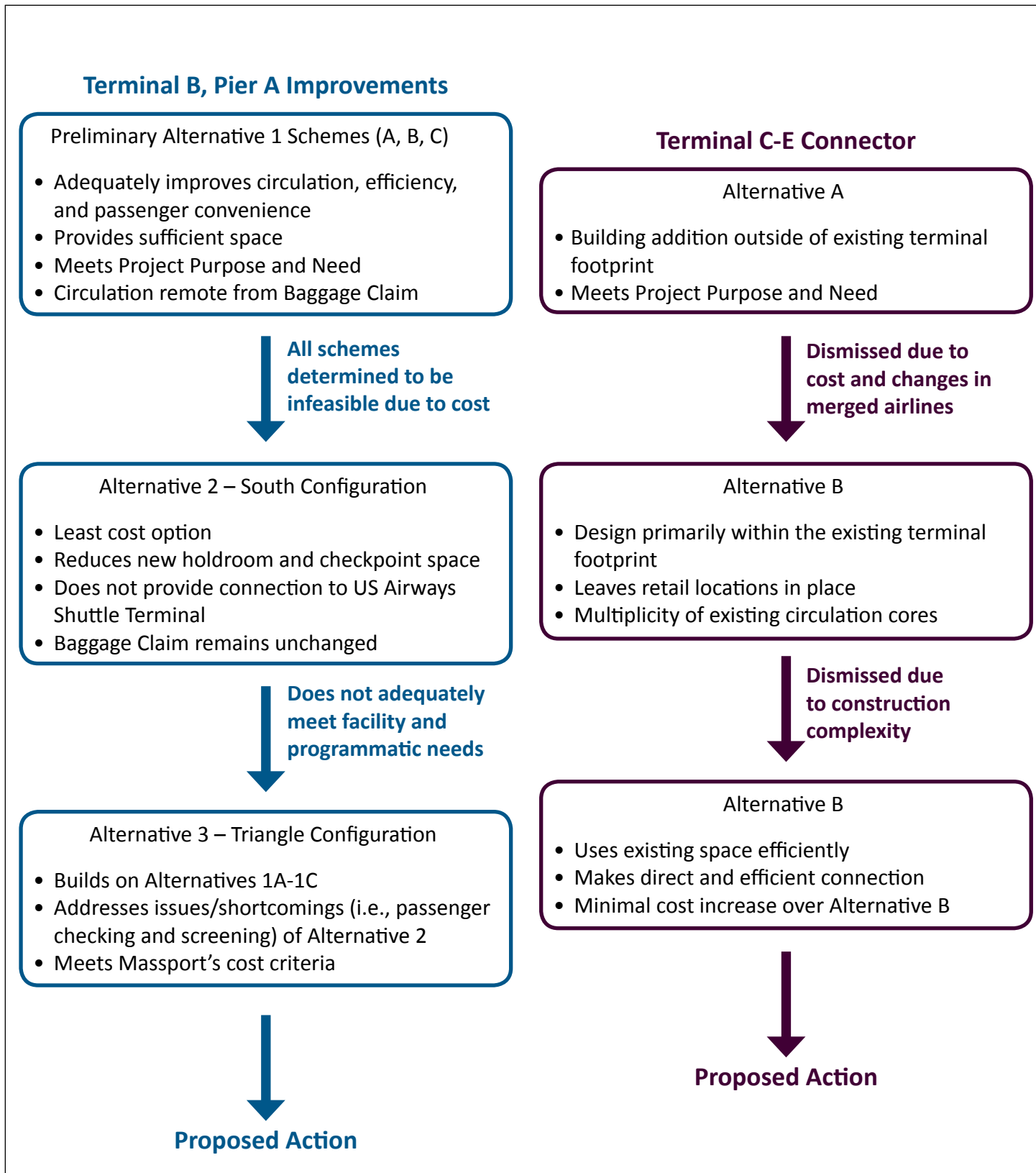
Source(s): AECOM



Figure 3.2

Terminal C-E Connector Area
Existing Conditions

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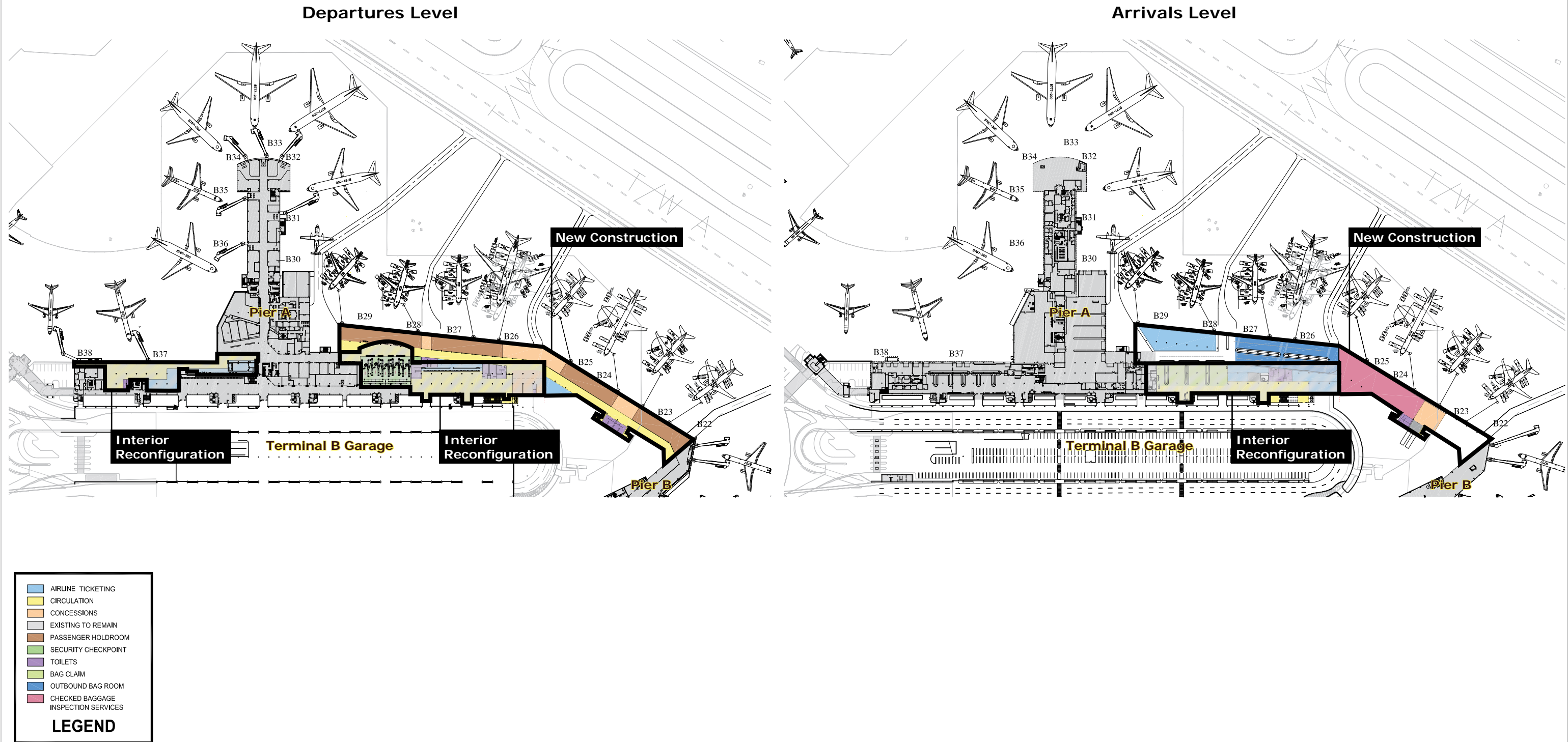
Source(s):AECOM



Figure 3.3

Project Alternatives Selection Process

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Source(s): AECOM



Figure 3.4A
Terminal B, Pier A Improvements
Alternative 1A
Bent Bar Configuration

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Renovations and Improvements at Terminals B and C/E

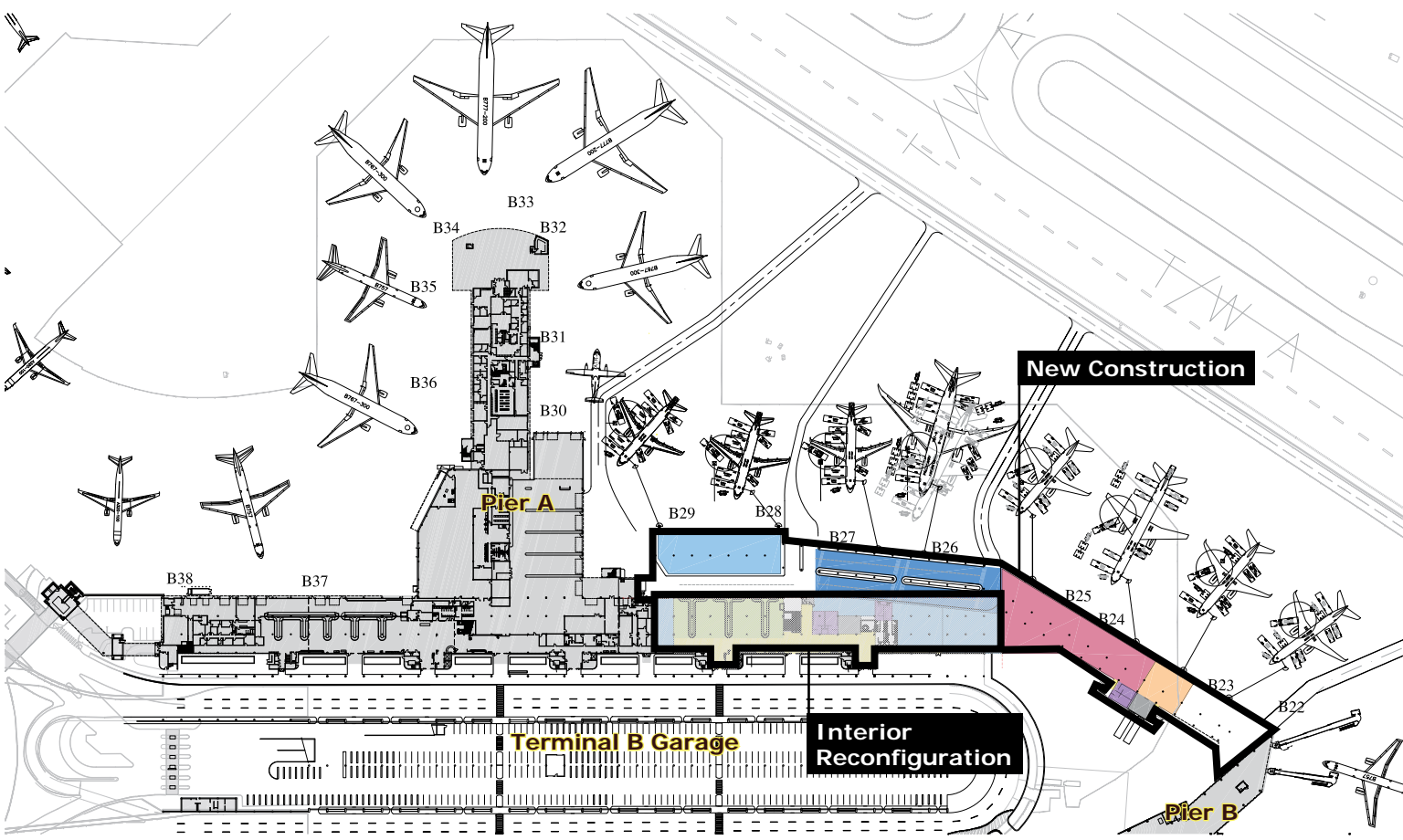
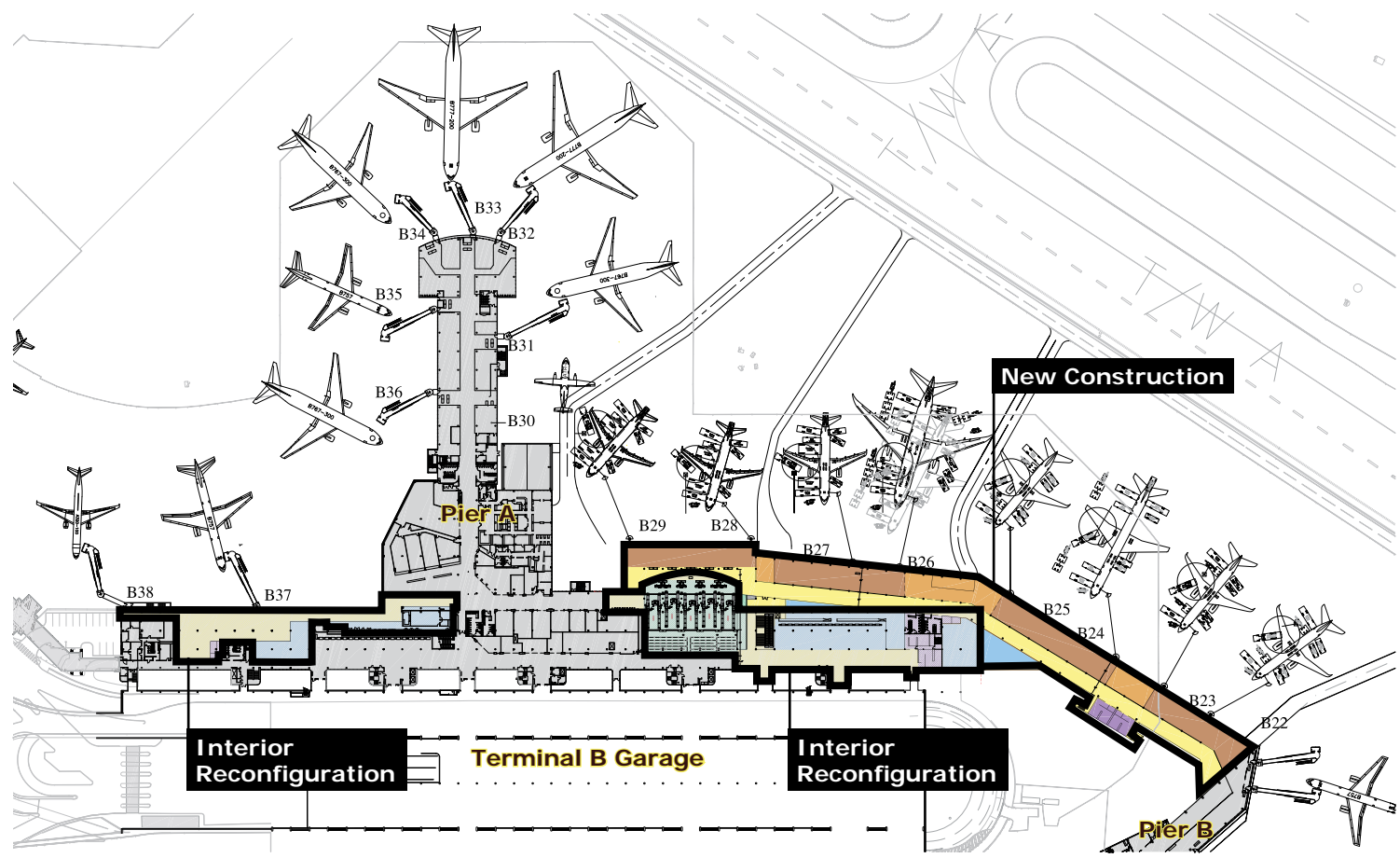
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Departures Level

Arrivals Level



LEGEND

- AIRLINE TICKETING
- CIRCULATION
- CONCESSIONS
- EXISTING TO REMAIN
- PASSENGER HOLDROOM
- SECURITY CHECKPOINT
- TOILETS
- BAG CLAIM
- OUTBOUND BAG ROOM
- CHECKED BAGGAGE INSPECTION SERVICES

Source(s): AECOM



Figure 3.4B
Terminal B, Pier A Improvements
Alternative 1B
Staggered Bar Configuration

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AT TERMINALS B AND C/E
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Departures Level

Arrivals Level



	AIRLINE TICKETING
	CIRCULATION
	CONCESSIONS
	EXISTING TO REMAIN
	PASSENGER HOLDROOM
	SECURITY CHECKPOINT
	TOILETS
	BAG CLAIM
	OUTBOUND BAG ROOM
	CHECKED BAGGAGE INSPECTION SERVICES

LEGEND

Source(s): AECOM



Figure 3.4C
Terminal B, Pier A Improvements
Alternative 1C
Curved End Configuration

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Table 3-2 Terminal B, Pier A Improvements: Comparison of the Preliminary Alternatives

Preliminary Alternative	Alternative 1A ¹	Alternative 1B ²	Alternative 1C ³
Terminal Configuration	Bent Bar	Staggered Bar Configuration	Curved End Configuration
Size	103,200 square feet of new construction; 95,400 square feet of interior renovation	106,000 square feet of new construction; 96,500 square feet of interior renovation	95,900 square feet of new construction; 101,500 square feet of interior renovation
Key Design Features/Differences	<ul style="list-style-type: none"> - Holdrooms and concourse located in simple bent bar configuration - Consolidates passenger processing (10-lane checkpoint) - Ticketing hall provides increase in queue depth and ATO space - Airline club has airside views - Concessions & food court centrally located at bend in concourse - New truck dock & commissary serve both sides of Terminal B - Allows for connection to US Airways Shuttle Terminal 	<ul style="list-style-type: none"> - Hold room at B28 & B29 offset toward airside; increased depth at checkpoint - Vertical circulation close to checkpoint and bag claim - Concessions located on airside - Airline club opposite facing 'infield' - New truck dock & commissary 	<ul style="list-style-type: none"> Departures level plan of Alternative 1B was refined through reconfiguration of the holdroom profile behind the checkpoint - Lens-shaped space (radiused edge) was designed Little to no changes were made to the arrivals level plan - Separate elevator/stair core absorbed into hold room zone - Truck dock relocated under building
Pros	<ul style="list-style-type: none"> - Meets Purpose & Need - Provides sufficient space - Is a straight-forward design 	<ul style="list-style-type: none"> - Provides increased depth at checkpoint and queue - Reduced public circulation - Greater area for airline operations - Consolidated public toilets 	<ul style="list-style-type: none"> - Provides a smooth transition/ improved public circulation behind checkpoint - Allows greater depth of ATO space
Cons	Passenger circulation space is remote from the baggage claim area	The shape of the holdroom creates hard corners and jogged movements	<ul style="list-style-type: none"> - Reduced hold room width - Best plan, but highest cost
Rationale for Dismissal	Too costly	Too costly	Too costly

1 See Figure 3.4A

2 See Figure 3.4B

3 See Figure 3.4C

3.3.2.2 Terminal B, Pier A Improvements Alternative 2 - South Configuration

Because financial constraints rendered all of the Alternative 1 schemes infeasible, a much lower cost option was developed and evaluated (Alternative 2). Alternative 2 includes approximately 59,800 square feet of new construction (almost half of the amount of new construction proposed for Alternatives 1A-1C) and 47,600 square feet of interior renovated area.

The costly elements and features within Alternative 1C were re-evaluated in an effort to develop more affordable alternatives. Alternative 2, as presented in Figure 3.5, was developed to illustrate what could be built for an approximately \$60 million budget. Several measures were undertaken to curtail costs, including the following reductions to plan areas and previous program requirements:

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- Do not expand passenger checkpoint
- Do not relocate existing escalators and stair
- Do not relocate existing toilet rooms
- Expand ticketing hall to the extent possible within existing available area
- Reduce concourse and holdroom dimensions from those of previous options
- Eliminate proposed new truck dock, commissary, and service elevator,
- Retain existing outbound bag room, and provide additional bag room expansion to the south
- Retain existing inbound bag room – no expansion of existing
- Renovate existing operations and office spaces – expand into existing bag screening space

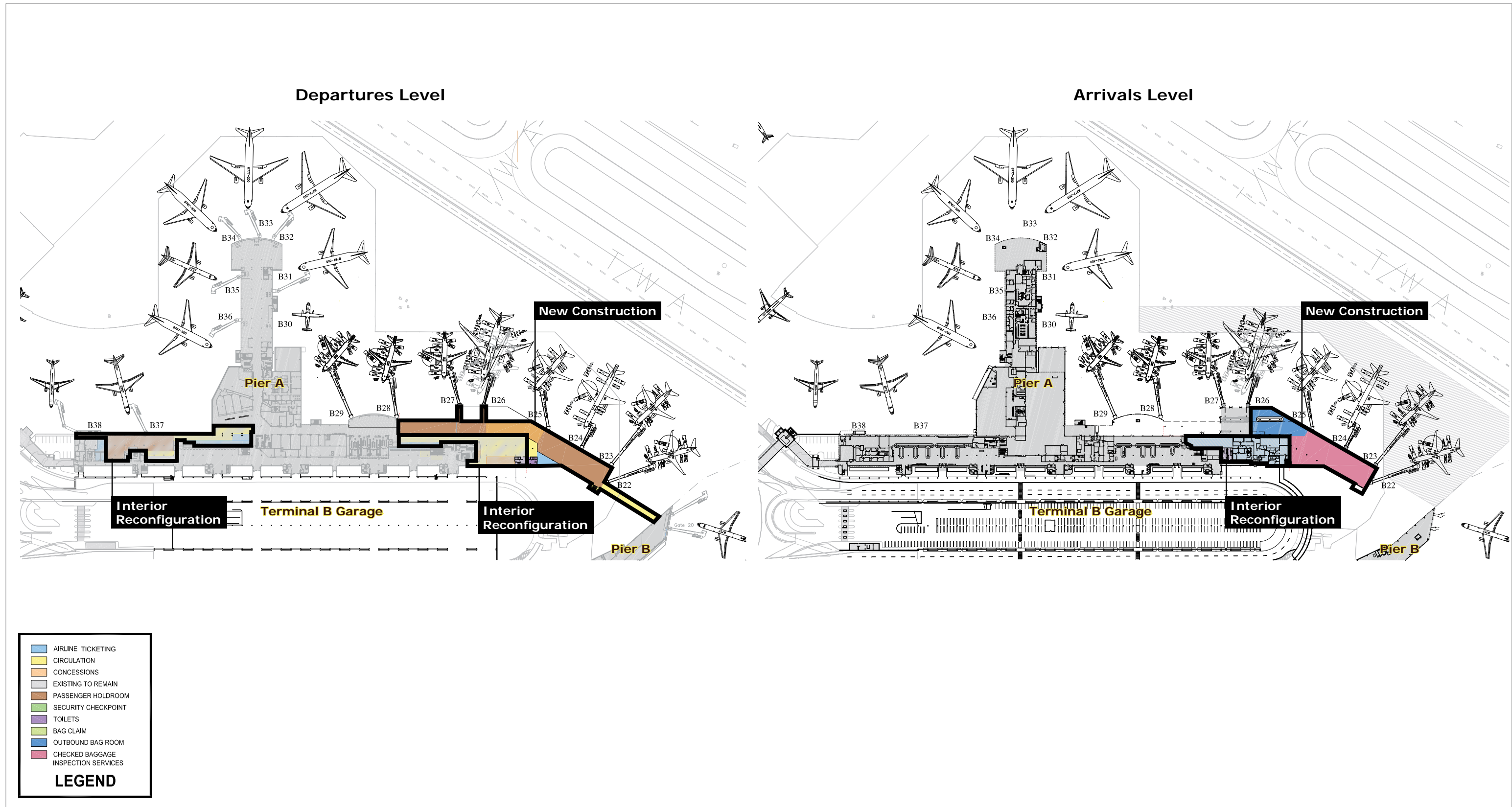
Under Alternative 2, the overall layout of the departures level is considerably reduced in new area compared to Alternatives 1A-1C. Massport determined that while Alternative 2 provides the necessary holdroom space to support the eight-gate fleet mix, adequate ticketing, a new CBIS, and expanded bag make-up areas as well as public space, it fails to provide several of the critical program needs, especially passenger ticketing and checkpoint requirements. Alternative 2 does not provide the available space for addressing the checkpoint queue issues, or increased area required for screening equipment and additional lanes. The ticketing hall in Alternative 2 may provide adequate ticket counter positions, but queue space and airport ticket office (ATO) space are limited and substantially below typical planning parameters. Therefore, Alternative 2 was dismissed from further consideration.

3.3.2.3 Terminal B, Pier A Improvements Alternative 3 - Triangle Configuration (Proposed Action)

Due to the concerns identified with Alternative 2, an additional alternative was developed that built on the concepts from earlier studies and addresses the issues associated with the passenger checking and screening, and meets Massport's cost criteria. Alternative 3, the Triangle Configuration as shown on Figure 3.6, includes approximately 84,000 square feet of new construction and 78,800 square feet of interior renovated area. It consists of an increased footprint on the Departures Level to accommodate a consolidated ticketing area, airline ticket office, escalators, an expanded security checkpoint, new and improved passenger holdroom areas, including an airline passenger lounge, secure public circulation areas, concessions, and public restroom. On the Arrivals Level, an increased footprint will include reconfigured inbound baggage processing space, new outbound baggage processing space, a new TSA screening room (in compliance with revised TSA baggage screening guidelines), escalators, airlines operations offices, and access to an infield area for GSE parking.

The major feature of the Triangle Configuration is an extended holdroom and concourse parallel to the taxiway, terminated at one end by a large triangular plan form. This creates a large apron area between the end of the holdrooms and the existing American Airlines pier, creating additional parking on the apron area for aircraft and facilitating baggage cart movements around the baggage handling rooms at arrivals level.

A major advantage of Alternative 3 is that it reduces construction impacts on the existing building areas, and simplifies the structural connections to the existing building. Public circulation and holdroom areas have been reduced, all in an effort to reduce costs. Therefore, Alternative 3 was chosen as the Proposed Action.



Source(s): AECOM



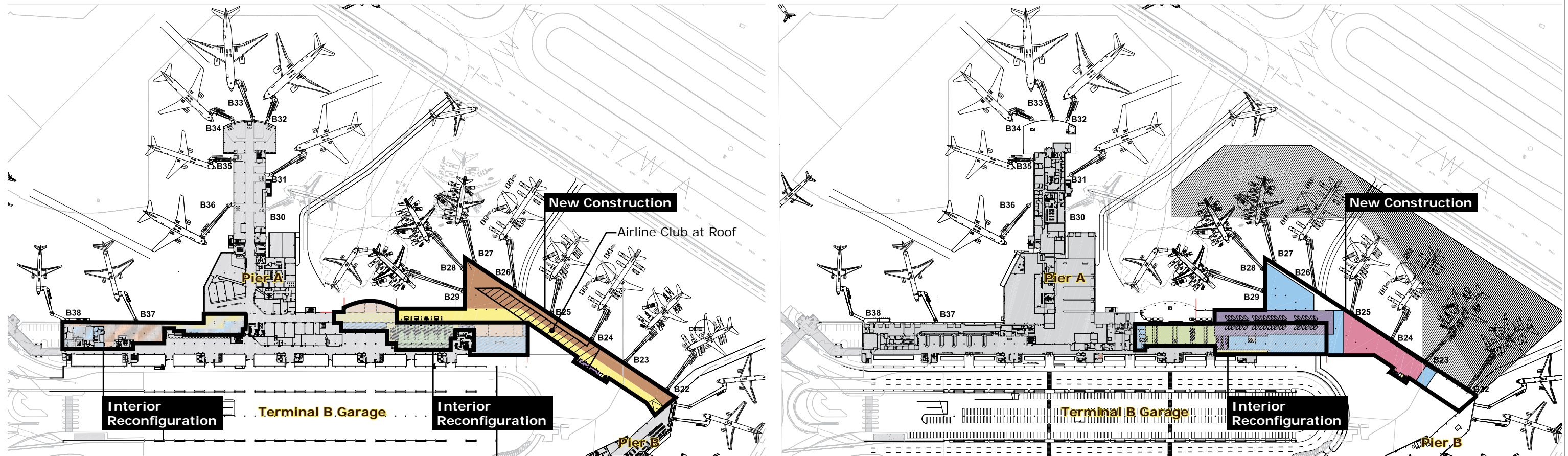
Figure 3.5
Terminal B, Pier A Improvements
Alternative 2
South Configuration

RENOVATIONS AND IMPROVEMENTS
AT TERMINALS B AND C/E
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Departures Level

Arrivals Level



■	AIRLINE TICKETING
■	CIRCULATION
■	CONCESSIONS
■	EXISTING TO REMAIN
■	PASSENGER HOLDROOM
■	SECURITY CHECKPOINT
■	TOILETS
■	BAG CLAIM
■	OUTBOUND BAG ROOM
■	CHECKED BAGGAGE INSPECTION SERVICES

LEGEND

Source(s): AECOM



Figure 3.6
Terminal B, Pier A Improvements
Alternative 3 - Triangle Configuration
(Proposed Action)

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3.3.3 Terminal B, Pier A Improvements Comparison of Alternatives

The following section compares the alternatives and identifies the Preferred Alternative. Table 3-3 compares the square footage of new construction and interior renovation, estimated cost, and schedule of each Terminal B, Pier A Improvements alternative. From an environmental impact perspective, there is very little difference across these alternatives.

Table 3-3 Comparison of Terminal B, Pier A Improvements Alternatives

	No-Action/ No-Build Alternative	Alternatives 1A – 1C	Alternative 2	Alternative 3 (Proposed Action)
Total Square Footage	0	202,500 – 197,400 sf	107,400 sf	162,800 sf
New Building Area	0	106,000 – 95,900 sf	59,800 sf	84,000 sf
Interior Renovation	Possible -TBD	101,500 – 95,400 sf	47,600 sf	78,800 sf
Estimated Cost	NA	\$120 Million	\$60 Million	\$76 Million

sf Square Feet

A No-Build/No-Action Alternative does not address the Purpose and Need or project goals and objectives. Nor does it address the issues of terminal flexibility, efficiency, and connectivity as the existing gate placement and holdroom limitations will simply not accommodate the United/Continental Airlines merger or provide needed flexibility for future operational scenarios and customer service enhancements.

Preliminary Alternatives 1A, 1B, and 1C adequately meet all the program requirements; however, these options are not financially feasible. Alternative 2 fails to provide several of the critical program needs, especially passenger ticketing and checkpoint requirements.

Alternative 3 aims to strike a balance between cost and program requirements. It meets most planning parameters, but costs \$16 million more than the least expensive alternative (Alternative 2). Alternative 3 accommodates all aircraft gates required by the United/Continental merger, and does so in an efficient manner by providing a plan geometry that encloses the maximum amount of required space with the least amount of building enclosure and with the least public circulation space. For these reasons, Alternative 3 is identified as the Proposed Action and serves as the basis for advancing the design and for assessing potential environmental benefits and impacts.

3.3.4 Terminal C-E Connector Alternatives

The following section describes the alternatives considered for the Terminal C-E Connector. A key element of the Project is connecting Terminals C and E to allow for greater connectivity and flexibility in the use of the airside facilities and supporting activities. The proposed airside connection, although conceptually simple, was challenging since the two terminal buildings have varied finished floor elevations and the connection will require crossing over a third intermediate building (an active outbound baggage screening building) with an entirely different roof elevation. Multiple variations of the basic design were studied with varying degrees of impact on existing terminal facilities.

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3.3.4.1 Terminal C-E Connector Alternative A

Initial concepts for the Terminal C-E Connector (shown in Figure 3.7) included an expansion of approximately 12,100 square feet to the face of Terminal C spanning across a single-story baggage screening area as well as approximately 8,000 square feet of renovated existing interior space. Alternative A includes moving sidewalks that will speed travel from Terminal E Gates E1B through E1E to Gates C11 and higher at Terminal C, Pier B. An airside glass wall provides natural light and helps orient passengers moving between Terminals C and E. Along the edges of the connector, concessions, restrooms, or an airline club will be built, and the roof structure of the Gate C3 bag screening room provides an opportunity for future additional uses.

While Alternative A could be built with minor impacts to terminals or airside operations, in a response to changing circumstances regarding airline relocations, Massport initiated scope reductions for the Connector. Revisions to the plan realigned the Connector so it could be built primarily inside the face of the existing building.

3.3.4.2 Terminal C-E Connector Alternative B

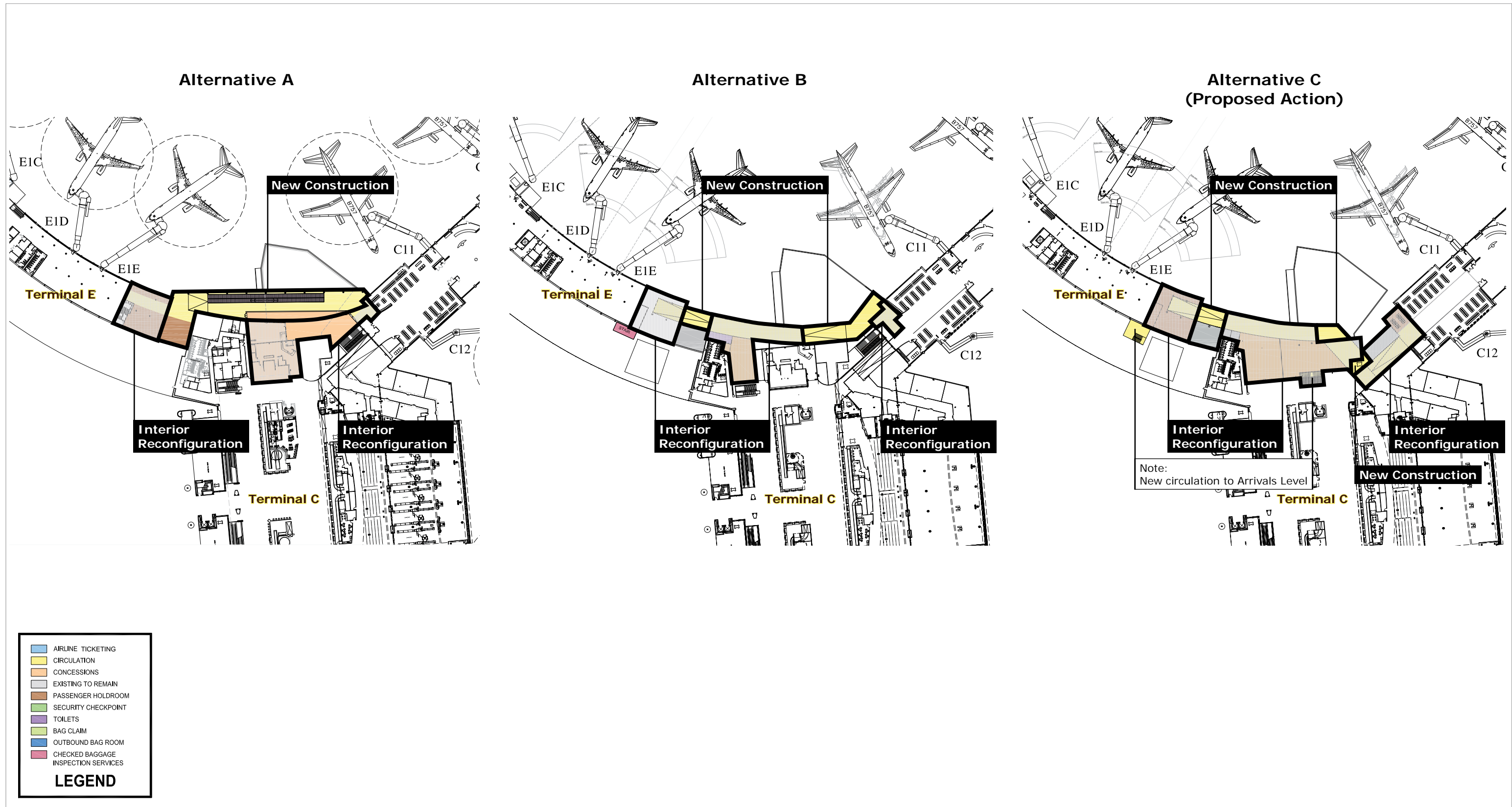
Terminal C-E Connector Alternative B (shown in Figure 3.7) includes approximately 8,400 square feet of interior renovation and only 5,300 square feet of new building construction. This Connector alignment is inside the existing Building C envelope, simplifying construction where it exits Terminal E, and reducing new construction to a small infill section on the Departures Level between the end of Terminal E and Terminal C.

3.3.4.3 Terminal C-E Connector Alternative C (Proposed Action)

The final (and preferred) concept for the Terminal C-E Connector, Alternative C (shown in Figure 3.7) was developed as a simplified solution that further reduces the amount of new building construction while reorganizing circulation post-security and enhances accessibility to the Arrivals Level baggage claim. Alternative C includes approximately 18,900 square feet of interior renovation and only 3,500 square feet of new building construction.

The new circulation route connects Terminal E to Terminal C, running along the inside of the Terminal C facade and tying into Terminal C, Pier B immediately across from the new security checkpoint concessions and circulation corridor.

The new post-security connector will run primarily along the perimeter of the existing Terminals C and E, and is mostly confined within the existing Terminal C Departures Level building envelope. A connecting portion between the two terminals will provide the major link at the existing Terminal E lower roof level. The Terminal C-E Connector will provide post-security public circulation areas, reconfigured office space within both terminals, and reconfigured concessions within Terminal C. Alternative C will provide connectivity and flexibility for airline gate expansion or contraction.



Source(s): AECOM



Figure 3.7
Terminal C-E Connector Alternatives

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3.3.4.4 Comparison of Terminal C-E Connector Alternatives

The No-Build/No-Action Alternative for the Terminal C-E Connector does not address the Purpose and Need or project goals and objectives as it does not address the issues of terminal flexibility and connectivity. Table 3-4 compares the square footage of new construction and interior renovation, estimated cost, and schedule of each Terminal C-E Connector alternative. As with the Terminal B, Pier A Improvements, from an environmental impact perspective, there is very little difference across all of the alternatives.

Table 3-4 Comparison of Terminal C-E Alternatives

	No-Action/ No-Build Alternative	Alternative A	Alternative B	Alternative C/ Proposed Action
Total Square Footage	0	20,200 sf	13,700 sf	22,400 sf
New Building Area	0	12,100 sf	5,300 sf	3,500 sf
Interior Renovation	Possible -TBD	8,100 sf	8,400 sf	18,900 sf
Estimated Cost	NA	\$10.5 million	\$4.9 Million	\$5.6 Million

sf Square Feet

Alternative A, which was built largely outside of the existing terminal footprint, was designed as a major connector complete with pedestrian moving walkways. Alternative A assumes that a larger merged airline would occupy gates in Terminals C and E and would facilitate the movement of large numbers of passengers between both terminals. Changes in merged airline relocations, and the higher cost of this alternative led to a scope reduction and additional design studies aimed at less costly alternatives.

Alternative B was designed to be built primarily within the existing footprint of the terminals, reusing existing space by reconfiguring current uses. This barebones approach did not meet the functionality required.

Alternative C has a chief advantage over the other alternatives: it makes direct, efficient connections between Terminals C and E by using existing enclosed space efficiently thereby eliminating some construction complexity. Also, it reduces new construction area, and it consolidates vertical circulation at this end of Terminal C. Alternative C is identified as the Proposed Action.

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4

Affected Environment

4.1 Introduction

The Affected Environment for the Project is documented for each applicable environmental resource category, as specified in Federal Aviation Administration (FAA) *Order 1050.1E*¹ to provide context for understanding the potential impacts of the Project. The purpose of the Affected Environment analysis is to describe the character of the environment in which the proposed Renovations and Improvements at Terminals B and E would occur (the “Baseline Condition”). The Baseline Condition is based on data from 2010, including the 2010 passenger and aircraft operations forecasts described in Chapter 2, *Purpose and Need*. In accordance with the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA), the Renovations and Improvements Program is compared to the Future No-Build in the same analysis year (2020) for each applicable environmental resource category to determine the effect (beneficial or adverse) of the proposed action. These comparisons are presented in Chapter 5, *Environmental Consequences and Mitigation*.

This chapter summarizes environmental resources that the Project could potentially affect. The Project Area includes the proposed improvement areas at Terminals B, C and E, and adjacent environmental resources that could be affected by the Project.

4.2 Overview of Environmental Resources Categories Evaluated

While all resource categories were initially considered, several were not further evaluated due to their absence from the Airport setting and/or the Project Area (because the Improvement Program would not physically affect the resource category), or because the Improvement Program would not result in changes to aircraft operations or passenger activity levels that would affect a resource category. Table 4-1 lists the impact categories and identifies if they may be affected or not affected by implementation, or if they are not present.

¹ FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, released March 20, 2006.

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Table 4-1 NEPA Defined Environmental Resource Categories Evaluated¹

Environmental Resource	Included in Environmental Consequences Analysis (Yes/No)	Explanation
Noise	No	There would be no change in aircraft operations activity levels as a result of the Project and, therefore, aircraft noise levels at or surrounding the Airport are not expected to change. Short term construction impacts are assessed under Construction.
Compatible Land Use	No	See explanation for Noise. The Project is restricted to activities and purposes compatible with typical airport operations and would not alter the existing off-airport land use patterns.
Socioeconomic Impacts and Secondary (Induced) Impacts	No	The Program would not cause: <ul style="list-style-type: none"> • Extensive relocation of residents or community businesses; • Disruption in local traffic patterns that would substantially reduce the level of service of roads serving the airport and surrounding communities; or • A substantial loss in the community tax base. The Project would result in economic benefits related to construction and new goods/services in the form of temporary jobs and on-Airport spending, respectively.
Environmental Justice Populations, and Children’s Environmental Health and Safety	No	The Project is not expected to cause disproportionately high and adverse human health or environmental effects on minority and low-income populations, or disproportionate health and safety risks to children.
Surface Transportation	Yes	The Project would change curb-side access and on-Airport traffic circulation. Short term construction impacts are assessed under Construction.
Air Quality	Yes	The changes to curb-side access and are anticipated to result in improved access and traffic circulation and, therefore, would not exceed one or more of the NAAQS. (The benefits to air quality are discussed in a qualitative manner.) Short term construction impacts are assessed under Construction.
Historical, Architectural, Archaeological and Cultural Resources	No	There are no known historical, archaeological, or cultural resources within the Project Area.
Department of Transportation Act, Section 4(f) Properties	No	There are no known Section 4(f) properties within the vicinity of the Project Area.
Water Quality	Yes	The Project would result in changes to stormwater management facilities within the Project Area.
Hazardous Materials, Pollution Prevention, and Solid Waste²	Yes	The Project includes upgrading the jet fuel hydrant system, which will be conducted in compliance with Federal requirements. There are no National Priority List sites on Logan Airport.

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Table 4-1 NEPA Defined Environmental Resource Categories Evaluated¹ (continued)

Environmental Resource	Included in Environmental Consequences Analysis (Yes/No)	Explanation
Light Emissions and Visual Impact	No	Because the Project Area is set on-Airport and not adjacent to the residential communities surrounding the Airport, light emissions from the Project would not create annoyance and interfere with normal activities. Similarly visual effects of the Improvement Program would not contrast with existing environments.
Farmlands	No	Farmland of Statewide Importance, as defined by the <i>Farmland Protection Act Policy</i> , ³ does not exist within the Airport boundaries or within the vicinity of the Airport.
Natural Resources and Energy Supply/Sustainable Design	Yes	The Project construction, operation, or maintenance would cause additional demands on energy supplies that can be accommodated by current power suppliers. No impacts to natural resources are anticipated since the Project is built on paved land fully developed for airport uses. The Project will meet Massport's Sustainable Design Standards and Guidelines.
Wetlands	No	Wetlands are present on Logan Airport property; however, there are no wetland resource areas within the Project Area.
Floodplains	No	The Project Area is not located within a 100-year flood zone.
Coastal Resources	No	The Project Area is proposed within entirely previously developed/disturbed portion of the Airport. The Program would be consistent with the Coastal Zone Management Plan.
Fish, Wildlife, and Plants	No	The Boston Harbor and areas within the vicinity of the Airport provide Essential Fish Habitat; however, the Project is proposed within entirely previously developed/disturbed portion of the Airport and, therefore, would not directly or indirectly alter or impact this priority habitat.
Threatened and Endangered Species	No	While there are known federally listed threatened or endangered species under USFWS jurisdiction in the Boston Harbor, there are no known such species within the Airport boundaries or Project Area. ⁴ According to the <i>Massachusetts Natural Heritage Atlas</i> (13th Edition), a large portion of the airfield at Logan Airport is priority habitat for the upland sandpiper (<i>Bartramia longicauda</i>), which is listed as endangered in Massachusetts; however, this species does not occur within the Project Area. ⁵
Wild and Scenic Rivers	No	There are no wild or scenic rivers within the vicinity of Logan Airport. ⁶
Construction	Yes	Short-term construction activities are expected to cause temporary impacts related to traffic, air quality, water quality, and solid and hazardous waste. ⁷ Mitigation measures will be implemented.

NAAQS=National Ambient Air Quality Standards

1 Environmental resource categories as specified in FAA Order 1050.1E.

2 There are several state-listed disposal sites on-Airport. Refer to the *Logan Airport 2010 EDR* where they are listed and tracked in detail.

3 United States Department of Agriculture, *Farmland Protection Policy Act* (7 U.S.C. 4201-4209), 1981.

4 Letter received from Mary A. Colligan, NMFS Regional Administrator for Protected Resources, dated July 13, 2009.

5 Massachusetts Natural Heritage and Endangered Species Program (NHESP) Atlas, October 2008.

6 As defined by the *Wild and Scenic Rivers Act of 1968*, 16 U.S.C. section 1271 et seq.

7 Short-term construction impacts are discussed in Chapter 5, *Environmental Consequences and Mitigation*.

4.3 Airport Environmental Setting

The following section describes the general environmental characteristics of Logan Airport. Section 4.4, *Environmental Conditions of the Project Area*, describes the resources within the immediate area of the proposed Project. The Project includes renovations and improvements at Terminal B, Pier A and connected portions of Terminals C and E.

4.3.1 Physical Setting

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including 700 acres underwater in Boston Harbor. Logan Airport, shown in Figure 1.1, is one of the most land-constrained airports in the nation as it is located primarily on filled land within the heavily urbanized Boston Harbor Watershed and is surrounded by water on three sides. The majority of the seabed adjacent to the Logan Airport property is classified as either low-relief mud or altered by anthropogenic modification. Modified areas are those where the effects of human activity, such as dredging, spoil disposal, construction, pipelines and cables are clearly visible.

Logan Airport is close to downtown Boston and is accessible by public transit and a well connected roadway system. The airfield comprises six runways, approximately 15 miles of taxiway, and approximately 240 acres of concrete and asphalt apron. Logan Airport has four passenger terminals (Terminal A, B, C and E), each with its own ticketing, baggage claim, and ground transportation facilities. Massport continues to evaluate and implement enhancements to Logan Airport's security, operational efficiency, and accessibility to and from the Boston metropolitan area, while carefully monitoring the environmental effects of Logan Airport operations.

4.3.1.1 Terminal B

Terminal B is comprised of two individual piers, Pier A and Pier B, separated by a shared parking garage (the Terminal B Garage), as shown in Figure 1.3. The existing Terminal B, Pier A is approximately 330,000 square feet. Designed by John Carl Warnecke & Associates and Desmond & Lord, Inc. in 1972 and 1973, construction of Pier B was completed for US Airways in 1974 and Pier A for American Airlines in 1975. The terminal remained largely unchanged until HNTB designed the US Airways expansion in 1979, which was constructed in 1980. From 1980 until 2000, numerous small projects including passenger seating area improvements, concessions expansions, and passenger lounges were completed at both piers.

In response to the aftermath of September 11, 2001, the Department of Homeland Security (DHS), along with Massport, implemented an airport-wide hold baggage screening project to enhance hold baggage screening capabilities for outbound passengers on both international and domestic flights. In-line baggage screening enhancements were constructed for both piers at Terminal B as part of this initiative and were completed in 2002.

Since the planned American Airlines expansion was terminated, a number of upgrades including concessions improvements, checkpoint consolidation, and restrooms upgrade were implemented at Pier A to improve significant deficiencies.

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4.3.1.2 Terminals C and E

Built originally in 1961, Terminal C serves jetBlue as well as Cape Air, Sun Country Airlines, and United. The terminal has three groups of gates: C11-C21, C25-C36, and C40-C42. The two Terminal C security checkpoints providing access to Gates C11 through C21 on the left and Gates C25 to C36 on the right were replaced by a common checkpoint in July, 2011. The Terminal D gates (the three gates at the north end of Terminal C) were renumbered and labeled as part of Terminal C in 2006.

Terminal E, also known as the John A. Volpe International Terminal named after the former Governor of Massachusetts and U.S. Secretary of Transportation, is the international terminal for Logan Airport. There are 13 Terminal E gates, and the terminal processes all international arrivals through the Federal Inspections Services (FIS) facility. In addition to the international air carriers, Southwest Airlines (including the former AirTran Airways) leases gates at the terminal. Unlike the other terminals, where the upper level is used for departures while the lower level is used for arrivals, the third level is used for departures while the ground level is used for arrivals and customs in Terminal E. The second level is used for passport control.

Parking for both Terminals C and E is provided in the central parking complex, connected to the terminals via passenger bridges.

4.3.2 Airport Noise Environment

The noise environment of the Airport has been documented in the *Logan Airport 2010 EDR*.² Refer to Appendix H, *Noise Abatement* for the Airport-wide Baseline Condition for noise.

In 2010, the overall number of people exposed to DNL values greater than 65 dB was 3,830 people.³ Within the DNL 70 dB contour the number of people was 130. As described in the *Logan Airport 2010 EDR*, Massport strives to minimize the noise effects of Airport operations on its neighbors through the use of a variety of noise abatement programs, procedures, and other tools. Logan Airport has an extensive noise abatement program, which includes: residential and school sound insulation programs; flight tracks designed to optimize over-water operations (especially during nighttime hours); and preferential runway use goals. The foundation of Massport's comprehensive noise abatement program is the *Logan Airport Noise Abatement Rules and Regulations*⁴ (the "Noise Rules") which have been in effect since 1986. All of the residences exposed to levels greater than DNL 65 dB in 2010 that have chosen to participate in the Massport's residential sound insulation program (RSIP) have been sound-insulated by Massport.

4.3.3 Airport Compatible Land Use

Refer to Section 4.3.1, *Physical Setting*, for a description of on-Airport land uses. As previously mentioned, the Airport is surrounded by the Boston Harbor on three sides. The remaining side of the Airport (the northwestern edge) is surrounded by the Jeffries Point and Gove Street residential neighborhoods, Memorial Stadium Park, and Airport access roadways.

² *Logan Airport 2010 Environmental Data Report* (EOEA #3247), October 2011.

³ Based on the 2010 Census.

⁴ *Logan Airport Noise Abatement Rules and Regulations* are codified at 740 CMR 24.01 et seq.

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4.3.4 Airport Surface Transportation

This section describes the existing surface transportation system near Logan Airport and airport-wide surface transportation conditions.

4.3.4.1 Airport Access and Gateways

Gateways are defined as access points to/from Logan Airport, which include the Route 1A roadway ramps, Ted Williams Tunnel (Interstate 90) ramps, Neptune Road/Frankfort Street, and Maverick Street (restricted access). Figure 4.1 shows the roadway infrastructure at Logan Airport in 2010. Local connections to East Boston and Bennington Street, as well as regional connections via Route 1A are made from Frankfort Street via Neptune Street. Prescott Street is a two-lane roadway that provides access from both the North Service Road and Frankfort Street to the North Cargo area and the airside roadway infrastructure. Harborside Drive is a four-lane on-Airport service roadway situated along the eastern border of the SWSA (also referred to as Transportation Way), separating it from the airport terminal area. Harborside Drive provides direct connections to the terminal area roadways and Interstate 90 (I-90) and Interstate 93 (I-93) via the Ted Williams Tunnel; access to Route 1A and the Sumner/Callahan Tunnels is available from the terminal area roadways. Harborside Drive provides access to the Logan Office Center, temporary taxi pool, Hyatt Hotel and South Cargo Area which includes the secured, South Gate access to the airfield.

4.3.4.2 Vehicle Miles Traveled Airport-Wide

The *Logan Airport 2010 EDR* presents the traffic conditions, including traffic volumes of gateways and the vehicle miles traveled on Airport roadways. Table 4-2 summarizes the vehicle-miles-travelled (VMT)⁵ estimates for Logan Airport-related traffic from 2004 through 2010. The average annual weekday daily traffic (AWDT) VMT for Airport-related traffic increased by 4.8 percent in 2010 compared to 2009, which can be attributed to an increase in annual passengers at the Airport and a change in distribution of traffic volumes among the different gateways. This 4.8 percent increase in VMT is lower than the 5.7 percent increase in airport-related AWDT volumes. Details of the 2010 VMT estimates are presented in Appendix G, *Ground Access of the Logan Airport 2010 EDR*.

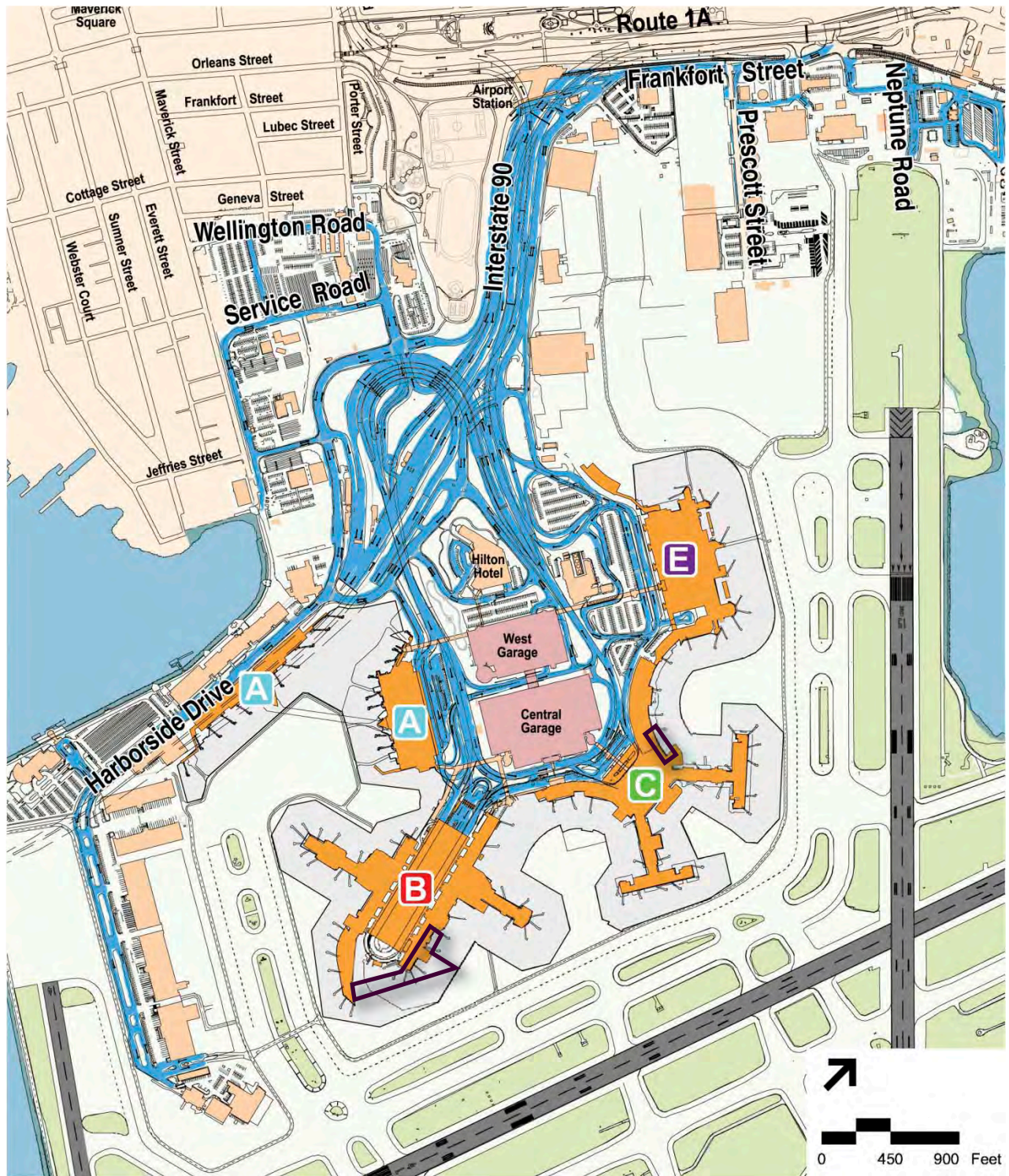
Table 4-2 Airport Study Area Vehicle Miles Traveled (VMT) for Airport-Related Traffic

Analysis Year	AM Peak Hour	PM Peak Hour	High 8-Hour	Average Weekday	Average Weekday Percent Change
2004	8,292	10,563	77,029	160,477	3.5%
2005	8,477	10,998	80,240	167,166	4.2%
2006	NA	NA	NA	NA	NA
2007	9,594	12,304	88,614	184,613	10.4%
2008	8,533	10,941	78,663	163,882	(11.2%)
2009	8,098	10,379	74,612	155,442	(5.2%)
2010	8,451	10,887	78,185	162,885	4.8%

Source: *Logan Airport 2010 EDR*

NA Information Not Available

⁵ VMT is calculated as the total number of vehicle miles traveled within Logan Airport roadway system. VMT is an important metric because it is used to calculate the air quality emissions that are contributed from motor vehicles and it is one indication of the traffic levels on roadways within specific areas and at specific times.



Legend
Project Area



Figure 4.1
Logan Airport Roadway Network

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4.3.4.3 Airport Parking Facilities

The total number of employee and commercial parking spaces permitted at Logan Airport is limited by the Logan Airport Parking Freeze under the State Implementation Plan (SIP). Historically, parking supply at Logan Airport has varied in terms of the specific locations and sizes of individual lots, the mix of parking spaces for air travelers and employee spaces, and the number of spaces in and out of service at any one time due to construction projects being undertaken at Logan Airport, while at all times remaining in compliance with the Logan Airport Parking Freeze. The Airport is limited to 20,692 parking spaces total (commercial and employee). Table 4-3 lists the existing parking facilities at Logan Airport.

In 2010, the Logan Airport parking supply underwent several changes when Massport initiated construction of the SWSA Redevelopment Program with the ConRAC enabling projects. This effort started to eliminate various surface parking lots that were used to accommodate overflow parking. For example, Massport began construction of the Logan Airport Parking Deck Project (Economy Parking), by adding two structured levels to the existing at-grade Economy Lot in the North Cargo Area. Meanwhile, continued rehabilitation of the Terminal B Garage and roadways caused the temporary loss of terminal area commercial parking spaces.

Table 4-3 Logan Airport Commercial Parking¹

Location	Number of Spaces
Central Garage and West Garage	10,344
Terminal B Garage	2,632
Gulf (Citgo) Lot	222
Terminal E Lot 1	269
Terminal E Lot 2	257
Signature (General Aviation)	35
Logan Airport Parking Deck Structure: Economy Parking	2,789
Hotels	505
Total spaces in service	17,053
Total commercial spaces (freeze limit)	18,019¹

Source: *March 2012 Parking Freeze Report*

1 As of March 2012.

2 In 2010, 300 employee spaces were converted to commercial spaces under the Logan Airport Parking Freeze, increasing the inventory of commercial spaces to 17,619 commercial and reducing the inventory of employee spaces to 3,073.

4.3.4.4 Public Transportation

The Massachusetts Bay Transportation Authority (MBTA) collaborates with Massport to provide direct connections to Logan Airport via rapid transit (Blue Line subway at the Airport Station and Silver Line bus rapid transit at each of the terminals) as well as North Shore commuter bus service to South Station that includes a stop at Terminal C. The MBTA operates local bus service on Maverick Street at Jeffries Point and two early morning daily trips from Dudley Square and Andrew Square. Massport Shuttles #22 and #33 provide transit connection from Airport Station to each airport terminal and Massport Shuttle #66 connects the Airport Station and the Logan Airport water dock with each terminal. Figure 4.2 shows the public transit connections available at Logan Airport. Massport's two Sunrise Shuttles also provide early-morning service to employees in East Boston that need airport access before MBTA starts daily operations.

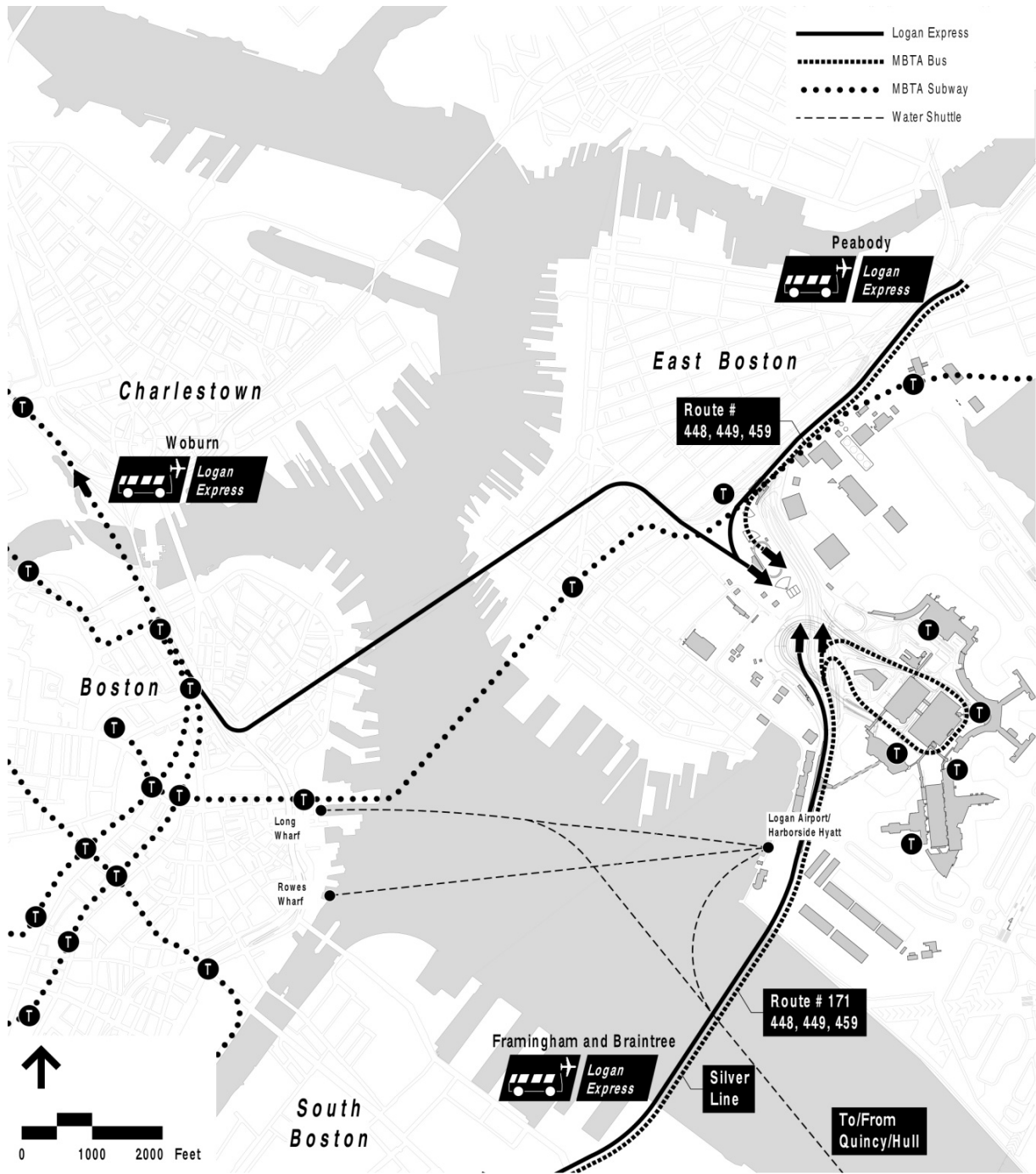


Figure 4.2

Logan Airport - Public Transportation Options

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Three companies provide water transportation within the Boston area: City Water Taxi, Rowes Wharf Water Shuttle, and the MBTA's Harbor Express. These companies stop at the Logan Airport dock on Harborside Drive. (Massport provides a courtesy shuttle bus service (#66) between the Logan Airport dock, the MBTA Airport Station, and all Airport terminals. Collectively, these companies serve numerous destinations throughout Boston Inner Harbor.) The water taxi landings include Long, Rowes, and Central Wharfs; the World Trade Center and the Moakley Courthouse in South Boston; Lovejoy Wharf near North Station; and stops in the North End, Charlestown, Chelsea, and East Boston. The MBTA Harbor Express provides services to Long Wharf and destinations outside of the Inner Harbor, including Quincy and Hull.

Massport provides frequent, scheduled express bus service (Logan Express) to Logan Airport from Braintree, Peabody, Framingham, and Woburn. Full-service bus terminals and secure parking are provided at all four express bus locations.

4.3.4.5 Other Modes of Ground Transportation

Private automobile access to the Airport is classified as curbside drop-off (and pick up) or parked at a terminal area garage/lot or remote/Economy lot. Taxis operate on-Airport and are dispatched from the Taxi Pool, which is temporarily located in a surface lot next to the Logan Office Center off of Harborside Drive while the SWSA is redeveloped. According to the *Logan Airport 2010 EDR*, the total number of taxis dispatched rose in 2010 by 12 percent compared to 2009.

To accommodate the use of privately-operated shared-ride vans, buses, and limousine services, Massport provides designated curb areas at all airport terminals. Scheduled express bus service is offered by several privately-operated carriers from outlying areas of the Boston metropolitan area and neighboring states. Shared-ride van services include services between Logan Airport and many hotels in the Greater Boston area. Shared-ride vans also provide service from western Massachusetts and other regional points throughout New England. Massport offers a 50 percent discount on the ground access fees for alternative fuel vehicles (AFVs), including those that use compressed natural gas (CNG) or are powered by electricity.

Currently, nine rental car brands serve Logan Airport. Seven (Alamo, Avis, Budget, Dollar, Enterprise, Hertz, and National) and are located on-airport in the SWSA. The two rental car brands that operate from sites on Route 1A north of the Airport (Advantage, Thrifty) will relocate onto the Airport when the ConRAC construction is completed in the SWSA. Each rental car brand operates its own diesel-fueled shuttle bus fleet that runs between all terminals and their respective on or off-airport facilities. The SWSA Redevelopment project will consolidate the bus fleet into a single diesel-electric hybrid and CNG fleet serving all terminals and Airport Station. This future Unified Bus System will be taken into account when assessing the environmental consequences of the proposed Project.

4.3.4.6 Pedestrian and Bicycle Facilities

While pedestrian and bicycle facilities are limited throughout the Airport, Massport has made and continues to make substantial progress in providing pedestrian access Airport-wide. There are sidewalks along Harborside Drive and Hotel Drive that connect to the terminals, where a series of overhead walkways connect the Central Garage to Terminals A, B, C and E as well as to the Hilton Hotel. The sidewalks along Harborside Drive and Maverick Street and the Harborwalk (a "mixed use" path used for walking, jogging, and biking) facilitate

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pedestrian access to the Logan Airport Dock, Airport MBTA Station, and to the pedestrian and bicycle amenities at the Memorial Stadium Park, Bremen Street Park, and the East Boston Greenway. Pedestrian access has been improved through the Maverick Street Gate. Bicycle racks are provided at Terminal A, the Logan Office Center, the Central Garage, and at the MBTA's Airport Station. Additionally, pedestrian and bicycle infrastructure is being provided as part of the ConRAC facility. Such facilities include:

- New pedestrian and bicycle facilities, including secure and covered bicycle storage at Customer Service Center and Quick Turn-Around (QTA) buildings for employees, customers and the general public, as well as shower/changing facilities within the QTA buildings for employees.
- 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 (MBTA Airport Station), along Porter Street, and surrounding East Boston neighborhoods.
- Street and pedestrian-level lighting and advanced warning signals and/or systems at crosswalks.

4.3.4.7 Transportation Management Association

The Logan Employee Transportation Management Association (TMA) is a non-profit coalition of airport businesses working to reduce traffic congestion and pollution by organizing/supporting alternatives to single-occupancy commuting. It encourages employees to use public transportation and other shared-ride options. To help accomplish these objectives, Massport created the Logan TMA in 1997 and supports it with an annual contribution of \$65,000, as well as with space and equipment for the Logan TMA Transportation Office in Terminal C. The Massachusetts Department of Transportation's (MassDOT) Office of Transportation Planning, through its *MassRIDES* program, is the coordinator for the Logan TMA.

The Logan Employee TMA operates two Sunrise Shuttle routes between East Boston and the Logan terminals. The shuttle route passes through the SWSA. The service operates between 3:00 AM and 6:00 AM, providing vital transportation services before MBTA services begin at 5:00 AM.

The Logan TMA advises employers on transit benefits and provides information on available commuting transportation alternatives, ride-matching services, and reduced-rate high occupancy vehicle (HOV)/transit fare options. The TMA also provides a forum for Logan Airport tenants and employees to address common transportation concerns, and works with government entities and employers to create coordinated transportation management programs.

The Logan TMA actively encourages airlines, rental car companies, contract cargo transport companies, and other tenants at Logan Airport to join the Logan TMA as a means to offer commuting incentives to their employees and to help to reduce traffic growth and parking demands at the airport. To encourage membership, the Logan TMA instituted individual membership for employees whose companies are not corporate members.

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4.3.5 Airport Air Quality

This section describes the regulatory context related to air quality and the airport wide air quality conditions at Logan Airport for the Baseline Condition.

4.3.5.1 National Ambient Air Quality Standards

The federal Clean Air Act (CAA), the National Ambient Air Quality Standards (NAAQS), and similar state laws govern air quality issues in Massachusetts. The NAAQS and the Massachusetts State Implementation Plan (SIP), promulgated to demonstrate compliance with the CAA (and its 1990 amendments), regulate air quality issues in Boston metropolitan area and state, and are discussed in the next section.

The United States Environmental Protection Agency (USEPA) established NAAQS for a group of criteria air pollutants to protect public health, the environment, and the quality of life from the detrimental effects of air pollution. These NAAQS are set for the following six pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), and sulfur dioxide (SO₂). The NAAQS primary standards (designed to protect human health) and secondary standards (designed to protect human welfare) are summarized on Table 4-4.

Table 4-4 National Ambient Air Quality Standards

Pollutant	Averaging Time	Standard		Notes:
		ppm	µg/m ³	
Carbon Monoxide (CO)	1 hour	35	40,000	Not to be exceeded more than once a year.
	8 hour	9	10,000	Not to be exceeded more than once a year.
Lead (Pb)	Rolling 3-Month Avg	—	0.15	Not to exceed this level. Effective January 12, 2009.
	Quarterly	—	1.5	Not to exceed this level.
Nitrogen Dioxide (NO ₂)	1 hour	0.100	188	The three-year average of the 98 th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm. Effective January 22, 2010.
	Annual	0.053	100	Not to exceed this level.
Ozone (O ₃)	8 hour ¹	0.08	157	The average of the annual 4th highest daily 8-hour maximum over a three-year period is not to exceed this level.
	8 hour ²	0.075	147	The average of the annual 4th highest daily 8-hour maximum over a three-year period is not to exceed this level. Effective May 27, 2008.
Particulate Matter with a diameter ≤ 10 µm (PM ₁₀)	24 hour	—	150	Not to be exceeded more than once a year on average over three years.
Particulate Matter with a diameter ≤ 2.5 µm (PM _{2.5})	24 hour	—	35	The three-year average of the 98 th percentile for each population-oriented monitor within an area is not to exceed this level.
	Annual	—	15	The three-year average of the weighted annual mean from single or multiple monitors within an area is not to exceed this level.
Sulfur Dioxide (SO ₂)	1 hour	0.075	197	Final rule signed June 2, 2010. The three-year average of the 99 th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed this level.
	3 hour	0.5	1,300	Not to be exceeded more than once a year.
	24 hour	0.14	365	Not to be exceeded more than once a year. (The 24 hour standard was revoked as of June 2, 2010).
	Annual	0.03	80	Not to exceed this level. (The Annual standard was revoked as of June 2, 2010.)

Source: EPA, 2011 (www.epa.gov/air/criteria.html).

1 The 1997 NAAQS for ozone.

2 The 2008 NAAQS for ozone.

ppm Parts per million

µg/m³ Micrograms per cubic meter

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Based on air monitoring data and in accordance with the CAA, all areas within Massachusetts are designated as *attainment*, *nonattainment*, *maintenance*, or *unclassifiable* with respect to the NAAQS.⁶ An area with air quality better than the NAAQS is designated as attainment; an area with air quality worse than the NAAQS is designated as nonattainment; and an area that is in transition from nonattainment to attainment is designated as attainment/maintenance. An area may also be designated as unclassifiable when there is a temporary lack of data to form a basis for determining attainment status. Nonattainment areas can be further classified as extreme, severe, serious, moderate, and marginal by the degree of non-compliance with the NAAQS. The current attainment/nonattainment designations for the Boston metropolitan area are summarized in Table 4-5.

The entire Boston metropolitan area is currently designated as attainment for all the criteria pollutants except O₃. The City of Boston is part of the Eastern Massachusetts nonattainment area (Boston-Lawrence-Worcester) for O₃ and is designated as “moderate” nonattainment for the 1997 eight-hour ozone standard (Table 4-5). The Eastern Massachusetts nonattainment area consists of ten counties in Massachusetts (Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk, and Worcester). Logan Airport is located in Suffolk County. The Boston area is also currently designated as attainment/maintenance for CO, indicating that it is in transition back to attainment for this pollutant.

Table 4-5 Attainment/Nonattainment Designations for the Boston Metropolitan Area

Pollutant	Designation
Carbon monoxide (CO)	Attainment/Maintenance ¹
Nitrogen Dioxides (NO ₂)	Attainment
Ozone (8-hr)	Nonattainment (Moderate)
Particulate matter (PM ₁₀)	Attainment
Particulate matter (PM _{2.5})	Attainment
Sulfur Dioxide (SO ₂)	Attainment
Lead (Pb)	Attainment

Source: EPA, 2011 (www.epa.gov/air/oaqps/greenbk/).

¹ The Boston area was previously designated nonattainment for this pollutant but has since attained compliance with the NAAQS.

4.3.5.2 State Implementation Plan (SIP)

A SIP is a state’s regulatory plan for bringing nonattainment areas within that state into compliance with the NAAQS. The Massachusetts Department of Environmental Protection (DEP) is required to submit updated SIPs to the EPA periodically to address CAA requirements. The current and future SIPs for the Boston area are summarized in Table 4-6.

⁶ Environmental Protection Agency, *The Green Book Nonattainment Areas for Criteria Pollutants* (www.epa.gov/air/oaqps/greenbk/).

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Table 4-6 State Implementation Plan for Ozone

Standard	Title	Status	Comments
One-Hour	One-hour Ozone Attainment Demonstration for the Massachusetts Portion of the Boston-Lawrence-Worcester, Massachusetts-New Hampshire Ozone Nonattainment Area.	Published December 6, 2002, as final rule.	EPA approved this SIP revision and established an attainment date of November 15, 2007, for the entire multi-state nonattainment area. Focuses on the control of NO _x and VOCs as precursors to ozone. This is the "currently approved" SIP for the Boston area.
Eight-Hour	Final Massachusetts State Implementation Plan To Demonstrate Attainment of the National Ambient Air Quality Standard for Ozone	Submitted to EPA, January 31, 2008, for approval.	This standard calls for the attainment of the 1997 eight-hour NAAQS for ozone by 2010 and focuses on the control of NO _x and VOCs as precursors to ozone. (The EPA assessment of a new eight hour NAAQS for ozone is scheduled for 2013.) ^{1,2}

Source: Massachusetts DEP (www.mass.gov/dep/air/priorities/sip.htm).

- 1 In 2007, the EPA promulgated a new eight-hour NAAQS for ozone. Informally called the "2008 standard" to differentiate it from the former "1997 standard", this new standard is more strict (i.e., lower) than the former standard. In 2009, EPA proposed to further tighten the ozone standard and DEP recommended that the entire state of Massachusetts be designated as non-attainment for this new standard when it is promulgated. On September 2, 2011, the President requested that the EPA withdraw regulations tightening the ozone standard until 2013 when the EPA, under the Clean Air Act, will be required to review, and if appropriate, revise the ozone standard.
- 2 The SIP established the Logan Airport Parking Freeze and the limit of 17,319 commercial and 3,373 employee spaces at the Airport in 2007, which remained the same in 2010.

4.3.5.3 Logan Airport 2010 Emissions Inventory

In 2010, Massport conducted its annual emissions inventory for Logan Airport. Pollutants inventoried include: VOCs; CO; NO_x; PM₁₀; PM_{2.5}; and SO_x. Emissions of O₃ were not included because it is a secondary pollutant formed by emissions of NO_x and VOCs, which serve as a surrogate for ozone formation. There were no exceedences for any criteria pollutants at Logan Airport in 2010.⁷

Air quality conditions in 2010 are described below:

- Total emissions of VOC were 1,019 kilograms per day (kg/day) representing a slight increase compared to 2009 levels, but continue to follow a long-term downward trend decreasing by almost 78 percent since 1990. (This increase is primarily due to the increase in landing and takeoff operations when compared to 2009.)
- Total NO_x emissions at Logan Airport (net total with reductions) were approximately 742 tons per year (tpy) lower than Massport's 1999 AQI benchmark. This represents a 32 percent decrease in NO_x emissions since 1999.
- Total emissions of CO were 7,160 kg/day, representing a 10 percent reduction from 2009 levels.
- Total emissions of PM₁₀/PM_{2.5} associated with Logan Airport heating and cooling decreased in 2010 by approximately 10 percent to 64 kg/day compared to 2009 levels mostly due to the decreased use of No. 6 fuel oil.
- The annual NO₂ concentrations at all monitoring locations in 2010 were well within the NAAQS and, since 1999, there has been a continuing trend of decreasing NO₂ concentrations at both the Massport and DEP monitoring sites located in the vicinity of Logan Airport.
- Since 2006, Massport has voluntarily prepared a greenhouse gas (GHG) emissions inventory, reported in the *Logan Airport 2010 EDR*, in accordance with the MEPA *Greenhouse Gas Policy and Protocol*. The 2010 GHG

⁷ *Logan Airport 2010 Environmental Data Report (EOEA #3247)*, October 2011.

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emission inventory was updated incorporating guidance developed by the Transportation Research Board's (TRB) Airport Cooperative Research Program (ACRP). The ACRP guidance was published in April 2009 for airport operators developing an airport-specific GHG emissions inventory.⁸ The 2010 inventory assigns emissions based on ownership or control (e.g., Massport, airlines and other airport tenants, and the general public). The vast majority of emission sources at Logan Airport are owned or controlled by the airlines, airport tenants, and the general public (through emissions from motor vehicles). Massport sources contribute 12 percent of the total GHG emissions for the Airport. Total Logan Airport GHG emissions in 2010 were slightly lower (0.4 percent) than 2009 levels.

4.3.6 Airport Water Quality

Boston Harbor has seen dramatic improvements in water quality over the last few years, as a result of long-term community involvement and regulatory controls. The Massachusetts Water Resources Authority (MWRA) Deer Island Treatment Plant and Massachusetts Bay Wastewater Effluent Outfall have also contributed to the improvement of water quality in Boston Harbor.

The Stormwater Management system at Logan Airport consists of both a closed and open conveyance system. The closed system includes catch basins and pipes to convey stormwater from runways, taxiways, and the perimeter roadway (approximately 910 acres) to Airfield Outfalls A-1 through A-44 discharging into Boston Harbor. The open stormwater system uses the airfield's grass swales and open channels to infiltrate stormwater from runway surfaces. Refer to Figure 4.3 for the Logan Airport drainage areas and outfalls.

On July 31, 2007, the United States Environmental Protection Agency (USEPA) and the Massachusetts Department of Environmental Protection (DEP) issued a National Pollutant Discharge Elimination System (NPDES) permit for Logan Airport's stormwater outfalls: NPDES Permit MA0000787. Massport holds a separate NPDES permit for the Fire Training Facility (NPDES Permit MA0032751). The NPDES permit MA0000787 authorizes stormwater discharges from the North, West, Northwest, Porter Street, and Maverick Street outfalls, and all of the airfield outfalls. Water quality monitoring results are available on the Massport website. Additional information on water quality can be found in the *Logan Airport 2010 EDR*.

4.3.7 Airport Hazardous Materials, Pollution Prevention, and Solid Waste

Although there have been reported spills and releases at Logan Airport, these have been addressed through the Massachusetts Contingency Plan (MCP) (310 CMR 40) process, and no releases have occurred within the construction limits of the Project. There are no National Priority List (NPL) sites on Logan Airport.

In accordance with the MCP process, Massport continues to assess, remediate, and bring to regulatory closure areas of subsurface contamination. Massport leads the performance of a variety of response actions, including remediation at sites where Massport is the responsible party, where there are multiple responsible parties, and where no responsible party has been identified. Tracking of MCP activity is reported annually by Massport in the *Logan Airport 2010 EDR* (EEA # 3247).

⁸ Transportation Research Board, Airport Cooperative Research Program, ACRP Report 11, Project 02-06, *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories*. See http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_011.pdf for the full report.



Figure 4.3

Logan Airport Drainage Areas and Outfalls

4.3.8 Airport Light Emissions and Visual Impacts

According to FAA *Order 1050.1E*, FAA must consider the extent to which any lighting associated with any action will create an annoyance among people in the vicinity or interfere with their normal activities.⁹

Terminals B, C and E are located within the terminal area complex which is separated from the surrounding community by roadways, parking structures and other airport related facilities, and are characterized by typical lighting required for public use facilities. The airfield is lighted according to FAA requirements including runway lights, navigational aids and signage.

Logan Airport has been part of the urban landscape since its construction in the 1920s. Surrounded by water on three sides, the landward face of the airport is encircled by series of airport edge buffers and the East Boston Greenway, and is separated from the surrounding community by roadways and a sports stadium. Due to the topography of the area, residents in the Jeffries Point neighborhood look down on the airport in the vicinity of the Southwest Service Area. The consolidated car rental facility that is current under construction was designed with neighborhood views and compatibility in mind. Terminals B, C and E, while visible from the community, are more than three-quarters of a mile from the nearest residence.

4.3.9 Airport Natural Resources and Energy Supply/Sustainable Design

Logan Airport is a complex of interconnected buildings, transportation facilities, utility infrastructure, natural environments and management systems. The long-range planning, ongoing development, and day-to-day operations present opportunities to adopt sustainable practices that mirror Massport's environmental goals and demonstrate its leadership within New England and the aviation industry.

4.3.9.1 Natural Resources and Energy Supply

In 2010, Logan Airport used 201,117,755 kilowatt hours of electricity, 54 percent of which supplied the terminals. About 18 percent of energy used at Logan Airport is attributable to Massport uses, and the remainder to tenants. In 2010, approximately 4 million therms of natural gas were used Airport-wide. In 2010, on-airport renewable energy installations produced approximately 1 percent of the Airport's electricity needs. This is expected to increase as new on-airport solar installations come online. In addition, Massport operates a central heating and cooling system on Logan Airport, which is an efficient method of providing heating and cooling to multiple buildings in a large campus setting. The function of the central heating plant (CHP) is to provide both heating and cooling to the terminals and high temperature hot water to West Garage, Logan Office Center, Facilities I, and Hangars 8, 9, and 16.

Massport continues to make strides in reducing energy use at the Airport. In 2009, Massport began developing a comprehensive Energy Master Plan for all Massport facilities. In 2010, the Massport Board approved the Energy Master Plan. Further, the Board allocated funding for a capital project to implement energy efficiency improvements targeted at achieving energy efficiency, GHG reductions, and renewable energy targets as defined by the Governor's Executive Order 484 - *Leading by Example*.

⁹ Federal Aviation Administration. Order 1050.1E, Environmental Impacts: Policies and Procedures, 20 March 2006.

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4.3.9.2 Sustainability at Logan Airport

Sustainability is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."¹⁰ Massport has a commitment to implementing environmentally sustainable practices authority- and airport-wide, and continues to make progress on a range of initiatives. The *Logan Airport 2010 EDR* describes how sustainability is incorporated into many aspects of all of Massport's activities: goals and commitments; planning and design; construction; operations, and maintenance. The following sections generally describe the current sustainable goals and initiatives at Logan Airport.

Sustainability Goals and Initiatives

In October 2000, the Massport Board approved an Authority-wide Environmental Management Policy, which articulates Massport's commitment to protect the environment and to implement sustainable design principles.¹¹ In October 2004, Massport prepared the *Massachusetts Port Authority Sustainability Plan* which presents Massport's long-term and short-term sustainability goals. It also identifies the actions necessary to achieve the goals, the staff members responsible for each sustainability goal, and the timeline for achieving the goals. The short-term goals set out in the Sustainability Plan are described below. To oversee many of these sustainability initiatives, Massport appointed its first full-time Sustainability Program Manager in 2008.

In 2009, Massport participated in the *2010 Environmental Benchmarking Survey* sponsored by Airport Council International-North America (ACI-NA) in order to assess solar power, purchase of renewable energy, availability of low emission ground transportation, recycling and "green" purchasing. Also in 2009, Massport published its *Sustainable Design Standards and Guidelines* (SDSG) for use by architects, engineers, and planners working on capital improvement projects for Massport facilities. The SDSG apply to both new construction and rehabilitation projects (building and non-building) of any square footage or monetary value.

Additionally, Massport is committed to supporting the Commonwealth's sustainable initiatives, including the recent Executive Order 484 – *Leading By Example* (EO 484) promulgated by Governor Patrick in April 2007. EO 484 establishes the Leading by Example Program as a way to oversee and coordinate sustainable efforts (e.g., promote energy conservation, waste reduction, natural resource protection) by state agencies and encourage private sector developers to implement sustainable practices. As part of EO 484, the Executive Office for Administration and Finance mandates a set of minimum standards for sustainable design and construction of new buildings and major renovations by Executive Agencies (the MA "LEED Plus" program). While Massport is not an executive agency of the Commonwealth, it is nevertheless committed to constructing its facilities, in accordance the MA LEED Plus whenever feasible. Elements of the MA LEED Plus program related to energy performance and water efficiency are incorporated into the SDSG.

Sustainable Projects and Initiatives

The following briefly describes key past or current sustainability projects at Logan Airport. Refer to the *Logan 2010 EDR* for further detail on these projects and for additional sustainability projects and initiatives.

¹⁰ Brundtland_Report, United Nations. "Report of the World Commission on Environment and Development." General Assembly Resolution 42/187, December 11, 1987.

¹¹ The Environmental Management Policy can be viewed on Massport's website at: www.massport.com/environment/Pages/EnvironmentalManagementPolicy.aspx

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- Certified Green Buildings/Operations (LEED and ISO 14001, as noted) at Logan Airport include:
 - Terminal A (LEED certified)
 - Signature Flight Support General Aviation (GA) Facility (LEED certified)
 - Future ConRAC Facility (anticipated; includes Logan's new Unified Bus Fleet) (LEED certified)
 - Future Green Bus Depot (anticipated) (LEED certified)
 - Maintenance Facilities I, II and III Operations (ISO 14001 certified)
- Terminal B Garage Renovations, including substantial energy efficiency upgrades and rainwater harvesting (described further below in Section 4.4.6).
- New Cell Phone Waiting Lot, including use of porous pavement (a permeable pavement surface over a stone reservoir, which allows water to penetrate through the pavement and filter the runoff before it seeps to the subsoil and recharges the groundwater) and landscaping to reduce/control stormwater runoff.
- Warm Mix Asphalt, which is heated to a lower temperature than hot mix asphalt saving energy, resulting in 20 percent lower GHG emissions than hot mix asphalt was used on the outer edges of Runway 4R-22L, Runway 9 27, and the new centerfield taxiway.
- Massport has several programs in place that contribute to the environmentally sustainable operation and maintenance of Logan Airport and its facilities, and encourages its tenants to do the same. A key example is the Energy Master Plan, which identifies energy efficiency improvements targeted at achieving energy and renewable energy targets (and greenhouse gas emissions reductions targets), as defined by EO 484. Refer to the *Logan 2010 EDR* for additional sustainable operation and maintenance measures. Multiple renewable energy projects that are planned and/or currently being evaluated include:
 - Terminal A (solar)
 - Economy Parking (solar)
 - Logan Office Center (wind)
 - Green Bus Depot (solar - pending)
 - ConRAC Facility (solar, wind - pending)

4.3.10 Historical, Archaeological, and Cultural Resources

There are no known historical, archaeological, or cultural resources within the boundaries of the Airport.

According to the Massachusetts Historical Commission's (MHC) on-line database (the Massachusetts Cultural Resource Information System, or MACRIS),¹² there are no properties listed in the State or National Register of Historic Places at Logan Airport. Furthermore, none of the airport terminals proposed to be modified as part of the Project (B, C and E) are individually inventoried by MHC. Terminals B, C, and E were all constructed less than 50 years ago and have been modified since their original construction.

4.3.11 Department of Transportation Act, Section 4(f) Properties

Section 4(f) properties are publicly owned parks, recreation areas, wildlife or waterfowl refuges, or historic properties or archaeological sites on or eligible for the National Register of Historic Places. There are no known

¹² Accessed on April 19, 2012 (Website: <http://mhc-macris.net/>).

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Section 4(f) properties within the boundaries of the Airport. There are two Section 4(f) properties in the vicinity of the Airport: (i) the East Boston Memorial Stadium Park; and (ii) Porzio Park. The 17.7-acre East Boston Memorial Stadium Park is located off-airport adjacent to and north of the SWSA site and includes former Massport land that was provided to the City of Boston in 2003 and was used to expand the park. The facilities include a baseball field, softball field, little league field, football/lacrosse/rugby field, play equipment/tot lot, cricket, a passive area, and a running track. Pedestrian and vehicular access is at the southwest corner of the park, via a paved area. The park facilities are operated and maintained by the Boston Parks and Recreation Department.

The 2.4-acre Porzio Park is located in the Jeffries Point neighborhood of East Boston between Sumner and Maverick Streets. The park faces Boston Harbor and is approximately 200 feet from the edge of the Airport. The facilities include a basketball court, tennis courts, a street hockey rink, play equipment/tot lot, a spray fountain, handball courts, and a passive area. The park facilities are operated and maintained by the Boston Parks and Recreation Department.

4.4 Affected Environment of the Project Area

All proposed improvements are located on fully developed areas of the Airport. The following sections describe the existing environmental conditions specific to the Project Areas that the Program would affect. Figures 3.1 and 3.2 show the existing conditions of the Terminal B Improvements and Terminals C-E Connector project areas, respectively. As presented in Table 4-1, the No-Build Alternative, Build Alternative, and reasonable alternatives would not affect the following resources:

- Noise;
- Land Use;
- Socioeconomic Impacts and Secondary (Induced) Impacts;
- Environmental Justice Populations, and Children's Environmental Health and Safety;
- Historical, Architectural, Archaeological and Cultural Resources;
- Department of Transportation Act, Section 4(f) Properties;
- Farmlands;
- Wetlands;
- Floodplains;
- Coastal Resources;
- Fish, Wildlife, and Plants;
- Threatened and Endangered Species; and
- Wild and Scenic Rivers.

4.4.1 Project Area Existing Conditions and Previous Terminal Improvements

As previously described, Terminal B is comprised of two individual piers, Pier A and Pier B (a total of 36 gates), separated by the Terminal B Garage. The current configuration requires passengers to cross over the airport roadways, through a parking garage, and re-enter through security in order to get to and from Terminal B, Piers A and B. Additionally, there is no airside connection from Terminal B to Terminal C.

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The existing Terminal B, Pier A, which was constructed in 1975 and totals approximately 330,000 square feet, has 16 gates total, eight of which are in the Project Area (Gates B22 through B29) at the east end of Pier A. This includes four gates made available by American Airlines' reduced schedule and the four gates recently vacated by American Eagle.

A major expansion to Pier A was planned by American Airlines between 1998 and 2002. This expansion included larger gates to accommodate wide-body aircraft intended to operate internationally, new passenger hold rooms, expanded ticketing and security checkpoint, and larger inbound and outbound baggage handling facilities. Concurrently, Massport's Terminal B South Addition was planned during the same period, and included three large wide-body gates, (alternatively four standard wide-body gates); new terminal frontage at departures and arrivals levels; ticketing, passenger checkpoint; passenger hold rooms; baggage handling; and Satellite Federal Inspection Services (FIS) – Customs and Immigration Facilities. Although the projects were reviewed and cleared under NEPA and MEPA, these two projects were terminated following the events of September 11, 2001.

In response to the aftermath of September 11, 2001, the DHS, along with Massport, implemented an airport-wide hold baggage screening project to enhance hold baggage screening capabilities for outbound passengers on both international and domestic flights. In-line baggage screening enhancements were constructed at Terminal B as part of this initiative and were completed in 2002.

Since the American Airlines expansion was terminated, several terminal upgrades were performed at Pier A to improve significant deficiencies. These projects included:

- Connector and American Eagle gate hold renovation;
- Post-security concessions food court and landside concessions improvements;
- Checkpoint consolidations; and
- Restroom upgrades.

4.4.2 Project Area Surface Transportation

Since the mid-1970s, Massport has been committed to increasing use of high occupancy vehicle (HOV) ground transportation modes for traveling to and from Logan Airport. Massport programs have encouraged use of various high occupancy modes, including public transit, water taxis, and Logan Express bus service. Vehicle access in the terminal areas is focused on furthering that commitment by allocating a large portion of existing terminal curbside space for high-occupancy vehicles. Pedestrian access is provided via a combination of marked crosswalks with flashing beacons, overhead walkways, internal terminal walkways and sidewalks.

4.4.2.1 Vehicular Circulation

The bi-level, Terminal Area roadway system provides direct access to the Departure and Arrival Level curbsides of Terminal B for both private and public transit vehicles. The Terminal B roadways provide four lanes of travel in a U-shaped alignment that accesses both Pier A and B of the terminal. The 2,380-space Terminal B Parking Garage is located between the two piers of Terminal B and is accessed from the Terminal B roadways.

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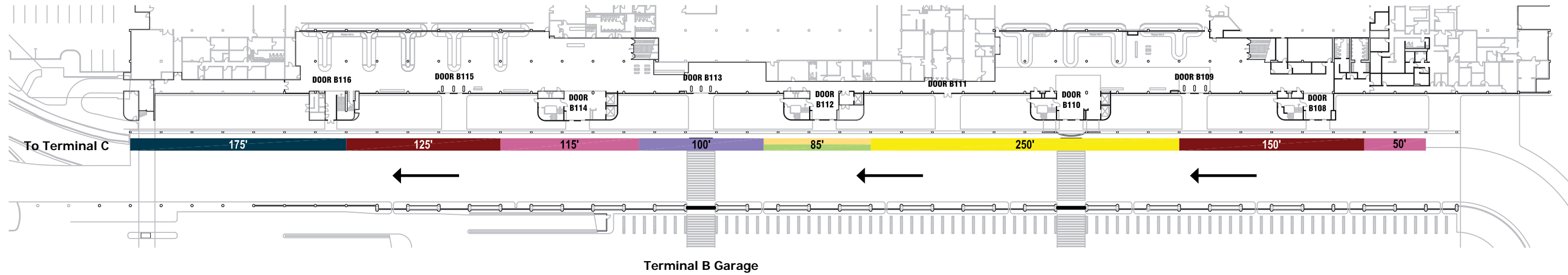
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Massport's Ground Transportation Unit (GTU), in conjunction with the Massachusetts State Police, manages the operation and enforcement of these ground transportation services. The ground transportation mode allocation of the 1,050-foot Arrival Level and 990-foot Departure Level curbsides are graphically shown in Figure 4.4. The following list of curbside users demonstrates the large variety and quantity of ground transportation modes serviced by the Terminal B curbsides:

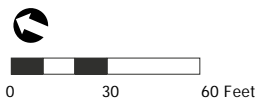
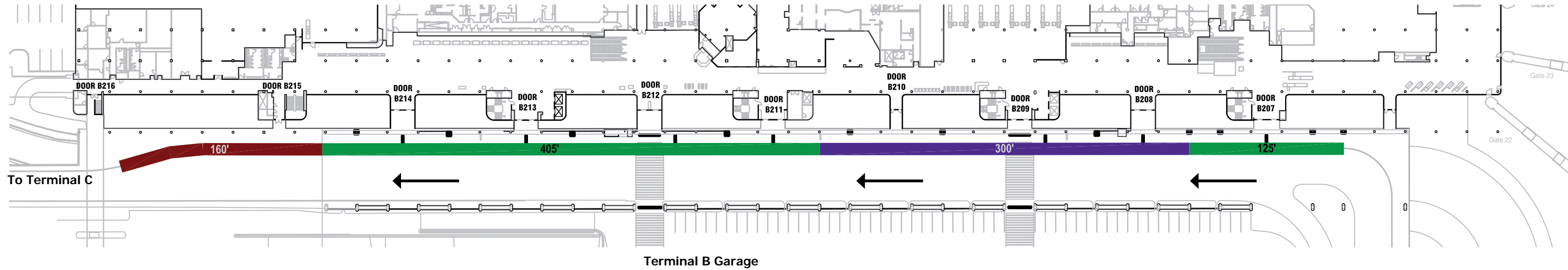
- Passenger car active pick-up (Arrival Level) and drop-off (Departure Level)
- Limousines (Departure Level)
- Taxi pick-up (Stand at Arrival Level) and drop-off (Departure Level)
- Logan Express Buses (Arrival and Departure Levels)
- Charter Buses (Arrival Level)
- Scheduled Transit Buses– Peter Pan, P&B, Concord Coach, Vermont Transit, C&J Dartmouth Coach (Arrival Level)
- MBTA/Massport Silver Line Buses (Arrival Level)
- Shared Van Services (Arrival Level)
- Hotel Courtesy Shuttle Buses (Arrival Level)
- Eight Rental Car Shuttle Buses (Arrival Level)
- Off-airport Parking Shuttle Buses (Arrival Level)
- Route 11: Massport Inter-terminal Shuttle Bus (Arrival Level)
- Route 22: Massport Airport Station - Terminals A & B Shuttle Bus (Arrival Level)
- Route 44: Massport Harborside Drive & Bird Island Flats - Airport Station (Arrival Level)
- Route 55: Massport Airport Station – All Terminals Shuttle Bus (Arrival Level)
- Route 66: Massport Harborside Drive - Airport Station – Water Transportation Dock Shuttle Bus (Arrival Level)
- Route 77: Massport Employee Parking - All Terminals Shuttle Bus (Arrival Level)
- Route 88: Massport Economy Parking - All Terminals (Arrival Level)

Terminal roadways and curbs interact on an Airport-wide basis where queues at one terminal could lead to traffic congestion at another terminal. The long, linear curbsides of Terminal B have experienced periods of congestion in the form of double- and triple-parking and periodic queuing due to high passenger levels and limited curbside space. Private vehicles picking up passengers at Terminal B are encouraged to utilize short-term parking located in the Central Garage and meet passengers in the Terminal. However, active passenger car pick-up does occur at the Terminal B, Pier A Arrival Level curbside within two unassigned areas of curbside. Active pick-up does occasionally encroach into curbside areas allocated to high-occupancy vehicles; this can cause operational problems for those ground transportation modes. Currently, Terminal C curb constraints create double- and triple-parking in the active passenger car drop-off and pick-up curbside zones during peak travel periods. The planned consolidated rental car shuttle busing operation and Airport-wide Curbside Improvement Project aim to improve congestion, delay, and safety of all terminal roadways and curbsides (arrival and departure levels). Refer to the 'No-Action/No-Build Condition Transportation Improvements' section in Chapter 5, *Environmental Consequences and Mitigation*, for further details.

Arrival Level - Terminal B, Pier A



Departure Level - Terminal B, Pier A



Legend

- | | |
|--------------------------------------|---------------------------|
| Silver Line | Airport Shuttles |
| Scheduled Bus | Shared Van |
| Logan Express | Limo |
| Active Pick-up/Thru Traffic/Drop Off | Charter Bus |
| Taxi | Unassigned |
| Courtesy Bus | All Bus Pick Up/ Drop Off |



Figure 4.4

2011 Existing Terminal B - Pier A
Ground Transportation Mode
Curbside Allocation

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4.4.2.2 Pedestrian Circulation

In order to serve the portion of passengers that choose to park within the Central Parking facilities (Central, West and Terminal B garage) and to provide inter-terminal connections, pedestrian amenities are an important part of the surface transportation elements for Terminal B, Pier A. Exterior sidewalks and an interior walkway connect Pier A of Terminal B with Terminal C. The connection to the overhead walkway system to the Central Garage and Terminal A is accessed from the interior walkway to Terminal C. Exterior sidewalk access between Pier A and Terminal A is available, but it circuitous and requires walking to through the Pier B curbside or the Terminal B Garage.

Pedestrian crosswalks, supplemented with in-pavement flashing lights, cross the Departure and Arrival Level roadways to connect the terminal with the first and second floor of the Terminal B garage. Upper levels of the garage are accessed from multiple elevators available within the Terminal.

4.4.2.3 Surface Transportation Traffic Assessment

This section describes the surface transportation traffic assessment methodology and baseline traffic conditions for the Project Areas.

Methodology

In order to verify the observed curb congestion at Terminal B and establish a baseline for comparison to future conditions, an analysis of curbside operations was performed using the Quick Analysis Tool for Airport Roadways (QATAR) spreadsheet model.¹³ Based on existing peak hour vehicle demands for each curbside zone, QATAR calculates a curbside zone utilization and level of service (LOS) as well as double and triple parking impacts on the adjacent roadway lanes. Peak hourly arriving and departing passenger flows by each travel mode were developed using these hourly passenger numbers and mode split percentages from the latest Logan Air Passenger Survey.

Existing Traffic Conditions

Based on a review of the 2010 August (peak month) weekday flight and passenger records, peak hour passenger demand of 968 passengers and 692 passengers was determined for the Departure and Arrival Level curbsides, respectively. By applying the following information to the peak hour passenger demand, peak hour vehicle usage of each of the curbside zones for Terminal B, Pier A was developed.

- Ground transportation mode split percentages (2010 Logan Air Passenger Survey)
- Vehicle occupancy
- High occupancy vehicle schedules or headway data

This vehicle demand was entered into the QATAR model along with dimensional and usage information regarding curbside allocation. The entirety of the Terminal B, Pier A Departure Level curbside operates at LOS A. The analysis indicates that the majority of the Terminal B, Pier A Arrival Level curbside will operate at LOS A as well, with the following exceptions:

¹³ "Airport Curbside and Terminal Area Roadway Operations." LeighFisher, Dowling Associates Inc., JD Franz Research Inc., and WILTEC. *Airport Cooperative Research Program, Report 40*. Transportation Research Board (2010), Print.

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- Active passenger car pick-up occurs within the two unassigned sections of the curbside. Within these zones, the amount of passenger vehicle demand will reduce to a LOS D for the curb lane and the adjacent second lane.
- The Courtesy Bus curbside zone accommodates hotel, off-airport parking and rental car shuttle buses. This demand combined with limited space results in a LOS E for the curb lane and the adjacent second lane. It should be noted that the on-going SWSA Redevelopment Project includes consolidation of the eight existing rental car shuttle routes into a single shuttle bus route, reducing peak hour bus activity from in excess of 95 buses per hour to 20 or less buses per hour which will alleviate congestion in this zone. This consolidation will be taken into account in the environmental consequences analysis.

The detailed summary of volume development and QATAR analysis output is provided in the Appendix B.

4.4.3 Project Area Air Quality

Private automobile access to the Airport is classified as curbside drop-off (and pick up) or parked at a terminal area garage/lot or the remote Economy Parking Lot. To accommodate the use of privately-operated shared-ride vans, buses, and limousine services, Massport provides designated curb areas at all airport terminals. Currently, the curbside drop-off (and pick-up) activities are controlled by state police enforcement and Massport's policy on designated curb areas for services. As a result, the limited time and queuing that occurs from these vehicles in the Terminal B and E areas does not have the potential to result in adverse local air quality impacts.

4.4.4 Project Area Water Quality

The stormwater management system that serves the Project Study Area consists of both a closed and open stormdrain system. The terminal complex drains to the West Outfall which is equipped with end-of-pipe pollution control facilities for the removal of debris and floating oil and grease from stormwater prior to discharge into Boston Harbor. The existing drainage collection system passes beneath the proposed terminal improvement area.

4.4.5 Project Area Hazardous Materials, Pollution Prevention, and Solid Waste

Massport continues to ensure that all areas of subsurface contamination discovered at the Airport are properly assessed, remediated, and brought to regulatory closure, in accordance with the MCP. There are no NPL sites on Logan Airport and, therefore, within the Project Area.

There are no known known MCP sites located within the Project Areas, except for the fuel distribution system which serves the entire terminal complex.¹⁴ There is one 500-gallon Above-Ground Storage Tank (AST) located near Gate 29, which fuels an emergency generator (installed in December of 1998). There are no Underground Storage Tanks (USTs). The specific location of the tracking sites is not known in relation to Terminal B. Inspection and monitoring reports were submitted to the DEP detailing monitoring and product recovery efforts along the fuel distribution system between September 2009 and September 2010. A Release Abatement Measure (RAM) Status Report for the BOSFUEL Project was submitted in February, and the report was revised in March 2010. Massport continues to work with DEP to address regulatory requirements.

¹⁴ MassDEP Tracking number 3-1287

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4.4.6 Project Area Natural Resources and Energy Supply/Sustainable Design

No natural resources are located in the vicinity of Terminals B, C, and E since they are all fully developed impervious areas. In 2010, Terminal B used 30.5 million kilowatt-hours (kWhs) of electricity (which is fed from Switching Station B that has a capacity of 20 Megawatts), Terminal C used 29.8 kWhs and Terminal E used 28.9 kWhs of electricity. There are currently no issues with sufficient power for the terminals.

In 2010, Massport completed the energy-related upgrades as part of a four-year rehabilitation of the Terminal B parking garage. These upgrades consisted of the installation of solar panels on the top parking deck and high efficiency LED lighting throughout the structure, including motion-detecting lighting fixtures which use approximately 50 percent less electricity than the existing lighting reducing existing usage by 2,261,218 kWhs of electricity per year. These upgrades, along with other energy conservation measures, will avoid approximately 1,300 metric tons of CO₂, which is the equivalent of not using 3,040 barrels of oil or 148,385 gallons of gasoline annually. Massport expects a savings of \$3.8 million in electrical usage over the next 20 years based on costs of \$0.12 per kWh.

Additionally, the installation of 16 solar panel trees is expected to produce 83,980 kWhs of electricity, or 2.5 percent of the total garage annual consumption. This is equal to the reduction of 50 metric tons of CO₂ the equivalent of not using 115 barrels of oil or 5,637 gallons of gasoline annually. Each solar panel is a single structure design with a stem and steel frame that uses solar panels as a roof over parked cars. The design has the added benefit of collecting rainwater that will be used for landscaping and cleaning projects on the Airport. As documented in the *Logan 2010 EDR*, lifetime data shows that the Terminal B solar installation has produced about 370,000 kWh of electricity equivalent to powering 2,838 computers for a year.

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Environmental Consequences and Mitigation

5.1 Introduction

According to the Council on Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act (NEPA) (40 CFR 1500.2(f)), project proponents shall, to the fullest extent possible:

“Use all practicable means consistent with the requirements of the Act and other essential considerations of nation policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions on the quality of the human environment.”¹

In accordance with the NEPA regulations, this chapter documents the potential effects of the Project for each applicable environmental resource category, as specified in Federal Aviation Administration (FAA) *Order 1050.1E*² and listed in Table 5-1. This chapter also evaluates measures that would avoid and/or minimize impacts including limiting the degree or magnitude of the Project and its implementation.

This EA provides an analysis of whether an impact is significant, in accordance with FAA guidance on impact thresholds for significant adverse effects provided in FAA *Order 1050.1E*. The impact thresholds identified in FAA *Order 1050.1E* are discussed in Section 5.4. For each resource category analyzed in this EA, a finding of significance is provided and summarized at the end of this chapter. Based on the impact analysis presented herein, there are no adverse environmental impacts associated with the proposed Project.

5.2 Analysis Years

In accordance with NEPA, the Build Alternative is compared to the No-Action/No-Build Alternative in the same analysis year for each environmental impact category to determine the effect (beneficial or adverse) of the alternative. As described in Chapter 3, *Affected Environment*, the baseline condition is 2010, the year for which the most recent complete set of data is available. The Project is scheduled to be complete at the end of 2013, which represents the future build year. The analysis also evaluates conditions five years after the full opening of

1 Council on Environmental Quality, Regulations for Implementing the National Environmental Policy Act (40 CFR 1500), http://ceq.hss.doe.gov/nepa/regs/ceq/toc_ceq.htm.

2 FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, released March 20, 2006.

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the Project in 2018. There are no changes in Airport-wide passenger and aircraft activity levels associated with the project in 2013 and 2018; rather, passengers and aircraft operations are reallocated among terminals so as to allow more efficient and balanced functioning of the terminal facilities. Chapter 2, *Purpose and Need*, describes the passenger and aircraft operations activity levels for the future No-Action/No-Build and Build Conditions in 2013 and 2018.

5.2.1 No-Action/No-Build Alternative

Terminal B is currently comprises two individual piers (Pier A constructed in 1975 and Pier B constructed in 1974) separated by the shared Terminal B Garage. Refer to Figure 3.1 for the existing Terminal B, Pier A departures and arrivals levels. The terminal remained largely unchanged until the US Airways expansion, which was constructed in 1980. From 1980 until 2000, numerous small projects including gate hold improvements, concession-area expansions, and passenger lounges were completed at both piers.

The 2013 No-Action/No-Build Alternative would essentially leave Terminal B, Pier A as it currently exists and may include cosmetic upgrades to the terminal, or energy-related upgrades related to Massport's ongoing sustainability initiatives. Additionally, internal renovations/modifications, such as improving connectivity of Terminals B and C as part of Massport's ongoing maintenance and facility upgrades of all terminals may take place. There would be no gate changes under the No-Action/No-Build Condition.

A key planned improvement to Airport-wide vehicular circulation is the implementation of the Unified Bus System as part of the Consolidated Rental Car (ConRAC) facility project in the Southwest Service Area (SWSA). The Unified Bus System will serve the Consolidated Rental Car facility, the MBTA Blue Line Airport rapid transit station and all passenger terminals, both upper and lower levels. The new system will use diesel-electric hybrid alternative fuel 60-foot articulated buses. Implementation of the Unified Bus System will dramatically reduce trips from the individual rental car shuttle bus fleets and Massport bus routes, thus, improving curbside traffic at all terminals. No other ongoing projects affecting Terminals B or C/E are currently anticipated as part of a future No-Action/No-Build Alternative. These bus system improvements will be in place in 2013.

Under the future No-Action/No-Build Alternative for the Terminal C-E Connector, the terminals would not be linked on the airside and, thus, would not allow for flexibility in baggage and passenger handling accommodating airline mergers.

5.2.2 Proposed Build Alternative

The Build Alternative includes both the Terminal B, Pier A Improvements and the Terminal C-E Connector.

5.2.2.1 Terminal B, Pier A Improvements

As described in Chapter 3, *Alternatives*, the proposed Build Alternative for the Terminal B, Pier A Improvements (see Figure 3.6), includes approximately 84,000 square feet of new construction and 78,800 square feet of interior renovated area. It consists of an increased footprint on the Departures Level to accommodate a consolidated ticketing area, airline ticket office, escalators, an expanded security checkpoint, new and improved passenger holdroom areas, including an airline passenger lounge, secure public circulation areas, concessions, and public restroom. On the Arrivals Level, an increased footprint will include reconfigured inbound baggage processing space, new outbound baggage processing space, a new Transportation Security Administration (TSA) screening

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room (in compliance with revised TSA baggage screening guidelines), escalators, airlines operations offices, and access to an infield area for ground service equipment (GSE) parking.

The major feature of the proposed Build Alternative is an extended holdroom and concourse parallel to the taxiway, terminated at one end by a large triangular plan form. This creates a large apron area between the end of the holdrooms and the existing American Airlines pier, creating additional apron area for parking smaller aircraft and facilitating baggage cart movements around the baggage handling rooms at arrivals level.

As described above, the future Build Condition will include improvements to the Terminal B curbs associated with the proposed Project, and also include implementation of the Unified Bus System as part of the completion of the ConRAC facility in the SWSA. This is described in further detail in Section 5.5.1, *Surface Transportation*.

5.2.2.2 Terminal C-E Connector

The proposed Terminal C-E Connector, (shown in Figure 3.7), includes 3,500 square feet of new building construction and approximately 18,900 square feet of interior renovation and reorganizes circulation post-security and enhances accessibility to the Arrivals Level baggage claim. The new passenger circulation route connects Terminal E to Terminal C, running along the inside of the Terminal C facade and tying into Terminal C, Pier B immediately across from the new security checkpoint concessions and circulation corridor.

The new post-security connector will run primarily along the perimeter of the existing Terminals C and E, and is mostly confined within the existing Terminal C Departures Level building envelope. A connecting portion between the two terminals will provide the major link at the existing Terminal E lower roof level. The Terminal C-E Connector will provide secure public circulation areas, reconfigured office space within both terminals, and reconfigured concessions within Terminal C.

See Chapter 3, *Alternatives*, for detailed descriptions of the Build and No-Action/No-Build Alternatives.

5.3 Methodology

The following section describes how the environmental consequences were determined for each resource category for the proposed Project.

5.3.1 Direct Impacts

Direct impacts are defined by NEPA as impacts caused by the proposed action and occur at the same place and at the same time. The list of resource categories evaluated was developed based on the FAA's NEPA regulations (FAA *Order 1050.1E*) and include:

- Surface Transportation
- Air Quality
- Water Quality
- Hazardous Materials and Solid Waste; and
- Natural Resources and Energy Supply/Sustainable Design

5.3.2 Indirect Impacts

Indirect impacts are defined as those impacts that are caused by a proposed action and occurring later in time or at another location, but that are still reasonably foreseeable. Indirect impacts could occur elsewhere at Logan Airport or in the nearby neighborhoods as a result of the proposed action. The proposed Project will cause no off-Airport adverse permanent indirect impacts since the project elements, located in the Terminal Area Complex, are consistent with current uses and are sufficiently far from neighboring communities as not to result in visual changes to the Airport. The project elements will also not result in off-airport changes to the ground transportation, air quality, or noise environments. Additionally, the proposed Project would not result in an overall increase in Airport operations as the same number of passenger and operations would occur under the No-Build/No-Action Alternative.

On-Airport, the proposed Project will enhance the efficient functioning of the terminals by better distributing aircraft and vehicular traffic among the terminals in response to current and future airline realignments. Congestion that is currently experienced at the Terminal C curbs and the airport roadways approaching Terminal C will be relieved. This is discussed further in Section 5.5.1, *Surface Transportation*. The proposed Project will also allow for better use of under-utilized aircraft gates at Terminal B, Pier A, and will also permit more efficient functioning of jetBlue operations at Terminal C. With the changes in the airline industry and consolidation of airlines, the freed-up space in Terminal C will give jetBlue the ability to backfill routes and serve markets that may no longer be offered by other airlines. The proposed Project will allow the terminal complex to better accommodate overall increases in passenger levels that are forecast for the Airport through 2030 independent of this action.

5.3.3 Temporary Construction-Related Impacts

Temporary, construction-related impacts occur on a short-term basis during construction only based on construction methods, duration, materials, and equipment. Temporary, construction-related impacts were evaluated for surface transportation, air quality, and noise.

The following on-Airport projects would be under construction during the same time period as the Project: the ConRAC Facility; Green Bus Depot; Greenway Extension; Runway 33L Safety Area Improvements Project; and Runway 15R-33L Repaving Project. These are considered in the construction impacts assessment.

5.3.4 Cumulative Impacts

FAA's NEPA regulations describe cumulative impacts as the incremental impact of a proposed project when added to the past, present, and reasonably foreseeable future projects undertaken by any agency or person. The proposed Project will not result in a change to the number of passengers or aircraft projected to be accommodated at Logan Airport compared to the No-Action/No-Build Condition. The Project will reallocate/shift passengers and aircraft operations among terminals and will not result in changes to the overall airport forecasts. The Logan Airport Environmental Data Reports (EDRs) and Environmental Status and Planning Report (ESPR) evaluate the cumulative impact of overall airport operations through a comprehensive assessment of current and future cumulative airport impacts in the areas of surface transportation, noise, air quality, and water quality. The EDRs and ESPRs take future projects into account in the future impact assessments. The proposed Project is identified in the *Logan 2010 EDR*, as are projects such as the ConRAC Facility in the SWSA, the Green Bus Depot, and the Runway Safety Area Improvements Project.

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At a minimum, the timeframe for consideration of cumulative impacts would take into account past impacts and future impacts through 2018, which is five years after the projected completion of the proposed improvements. The ground transportation and air quality analyses by nature are cumulative because they take into consideration background and current conditions as well as future actions. The existing airport drainage system would handle the Project-related stormwater runoff. Additionally, the Project will consider stormwater capture and re-use, such as a rainwater storage tanks. The estimated energy demand for the Project would not result in a significant increase to the overall energy usage of the Airport. The assessment of temporary construction impacts (ground transportation, air quality and noise) includes a cumulative assessment (qualitative) by taking other construction activities elsewhere on-Airport scheduled during the Project's construction duration.

5.4 Significance Thresholds

For each environmental resource category, the Project was compared to the No-Action/No-Build Alternative to determine the effect (beneficial or adverse). This section provides an analysis of whether that impact is significant, based on FAA guidance for significant adverse effects provided in FAA *Order 1050.1E*. Significance thresholds identify the minimum attributes and characteristics that need to be present in a resource category (such as noise, water quality, or historic resources) for that category to be identified as potentially adversely affected by the action.

Significance thresholds of environmental resources relevant to the Project are summarized in Table 5-1. (This table excludes those impact categories that the No-Action/No-Build and Build Alternatives would not affect and/or are not present in the Study Area, as discussed in Chapter 4, *Affected Environment*.) Measures proposed to avoid, reduce, or minimize the potential impacts are presented under Section 5.4.

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Table 5-1 FAA Order 1050.1E Impact Thresholds for Significant Adverse Effects

Section Number	Impact Category	Order 1050.1E Impact Threshold for Significant Adverse Effects	Significant Impacts (Yes/No)
5.4.1	Surface Transportation	Disruption in local traffic patterns that would substantially reduce the level of service of roads serving the airport and surrounding communities	No ¹
5.4.2	Air Quality	When a project or action exceeds one or more of the National Ambient Air Quality Standards (NAAQS).	No ¹
5.4.3	Water Quality	When an action would not meet water quality standards. Potential difficulty in obtaining a permit or authorization may indicate a significant impact.	No
5.4.4	Hazardous Materials and Solid Waste	When an action involves a property on or eligible for the National Priority List. Uncontaminated properties within a NPL site's boundary do not always trigger this significant impact threshold. For solid waste: None established.	No
5.4.5	Natural Resources and Energy Supply/ Sustainable Design	When an action's construction, operation, or maintenance would cause demands that would exceed available or future (project year) natural resource or energy supplies.	No
5.4.6	Construction Impacts	See significance threshold for the resource(s) construction would affect.	No

Note: Excludes categories that the no-build and build alternatives would not affect and/or those resources not present in the Study Area.

1 Massport is committed to designing and implementing measures such as curbside reallocation to avoid congestion and to maintain appropriate levels of service.

5.5 Environmental Consequences and Mitigation

Project-related impacts are described below for each impact category, as listed in Table 5-1. This section also identifies measures that would avoid and/or minimize impacts.

5.5.1 Surface Transportation

FAA *Order 5050.4B* requires an assessment of the surface transportation system as part of the NEPA process when the action could cause disruption of local traffic patterns that substantially reduce the level of service of roads serving an airport and its surrounding communities.³ The Project will not change the number of aircraft operations or passenger activity levels airport-wide, and is anticipated to have only temporary increases in traffic associated with construction workers and vehicles (refer to Section 5.4.6).

With the consolidation of United/Continental, the Project will shift some passenger activity from Terminals A and C to Terminal B, Pier A to better use currently underutilized facilities and provide for more efficient air carrier operations. To evaluate the effect of this shifted passenger load on the Terminal B roadways and curbsides, an analysis and comparison of existing passenger loads and curbside operations for future conditions with and without the proposed airline shift and consolidation was performed. To assess curbside operations, the peak month, average weekday daily condition was analyzed since this represents the time period where the curbs would have to accommodate the highest passenger activity levels.

³ Federal Aviation Administration Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects*, Federal Aviation Administration United States Department of Transportation, 28 April 2006.

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5.5.1.1 Future No-Action/No-Build Conditions

Future passenger activity levels were developed for 2013 and 2018 No-Action/No-Build Conditions based on a number of input data related to air passenger activity at the terminal. Peak month, average weekday daily air passengers demand estimates were determined based on existing and future flight schedules for all air carriers operating at Terminal B, Pier A. Average daily air passenger estimates are calculated by taking the number of daily aircraft operations, by aircraft type, and then applying appropriate aircraft load factors ⁴ to the seating capacity of those aircraft types.

Under future No-Action/No-Build Conditions, projected flight information for American Airlines and Virgin Atlantic were developed by the airlines and Massport for August 2012. Peak month, average weekday daily passenger demand forecasts for the years 2013 and 2018 were developed for Terminal B using the FAA Terminal Area Forecast (TAF). A TAF growth factor of 0.6 percent was applied to grow passenger enplanements and deplanements from 2012 to 2013, and a growth factor of 2.07 percent annually from 2012 to 2018. Peak hour demand for arriving and departing passengers were developed from this daily passenger forecast and flight schedule. This peak hour passenger demand, shown in Table 5-2, is slightly lower than 2010 Existing Conditions passenger demand due to the elimination of American Eagle operations and general reduction in American Airlines flight operations.

5.5.1.2 Future Build Conditions

Projected flight information for the merged United/Continental operation was added to the 2013 and 2018 No-Action/No-Build Condition to determine the 2013 and 2018 Build Condition flight schedule, daily passenger demand and peak hour passenger demand for Terminal B, Pier A. The resulting 2013 and 2018 Build Conditions peak hour passenger demands are summarized in Table 5-2 and reflect a doubling of passenger activity when compared to future No-Action/No-Build Conditions. It should be noted that the Project will not result in additional passengers Airport-wide, rather a reallocation of passengers among terminals.

Table 5-2 Terminal B, Pier A Peak Hour Passenger Demand

	2010	2013 No-Action/ No-Build ¹	2013 Build	Percent Change (No-Action/ No-Build vs. Build) ²	2018 No-Action/ No-Build	2018 Build	Percent Change (No-Action/ No-Build vs. Build) ²
Arrivals	692	563	1,140	102%	629	1,273	102%
Departures	968	687	1,407	104%	768	1,572	105%

1 Reduction in passengers between 2010 Existing and 2013 No-Action/No-Build Conditions attributable to elimination of American Eagle operations and a general reduction in American flight operations.

2 Build Condition versus No-Action/No-Build Condition reflects the relocation of future passenger activities from Terminal A and C.

Note: The Project will not result in additional passengers airport-wide, rather a reallocation of passengers among terminals.

5.5.1.3 Proposed Transportation Improvements

Under the future No-Action/No-Build Condition, the Terminal B, Pier A curbs will be improved by several airport-wide projects.

⁴ Load factors represent an average (or typical) occupancy for a particular air carrier. For example, if an air carrier typically carries passengers on its flights at 75 percent capacity, the representing load factor would be 0.75.

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No-Action/No-Build Condition Transportation Improvements

Consolidated Busing

As part of the construction of the Consolidated Rental Car Facility in the SWSA, the existing, separate rental car shuttle bus operations will be combined with Massport's Shuttle Route 22/33 (Airport Station – Terminals) into a single busing operation. This consolidation of shuttle buses will reduce peak hour bus traffic at the Terminal B, Pier A curbside from 115 to 20 buses per hour and reduce congestion and double-parking.

Airport-wide Curbside Improvement Project

With the switch from individual rental car shuttle buses to a consolidated shuttle bus system requiring changes to each terminal's curbside zone allocations, Massport has chosen to build on this by performing a comprehensive operational customer service and safety analysis of each terminal curbside. This study and resulting recommended improvements will focus on terminal area safety, stakeholder outreach and coordination, and development of curbside allocation alternatives that adjust transportation mode locations to meet safety and operational considerations. The alternatives will incorporate safety recommendations, intelligent transportation system (ITS) elements, vehicular and pedestrian way-finding signage, and curbside operational recommendations.

Build Condition Transportation Improvements

Specific to the Terminal B, Pier A curbsides, some combination of the following strategies and improvements will be evaluated and implemented before the completion of the Project in late 2013, and would occur with or without the proposed Project:

1. Modification of the dual-stop requirement for Massport operated scheduled bus service (Logan Express, on-airport shuttle buses). The buses currently stop at the beginning and approximate midpoint of the curbsides for passenger convenience, not operational considerations.
2. Use of the 'horseshoe' end of the Terminal B Arrival Level roadway to provide additional curb dedicated to taxis. The area would be operated as a holding area, or mini-pool, for the Pier A taxi stand to eliminate excessive queuing from the taxi stand that could impact roadway operations.
3. Installation of internal pedestrian wayfinding signage in the renovated areas guiding arriving passengers to the most direct and efficient paths to all ground transportation modes (MBTA services, including the Blue and Silver Lines, scheduled buses including Logan Express, as well as taxis, limos and shared ride shuttles) via Terminal B, Pier B.
4. Installation of transponder system at the terminal access and egress to track and enforce the 10-minute dwell time rule for limousines. The transponder system would be incorporated with Massport's Gatekeeper tracking database and MassDOT's Fastlane system to allow collection of fines from limousine operators that violate Massport's dwell time rule.

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5.5.1.4 Curbside Operation Analysis

The following section compares the No-Action/No-Build and Future Build Conditions (in 2013 and 2018).

Future No-Action/No-Build Condition Curbside Operations

Future curb demand for the Arrival and Departure Level curbsides at Terminal B, Pier A was calculated using the future peak hour passenger levels and ground transportation mode share information from the 2010 Logan Air Passenger Survey, as described in Section 4.4.2.3, *Surface Transportation Traffic Assessment*. With the reduction of future No-Action/No-Build Condition passenger demand from 2010 Existing passenger levels, curbside operations are projected to remain or slightly improve over existing operational conditions without any curbside allocation or operational improvements, with one exception. Analysis indicates that the change from separate rental car shuttle bus routes to a consolidated bus operation will result in a substantial improvement for the Courtesy Bus curbside zone, improving from a Level-of-Service (LOS) E to a LOS A for all future conditions. Complete copies of the QATAR analysis can be found in Appendix B.

Build Condition Curbside Operations

Since the project-specific and airport-wide curbside allocation and operation improvements are still being refined by Massport, it was assumed that the curb configuration adjacent to Terminal B, Pier A would remain the same as existing conditions for all future build conditions analysis. While passenger counts are projected to increase at Terminal B, Pier A, curbside operations for high-occupancy vehicle zones on the curbsides are not projected to change since operational details, such as schedule, headway or vehicle type, for those ground transportation modes have sufficient existing capacity under existing conditions and, therefore, would not be required to be altered to accommodate the projected change in passenger activity. However, it is anticipated that specific curbside demand of ground transportation modes (taxi, limousine, active passenger car drop-off and pick-up) more directly tied to passenger activity would increase in the future. Analysis of the Build conditions indicates that, without additional operational measures, operations within these affected zones, particularly the passenger car active pick-up and drop-off zones, will worsen with congestion and without active management, with double- and triple-parking occurring more frequently.

Transportation infrastructure and operations management improvements that are anticipated as part of the Airport-wide Curbside Improvement Project will provide an improved and more efficient ground access system that would be able to accommodate future passenger demands at Terminal B. Massport is confident that improved curb configuration and operations management actions will be in place by the completion of the Project and will alleviate the operational deficiencies identified in the Future Build curbside analysis.

5.5.1.5 Indirect Impacts

Similar to Terminal B, current ground transportation traffic operations in Terminal C are affected by the Project. The primary impact is caused by operations along stacked and adjacent curb areas. As described previously in Chapter 4, *Affected Environment*, currently Terminal C curb constraints create double- and triple-parking in the active passenger car drop-off and pick-up curbside zones. Under the Build Condition, with the relocation of United Airlines operations to Terminal B, Pier A, approximately 150 to 160 and 295 to 330 passenger cars during the peak hour would be removed from the Terminal C Arrival Level and Departure Level roadways, respectively. This reduction of passenger cars combined with the previously discussed consolidated busing operation will improve congestion, delay and safety of the Terminal C Arrival and Departure Level curbsides.

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5.5.2 Air Quality

Air quality is evaluated in terms of any changes in mobile and stationary sources associated with the Project when compared to the No-Action/No-Build Condition. The proposed Project would not increase Airport-wide mobile or stationary source direct and indirect emissions, including emissions from construction vehicles and equipment, such that they would be substantially below the Federal General Conformity *de minimis* thresholds of 50 tons per year (tpy) of volatile organic compounds (VOC) and 50 tpy of nitrogen oxides (NO_x), and 100 tpy of carbon monoxide (CO). Therefore, a Clean Air Act (CAA) General Conformity Determination is not required.

The Project will:

- Not increase mobile or stationary source emissions (including greenhouse gas [GHG] emissions);
- Not cause or contribute to violations of National Ambient Air Quality Standards (NAAQS);
- Not cause additional or worsen existing violations of or contribute to new violations of the NAAQS; and
- Not affect attainment of the NAAQs.

5.5.2.1 Mobile Source Emissions

The proposed Project will not alter the level of aircraft operations at Logan Airport. Two areas of mobile source emissions (including mobile source GHG emissions) will change: (i) the eight aircraft parking locations; and (ii) landside curb utilization. Some aircraft and vehicle activity will be relocated due to the Project, but will not change on an Airport-wide basis. Under the Build Conditions (in 2013 and 2018), aircraft activity associated with the Continental/United merger that now operate out of Terminals A and C will operate out of currently under-utilized gates at Terminal B, Pier A. There is sufficient space on the airside of Terminal B, Pier A to reconfigure the existing apron and gates to adequately accommodate the relocated aircraft operations. Passengers that were formerly served by United and Continental at Terminals C and A, respectively, will be served out of Terminal B, Pier A and landside surface transportation access will be adjusted accordingly. As shown in the surface transportation analysis above, the proposed Project will be designed to accommodate passenger surface transportation access at the Terminal B curbs, with acceptable levels of service and no increases in curbside idling and congestion from private automobiles dropping off or picking up passengers, as well as from other modes of transportation such as taxis and limousines.

The Project will affect landside ground access activities. Some passenger activity from Terminals A and C will be shifted to Terminal B, providing relief to existing passenger loads and curbside operations at Terminals A and C, and to better use under-utilized facilities and provide for more efficient air carrier operations at Terminal B. While mobile emissions associated with Terminal B, Pier A may be slightly higher under future conditions, the Airport-wide emissions will remain the same. The primary pollutant of concern from automobiles due to landside ground access activities is CO. The emissions of other airport activity related air pollutants will remain unchanged. The Logan Airport 2010 EDR demonstrates that the total CO emissions at Logan Airport in 2010 were 2,881 tpy (7,160 kilograms per day [kg/day]), or approximately 10 percent lower than 2009 levels. This is consistent with the long-term downward trend of 59 percent overall reductions from 1990 to 2010 in CO emissions associated with airport activities. As discussed above in Section 5.5.1, the Project will not result in additional airport ground traffic or roadway congestion. The Project will be managed so that there is no vehicular idling at the curbs. As a result, CO emissions will not change airport-wide and will be similar at the Terminal B, Pier A curbs, compared to the No-Action/No-Build Condition.

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5.5.2.2 Stationary Source Emissions

No significant changes to stationary sources of emissions, including GHG emissions associated with building energy use would result due to the proposed Project. The Project will include new construction as well as renovations to existing building layouts and heating/cooling systems. To the extent possible, the Project will use existing energy infrastructure, including a new chilled water line from Terminal A to provide air conditioning systems and a new high-temperature hot water line also from Terminal A. Also, new air-handling units at existing terminal mechanical penthouses will replace original existing high-maintenance and low-efficiency machines resulting in lower emissions. Additionally, all jet bridges are planned to be upgraded with 400 Hertz (Hz) power and pre-conditioned air (PCA) to reduce the use of on-board diesel powered auxiliary power units (APUs) and associated air emissions, including GHG emissions.

5.5.2.3 Indirect Impacts

The Project will result in improvements in landside ground access activities at Terminal C and A. Some of the existing roadway traffic flow, passenger loads, and curbside operations at Terminal C and A will be relocated to Terminal B resulting in their indirect emissions being reduced. Increases in these landside ground access activities emissions will be shifted to Terminal B, but the emissions of mobile sources at Airport-wide will remain substantially unchanged.

5.5.3 Water Quality

Massport's Stormwater Pollution Prevention Plan (SWPPP) addresses stormwater pollutants in general, and also addresses deicing and anti-icing chemical, potential bacteria, fuel and oil, and other sources of stormwater pollutants. In accordance with the Logan Stormwater Permit (MA0000787) and Logan SWPPP, the 2011 Annual Certificates of Compliance were submitted to EPA and MassDEP on December 13, 2011, for Massport and each tenant co-permittee.

Under the Build Condition, the existing Airport drainage system will be reconfigured to handle the Project runoff. The distribution of stormwater between the building and ramp will shift to more roof collection, but the aggregate amount of stormwater will remain unchanged from the No-Action/No-Build Condition volume. The system will be modified as necessary to accommodate the new roof area drainage and surface drainage both landside and airside.

As described in Chapter 4, *Affected Environment*, in an effort to manage stormwater effluent and protect groundwater resources from aircraft deicing operations during the winter months, Massport holds a National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharge at the major outfalls within the Airport proper. In compliance with the NPDES permit, Massport monitors discharges and submits reports to the USEPA and DEP. Aircraft deicing operations are conducted by each airline with mobile deicing trucks at their individual gates as well as designated deicing locations. It is anticipated that aircraft deicing practices will be the same under Build Conditions as under No-Action/No-Build Condition for the Project (Terminal B, Pier A).

5.5.3.1 Indirect Impacts

No indirect water quality impacts are anticipated from the proposed Project.

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5.5.4 Hazardous Materials, Pollution Prevention, and Solid Waste

The Project includes several supporting infrastructure elements, including new and re-located jet-fuel hydrants to serve the reconfigured aircraft gates on the apron. Under Build Conditions, Massport will continue to ensure that any areas of subsurface contamination discovered within the Project Areas are properly assessed, remediated, and brought to regulatory closure, in accordance with the Massachusetts Contingency Plan (MCP). There is one known MCP site located within the Project Study Area as described in Chapter 4, *Affected Environment*. The Project will not affect that remediation process.

Hazardous materials encountered during the project construction will be addressed in accordance with applicable MCP regulations (310 CMR 40.00), Massachusetts General Law Chapter 21E, and the Oil and Hazardous Materials Release Prevention and Response Act, as required.

5.5.4.1 Aircraft Fuel Facilities

A central fueling farm is located at the north end of the Airport and is connected to the terminals via a buried fueling loop around each of the terminal buildings. Fuel is transferred from fueling pits to aircraft at each gate utilizing fuel pump trucks or hydrant carts. The new fueling loop for Terminal B, Pier A will be relocated outside the new building footprint to maintain the safety zone around the fueling system, as required by National Fire Protection Association (NFPA) Code 407. The proposed Project will meet NFPA requirements either by appropriate distance or by building face treatment with deluge sprinkler systems.

In addition to a new fueling line and hydrant pits, a metering system will be installed at each hydrant pit as well as emergency cut-off valves on the building at each gate. Cathodic protection will also be installed (to be compatible with the existing system and upgraded where possible).

5.5.4.2 Indirect Impacts

No indirect hazardous materials, pollution prevention, or solid waste-related impacts are anticipated from the proposed Project.

5.5.5 Natural Resources and Energy Supply/Sustainable Design

Under FAA *Order 1050.1E* and *Order 5050.4B*, a significant adverse effect occurs when the proposed project would cause significant adverse impacts on energy supplies or natural resources. The Project would not have a significant adverse impact on energy supply or natural resources because there is existing capacity available to support operation of the new building systems. Additionally, both renovated and new building area will be fit out with efficient building systems, in accordance with Massport's *Sustainable Design Standards and Guidelines* (SDSG), as described further below. There are no natural resources within the Project Area.

5.5.5.1 Sustainable Design Opportunities

The proposed Project includes new construction as well as renovations to existing building layouts, finishes and systems. The Project will follow Massport's SDSG, and will incorporate sustainable design principles as they relate to the project site design, materials, energy efficiency, water use and management, air emissions, and indoor air quality. During the Preliminary Design Phase and later design phases for the Project, the following sustainable design opportunities will be considered for their feasibility and applicability:

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- Measures to reduce energy use by at least 20 percent
- Incorporation of infrastructure for collection, storage and handling of recyclables (approved pre-security and post-security recycling stations, on-site collection bins and storage dumpsters)
- Design for deconstruction and flexible re-use of space as Terminal needs change over time
- Passive solar options for building envelope efficiency such as broad roof overhangs or shading devices to reduce solar heat gain and glare
- Energy efficiency measures for building mechanical, electrical, and plumbing systems
- Measures to reduce water use by 50 percent
- Alternative and/or renewable energy systems
- White roof to reduce solar glare
- Stormwater capture and re-use
- Equip/upgrade jet bridges with 400-Hz power and pre-conditioned air to reduce the use of on-board gas powered APUs and associated air emissions (GHG emissions)

Many additional sustainable design opportunities will be addressed as project design progresses into Design Development and Construction Documents, especially as they relate to the proper specification of sustainable materials and construction practices.

5.5.5.2 Natural Resources/Energy Conservation

The additional energy demand for the new building space in Terminal B, Pier A is estimated to be approximately 515 kilowatt hours (kWhs), which will not result in a significant energy increase at the Airport.

Mechanical systems that service the existing and new building construction will be new, high efficiency units and ductwork. At 30 percent design, energy modeling analysis will be conducted and will continue throughout the design phase to identify measures to reduce energy use by at least 20 percent compared to a baseline standard per Massport's Energy Initiative. The following areas of the design will be reviewed to achieve the overall energy reduction performance goal for the proposed Project:

- Building Envelope:
 - Thermal insulation of exterior walls, roof and second floor slab with unconditioned space below
 - Glazed window area limited to where needed for views
 - High efficiency glazing and solar shading devices to reduce solar heat gain
 - Vestibules and air sealing of wall openings on air-side of building
- Lighting:
 - Reduced lighting energy intensity (watts/square foot) where feasible for occupancy

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- Daylight sensors and daylight harvesting lighting controls
- Lighting controls including occupancy sensors and timer systems
- Mechanical:
 - Energy-efficient equipment
 - Heat recovery systems
 - Automatic control systems
 - Commissioning of systems for proper functioning
- Building equipment:
 - Energy efficiency/energy harvesting technologies on major equipment such as escalators, elevators and baggage handling equipment
 - Energy Star kitchen appliances and office computers

Indirect Impacts

No indirect natural resources or energy supply impacts are anticipated from the proposed Project.

5.5.6 Temporary Construction-Related Impacts

Enabling activities, such as interior demolition are anticipated to begin in June 2012. Construction of new building areas is anticipated to commence in late June or July 2012 with completion by the end of 2013. The Project will be constructed in a single phase with the exception of the new Security Checkpoint. The checkpoint will be constructed in multiple phases, allowing it to operate at full capacity throughout construction.

To avoid airside security issues, a TSA-approved temporary Security Identification Display Area (SIDA) fence will be constructed as part of the Terminal B, Pier A Improvements project to allow construction activities to occur outside of secured areas. Construction laydown areas will be located both in the infield area of the terminal as well as the construction zone between the Terminal and the SIDA fence along the vehicle service road. In accordance with Massport policy, significant nighttime or weekend work is not anticipated.

Construction site access will occur by two different routes. Daily contractor access will occur through the Terminal B Garage gate located at the south end of the parking garage blast wall. This will be a landside gate during Terminal B construction. Large construction equipment, major material deliveries, demolition materials and trash hauling will occur through the South or North gates. During peak traffic periods, Massport will require that Contractor's staff and sub-contractors are shuttled to the project construction sites.

New terminal foundations will be composed of deep pilings, pier caps, grade beams and structural slabs. All superstructure is anticipated to be structural steel. Construction cranes will be utilized on-site for steel erection and precast panel installation. Table 5-3 presents the construction equipment requirements for the Project.

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Table 5-3 Terminal B and E Renovations and Improvements - Landside Equipment Requirements by Quarter

Equipment Estimate	2012				2013		
	May-July	Aug-Oct	Nov-Jan	Feb-April	May-July	Aug-Oct	Nov-Jan
Aerial Lift	1	1	-	1	1	-	-
Air Compressor	-	-	-	-	-	-	-
Asphalt Paver	-	1	-	-	-	-	-
Auger	-	1	-	-	-	-	-
Backhoe	1	-	-	-	-	-	-
Bulldozer	1	1	-	-	-	-	-
Concrete Paver	1	1	1	-	-	-	-
Concrete Pump Truck	1	1	1	1	-	1	-
Concrete Transit Mixer	3	3	4	1	-	1	-
Crane- Mobile	1	1	1	1	1	-	-
Dump Trailer	2	-	-	-	-	-	-
Dump Truck	2	5	-	-	-	-	-
Dumpster	-	-	-	-	-	1	-
Excavator	1	-	1	-	-	-	-
Front End Loader	-	-	-	-	-	-	-
Grader	1	-	-	-	-	-	-
Material Handler	1	2	1	1	1	-	-
Pile Vibrator	1	-	-	-	-	-	-
Primer Truck	-	1	-	-	-	-	-
Reclaimer	1	-	-	-	-	-	-
Roller- Dirt	1	-	-	-	-	-	-
Roller- Pvmt	-	1	-	-	-	-	-
Skid Steer	-	1	-	-	-	-	-
Sweeper	-	1	-	-	-	-	-
Tack Truck	-	1	-	-	-	-	-
Truck And High-Bed Trailer	1	1	3	1	1	-	-
Utility Truck	2	2	3	-	3	2	1
Vibratory Plate Compactor	1	-	-	-	-	-	-
Water Pump	1	1	-	-	-	-	-
Water Truck	1	1	-	-	-	-	-
Welding Machine	-	-	1	1	1	1	-

Note: Numbers denote average equipment per daily shift

Construction impacts are considered under the affected review categories below (specifically surface transportation, air quality, and noise). During construction there would be limited short-term impacts from added vehicle trips to and from the site by construction equipment, fugitive dust, and noise. Demolition materials and other routine construction wastes will be appropriately recycled and disposed.

5.5.6.1 Construction Surface Transportation Impacts

Short-term construction impacts are expected to be limited to the segments of the East Boston roadways that provide direct access to the Airport's entrances (Service Road, Frankfurt Street, and Prescott Street) and on-airport roadways (Transportation Way, Harborside Drive and Terminal Area roadways). As described in Massport's construction management specifications, construction vehicles are restricted from using local roads.

Construction of the Project would be primarily undertaken from a defined work area of the airfield. Most of the materials and workers would be delivered to the Terminal B and C/E construction areas via secure escort from either the North or South Gate. Materials to be delivered by truck would primarily include asphalt pavement,

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concrete and miscellaneous metals. Construction workers would not be allowed to drive or park at the Airport with the exception of limited supervisory personnel. The majority of workers would be transported to the site by shuttle bus from a remote contractor lot or existing airport shuttles.

Construction Traffic Methodology

The estimated numbers of pieces of construction equipment associated with the construction schedule are provided in the Technical Appendix for each week from 2012 through 2013. Based on these equipment schedules, estimates of the types and numbers of pieces of heavy equipment required for the proposed Project construction per work shift were developed.

Construction Truck Traffic

The peak quarter for construction activity is anticipated to occur between August and October 2012, generally associated with overlapping activities including foundation work, apron reconstruction, foundation and utility connection activities. The detailed construction equipment schedules indicate that a maximum of 25 pieces of construction equipment will be required each day during the peak quarter of 2012 (Table 5-3).

Most of the heavy construction equipment, including some mobile cranes, excavators, concrete pump trucks, pavers and miscellaneous equipment (welders, compressors, vibro-compactors) would be stored on the Airport during non-work hours. This equipment would be used during most workdays; however, this equipment would not enter or leave the airport as a daily construction trip. The following types of equipment would enter and leave the Airport for each work shift:

- Concrete Transit Mixers
- Dump Trucks
- Dump Trailers
- Truck / High-bed Trailers
- Water Trucks
- Utility Trucks

The projected daily need for these types of heavy and light trucks was used to estimate the daily number of truck arrivals and total truck trips (arrivals plus departures) to the Airport, as presented in Table 5-4. The proposed Terminal B and C/E Renovations and Improvements construction would generate approximately two to 24 total truck trips per weekday, depending on the project phase.

Table 5-4 Daily Construction Trips

Year	2012				2013			
	Quarter	May-July	Aug-Oct	Nov-Jan	Feb-April	May-July	Aug-Oct	Nov-Jan
Total Daily		11	12	10	2	4	3	1
Total Daily Trips		22	24	20	4	8	6	2

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It is expected that construction would take place primarily during the day shift, approximately 7 AM to 7 PM. Thus, the daily truck volume to and from the site would be the number of truck trips per work shift. It was assumed that most light duty trucks, such as escort trucks and pick-up trucks associated with supervisory workers, would all arrive to the project site during the morning peak hour and exit during the evening peak hour. No significant nighttime or weekend work is anticipated.

Construction Truck Route

Massport's agreement with the Contractor would specify that direct construction truck traffic access to the Terminal B and C/E construction sites be through the Airport's North or South Gates for the duration of construction (Figure 5.1). A small number of supervisory and utility truck vehicles will be allowed to access the planned construction staging area located south of the horseshoe end of the Terminal B Arrival Level roadway. The agreement would limit Airport access by the Contractor to federal or State highways, restricting any use of East Boston roadways by construction vehicles. Where possible, construction vehicles will use the East Boston-Chelsea Bypass Road. Truck trips directly to the project site are anticipated to come from all directions and would be routed in any of the following ways (Figure 5.1):

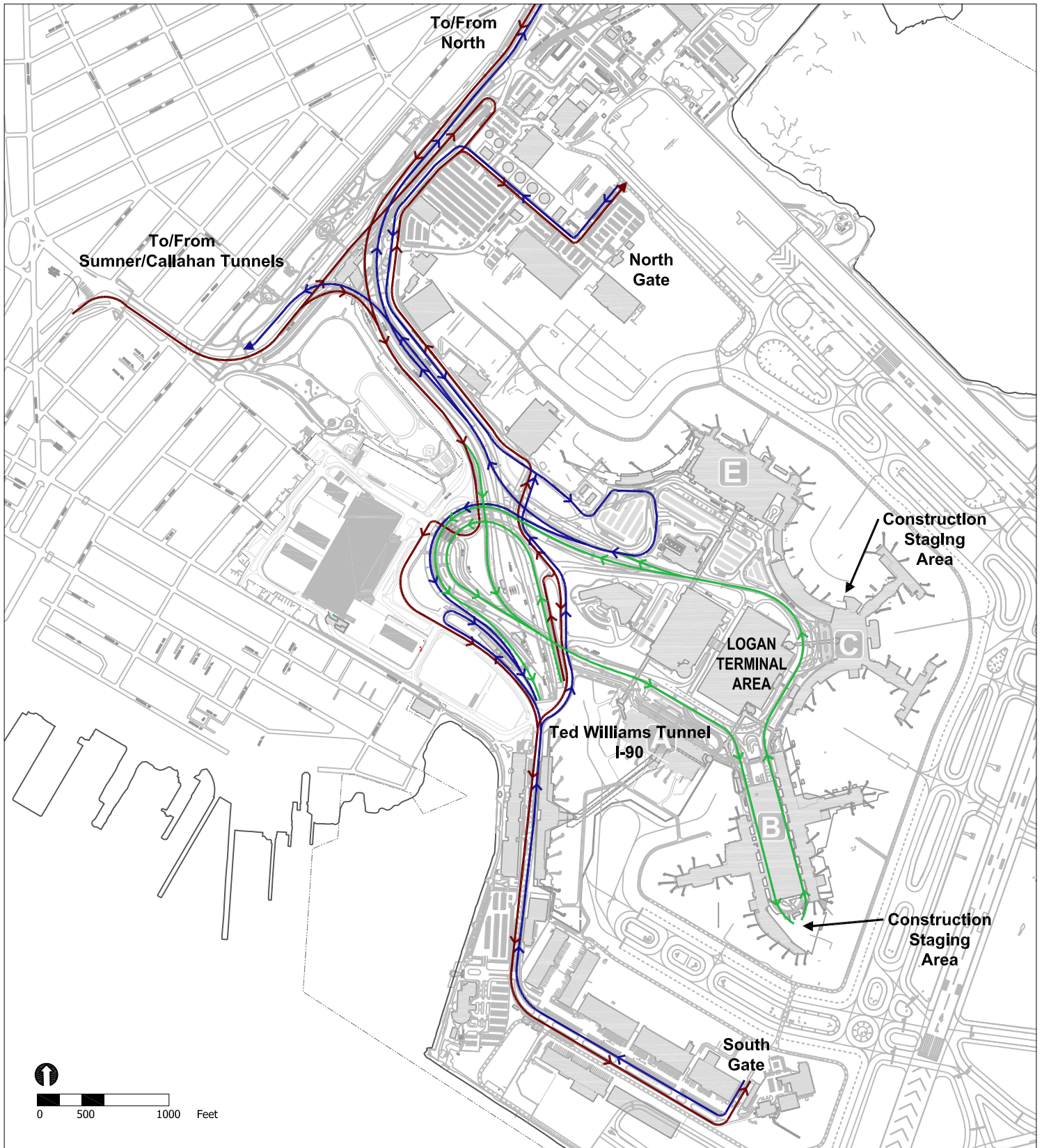
North Gate

- Access via McClellan Highway (Route 1A) southbound, Transportation Way, Hotel Drive, Service Road (SR-2) and Prescott Street; egress via Prescott Street, SR-2, and the Airport Exit ramp from Terminal E to Route 1A northbound.
- Access via Callahan Tunnel, Route 1A Northbound, Frankfort Street off-ramp, Frankfort Street southbound and Prescott Street; egress via Prescott Street, SR-2, the Airport Exit ramp from Terminal E, Route 1A Southbound to the Sumner Tunnel
- Access via Ted Williams Tunnel, Ramp T-S, Hotel Drive, SR-2 and Prescott Street; Egress via Prescott Street, SR-2, and the Airport Exit ramp from Terminal E to Ted Williams Tunnel.

South Gate

- Access via McClellan Highway (Route 1A) southbound, Transportation Way, Harborside Drive; egress via Harborside Drive, Hotel Drive, SR-2 and the Airport Exit ramp from Terminal E to Route 1A northbound.
- Access via Callahan Tunnel, I-90 westbound, Transportation Way, Harborside Drive; egress via Harborside Drive, Hotel Drive, SR-2 and the Airport Exit ramp from Terminal E to the Sumner Tunnel.
- Access via Ted Williams Tunnel, Ramp T-S, Hotel Drive and Harborside Drive; Egress via Harborside Drive, Transportation Way and Ramp S-T to Ted Williams Tunnel.

Access to the Terminal B laydown area is available from each Airport gateway via the Terminal Area Arrival Roadway and Terminal B Arrival Level Roadway.



Legend

- Access Routes
- Egress Routes
- Small Vehicle Contractor Access



Figure 5.1

Temporary Construction Access/Egress Routes

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Construction Traffic Maintenance

Vehicular traffic flow on the Airport roadway network during construction will be managed to maintain acceptable levels of service. If necessary, Massport has the ability to modify contractor schedules and access routes to minimize impacts.

Based on the maximum of 24 total daily construction truck trips and the access restrictions described above, the Terminal B and C/E Renovations and Improvements would have minimal impact on airport or regional roadways. The airport roadway infrastructure accommodates over 119,000 daily trips each weekday and can accommodate the anticipated 24 additional daily construction truck trips associated with the proposed renovations and improvements construction without causing capacity or delay problems.

Coordination with Other Construction Activities

The following projects are anticipated to be ongoing during construction of the proposed Project:

- Green Bus Depot – Completion expected September 2012.
- Runway 33L Runway Safety Area Improvement and Light Pier Replacement – Completion expected November 2012.
- Runway 15R-33L Repaving Project – June 2012 through November 2012.
- ConRAC Facility in the SWSA–Completion expected July 2014.

Due to the minimal impact of the proposed Project construction on the roadways and the location of the other construction activities in different areas of the Airport (SWSA and airside), the concurrent construction of these projects can be adequately accommodated by the Airport and regional roadway systems.

Surface Transportation Construction Mitigation

The Airport roadways can support the anticipated construction-related traffic, therefore, no specific mitigation is proposed and no Project-specific transportation access plan is proposed. Massport requires all contractors to limit construction-related traffic to access and egress through the North Gate via only state and federal highways and the Airport roadway network prohibiting construction-related traffic on the local East Boston roadways.

Massport also requires contractors to implement construction worker vehicle trip management, including requiring contractors to provide off-airport parking and using high-occupancy vehicle transportation modes for employees.

Construction Air Quality Impacts

Project construction would generate temporary construction period air emissions and fugitive dust associated with minor demolition and building of the new portions of the terminal, as well as with construction vehicles and equipment. The emissions from construction activities are not expected to be substantial. Emissions produced by the operation of construction equipment include NO_x, VOCs, CO, and particulate matter (PM) are expected to be short-term due to the transitory nature of construction activity. City of Boston and Massachusetts Clean Air Quality requirements will be enforced during the construction.

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Construction Air Quality Methodology

A mesoscale analysis was conducted to determine the potential increase in regional emissions from construction activities. The construction equipment and the duration of their use were combined with United States Environmental Protection Agency's (USEPA) MOBILE 6.2⁵ emissions model to calculate daily regional emissions for the peak day and for the year as identified in the construction surface transportation analysis.

Project-Related Construction Air Quality

The 2010 EDR for Boston's Logan Airport estimated 2010 emissions. These emissions establish a benchmark against which construction activity emissions can be compared. The 2010 Logan Airport emissions were calculated for NO_x, CO, and PM of 2.5 and 10 microns. As shown in Table 5-5, the Project-related air quality impacts due to construction represent a very small percentage of Logan Airport's estimated 2010 emissions and are expected to be similar under the 2012 and 2013 conditions.

In addition to the daily emissions from construction, the air quality analysis calculated the tons per year construction emissions (Table 5-5). The Project-related construction activities would not adversely impact air quality. Any temporary construction-related emissions (in conjunction with future Project-related emissions for which none are projected, as demonstrated in Section 5.5.2, *Air Quality*) are well below the Federal general conformity *de minimis* thresholds of 50 tpy of VOC and 50 tpy of NO_x, and 100 tpy of CO.

Table 5-5 Construction Period Air Quality Impacts

Criteria Pollutant	Logan Airport 2010 (Kg/day)	Proposed Project Construction (Kg/day)	Percent of Daily Total	Proposed Project (Tons/year)	General Conformity <i>de minimis</i> threshold (Tons/year)
VOCs	1,019	0.610	0.060%	0.25	50
NO _x	3,989	5.137	0.129%	2.07	50
CO	7,160	4.871	0.068%	1.96	100
PM _{2.5/10}	64	0.017	0.027%	0.01	-

Kg/day – kilograms per day
NO_x – Oxides of Nitrogen
PM 2.5/10 – Particulate Matter

VOC – Volatile Organic Compounds
CO – Carbon Monoxide

Air Quality Construction Mitigation

Massport is committed to the mitigation of construction-related emissions at the airport through the implementation of several emission reduction requirements and initiatives that are already in place. Massport will require the contractor to utilize ultra-low sulfur diesel fuel for off-road construction vehicles and/or equipment. Construction contracts will require that gasoline and diesel motorized construction equipment be well maintained and in good running order during the work effort on the proposed Project.

Fugitive dust emissions are proportional to the amount of earth moved and the length of travel on unpaved roads. Any impacts from fugitive dust particles would be of short duration and localized. Mitigating fugitive

4 MOBILE 6.2 (Mobile Source Emission Factor Model), The May 19, 2004 official release from US EPA, Office of Mobile Sources, Ann Arbor, MI.

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dust emissions involves curbing or eliminating its generation. Mitigation measures that will be used in site construction include wetting and stabilization to suppress dust generation, cleaning paved roadways, and scheduling construction to minimize the amount and duration of exposed earth.

The construction of the proposed Project will comply with the requirements of the Massachusetts Department of Environmental Protection's (DEP) Clean Construction Equipment Initiative aimed at reducing air emissions from diesel-powered construction equipment. Massport requires that construction contractors install emission control devices, such as diesel oxidation catalysts and/or diesel particulate filters on certain equipment types (front-end loaders, backhoes, excavators, cranes, and air compressors).⁶ Idle reduction and dust and odor control would also be addressed.

Massport requires all contractors to adhere to construction worker vehicle trip management, including requiring contractors to provide off-airport parking and using high-occupancy vehicle transportation modes for employees.

5.5.6.2 Construction Noise Impacts

The construction of the proposed Project would generate noise associated with the renovation and improvement activities. Construction equipment is expected to be used intermittently throughout the improvement Project's construction phase. The construction phase for the external portion of the project is expected to occur only during daytime hours. Normal flight operations will continue to function during project construction.

City of Boston Construction Noise Criteria

The City of Boston has established regulations for evaluating sound levels associated with construction activities. The Air Pollution Control Commission of the City of Boston, acting under the authority granted in Chapter 40, Section 21 of the General Laws of the Commonwealth of Massachusetts, and by the City of Boston Code, Ordinances, Title 7, Section 50, has adopted regulations for the Control of Noise in the City of Boston. Regulation 3, "Restrictions on Noise Emitted from Construction Sites," establishes maximum allowable sound levels based upon the land use impacted by the construction of a proposed project. The noise criteria provided in the regulations were used to evaluate whether or not the Project will generate sound levels that result in adverse impacts.

The City of Boston noise control regulation considers construction sound levels to be an impact if operation of construction devices exceeds the L_{10}^7 sound levels shown in Table 5-6.

⁶ The goal of these initiatives is to reduce the emissions associated with construction equipment. The effort involves retrofitting heavy construction equipment with emission control devices designed to reduce the amount of air pollution (volatile organic compounds (VOCs), carbon monoxide (CO), and particulate matter (PM)) emitted from the vehicle.

⁷ L_{10} level is the A-weighted sound level exceeded ten per cent of the time, as defined by the Regulations for the Control of Noise in the City of Boston, Regulations for the Control of Noise in the City of Boston, City of Boston, Air Pollution Control Commission.

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Table 5-6 City of Boston Construction Noise Limits, dB(A)

Land Use	L10 Sound Level	Lmax/ Maximum Noise Level
Residential or Institutional	75	86
Business or Recreational	80	--
Industrial	85	--

Source: Regulations for the Control of Noise in the City of Boston, City of Boston, Air Pollution Control Commission.

If the existing background L_{10} sound level already exceeds the limits referenced in Table 5-6, the L_{10} sound level during construction must not exceed the background L_{10} sound level by 5 dB(A) or greater. Unless exempt, no individual piece of construction equipment can generate a noise level exceeding 86 dB(A) at a distance of fifty (50) feet from the device.

Construction Noise Methodology

The noise analysis used the Federal Highway Administration's (FHWA) Roadway Construction Noise Model 1.1 (RCNM)⁸ to calculate the sound levels associated with the construction equipment at the closest receptor locations, typically residential areas. The noise analysis presents conservative results because it assumes that all of the construction equipments are operating at the same time.

The noise analysis evaluated sound levels of construction activities associated with the Project. Construction sound levels are a function of the types of equipment being used, the number of each type of equipment, and the distances between the construction equipment and the sensitive receptor locations. Overall construction sound levels are governed primarily by the noisiest pieces of equipment operating at a given time. The RCNM contains both equipment specification reference sound level data and actual measured sound level data. The noise analysis used the highest value for all equipment. The noise analysis used the default equipment usage factor from the model.

The type and units for each piece of equipment vary depending on the construction phase. During any particular activity, multiple pieces of equipment may operate simultaneously and for various durations throughout the construction period. Table 5-7 presents the construction equipment and the reference sound levels associated with the various types of construction equipment.

8 FHWA Roadway Construction Noise Model: User's Guide Federal Highway Administration, FHWA-HEP-05-054, January 2006.

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Table 5-7 Construction Equipment Reference Sound Levels, dB(A)

Equipment	Usage Factor (%)	L _{max} at 50 feet ¹	Unit per day ²
Aerial Lift	20	85	4
Asphalt Paver	50	85	1
Auger	20	85	-
Backhoe	40	80	-
Bulldozer	40	85	-
Concrete Paver	50	85	1
Concrete Pump Truck	20	82	1
Concrete Transit Mixer	40	85	14
Mobile Crane	16	85	2
Dump Trailer ³	40	84	-
Dump Truck	40	84	25
Dumpster ⁴	40	84	-
Excavator	40	85	-
Front End Loader	40	80	-
Grader	40	85	-
Material Handler ⁵	40	80	6
Pile Vibrator	20	101 ⁸	-
Primer Truck ⁴	40	84	1
Reclaimer ⁶	20	90 ⁸	-
Dirt Roller	20	85	-
Pavement Roller	20	85	3
Skid Steer ⁵	40	80	1
Sweeper	10	82 ⁸	1
Tack Truck ⁴	40	84	1
Truck and High Bed Trailer ⁴	40	84	1
Utility Truck ⁷	40	75 ⁸	7
Vibratory Plate Compactor	20	83 ⁸	-
Water Pump	50	81 ⁸	3
Water Truck ⁴	40	84	1
Welding Machine	40	74 ⁸	-

1 Source: Reference sound level data based on equipment specifications, Federal Highway Administration, Roadway Construction Noise Model, Version 1.0, February 2006.

2 Represents day with most equipment in operation.

3 Assumed reference sound level is equivalent to a dump truck.

4 Assumed reference sound level is equivalent to a flat bed truck.

5 Assumed reference sound level is equivalent to a front end loader.

6 Assumed reference sound level is equivalent to a pavement scarifier.

7 Assumed reference sound level is equivalent to a pickup truck.

8 Reference sound level is based on actual measurements obtained from the RCNM.

L_{max} Maximum sound level

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The study area was evaluated to identify areas that are sensitive to construction activities associated with the Project. The noise analysis identified four sensitive receptor locations in the vicinity of the Project. These receptor locations include one location to the north, two locations to the east, and one location to the west of the Project. These receptor locations included;

- Receptor 1 – East Boston Yacht Club;
- Receptor 2 – Loring Road near Court Road;
- Receptor 3 – Somerset Avenue near Johnson Avenue; and
- Receptor 4 – Jeffries Point Yacht Club.

These receptor locations were selected based on land use considerations and represent the most sensitive locations (predominantly residential uses) in the study area that are likely to experience changes in sound levels due to the proposed project. Figure 5.2 presents the receptor locations used in the noise analysis.

Project-Related Construction Sound Levels

The Project is expected to generate typical sound levels associated with construction activities, including use of heavy equipment operations for excavation, material transport, and pile driving. Heavy machinery would be used intermittently throughout construction and these activities would occur during normal weekday working hours. The type of equipment and unit of equipment will vary between the different construction phases. The noise analysis represents the day with the most equipment in operation. Most of the construction activities will occur on the air field side of the Terminals. Table 5-8 presents the sound levels associated with the construction activities of the Project. All receptor locations evaluated are below the City of Boston's noise criteria. The highest L_{10} value is 64 dB(A), which is below the City's criteria of 75 dB(A). Additionally, the L_{max} of 49 dB(A) is also below the City's criteria of 86 dB(A).

Table 5-8 Construction Equipment Sound Levels, dB(A)

Receptor Locations	Project Sound Levels		City of Boston Criteria ¹	
	L_{10} ²	L_{max} ³	L_{10}	L_{max}
Receptor 1 – East Boston Yacht Club – Boston ²	62	45	75	86
Receptor 2 – Loring Road near Court Road – Winthrop	62	43	75	86
Receptor 3 – Somerset Avenue near Johnson Avenue – Winthrop	61	42	75	86
Receptor 4 – Jeffries Point Yacht Club – Boston	64	49	75	86

¹ City of Boston's noise criteria for residential use.

² L_{10} represents total sound level of all equipment.

³ L_{max} represents sound level of noisiest piece of equipment.

The noise analysis demonstrated that the sound levels from construction activities associated with the proposed Project comply with the City of Boston's noise criteria. The methodology (FHWA's Roadway Construction Noise Model) used in the noise analysis was conservative because it assumed that all of the construction equipments were operating at the same time. In addition, this analysis assumed the same equipment for both the Terminal B, Pier A renovation and improvements as well as the Terminal C-E Connector.



Source(s): MassGIS

Legend

R1 Noise Receptor



Figure 5.2

Construction Noise Receptors

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The construction noise analysis evaluated the potential cumulative impacts associated with the construction activities of the Project and the other Logan Airport construction projects, described above. Since sound levels decrease with distance and to the distances between the construction projects, it is expected the proposed Project will have minimal additive noise impacts to other ongoing construction projects.

Construction Noise Mitigation

Sound levels from activities associated with the construction of the proposed Project comply with the City of Boston's noise criteria; therefore no noise mitigation is required. However, construction equipment would use noise-reduction measures.

5.5.6.3 Other Construction Impacts

The proposed Project includes enhancements to the hydrant fuel system on the apron surrounding Terminal B, Pier and with associated apron and pavement reconstruction (demolition and reconstruction of more than one acre of concrete ramp space). During demolition, this area will be open and while run-off will be controlled during this work, it is possible that some discharge may occur into storm drainage. Therefore, the proposed Project will be required to comply with the requirements of the NPDES General Permit for Stormwater Discharges from Construction Activities. NPDES requires the filing of a Notice of Intent and a SWPPP. An Erosion and Sedimentation Control Program will be put in place to minimize construction phase impacts to Boston Harbor and adjacent resources.

The Fuel Distribution System site has an existing Release Tracking Number (for a 500-gallon AST located near Gate 29, as discussed in Chapter 4, *Affected Environment*), which would be covered by a Release Abatement Measure plan(s) filed with the DEP, as appropriate. The construction SWPPP would include provisions for responding to any releases that result from construction activities, such as fuel or hydraulic fluid spills.

5.5.6.4 Construction Period Mitigation

Construction impacts and mitigation are considered under each of the individual impact review categories above. During construction there would be limited short-term impacts from added vehicle trips to and from the site by construction equipment, fugitive dust, noise, negligible amounts of sediment added to the area's stormwater collection system, and demolition materials and other routine construction wastes in need of proper disposal.

Massport specifically prohibits delivery of materials through residential streets, creation of borrow pits and disposal of spoil, burning of debris, and water pollution from erosion. In addition, Massport will require that the project design and construction planning would incorporate appropriate environmental protection measures. All construction impacts would be mitigated as required by construction contracts, therefore, a significant adverse effect would not be allowed to occur.

5.6 Summary

Compared to the No-Action/No-Build Condition, the proposed Project is expected to result in surface transportation impacts to the active passenger car drop-off and pick-up zones without curbside reallocation measures. However, transportation infrastructure and operations management improvements included as part of the Project in combination with the Airport-wide Curbside Improvement Project would result in improved

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and more efficient ground access system that would be able to accommodate future passenger demands at Terminal B. Therefore, regarding air quality conditions associated with vehicles, the Project (including temporary construction activities) would not exceed a *de minimis* impact threshold and is in compliance with the CAA General Conformity regulations.

Construction would result in minor increases to truck traffic, noise, and emissions of air quality pollutants; however, these increases would not adversely affect the roadway system or local traffic conditions, would not exceed applicable noise impact criteria, and would not result in air quality impacts.

Table 5-9 Summary of Significant Impacts

Impact Category	Significant Adverse Effect (yes/no)
Surface Transportation	No. The proposed Project would not adversely affect the airport roadway network or increase traffic on local roadways.
Air Quality	No. The proposed Project would not result in an increase of Airport-wide mobile or stationary source emissions and, accounting for temporary construction-related emissions, would be substantially below the General Conformity <i>de minimis</i> thresholds.
Water Quality	No. The proposed project is in compliance with water quality standards.
Hazardous Materials and Solid Waste	No. The proposed project does not involve a project on or eligible for the National Priority List.
Construction Impacts	No. Construction would not result in significant traffic, noise, air quality, or water quality impacts; the projected air emissions associated with the construction vehicles and equipment would be minimal.

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6

Regulatory Compliance and Public/Agency Coordination

6.1 Introduction

This chapter discusses the state and federal permits that are anticipated to be required for the Project, in addition to complying with the National Environmental Policy Act (NEPA). Massport's efforts to coordinate with local, state, and federal agencies as well as the public are also discussed.

6.2 Regulatory Compliance

Table 6-1 lists anticipated required state and federal permits and the current status of the permits and other approvals. Subsequent sections describe more fully how the Project will comply with these regulatory requirements.

Table 6-1 Anticipated Required Permits and Approvals

Issuing Agency	Approval or Permit	Status
Federal Aviation Administration	Airport Layout Plan Approval	Approval to be issued
	Finding of No Significant Impact (FONSI)	EA submitted herein; determination will be made at the conclusion of the NEPA process
	Conformity Determination	EA submitted herein; determination will be made at the conclusion of the NEPA process
U.S. Environmental Protection Agency Region 1	National Pollutant Discharge Elimination System (NPDES) Individual Permit	The Project will meet the standards included in Logan Airport's individual NPDES permit (No. MA0000787)
	NPDES Construction General Permit	Construction-related; a SWPPP will be developed by Contractor
Massachusetts Contingency Plan (MCP)	Hazardous materials encountered during the development would be addressed in accordance with applicable MCP regulations.	As required

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6.2.1 Airport Layout Plan Approval

This Environmental Assessment (EA) is required because Massport is seeking Federal Aviation Administration (FAA) approval for a modification of the Airport Layout Plan (ALP), which includes the components of the proposed Project—the Terminal B improvements and modifications, and the Terminal C-E Connector. The ALP approval is a federal action that requires review pursuant to NEPA, as described in FAA *Order 5050.4B*. FAA's approval of the ALP will incorporate modifications to building footprints associated with the selected alternative.

6.2.2 National Environmental Policy Act

The FAA has determined that the Project proposed by Massport (as the Sponsor) requires an EA under NEPA due to changes to the Logan ALP necessitated by the Project. This EA identifies project alternatives and documents the potential environmental effects associated with the construction and operation of proposed terminal improvements at Logan Airport. The Project is not expected to result in any significant environmental impacts, such as increased vehicle traffic or new land disturbance/impervious surface area. A draft Finding of No Significant Impact (FONSI) for the Project is included as Appendix A. Based on its review of the comments on the EA or, if additional information is needed to make a determination, further review under NEPA may follow.

6.2.3 National Pollutant Discharge Elimination System Permits

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. Point sources are discrete conveyances such as pipes or man-made ditches. The NPDES program includes permitting for municipal, industrial, and construction-related sources of pollution under general or individual permits. The Project must meet the standards included in Logan Airport's individual NPDES permit (No. MA0000787), which allows Massport to discharge stormwater from outfalls on the airport property. Both project elements will be designed to meet the standards of Logan Airport's NPDES individual permit.

The Project would also require completion and submittal of a Stormwater Notice of Intent to the USEPA for coverage under the NPDES Construction General Permit for stormwater discharge from construction activities because the Project will require the demolition and reconstruction of more than one acre of concrete ramp space. During demolition, this area will be open and while run-off will be controlled during this work, it is possible that some discharge may occur into storm drainage. The Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific sedimentation and erosion control measures for the entire duration of the construction activities. Standard 8 of the Massachusetts Stormwater Management Policy also requires the use of erosion and sediment controls during construction. Proper implementation of the SWPPP will ensure that no negative impacts would occur from construction-related runoff. Mitigation measures included in Logan Airport's existing SWPPP to minimize sedimentation and erosion are described in Chapter 5, *Environmental Consequences and Mitigation*.

6.2.4 Air Quality/General Conformity Determination

As part of this EA, future air quality conditions have been assessed to determine (for EPA review and consultation) if the proposed Project is in conformance with the Clean Air Act (CAA). The proposed Project will not change the aircraft operational levels at Logan Airport nor will it alter ground-based aircraft movements

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(i.e., aircraft taxi and delay periods) or result in increased surface transportation traffic. Therefore, operational emissions (mobile and stationary source) will not change due to the Project. While construction activities are expected to generate short-term construction-related air emissions, including exhaust emissions from on-road construction vehicles, off-road construction equipment, evaporative emissions from asphalt placement and curing, and the generation of fugitive dust from disturbance of unpaved areas, these Project-related emissions would be substantially below federal General Conformity *de minimis* thresholds. In addition to generating Project-related emissions well below *de minimis* thresholds, the Project activities (e.g., routine maintenance and repair activities; terminal and concourse upgrades) fall under the list of activities "Presumed to Conform" by the FAA according to the July 30, 2007 Federal Register.¹

As part of the Project approvals process and to minimize air emissions, Massport will require all contractors to comply with certain construction guidelines that relate to:

- Construction vehicle/equipment anti-idling;
- Retrofitting of appropriate diesel construction equipment with diesel oxidation catalyst and/or particulate filters; and
- Construction worker vehicle trip management, including requiring contractors to provide off-airport parking, and use high-occupancy vehicle transportation modes for employees.

6.2.5 Massachusetts Contingency Plan

During construction, the soil and groundwater contamination issues surrounding the existing terminal facilities will be addressed, as needed, in compliance with the Massachusetts Contingency Plan (MCP). In compliance with the MCP, a Soil Management Plan may be required to determine whether any excavated soils which are generated through foundation construction or improvements to the fuel hydrant system can be reused onsite, and/or determine requirements for off-site reuse, recycling, or disposal. Soil will be disposed of in conformance with Massport's soil management policy. The Soils Management Plan would be developed under the supervision of a Licensed Site Professional (LSP), and would be integrated into the requirements of existing Response Action Outcomes for portions of the site covered by Release Tracking Numbers and/or Release Abatement Measures plans for newly identified areas of contamination. The Soil Management Plan would be developed in concert with a groundwater management plan, which will address requirements for dewatering and collection, testing and/or treatment and disposal or discharge of water pumped from excavations, if required.

6.3 Public and Agency Involvement

Throughout the preparation of this EA Massport has coordinated with the FAA and other appropriate state and federal agencies.

¹ Federal Register (72 FR 415), *Federal Presumed To Conform Actions Under General Conformity*, Federal Aviation Administration, July 30, 2007.

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6.3.1 Public Involvement

As requested by FAA, an informational meeting on the Project will be hosted by Massport with invited participation by regulatory agencies, organized community groups interested in airport activity and local residents will be held during the NEPA review process. While this public meeting is not required as part of the EA process, Massport and the FAA are committed to reaching out to interested parties. Community and agency outreach and coordination will continue through permitting, design, and construction of the Project. Massport has also consulted directly with resource agencies regarding potential impacts, avoidance, and minimization of these impacts, and mitigation strategies.

This public information session is currently scheduled for June 5, 2012. Community groups will be made aware of the meeting. The goal of this meeting is to acquaint the nearby community with the Project, including construction schedule/activities, and to solicit input regarding potential neighborhood issues.

Massport posts information about key regulatory filings on its website. The most recent environmental filings, including this EA and all supporting documentation will be made available on its website at the following URL: www.massport.com/environment/environmental_reporting/Pages/EnvironmentalFilings.aspx.

6.3.2 Agency Consultation and Coordination

This EA will be distributed to local, state, and federal agencies for their review and comment (refer to Chapter 7, *Distribution List*). Prior to the submittal of this EA, Massport began agency consultation and coordination by reaching out to resource agencies to receive data and feedback regarding affected environmental resources and potential impacts. This outreach included coordination with to the Secretary of the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) via the Massachusetts Environmental Policy Act (MEPA) Office. The purpose of this outreach was to provide the MEPA Office with an update on the Project that was briefly noted in Chapter 3, *Airport Planning* of the recent *Logan Airport 2010 EDR* [EEA #3247]. The Project does not exceed any applicable Environmental Notification Form (ENF) review thresholds.

Throughout the design process, Massport will coordinate with its sister transportation agencies (MassDOT and the MBTA) regarding the improvements to the Terminal B curbs.

7

Distribution List

Federal Aviation Administration (FAA) *Order 5050.4B* states that airport development will likely trigger public interest. Distributing an Environmental Assessment (EA) to the public is the best way to provide the public with the information needed to formulate an opinion. FAA *Order 5050.4B, Paragraph 804*, requires distribution to the federal agencies having jurisdiction by law or regulation over the action and to the public for review. The following is a list of recipients of this EA.

The list includes representatives of governmental agencies and community groups and/or local residents concerned with activities at Logan Airport. The 'C' indicates that a compact disc (CD) was sent and a 'P' indicates that a printed copy was sent.

This EA is available on Massport's website at www.massport.com and electronically on CD. Limited CD or printed copies of the EA may be requested from Christina Bocchino, Massport, Suite 200S, Logan Office Center, One Harborside Drive, East Boston, MA 02128, telephone (617) 568-3507, e mail: cbocchino@massport.com. Printed and electronic copies of this report are available for review at the following public libraries.

- Boston Public Library, Main Branch
666 Boylston Street, Boston, MA 02117
- Boston Public Library, Connolly Branch
433 Centre Street, Jamaica Plain, MA 02130
- Boston Public Library, Orient Heights Branch
18 Barnes Avenue, East Boston, MA 02128
- Winthrop Public Library
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179 Main Street, Charlestown, MA 02129
- Boston Public Library, East Boston Branch
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Renovations and Improvements at Terminals B and C/E
Boston-Logan International Airport
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Renovations and Improvements at Terminals B and C/E

Boston-Logan International Airport

East Boston, Massachusetts

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Renovations and Improvements at Terminals B and C/E

Boston-Logan International Airport

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Renovations and Improvements at Terminals B and C/E

Boston-Logan International Airport

East Boston, Massachusetts

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Appendix A

Draft Finding of No Significant Impact

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**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
DRAFT FINDING OF NO SIGNIFICANT IMPACT**

DRAFT FOR REVIEW AND COMMENT

This draft Finding of No Significant Impact (FONSI) is being made available by FAA for review by other Federal agencies with jurisdiction by law or regulation over the proposed action, and interested members of the public. The draft FONSI will be available for a 30-day period. Comments on the draft FONSI should be directed to the attention of Richard Doucette, Environmental Program Manager, FAA New England Region - Airports Division, 12 New England Executive Park, Burlington, MA 01803.

**Renovations and Improvements at Terminals B and C/E
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Proposed Action

The Massachusetts Port Authority (Massport) is the sponsor of the Boston Logan International Airport **Renovations and Improvements at Terminals B and C/E** project. The purpose of the Project is to:

- Improve passenger service and convenience
- Improve terminal flexibility and efficiency for the airlines and Massport
- Improve passenger connectivity between terminals.

The Project consists of two key components: (1) upgrading the facilities at Terminal B, Pier A to accommodate a recent airline merger (United/Continental) and provide a post-security connection between both sides of Terminal B, Piers A and B (the “Terminal B, Pier A Improvements”); and (2) improving connectivity to Terminal C, including a post-security connection airside between Terminals C and E (the “Terminal C-E Connector”). In addition to connecting Pier A and Pier B of Terminal B, the Project will include new ticket counter positions, renovated and expanded passenger handling areas, a renovated security checkpoint with additional lanes, concession space, and baggage handling systems. The Project will also provide enhanced customer service with new post-security connections between the two sides of Terminal B, and between Terminals C and E.

Federal actions include approval of a revised Airport Layout Plan (ALP), and the project requires a NPDES Construction General Permit and must meet the standards included in Logan Airport’s individual NPDES permit (No. MA0000787). The Project would not increase Airport-wide mobile or stationary source direct and indirect emissions. Emissions from construction vehicles and equipment would be substantially below the Federal General Conformity *de minimis* thresholds and therefore, a Clean Air Act General Conformity Determination is not required.

While the Terminal B, Pier A Renovations and Improvements are completely independent of the proposed Terminal C-E Connector, because of their common goals, proximity, and similar timing, they are being considered as a single action from an environmental review perspective. Massport and FAA prepared an Environmental Assessment (EA) to assess this proposed action.

Alternatives Considered

The EA included a review of alternatives to both components of the proposed action. The No-Build/No-Action Alternative does not address the Purpose and Need. Alternatives that were eliminated from further consideration were dismissed for cost or operational reasons. There were no differences based on environmental impacts.

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
DRAFT FINDING OF NO SIGNIFICANT IMPACT**

Terminal B, Pier A Renovations and Improvements

For the Terminal B, Pier A Renovations and Improvements component, Preliminary Alternatives 1A, 1B, and 1C adequately meet all the program requirements; however, these options are not financially feasible. Alternative 2 failed to provide several of the critical program needs, especially passenger ticketing and checkpoint requirements. Alternative 3 (the proposed action) strikes a balance between cost and program requirements, meeting most planning parameters where it accommodates all aircraft gates required by the United /Continental merger in an efficient manner. Alternative 3 was identified as the proposed action and served as the basis for advancing the design and for assessing potential environmental benefits and impacts as part of the EA.

Terminal C-E Connector

Terminal C-E Connector Alternative A consisted of a new structure built largely outside of the existing terminal footprint as a major connector complete with pedestrian moving walkways (assuming that a larger merged airline would occupy gates in both terminals). Changes in merged airline relocations and the higher cost of this alternative led to a scope reduction and additional design studies aimed at less costly alternatives. Alternative B was designed to be built primarily within the existing footprint of the terminals, reusing existing space by reconfiguring current uses; however, this approach did not meet the functionality required. Alternative C, the proposed action, creates direct and efficient connections between Terminals C and E by using existing enclosed space efficiently; thereby, eliminating construction complexity. Also, it reduces new construction area and consolidates vertical circulation at this end of Terminal C.

Assessment

The project was evaluated in a federal document, **Environmental Assessment, May 2012**. Pages 5-1 through 5-28 provide a review of the impact of the proposed projects across six applicable categories in accordance with the requirements of NEPA. The report was accepted as a Federal document by the FAA on May 11, 2012. Based on the impact analysis presented herein, there are no adverse environmental impacts associated with the proposed Project.

Consistency with Community Planning

Improvements to terminal efficiency and flexibility, and passenger service and convenience of Logan International Airport are fully consistent with all local, state, and community planning.

Mitigation Measures

To ensure continued efficient operations of the vehicular curbs, the proposed action includes several operational measures specific to the Terminal B, Pier A curbsides. Some combination of the following strategies and improvements will be evaluated and implemented before the completion of the Project in 2013, and would occur with or without the proposed Project:

1. Modification of the dual-stop requirement for Massport operated scheduled bus service (Logan Express, on-airport shuttle buses, etc.).
2. Use of the 'horseshoe' end of the Terminal B Arrival Level roadway to provide additional curb dedicated to taxis. The area would be operated as storage, or mini taxi pool, for the Pier A taxi stand to eliminate excessive queuing from the taxi stand that could impact roadway operations.
3. Installation of internal pedestrian wayfinding signage in the renovated terminal areas directing arriving passengers to the most direct and efficient paths to all ground transportation modes (MBTA services, including the Blue and Silver Lines, scheduled buses including Logan Express, as well as taxis, limos and shared ride shuttles).

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
DRAFT FINDING OF NO SIGNIFICANT IMPACT**

4. Installation of a transponder system at the terminal access and egress to track and enforcement of the 10-minute dwell time rule for limousines. The transponder system would be integrated with Massport's Gatekeeper tracking database and MassDOT's Fastlane system to allow collection of fines from limousine operators that violate Massport's dwell time rule. State idling regulations will also be strictly enforced.

Both renovated and new building area will be fit out with efficient building systems, in accordance with Massport's *Sustainable Design Standards and Guidelines*, as they relate to the project site design, materials, energy efficiency, water use and management, air emissions, and indoor air quality. Building mechanical, plumbing, and lighting systems that service the existing and new building construction will be new and efficient in order to conserve energy and water.

Massport commits to follow appropriate construction management practices to minimize minor temporary construction related impacts. Construction-related air quality emissions are below *de minimis* levels for each criteria pollutant. All federal and state water quality requirements will be met. Hazardous materials encountered during the project construction would be addressed in accordance with applicable MCP regulations (310 CMR 40.00), Massachusetts General Law Chapter 21E, and the Oil and Hazardous Materials Release Prevention and Response Act, as required.

Finding of No Significant Impact

I have carefully and thoroughly considered the facts contained in the attached EA. Based on that information, I find the proposed Federal action is consistent with existing national environmental policies and objectives of Section 101(a) of the National Environmental Policy Act of 1969 (NEPA) and other applicable environmental requirements. I also find the proposed Federal action, with the required mitigation referenced above, will not significantly affect the quality of the human environment or include any condition requiring any consultation pursuant to section 102(2)(C) of NEPA. As a result, FAA will not prepare an EIS for this action.

APPROVED:

Richard Doucette,
Environmental Program Manager

Date

DISAPPROVED:

Richard Doucette,
Environmental Program Manager

Date

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
DRAFT FINDING OF NO SIGNIFICANT IMPACT**

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Appendix B

Surface Transportation Supporting Documentation

- 2010 Boston-Logan International Airport Arrivals, Seats and Passengers
- 2010 Boston-Logan International Airport Departures, Seats and Passengers
- 2012 Boston-Logan International Airport Arrivals, Seats and Passengers
- 2012 Boston-Logan International Airport Departures, Seas and Passengers
- Logan Terminal B – Pier A, 2010 Departures
- Logan Terminal B – Pier A, 2010 Arrivals
- Logan Terminal B – Pier A, 2012, 2013 Build, and 2018 Build Departures
- Logan Terminal B – Pier A, 2012, 2013 Build, and 2018 Build Arrivals
- Logan Terminal B – Pier A, 2012, 2013 No-Build, and 2018 No-Build Departures
- Logan Terminal B – Pier A, 2012, 2013 No-Build, and 2018 No-Build Arrivals
- QATAR v0.6 Analysis

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2010 BOS DEPARTURES, Seats & Passengers: Aug 2010 Actua

American & Virgin America

as of 1/19

BOS Departures

BOS Dep	Downline			Actual BOS				
	Time	Arr Time	Dest	AI	Flight	Equip	Seats	Market/Equip LF
0530	0845	MIA	AA	1711	757	188	89%	168
0600	0855	DFW	AA	1241	757	188	88%	166
0600	0710	JFK	AA	4382	ERD	44	81%	36
0600	0710	LGA	AA	4420	ERD	44	67%	30
0600	0745	ORD	AA	1425	757	188	92%	172
0600	0800	RDU	AA	4446	ER3	37	89%	33
0620	0800	DCA	AA	4519	ER3	37	79%	29
0700	0850	ORD	AA	1141	M80	140	93%	131
0700	0850	YYZ	AA	4386	ER3	37	78%	29
0700	1010	LAX	VX	363	320	149	93%	138
0705	1010	DFW	AA	2029	M83	140	91%	128
0720	1040	MIA	AA	775	757	188	89%	168
0755	1110	LAX	AA	25	738	148	96%	143
0810	0930	LGA	AA	4495	ER3	37	67%	25
0810	1125	MIA	AA	941	757	188	89%	168
0815	1145	SFO	AA	183	757	188	93%	175
0820	1005	ORD	AA	415	738	148	89%	131
0825	0940	JFK	AA	4384	ERD	44	81%	36
0845	1050	RDU	AA	4553	ERD	44	89%	39
0845	1220	SFO	VX	351	319	122	89%	108
0855	1035	DCA	AA	4565	ER3	37	79%	29
0855	1255	SJU	AA	1937	738	148	86%	128
0905	2045	LHR	AA	156	757	188	83%	157
0910	1055	ORD	AA	1491	M80	140	93%	131
0915	1210	DFW	AA	1133	757	188	88%	166
0950	1105	JFK	AA	4377	ERD	44	81%	36
0955	1135	DCA	AA	4486	ER3	37	79%	29
1015	1320	DFW	AA	1897	M83	140	91%	128
1030	1215	ORD	AA	1619	738	148	89%	131
1115	1435	MIA	AA	1990	757	188	89%	168
1125	1240	LGA	AA	4505	ER3	37	67%	25
1145	1259	JFK	AA	4393	ER3	37	81%	30
1150	1550	SJU	AA	1977	738	148	86%	128
1205	1510	DFW	AA	1181	M83	140	91%	128
1235	1420	ORD	AA	2231	738	148	89%	131
1300	1455	YYZ	AA	4438	ER3	37	78%	29
1320	1500	DCA	AA	4677	ERD	44	79%	35
1325	1525	RDU	AA	4560	ER3	37	89%	33
1345	1459	LGA	AA	4428	ER3	37	67%	25
1405	1520	JFK	AA	4389	ERD	44	81%	36
1405	1550	ORD	AA	557	738	148	89%	131
1425	1755	MIA	AA	949	757	188	89%	168
1445	1640	YYZ	AA	4380	ERD	44	78%	34
1500	1645	DCA	AA	4432	ER3	37	79%	29
1505	1810	DFW	AA	871	757	188	88%	166
1555	1745	ORD	AA	597	M80	140	93%	131
1610	1920	DFW	AA	1281	M83	140	91%	128
1635	1800	LGA	AA	4523	ER3	37	67%	25
1640	1955	LAX	VX	367	320	149	93%	138
1645	2000	LAX	AA	145	738	148	96%	143
1705	2010	DFW	AA	1955	M83	140	91%	128
1730	1859	LGA	AA	4506	ER3	37	67%	25
1730	2105	MIA	AA	1927	757	188	89%	168
1735	1945	RDU	AA	4487	ERD	44	89%	39
1740	1910	JFK	AA	4529	ER3	37	81%	30
1740	1930	ORD	AA	2281	738	148	89%	131
1755	1940	DCA	AA	4531	ER3	37	79%	29
1845	0735	CDG	AA	146	757	188	78%	146
1850	2220	SFO	AA	197	757	188	93%	175
1905	2059	YYZ	AA	4547	ERD	44	78%	34
1915	0650	LHR	AA	108	763	225	87%	195
1920	2045	JFK	AA	4397	ERD	44	81%	36
1920	2245	LAX	AA	223	738	148	96%	143
1935	2115	ORD	AA	1081	738	148	89%	131
1940	2320	SFO	VX	355	319	122	89%	108
1945	2105	LGA	AA	4490	ER3	37	67%	25
2005	2205	RDU	AA	4569	ERD	44	89%	39
2045	2340	DFW	AA	1333	M83	140	91%	128
2055	2359	LAX	VX	371	320	149	93%	138
2200	0935	LHR	AA	124	757	188	83%	157

*Shaded rows indicate flights during the peak hour

2010 SUMMARY		
Peak Hour		Passengers
18:45	19:45	968
Time Period		Passengers
0:00	1:00	
0:15	1:15	
0:30	1:30	
0:45	1:45	
1:00	2:00	
1:15	2:15	
1:30	2:30	
1:45	2:45	
2:00	3:00	
2:15	3:15	
2:30	3:30	
2:45	3:45	
3:00	4:00	
3:15	4:15	
3:30	4:30	
3:45	4:45	
4:00	5:00	
4:15	5:15	
4:30	5:30	
4:45	5:45	168
5:00	6:00	168
5:15	6:15	604
5:30	6:30	633
5:45	6:45	466
6:00	7:00	466
6:15	7:15	455
6:30	7:30	593
6:45	7:45	593
7:00	8:00	736
7:15	8:15	503
7:30	8:30	677
7:45	8:45	677
8:00	9:00	839
8:15	9:15	933
8:30	9:30	757
8:45	9:45	757
9:00	10:00	518
9:15	10:15	231
9:30	10:30	193
9:45	10:45	324
10:00	11:00	259
10:15	11:15	259
10:30	11:30	324
10:45	11:45	193
11:00	12:00	350
11:15	12:15	478
11:30	12:30	286
11:45	12:45	417
12:00	13:00	259
12:15	13:15	160
12:30	13:30	228
12:45	13:45	97
13:00	14:00	122
13:15	14:15	260
13:30	14:30	360
13:45	14:45	360
14:00	15:00	369
14:15	15:15	397
14:30	15:30	229
14:45	15:45	229
15:00	16:00	326
15:15	16:15	259
15:30	16:30	259
15:45	16:45	421
16:00	17:00	434
16:15	17:15	434
16:30	17:30	434
16:45	17:45	664
17:00	18:00	550
17:15	18:15	422
17:30	18:30	422
17:45	18:45	29
18:00	19:00	321
18:15	19:15	355
18:30	19:30	728
18:45	19:45	968
19:00	20:00	672
19:15	20:15	677
19:30	20:30	304
19:45	20:45	64
20:00	21:00	305
20:15	21:15	266
20:30	21:30	266
20:45	21:45	266
21:00	22:00	
21:15	22:15	157
21:30	22:30	157
21:45	22:45	157
22:00	23:00	157
22:15	23:15	
22:30	23:30	
22:45	23:45	
23:00	0:00	
23:15	0:15	
23:30	0:30	
23:45	0:45	

2010 BOS ARRIVALS, Seats & Passengers: Aug 2010 Actua

American & Virgin America

as of 1/19

BOS Arrivals

Seats	Equip	Flight	AI	Orig	Upline Dep Time	BOS Arr Time	Actual BOS Market/Equip LF	Pax
44	ERD	4399	AA	JFK	2230	0005	81%	36
188	757	936	AA	MIA	2155	0100	89%	168
148	738	1358	AA	ORD	2210	0120	89%	131
149	320	370	VX	LAX	2110	0535	93%	138
148	738	192	AA	LAX	2215	0645	96%	143
122	319	358	VX	SFO	2250	0730	89%	108
37	ER3	4464	AA	LGA	0630	0740	67%	25
188	757	150	AA	SFO	2325	0755	93%	175
44	ERD	4570	AA	RDU	0605	0800	89%	39
44	ERD	4539	AA	YYZ	0645	0820	78%	34
37	ER3	4478	AA	DCA	0700	0830	79%	29
44	ERD	4381	AA	JFK	0759	0915	81%	36
37	ER3	4502	AA	LGA	0810	0920	67%	25
148	738	876	AA	ORD	0625	0940	89%	131
37	ER3	4457	AA	RDU	0755	0945	89%	33
188	757	452	AA	MIA	0700	1015	89%	168
37	ER3	4436	AA	DCA	0935	1100	79%	29
37	ER3	4680	AA	YYZ	0925	1100	78%	29
140	M83	1466	AA	DFW	0640	1120	91%	128
148	738	1718	AA	ORD	0835	1145	89%	131
37	ER3	4504	AA	LGA	1030	1150	67%	25
44	ERD	4676	AA	JFK	1110	1225	81%	36
44	ERD	4480	AA	DCA	1125	1250	79%	35
148	738	444	AA	ORD	1000	1315	89%	131
37	ER3	4562	AA	RDU	1120	1320	89%	33
225	763	109	AA	LHR	1055	1325 E	87%	-
188	757	2060	AA	MIA	1010	1325	89%	168
188	757	1106	AA	DFW	0915	1355	88%	166
44	ERD	4394	AA	JFK	1245	1410	81%	36
37	ER3	4511	AA	LGA	1320	1435	67%	25
140	M80	1210	AA	ORD	1145	1510	93%	131
140	M83	654	AA	DFW	1040	1525	91%	128
149	320	360	VX	LAX	0715	1545	93%	138
188	757	147	AA	CDG	1350	1550 E	78%	-
148	738	222	AA	LAX	0715	1550	96%	143
37	ER3	4398	AA	JFK	1430	1605	81%	30
140	M83	548	AA	DFW	1130	1615	91%	128
188	757	944	AA	MIA	1300	1615	89%	168
148	738	2340	AA	ORD	1310	1650	89%	131
37	ER3	4524	AA	DCA	1535	1705	79%	29
44	ERD	4388	AA	JFK	1540	1710	81%	36
37	ER3	4443	AA	YYZ	1530	1715	78%	29
188	757	1122	AA	DFW	1240	1730	88%	166
37	ER3	4695	AA	LGA	1610	1730	67%	25
188	757	125	AA	LHR	1515	1810 E	83%	-
148	738	1334	AA	SJU	1400	1810	81%	120
44	ERD	4533	AA	RDU	1635	1830	89%	39
148	738	1810	AA	ORD	1500	1835	89%	131
122	319	350	VX	SFO	1005	1850	89%	108
44	ERD	4551	AA	YYZ	1715	1855	78%	34
37	ER3	4473	AA	LGA	1759	1920	67%	25
188	757	535	AA	MIA	1600	1920	89%	168
44	ERD	4483	AA	DCA	1810	1940	79%	35
140	M80	2098	AA	ORD	1615	1950	93%	131
140	M83	1976	AA	DFW	1505	2000	91%	128
149	320	364	VX	LAX	1135	2000	93%	138
140	M80	154	AA	ORD	1700	2030	93%	131
37	ER3	4489	AA	LGA	1940	2050	67%	25
188	757	155	AA	LHR	1805	2050 E	83%	-
148	738	2478	AA	SJU	1650	2050	86%	128
148	738	264	AA	LAX	1220	2055	96%	143
37	ER3	4415	AA	RDU	1920	2110	89%	33
140	M83	1030	AA	DFW	1640	2125	91%	128
44	ERD	4568	AA	DCA	2000	2130	79%	35
188	757	672	AA	MIA	1840	2155	89%	168
188	757	194	AA	SFO	1315	2155	93%	175
37	ER3	4696	AA	JFK	2030	2210	81%	30
140	M83	632	AA	DFW	1755	2235	91%	128
188	757	874	AA	ORD	1915	2240	92%	172
188	757	560	AA	DFW	1910	2340	88%	166

*Shaded rows indicate flights during the peak hour

2010 SUMMARY		
Peak Hour		Passengers
20:00	21:00	692
Time Period		Passengers
0:00	1:00	36
0:15	1:15	168
0:30	1:30	299
0:45	1:45	299
1:00	2:00	299
1:15	2:15	131
1:30	2:30	
1:45	2:45	
2:00	3:00	
2:15	3:15	
2:30	3:30	
2:45	3:45	
3:00	4:00	
3:15	4:15	
3:30	4:30	
3:45	4:45	
4:00	5:00	
4:15	5:15	
4:30	5:30	
4:45	5:45	138
5:00	6:00	138
5:15	6:15	138
5:30	6:30	138
5:45	6:45	
6:00	7:00	143
6:15	7:15	143
6:30	7:30	143
6:45	7:45	276
7:00	8:00	308
7:15	8:15	347
7:30	8:30	382
7:45	8:45	278
8:00	9:00	103
8:15	9:15	64
8:30	9:30	90
8:45	9:45	192
9:00	10:00	225
9:15	10:15	225
9:30	10:30	332
9:45	10:45	201
10:00	11:00	168
10:15	11:15	226
10:30	11:30	186
10:45	11:45	186
11:00	12:00	342
11:15	12:15	284
11:30	12:30	192
11:45	12:45	192
12:00	13:00	70
12:15	13:15	70
12:30	13:30	367
12:45	13:45	367
13:00	14:00	498
13:15	14:15	533
13:30	14:30	201
13:45	14:45	226
14:00	15:00	61
14:15	15:15	156
14:30	15:30	284
14:45	15:45	259
15:00	16:00	539
15:15	16:15	439
15:30	16:30	606
15:45	16:45	606
16:00	17:00	457
16:15	17:15	492
16:30	17:30	225
16:45	17:45	416
17:00	18:00	284
17:15	18:15	339
17:30	18:30	311
17:45	18:45	291
18:00	19:00	433
18:15	19:15	313
18:30	19:30	506
18:45	19:45	370
19:00	20:00	358
19:15	20:15	624
19:30	20:30	431
19:45	20:45	527
20:00	21:00	692
20:15	21:15	459
20:30	21:30	587
20:45	21:45	491
21:00	22:00	538
21:15	22:15	535
21:30	22:30	407
21:45	22:45	673
22:00	23:00	330
22:15	23:15	300
22:30	23:30	300
22:45	23:45	338
23:00	0:00	166
23:15	0:15	201
23:30	0:30	201
23:45	0:45	36

2012 BOS DEPARTURES, Seats & Passengers: Thursday in Aug 2012

American Airlines AA
 Continental CO
 United UA
 Spirit NK
 Virgin America VX
 as of 10/18 CONFIDENTIAL

BOS Departures

BOS Dep	Downline	Time	Arr Time	Dest	AI	Flight	Equip	Seats	Airline	BOS LF	Pax
0525	0815	IAH	CO	1524	739	173	88%	152			
0530	0840	MIA	AA	2297	757	187	84%	158			
0530	0729	MYR	NK	103	320	178	88%	156			
0600	0745	ORD	AA	1597	738	158	84%	133			
0600	0721	EWR	CO	1711	738	157	88%	138			
0600	0734	IAD	UA	795	320	138	88%	121			
0600	0735	ORD	UA	245	319	120	88%	105			
0600	0800	CLE	CO	2227	ERJ	50	88%	44			
0610	0910	DFW	AA	1461	738	158	84%	133			
0610	0938	SFO	UA	893	752	182	88%	160			
0630	0753	EWR	CO	1436	73G	124	88%	109			
0630	0951	LAX	UA	399	752	182	88%	160			
0655	0828	ORD	UA	835	752	182	88%	160			
0700	0850	ORD	AA	451	738	158	84%	133			
0700	1020	MIA	AA	1171	757	187	84%	158			
0700	1015	LAX	VX	363	320	149	84%	124			
0705	1010	DFW	AA	1981	738	158	84%	133			
0719	0857	IAD	UA	773	320	138	88%	121			
0730	0851	EWR	CO	9	738	157	88%	138			
0735	1055	LAX	AA	25	738	158	84%	133			
0740	1041	IAH	CO	1707	738	157	88%	138			
0742	1120	SFO	UA	269	752	182	88%	160			
0755	0930	ORD	UA	881	320	138	88%	121			
0800	0945	ORD	AA	549	738	158	84%	133			
0801	1035	DEN	UA	339	752	182	88%	160			
0810	1130	MIA	AA	573	757	187	84%	158			
0840	1025	ORD	AA	415	738	158	84%	133			
0840	1215	SFO	VX	351	319	122	84%	102			
0845	1001	EWR	CO	854	735	114	88%	100			
0855	2040	LHR	AA	156	757	187	84%	158			
0855	1036	ORD	UA	895	752	182	88%	160			
0905	1225	MIA	AA	2511	757	187	84%	158			
0935	1230	DFW	AA	1365	757	187	84%	158			
0943	1120	IAD	UA	897	752	182	88%	160			
0945	1059	EWR	CO	1601	738	157	88%	138			
0945	1145	CLE	CO	2229	ERJ	50	88%	44			
0950	1048	JFK	AA	1899	738	160	84%	135			
1005	1233	DEN	UA	501	752	182	88%	160			
1035	1339	IAH	CO	1844	738	157	88%	138			
1037	1402	SFO	UA	577	752	182	88%	160			
1040	1220	ORD	AA	1481	738	158	84%	133			
1115	1435	MIA	AA	527	757	187	84%	158			
1120	1428	FLL	NK	607	319	145	88%	127			
1142	1322	ORD	UA	3468	E70	70	88%	61			
1200	1340	ORD	AA	1417	738	158	84%	133			
1225	1520	DFW	AA	475	738	158	84%	133			
1225	1334	ACY	NK	127	319	145	88%	127			
1259	1440	EWR	CO	1871	735	114	88%	100			
1335	1640	IAH	CO	1783	739	173	88%	152			
1337	1515	ORD	UA	582	320	138	88%	121			
1350	1535	ORD	AA	1835	738	158	84%	133			
1401	1546	IAD	UA	823	320	138	88%	121			
1426	1611	EWR	CO	1529	73G	124	88%	109			
1445	1755	DFW	AA	1027	757	187	84%	158			
1454	1816	SFO	UA	789	752	182	88%	160			
1459	1639	ORD	UA	3448	E70	70	88%	61			
1510	1840	MIA	AA	2551	757	187	84%	158			
1515	1700	ORD	AA	1801	738	158	84%	133			
1515	1825	DFW	AA	349	738	158	84%	133			
1530	1713	EWR	CO	1634	735	114	88%	100			
1530	1802	DEN	CO	1857	739	173	88%	152			
1550	1648	JFK	AA	1851	738	160	84%	135			
1608	1940	SFO	UA	587	752	182	88%	160			
1625	1940	LAX	AA	145	757	187	84%	158			
1629	1809	ORD	UA	3474	E70	70	88%	61			
1630	2010	SFO	VX	353	319	122	84%	102			
1635	1945	DFW	AA	1575	738	158	84%	133			
1645	1820	EWR	CO	1462	738	157	88%	138			
1645	1955	IAH	CO	1764	738	157	88%	138			
1712	1949	DEN	UA	593	320	138	88%	121			
1717	1854	IAD	UA	244	319	120	88%	105			
1735	2110	MIA	AA	1939	757	187	84%	158			
1735	1914	ORD	UA	629	752	182	88%	160			
1745	1940	ORD	AA	1339	738	158	84%	133			
1745	2100	LAX	VX	367	320	149	84%	124			
1750	1929	EWR	CO	1611	739	173	88%	152			
1755	2134	SFO	UA	731	752	182	88%	160			
1805	2006	CLE	CO	1431	ERJ	50	88%	44			
1825	2147	LAX	UA	663	752	182	88%	160			
1845	2210	LAX	AA	223	757	187	84%	158			
1845	2154	IAH	CO	1630	738	157	88%	138			
1850	0735	CDG	AA	146	757	187	84%	158			
1850	2040	ORD	AA	607	738	158	84%	133			
1900	2225	SFO	CO	1863	738	157	88%	138			
1910	2008	JFK	AA	1807	738	160	84%	135			
1912	2050	ORD	UA	494	320	138	88%	121			
1917	2102	IAD	UA	861	752	182	88%	160			
1930	2310	SFO	VX	357	319	122	84%	102			
1945	2257	FLL	NK	615	319	145	88%	127			
2000	2255	DFW	AA	1333	757	187	84%	158			
2005	0745	LHR	AA	108	757	187	84%	158			
2015	2146	EWR	CO	1401	73G	124	88%	109			
2131	2305	ORD	UA	3531	E70	70	88%	61			
2255	1035	LHR	AA	124	757	187	84%	158			

2012 SUMMARY		
Peak Hour	All Passengers	American and Virgin Passengers
6:45	7:45	1,399
Time Period		Passengers
0:00	1:00	
0:15	1:15	
0:30	1:30	
0:45	1:45	
1:00	2:00	
1:15	2:15	
1:30	2:30	
1:45	2:45	
2:00	3:00	
2:15	3:15	
2:30	3:30	
2:45	3:45	
3:00	4:00	
3:15	4:15	
3:30	4:30	
3:45	4:45	
4:00	5:00	
4:15	5:15	
4:30	5:30	152
4:45	5:45	466
5:00	6:00	466
5:15	6:15	1,301
5:30	6:30	1,149
5:45	6:45	1,103
6:00	7:00	1,263
6:15	7:15	978
6:30	7:30	1,099
6:45	7:45	1,399
7:00	8:00	1,360
7:15	8:15	1,262
7:30	8:30	1,141
7:45	8:45	808
8:00	9:00	1,104
8:15	9:15	811
8:30	9:30	811
8:45	9:45	893
9:00	10:00	792
9:15	10:15	794
9:30	10:30	794
9:45	10:45	907
10:00	11:00	591
10:15	11:15	431
10:30	11:30	716
10:45	11:45	347
11:00	12:00	347
11:15	12:15	480
11:30	12:30	456
11:45	12:45	394
12:00	13:00	494
12:15	13:15	361
12:30	13:30	100
12:45	13:45	373
13:00	14:00	406
13:15	14:15	527
13:30	14:30	636
13:45	14:45	363
14:00	15:00	609
14:15	15:15	646
14:30	15:30	804
14:45	15:45	1,056
15:00	16:00	812
15:15	16:15	814
15:30	16:30	766
15:45	16:45	750
16:00	17:00	890
16:15	17:15	851
16:30	17:30	737
16:45	17:45	820
17:00	18:00	1,114
17:15	18:15	1,036
17:30	18:30	1,091
17:45	18:45	773
18:00	19:00	791
18:15	19:15	1,141
18:30	19:30	1,141
18:45	19:45	1,243
19:00	20:00	783
19:15	20:15	705
19:30	20:30	654
19:45	20:45	552
20:00	21:00	425
20:15	21:15	109
20:30	21:30	
20:45	21:45	61
21:00	22:00	61
21:15	22:15	61
21:30	22:30	61
21:45	22:45	
22:00	23:00	158
22:15	23:15	158
22:30	23:30	158
22:45	23:45	158
23:00	0:00	
23:15	0:15	
23:30	0:30	
23:45	0:45	

*Shaded rows indicate flights during the peak hour

2012 BOS ARRIVIALS, Seats & Passengers: Thursday in Aug 2012

American Airlines AA
 Continental CO
 United UA
 Spirit NK
 Virgin America VX
 as of 10/18 CONFIDENTIAL

BOS Arrivals

Seats	Equip	Flight	AI	Orig	Upline Dep	BOS Arr	Pax
					Time	Time	
187	757	936	AA	MIA	2115	0015	158
138	320	739	UA	SFO	1548	0019	121
178	320	126	NK	MYR	2230	0025	156
182	752	618	UA	ORD	2118	0030	160
158	738	1358	AA	ORD	2215	0120	133
149	320	370	VX	LAX	2105	0525	124
187	757	192	AA	LAX	2205	0630	158
182	752	710	UA	LAX	2230	0656	160
122	319	358	VX	SFO	2245	0720	102
182	752	733	UA	SFO	2250	0727	160
114	735	502	CO	EWR	0630	0741	100
114	735	1664	CO	EWR	0630	0742	100
160	738	1838	AA	JFK	0735	0830	135
157	738	554	CO	EWR	0730	0852	138
157	738	1787	CO	EWR	0730	0853	138
182	752	524	UA	ORD	0602	0915	160
50	ERJ	2242	CO	CLE	0735	0915	44
158	738	876	AA	ORD	0635	0945	133
182	752	860	UA	IAD	0813	0945	160
157	738	1851	CO	EWR	0825	0945	138
157	738	552	CO	EWR	0830	0952	138
187	757	452	AA	MIA	0705	1015	158
145	319	610	NK	FLL	0730	1040	127
70	E70	3468	UA	ORD	0750	1104	61
158	738	1718	AA	ORD	0755	1105	133
158	738	2408	AA	DFW	0655	1130	133
145	319	354	NK	ACY	1040	1145	127
114	735	562	CO	EWR	1045	1149	100
114	735	1871	CO	EWR	1105	1219	100
138	320	528	UA	ORD	0905	1220	121
173	739	282	CO	IAH	0735	1233	152
173	739	1783	CO	IAH	0740	1239	152
158	738	1044	AA	ORD	0945	1255	133
138	320	728	UA	ORD	1009	1321	121
187	757	1106	AA	DFW	0845	1325	158
124	73G	1529	CO	IAH	0845	1341	109
124	73G	603	CO	IAH	0845	1345	109
182	752	884	UA	IAD	1228	1404	160
187	757	2074	AA	MIA	1100	1410	158
158	738	608	AA	DFW	0940	1420	133
158	738	1210	AA	ORD	1110	1420	133
70	E70	3448	UA	ORD	1108	1425	61
173	739	1512	CO	DEN	0840	1435	152
160	738	1850	AA	JFK	1345	1440	135
114	735	882	CO	EWR	1335	1449	100
114	735	572	CO	EWR	1345	1454	100
182	752	226	UA	SFO	0621	1500	160
187	757	109	AA	LHR	1225	1510	-
187	757	222	AA	LAX	0650	1515	158
187	757	147	AA	CDG	1325	1525	-
158	738	406	AA	DFW	1105	1540	133
122	319	350	VX	SFO	0705	1540	102
70	E70	3474	UA	ORD	1234	1551	61
157	738	1764	CO	IAH	1100	1555	138
157	738	1636	CO	EWR	1450	1600	138
138	320	244	UA	DEN	1026	1619	121
187	757	1506	AA	MIA	1320	1635	158
120	319	241	UA	IAD	1508	1639	105
182	752	578	UA	ORD	1331	1645	160
158	738	2340	AA	ORD	1325	1650	133
149	320	360	VX	LAX	0825	1650	124
173	739	1706	CO	EWR	1545	1700	152
182	752	347	UA	LAX	0838	1705	160
50	ERJ	1675	CO	CLE	1525	1715	44
187	757	1896	AA	DFW	1250	1735	158
182	752	715	UA	SFO	0853	1735	160
187	757	125	AA	LHR	1500	1745	-
160	738	1806	AA	JFK	1655	1750	135
158	738	1810	AA	ORD	1440	1755	133
157	738	1630	CO	IAH	1255	1755	138
157	738	1863	CO	EWR	1650	1801	138
182	752	386	UA	DEN	1225	1815	160
138	320	822	UA	IAD	1702	1830	121
122	319	352	VX	SFO	1000	1835	102
187	757	1926	AA	MIA	1545	1900	158
145	319	618	NK	FLL	1555	1905	127
158	738	2098	AA	ORD	1605	1930	133
124	73G	8	CO	EWR	1800	1930	109
182	752	882	UA	ORD	1618	1939	160
158	738	2230	AA	DFW	1535	2010	133
182	752	788	UA	SFO	1130	2012	160
158	738	264	AA	LAX	1150	2015	133
157	738	1523	CO	IAH	1540	2036	138
187	757	696	AA	MIA	1730	2045	158
187	757	155	AA	LHR	1805	2045	-
70	E70	3532	UA	ORD	1733	2050	61
158	738	154	AA	ORD	1800	2120	133
157	738	1093	CO	EWR	2000	2126	138
50	ERJ	2259	CO	CLE	1950	2130	44
182	752	836	UA	ORD	1834	2150	160
187	757	614	AA	DFW	1725	2155	158
187	757	1772	AA	MIA	1855	2205	158
120	319	509	UA	IAD	2050	2219	105
138	320	892	UA	SFO	1408	2234	121
114	735	1642	CO	EWR	2130	2249	100
158	738	596	AA	ORD	2005	2315	133
182	752	714	UA	DEN	1737	2332	160
158	738	610	AA	DFW	1905	2335	133
157	738	1751	CO	IAH	1850	2344	138
138	320	898	UA	IAD	2205	2344	121

2012 SUMMARY			
Peak Hour		All	American and Virgin
14:00	15:00	Passengers	Passengers
		1,133	560
Time Period		Passengers	
0:00	1:00	595	
0:15	1:15	595	
0:30	1:30	293	
0:45	1:45	133	
1:00	2:00	133	
1:15	2:15	133	
1:30	2:30		
1:45	2:45		
2:00	3:00		
2:15	3:15		
2:30	3:30		
2:45	3:45		
3:00	4:00		
3:15	4:15		
3:30	4:30		
3:45	4:45		
4:00	5:00		
4:15	5:15		
4:30	5:30	124	
4:45	5:45	124	
5:00	6:00	124	
5:15	6:15	124	
5:30	6:30		
5:45	6:45	158	
6:00	7:00	318	
6:15	7:15	318	
6:30	7:30	579	
6:45	7:45	621	
7:00	8:00	462	
7:15	8:15	462	
7:30	8:30	200	
7:45	8:45	135	
8:00	9:00	411	
8:15	9:15	411	
8:30	9:30	614	
8:45	9:45	479	
9:00	10:00	772	
9:15	10:15	772	
9:30	10:30	727	
9:45	10:45	854	
10:00	11:00	347	
10:15	11:15	480	
10:30	11:30	322	
10:45	11:45	328	
11:00	12:00	556	
11:15	12:15	361	
11:30	12:30	582	
11:45	12:45	752	
12:00	13:00	658	
12:15	13:15	658	
12:30	13:30	716	
12:45	13:45	521	
13:00	14:00	497	
13:15	14:15	814	
13:30	14:30	864	
13:45	14:45	1,042	
14:00	15:00	1,133	
14:15	15:15	975	
14:30	15:30	805	
14:45	15:45	753	
15:00	16:00	752	
15:15	16:15	730	
15:30	16:30	693	
15:45	16:45	721	
16:00	17:00	940	
16:15	17:15	1,114	
16:30	17:30	1,036	
16:45	17:45	1,091	
17:00	18:00	1,079	
17:15	18:15	906	
17:30	18:30	1,022	
17:45	18:45	927	
18:00	19:00	520	
18:15	19:15	668	
18:30	19:30	508	
18:45	19:45	687	
19:00	20:00	687	
19:15	20:15	695	
19:30	20:30	829	
19:45	20:45	564	
20:00	21:00	784	
20:15	21:15	491	
20:30	21:30	628	
20:45	21:45	534	
21:00	22:00	633	
21:15	22:15	791	
21:30	22:30	625	
21:45	22:45	702	
22:00	23:00	484	
22:15	23:15	326	
22:30	23:30	355	
22:45	23:45	786	
23:00	0:00	685	
23:15	0:15	685	
23:30	0:30	987	
23:45	0:45	595	

*Shaded rows indicate flights during the peak hour

Logan Terminal B - Pier A

Departures

2010

Peak Hour: 6:45 - 7:45 PM

Peak Hour Passengers: 968

Originating Passenger Factor¹: 0.93

Peak Hour Originating Passengers: 900

<u>Vehicle Type</u>	<u>Mode Split</u>		<u>Occupancy</u> ³	<u>Vehicles based</u>	
	<u>Percentage</u> ²	<u>PAX</u>		<u>on Occupancy</u>	<u>Adjusted Vehicles</u> ⁹
Private Vehicle	21%	189	1.5	126	126
Rental Car	6%	54	1.6	34	34
Taxicabs	23%	207	1.4	148	148
Courtesy Vehicles					
Airport Operated Shuttles (Parking) ⁴	15%	135	n/a	n/a	n/a
Airport Operated Shuttles (Subway, Waterway)	5%	45	n/a	n/a	n/a
Airport Operated Shuttles (MPA Employee Shuttle)	n/a	n/a	n/a	n/a	12
Rental Car Shuttles	6%	54	n/a	n/a	n/a
Hotel-Motel Shuttles	5%	45	n/a	n/a	n/a
Shared Ride ⁵	8%	72	3.5	21	32
MBTA Silver Line ⁶	4%	36	n/a	n/a	n/a
Logan Express ⁷	4%	36	8.8	4	7
Scheduled Bus Service ⁸	3%	27	8.8	3	3
Charter Bus	1%	9	8.8	1	1
Total		909	4.9	336	363

Notes:

1/ Airport forecasts for strategic planning presentation, May 11, 2011, SH & IE.

2/ Based on mode-split data from 2010 Logan Airport Passenger Survey, Massport.

3/ Long Range Ground Access Policy Plan: Phase 1 Report. Prepared By: Ricondo & Associates, Inc., October 2008.

4/ Passengers using Parking shuttles are calculated on the basis of percentage of private vehicles that parked in one of the airport or off airport parking products with or without dropping off the passengers first. It is to be noted that all vehicles that parked in the Close-In parking lots were assumed to walk to their respective terminals and were not considered as a part of this calculation.

5/ Shared ride consists of Other HOV and Unscheduled Vans. Arriving passengers who take limos are picked up on the departures level.

6/ Vehicles calculated based on an assumed headway of 10 minutes. Passengers dropped at Arrivals curbside.

7/ Vehicles calculated on the basis of half hour headway for three routes and one hour headway for one route. Making a total of 7 vehicles per hour

8/ Other Scheduled Bus Service consists of MBTA busses, and Other Busses.

9/ Adjusted vehicle numbers based on published or planned operational service levels, when applicable.

Logan Terminal B - Pier A

Arrivals

2010

Peak Hour: 8:00 - 9:00 PM

Peak Hour Passengers: 692

Originating Passenger Factor ¹: 0.93

Peak Hour Originating Passengers: 644

<u>Vehicle Type</u>	<u>Mode Split</u>		<u>Occupancy</u> ³	<u>Vehicles based on Occupancy</u>	<u>2010</u>
	<u>Percentage</u> ²	<u>PAX</u>			<u>Adjusted Vehicles</u> ¹⁰
Private Vehicle	21%	135	1.5	90	90
Rental Car	n/a	n/a	1.6	n/a	n/a
Taxicabs	25%	161	1.5	107	107
Courtesy Vehicles					
Airport Operated Shuttles (Parking) ⁴	15%	97	4.8	20	24
Airport Operated Shuttles (Subway, Waterway)	6%	39	4.8	8	
Rental Car Shuttles ⁹	10%	64	4.8	13	95
Hotel-Motel Shuttles	5%	32	4.8	7	20
Shared Ride ⁵	7%	45	3.5	13	2
MBTA Silver Line ⁶	5%	32	8.8	4	5
Logan Express ⁷	3%	19	8.8	2	7
Scheduled Bus Service ⁸	2%	13	8.8	1	1
Charter Bus ⁹	1%	6	8.8	1	1
Total		644	5.2	267	353

Notes:

1/ Airport forecasts for strategic planning presentation, May 11, 2011, SH & IE.

2/ Based on mode-split data from 2010 Logan Airport Passenger Survey, Massport.

3/ Long Range Ground Access Policy Plan: Phase 1 Report. Prepared By: Ricondo & Associates, Inc., October 2008.

4/ Passengers using Parking shuttles are calculated on the basis of percentage of private vehicles that parked in one of the airport or off airport parking products with or without dropping off the passengers first. It is to be noted that all vehicles that parked in the Close-In parking lots were assumed to walk to their respective terminals and were not considered as a part of this calculation. Adjusted parking shuttle vehicles based on MPA shuttle schedule.

5/ Shared ride consists of Other HOV and Unscheduled Vans. Arriving passengers who take limos are picked up on the departures level.

6/ Vehicles calculated based on an assumed headway of 10 minutes

7/ Vehicles calculated on the basis of half hour headway for three routes and one hour headway for one route. Making a total of 7 vehicles per hour

8/ Other Scheduled Bus Service consists of MBTA busses, and Other Busses.

9/ Assumed that there were no rental car pickups on the Arrival Curb. All arriving passengers choosing rental car mode of travel were assumed to take the Rental Car Shuttles. Adjusted rental car shuttles based on survey data compiled by ConRAC project.

10/ Adjusted vehicle numbers based on published or planned operational service levels, when applicable.

Logan Terminal B - Pier A

Departures

2012, 2013 & 2018 Build

2012 Peak Hour: 6:45 - 7:45 AM		
Peak Hour Passengers:	1,399	
Originating Passenger Factor ¹ :	0.93	
Peak Hour Originating Passengers:	1,301	
		2013
		2018
	Growth Factor:	1.006
	Peak Hour Passengers:	1,407
		1,572

<u>Vehicle Type</u>	<u>Mode Split</u>		<u>Vehicles based</u>		<u>2012</u>	<u>2013 Build</u>	<u>2018 Build</u>
	<u>Percentage</u> ²	<u>PAX</u>	<u>Occupancy</u> ³	<u>on Occupancy</u>	<u>Adjusted Vehicles</u> ¹⁰	<u>Adjusted Vehicles</u>	<u>Adjusted Vehicles</u>
Private Vehicle	21%	273	1.5	182	182	183	205
Rental Car	6%	78	1.6	49	49	49	55
Taxicabs	23%	299	1.4	214	214	215	240
Courtesy Vehicles							
Airport Operated Shuttles (Parking) ⁴	15%	195	n/a	n/a	n/a	n/a	n/a
Airport Operated Shuttles (Subway, Waterway)	5%	65	n/a	n/a	n/a	n/a	n/a
Airport Operated Shuttles (MPA Employee Shuttle)	n/a	n/a	n/a	n/a	10	10	11
Rental Car Shuttles	6%	78	n/a	n/a	n/a	n/a	n/a
Unified Rental Car Shuttle ⁹	n/a	n/a	n/a	n/a	15	15	17
Hotel-Motel Shuttles	5%	65	n/a	n/a	n/a	n/a	n/a
Shared Ride ⁵	8%	104	3.5	30	48	48	54
MBTA Silver Line ⁶	4%	52	n/a	n/a	n/a	n/a	n/a
Logan Express ⁷	4%	52	8.8	6	7	7	8
Scheduled Bus Service ⁸	3%	39	8.8	4	4	4	5
Charter Bus	1%	13	8.8	1	1	1	1
Total		1,314	4.9	486	530	533	596

Notes:

1/ Airport forecasts for strategic planning presentation, May 11, 2011, SH & IE.

2/ Based on mode-split data from 2010 Logan Airport Passenger Survey, Massport.

3/ Long Range Ground Access Policy Plan: Phase 1 Report. Prepared By: Ricondo & Associates, Inc., October 2008.

4/ Passengers using Parking shuttles are calculated on the basis of percentage of private vehicles that parked in one of the airport or off airport parking products with or without dropping off the passengers first. It is to be noted that all vehicles that parked in the Close-In parking lots were assumed to walk to their respective terminals and were not considered as a part of this calculation.

5/ Shared ride consists of Other HOV and Unscheduled Vans. Arriving passengers who take limos are picked up on the departures level.

6/ Vehicles calculated based on an assumed headway of 10 minutes. Passengers dropped at Arrivals curbside.

7/ Vehicles calculated on the basis of half hour headway for three routes and one hour headway for one route. Making a total of 7 vehicles per hour

8/ Other Scheduled Bus Service consists of MBTA busses, and Other Busses.

9/ Unified Rental Car Shuttle consolidates Rental Car Shuttles and MPA Shuttle Service to airport station. The Unified Rental Car Shuttle will drop on departures level and pick-up on arrivals level.

10/ Adjusted vehicle numbers based on published or planned operational service levels, when applicable.

Logan Terminal B - Pier A

Arrivals

2012, 2013 & 2018 Build

2012 Peak Hour: 2:00 - 3:00 PM		
Peak Hour Passengers:	1,133	
Originating Passenger Factor ¹ :	0.93	
Peak Hour Originating Passengers:	1,054	
		2013
Growth Factor:		1.006
		2018
Peak Hour Passengers:		1,140
		1,273

<u>Vehicle Type</u>	<u>Mode Split</u>		<u>Vehicles based</u>		<u>2012</u>	<u>2013 Build</u>	<u>2018 Build</u>
	<u>Percentage</u> ²	<u>PAX</u>	<u>Occupancy</u> ³	<u>on Occupancy</u>	<u>Adjusted Vehicles</u> ¹⁰	<u>Adjusted Vehicles</u>	<u>Adjusted Vehicles</u>
Private Vehicle	21%	221	1.5	148	148	148	166
Rental Car	n/a	n/a	1.6	n/a	n/a	n/a	n/a
Taxicabs	25%	263	1.5	176	176	177	197
Courtesy Vehicles							
Airport Operated Shuttles (Parking) ⁴	15%	158	4.8	33	19	19	21
Airport Operated Shuttles (Subway, Waterway)	6%	63	4.8	13			
Rental Car Shuttles	10%	105	4.8	22	n/a	n/a	n/a
Unified Rental Car Shuttle ⁹	n/a	n/a	n/a	n/a	15	15	17
Hotel-Motel Shuttles	5%	53	4.8	11	11	11	12
Shared Ride ⁵	7%	74	3.5	21	3	3	3
MBTA Silver Line ⁶	5%	53	8.8	6	6	6	7
Logan Express ⁷	3%	32	8.8	4	7	7	8
Scheduled Bus Service ⁸	2%	21	8.8	2	2	2	3
Charter Bus	1%	11	8.8	1	1	1	1
Total		1,054	5.2	436	388	390	436

Notes:

1/ Airport forecasts for strategic planning presentation, May 11, 2011, SH & IE.

2/ Based on mode-split data from 2010 Logan Airport Passenger Survey, Massport.

3/ Long Range Ground Access Policy Plan: Phase 1 Report. Prepared By: Ricondo & Associates, Inc., October 2008.

4/ Passengers using Parking shuttles are calculated on the basis of percentage of private vehicles that parked in one of the airport or off airport parking products with or without dropping off the passengers first. It is to be noted that all vehicles that parked in the Close-In parking lots were assumed to walk to their respective terminals and were not considered as a part of this calculation.

5/ Shared ride consists of Other HOV and Unscheduled Vans. Arriving passengers who take limos are picked up on the departures level.

6/ Vehicles calculated based on an assumed headway of 10 minutes. Passengers dropped at Arrivals curbside.

7/ Vehicles calculated on the basis of half hour headway for three routes and one hour headway for one route. Making a total of 7 vehicles per hour

8/ Other Scheduled Bus Service consists of MBTA busses, and Other Busses.

9/ Unified Rental Car Shuttle consolidates Rental Car Shuttles and MPA Shuttle Service to airport station. The Unified Rental Car Shuttle will drop on departures level and pick-up on arrivals level.

10/ Adjusted vehicle numbers based on published or planned operational service levels, when applicable.

Logan Terminal B - Pier A

Departures

2012, 2013 & 2018 No Build

2012 Peak Hour: 6:45 - 7:45 AM				
(American Airlines & Virgin America) Peak Hour Passengers:	683		2013	2018
Originating Passenger Factor ¹ :	0.93		1.006	1.124
Peak Hour Originating Passengers:	635		687	768

<u>Vehicle Type</u>	<u>Mode Split</u>		<u>Vehicles based</u>		<u>2012</u>	<u>2013 NB</u>	<u>2018 NB</u>
	<u>Percentage</u> ²	<u>PAX</u>	<u>Occupancy</u> ³	<u>on Occupancy</u>	<u>Adjusted Vehicles</u> ¹⁰	<u>Adjusted Vehicles</u>	<u>Adjusted Vehicles</u>
Private Vehicle	21%	133	1.5	89	89	89	100
Rental Car	6%	38	1.6	24	24	24	27
Taxicabs	23%	146	1.4	104	104	105	117
Courtesy Vehicles							
Airport Operated Shuttles (Parking) ⁴	15%	95	n/a	n/a	n/a	n/a	n/a
Airport Operated Shuttles (Subway, Waterway)	5%	32	n/a	n/a	n/a	n/a	n/a
Airport Operated Shuttles (MPA Employee Shuttle)	n/a	n/a	n/a	n/a	10	10	11
Rental Car Shuttles	6%	38	n/a	n/a	n/a	n/a	n/a
Unified Rental Car Shuttle ⁹	n/a	n/a	n/a	n/a	15	15	17
Hotel-Motel Shuttles	5%	32	n/a	n/a	n/a	n/a	n/a
Shared Ride ⁵	8%	51	3.5	15	24	24	27
MBTA Silver Line ⁶	4%	25	n/a	n/a	n/a	n/a	n/a
Logan Express ⁷	4%	25	8.8	3	7	7	8
Scheduled Bus Service ⁸	3%	19	8.8	2	2	2	2
Charter Bus	1%	6	8.8	1	1	1	1
Total		642	4.9	237	276	278	311

Notes:

1/ Airport forecasts for strategic planning presentation, May 11, 2011, SH & IE.

2/ Based on mode-split data from 2010 Logan Airport Passenger Survey, Massport.

3/ Long Range Ground Access Policy Plan: Phase 1 Report. Prepared By: Ricondo & Associates, Inc., October 2008.

4/ Passengers using Parking shuttles are calculated on the basis of percentage of private vehicles that parked in one of the airport or off airport parking products with or without dropping off the passengers first. It is to be noted that all vehicles that parked in the Close-In parking lots were assumed to walk to their respective terminals and were not considered as a part of this calculation.

5/ Shared ride consists of Other HOV and Unscheduled Vans. Arriving passengers who take limos are picked up on the departures level.

6/ Vehicles calculated based on an assumed headway of 10 minutes. Passengers dropped at Arrivals curbside.

7/ Vehicles calculated on the basis of half hour headway for three routes and one hour headway for one route. Making a total of 7 vehicles per hour

8/ Other Scheduled Bus Service consists of MBTA busses, and Other Busses.

9/ Unified Rental Car Shuttle consolidates Rental Car Shuttles and MPA Shuttle Service to airport station. The Unified Rental Car Shuttle will drop on departures level and pick-up on arrivals level.

10/ Adjusted vehicle numbers based on published or planned operational service levels, when applicable.

Logan Terminal B - Pier A

Arrivals

2012, 2013 & 2018 No Build

2012 Peak Hour: 2:00 - 3:00 PM				
(American Airlines & Virgin America) Peak Hour Passengers:	560		2013	2018
Originating Passenger Factor ¹ :	0.93		1.006	1.124
Peak Hour Originating Passengers:	521		563	629
		Growth Factor:		
			Peak Hour Passengers:	

<u>Vehicle Type</u>	<u>Mode Split</u>		<u>Vehicles based</u>		<u>2012</u>	<u>2013 NB</u>	<u>2018 NB</u>
	<u>Percentage</u> ²	<u>PAX</u>	<u>Occupancy</u> ³	<u>on Occupancy</u>	<u>Adjusted Vehicles</u> ¹⁰	<u>Adjusted Vehicles</u>	<u>Adjusted Vehicles</u>
Private Vehicle	21%	109	1.5	73	73	73	82
Rental Car	n/a	n/a	1.6	n/a	n/a	n/a	n/a
Taxicabs	25%	130	1.5	87	87	87	98
Courtesy Vehicles							
Airport Operated Shuttles (Parking) ⁴	15%	78	4.8	16	19	19	21
Airport Operated Shuttles (Subway, Waterway)	6%	31	4.8	7			
Rental Car Shuttles	10%	52	4.8	11	n/a	n/a	n/a
Unified Rental Car Shuttle ⁹	n/a	n/a	n/a	n/a	15	15	17
Hotel-Motel Shuttles	5%	26	4.8	5	5	5	6
Shared Ride ⁵	7%	36	3.5	10	1	1	1
MBTA Silver Line ⁶	5%	26	8.8	3	6	6	7
Logan Express ⁷	3%	16	8.8	2	7	7	8
Scheduled Bus Service ⁸	2%	10	8.8	1	1	1	1
Charter Bus	1%	5	8.8	1	1	1	1
Total		521	5.2	216	215	217	242

Notes:

1/ Airport forecasts for strategic planning presentation, May 11, 2011, SH & IE.

2/ Based on mode-split data from 2010 Logan Airport Passenger Survey, Massport.

3/ Long Range Ground Access Policy Plan: Phase 1 Report. Prepared By: Ricondo & Associates, Inc., October 2008.

4/ Passengers using Parking shuttles are calculated on the basis of percentage of private vehicles that parked in one of the airport or off airport parking products with or without dropping off the passengers first. It is to be noted that all vehicles that parked in the Close-In parking lots were assumed to walk to their respective terminals and were not considered as a part of this calculation.

5/ Shared ride consists of Other HOV and Unscheduled Vans. Arriving passengers who take limos are picked up on the departures level.

6/ Vehicles calculated based on an assumed headway of 10 minutes. Passengers dropped at Arrivals curbside.

7/ Vehicles calculated on the basis of half hour headway for three routes and one hour headway for one route. Making a total of 7 vehicles per hour

8/ Other Scheduled Bus Service consists of MBTA busses, and Other Busses.

9/ Unified Rental Car Shuttle consolidates Rental Car Shuttles and MPA Shuttle Service to airport station. The Unified Rental Car Shuttle will drop on departures level and pick-up on arrivals level.

10/ Adjusted vehicle numbers based on published or planned operational service levels, when applicable.

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2010 Existing Conditions
Level / type of roadway	Arrivals
Total lanes / approach lanes	4 / 2
Number of curbside zones	11
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	4.6
Taxicabs	25.0	1.0
Airport op shuttle-park/subway	40.0	0.6
Rental Car Shuttles	40.0	0.9
Hotel-Motel Shuttles	40.0	1.5
Shared Ride	30.0	1.5
MBTA Silver Line	70.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	3.0
Charter Bus	50.0	3.0

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name	Bus Pick Up	Undefined	Taxi	CW1	Taxi	ared Van/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Type	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Curbside frontage (feet)	50	150	76	23	151	85	77	23	115	125	175
Number of lanes	4	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	90	90	90	90	90	90	90	90	90	90	90
Taxicabs	107	107	107	107	107	107	107	107	107	107	107
Airport op shuttle-park/subway	24	24	24	24	24	24	24	24	24	24	24
Rental Car Shuttles	95	95	95	95	95	95	95	95	95	95	95
Hotel-Motel Shuttles	20	20	20	20	20	20	20	20	20	20	20
Shared Ride	2	2	2	2	2	2	2	2	2	2	2
MBTA Silver Line	5	5	5	5	5	5	5	5	5	5	5
Logan Express	7	7	7	7	7	7	7	7	7	7	7
Scheduled Bus Service	1	1	1	1	1	1	1	1	1	1	1
Charter Bus	1	1	1	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	-	45	-	-	-	-	-	-	-	45	-
Taxicabs	-	-	71	-	36	-	-	-	-	-	-
Airport op shuttle-park/subway	24	-	-	-	-	-	-	-	24	-	-
Rental Car Shuttles	-	-	-	-	-	-	95	-	-	-	-
Hotel-Motel Shuttles	-	-	-	-	-	-	20	-	-	-	-
Shared Ride	-	-	-	-	-	2	-	-	-	-	-
MBTA Silver Line	-	-	-	-	-	-	-	-	-	-	5
Logan Express	7	-	-	-	-	-	-	-	7	-	-
Scheduled Bus Service	-	-	-	-	-	1	-	-	-	-	-
Charter Bus	-	-	-	-	-	1	-	-	-	-	-

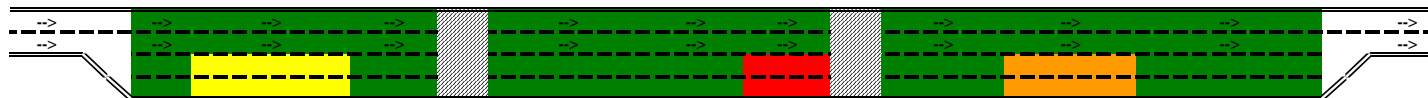
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2010 Existing Conditions
 Level / type of roadway Arrivals
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 11



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name/description	Bus Pick Up	Undefined	Taxi	CW1	Taxi	Shared Van/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Curb length (feet)	50	150	76	23	151	85	77	23	115	125	175
Zone type	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Roadway volume (vph)	352	352	352	352	352	352	352	352	352	352	352
Roadway capacity (vph)	2,682	2,620	2,682	2,708	2,706	2,710	1,696	2,708	2,706	2,458	2,706
Roadway V/C ratio	0.131	0.134	0.131	0.130	0.130	0.130	0.208	0.130	0.130	0.143	0.130
Roadway LOS	A	A	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	7.0	3.0	N/A	2.0	1.0	4.0	N/A	1.0	7.0	1.0
Curb capacity per lane (vehicles)	1.0	6.0	3.0	N/A	6.0	2.0	2.0	N/A	3.0	5.0	3.0
Curb utilization ratic	1.000	1.167	1.000	N/A	0.333	0.500	2.000	N/A	0.333	1.400	0.333
Curb LOS	A	C	A	N/A	A	A	E	N/A	A	D	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeon on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name	Bus Pick Up	Undefined	Taxi	CW1	Taxi	hared Var/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Type of zone	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Curbside length (feet)	50	150	76	23	151	85	77	23	115	125	175
Number of lanes	4	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2	2
Roadway volume (vph)	352	352	352	352	352	352	352	352	352	352	352
Curbside demand (vph)	31	45	71	-	36	4	115	-	31	45	5
Average dwell time (minutes)	0.65	4.60	1.00	-	1.00	2.25	1.00	-	0.65	4.60	0.90
Average vehicle length (feet)	42.26	25.00	25.00	-	25.00	40.00	40.00	-	42.26	25.00	70.00
Average vehicle arrival rate (vph)	31.00	45.00	71.00	-	36.00	4.00	115.00	-	31.00	45.00	5.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,825	2,759	2,825	2,850	2,850	2,854	1,786	2,850	2,850	2,589	2,850
Adjusted through lane roadway capacity	2,682	2,620	2,682	2,708	2,706	2,710	1,696	2,708	2,706	2,458	2,706
Estimated roadway V/C ratio	0.131	0.134	0.131	0.130	0.130	0.130	0.208	0.130	0.130	0.143	0.130
Curb capacity per lane (vehicles)	1.00	6.00	3.00	-	6.00	2.00	2.00	-	3.00	5.00	3.00
Curb utilization ratio	1.000	1.167	1.000	-	0.333	0.500	2.000	-	0.333	1.400	0.333
% occupancy in lane 1	0.895	0.980	0.895	-	0.330	0.490	1.000	-	0.330	1.000	0.330
% occupancy in lane 2	0.095	0.180	0.095	-	-	-	0.745	-	-	0.390	-
% occupancy in lane 3	-	-	-	-	-	-	0.25	-	-	-	-
# of cars in curbside lane	0.90	5.88	2.69	-	1.98	0.98	2.00	-	0.99	5.00	0.99
# of double-parked cars	0.10	1.08	0.29	-	-	-	1.49	-	-	1.95	-
# of triple-parked cars	-	-	-	-	-	-	0.490	-	-	-	-
Curbside LOS	A	C	A	-	A	A	E	-	A	D	A
Roadway LOS	A	A	A	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2010 Existing Conditions
Level / type of roadway	Departures
Total lanes / approach lanes	4 / 2
Number of curbside zones	8
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	1.7
Rental Car	25.0	1.7
Taxicabs	25.0	1.3
Airport op shuttle-Employee	40.0	0.6
Shared Ride	30.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	2.4
Charter Bus	50.0	2.4

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Type	active	active	xwalk	active	active	xwalk	active	active
Curbside frontage (feet)	125	128	23	149	128	23	254	160
Number of lanes	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	126	126	126	126	126	126	126	126
Rental Car	34	34	34	34	34	34	34	34
Taxicabs	148	148	148	148	148	148	148	148
Airport op shuttle-Employee	12	12	12	12	12	12	12	12
Shared Ride	32	32	32	32	32	32	32	32
Logan Express	7	7	7	7	7	7	7	7
Scheduled Bus Service	3	3	3	3	3	3	3	3
Charter Bus	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	32	-	-	-	32	-	62	-
Rental Car	9	-	-	-	9	-	16	-
Taxicabs	37	-	-	-	37	-	74	-
Airport op shuttle-Employee	-	5	-	7	-	-	-	-
Shared Ride	-	14	-	18	-	-	-	-
Logan Express	-	3	-	4	-	-	-	-
Scheduled Bus Service	-	1	-	2	-	-	-	-
Charter Bus	-	-	-	1	-	-	-	-

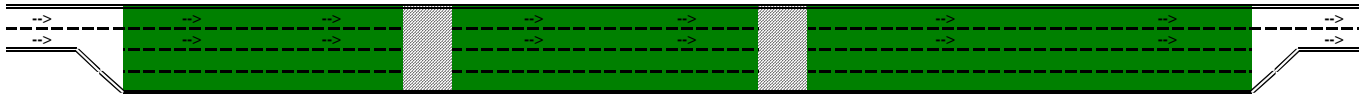
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2010 Existing Conditions
 Level / type of roadway Departures
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 8



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name/description	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Curb length (feet)	125	128	23	149	128	23	254	160
Zone type	active	active	xwalk	active	active	xwalk	active	active
Roadway volume (vph)	363	363	363	363	363	363	363	363
Roadway capacity (vph)	2,718	2,706	2,708	2,710	2,718	2,708	2,721	2,706
Roadway V/C ratio	0.134	0.134	0.134	0.134	0.134	0.134	0.133	0.134
Roadway LOS	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	4.0	1.0	N/A	2.0	4.0	N/A	7.0	0.0
Curb capacity per lane (vehicles)	5.0	4.0	N/A	4.0	5.0	N/A	10.0	0.0
Curb utilization ratio	0.800	0.250	N/A	0.500	0.800	N/A	0.700	0.000
Curb LOS	A	A	N/A	A	A	N/A	A	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeen on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Type of zone	active	active	xwalk	active	active	xwalk	active	active
Curbside length (feet)	125	128	23	149	128	23	254	160
Number of lanes	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2
Roadway volume (vph)	363	363	363	363	363	363	363	363
Curbside demand (vph)	78	23	-	32	78	-	152	-
Average dwell time (minutes)	1.51	0.89	-	0.96	1.51	-	1.51	-
Average vehicle length (feet)	25.00	35.65	-	36.56	25.00	-	25.00	-
Average vehicle arrival rate (vph)	78.00	23.00	-	32.00	78.00	-	152.00	-
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,862	2,850	2,850	2,854	2,862	2,850	2,866	2,850
Adjusted through lane roadway capacity	2,718	2,706	2,708	2,710	2,718	2,708	2,721	2,706
Estimated roadway V/C ratio	0.134	0.134	0.134	0.134	0.134	0.134	0.133	0.134
Curb capacity per lane (vehicles)	5.00	4.00	-	4.00	5.00	-	10.00	-
Curb utilization ratio	0.800	0.250	-	0.500	0.800	-	0.700	-
% occupancy in lane 1	0.790	0.240	-	0.490	0.790	-	0.690	-
% occupancy in lane 2	-	-	-	-	-	-	-	-
% occupancy in lane 3	-	-	-	-	-	-	-	-
# of cars in curbside lane	3.95	0.96	-	1.96	3.95	-	6.90	-
# of double-parked cars	-	-	-	-	-	-	-	-
# of triple-parked cars	-	-	-	-	-	-	-	-
Curbside LOS	A	A		A	A		A	A
Roadway LOS	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2013 No Build
Level / type of roadway	Arrivals
Total lanes / approach lanes	4 / 2
Number of curbside zones	11
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	4.6
Taxicabs	25.0	1.0
Airport op shuttle-park/water	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Hotel-Motel Shuttles	40.0	1.5
Shared Ride	30.0	1.5
MBTA Silver Line	70.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	3.0
Charter Bus	50.0	3.0

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name	Bus Pick Up	Undefined	Taxi	CW1	Taxi	ared Van/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Type	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Curbside frontage (feet)	50	150	76	23	151	85	77	23	115	125	175
Number of lanes	4	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2	2
Volume of vehicles using roadway (vph)											
Private vehicles	73	73	73	73	73	73	73	73	73	73	73
Taxicabs	87	87	87	87	87	87	87	87	87	87	87
Airport op shuttle-park/water	19	19	19	19	19	19	19	19	19	19	19
Unified Rental Car Shuttle	15	15	15	15	15	15	15	15	15	15	15
Hotel-Motel Shuttles	5	5	5	5	5	5	5	5	5	5	5
Shared Ride	1	1	1	1	1	1	1	1	1	1	1
MBTA Silver Line	6	6	6	6	6	6	6	6	6	6	6
Logan Express	7	7	7	7	7	7	7	7	7	7	7
Scheduled Bus Service	1	1	1	1	1	1	1	1	1	1	1
Charter Bus	1	1	1	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	-	36	-	-	-	-	-	-	-	37	-
Taxicabs	-	-	29	-	58	-	-	-	-	-	-
Airport op shuttle-park/water	19	-	-	-	-	-	-	-	19	-	-
Unified Rental Car Shuttle	-	-	-	-	-	-	15	-	-	-	-
Hotel-Motel Shuttles	-	-	-	-	-	-	5	-	-	-	-
Shared Ride	-	-	-	-	-	1	-	-	-	-	-
MBTA Silver Line	-	-	-	-	-	-	-	-	-	-	6
Logan Express	7	-	-	-	-	-	-	-	7	-	-
Scheduled Bus Service	-	-	-	-	-	1	-	-	-	-	-
Charter Bus	-	-	-	-	-	1	-	-	-	-	-

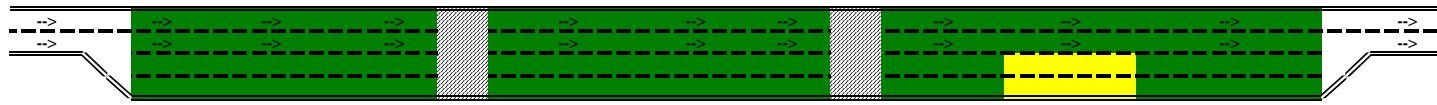
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2013 No Build
 Level / type of roadway Arrivals
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 11



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name/description	Bus Pick Up	Undefined	Taxi	CW1	Taxi	Shared Van/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Curb length (feet)	50	150	76	23	151	85	77	23	115	125	175
Zone type	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Roadway volume (vph)	215	215	215	215	215	215	215	215	215	215	215
Roadway capacity (vph)	2,682	2,682	2,720	2,708	2,710	2,710	2,682	2,708	2,706	2,599	2,706
Roadway V/C ratio	0.080	0.080	0.079	0.079	0.079	0.079	0.080	0.079	0.079	0.083	0.079
Roadway LOS	A	A	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	6.0	2.0	N/A	3.0	1.0	1.0	N/A	1.0	6.0	1.0
Curb capacity per lane (vehicles)	1.0	6.0	3.0	N/A	6.0	2.0	1.0	N/A	3.0	5.0	3.0
Curb utilization ratic	1.000	1.000	0.667	N/A	0.500	0.500	1.000	N/A	0.333	1.200	0.333
Curb LOS	A	A	A	N/A	A	A	A	N/A	A	C	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeon on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name	Bus Pick Up	Undefined	Taxi	CW1	Taxi	hared Var/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Type of zone	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Curbside length (feet)	50	150	76	23	151	85	77	23	115	125	175
Number of lanes	4	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2	2
Roadway volume (vph)	215	215	215	215	215	215	215	215	215	215	215
Curbside demand (vph)	26	36	29	-	58	3	20	-	26	37	6
Average dwell time (minutes)	0.65	4.60	1.00	-	1.00	2.50	0.83	-	0.65	4.60	0.90
Average vehicle length (feet)	42.69	25.00	25.00	-	25.00	43.33	55.00	-	42.69	25.00	70.00
Average vehicle arrival rate (vph)	26.00	36.00	29.00	-	58.00	3.00	20.00	-	26.00	37.00	6.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,825	2,825	2,865	2,850	2,854	2,854	2,825	2,850	2,850	2,737	2,850
Adjusted through lane roadway capacity	2,682	2,682	2,720	2,708	2,710	2,710	2,682	2,708	2,706	2,599	2,706
Estimated roadway V/C ratio	0.080	0.080	0.079	0.079	0.079	0.079	0.080	0.079	0.079	0.083	0.079
Curb capacity per lane (vehicles)	1.00	6.00	3.00	-	6.00	2.00	1.00	-	3.00	5.00	3.00
Curb utilization ratio	1.000	1.000	0.667	-	0.500	0.500	1.000	-	0.333	1.200	0.333
% occupancy in lane 1	0.895	0.895	0.660	-	0.490	0.490	0.895	-	0.330	0.995	0.330
% occupancy in lane 2	0.095	0.095	-	-	-	-	0.095	-	-	0.195	-
% occupancy in lane 3	-	-	-	-	-	-	-	-	-	-	-
# of cars in curbside lane	0.90	5.37	1.98	-	2.94	0.98	0.90	-	0.99	4.98	0.99
# of double-parked cars	0.10	0.57	-	-	-	-	0.10	-	-	0.98	-
# of triple-parked cars	-	-	-	-	-	-	-	-	-	-	-
Curbside LOS	A	A	A	-	A	A	A	-	A	C	A
Roadway LOS	A	A	A	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2013 No Build
Level / type of roadway	Departures
Total lanes / approach lanes	4 / 2
Number of curbside zones	8
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	1.7
Rental Car	25.0	1.7
Taxicabs	25.0	1.3
Airport op shuttle-Employee	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Shared Ride	30.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	2.4
Charter Bus	50.0	2.4

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Type	active	active	xwalk	active	active	xwalk	active	active
Curbside frontage (feet)	125	128	23	149	128	23	254	160
Number of lanes	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	89	89	89	89	89	89	89	89
Rental Car	24	24	24	24	24	24	24	24
Taxicabs	105	105	105	105	105	105	105	105
Airport op shuttle-Employee	10	10	10	10	10	10	10	10
Unified Rental Car Shuttle	15	15	15	15	15	15	15	15
Shared Ride	24	24	24	24	24	24	24	24
Logan Express	7	7	7	7	7	7	7	7
Scheduled Bus Service	2	2	2	2	2	2	2	2
Charter Bus	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	22	-	-	-	22	-	45	-
Rental Car	6	-	-	-	6	-	12	-
Taxicabs	26	-	-	-	26	-	53	-
Airport op shuttle-Employee	-	5	-	5	-	-	-	-
Unified Rental Car Shuttle	-	7	-	8	-	-	-	-
Shared Ride	-	11	-	13	-	-	-	-
Logan Express	-	3	-	4	-	-	-	-
Scheduled Bus Service	-	1	-	1	-	-	-	-
Charter Bus	-	-	-	1	-	-	-	-

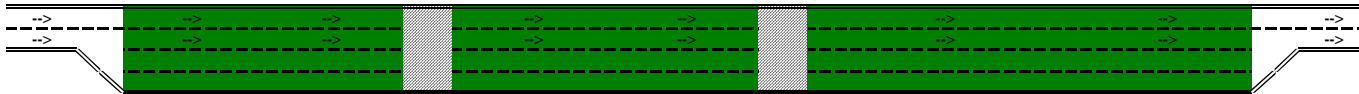
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2013 No Build
 Level / type of roadway Departures
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 8



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name/description	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Curb length (feet)	125	128	23	149	128	23	254	160
Zone type	active	active	xwalk	active	active	xwalk	active	active
Roadway volume (vph)	277	277	277	277	277	277	277	277
Roadway capacity (vph)	2,717	2,720	2,708	2,720	2,717	2,708	2,717	2,706
Roadway V/C ratio	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102
Roadway LOS	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	3.0	2.0	N/A	2.0	3.0	N/A	6.0	0.0
Curb capacity per lane (vehicles)	5.0	3.0	N/A	3.0	5.0	N/A	10.0	0.0
Curb utilization ratio	0.600	0.667	N/A	0.667	0.600	N/A	0.600	0.000
Curb LOS	A	A	N/A	A	A	N/A	A	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeen on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Type of zone	active	active	xwalk	active	active	xwalk	active	active
Curbside length (feet)	125	128	23	149	128	23	254	160
Number of lanes	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2
Roadway volume (vph)	277	277	277	277	277	277	277	277
Curbside demand (vph)	54	27	-	32	54	-	110	-
Average dwell time (minutes)	1.51	0.81	-	0.86	1.51	-	1.51	-
Average vehicle length (feet)	25.00	42.59	-	42.81	25.00	-	25.00	-
Average vehicle arrival rate (vph)	54.00	27.00	-	32.00	54.00	-	110.00	-
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,862	2,865	2,850	2,865	2,862	2,850	2,862	2,850
Adjusted through lane roadway capacity	2,717	2,720	2,708	2,720	2,717	2,708	2,717	2,706
Estimated roadway V/C ratio	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102
Curb capacity per lane (vehicles)	5.00	3.00	-	3.00	5.00	-	10.00	-
Curb utilization ratio	0.600	0.667	-	0.667	0.600	-	0.600	-
% occupancy in lane 1	0.590	0.660	-	0.660	0.590	-	0.590	-
% occupancy in lane 2	-	-	-	-	-	-	-	-
% occupancy in lane 3	-	-	-	-	-	-	-	-
# of cars in curbside lane	2.95	1.98	-	1.98	2.95	-	5.90	-
# of double-parked cars	-	-	-	-	-	-	-	-
# of triple-parked cars	-	-	-	-	-	-	-	-
Curbside LOS	A	A		A	A		A	A
Roadway LOS	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2013 Build
Level / type of roadway	Arrivals
Total lanes / approach lanes	4 / 2
Number of curbside zones	11
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	4.6
Taxicabs	25.0	1.0
Airport op shuttle-park/water	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Hotel-Motel Shuttles	40.0	1.5
Shared Ride	30.0	1.5
MBTA Silver Line	70.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	3.0
Charter Bus	50.0	3.0

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name	Bus Pick Up	Undefined	Taxi	CW1	Taxi	ared Van/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Type	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Curbside frontage (feet)	50	150	76	23	151	85	77	23	115	125	175
Number of lanes	4	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	148	148	148	148	148	148	148	148	148	148	148
Taxicabs	177	177	177	177	177	177	177	177	177	177	177
Airport op shuttle-park/water	19	19	19	19	19	19	19	19	19	19	19
Unified Rental Car Shuttle	15	15	15	15	15	15	15	15	15	15	15
Hotel-Motel Shuttles	11	11	11	11	11	11	11	11	11	11	11
Shared Ride	3	3	3	3	3	3	3	3	3	3	3
MBTA Silver Line	6	6	6	6	6	6	6	6	6	6	6
Logan Express	7	7	7	7	7	7	7	7	7	7	7
Scheduled Bus Service	2	2	2	2	2	2	2	2	2	2	2
Charter Bus	1	1	1	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	-	74	-	-	-	-	-	-	-	74	-
Taxicabs	-	-	59	-	118	-	-	-	-	-	-
Airport op shuttle-park/water	19	-	-	-	-	-	-	-	19	-	-
Unified Rental Car Shuttle	-	-	-	-	-	-	15	-	-	-	-
Hotel-Motel Shuttles	-	-	-	-	-	-	11	-	-	-	-
Shared Ride	-	-	-	-	-	3	-	-	-	-	-
MBTA Silver Line	-	-	-	-	-	-	-	-	-	-	6
Logan Express	7	-	-	-	-	-	-	-	7	-	-
Scheduled Bus Service	-	-	-	-	-	2	-	-	-	-	-
Charter Bus	-	-	-	-	-	1	-	-	-	-	-

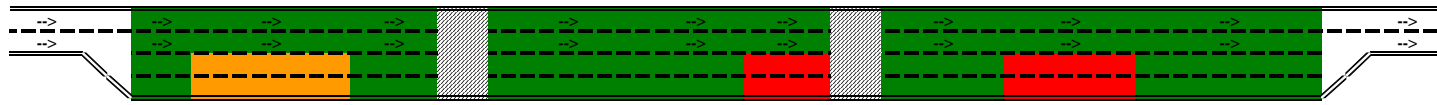
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2013 Build
 Level / type of roadway Arrivals
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 11



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name/description	Bus Pick Up	Undefined	Taxi	CW1	Taxi	Shared Van/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Curb length (feet)	50	150	76	23	151	85	77	23	115	125	175
Zone type	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Roadway volume (vph)	389	389	389	389	389	389	389	389	389	389	389
Roadway capacity (vph)	2,682	2,186	2,682	2,708	2,720	2,710	1,696	2,708	2,706	1,696	2,706
Roadway V/C ratio	0.145	0.178	0.145	0.144	0.143	0.144	0.229	0.144	0.144	0.229	0.144
Roadway LOS	A	A	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	10.0	3.0	N/A	4.0	1.0	2.0	N/A	1.0	10.0	1.0
Curb capacity per lane (vehicles)	1.0	6.0	3.0	N/A	6.0	2.0	1.0	N/A	3.0	5.0	3.0
Curb utilization ratic	1.000	1.667	1.000	N/A	0.667	0.500	2.000	N/A	0.333	2.000	0.333
Curb LOS	A	D	A	N/A	A	A	E	N/A	A	E	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeon on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name	Bus Pick Up	Undefined	Taxi	CW1	Taxi	hared Var/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Type of zone	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Curbside length (feet)	50	150	76	23	151	85	77	23	115	125	175
Number of lanes	4	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2	2
Roadway volume (vph)	389	389	389	389	389	389	389	389	389	389	389
Curbside demand (vph)	26	74	59	-	118	6	26	-	26	74	6
Average dwell time (minutes)	0.65	4.60	1.00	-	1.00	2.25	0.98	-	0.65	4.60	0.90
Average vehicle length (feet)	42.69	25.00	25.00	-	25.00	40.00	51.54	-	42.69	25.00	70.00
Average vehicle arrival rate (vph)	26.00	74.00	59.00	-	118.00	6.00	26.00	-	26.00	74.00	6.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,825	2,303	2,825	2,850	2,865	2,854	1,786	2,850	2,850	1,786	2,850
Adjusted through lane roadway capacity	2,682	2,186	2,682	2,708	2,720	2,710	1,696	2,708	2,706	1,696	2,706
Estimated roadway V/C ratio	0.145	0.178	0.145	0.144	0.143	0.144	0.229	0.144	0.144	0.229	0.144
Curb capacity per lane (vehicles)	1.00	6.00	3.00	-	6.00	2.00	1.00	-	3.00	5.00	3.00
Curb utilization ratio	1.000	1.667	1.000	-	0.667	0.500	2.000	-	0.333	2.000	0.333
% occupancy in lane 1	0.895	1.000	0.895	-	0.660	0.490	1.000	-	0.330	1.000	0.330
% occupancy in lane 2	0.095	0.580	0.095	-	-	-	0.745	-	-	0.745	-
% occupancy in lane 3	-	0.08	-	-	-	-	0.25	-	-	0.25	-
# of cars in curbside lane	0.90	6.00	2.69	-	3.96	0.98	1.00	-	0.99	5.00	0.99
# of double-parked cars	0.10	3.48	0.29	-	-	-	0.75	-	-	3.73	-
# of triple-parked cars	-	0.480	-	-	-	-	0.245	-	-	1.225	-
Curbside LOS	A	D	A	-	A	A	E	-	A	E	A
Roadway LOS	A	A	A	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2013 Build
Level / type of roadway	Departures
Total lanes / approach lanes	4 / 2
Number of curbside zones	8
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	1.7
Rental Car	25.0	1.7
Taxicabs	25.0	1.3
Airport op shuttle-Employee	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Shared Ride	30.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	2.4
Charter Bus	50.0	2.4

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Type	active	active	xwalk	active	active	xwalk	active	active
Curbside frontage (feet)	125	128	23	149	128	23	254	160
Number of lanes	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	183	183	183	183	183	183	183	183
Rental Car	49	49	49	49	49	49	49	49
Taxicabs	215	215	215	215	215	215	215	215
Airport op shuttle-Employee	10	10	10	10	10	10	10	10
Unified Rental Car Shuttle	15	15	15	15	15	15	15	15
Shared Ride	48	48	48	48	48	48	48	48
Logan Express	7	7	7	7	7	7	7	7
Scheduled Bus Service	4	4	4	4	4	4	4	4
Charter Bus	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	46	-	-	-	46	-	91	-
Rental Car	12	-	-	-	12	-	25	-
Taxicabs	54	-	-	-	54	-	107	-
Airport op shuttle-Employee	-	5	-	5	-	-	-	-
Unified Rental Car Shuttle	-	7	-	8	-	-	-	-
Shared Ride	-	22	-	26	-	-	-	-
Logan Express	-	3	-	4	-	-	-	-
Scheduled Bus Service	-	2	-	2	-	-	-	-
Charter Bus	-	-	-	1	-	-	-	-

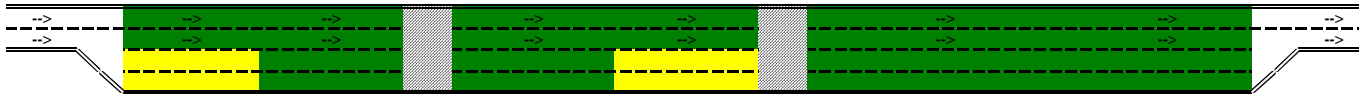
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2013 Build
 Level / type of roadway Departures
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 8



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name/description	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Curb length (feet)	125	128	23	149	128	23	254	160
Zone type	active	active	xwalk	active	active	xwalk	active	active
Roadway volume (vph)	532	532	532	532	532	532	532	532
Roadway capacity (vph)	2,599	2,720	2,708	2,710	2,599	2,708	2,682	2,706
Roadway V/C ratio	0.205	0.196	0.196	0.196	0.205	0.196	0.198	0.197
Roadway LOS	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	6.0	2.0	N/A	2.0	6.0	N/A	10.0	0.0
Curb capacity per lane (vehicles)	5.0	3.0	N/A	4.0	5.0	N/A	10.0	0.0
Curb utilization ratio	1.200	0.667	N/A	0.500	1.200	N/A	1.000	0.000
Curb LOS	C	A	N/A	A	C	N/A	A	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeen on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Type of zone	active	active	xwalk	active	active	xwalk	active	active
Curbside length (feet)	125	128	23	149	128	23	254	160
Number of lanes	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2
Roadway volume (vph)	532	532	532	532	532	532	532	532
Curbside demand (vph)	112	39	-	46	112	-	223	-
Average dwell time (minutes)	1.51	0.88	-	0.90	1.51	-	1.51	-
Average vehicle length (feet)	25.00	39.23	-	39.35	25.00	-	25.00	-
Average vehicle arrival rate (vph)	112.00	39.00	-	46.00	112.00	-	223.00	-
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,737	2,865	2,850	2,854	2,737	2,850	2,825	2,850
Adjusted through lane roadway capacity	2,599	2,720	2,708	2,710	2,599	2,708	2,682	2,706
Estimated roadway V/C ratio	0.205	0.196	0.196	0.196	0.205	0.196	0.198	0.197
Curb capacity per lane (vehicles)	5.00	3.00	-	4.00	5.00	-	10.00	-
Curb utilization ratio	1.200	0.667	-	0.500	1.200	-	1.000	-
% occupancy in lane 1	0.995	0.660	-	0.490	0.995	-	0.895	-
% occupancy in lane 2	0.195	-	-	-	0.195	-	0.095	-
% occupancy in lane 3	-	-	-	-	-	-	-	-
# of cars in curbside lane	4.98	1.98	-	1.96	4.98	-	8.95	-
# of double-parked cars	0.98	-	-	-	0.98	-	0.95	-
# of triple-parked cars	-	-	-	-	-	-	-	-
Curbside LOS	C	A	-	A	C	-	A	A
Roadway LOS	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2013 Build with Modifications - Option 1
Level / type of roadway	Arrivals
Total lanes / approach lanes	4 / 2
Number of curbside zones	10
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	4.6
Taxicabs	25.0	1.0
Airport op shuttle-park/water	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Hotel-Motel Shuttles	40.0	1.5
Shared Ride	30.0	1.5
MBTA Silver Line	70.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	3.0
Charter Bus	50.0	3.0

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10
Name	MPA Shuttles	Logan Express	Taxi	CW1	Taxi	Unified Shuttle	CW2	Silver Line	active Pick Up	Chartered Van/Bus
Type	active	active	active	xwalk	active	active	xwalk	active	active	active
Curbside frontage (feet)	100	100	76	23	151	120	23	80	300	77
Number of lanes	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	148	148	148	148	148	148	148	148	148	148
Taxicabs	177	177	177	177	177	177	177	177	177	177
Airport op shuttle-park/water	19	19	19	19	19	19	19	19	19	19
Unified Rental Car Shuttle	15	15	15	15	15	15	15	15	15	15
Hotel-Motel Shuttles	11	11	11	11	11	11	11	11	11	11
Shared Ride	3	3	3	3	3	3	3	3	3	3
MBTA Silver Line	6	6	6	6	6	6	6	6	6	6
Logan Express	7	7	7	7	7	7	7	7	7	7
Scheduled Bus Service	2	2	2	2	2	2	2	2	2	2
Charter Bus	1	1	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	-	-	-	-	-	-	-	-	148	-
Taxicabs	-	59	-	118	-	-	-	-	-	-
Airport op shuttle-park/water	19	-	-	-	-	-	-	-	-	-
Unified Rental Car Shuttle	-	-	-	-	-	15	-	-	-	-
Hotel-Motel Shuttles	-	-	-	-	-	-	-	-	-	11
Shared Ride	-	-	-	-	-	-	-	-	-	3
MBTA Silver Line	-	-	-	-	-	-	-	6	-	-
Logan Express	-	7	-	-	-	-	-	-	-	-
Scheduled Bus Service	-	-	-	-	-	-	-	-	-	2
Charter Bus	-	-	-	-	-	-	-	-	-	1

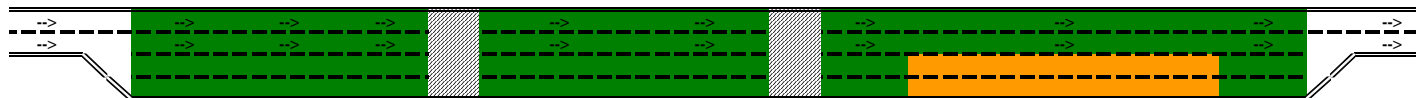
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2013 Build with Modifications - Option 1
 Level / type of roadway Arrivals
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 10



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10
Name/description	MPA Shuttles	Logan Express	Taxi	CW1	Taxi	Unified Shuttle	CW2	Silver Line	Active Pick Up	Shared Van/Bus
Curb length (feet)	100	100	76	23	151	120	23	80	300	77
Zone type	active	active	active	xwalk	active	active	xwalk	active	active	active
Roadway volume (vph)	389	389	389	389	389	389	389	389	389	389
Roadway capacity (vph)	2,706	2,720	2,706	2,708	2,706	2,710	2,708	2,682	2,449	2,682
Roadway V/C ratio	0.144	0.143	0.144	0.144	0.144	0.144	0.144	0.145	0.159	0.145
Roadway LOS	A	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	3.0	0.0	N/A	0.0	1.0	N/A	1.0	17.0	2.0
Curb capacity per lane (vehicles)	3.0	4.0	0.0	N/A	0.0	2.0	N/A	1.0	12.0	2.0
Curb utilization ratio	0.333	0.750	0.000	N/A	0.000	0.500	N/A	1.000	1.417	1.000
Curb LOS	A	A	A	N/A	A	A	N/A	A	D	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeen on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10
Name	MPA Shuttles	Logan Express	Taxi	CW1	Taxi	Unified Shuttle	CW2	Silver Line	Active Pick Up	Shared Van/Bus
Type of zone	active	active	active	xwalk	active	active	xwalk	active	active	active
Curbside length (feet)	100	100	76	23	151	120	23	80	300	77
Number of lanes	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2
Roadway volume (vph)	389	389	389	389	389	389	389	389	389	389
Curbside demand (vph)	19	66	-	118	-	15	-	6	148	17
Average dwell time (minutes)	0.60	0.98	-	-	-	0.60	-	0.90	4.60	1.76
Average vehicle length (feet)	40.00	27.65	-	-	-	60.00	-	70.00	25.00	40.00
Average vehicle arrival rate (vph)	19.00	66.00	-	-	-	15.00	-	6.00	148.00	17.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,850	2,865	2,850	2,850	2,850	2,854	2,850	2,825	2,580	2,825
Adjusted through lane roadway capacity	2,706	2,720	2,706	2,708	2,706	2,710	2,708	2,682	2,449	2,682
Estimated roadway V/C ratio	0.144	0.143	0.144	0.144	0.144	0.144	0.144	0.145	0.159	0.145
Curb capacity per lane (vehicles)	3.00	4.00	-	-	-	2.00	-	1.00	12.00	2.00
Curb utilization ratio	0.333	0.750	-	-	-	0.500	-	1.000	1.417	1.000
% occupancy in lane 1	0.330	0.740	-	-	-	0.490	-	0.895	1.000	0.895
% occupancy in lane 2	-	-	-	-	-	-	-	0.095	0.410	0.095
% occupancy in lane 3	-	-	-	-	-	-	-	-	-	-
# of cars in curbside lane	0.99	2.96	-	-	-	0.98	-	0.90	12.00	1.79
# of double-parked cars	-	-	-	-	-	-	-	0.10	4.92	0.19
# of triple-parked cars	-	-	-	-	-	-	-	-	-	-
Curbside LOS	A	A	A		A	A		A	D	A
Roadway LOS	A	A	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2013 Build with Modifications - Option 1
Level / type of roadway	Departures
Total lanes / approach lanes	4 / 2
Number of curbside zones	7
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	1.7
Rental Car	25.0	1.7
Taxicabs	25.0	1.3
Airport op shuttle-Employee	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Shared Ride	30.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	2.4
Charter Bus	50.0	2.4

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name	Unified Bus	Shuttles	CW1	Active Drop	CW2	Limo	Active Drop
Type	active	active	xwalk	active	xwalk	active	active
Curbside frontage (feet)	140	113	23	277	23	100	314
Number of lanes	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	183	183	183	183	183	183	183
Rental Car	49	49	49	49	49	49	49
Taxicabs	215	215	215	215	215	215	215
Airport op shuttle-Employee	10	10	10	10	10	10	10
Unified Rental Car Shuttle	15	15	15	15	15	15	15
Shared Ride	48	48	48	48	48	48	48
Logan Express	7	7	7	7	7	7	7
Scheduled Bus Service	4	4	4	4	4	4	4
Charter Bus	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	-	-	-	101	-	-	82
Rental Car	-	-	-	29	-	-	20
Taxicabs	-	-	-	118	-	-	97
Airport op shuttle-Employee	-	10	-	-	-	-	-
Unified Rental Car Shuttle	15	-	-	-	-	-	-
Shared Ride	-	-	-	-	-	48	-
Logan Express	-	7	-	-	-	-	-
Scheduled Bus Service	-	-	-	-	-	4	-
Charter Bus	-	-	-	-	-	1	-

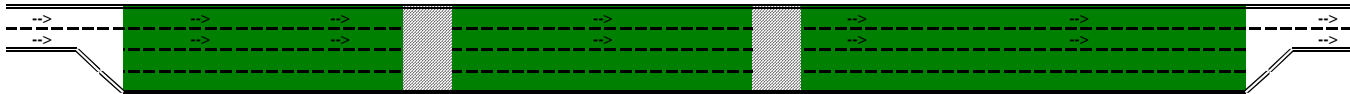
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2013 Build with Modifications - Option 1
 Level / type of roadway Departures
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 7



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name/description	Unified Bus	Shuttles	CW1	Active Drop	CW2	Limo	Active Drop
Curb length (feet)	140	113	23	277	23	100	314
Zone type	active	active	xwalk	active	xwalk	active	active
Roadway volume (vph)	532	532	532	532	532	532	532
Roadway capacity (vph)	2,710	2,706	2,708	2,682	2,708	2,682	2,721
Roadway V/C ratio	0.196	0.197	0.196	0.198	0.196	0.198	0.196
Roadway LOS	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	1.0	N/A	11.0	N/A	3.0	9.0
Curb capacity per lane (vehicles)	2.0	3.0	N/A	11.0	N/A	3.0	13.0
Curb utilization ratio	0.500	0.333	N/A	1.000	N/A	1.000	0.692
Curb LOS	A	A	N/A	A	N/A	A	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeen on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name	Unified Bus	Shuttles	CW1	Active Drop	CW2	Limo	Active Drop
Type of zone	active	active	xwalk	active	xwalk	active	active
Curbside length (feet)	140	113	23	277	23	100	314
Number of lanes	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2
Roadway volume (vph)	532	532	532	532	532	532	532
Curbside demand (vph)	15	17	-	248	-	53	199
Average dwell time (minutes)	0.60	0.68	-	1.51	-	1.04	1.51
Average vehicle length (feet)	60.00	44.12	-	25.00	-	31.89	25.00
Average vehicle arrival rate (vph)	15.00	17.00	-	248.00	-	53.00	199.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,854	2,850	2,850	2,825	2,850	2,825	2,866
Adjusted through lane roadway capacity	2,710	2,706	2,708	2,682	2,708	2,682	2,721
Estimated roadway V/C ratio	0.196	0.197	0.196	0.198	0.196	0.198	0.196
Curb capacity per lane (vehicles)	2.00	3.00	-	11.00	-	3.00	13.00
Curb utilization ratio	0.500	0.333	-	1.000	-	1.000	0.692
% occupancy in lane 1	0.490	0.330	-	0.895	-	0.895	0.690
% occupancy in lane 2	-	-	-	0.095	-	0.095	-
% occupancy in lane 3	-	-	-	-	-	-	-
# of cars in curbside lane	0.98	0.99	-	9.85	-	2.69	8.97
# of double-parked cars	-	-	-	1.05	-	0.29	-
# of triple-parked cars	-	-	-	-	-	-	-
Curbside LOS	A	A		A		A	A
Roadway LOS	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2018 No Build
Level / type of roadway	Arrivals
Total lanes / approach lanes	4 / 2
Number of curbside zones	11
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	4.6
Taxicabs	25.0	1.0
Airport op shuttle-park/water	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Hotel-Motel Shuttles	40.0	1.5
Shared Ride	30.0	1.5
MBTA Silver Line	70.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	3.0
Charter Bus	50.0	3.0

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name	Bus Pick Up	Undefined	Taxi	CW1	Taxi	ared Van/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Type	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Curbside frontage (feet)	50	150	76	23	151	85	77	23	115	125	175
Number of lanes	4	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	82	82	82	82	82	82	82	82	82	82	82
Taxicabs	98	98	98	98	98	98	98	98	98	98	98
Airport op shuttle-park/water	21	21	21	21	21	21	21	21	21	21	21
Unified Rental Car Shuttle	17	17	17	17	17	17	17	17	17	17	17
Hotel-Motel Shuttles	6	6	6	6	6	6	6	6	6	6	6
Shared Ride	1	1	1	1	1	1	1	1	1	1	1
MBTA Silver Line	7	7	7	7	7	7	7	7	7	7	7
Logan Express	8	8	8	8	8	8	8	8	8	8	8
Scheduled Bus Service	1	1	1	1	1	1	1	1	1	1	1
Charter Bus	1	1	1	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	-	41	-	-	-	-	-	-	-	41	-
Taxicabs	-	-	33	-	65	-	-	-	-	-	-
Airport op shuttle-park/water	21	-	-	-	-	-	-	-	21	-	-
Unified Rental Car Shuttle	-	-	-	-	-	-	17	-	-	-	-
Hotel-Motel Shuttles	-	-	-	-	-	-	6	-	-	-	-
Shared Ride	-	-	-	-	-	1	-	-	-	-	-
MBTA Silver Line	-	-	-	-	-	-	-	-	-	-	7
Logan Express	8	-	-	-	-	-	-	-	8	-	-
Scheduled Bus Service	-	-	-	-	-	1	-	-	-	-	-
Charter Bus	-	-	-	-	-	1	-	-	-	-	-

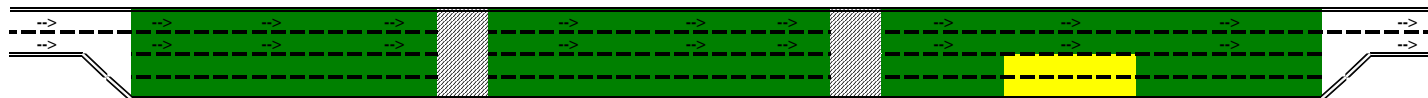
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2018 No Build
 Level / type of roadway Arrivals
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 11



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name/description	Bus Pick Up	Undefined	Taxi	CW1	Taxi	Shared Van/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Curb length (feet)	50	150	76	23	151	85	77	23	115	125	175
Zone type	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Roadway volume (vph)	242	242	242	242	242	242	242	242	242	242	242
Roadway capacity (vph)	2,682	2,682	2,720	2,708	2,710	2,710	2,682	2,708	2,706	2,599	2,706
Roadway V/C ratio	0.090	0.090	0.089	0.089	0.089	0.089	0.090	0.089	0.089	0.093	0.089
Roadway LOS	A	A	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	6.0	2.0	N/A	3.0	1.0	1.0	N/A	1.0	6.0	1.0
Curb capacity per lane (vehicles)	1.0	6.0	3.0	N/A	6.0	2.0	1.0	N/A	3.0	5.0	3.0
Curb utilization ratic	1.000	1.000	0.667	N/A	0.500	0.500	1.000	N/A	0.333	1.200	0.333
Curb LOS	A	A	A	N/A	A	A	A	N/A	A	C	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeon on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name	Bus Pick Up	Undefined	Taxi	CW1	Taxi	hared Var/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Type of zone	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Curbside length (feet)	50	150	76	23	151	85	77	23	115	125	175
Number of lanes	4	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2	2
Roadway volume (vph)	242	242	242	242	242	242	242	242	242	242	242
Curbside demand (vph)	29	41	33	-	65	3	23	-	29	41	7
Average dwell time (minutes)	0.66	4.60	1.00	-	1.00	2.50	0.83	-	0.66	4.60	0.90
Average vehicle length (feet)	42.76	25.00	25.00	-	25.00	43.33	54.78	-	42.76	25.00	70.00
Average vehicle arrival rate (vph)	29.00	41.00	33.00	-	65.00	3.00	23.00	-	29.00	41.00	7.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,825	2,825	2,865	2,850	2,854	2,854	2,825	2,850	2,850	2,737	2,850
Adjusted through lane roadway capacity	2,682	2,682	2,720	2,708	2,710	2,710	2,682	2,708	2,706	2,599	2,706
Estimated roadway V/C ratio	0.090	0.090	0.089	0.089	0.089	0.089	0.090	0.089	0.089	0.093	0.089
Curb capacity per lane (vehicles)	1.00	6.00	3.00	-	6.00	2.00	1.00	-	3.00	5.00	3.00
Curb utilization ratio	1.000	1.000	0.667	-	0.500	0.500	1.000	-	0.333	1.200	0.333
% occupancy in lane 1	0.895	0.895	0.660	-	0.490	0.490	0.895	-	0.330	0.995	0.330
% occupancy in lane 2	0.095	0.095	-	-	-	-	0.095	-	-	0.195	-
% occupancy in lane 3	-	-	-	-	-	-	-	-	-	-	-
# of cars in curbside lane	0.90	5.37	1.98	-	2.94	0.98	0.90	-	0.99	4.98	0.99
# of double-parked cars	0.10	0.57	-	-	-	-	0.10	-	-	0.98	-
# of triple-parked cars	-	-	-	-	-	-	-	-	-	-	-
Curbside LOS	A	A	A	-	A	A	A	-	A	C	A
Roadway LOS	A	A	A	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2018 No Build
Level / type of roadway	Departures
Total lanes / approach lanes	4 / 2
Number of curbside zones	8
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	1.7
Rental Car	25.0	1.7
Taxicabs	25.0	1.3
Airport op shuttle-Employee	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Shared Ride	30.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	2.4
Charter Bus	50.0	2.4

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Type	active	active	xwalk	active	active	xwalk	active	active
Curbside frontage (feet)	125	128	23	149	128	23	254	160
Number of lanes	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	100	100	100	100	100	100	100	100
Rental Car	27	27	27	27	27	27	27	27
Taxicabs	117	117	117	117	117	117	117	117
Airport op shuttle-Employee	11	11	11	11	11	11	11	11
Unified Rental Car Shuttle	17	17	17	17	17	17	17	17
Shared Ride	27	27	27	27	27	27	27	27
Logan Express	8	8	8	8	8	8	8	8
Scheduled Bus Service	2	2	2	2	2	2	2	2
Charter Bus	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	25	-	-	-	25	-	50	-
Rental Car	7	-	-	-	7	-	13	-
Taxicabs	29	-	-	-	29	-	59	-
Airport op shuttle-Employee	-	5	-	6	-	-	-	-
Unified Rental Car Shuttle	-	8	-	9	-	-	-	-
Shared Ride	-	12	-	15	-	-	-	-
Logan Express	-	4	-	4	-	-	-	-
Scheduled Bus Service	-	1	-	1	-	-	-	-
Charter Bus	-	-	-	1	-	-	-	-

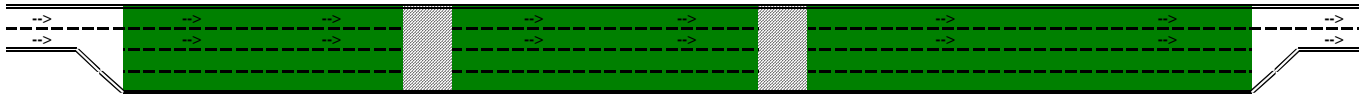
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2018 No Build
 Level / type of roadway Departures
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 8



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name/description	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Curb length (feet)	125	128	23	149	128	23	254	160
Zone type	active	active	xwalk	active	active	xwalk	active	active
Roadway volume (vph)	310	310	310	310	310	310	310	310
Roadway capacity (vph)	2,718	2,720	2,708	2,710	2,718	2,708	2,717	2,706
Roadway V/C ratio	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.115
Roadway LOS	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	4.0	2.0	N/A	2.0	4.0	N/A	6.0	0.0
Curb capacity per lane (vehicles)	5.0	3.0	N/A	4.0	5.0	N/A	10.0	0.0
Curb utilization ratio	0.800	0.667	N/A	0.500	0.800	N/A	0.600	0.000
Curb LOS	A	A	N/A	A	A	N/A	A	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeen on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Type of zone	active	active	xwalk	active	active	xwalk	active	active
Curbside length (feet)	125	128	23	149	128	23	254	160
Number of lanes	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2
Roadway volume (vph)	310	310	310	310	310	310	310	310
Curbside demand (vph)	61	30	-	36	61	-	122	-
Average dwell time (minutes)	1.51	0.81	-	0.85	1.51	-	1.51	-
Average vehicle length (feet)	25.00	43.00	-	42.50	25.00	-	25.00	-
Average vehicle arrival rate (vph)	61.00	30.00	-	36.00	61.00	-	122.00	-
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,862	2,865	2,850	2,854	2,862	2,850	2,862	2,850
Adjusted through lane roadway capacity	2,718	2,720	2,708	2,710	2,718	2,708	2,717	2,706
Estimated roadway V/C ratio	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.115
Curb capacity per lane (vehicles)	5.00	3.00	-	4.00	5.00	-	10.00	-
Curb utilization ratio	0.800	0.667	-	0.500	0.800	-	0.600	-
% occupancy in lane 1	0.790	0.660	-	0.490	0.790	-	0.590	-
% occupancy in lane 2	-	-	-	-	-	-	-	-
% occupancy in lane 3	-	-	-	-	-	-	-	-
# of cars in curbside lane	3.95	1.98	-	1.96	3.95	-	5.90	-
# of double-parked cars	-	-	-	-	-	-	-	-
# of triple-parked cars	-	-	-	-	-	-	-	-
Curbside LOS	A	A		A	A		A	A
Roadway LOS	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2018 Build
Level / type of roadway	Arrivals
Total lanes / approach lanes	4 / 2
Number of curbside zones	11
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	4.6
Taxicabs	25.0	1.0
Airport op shuttle-park/water	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Hotel-Motel Shuttles	40.0	1.5
Shared Ride	30.0	1.5
MBTA Silver Line	70.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	3.0
Charter Bus	50.0	3.0

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name	Bus Pick Up	Undefined	Taxi	CW1	Taxi	ared Van/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Type	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Curbside frontage (feet)	50	150	76	23	151	85	77	23	115	125	175
Number of lanes	4	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	166	166	166	166	166	166	166	166	166	166	166
Taxicabs	197	197	197	197	197	197	197	197	197	197	197
Airport op shuttle-park/water	21	21	21	21	21	21	21	21	21	21	21
Unified Rental Car Shuttle	17	17	17	17	17	17	17	17	17	17	17
Hotel-Motel Shuttles	12	12	12	12	12	12	12	12	12	12	12
Shared Ride	3	3	3	3	3	3	3	3	3	3	3
MBTA Silver Line	7	7	7	7	7	7	7	7	7	7	7
Logan Express	8	8	8	8	8	8	8	8	8	8	8
Scheduled Bus Service	3	3	3	3	3	3	3	3	3	3	3
Charter Bus	1	1	1	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	-	83	-	-	-	-	-	-	-	83	-
Taxicabs	-	-	66	-	131	-	-	-	-	-	-
Airport op shuttle-park/water	21	-	-	-	-	-	-	-	21	-	-
Unified Rental Car Shuttle	-	-	-	-	-	-	17	-	-	-	-
Hotel-Motel Shuttles	-	-	-	-	-	-	12	-	-	-	-
Shared Ride	-	-	-	-	-	3	-	-	-	-	-
MBTA Silver Line	-	-	-	-	-	-	-	-	-	-	7
Logan Express	8	-	-	-	-	-	-	-	8	-	-
Scheduled Bus Service	-	-	-	-	-	3	-	-	-	-	-
Charter Bus	-	-	-	-	-	1	-	-	-	-	-

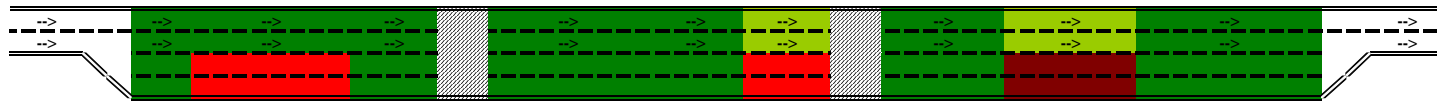
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2018 Build
 Level / type of roadway Arrivals
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 11



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name/description	Bus Pick Up	Undefined	Taxi	CW1	Taxi	Shared Van/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Curb length (feet)	50	150	76	23	151	85	77	23	115	125	175
Zone type	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Roadway volume (vph)	435	435	435	435	435	435	435	435	435	435	435
Roadway capacity (vph)	2,682	1,958	2,682	2,708	2,715	2,710	1,696	2,708	2,706	1,357	2,706
Roadway V/C ratio	0.162	0.222	0.162	0.161	0.160	0.161	0.256	0.161	0.161	0.321	0.161
Roadway LOS	A	A	A	A	A	A	B	A	A	B	A
Curb demand (# in sys 95% of time)	1.0	11.0	3.0	N/A	5.0	1.0	2.0	N/A	1.0	11.0	1.0
Curb capacity per lane (vehicles)	1.0	6.0	3.0	N/A	6.0	2.0	1.0	N/A	3.0	5.0	3.0
Curb utilization ratic	1.000	1.833	1.000	N/A	0.833	0.500	2.000	N/A	0.333	2.200	0.333
Curb LOS	A	E	A	N/A	A	A	E	N/A	A	F	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeon on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11
Name	Bus Pick Up	Undefined	Taxi	CW1	Taxi	hared Var/Bus	Courtesy Bus	CW2	Bus Pick Up	Undefined	Silver Line
Type of zone	active	active	active	xwalk	active	active	active	xwalk	active	active	active
Curbside length (feet)	50	150	76	23	151	85	77	23	115	125	175
Number of lanes	4	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2	2
Roadway volume (vph)	435	435	435	435	435	435	435	435	435	435	435
Curbside demand (vph)	29	83	66	-	131	7	29	-	29	83	7
Average dwell time (minutes)	0.66	4.60	1.00	-	1.00	2.36	0.97	-	0.66	4.60	0.90
Average vehicle length (feet)	42.76	25.00	25.00	-	25.00	41.43	51.72	-	42.76	25.00	70.00
Average vehicle arrival rate (vph)	29.00	83.00	66.00	-	131.00	7.00	29.00	-	29.00	83.00	7.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,825	2,062	2,825	2,850	2,860	2,854	1,786	2,850	2,850	1,429	2,850
Adjusted through lane roadway capacity	2,682	1,958	2,682	2,708	2,715	2,710	1,696	2,708	2,706	1,357	2,706
Estimated roadway V/C ratio	0.162	0.222	0.162	0.161	0.160	0.161	0.256	0.161	0.161	0.321	0.161
Curb capacity per lane (vehicles)	1.00	6.00	3.00	-	6.00	2.00	1.00	-	3.00	5.00	3.00
Curb utilization ratio	1.000	1.833	1.000	-	0.833	0.500	2.000	-	0.333	2.200	0.333
% occupancy in lane 1	0.895	1.000	0.895	-	0.815	0.490	1.000	-	0.330	1.000	0.330
% occupancy in lane 2	0.095	0.665	0.095	-	0.015	-	0.745	-	-	0.850	-
% occupancy in lane 3	-	0.17	-	-	-	-	0.25	-	-	0.35	-
# of cars in curbside lane	0.90	6.00	2.69	-	4.89	0.98	1.00	-	0.99	5.00	0.99
# of double-parked cars	0.10	3.99	0.29	-	0.09	-	0.75	-	-	4.25	-
# of triple-parked cars	-	0.990	-	-	-	-	0.245	-	-	1.750	-
Curbside LOS	A	E	A		A	A	E		A	F	A
Roadway LOS	A	A	A	A	A	A	B	A	A	B	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2018 Build
Level / type of roadway	Departures
Total lanes / approach lanes	4 / 2
Number of curbside zones	8
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	1.7
Rental Car	25.0	1.7
Taxicabs	25.0	1.3
Airport op shuttle-Employee	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Shared Ride	30.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	2.4
Charter Bus	50.0	2.4

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Type	active	active	xwalk	active	active	xwalk	active	active
Curbside frontage (feet)	125	128	23	149	128	23	254	160
Number of lanes	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	205	205	205	205	205	205	205	205
Rental Car	55	55	55	55	55	55	55	55
Taxicabs	240	240	240	240	240	240	240	240
Airport op shuttle-Employee	11	11	11	11	11	11	11	11
Unified Rental Car Shuttle	17	17	17	17	17	17	17	17
Shared Ride	54	54	54	54	54	54	54	54
Logan Express	8	8	8	8	8	8	8	8
Scheduled Bus Service	5	5	5	5	5	5	5	5
Charter Bus	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	51	-	-	-	51	-	103	-
Rental Car	14	-	-	-	14	-	27	-
Taxicabs	60	-	-	-	60	-	120	-
Airport op shuttle-Employee	-	5	-	6	-	-	-	-
Unified Rental Car Shuttle	-	8	-	9	-	-	-	-
Shared Ride	-	24	-	30	-	-	-	-
Logan Express	-	4	-	4	-	-	-	-
Scheduled Bus Service	-	2	-	3	-	-	-	-
Charter Bus	-	-	-	1	-	-	-	-

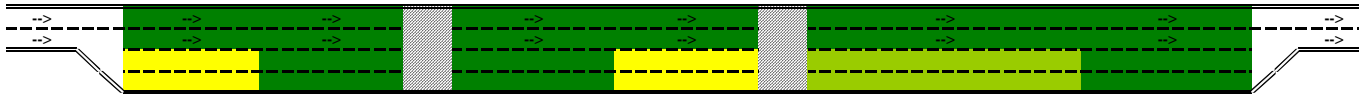
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2018 Build
 Level / type of roadway Departures
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 8



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name/description	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Curb length (feet)	125	128	23	149	128	23	254	160
Zone type	active	active	xwalk	active	active	xwalk	active	active
Roadway volume (vph)	596	596	596	596	596	596	596	596
Roadway capacity (vph)	2,599	2,720	2,708	2,710	2,599	2,708	2,647	2,706
Roadway V/C ratio	0.229	0.219	0.220	0.220	0.229	0.220	0.225	0.220
Roadway LOS	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	6.0	2.0	N/A	2.0	6.0	N/A	11.0	0.0
Curb capacity per lane (vehicles)	5.0	3.0	N/A	4.0	5.0	N/A	10.0	0.0
Curb utilization ratio	1.200	0.667	N/A	0.500	1.200	N/A	1.100	0.000
Curb LOS	C	A	N/A	A	C	N/A	B	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeen on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
Name	Active Drop	Limo	CW1	Limo	Active Drop	CW2	Active Drop	Undefined
Type of zone	active	active	xwalk	active	active	xwalk	active	active
Curbside length (feet)	125	128	23	149	128	23	254	160
Number of lanes	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2
Roadway volume (vph)	596	596	596	596	596	596	596	596
Curbside demand (vph)	125	43	-	53	125	-	250	-
Average dwell time (minutes)	1.51	0.87	-	0.92	1.51	-	1.51	-
Average vehicle length (feet)	25.00	39.53	-	39.25	25.00	-	25.00	-
Average vehicle arrival rate (vph)	125.00	43.00	-	53.00	125.00	-	250.00	-
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,737	2,865	2,850	2,854	2,737	2,850	2,788	2,850
Adjusted through lane roadway capacity	2,599	2,720	2,708	2,710	2,599	2,708	2,647	2,706
Estimated roadway V/C ratio	0.229	0.219	0.220	0.220	0.229	0.220	0.225	0.220
Curb capacity per lane (vehicles)	5.00	3.00	-	4.00	5.00	-	10.00	-
Curb utilization ratio	1.200	0.667	-	0.500	1.200	-	1.100	-
% occupancy in lane 1	0.995	0.660	-	0.490	0.995	-	0.945	-
% occupancy in lane 2	0.195	-	-	-	0.195	-	0.145	-
% occupancy in lane 3	-	-	-	-	-	-	-	-
# of cars in curbside lane	4.98	1.98	-	1.96	4.98	-	9.45	-
# of double-parked cars	0.98	-	-	-	0.98	-	1.45	-
# of triple-parked cars	-	-	-	-	-	-	-	-
Curbside LOS	C	A	-	A	C	-	B	A
Roadway LOS	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2018 Build with Modifications - Option 1
Level / type of roadway	Arrivals
Total lanes / approach lanes	4 / 2
Number of curbside zones	10
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	4.6
Taxicabs	25.0	1.0
Airport op shuttle-park/water	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Hotel-Motel Shuttles	40.0	1.5
Shared Ride	30.0	1.5
MBTA Silver Line	70.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	3.0
Charter Bus	50.0	3.0

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10
Name	MPA Shuttles	Logan Express	Taxi	CW1	Taxi	Unified Shuttle	CW2	Silver Line	active Pick Up	ared Van/Bus
Type	active	active	active	xwalk	active	active	xwalk	active	active	active
Curbside frontage (feet)	100	100	76	23	151	120	23	80	300	77
Number of lanes	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	166	166	166	166	166	166	166	166	166	166
Taxicabs	197	197	197	197	197	197	197	197	197	197
Airport op shuttle-park/water	21	21	21	21	21	21	21	21	21	21
Unified Rental Car Shuttle	17	17	17	17	17	17	17	17	17	17
Hotel-Motel Shuttles	12	12	12	12	12	12	12	12	12	12
Shared Ride	3	3	3	3	3	3	3	3	3	3
MBTA Silver Line	7	7	7	7	7	7	7	7	7	7
Logan Express	8	8	8	8	8	8	8	8	8	8
Scheduled Bus Service	3	3	3	3	3	3	3	3	3	3
Charter Bus	1	1	1	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	-	-	-	-	-	-	-	-	166	-
Taxicabs	-	-	66	-	131	-	-	-	-	-
Airport op shuttle-park/water	21	-	-	-	-	-	-	-	-	-
Unified Rental Car Shuttle	-	-	-	-	-	17	-	-	-	-
Hotel-Motel Shuttles	-	-	-	-	-	-	-	-	-	12
Shared Ride	-	-	-	-	-	-	-	-	-	3
MBTA Silver Line	-	-	-	-	-	-	-	7	-	-
Logan Express	-	8	-	-	-	-	-	-	-	-
Scheduled Bus Service	-	-	-	-	-	-	-	-	-	3
Charter Bus	-	-	-	-	-	-	-	-	-	1

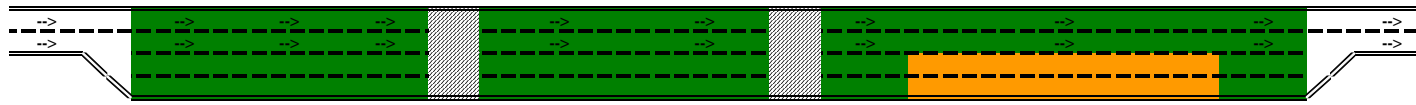
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2018 Build with Modifications - Option 1
 Level / type of roadway Arrivals
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 10



Zone ID	Zone 1	Zone 2 Logan	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10 Shared Van/Bus
Name/description	MPA Shuttles	Express	Taxi	CW1	Taxi	Unified Shuttle	CW2	Silver Line	Active Pick Up	
Curb length (feet)	100	100	76	23	151	120	23	80	300	77
Zone type	active	active	active	xwalk	active	active	xwalk	active	active	active
Roadway volume (vph)	435	435	435	435	435	435	435	435	435	435
Roadway capacity (vph)	2,706	2,710	2,682	2,708	2,715	2,710	2,708	2,682	2,280	2,682
Roadway V/C ratio	0.161	0.161	0.162	0.161	0.160	0.161	0.161	0.162	0.191	0.162
Roadway LOS	A	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	1.0	3.0	N/A	5.0	1.0	N/A	1.0	19.0	2.0
Curb capacity per lane (vehicles)	3.0	2.0	3.0	N/A	6.0	2.0	N/A	1.0	12.0	2.0
Curb utilization ratio	0.333	0.500	1.000	N/A	0.833	0.500	N/A	1.000	1.583	1.000
Curb LOS	A	A	A	N/A	A	A	N/A	A	D	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeen on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10
Name	MPA Shuttles	Logan Express	Taxi	CW1	Taxi	Unified Shuttle	CW2	Silver Line	Active Pick Up	Shared Van/Bus
Type of zone	active	active	active	xwalk	active	active	xwalk	active	active	active
Curbside length (feet)	100	100	76	23	151	120	23	80	300	77
Number of lanes	4	4	4	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2	2	2	2
Roadway volume (vph)	435	435	435	435	435	435	435	435	435	435
Curbside demand (vph)	21	8	66	-	131	17	-	7	166	19
Average dwell time (minutes)	0.60	0.80	1.00	-	1.00	0.60	-	0.90	4.60	1.82
Average vehicle length (feet)	40.00	50.00	25.00	-	25.00	60.00	-	70.00	25.00	40.53
Average vehicle arrival rate (vph)	21.00	8.00	66.00	-	131.00	17.00	-	7.00	166.00	19.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,850	2,854	2,825	2,850	2,860	2,854	2,850	2,825	2,402	2,825
Adjusted through lane roadway capacity	2,706	2,710	2,682	2,708	2,715	2,710	2,708	2,682	2,280	2,682
Estimated roadway V/C ratio	0.161	0.161	0.162	0.161	0.160	0.161	0.161	0.162	0.191	0.162
Curb capacity per lane (vehicles)	3.00	2.00	3.00	-	6.00	2.00	-	1.00	12.00	2.00
Curb utilization ratio	0.333	0.500	1.000	-	0.833	0.500	-	1.000	1.583	1.000
% occupancy in lane 1	0.330	0.490	0.895	-	0.815	0.490	-	0.895	1.000	0.895
% occupancy in lane 2	-	-	0.095	-	0.015	-	-	0.095	0.540	0.095
% occupancy in lane 3	-	-	-	-	-	-	-	-	0.04	-
# of cars in curbside lane	0.99	0.98	2.69	-	4.89	0.98	-	0.90	12.00	1.79
# of double-parked cars	-	-	0.29	-	0.09	-	-	0.10	6.48	0.19
# of triple-parked cars	-	-	-	-	-	-	-	-	0.480	-
Curbside LOS	A	A	A	-	A	A	-	A	D	A
Roadway LOS	A	A	A	A	A	A	A	A	A	A

Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Summary of Inputs and Assumptions

Model run by: Kkeen on 5/1/2012

Airport	BOS
Roadway location	Terminal B - Pier A
Scenario	2018 Build with Modifications - Option 1
Level / type of roadway	Departures
Total lanes / approach lanes	4 / 2
Number of curbside zones	7
% of 1st lane full when next vehicle double parks	80%
% of 2nd lane full when next vehicle triple parks	50%
Crosswalk adjustment factor	100%
Regional adjustment factor	95%

Frontage and dwell time per curbside operation

Vehicle class	Vehicle parking length (feet)	Average dwell time (minutes)
Private vehicles	25.0	1.7
Rental Car	25.0	1.7
Taxicabs	25.0	1.3
Airport op shuttle-Employee	40.0	0.6
Unified Rental Car Shuttle	60.0	0.6
Shared Ride	30.0	0.9
Logan Express	50.0	0.8
Scheduled Bus Service	50.0	2.4
Charter Bus	50.0	2.4

Assumptions by zone

Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name	Unified Bus	Shuttles	CW1	Active Drop	CW2	Limo	Active Drop
Type	active	active	xwalk	active	xwalk	active	active
Curbside frontage (feet)	140	113	23	277	23	100	314
Number of lanes	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2

Volume of vehicles using roadway (vph)

Private vehicles	205	205	205	205	205	205	205
Rental Car	55	55	55	55	55	55	55
Taxicabs	240	240	240	240	240	240	240
Airport op shuttle-Employee	11	11	11	11	11	11	11
Unified Rental Car Shuttle	17	17	17	17	17	17	17
Shared Ride	54	54	54	54	54	54	54
Logan Express	8	8	8	8	8	8	8
Scheduled Bus Service	5	5	5	5	5	5	5
Charter Bus	1	1	1	1	1	1	1

Volume of vehicles using curbside (vph)

Private vehicles	-	-	-	113	-	-	92
Rental Car	-	-	-	30	-	-	25
Taxicabs	-	-	-	132	-	-	108
Airport op shuttle-Employee	-	11	-	-	-	-	-
Unified Rental Car Shuttle	17	-	-	-	-	-	-
Shared Ride	-	-	-	-	-	54	-
Logan Express	-	8	-	-	-	-	-
Scheduled Bus Service	-	-	-	-	-	5	-
Charter Bus	-	-	-	-	-	1	-

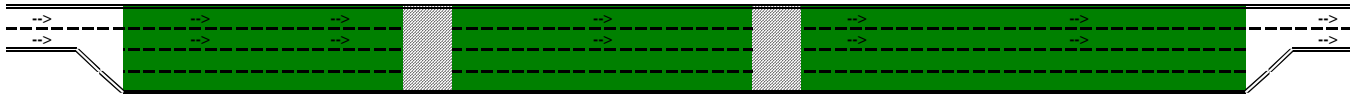
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: Kkeen on 5/1/2012

Airport BOS
 Roadway location Terminal B - Pier A
 Scenario 2018 Build with Modifications - Option 1
 Level / type of roadway Departures
 Total lanes / approach lanes 4 / 2
 Number of curbside zones 7



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name/description	Unified Bus	Shuttles	CW1	Active Drop	CW2	Limo	Active Drop
Curb length (feet)	140	113	23	277	23	100	314
Zone type	active	active	xwalk	active	xwalk	active	active
Roadway volume (vph)	596	596	596	596	596	596	596
Roadway capacity (vph)	2,710	2,706	2,708	2,682	2,708	2,682	2,720
Roadway V/C ratio	0.220	0.220	0.220	0.222	0.220	0.222	0.219
Roadway LOS	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	1.0	N/A	11.0	N/A	3.0	10.0
Curb capacity per lane (vehicles)	2.0	3.0	N/A	11.0	N/A	3.0	13.0
Curb utilization ratio	0.500	0.333	N/A	1.000	N/A	1.000	0.769
Curb LOS	A	A	N/A	A	N/A	A	A

Level-of-service (LOS) key:



Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Detailed Report By Zone

Model run by: Kkeen on 5/1/2012

ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Name	Unified Bus	Shuttles	CW1	Active Drop	CW2	Limo	Active Drop
Type of zone	active	active	xwalk	active	xwalk	active	active
Curbside length (feet)	140	113	23	277	23	100	314
Number of lanes	4	4	4	4	4	4	4
Number of approach lanes	2	2	2	2	2	2	2
Roadway volume (vph)	596	596	596	596	596	596	596
Curbside demand (vph)	17	19	-	275	-	60	225
Average dwell time (minutes)	0.60	0.68	-	1.51	-	1.05	1.51
Average vehicle length (feet)	60.00	44.21	-	25.00	-	32.00	25.00
Average vehicle arrival rate (vph)	17.00	19.00	-	275.00	-	60.00	225.00
Crosswalk adjustment factor	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Regional adjustment factor	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Through lane roadway capacity	2,854	2,850	2,850	2,825	2,850	2,825	2,865
Adjusted through lane roadway capacity	2,710	2,706	2,708	2,682	2,708	2,682	2,720
Estimated roadway V/C ratio	0.220	0.220	0.220	0.222	0.220	0.222	0.219
Curb capacity per lane (vehicles)	2.00	3.00	-	11.00	-	3.00	13.00
Curb utilization ratio	0.500	0.333	-	1.000	-	1.000	0.769
% occupancy in lane 1	0.490	0.330	-	0.895	-	0.895	0.760
% occupancy in lane 2	-	-	-	0.095	-	0.095	-
% occupancy in lane 3	-	-	-	-	-	-	-
# of cars in curbside lane	0.98	0.99	-	9.85	-	2.69	9.88
# of double-parked cars	-	-	-	1.05	-	0.29	-
# of triple-parked cars	-	-	-	-	-	-	-
Curbside LOS	A	A		A		A	A
Roadway LOS	A	A	A	A	A	A	A

Appendix C

Construction Supporting Documentation

- Daily Construction Vehicles
- Emission Calculations
- Emission Factors
- Roadway Construction Noise Model Sound Level Calculations

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Daily Construction Vehicles

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CONSTRUCTION VEHICLE DAILY SUMMARY

OVERALL SUMMARY		
	Daily Max	Date
All Equipment	25	Monday, August 6, 2012
w/o Aerial Lift, Primer Truck, Utility Truck	21	Monday, August 6, 2012

QUARTERLY SUMMARY - DAILY MAX							
Equipment	2012			2013			
	May-July	Aug-Oct	Nov-Jan	Feb-April	May-July	Aug-Oct	Nov-Jan
AERIAL LIFT	1	1		1	1		
AIR COMPRESSOR							
ASPHALT PAVER		1					
AUGER		1					
BACKHOE	1						
BULLDOZER	1	1					
CONCRETE PAVER	1	1	1				
CONCRETE PUMP TRUCK	1	1	1	1		1	
CONCRETE TRANSIT MIXER	3	3	4	1		1	
CRANE- MOBILE	1	1	1	1	1		
DUMP TRAILER	2						
DUMP TRUCK	2	5					
DUMPSTER							1
EXCAVATOR	1		1				
FRONT END LOADER							
GRADER	1						
MATERIAL HANDLER	1	2	1	1	1		
PILE VIBRATOR	1						
PRIMER TRUCK		1					
RECLAIMER	1						
ROLLER- DIRT	1						
ROLLER- PVMT		1					
SKID STEER		1					
SWEEPER		1					
TACK TRUCK		1					
TRUCK AND HIGH-BED TRAILER	1	1	3	1	1		
UTILITY TRUCK	2	2	3		3	2	1
VIBRATORY PLATE COMPACTOR	1						
WATER PUMP	1	1					
WATER TRUCK	1	1					
WELDING MACHINE			1	1	1	1	
Daily Max	23	25	16	7	8	6	1
Daily Max w/o Aerial Lift, Primer Truck, Utility Truck	20	21	13	6	4	4	0
Date	Monday, July 23, 2012	Monday, August 6, 2012	Monday, November 25, 2012	Monday, March 31, 2013	Monday, June 30 & July 7, 2013	Monday, October 6, 2013	Mon, Nov, 3 & Wed, Nov 5, 2013

Emission Calculations

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PARTICULAT MATTER	August				% Usage	# of Trips	Distance	VMT	Speed	Emission Factors	Emissions
	Daily										
AERIAL LIFT	4				100%	80	1	81	10	0.0198	1.6038
ASPHALT PAVER	1				100%	20	1	21	10	0.0198	0.4158
AUGER					20%						
BACKHOE					40%						
BULLDOZER					40%						
CONCRETE PAVER	1				100%	20	1	21	10	0.0198	0.4158
CONCRETE PUMP TRUCK	1				100%	20	3	23	10	0.0198	0.4554
CONCRETE TRANSIT MIXER	14				40%	280	3	283	10	0.0198	2.24136
CRANE- MOBILE	2				100%	40	3	43	10	0.0198	0.8514
DUMP TRAILER					50%						
DUMP TRUCK	25				40%	500	25	525	10	0.0198	4.158
DUMPSTER					40%						
EXCAVATOR					40%						
FRONT END LOADER					40%						
GRADER					40%						
MATERIAL HANDLER	6				40%	120	3	123	10	0.0198	0.97416
PILE VIBRATOR					20%	0					
PRIMER TRUCK	1				100%	20	3	23	10	0.0198	0.4554
RECLAIMER					20%						
ROLLER- DIRT					20%						
ROLLER- PVMT	3				100%	60	3	63	10	0.0198	1.2474
SKID STEER	1				100%	20	3	23	10	0.0198	0.4554
SWEEPER	1				100%	20	5	25	10	0.0198	0.495
TACK TRUCK	1				100%	20	5	25	10	0.0198	0.495
TRUCK AND HIGH-BED TRAILER	1				100%	20	5	25	10	0.0198	0.495
UTILITY TRUCK	7				40%	140	25	165	10	0.0198	1.3068
VIBRATORY PLATE COMPACTOR					20%						
WATER PUMP	3				50%	60	5	65	10	0.0198	0.6435
WATER TRUCK	1				100%	20	5	25	10	0.0198	0.495
WELDING MACHINE					40%						
	73										17.20422

0.01720422
Kg/day

Assumptions
Number of Trips per Day 20

VOCs	August				% Usage	# of Trips	Distance	VMT	Speed	Emission Factors	Emissions
	Daily										
AERIAL LIFT	4				100%	80	5	85	10	0.699	59.415
ASPHALT PAVER	1				100%	20	1	21	10	0.699	14.679
AUGER					20%						
BACKHOE					40%						
BULLDOZER					40%						
CONCRETE PAVER	1				100%	20	1	21	10	0.699	14.679
CONCRETE PUMP TRUCK	1				100%	20	3	23	10	0.699	16.077
CONCRETE TRANSIT MIXER	14				40%	280	3	283	10	0.699	79.1268
CRANE- MOBILE	2				100%	40	3	43	10	0.699	30.057
DUMP TRAILER					50%						
DUMP TRUCK	25				40%	500	25	525	10	0.699	146.79
DUMPSTER					40%						
EXCAVATOR					40%						
FRONT END LOADER					40%						
GRADER					40%						
MATERIAL HANDLER	6				40%	120	3	123	10	0.699	34.3908
PILE VIBRATOR					20%	0					
PRIMER TRUCK	1				100%	20	3	23	10	0.699	16.077
RECLAIMER					20%						
ROLLER- DIRT					20%						
ROLLER- PVMT	3				100%	60	3	63	10	0.699	44.037
SKID STEER	1				100%	20	3	23	10	0.699	16.077
SWEEPER	1				100%	20	5	25	10	0.699	17.475
TACK TRUCK	1				100%	20	5	25	10	0.699	17.475
TRUCK AND HIGH-BED TRAILER	1				100%	20	5	25	10	0.699	17.475
UTILITY TRUCK	7				40%	140	25	165	10	0.699	46.134
VIBRATORY PLATE COMPACTOR					20%						
WATER PUMP	3				50%	60	5	65	10	0.699	22.7175
WATER TRUCK	1				100%	20	5	25	10	0.699	17.475
WELDING MACHINE					40%						
	73										610.1571

0.6101571
Kg/day

Assumptions
Number of Trips per Day 20

NOx	August				% Usage	# of Trips	Distance	VMT	Speed	Emission Factors	Emissions
	Daily										
AERIAL LIFT	4				100%	80	5	85	10	5.885	500.225
ASPHALT PAVER	1				100%	20	1	21	10	5.885	123.585
AUGER					20%						
BACKHOE					40%						
BULLDOZER					40%						
CONCRETE PAVER	1				100%	20	1	21	10	5.885	123.585
CONCRETE PUMP TRUCK	1				100%	20	3	23	10	5.885	135.355
CONCRETE TRANSIT MIXER	14				40%	280	3	283	10	5.885	666.182
CRANE- MOBILE	2				100%	40	3	43	10	5.885	253.055
DUMP TRAILER					50%						
DUMP TRUCK	25				40%	500	25	525	10	5.885	1235.85
DUMPSTER					40%						
EXCAVATOR					40%						
FRONT END LOADER					40%						
GRADER					40%						
MATERIAL HANDLER	6				40%	120	3	123	10	5.885	289.542
PILE VIBRATOR					20%	0					
PRIMER TRUCK	1				100%	20	3	23	10	5.885	135.355
RECLAIMER					20%						
ROLLER- DIRT					20%						
ROLLER- PVMT	3				100%	60	3	63	10	5.885	370.755
SKID STEER	1				100%	20	3	23	10	5.885	135.355
SWEEPER	1				100%	20	5	25	10	5.885	147.125
TACK TRUCK	1				100%	20	5	25	10	5.885	147.125
TRUCK AND HIGH-BED TRAILER	1				100%	20	5	25	10	5.885	147.125
UTILITY TRUCK	7				40%	140	25	165	10	5.885	388.41
VIBRATORY PLATE COMPACTOR					20%						
WATER PUMP	3				50%	60	5	65	10	5.885	191.2625
WATER TRUCK	1				100%	20	5	25	10	5.885	147.125
WELDING MACHINE					40%						
	73										5137.0165

5.1370165
Kg/day

Assumptions
Number of Trips per Day 20

CO	August				% Usage	# of Trips	Distance	VMT	Speed	Emission Factors	Emissions
	Daily										
AERIAL LIFT	4				100%	80	5	85	10	5.58	474.3
ASPHALT PAVER	1				100%	20	1	21	10	5.58	117.18
AUGER					20%						
BACKHOE					40%						
BULLDOZER					40%						
CONCRETE PAVER	1				100%	20	1	21	10	5.58	117.18
CONCRETE PUMP TRUCK	1				100%	20	3	23	10	5.58	128.34
CONCRETE TRANSIT MIXER	14				40%	280	3	283	10	5.58	631.656
CRANE- MOBILE	2				100%	40	3	43	10	5.58	239.94
DUMP TRAILER					50%						
DUMP TRUCK	25				40%	500	25	525	10	5.58	1171.8
DUMPSTER					40%						
EXCAVATOR					40%						
FRONT END LOADER					40%						
GRADER					40%						
MATERIAL HANDLER	6				40%	120	3	123	10	5.58	274.536
PILE VIBRATOR					20%	0					
PRIMER TRUCK	1				100%	20	3	23	10	5.58	128.34
RECLAIMER					20%						
ROLLER- DIRT					20%						
ROLLER- PVMT	3				100%	60	3	63	10	5.58	351.54
SKID STEER	1				100%	20	3	23	10	5.58	128.34
SWEEPER	1				100%	20	5	25	10	5.58	139.5
TACK TRUCK	1				100%	20	5	25	10	5.58	139.5
TRUCK AND HIGH-BED TRAILER	1				100%	20	5	25	10	5.58	139.5
UTILITY TRUCK	7				40%	140	25	165	10	5.58	368.28
VIBRATORY PLATE COMPACTOR					20%						
WATER PUMP	3				50%	60	5	65	10	5.58	181.35
WATER TRUCK	1				100%	20	5	25	10	5.58	139.5
WELDING MACHINE					40%						
	73										4870.782
											4.870782
											Kg/day

Assumptions
Number of Trips per Day 20

	Emissions kilograms/day			
	VOC	NOX	CO	PM
EDR Logan Airport Emissions	1019	3989	7160	64
Construction Emissions	0.610	5.137	4.871	0.017
% Construction/EDR Emissions	0.060%	0.129%	0.068%	0.027%

	Emissions Tons/year			
	VOC	NOX	CO	PM
Construction Emissions	0.25	2.07	1.96	0.01

Emission Factors

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Converting Date: 3/26/2012

Mobile Output File: C:\Run\mobile\MA12_ALL\MA12_SUM.TXT

Excel File: C:\Run\mobile\MA12_ALL\MA12_SUM.TXT

Mobile Emission Rate

Speed	Type	VOC	CO	NOx
2.5	Arterial	2.1600	12.5000	1.2900
3	Arterial	1.7400	11.0000	1.2400
3	Arterial	1.7400	11.0000	1.2400
4	Arterial	1.2200	9.1200	1.1800
4	Arterial	1.2200	9.1200	1.1800
5	Arterial	0.9100	8.0000	1.1400
5	Arterial	0.9100	8.0000	1.1400
6	Arterial	0.7900	7.1900	1.0800
6	Arterial	0.7900	7.1900	1.0800
7	Arterial	0.7000	6.6200	1.0300
7	Arterial	0.7000	6.6200	1.0300
8	Arterial	0.6400	6.1900	0.9900
8	Arterial	0.6400	6.1900	0.9900
9	Arterial	0.5900	5.8500	0.9600
9	Arterial	0.5900	5.8500	0.9600
10	Arterial	0.5500	5.5800	0.9400
10	Arterial	0.5500	5.5800	0.9400
11	Arterial	0.5200	5.3500	0.9100
11	Arterial	0.5200	5.3500	0.9100
12	Arterial	0.5000	5.1500	0.8800
12	Arterial	0.5000	5.1500	0.8800
13	Arterial	0.4800	4.9900	0.8500
13	Arterial	0.4800	4.9900	0.8500
14	Arterial	0.4600	4.8400	0.8300
14	Arterial	0.4600	4.8400	0.8300
15	Arterial	0.4400	4.7200	0.8100
15	Arterial	0.4400	4.7200	0.8100
16	Arterial	0.4300	4.6000	0.7900
16	Arterial	0.4300	4.6000	0.7900
17	Arterial	0.4100	4.4900	0.7800
17	Arterial	0.4100	4.4900	0.7800
18	Arterial	0.4000	4.3900	0.7600
18	Arterial	0.4000	4.3900	0.7600
19	Arterial	0.3900	4.3000	0.7500
19	Arterial	0.3900	4.3000	0.7500
20	Arterial	0.3800	4.2200	0.7400
20	Arterial	0.3800	4.2200	0.7400
21	Arterial	0.3700	4.1600	0.7300
21	Arterial	0.3700	4.1600	0.7300
22	Arterial	0.3700	4.1100	0.7200

Roadway Construction Noise Model Sound Level Calculations

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Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 3/27/2012
 Case Description: B3

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)			Equipment	Receptor Distance (feet)	Estimated Shielding (dBA)
		Daytime	Evening	Night			
East Boston Yacht Club	Residential	66	66	66			
Description	Impact Device	Usage(%)	Spec	Actual	Receptor Distance (feet)	Estimated Shielding (dBA)	
			Lmax (dBA)	Lmax (dBA)			
Dump Truck	No	40	84	84	6800	5	
Dump Truck	No	40	84	84	6800	5	
Dump Truck	No	40	84	84	6800	5	
Dump Truck	No	40	84	84	6800	5	
Dump Truck	No	40	84	84	6800	5	
Dump Truck	No	40	84	84	6800	5	
Dump Truck	No	40	84	84	6800	5	
Dump Truck	No	40	84	84	6800	5	
Front End Loader	No	40	80	80	6800	5	
Front End Loader	No	40	80	80	6800	5	
Front End Loader	No	40	80	80	6800	5	
Front End Loader	No	40	80	80	6800	5	
Front End Loader	No	40	80	80	6800	5	
Front End Loader	No	40	80	80	6800	5	
Flat Bed Truck	No	40	84	84	6800	5	
Roller	No	20	85	85	6800	5	
Roller	No	20	85	85	6800	5	
Roller	No	20	85	85	6800	5	
Vacuum Street Sweeper	No	10		81.6	6800	5	
Front End Loader	No	40	80	80	6800	5	

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)							
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Dump Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	32.3	31.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	32.3	31.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	32.3	31.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	32.3	31.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	32.3	31.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	32.3	31.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	37.3	33.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	37.3	33.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	37.3	33.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vacuum Street Sweeper	33.9	26.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	32.3	31.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	37.3	46.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Loring Rd/Court Rd	Residential	70	70	70

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)	
			Spec Lmax (dBA)	Actual Lmax (dBA)			
Dump Truck	No	40	84	84	6900	0	
Dump Truck	No	40	84	84	6900	0	
Dump Truck	No	40	84	84	6900	0	
Dump Truck	No	40	84	84	6900	0	
Dump Truck	No	40	84	84	6900	0	
Dump Truck	No	40	84	84	6900	0	
Dump Truck	No	40	84	84	6900	0	
Dump Truck	No	40	84	84	6900	0	
Front End Loader	No	40	80	80	6900	0	
Front End Loader	No	40	80	80	6900	0	
Front End Loader	No	40	80	80	6900	0	
Front End Loader	No	40	80	80	6900	0	
Front End Loader	No	40	80	80	6900	0	
Flat Bed Truck	No	40	84	84	6900	0	
Roller	No	20	85	85	6900	0	
Roller	No	20	85	85	6900	0	
Roller	No	20	85	85	6900	0	
Vacuum Street Sweeper	No	10			81.6	6900	0
Front End Loader	No	40	80	80	6900	0	

Equipment	Results													
	Calculated (dBA)				Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day Lmax	L10	Evening Lmax	L10	Night Lmax	L10	Day Lmax	L10	Evening Lmax	L10	Night Lmax	L10
Dump Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.2	36.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.2	36.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.2	36.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.2	36.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.2	36.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	42.2	38.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	42.2	38.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	42.2	38.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vacuum Street Sweeper	38.8	31.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.2	36.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	42.2	51.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Somerset Ave/Johnson Ave	Residential	67	67	67

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)	
			Spec Lmax (dBA)	Actual Lmax (dBA)			
Dump Truck	No	40	84	84	7400	0	
Dump Truck	No	40	84	84	7400	0	
Dump Truck	No	40	84	84	7400	0	
Dump Truck	No	40	84	84	7400	0	
Dump Truck	No	40	84	84	7400	0	
Dump Truck	No	40	84	84	7400	0	
Dump Truck	No	40	84	84	7400	0	
Dump Truck	No	40	84	84	7400	0	
Front End Loader	No	40	80	80	7400	0	
Front End Loader	No	40	80	80	7400	0	
Front End Loader	No	40	80	80	7400	0	
Front End Loader	No	40	80	80	7400	0	
Front End Loader	No	40	80	80	7400	0	
Front End Loader	No	40	80	80	7400	0	
Flat Bed Truck	No	40	84	84	7400	0	
Roller	No	20	85	85	7400	0	
Roller	No	20	85	85	7400	0	
Roller	No	20	85	85	7400	0	
Vacuum Street Sweeper	No	10			81.6	7400	0
Front End Loader	No	40	80	80	7400	0	

Equipment	Results													
	Calculated (dBA)				Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day Lmax	Day L10	Evening Lmax	Evening L10	Night Lmax	Night L10	Day Lmax	Day L10	Evening Lmax	Evening L10	Night Lmax	Night L10
Dump Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	36.6	35.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	36.6	35.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	36.6	35.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	36.6	35.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	36.6	35.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	36.6	35.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	41.6	37.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	41.6	37.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	41.6	37.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vacuum Street Sweeper	38.2	31.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	36.6	35.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	41.6	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Jefferies Point Yacht Club	Residential	61	61	61

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Dump Truck	No	40	84	84	3100	5
Dump Truck	No	40	84	84	3100	5
Dump Truck	No	40	84	84	3100	5
Dump Truck	No	40	84	84	3100	5
Dump Truck	No	40	84	84	3100	5
Dump Truck	No	40	84	84	3100	5
Dump Truck	No	40	84	84	3100	5
Dump Truck	No	40	84	84	3100	5
Front End Loader	No	40	80	80	3100	5
Front End Loader	No	40	80	80	3100	5
Front End Loader	No	40	80	80	3100	5
Front End Loader	No	40	80	80	3100	5
Front End Loader	No	40	80	80	3100	5
Front End Loader	No	40	80	80	3100	5
Flat Bed Truck	No	40	84	84	3100	5
Roller	No	20	85	85	3100	5
Roller	No	20	85	85	3100	5
Roller	No	20	85	85	3100	5
Vacuum Street Sweeper	No	10			81.6	5
Front End Loader	No	40	80	80	3100	5

Equipment	Results													
	Calculated (dBA)				Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day Lmax	Day L10	Evening Lmax	Evening L10	Night Lmax	Night L10	Day Lmax	Day L10	Evening Lmax	Evening L10	Night Lmax	Night L10
Dump Truck	43.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	43.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	43.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	43.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	43.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	43.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	43.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	43.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	39.2	38.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	39.2	38.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	39.2	38.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	39.2	38.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	39.2	38.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	39.2	38.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	43.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	44.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	44.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	44.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vacuum Street Sweeper	40.7	33.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	39.2	38.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	44.2	53.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 3/27/2012
 Case Description: B4

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Boston Yacht Club	Residential	66	66	66

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Flat Bed Truck	No	40	84	84	6800	5
Flat Bed Truck	No	40	84	84	6800	5
Pickup Truck	No	40		75	6800	5
Pickup Truck	No	40		75	6800	5
Pickup Truck	No	40		75	6800	5
Pickup Truck	No	40		75	6800	5
Pickup Truck	No	40		75	6800	5
Pickup Truck	No	40		75	6800	5
Pickup Truck	No	40		75	6800	5
Pumps	No	50		80.9	6800	5
Pumps	No	50		80.9	6800	5
Pumps	No	50		80.9	6800	5
Flat Bed Truck	No	40	84	84	6800	5

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Flat Bed Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	27.3	26.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	27.3	26.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	27.3	26.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	27.3	26.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	27.3	26.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	27.3	26.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	33.3	33.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	33.3	33.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	33.3	33.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	36.3	35.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	36.3	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Loring Rd/Court Rd	Residential	70	70	70

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)	
			Spec Lmax (dBA)	Actual Lmax (dBA)			
Flat Bed Truck	No	40		84	6900	0	
Flat Bed Truck	No	40		84	6900	0	
Pickup Truck	No	40			75	6900	0
Pickup Truck	No	40			75	6900	0
Pickup Truck	No	40			75	6900	0
Pickup Truck	No	40			75	6900	0
Pickup Truck	No	40			75	6900	0
Pickup Truck	No	40			75	6900	0
Pickup Truck	No	40			75	6900	0
Pumps	No	50			80.9	6900	0
Pumps	No	50			80.9	6900	0
Pumps	No	50			80.9	6900	0
Flat Bed Truck	No	40		84	6900	0	

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Flat Bed Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.2	31.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.2	31.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.2	31.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.2	31.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.2	31.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.2	31.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.2	31.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	38.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	38.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	38.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.2	40.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	41.2	47.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Somerset Ave/Johnson Ave	Residential	67	67	67

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)	
			Spec Lmax (dBA)	Actual Lmax (dBA)			
Flat Bed Truck	No	40		84	7400	0	
Flat Bed Truck	No	40		84	7400	0	
Pickup Truck	No	40			75	7400	0
Pickup Truck	No	40			75	7400	0
Pickup Truck	No	40			75	7400	0
Pickup Truck	No	40			75	7400	0
Pickup Truck	No	40			75	7400	0
Pickup Truck	No	40			75	7400	0
Pickup Truck	No	40			75	7400	0
Pumps	No	50			80.9	7400	0
Pumps	No	50			80.9	7400	0
Pumps	No	50			80.9	7400	0
Flat Bed Truck	No	40		84	7400	0	

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Flat Bed Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	31.6	30.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	31.6	30.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	31.6	30.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	31.6	30.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	31.6	30.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	31.6	30.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	37.5	37.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	37.5	37.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	37.5	37.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	40.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	40.6	47.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Jefferies Point Yacht Club	Residential	61	61	61

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Flat Bed Truck	No	40	84		3100	5
Flat Bed Truck	No	40	84		3100	5
Pickup Truck	No	40			75 3100	5
Pickup Truck	No	40			75 3100	5
Pickup Truck	No	40			75 3100	5
Pickup Truck	No	40			75 3100	5
Pickup Truck	No	40			75 3100	5
Pickup Truck	No	40			75 3100	5
Pickup Truck	No	40			75 3100	5
Pumps	No	50			80.9 3100	5
Pumps	No	50			80.9 3100	5
Pumps	No	50			80.9 3100	5
Flat Bed Truck	No	40	84		3100	5

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Flat Bed Truck	43.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	34.2	33.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	40.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	43.2	49.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Somerset Ave/Johnson Ave	Residential	67	67	67

Description	Impact Device	Usage(%)	Equipment Spec		Receptor Distance (feet)	Estimated Shielding (dBA)
			Lmax (dBA)	Actual Lmax (dBA)		
			Man Lift	No		
Man Lift	No	20	85	7000	0	
Man Lift	No	20	85	7000	0	
Man Lift	No	20	85	7000	0	
Paver	No	50	85	7000	0	
Paver	No	50	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	
Concrete Mixer Truck	No	40	85	7000	0	

Equipment	Results													
	Calculated (dBA)		Noise Limits (dBA)					Noise Limit Exceedance (dBA)						
	*Lmax	L10	Day Lmax	L10	Evening Lmax	L10	Night Lmax	L10	Day Lmax	L10	Evening Lmax	L10	Night Lmax	L10
Man Lift	42.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	42.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	42.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	42.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	42.1	42.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	42.1	42.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	42.1	41.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	42.1	53.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 3/27/2012
 Case Description: CE3

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Boston Yacht Club	Residential	66	66	66

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Dump Truck	No	40	84	84	5000	0
Dump Truck	No	40	84	84	5000	0
Dump Truck	No	40	84	84	5000	0
Dump Truck	No	40	84	84	5000	0
Dump Truck	No	40	84	84	5000	0
Dump Truck	No	40	84	84	5000	0
Dump Truck	No	40	84	84	5000	0
Dump Truck	No	40	84	84	5000	0
Front End Loader	No	40	80	80	5000	0
Front End Loader	No	40	80	80	5000	0
Front End Loader	No	40	80	80	5000	0
Front End Loader	No	40	80	80	5000	0
Front End Loader	No	40	80	80	5000	0
Front End Loader	No	40	80	80	5000	0
Flat Bed Truck	No	40	84	84	5000	0
Roller	No	20	85	85	5000	0
Roller	No	20	85	85	5000	0
Roller	No	20	85	85	5000	0
Vacuum Street Sweeper	No	10		81.6	5000	0
Front End Loader	No	40	80	80	5000	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Dump Truck	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	40	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	40	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	40	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	40	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	40	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	40	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	40	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	45	41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	45	41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	45	41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vacuum Street Sweeper	41.6	34.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	40	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	45	54.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Loring Rd/Court Rd	Residential	70	70	70

Description	Impact Device	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
		Usage(%)	Spec Lmax (dBA)		
Dump Truck	No	40	84	6100	0
Dump Truck	No	40	84	6100	0
Dump Truck	No	40	84	6100	0
Dump Truck	No	40	84	6100	0
Dump Truck	No	40	84	6100	0
Dump Truck	No	40	84	6100	0
Dump Truck	No	40	84	6100	0
Dump Truck	No	40	84	6100	0
Front End Loader	No	40	80	6100	0
Front End Loader	No	40	80	6100	0
Front End Loader	No	40	80	6100	0
Front End Loader	No	40	80	6100	0
Front End Loader	No	40	80	6100	0
Front End Loader	No	40	80	6100	0
Flat Bed Truck	No	40	84	6100	0
Roller	No	20	85	6100	0
Roller	No	20	85	6100	0
Roller	No	20	85	6100	0
Vacuum Street Sweeper	No	10		81.6 6100	0
Front End Loader	No	40	80	6100	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)							
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Dump Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	38.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	38.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	38.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	38.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	38.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	38.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	43.3	39.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	43.3	39.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	43.3	39.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vacuum Street Sweeper	39.9	32.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	38.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	43.3	52.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
	7000 Residential	67	67	67

Description	Impact Device	Equipment Usage(%)		Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
		Usage(%)					
Dump Truck	No		40	84		7000	0
Dump Truck	No		40	84		7000	0
Dump Truck	No		40	84		7000	0
Dump Truck	No		40	84		7000	0
Dump Truck	No		40	84		7000	0
Dump Truck	No		40	84		7000	0
Dump Truck	No		40	84		7000	0
Dump Truck	No		40	84		7000	0
Front End Loader	No		40	80		7000	0
Front End Loader	No		40	80		7000	0
Front End Loader	No		40	80		7000	0
Front End Loader	No		40	80		7000	0
Front End Loader	No		40	80		7000	0
Front End Loader	No		40	80		7000	0
Flat Bed Truck	No		40	84		7000	0
Roller	No		20	85		7000	0
Roller	No		20	85		7000	0
Roller	No		20	85		7000	0
Vacuum Street Sweeper	No		10		81.6	7000	0
Front End Loader	No		40	80		7000	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)							
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Dump Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.1	36.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.1	36.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.1	36.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.1	36.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.1	36.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.1	36.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	42.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	42.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	42.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vacuum Street Sweeper	38.7	31.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.1	36.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	42.1	51.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Jefferies Point Yacht Club	Residential	61	61	61

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Dump Truck	No	40	84	84	3200	0
Dump Truck	No	40	84	84	3200	0
Dump Truck	No	40	84	84	3200	0
Dump Truck	No	40	84	84	3200	0
Dump Truck	No	40	84	84	3200	0
Dump Truck	No	40	84	84	3200	0
Dump Truck	No	40	84	84	3200	0
Dump Truck	No	40	84	84	3200	0
Front End Loader	No	40	80	80	3200	0
Front End Loader	No	40	80	80	3200	0
Front End Loader	No	40	80	80	3200	0
Front End Loader	No	40	80	80	3200	0
Front End Loader	No	40	80	80	3200	0
Front End Loader	No	40	80	80	3200	0
Flat Bed Truck	No	40	84	84	3200	0
Roller	No	20	85	85	3200	0
Roller	No	20	85	85	3200	0
Roller	No	20	85	85	3200	0
Vacuum Street Sweeper	No	10			81.6 3200	0
Front End Loader	No	40	80	80	3200	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)							
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Dump Truck	47.9	46.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	47.9	46.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	47.9	46.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	47.9	46.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	47.9	46.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	47.9	46.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	47.9	46.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	47.9	46.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	43.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	43.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	43.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	43.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	43.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	43.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	47.9	46.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	48.9	44.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	48.9	44.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	48.9	44.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vacuum Street Sweeper	45.5	38.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	43.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	48.9	58.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 3/27/2012
 Case Description: CE4

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Boston Yacht Club	Residential	66	66	66

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Flat Bed Truck	No	40	84	84	5000	0
Flat Bed Truck	No	40	84	84	5000	0
Pickup Truck	No	40	75	75	5000	0
Pickup Truck	No	40	75	75	5000	0
Pickup Truck	No	40	75	75	5000	0
Pickup Truck	No	40	75	75	5000	0
Pickup Truck	No	40	75	75	5000	0
Pickup Truck	No	40	75	75	5000	0
Pumps	No	50	80.9	80.9	5000	0
Pumps	No	50	80.9	80.9	5000	0
Pumps	No	50	80.9	80.9	5000	0
Flat Bed Truck	No	40	84	84	5000	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Flat Bed Truck	44	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	44	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	35	35	34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	35	35	34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	35	35	34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	35	35	34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	35	35	34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	35	35	34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	40.9	40.9	40.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	40.9	40.9	40.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	40.9	40.9	40.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	44	44	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	44	44	50.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Loring Rd/Court Rd	Residential	70	70	70

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)	
			Spec Lmax (dBA)	Actual Lmax (dBA)			
Flat Bed Truck	No	40		84	6100	0	
Flat Bed Truck	No	40		84	6100	0	
Pickup Truck	No	40			75	6100	0
Pickup Truck	No	40			75	6100	0
Pickup Truck	No	40			75	6100	0
Pickup Truck	No	40			75	6100	0
Pickup Truck	No	40			75	6100	0
Pickup Truck	No	40			75	6100	0
Pickup Truck	No	40			75	6100	0
Pumps	No	50			80.9	6100	0
Pumps	No	50			80.9	6100	0
Pumps	No	50			80.9	6100	0
Flat Bed Truck	No	40		84	6100	0	

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Flat Bed Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.3	32.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.3	32.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.3	32.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.3	32.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.3	32.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.3	32.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.3	32.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	39.2	39.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	39.2	39.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	39.2	39.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	42.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	42.3	48.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Somerset Ave/Johnson Ave	Residential	67	67	67

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)	
			Spec Lmax (dBA)	Actual Lmax (dBA)			
Flat Bed Truck	No	40		84	7000	0	
Flat Bed Truck	No	40		84	7000	0	
Pickup Truck	No	40			75	7000	0
Pickup Truck	No	40			75	7000	0
Pickup Truck	No	40			75	7000	0
Pickup Truck	No	40			75	7000	0
Pickup Truck	No	40			75	7000	0
Pickup Truck	No	40			75	7000	0
Pickup Truck	No	40			75	7000	0
Pumps	No	50			80.9	7000	0
Pumps	No	50			80.9	7000	0
Pumps	No	50			80.9	7000	0
Flat Bed Truck	No	40		84	7000	0	

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Flat Bed Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.1	31.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.1	31.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.1	31.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.1	31.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.1	31.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	32.1	31.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	38	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	38	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	38	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	41.1	47.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Jefferies Point Yacht Club	Residential	61	61	61

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)	
			Spec Lmax (dBA)	Actual Lmax (dBA)			
Flat Bed Truck	No	40		84	3200	5	
Flat Bed Truck	No	40		84	3200	5	
Pickup Truck	No	40			75	3200	5
Pickup Truck	No	40			75	3200	5
Pickup Truck	No	40			75	3200	5
Pickup Truck	No	40			75	3200	5
Pickup Truck	No	40			75	3200	5
Pickup Truck	No	40			75	3200	5
Pickup Truck	No	40			75	3200	5
Pumps	No	50			80.9	3200	5
Pumps	No	50			80.9	3200	5
Pumps	No	50			80.9	3200	5
Flat Bed Truck	No	40		84	3200	5	

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	L10	Day		Evening		Night		Day		Evening		Night	
			Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10	Lmax	L10
Flat Bed Truck	42.9	41.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.9	32.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.9	32.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.9	32.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.9	32.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.9	32.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	33.9	32.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	39.8	39.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	39.8	39.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	39.8	39.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	42.9	41.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	42.9	49.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.



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