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CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: South Station Expansion Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15028
PROJECT PROPONENT	: Massachusetts Department of Transportation
DATE NOTICED IN MONITOR	: November 5, 2014

As Secretary of Energy and Environmental Affairs, I hereby determine that the Draft Environmental Impact Report (DEIR) submitted on this project **adequately and properly** complies with the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00). The Proponent may prepare and submit for review a Final Environmental Impact Report (FEIR) in response to the Scope provided below.

Project Description

As described in the DEIR, the project consists of an expansion of Boston's South Station by the Massachusetts Department of Transportation (MassDOT). The project, referred to as the South Station Expansion project, or SSX, is being undertaken to allow for expansion of intercity and high-speed rail (HSR) service into South Station and to improve existing rail operations and service delivery at South Station provided by the National Railroad Passenger Corporation (Amtrak) and the Massachusetts Bay Transportation Authority (MBTA). MassDOT, the MBTA, the Federal Railroad Administration (FRA) and Amtrak have identified the expansion of rail capacity at South Station as a critical regional and national transportation need. According to MassDOT, this need has been extensively documented in State and regional transportation plans including *Critical Infrastructure Needs on the Northeast Corridor* (2013); *The Northeast*

Corridor Infrastructure Master Plan (2010); *The Amtrak Vision for High-Speed Rail in the Northeast Corridor* (2010); *A Vision for the Northeast Corridor* (2012); MassDOT's *weMove Massachusetts: Planning for Performance* (the Commonwealth's 2040 Long-Range Transportation Plan (2014); MassDOT's *The Way Forward: a 21st Century Transportation Plan* (2013); MassDOT's *Massachusetts State Rail Plan* (2010); MassDOT's *Massachusetts Freight Plan* (2010); the MBTA's *Program for Mass Transportation* (2009); and the Boston Region Metropolitan Planning Organization's (MPO) *Paths to a Sustainable Region*, the long-range transportation plan for the metropolitan Boston region (2011).

To date, MassDOT has received \$32.5 million from the FRA and \$10 million in additional State funding to complete preliminary engineering and environmental assessment and permitting for the project. No additional sources of federal or State funding have been allocated for final engineering or construction of SSX.

South Station is the sixth busiest station in the national Amtrak system and is the terminus of Amtrak's Northeast Corridor (NEC) service and Lake Shore Limited service from Chicago via Albany; approximately 1.45 million Amtrak passengers used South Station facilities in 2012. From 2003 to 2012, the number of Amtrak passenger arrivals and departures through South Station increased by approximately 52 percent. South Station serves as the terminus for the western and southern lines of the MBTA's commuter rail system. There are nine main line approach tracks that currently converge in the South Station terminal area. Of these nine tracks, five arrive at South Station from the west, consisting of the NEC Main Line, which operate on tracks 1, 2, and 3, and the MBTA's Framingham/Worcester Line, which operates on tracks 5 and 7. The remaining four tracks arrive at South Station from the south, consisting of the MBTA's Fairmount Line, which operates on the Fairmount Line/Dorchester Branch tracks and the MBTA's Old Colony Line, which operates on the Old Colony tracks. Current weekday ridership at South Station includes an average of approximately 4,100 Amtrak combined boardings and alightings, and 42,000 combined MBTA commuter rail boardings and alightings.

South Station also provides connections to the MBTA's Red Line, Silver Line and local bus routes and intra-city bus routes run by private bus companies. Combined South Station boarding and alightings in 2012 include 54,000 on the Red Line, 12,700 on the Silver Line, 2,900 on local bus routes, and 12,200 on intercity/commuter bus routes.

According to the DEIR, the project will provide numerous benefits by supporting improved rail service, improved passenger service, pedestrian and bicycle improvements, improved vehicular circulation, improved multimodal connections, and supporting regional and local economic development. The project will improve operational efficiencies in and out of South Station, upgrade facilities to meet Americans with Disabilities Act (ADA) and life safety regulations, extend platform lengths to meet Amtrak and MBTA future berthing requirements, and enhance multimodal connections through this key transit hub. The project is expected to provide the ability to meet Amtrak's and the MBTA's established objectives of 95 percent on-time performance (OTP) for Amtrak and commuter rail service, and 90 percent for Amtrak Northeast Regional trains.

Currently, all 13 existing tracks and eight platforms are fully used by Amtrak and the MBTA, and both operators are constrained in their ability to increase service or offer new services due to the size and configuration of the station and terminal facilities. According to the DEIR, the daytime vehicle layover capacity for the MBTA's south side commuter rail service area is presently inadequate and unable to meet projected future demands. Additionally, South Station's passenger facilities, including platforms, waiting areas, and customer support services, do not meet preferred standards for passenger transit facilities. These deficiencies result in congestion and declining service reliability for Amtrak and the MBTA. The project is designed to reduce terminal capacity constraints, replace inadequate station facilities, and remedy problems associated with insufficient layover space.

The project is part of an overall plan to improve intercity and future HSR service in the NEC, as stated in Amtrak's *NEC Master Plan*, its *Vision for High Speed Rail in the Northeast Corridor*, and its 2012 update. By the year 2035, Amtrak projects that daily intercity rail ridership at South Station will increase to approximately 5,500 combined boardings and alightings. South Station commuter rail boarding and alightings are projected to increase to 56,000 daily riders by 2035. Amtrak's 2030 plans call for increased service between Boston and New York City and additional trains to operate over an "inland route" connecting Boston, Worcester, Springfield and New Haven. South Station presently operates with a total of thirteen tracks, all of which are fully utilized by Amtrak and the MBTA resulting in increasing congestion and declining service reliability.¹ Furthermore, there is insufficient vehicle layover space to meet existing and future South Station operational requirements. Amtrak and the MBTA currently store trains in the South Station terminal while waiting for slots at the existing south side layover yards.

The project is expected to improve the rail system's ability to absorb future demand along the MBTA's south side commuter rail lines and along the NEC. In the 2025 opening year, the project would support the projected increase in ridership of approximately 16,000 to 17,000 additional daily combined commuter rail and Amtrak intercity rail boardings and alightings at South Station over the No Build Alternative. By 2035, these numbers would increase to approximately 20,000 to 22,000.

The project includes five primary elements:

- Expansion of the South Station terminal facilities by approximately 400,000 square feet (sf) by adding seven tracks and four new platforms, reconfiguring existing platforms, and constructing larger passenger circulation and waiting areas, amenities, and back of house space. The Tower 1, Broad and Cove Interlockings will be reconfigured to reduce conflicting movements through the terminal area;²
- Acquisition and demolition of the U.S. Postal Service (USPS) General Mail Facility located on Dorchester Avenue to provide a 16-acre site upon which to expand South Station and restore Dorchester Avenue for public and station access. As part of the The

¹ South Station currently has less than half the original track capacity that was available when the station was first opened in 1899.

² An interlocking is a segment of railroad infrastructure comprised of track, turnouts, and signals linked (interlocked) in a way that allows for trains to move from on track to another, or across tracks, safely by preventing conflicting train movements.

USPS facility acquisition is identified as a state-funded project in the MBTA's current *FY2015-FY2019 Capital Investment Program (CIP)*;

- Creation of an approximately 2,500-foot extension of the Harborwalk along a reopened two-way Dorchester Avenue that will include pedestrian, bicycle, local transit, and vehicular improvements;
- Creation of opportunities for joint/private development adjacent to and/or over an expanded South Station. MassDOT anticipates that revenue from future air rights development could assist in supporting public transportation investments;
- Construction of additional rail layover space to address existing and future Amtrak and MBTA service expansions and other planned improvements. Layover facilities are used to store, service, inspect, and maintain trains when they are not in service.

The approximately 49-acre South Station project site is bounded by Summer Street to the north, Dorchester Avenue and the Fort Point Channel to the east, Atlantic Avenue to the west, and the MBTA's Cabot Yard to the south. The South Station project site also extends along a portion of the NEC Main Line to the west past the Cove Interlocking and along the MBTA's Fairmount/Old Colony Railroad Line to the south just past the Broadway Interlocking. South Station is located at the junction of several Boston neighborhoods including Chinatown, the Leather District, the Fort Point Channel, and the Seaport-Innovation District/South Boston Waterfront.

The project also includes the construction of layover facilities within the City of Boston. After completion of a layover facility alternative analysis that evaluated 28 potential locations, four sites for new and/or expanded layover facilities were further considered as part of the DEIR. These potential layover locations include:

- The Boston Transportation Department (BTD)-owned Tow Lot located along Frontage Road approximately one track-mile from South Station;
- Widett Circle, a 29.4-acre site located approximately one mile south of South Station at 100 Widett Circle and 1 and 2 Foodmart Road, primarily in private ownership;
- Beacon Yard Park, a freight yard and intermodal terminal most recently used by CSX Transportation, Inc. (CSXT) located along Cambridge Street in the Allston section of Boston, approximately four track-miles on the MBTA Framingham/Worcester Line from South Station; and
- Readville Yard 2, an existing MBTA layover yard and maintenance facility located off Wolcott Court in the Hyde Park section of Boston, approximately nine track-miles from South Station.

MEPA Procedural History

The DEIR was noticed in the November 5, 2014 Environmental Monitor. At the request of MassDOT, the review period was extended from the typical 30 days to 49-days. MassDOT held a public hearing on November 18, 2014 to review the DEIR and allow opportunities for questions and comments from the public.

Portions of the project site have previously been subject to MEPA review as far back as 1973. As previously indicated in the Environmental Notification Form (ENF), projects filed on the South Station site include:

- EEA No. 243 – South Station Urban Renewal Project;
- EEA No. 2868 – South Station Project;
- EEA No. 3173 – Temporary South Station Bus Terminal;
- EEA No. 3205 – South Station Project;
- EEA No. 4049 – Tunnel Ventilation Program Phase 1;
- EEA No. 4327 – South Station Wye Connector;
- EEA No. 3205/9131 – South Station Air Rights Project; and
- EEA No. 10270 – North/South Rail Link Project.

Of these prior filings, only three projects required the preparation of an EIR. The South Station Air Rights Project (SSAR) (EEA Nos. 3205 and 9131) consists of a 1.8 million square foot mixed-use development located on the northern end of the site above existing portions of the South Station headhouse and tracks. The project also includes a 70,000-sf horizontally expanded bus terminal, pedestrian connections from the train station concourse and platforms to the expanded bus terminal, and a 775-space three-level parking garage located above the bus terminal. The SSAR includes modifications to existing platform lengths at South Station, reducing platform lengths on Tracks 3-10 between 20 and 89 feet. The EIR complied with M.G.L. Chapter 30 and the Proponent filed a Notice of Project Change (NPC) for an extension of time in 2012.

The North/South Rail Link (NSRL) Project consists of a three-mile tunnel linking North and South Stations and associated rail infrastructure. The DEIR for this project was determined to adequately and properly comply with the MEPA Regulations in July 2003. A Final EIR has not been filed for this project. Given the lapse of time since the filing of the DEIR, this project, if it were to advance, would require reinitiating the MEPA review process with the filing of an ENF.

I have received numerous comments requesting that the scope of the SSX Project improvements include underground rail tracks and platforms for the NSRL Project. In the DEIR, MassDOT responded to similar requests that it is not currently in a financial position to endorse or advance the design of the extensive underground infrastructure associated with the NSRL. Furthermore, MassDOT stated that due to change in the physical nature of the corridor since the construction of the Central Artery Project, as well as new assumptions regarding staging, construction and costs since the last formal assessment of the NSRL, it believes that many of the goals of the NSRL project can be accomplished through more incremental efforts, such as the expansion of South Station. I acknowledge that a key benefit of the NSRL project that will not be realized by the SSX project currently under review is a seamless connection between South Station and North Station. This connection would provide enhanced service along the MBTA commuter rail, subway, and NEC lines and would facilitate operations and maintenance by eliminating the need to run non-revenue trains to reach more distant layover facility locations. MassDOT reiterated in the DEIR that the SSX project will be advanced in such a way that it will

not preclude the potential for future underground infrastructure, such as tunnel portals and station locations.

Jurisdiction and Permitting

This project is subject to MEPA review and requires the preparation of a mandatory EIR because it requires State Agency Actions and exceeds several MEPA review thresholds including:

- Expansion of an existing non-water-dependent structure, provided the use or structure occupies one or more acres of (historic) tidelands (301 CMR 11.03(3)(a)(5));
- New discharge or expansion in discharge to a sewer system of 100,000 or more GPD (301 CMR 11.03(5)(b)(4(a)));
- Generation of 3,000 or more unadjusted new additional daily trips on roadways providing access to a single location (301 CMR 11.03(6)(a)(6)); and
- Construction of 1,000 or more new parking spaces at a single location (301 CMR 11.03(6)(a)(7)).

The project requires a c.91 Waterways License and may require a Section 401 Water Quality Certification (401 WQC) from the Massachusetts Department of Environmental Protection (MassDEP), a Vehicular Access Permit from MassDOT, and air-rights easements or approvals from the MBTA.³ The project also requires an Amendment to the Fort Point Channel Downtown Waterfront Municipal Harbor Plan (MHP) and a Public Benefit Determination issued by the Executive Office of Energy and Environmental Affairs (EEA). The project may also require a MassDEP Dewatering General Permit for dewatering of non-contaminated groundwater and a MassDEP Remediation General Permit for dewatering of contaminated groundwater. The project may require an 8(m) Permit, Construction Site Dewatering Discharge Permit and/or a Sewer Use Discharge Permit from the Massachusetts Water Resources Authority (MWRA).

The project is subject to State Register Review (950 CMR 71.00) and Section 106 Review (36 CFR 800) by the Massachusetts Historical Commission (MHC). A Federal Consistency Certification from the Massachusetts Office of Coastal Zone Management (CZM) will also be required.

An Order of Conditions will be required from the Boston Conservation Commission, or in the case of an appeal, a Superseding Order of Conditions from MassDEP. The project will also require a Drainage Discharge Permit and may require a Dewatering Discharge Permit from the Boston Water and Sewer Commission (BWSC). Construction of the public/private development areas above South Station will require review by the Boston Redevelopment Authority (BRA).

The project requires several federal permits/approvals including, but not limited to: approval under the National Environmental Policy Act (NEPA), Part 77 Airspace Review from the Federal Aviation Administration (FAA), Modification of High Occupancy Vehicle

³ Since the filing of the ENF, the MassDEP Sewer Regulations (314 CMR 7.00) have been amended. The project is no longer anticipated to require a MassDEP Sewer Connection Permit (BRP WP 74). Wastewater permitting will be undertaken by the Boston Water and Sewer Commission.

Designation review by the Federal Highway Administration (FHWA), Section 4(f) Review by the United States Department of Transportation (USDOT) and a National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the United States Environmental Protection Agency (EPA). The project may require a NPDES Permit, a Notice of Intent, or a NPDES Permit Exclusion associated with construction period dewatering. The project is subject to the MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol.

The project will receive Financial Assistance in the form of funding from the Commonwealth and the Federal Railroad Administration (FRA). Therefore, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Project Changes Since the ENF

The DEIR presented modified project alternatives to those outlined in the ENF. These modifications were generally attributable to advancement in project design and environmental assessments. These updated project alternatives are described in detail later in this Certificate.

Since the ENF, MassDOT concluded that the Beacon Park Yard (BPY) layover site is the preferred location to the west of south station to meet existing and future MBTA commuter rail layover needs. This facility is proposed to provide storage for up to 20 eight-car trainsets in a parallel track arrangement and support facilities for MBTA operations. The BPY site is located within the study area of a separate MassDOT project, the Interstate 90 (I-90) Allston Interchange (EEA No. 15278). This project proposes myriad transportation and multi-modal improvements within Boston's Allston neighborhood and is intended to support redevelopment of land formerly owned by CSX and now under the control of Harvard University. In order to facilitate an evaluation of the cumulative environmental impacts associated with the proposed layover facility operations at BPY in conjunction with other elements of the I-90 Allston Interchange Project, I incorporated the assessment of environmental impacts from the BPY layover yard into the scope for a DEIR outlined in the Certificate on the ENF issued on December 24, 2014 for the I-90 project. However, as detailed later in this Certificate, the operational impacts of rail layover facilities located at BPY in relation to the future operations at South Station will continue to be addressed in conjunction with the South Station Expansion (SSX) project.

Review of the DEIR

Project Description and Permitting

The DEIR included a description of the proposed project elements and related potential environmental impacts. The DEIR included updated site plans depicting existing and post-development conditions for each project alternative. The existing conditions analysis highlighted operational constraints due to station design (e.g., no mid-platform boarding, substandard platform widths and lengths) and layover facility locations. Furthermore, the DEIR described how the proposed changes to the South Station headhouse and platforms will be integrated into

the existing South Station building and platforms, including connections to other modes of transit (e.g., private and MBTA buses, Red Line and Silver Line) and Main Line commuter rail operations. The DEIR included a table that identified anticipated permits from State, local and Federal entities for both the South Station site and the proposed layover sites. Draft Section 61 Findings for use by State Agencies in the permitting process were also included in the DEIR.

Project Purpose and Need

The DEIR included an extensive discussion of the project's purpose and need, with supporting ridership data and an evaluation of existing infrastructure deficiencies. The DEIR generally used an approximate opening year of 2025 and a horizon year of 2035 for the analyses performed in conjunction with the evaluation of potential project-related impacts.

According to the DEIR, terminal capacity constraints are attributable to the limited number of platform tracks and the configuration(s) of the track infrastructure (one main track and multiple approach interlockings). Because South Station is a terminal facility, every arriving train must be reversed to either leave the station for a new revenue trip, or to access a layover facility, further limiting station capacity. Furthermore, the configuration of the interlockings near South Station create additional challenges for train movements in and out of the terminal. These constraints were described as follows in the DEIR:

- **Tower 1 Interlocking** - South Station's main interlocking, Tower 1 is located immediately south of the terminal at the northern end of all Amtrak and MBTA lines that come into South Station from the west and south and consists of nine main line approach tracks converging into 13 station tracks and eight platforms. All moves for berthing trains entering or exiting South Station occur at Tower 1 Interlocking. In its current configuration, Tower 1 Interlocking contains two long ladder tracks, tracks that link a series of parallel tracks, which allow a train approaching South Station on any track to reach nearly every platform track. While this layout provides operational flexibility, it creates a bottleneck for Amtrak and MBTA operations by limiting the number of trains that can simultaneously move through the interlocking, resulting in service delays.
- **Cove and Broad Interlockings** – Located south and west of Tower 1 Interlocking are two additional approach (or "setup") interlockings. Cove Interlocking is located approximately 0.5 miles from South Station on the NEC and MBTA's Framingham/Worcester Line and serves as a universal interlocking for four of the five tracks approaching South Station. Cove Interlocking does not provide access to all tracks entering South Station. This interlocking allows trains to access the MBTA and Amtrak maintenance facilities via the Wye track. Broad Interlocking, located adjacent to the MBTA's South Side S&I facility, provides limited access between the MBTA Fairmount and Old Colony Railroad main line tracks and does not allow universal access to all tracks in both directions. This interlocking also allows trains to access the South Side S&I facility and to and from Cove Interlocking via the Wye track. The limitations of these two interlockings restrict "setup" train moves for appropriate tracks entering the station that could take place outside of the South Station terminal area, forcing them to take place within the Tower 1 Interlocking. According to the DEIR, this lack of

operational flexibility increases the number of conflicting movements within the already constrained Tower 1 Interlocking, exacerbating congestion, inefficiencies, and delays for trains and passengers.

Finally, the configuration of the Tower 1, Cove and Broad Interlockings also require many diverging moves in and out of the station to be made at Tower 1 Interlocking, at a speed of 10 miles per hour (mph), rather than the Cove or Broad Interlockings, which can be performed at speeds of 30 mph.

The DEIR emphasized the importance of improving service reliability, measured by OTP, at South Station. As noted by MassDOT, the interconnectedness and complexity of service at South Station results in individual train delays not only directly impacting overall station operations, but a cascading effect upon service line operations. Data presented in the DEIR indicate that both Amtrak NEC and MBTA commuter rail service have not met respective OTPs from 2008 to 2012.

Future (2035 No-Build) ridership growth on Amtrak and the MBTA commuter rail system are projected to increase operations at South Station for both revenue and non-revenue trips. Current weekday operations at South Station include 40 Amtrak and 280 MBTA revenue trips and 32 Amtrak and 97 MBTA non-revenue trips, for a total of 449 daily train movements at South Station terminal. By 2035, weekday operations at South Station are estimated to include 80 Amtrak and 315 MBTA revenue trips and 58 Amtrak and 101 non-revenue trips, for a total of 554 daily train movements at South Station terminal, an increase of 23 percent. To accommodate the 2035 operating plan, MassDOT performed simulation tests to determine the appropriate number of station tracks at South Station. These tests concluded that 20 total station tracks (an expansion of 7 tracks) would provide the optimal size to allow train volumes to pass through the Tower 1 Interlocking.

Expansion of South Station, along with implementation of other rail improvement projects, is expected to increase demand of vehicle layover facilities. The DEIR provided a clear analysis identifying the current vehicle layover space deficiencies, and described the additional demand associated with the SSX project. Current MBTA service levels require daytime layover space for 28 trainsets (locomotives and coaches); space exists for only 22 trainsets within dedicated layover facilities. This results in the storage of six non-revenue trains at South Station platforms while waiting for available slots at existing south side layover locations. Storage of trains on the platforms increases congestion at the terminal and creates operational conflicts.

According to the DEIR, Amtrak's current peak layover capacity for South Station service is eight trainsets during the day and 13 trainsets overnight. All of Amtrak's existing layover needs are accommodated at the Southhampton Street Yard. Amtrak's Front Yard is not used by Amtrak for layover functions, but is used for MBTA layover and Amtrak non-revenue trains, rail-bound equipment storage, and Amtrak maintenance-of-way material storage needs.

Layover space is needed to accommodate future MBTA service increases, fleet expansion and transition to longer trainsets (eight-car). Additionally, Amtrak will need to expand within its existing facilities to accommodate layover needs associated with its future service projections

(20 overnight trainset layover spots). While Amtrak has not identified the location of future layover needs, it indicated that it does not foresee a need for additional capacity beyond the use of its current system-wide Amtrak-owned facilities. The MBTA projects that by 2040 it will have the capacity to store only 28 of the 49 trainset spaces needed.⁴

As noted in the DEIR, the location of layover facilities is one of the main factors that determine the required diverging moves within Tower 1, Broad and Cove Interlockings. Currently, all layover facilities are located south of South Station, despite 60 percent of all revenue trains approaching South Station from the western routes. With the addition of Amtrak revenue trains, approximately 70 percent of trains approach from western routes. Exclusively southerly-located layover facilities contribute to the capacity constraints at South Station. While trains accessing layover facilities are non-revenue trains, they are still required to be dispatched carefully, and must pass through the Tower 1 Interlocking just like revenue trains. MassDOT noted the challenges of balancing competing revenue and non-revenue train movements to maximize operational performance near South Station. Given these constraints, MassDOT determined that rail layover facilities should be provided both west and south of South Station, with such split layover facilities improving operations and reducing conflicting movements by keeping trains on one side of the terminal or the other.

Finally, the DEIR discussed the need to improve substandard facilities at South Station. MassDOT has established an overall level of service (LOS) goal of LOS C for the South Station public circulation areas and LOS D for the station platforms in conjunction with the project. The current size and configuration of South Station headhouse facilities do not adequately support current and future passenger service needs. According to the DEIR, the existing headhouse and platforms result in a poor passenger experience (LOS E or F) and the concourse configuration results in confusion and inadequate connections between intercity rail, commuter rail, bus, and transit service.⁵ Furthermore, the station platforms do not comply with modern design standards, including MassDOT's current standard island platform requirements. Presently, Track 1, 2, and 12 can hold a maximum of seven-car MBTA trainsets and Track 13 can only accommodate a six-car MBTA trainset. Train length for Amtrak's Acela service is 664 feet and 748 for Amtrak regional trainsets. The MBTA and Amtrak have identified future berthing requirements associated with longer trainsets at 850 feet and 1,050 feet, respectively. Current platform LOS is adequate (LOS D) with the occupant load of one MBTA commuter rail bi-level coach consisting of an eight-car trainset, but services sharply decline when concurrent train arrivals occur on the same platform. The proposed project design includes platform and passenger waiting area improvements to meet MassDOT's LOS goals and provides a facility that remains a viable and attractive alternative to air and automobile travel.

Public Involvement and Agency Outreach Efforts

The DEIR summarized MassDOT's public involvement and Agency coordination efforts associated with the South Station design and MEPA review process. MassDOT has and will continue to use a variety of techniques to facilitate public engagement. These techniques include:

⁴ This analysis assumed that by 2025, the MBTA would be using a four-track layover yard on an MBTA easement at Beacon Park Yard for layover of 12 trainsets. This analysis also assumed reduced capacity by six trainsets at Southampton Yard and Front Yard due to the proposed expansion of the MBTA's fleet to eight-car trainsets.

⁵ Levels of Service (LOS) for pedestrian flow and queuing range from LOS A (no crowding) to LOS F (extreme crowding).

- Project Mailing List – MassDOT maintains a database of individuals and organizations and sends regular email updates, including the availability to review documents and public meeting dates;
- Social Media – MassDOT provides project-related updates through the MassDOT blog, Twitter, and Facebook pages;
- Meetings and Events – MassDOT hosts public informational meeting to share milestone information and collect comments and suggestions. These meetings have been held with a variety of community, civic, business, and citizen groups potentially affected by the project;
- Online survey – MassDOT opened an online survey in fall of 2013, available in English, Spanish and Chinese, to gather feedback on current and future amenities at South Station. MassDOT will consider the findings of the survey as the project design progresses; and
- Other Project Materials – MassDOT maintains a project website, creates project fact sheets and project snapshots for a non-technical audience, and created a project brochure available in English, Spanish, and Chinese.

Finally, while this project is not subject to the EEA Environmental Justice (EJ) Policy, MassDOT committed to evaluate the project for potential impacts to EJ communities based on federal and State guidelines. The DEIR included an EJ and Title VI Technical Report (EJ Report) prepared in accordance with the ENF and DEIR Certificates and the FRA's *Procedures for Considering Environmental Impacts* (1999). The EJ Report was prepared to demonstrate that MassDOT and the SSX project are in compliance with Title VI of the Civil Rights Act of 1964 and EEA's *Environmental Justice Policy*. The EJ Report described the study's methodology, existing conditions within the study area (both South Station and each potential layover site) with regard to minority, low income, or limited English proficiency populations, and potential project-related impacts to these identified EJ populations. Potential types of impacts assessed included:

- Changes in accessibility and mobility for EJ and disabled populations, compared to changes for non-disadvantaged populations;
- Direct impacts due to relocations and other indirect property impacts; and
- Indirect impacts due to air quality and noise impacts.

The DEIR identified the following conclusions from the EJ Report:

- The proposed transportation improvements will improve station accessibility and mobility for all users, including EJ and Title VI populations;
- The project will not result in disproportionate impacts to EJ and Title VI populations and will not directly displace these populations; no residences will be displaced by the project; and
- The displacement of the USPS facility could affect some EJ and Title VI populations due to facility relocation efforts. However, this facility is anticipated to be relocated within the area. Similarly, the displacement of 30 businesses at the Widett Circle layover facility could affect EJ populations. The EJ Report noted that it is anticipated

that businesses would be relocated in the Boston Area and would not result in the long-term loss of employment.

The EJ Report also included the results of Central Transportation Planning Staff (CTPS) travel demand modeling used to assess any changes to accessibility to needed services or employment for EJ populations. This analysis indicated that the SSX project will result in minimal or no changes for the communities of concern in any of the project alternatives. Finally, permanent changes in the No Build and Build Alternatives are expected to be negligible (either no change or changes of less than two percent) between both EJ and disabled populations and non-disadvantaged populations. The EJ Report concluded that impacts in the No Build and Build conditions will not be disproportionate or adverse on EJ communities or populations.

Alternatives Analysis

As noted previously, since the ENF MassDOT has continued to refine the project alternatives subsequent to additional evaluation of track configuration and platform alternatives, station concept design, layover facility concepts, and joint/private development alternatives.

The DEIR presented the results of an initial (Tier 1) screening of track configuration alternatives for South Station. The Tier 1 screening evaluated a series of “unconstrained” and “constrained” rail alternatives to develop potential track configurations. Unconstrained alternatives included those that were not limited by existing site boundaries and included opportunities located outside the original project study area. MassDOT determined that while these alternatives could accommodate Amtrak and MBTA service expansions, they resulted in unacceptable challenges associated with land acquisition, construction phasing, and separated passenger rail services. These alternatives were dismissed from further consideration.

Constrained alternatives focused on minimizing impacts to existing infrastructure, including SSAR infrastructure, while remaining within the project study area and improving terminal operations. MassDOT developed four alternatives with various layouts at the terminal and Tower 1 Interlocking to optimize operational flexibility, minimize disruption to existing operations, and/or maximize future joint development on-site. Each of these alternatives was subjected to a set of evaluation criteria: platform accessibility, infrastructure maintenance, constructability, and capital cost. The DEIR included tables identifying platform accessibility and the location of proposed crossover moves (i.e., Cove, Tower 1, or Broad) by service line (e.g., NEC, Old Colony, etc.) for each Constrained Alternative.

The DEIR also assessed platform length consistency for each Constrained Rail Alternative (CRA) with the established future platform length requirements by the MBTA (850 feet) and Amtrak (1,050 feet). This assessment included the projected track length reductions associated with the SSAR project. The DEIR described potential innovations MassDOT may incorporate into the project to maximize platform length given the constrained area. These include:

- Locating the locomotive and a portion of the first coach outside the platform, without the ability to board/alight at both ends of the coach. This approach

reduces platform berthing requirements by 135 feet, reducing the effective platform length to accommodate Amtrak trainsets to 915 feet and MBTA trainsets to 715 feet;

- Using a fixed type bumping post in lieu of the longer bumping posts currently in use at South Station;
- Terminating the overhead contact system (OCS) within the station area and using existing station structures (e.g., canopies, beams, columns) to support the OCS instead of using OCS tie-off poles.

The DEIR identified the amount of Tower 1 Interlocking trackwork requirements for each CRA, noting that less trackwork would result in less ongoing maintenance cost. Constructability of each CRA was assessed by evaluating the potential impact constructing the project would have on maintaining ongoing operations at South Station. Some alternatives would require completely shutting down South Station operations, requiring substitute transportation and busing for period of up to two to three years. Finally, order-of-magnitude capital costs for each CRA were determined, considering costs associated with all tracks, signal system, OCS, communication system, and associated civil work within the terminal and station areas, and the interlocking. These order-of-magnitude costs range from \$138 million (CRA 3) to \$493 million (CRA 1).

Based on the results of this assessment, two of these alternatives, CRAs 2 and 3, will be advanced to a Tier 2 screening process. Both of these alternatives support a 20-track South Station layout with up to eight trains moving through Tower 1 Interlocking simultaneously, increase terminal capacity by approximately 55 percent, create new 22-foot wide platforms that meet current ADA and National Fire Protection Association (NFPA) standards, establish direct access to the bus terminal and other modes of transit at South Station, and avoid impacts to the existing South Station Bus Terminal and future bus expansion elements of the SSAR project.

Constrained Rail Alternative 2 (CRA2) would streamline operations at South Station by redesigning the Tower 1 Interlocking to reduce the number of conflicting movements through the interlocking. NEC and Worcester/Framingham routes would access the westerly station tracks and the Fairmount and Old Colony routes would access the easterly station tracks. CRA 2 would also allow access to the MBTA's South Side Service and Inspection (S&I) facility for 18 of the terminal tracks. Tower 1 Interlocking would require extensive reconfiguration. While work could be staged to avoid completely shutting down South Station service during construction, it would likely result in substantial impacts to South Station operations during the construction period.

Constrained Rail Alternative 3 (CRA3) would include the construction of additional terminal tracks by adding special trackwork to the existing Tower 1 Interlocking, minimizing disruptions during the construction period. CRA 3 would maximize platform accessibility by facilitating universal platform accessibility for trains approaching on the Fairmount and Old Colony. Trains traveling on the Framingham/Worcester and NEC routes would have varying access to platforms contingent upon whether crossover moves were made at Tower 1 or Cove Interlockings (Tracks 1-14). CRA 3 would allow access the S&I facility for all tracks.

CRA 2 and CRA 3 include improvements to Cove and Broad Interlockings. These improvements include the installation of new crossovers, track realignment, and installation of a third running track at Broad Interlocking. These improvements will move conflicting train movements to areas outside the terminal that accommodate higher speeds and improve operations at the Tower 1 Interlocking while maintaining the flexibility of train movements within South Station. Additionally, these layout improvements would continue to provide the operational flexibility necessary in the event of an emergency or equipment failure.

The DEIR noted that station, track and layover facility designs will not preclude the placement of infrastructure associated with any future rail electrification that may be undertaken by MassDOT, nor preclude the potential use of diesel multiple units (DMU) if and when they may be incorporated into the MBTA future fleet. Furthermore, the DEIR stated that the project does not include any upgrades for freight traffic, but does not preclude Track 61 from being used for freight service to the Port of Boston in the future. I do note, however, that the introduction of potential future routes, such as those mentioned in some comment letters (e.g., DMU connections from Back Bay to the Boston Convention and Exhibition Center) present their own operational challenges, as they require crossing the NEC. If these projects are designed, funded, and advanced, MassDOT will be required to consider their potential impact on the operational improvements gained through the SSX project itself. However, this analysis is beyond the scope of the SSX project currently under review.

The DEIR also described the results of an initial screening analysis undertaken for the conceptual design of South Station. Similar to the track configurations, this initial evaluation considered both “unconstrained” and “constrained” alternatives. According to the DEIR, initial unconstrained alternatives included expanding the South Station footprint to include the USPS facility site, 245 Summer Street and relocating or altering the SSAR project. MassDOT opted to eliminate concepts that required the acquisition of 245 Summer Street or substantial alteration of the SSAR project to allow for advancement of design alternatives that are more financially feasible and readily constructible. The DEIR outlined a series of design principles for the expansion of the South Station headhouse. These design principles are intended to guide a design responsive to good planning and urban design, station architecture, access and connectivity, and historic preservation.

The DEIR included an expanded alternatives analysis that contained conceptual site layout plans, a summary of potential environmental impacts, and a supporting narrative for each of the following alternatives for the South Station Site:

- A No Build Alternative;
- Alternative 1 – Transportation Improvements Only;
- Alternative 2 – Joint/Private Development Minimum Build; and
- Alternative 3 – Joint/Private Development Maximum Build.

MassDOT has not identified a Preferred Alternative amongst the build alternatives. MassDOT will select a Preferred Alternative prior to submission of the FEIR.

No Build Alternative

The No Build Alternative consists of the following:

- Completion of the SSAR project, including associated expansion of the bus terminal and parking garage and modifications to the platforms and headhouse in the northern portion of the South Station rail terminal.
- South Station would remain in its current configuration with 13 tracks and 8 platforms, with terminal operations, including the Tower 1, Broad and Cove Interlockings configurations remaining unchanged. Activities conducted as part of the MBTA's State of Good Repair (SGP) program would be completed;
- The USPS General Mail Facility would not be relocated and the majority of Dorchester Avenue would remain unavailable for public use;
- Current roadway configurations surrounding South Station would remain unchanged (e.g., Atlantic Avenue, etc.);
- There would be no extension of the Harborwalk along the Fort Point Channel adjacent to the USPS facility;
- There would be no implementation of bicycle and pedestrian accommodations through and around the site; and
- There would be no expansion of joint/private development.

Alternative 1 – Transportation Improvements Only

Alternative 1 includes the expansion of South Station onto the 14-acre USPS facility site, only, with no additional provisions for joint/private air rights development. The South Station terminal would be expanded by 400,000 sf, to a total of 610,000 sf consisting of passenger platform areas and concourse levels with passenger support services, including amenities such as food and beverage sales. Capacity improvements would include the construction of seven new tracks and four new platforms for a total of 20 tracks and 11 platforms. Additionally, several existing tracks and platforms and the Tower 1, Cove and Broad Interlockings would be reconfigured. This Alternative would accommodate the previously approved air rights and station modifications associated with the SSAR project. This alternative also includes the reopening of Dorchester Avenue for public and station access, a 2,500-foot extension of the Harborwalks along Dorchester Avenue, and improved pedestrian and bicycle connections. An existing MBTA/BRA easement (presently utilized as a patio for 245 Summer Street) would be required to reopen Dorchester Avenue as a two-way street.

Alternative 1 also includes the implementation of a series of transit improvements projects expected to be in place by 2035 as indicated in the Boston area's Regional Transportation Plan (RTP). These projects include, but are not limited to:

- South Coast Rail commuter rail service;
- Green Line Extension to Tufts University and Union Square;
- Increased frequencies on the Fairmount Line with four new stations;
- The Silver Line Gateway Project; and
- Increased service on Amtrak intercity trains.

Alternative 2 – Joint/Private Development Minimum Build

Alternative 2 includes all of the transportation improvements provided in Alternative 1 with provisions to support future development through incorporation of appropriate structural foundations into the overall station and track design. Since a specific building program or development partner has not been established for air rights development, MassDOT, as directed by the MEPA office, evaluated the potential environmental impacts associated with a future project that would comply with existing State and local regulations, including existing building height and setback from the Fort Point Channel requirements in the c.91 regulations, the Fort Point Downtown Municipal Harbor Planning Area requirements, and the Massachusetts CZM program. This alternative consists of 660,000 sf of mixed uses including residential (220,600 sf), office (255,500 sf), retail (79,300 sf) and hotel (104,600sf) space located in six buildings ranging up to 12 stories (142 feet) in height. Approximately 234 parking spaces would be provided in structured underground parking.

Alternative 3 – Joint/Private Development Maximum Build

Alternative 3 includes all of the transportation improvements provided in Alternative 1 with provisions to support future development through incorporation of appropriate structural foundations into the overall station and track design. Alternative 3 would also include a joint/private development program unencumbered by the height and setback requirements included in Alternative 2, but would instead only be limited by the FAA's maximum height limit of 290 feet associated with Boston's Logan Airport. This alternative would require an amendment to the Municipal Harbor Plan (MHP), which would modify applicable c.91 regulations for this site. Alternative 3 consists of approximately 2,000,000 sf of mixed uses including residential (774,700 sf), office (917,300 sf), retail (75,620 sf) and hotel (266,600 sf) space in six buildings ranging up to 21 stories (not exceeding 290 feet). Approximately 506 parking spaces would be provided in structured underground parking.

Joint/private development alternatives were based on station requirements, engineering considerations, urban design criteria and financial feasibility. Concepts developed for the track configuration, station design, and layover facility sites are the same in each Build Alternative. Therefore, differences between alternatives presented in the DEIR are limited to those associated with Alternatives 2 and 3. According to the DEIR, MassDOT is conducting an in-depth financial feasibility analysis of joint/private development alternatives to determine financial viability, including potential revenues associated with leasing the air rights to a developer. The results of this analysis should inform the selection of a Preferred Alternative to be presented in the FEIR.

Layover Sites

The DEIR presented the results of a Tier 3 layover site screening analysis, building upon data prepared for the ENF and direction provided in the scope for the DEIR. MassDOT has determined that no single site can provide the physical and operational requirements to fully meet South Station's layover needs. The Tier 3 analysis included evaluation of various layover facility combinations to determine their ability to best meet system-wide layover needs, including expanded service at South Station and use of the four existing layover locations.

Established screening criteria included: ability to meet layover capacity and program needs, railroad operations requirements, and order-of-magnitude cost estimates. The FEIR will present a Preferred Alternative regarding layover facilities, assumed to include BPY and some combination of Widett Circle and/or Readville Yard 2.

Layover No Build Alternative

The DEIR described layover facility conditions associated with a No Build Alternative. In the No Build Alternative, Amtrak and the MBTA would continue to use Amtrak's Southampton Street Yard and the MBTA's Readville Yard 2 and S&I facilities as midday layover sites to support South Station operations. According to the DEIR, due to the planned expansion of the MBTA's fleet to all 8-car trainsets by 2035 (current trainsets vary from 5 to 8 cars) the MBTA would experience reduced layover capacity at Southampton Yard. Amtrak's Front Yard, currently used by the MBTA for midday layover for trainsets with six cars or less, would no longer be available for midday storage. Therefore, in this alternative, the MBTA would increasingly be required to store non-revenue trains at South Station platforms, outlying facilities, or by moving them around within the MBTA system while waiting for slots at the south side layover facilities. Widett Circle would remain in private ownership and no changes would be implemented at BPY.

BTD Tow Lot Layover

The approximately 11-acre BTD Tow Lot is primarily owned by the City of Boston and located approximately one track mile from South Station. It is currently used for the storage of impounded vehicles and by the City of Boston Department of Public Works (DPW). Use of this site would require an easement from Amtrak and displacement of existing on-site City of Boston uses. According to the DEIR, the City of Boston identified a series of requirements for the relocation of BTD uses (e.g., greater than 20 acres, located in City of Boston, etc.). Projected impacts to DPW functions (i.e., fueling facility, salt pile, single-story garages and ramps) would require either major modifications or relocation of the DPW facility. MassDOT determined that there were no sites available that meet the City's criteria for a suitable relocation for BTD and DPW facilities. MassDOT concluded that acquisition of the BTD Tow Lot is impractical and eliminated it from further consideration. I note that recent reports indicate that this site has been identified as a potential location for a future soccer stadium or a venue associated with Boston's 2024 Summer Olympics Bid.

Readville Yard 2 Layover

Readville Yard 2 is an approximately 17.4-acre site located in the Readville section of the Hyde Park neighborhood. It is located at the intersection of the NEC and the MBTA's Fairmount Line, approximately 8.8 track miles south of South Station. This facility, owned by the MBTA, currently houses a maintenance repair facility and is the largest layover yard used by the MBTA for south side service, with a total of 12 tracks. Ten of the tracks are used for storage and two are used for switching and movement of trains. The site also contains a building with three tracks for maintenance functions.

The Tier 3 analysis indicated that Readville Yard 2 could be expanded to provide storage for an additional eight, eight-car trainsets, for a total layover capacity of 18 eight-car trainsets. Support facilities would be expanded by 11,700 sf to provide additional crew space, a support shed, and construction of a power substation. The proposed layover expansion would increase the facility by approximately seven acres. While the MBTA currently owns the majority of this area, a partial taking of approximately 0.7 acres of an adjacent privately-owned property, owned by James Grant Company, would be required.

Beacon Park Yard Layover

The BPY site is MassDOT's preferred location for a westerly located layover facility. BPY is an approximately 30 acre site located in Allston along the MBTA's Worcester/Framingham Line approximately 3.8 track miles west of South Station. Historically, this site has been used as a freight yard and intermodal terminal in Boston for CSXT, which recently relocated to central Massachusetts. BPY is currently owned by Harvard University and remains encumbered by CSXT's operating rights. According to MassDOT, an agreement in principal has been reached with Harvard University to use approximately 22 acres of BPY for a new commuter rail layover, maintenance facility and rail station.

The Tier 3 analysis indicated that BPY could provide layover space for up to 20 eight-car trainsets with 31,400-sf of support facilities consisting of a crew building, support shed, and power substation.⁶ As noted previously, the potential environmental impacts associated with these proposed uses will be reviewed in conjunction with MassDOT's I-90 Allston Interchange project (EEA # 15278).

Widett Circle Layover

The Widett Circle layover facility site is located approximately one mile south of South Station. As noted in the DEIR, this site is comprised of two parcels: Cold Storage and Widett Circle. The Cold Storage parcel, located at 100 Widett Circle, is approximately 6.6 acres in area and currently houses a privately owned temperature controlled food storage and distribution facility. The building has an active rail siding served by CSX Transportation, Inc., (CSXT) with space for six freight cars. The DEIR acknowledged that a change in ownership of this site is anticipated, as plans are being advanced to convert the existing cold storage facility into a construction material recycling facility (EEA # 15070) by Celtic Recycling, LLC. Widett Circle, located at 1 and 2 Foodmart Road, is owned by the New Boston Food Market Development Corporation and is comprised of approximately 30 units leased to food processing, food storage, and food logistics businesses. I note the City of Boston's comment letter identifying Widett Circle as being located adjacent to the Dorchester Avenue corridor from Broadway to Andrew Stations as a "strategic planning area" where the City will be focusing efforts to identify a long term growth and economic plan.

The Tier 3 analysis indicated that Widett Circle could provide layover space for up to 30 eight-car trainsets and a 44,000-sf support facility including a crew building, support shed, and

⁶ I note that the ENF for the I-90 Allston Interchange Project (EEA No. 15278) identified additional potential uses at this facility beyond those mentioned in the DEIR, including maintenance operations such as wheel truing and car washing.

power substation. Construction of a layover facility at this location will require the acquisition of 29.4-acres of private property, relocation of existing on-site businesses and demolition of buildings.

Land Impacts

The South Station and proposed layover facility sites are all characterized by existing urban and industrial land uses. Since these are predominantly altered areas, direct land impacts are anticipated to be limited.

The DEIR included an analysis of existing land uses and zoning at the South Station and layover facility sites. All development alternatives at South Station will require the demolition of the USPS General Mail Facility. The relocation of this facility, if pursued by the USPS, may be subject to separate MEPA review contingent upon the characteristics and location of a new facility. The South Station site is regulated by a number of City of Boston zoning and overlay districts, including but not limited to, the Flood Hazard Overlay District, the Greenway Overlay District, and the South Station Economic Development Area (EDA). The DEIR discussed project consistency with relevant planning documents applicable to the South Station site including the *Fort Point Channel Watersheet Activation Plan*, the *Fort Point District 100 Acres Master Plan*, the *South Bay Planning Study*, and the *Chinatown Master Plan*. The DEIR noted the ongoing master planning process underway by the City of Boston for the South Station/USPS area. MassDOT will coordinate with the City of Boston to ensure that the conceptual joint/private development plans will be consistent with the City's master plan and its recommendations for amendments to and refinements of current zoning.

The proposed layover facilities are located in industrially-zoned areas and are generally consistent with current zoning. The northernmost portion of the Readville Yard 2 site is located in the Neponset River Riverfront Protection Overlay District and the southern boundary is proximate to a single-family residential district. MassDOT will design this facility consistent with the zoning requirements and applicable setbacks and screening requirements.

The DEIR described how the proposed layover facilities may impact existing on-site uses. Two of the proposed layover facilities will require the acquisition of private property; Widett Circle and Readville Yard 2 and displacement of existing businesses at Widett Circle. The DEIR noted that for the construction and/or expansion of the layover facilities, required property acquisitions will be limited to the minimum footprints required to support each function, including access roads, stormwater management facilities, and employee parking area, where required.

The DEIR included a listing of known development projects (either in planning, permitting, construction phases) near the South Station and layover facility sites. The DEIR described the type and size of each project, its location, and status of review according to the BRA's Article 80 database. This summary highlights the growth trends in and around the South Station site, particularly along in the Seaport/Innovation District.

There are no designated Article 97 lands within the project area. Open space within the South Station site includes Rolling Bridge Park, a park of local significance per Section 4(f) and will be assessed as part of the project's federal review process. An existing MBTA/BRA easement (presently include the patio for 245 Summer Street) will be required in order to reopen Dorchester Avenue as a public two-way street.

Wetlands, Waterways and Tidelands

The DEIR identified the general location of wetland resource areas regulated under the Massachusetts Wetlands Protection Act (WPA) on the South Station and layover facility sites. The DEIR summarized potential wetland resource area impacts associated with the SSX project.

- South Station: wetland resource impacts include approximately 346,900 sf (7.9 acres) of 100-foot jurisdictional buffer to coastal bank and approximately 129,200 sf (2.9 acres) of land subject to coastal storm flowage (LSCSF) (100-year floodplain). The project site also contains Coastal Bank and Land Under Ocean (LUO) associated with Fort Point Channel. These resources are beneath the bridges and will not be impacted. Coastal bank is also defined by the Fort Point Channel seawall along Dorchester Avenue. Modifications to the seawall involving excavation or reconstruction are not anticipated but minor repairs to address mortar voids and shifted granite blocks may be conducted. The minor repairs would be considered maintenance activities with no impacts to resource areas of bank, land under the ocean, or land subject to tidal action.
- Widett Circle: No impacts to WPA jurisdictional resource areas are anticipated at this location;
- Readville Yard 2: wetland resource impacts include approximately 2,100 sf (0.05 acres) of Riverfront Area. The project will also impact approximately 14,200 sf (0.3 acres) of the 100-foot buffer associated with the Neponset River bank. The expansion of the layover facility will also impact approximately 9,000 sf (0.2 acre) of potential isolated wetland areas. The DEIR indicated that if this is a classified isolated wetland resource area, it is not subject to jurisdiction under the WPA.

The DEIR described how each project element will be designed and constructed in a manner consistent with relevant performance standards established in the WPA Regulations (310 CMR 10.00).

The DEIR included a discussion of existing floodplain conditions and designations per the current and preliminary Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) within a one-half mile radius of each SSX project component. At the South Station site, based on wave interaction scenarios calculated for Fort Point Channel, the 100-year flood Zone AE has varying base flood elevations. The base flood elevation for the Zone AE in Fort Point Channel is 10 feet (North American Vertical Datum of 1988 (NAVD88)) for the area south of the site boundary, beginning west of Dorchester Ave, east of South Station in Fort Point Channel, the Zone AE area has a base flood elevation of 12 feet (NAVD88), and just south of the Northern Avenue Bridge, the Zone AE has a base elevation of 13 feet (NAVD88). The South Station study area also contains an area of Zone VE, which is the flood insurance rate zone that also corresponds to the 1% annual chance coastal flood, but has additional hazards associated with storm waves. The VE area in Boston Harbor ends at the mouth of Fort Point Channel and

has a base flood elevation of 14 feet (NAVD88) immediately northeast of the Northern Avenue Bridge.

The DEIR also noted that the majority of the South Station study area floodplain extending beyond the surface water of Fort Point Channel is developed land, consisting of roads and commercial development. The extent of the 100-year coastal flood hazard zone includes portions of the site along Dorchester Avenue between the USPS General Mail Facility/South Postal Annex and the Fort Point Channel, and extending to the I-90 ventilation building. One additional area of 100-year coastal flood zone occurs west of and adjacent to the Fairmount Line/Old Colony Railroad Bridge over Fort Point Channel. MassDOT indicated that based on site inspections, it appears that the vertical seawall/bulkheads along the channel predominantly contain the flood waters. The seawall/bulkheads are not a consistent elevation through the site, however, and locations where the 100-year coastal flood zone encroaches upon the site correlate with seawall/bulkheads with less height.

At Widett Circle, the 100-year flood zone does not encroach upon the site boundary; the Zone AE base flood hazard elevation is 10 feet (NAVD 88). In the Readville Yard 2 study area the Neponset River contains Zone AE area that coincide with the banks of the water body.

Chapter 91

The SSX project contains both filled and landlocked tidelands as defined in 310 CMR 9.00. The DEIR included graphics identifying key c.91 jurisdictional criteria (e.g., Mean High Water Mark (MHW), Historic Mean High and Mean Low Water Marks, filled tidelands, landlocked tidelands, etc.) at South Station Terminal and layover facility sites. The MHW of Fort Point Channel was determined to be 4.63 feet above mean sea level (NAVD 88). According to the DEIR, nearly all filled tidelands in the South Station site (including South Station, the USPS facility, MassDOT Vent Building #1 and the Dorchester Avenue extension) are held in fee by the Commonwealth or a quasi-public agency or authority in trust for the benefit of the public, and therefore meet the regulatory definition of Commonwealth Tidelands. Furthermore, the DEIR indicated that the filled tidelands at the South Station site do not meet the definition of landlocked tidelands.⁷

The Dorchester Avenue extension, which separates Fort Point Channel from the existing USPS facility, is owned in fee by the USPS, but the roadway is not open to the public at large for vehicular or pedestrian use. Accordingly, MassDOT concluded that this section of Dorchester Avenue does not meet the definition of a "public way" in the c.91 Waterways Regulations and does not by itself create landlocked tidelands at the South Station site. However, the DEIR noted that in 2000, during the planning for the SSAR, the Massachusetts Legislature created a very narrow exception to the landlocked tidelands provisions of c. 91. Section 85 of Chapter 235 of the 2000 Acts of Massachusetts General Court created a special exception under c. 91 to facilitate redevelopment on air-rights above intermodal transportation facilities that would be located on landlocked tidelands, but for the abandonment of an historic public way. While the statute does not specifically identify South Station as the focus of the Massachusetts Legislature's intent, the site meets the specific geographic criteria contained therein. Therefore,

⁷ Landlocked tidelands are defined as filled tidelands which are entirely separated from flowed tidelands by one or more interconnected public ways in existence on January 1, 1984 (310 CMR 9.02).

for potential air-rights development at the South Station site, this statute creates landlocked tidelands at a point 250 feet landward of the existing mean high water of Fort Point Channel. The Joint/Private Development Alternative 3 reflects these design parameters in compliance with the c.91 regulations. The Widett Circle layover facility contains landlocked tidelands. Readville Yard 2 does not contain any filled or landlocked tidelands subject to the c.91.

The DEIR summarized prior c.91 licensing for the South Station site, noting the license number, year of licensure, licensee, and authorized work. The DEIR distinguished between historic/superseded licenses and those issued for utility work in Fort Point Channel, the Central Artery/Tunnel Project, and the original South Station headhouse and track construction work. The DEIR included a description of proposed structural alterations or changes in use at the South Station site in each of the Build Alternatives (Alternatives 1, 2 and 3).

Each Build Alternative will require a new waterways (c.91) license pursuant to 310 CMR 9.05(1)(a) and (d). The DEIR provided an extensive discussion of demonstrating how each Build Alternative and layover facilities will be designed to meet the c.91 licensing criteria for a non-water-dependent (transportation improvements, joint/private development) and water-dependent (Harborwalk extension) uses. The DEIR identified the applicability of c.91 Basic Licensing Requirements for each Build Alternative and included a supporting narrative describing project compliance with specific provisions.⁸ The DEIR also described project consistency with the c.91 Proper Public Purpose requirements at 310 CMR 9.31(2).⁹

As noted previously, the parameters of Alternative 2 were predicated on the constraints imposed by the c.91 regulations regarding building setbacks and height limitations. The DEIR described proposed open spaces and project elements to activate the ground-level pedestrian environment and establish Facilities of Public Accommodation (FPAs).

The DEIR discussed how the project elements located in the Massachusetts Coastal Zone (i.e., South Station terminal and Widett Circle) comply with the Massachusetts Coastal Zone Policy for the purposes of Federal Consistency Review.

Municipal Harbor Plan

The Fort Point Downtown Municipal Harbor Plan (MHP) applies to approximately 37 acres of land and water and is generally bounded by the old Northern Avenue Bridge to the north, the West Fourth Street Bridge to the south, Fort Point Channel to the east, and Atlantic Avenue and the USPS parcel to the west. According to the DEIR, Phase 1 of the MHP was approved in October 2002 and renewed in February 2013. The Phase 1 MHP is specific to the property at 500 Atlantic Avenue. Phase 2 approval was granted in March 2004 and was specific to Atlantic Wharf only. At that time, the Secretary deferred approval of the Phase 2 area south of Summer Street, which includes the USPS parcel, pending the City's completion of a master planning effort for the South Station area. The master planning effort and MHP Amendment will draw from the BRA's Watersheet Activation Plan for the Fort Point Channel area for a list of potential public benefits for development projects along the Fort Point Channel.

⁸ 310 CMR 9.31(1)(i) and 310 CMR 9.32; 9.33; 9.34; 9.35(2); 9.35(3); 9.35(4); 9.35(5); and 9.36-9.40.

⁹ 310 CMR 9.51; 9.51(1); 9.51(2); 9.51(3)(d); 9.52; 9.53; 9.54; and 9.55;

As noted previously, the City's master planning efforts for the South Station/USPS area is ongoing and the Joint/Private Development Alternative 3 will require an amendment to the Phase 2 Fort Point Downtown MHP. To the extent that Alternative 3 will not meet the numeric standards under 310 CMR 9.00, substitute standards, referred to as "offsets and substitutions" will be required as part of an approved MHP. Potential offset measures anticipated for Alternative 3 will be determined during the preparation of the MHP and will be subject to additional technical and regulatory review during that public process. Such offset measures may include public programming and activation of the open space areas, and additional public amenities. The DEIR also noted that while the Joint/Private Development Alternative 2 is designed consistent with the c.91 regulations, pending decisions by the City of Boston's master planning process for the project area, this development alternative may also require an amendment to the Phase 2 Fort Point Downtown MHP.

Wind and Shadow Analyses

The DEIR included an analysis of potential impacts to the public realm from wind and shadow at the South Station terminal site in compliance with the c.91 regulations. The wind analysis evaluated mean speed and gusts for the No Build and Alternative 3 Build Conditions at 80 sensors located in the vicinity of South Station to identify the potential to exceed established wind speed criteria deemed comfortable for sitting, standing, and walking. Based upon the results of this analysis, MassDOT has incorporated mitigation into Alternative 3 in the form of high coniferous trees and screen walls at the ground plain near the project buildings proposed closest to the I-90 vent building and Dorchester Avenue. These mitigation measures are preliminary in nature and will be refined when final design takes place to ensure that wind conditions are suitable at the ground level environment but demonstrate that it is possible to reduce the wind speed at these potentially sensitive locations.

The DEIR also included a shadow analysis for the following alternatives to demonstrate compliance with the c.91 regulations:

- Existing Conditions (including the No Build Alternative which includes shadow impacts from the SSAR project);
- Alternative 1 – Transportation Improvements Only;
- Alternative 2 – Joint/Private Development Minimum Build; and
- Alternative 3 – Joint/Private Development Maximum Build.

The study used a 3D CAD model of the city and standard sun altitude and azimuth data for October 23. This date is typically accepted by MassDEP and CZM for shadow studies in c.91 jurisdiction. Hourly shadows were estimated from 9:00 AM through 6:00 PM. As stated in the DEIR, the shadow analysis examined the potential impacts to the ground-level public spaces within filled and flowed tidelands focusing on public open spaces, major pedestrian areas, sidewalks and the watersheet of Fort Point Channel. For the purposes of this analysis, shadows cast by proposed buildings or other structures onto existing or proposed buildings in the vicinity of South Station were not considered impacts because they do not meet the criteria established by 310 CMR 9.51(2)(c).

The results of the shadow study identified the following impacts on public spaces:

- Alternative 1 will not create any new shadows on exterior public spaces. As a nonwater-dependent infrastructure project, Alternative 1 would not be subject to 310 CMR 9.51(2)(c).
- Alternative 2 will create net new shadows lasting greater than one hour on South Station site open spaces between the joint/private development buildings for several hours, and late day shadows on the eastern shoreline of Fort Point Channel for approximately one hour, falling on sections of the Boston Harborwalk and across the Fort Point Channel. Alternative 2 will meet the c.91 standards for building height and setback and MassDOT does not expect that mitigation for these impacts will be required.
- Alternative 3 will create new shadows within the South Station site open spaces between the joint/private development buildings for a substantial portion of the day, shading each for approximately four to eight hours. Alternative 3 will also shade approximately 1,000 linear feet of the eastern shoreline of Fort Point Channel for approximately one hour late in the day. New shadows are also expected on the Fort Point Channel watershed in the afternoon. MassDOT opined that the predicted shadows on the South Boston shoreline of Fort Point Channel are not expected to have any adverse effects on public use of these spaces because much of the surrounding areas will already be shaded.

The DEIR also noted that MassDOT does not anticipate a mitigation requirement for new shadows cast on Dorchester Avenue because the Build Alternatives will result in a substantial net benefit to public use of the waterfront. MassDOT also opined that mitigation should not be required for the predicted new shadows on the South Boston waterfront shoreline of Fort Point Channel because of the brief duration.

The DEIR included a discussion of how the project will comply with the Public Benefit Determination (301 CMR 13.00) criteria established for non-water-dependent projects located completely or partially within tidelands or landlocked tidelands. This included a discussion of : the purpose and effect of the project, impact of the project on abutters and the surrounding community, enhancement to the property, benefits to the public trust rights in tidelands, benefits provided through previously obtained municipal permits, community activities on the South Station site, environmental protection and preservation, and public health, safety, and general welfare. Key project elements consistent with the regulations include, but are not limited to, reopening Dorchester Avenue to the public, construction of an extension of the Harborwalk, and reactivation of filled tidelands through mixed-use development and expanded transit, bicycle and pedestrian access. The DEIR concluded that the project will meet the requirements of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168, sec.8) by providing appropriate public benefits and adequately protecting the public trust rights inherent to tidelands.

Climate Change Adaptation and Resiliency

As noted in the Certificate on the ENF, the project is a critical piece of infrastructure not only for the City of Boston and the surrounding region, but is key to the operation of the NEC. As a coastal city, the project has an increased susceptibility to potential damage associated with the affects of climate change, most notably sea-level rise and flooding impacts due to increased storm frequency and intensity.

I commend MassDOT for undertaking a thorough evaluation of potential climate change-induced impacts on the SSX project. The DEIR contained a discussion of potential impacts associated with four categories of concern: storm intensity and frequency; excessive heat; sea level rise, storm surge and floodplains; and hurricane surge. MassDOT noted that in addition to using an analysis of potential climate change impact to inform design elements to be implemented upon construction, this analysis will be used to ensure that the ability to make future modifications will not be precluded.

The DEIR noted the potential for increased storm intensity and frequency to result in reduced function and performance of storm drainage systems and infrastructure supported by those systems. MassDOT intends to reuse portions of existing drainage infrastructure that discharges to Fort Point Channel. These drainage systems were designed using historic precipitation records and predictive models and may not be reflective of currently changing weather patterns. MassDOT will analyze portions of the drainage system to be reused to confirm acceptability for use with evolving precipitation intensity and frequency data, and rising sea levels. The DEIR also stated that increased heat can affect tracks by the expansion of steel rail causing buckling, or possibly causing electrical component failures for devices operating outside of normal temperature conditions. These failures have the potential to cause severe public safety risks or service disruptions. MassDOT intends to consider methods of track manufacturing and installation designed to minimize the buckling effect when developing engineering plans for the SSX project.

The DEIR included an assessment of the impacts of a two-foot sea level rise upon the SSX project, which is consistent with planning for a project with a design life of 50 years, the minimum sea level rise recommended by CZM. Sea level rise will increase the height of storm surges and associated coastal flooding frequencies and permanently inundate low-lying coastal areas. To assess the project's vulnerability to flooding, floodplains in the DEIR study areas were identified using both the effective 2009 and preliminary 2015 FEMA FIRM and Flood Insurance Study (FIS). The DEIR acknowledged that FEMA's current floodplain maps are based upon existing sea levels and historical data and do not account for sea level rise. The study presented in the DEIR estimated the potential reach of future coastal flood zones due to sea level rise by determining existing ground elevations and adding a two-foot sea level rise to the existing FEMA flood elevations. The DEIR noted that this analysis that doesn't take into account changes in bathymetry effecting flooding characteristics. The DEIR included graphics depicting potential areas of inundation in a 100-year flooding event with an additional two-foot sea level rise for the South Station and layover facility sites. This analysis identified the following potential impacts:

- South Station Site - In the absence of mitigation, the 100-year floodplain would encompass approximately 38 acres of the SSX project footprint, representing nearly complete inundation of the site and infrastructure, during a 100-year flood event.
- Widett Circle - The existing 100-year flood elevation does not reach the Widett Circle layover facility site by an overland connection. However, based upon a review of mapped ground elevations at the site, the layover facility site is at or slightly below the 100-year flood elevation depicted at the southern end of Fort Point Channel. There could be risks of flooding through unknown underground connections, such as storm drainage pipes. A future two-foot sea level rise on top of a 100-year flood event would create a direct overland connection to Fort Point Channel, resulting in complete inundation of the 30 acre-layover facility.
- Readville Yard 2 - Based upon the distance of the site from the ocean, the site's elevation, and the presence of downstream dams, it is anticipated that no changes to the 100-year floodplain would occur due to a two-foot rise in sea level.

The DEIR also included an analysis of storm-based flooding scenarios, as these storms can result in water levels that far exceed those experienced during the 100-year flooding event depicted on the FIRMs. MassDOT evaluated potential project site inundation areas using Hurricane Surge Inundation Maps produced as part of a Massachusetts Hurricane Evacuation Study. These maps were produced by FEMA and the Army Corps of Engineers using the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model. The maps show areas of coastal Massachusetts that would become inundated based upon different categories of hurricanes, ranging in strength from Category 1 to Category 4. The hurricane inundation modeling for the Boston area accounts for two potential scenarios: hurricanes with tracks from south or southwest to north or northeast and those that follow a path directly toward land from offshore (from southeast or east). As noted in the DEIR, hurricanes with tracks from south or southwest to north or northeast are predicted to have lower surge levels than those with tracks from the southeast or east.

This analysis identified the following potential impacts:

- South Station Site –A Category 1 hurricane from the east or southeast will inundate portions of the South Station project footprint, including areas along Dorchester Avenue and some areas along the western site boundary. A Category 2 hurricane from the east or southeast will inundate the majority of the area within the project footprint, with the exception of northern portions of the site from the USPS facility extending west to portions of the South Station headhouse. A Category 3 hurricane from the east or southeast will encompass the entire South Station project footprint and surrounding areas, and extend approximately 1,500 feet inland from Fort Point Channel. If the hurricane paths were from the south or southwest, the South Station footprint would not become inundated by Category 1 or 2 storms. Stronger hurricanes categorized as Category 3 and 4 would inundate much of the site, leaving only the northern portions of the USPS facility and headhouse above water.
- Widett Circle – a Category 1 hurricane from the east or southeast will completely flood the layover site, along with the majority of South Boston, Back Bay, and the

Fort Point Channel area, thereby making it the most vulnerable to hurricane surges of all four SSX project sites. If the hurricane path were from the south or southwest, a Category 2 storm or stronger would completely inundate the site.

- Readville Yard 2 – Hurricane surge inundation modeling indicates that this layover facility is not at risk of surge damage resulting from any of the existing hurricane scenarios.

The DEIR included a comparative table of the types of threats (risks) associated with sea level rise or a hurricane and a range of reasonably foreseeable mitigation measures that may be appropriate to address each risk for the station and layover sites. This table also qualitatively categorized potential mitigation measures by their likely relative cost to implement.

Stormwater

The DEIR described existing and proposed stormwater management infrastructure, groundwater and surface water quality conditions within a one-half-mile radius around the South Station and layover facility sites. The DEIR also presented conceptual existing and proposed stormwater runoff rates and volumes for the 2-, 10-, 50- and 100-year storm events at South Station and layover facilities.¹⁰

South Station is located adjacent to Fort Point Channel, which is part of Boston Inner Harbor. Boston Inner Harbor is included on MassDEP's *Massachusetts Year 2012 Integrated List of Waters* as a Category 5 water body and impaired for polychlorinated biphenyls (PCBs) in fish tissue, fecal coliform, enterococcus, dissolved oxygen, and other impairments. A draft Total Maximum Daily Load (TMDL) for Boston Harbor (in its entirety) has been established. Furthermore, the EPA has authorized a total of 36 combined sewer overflows (CSOs) and six NPDES permitted discharges in Boston Harbor. The DEIR identified and described seven CSOs and ten stormwater outfalls discharging to Fort Point Channel. Of the seven CSOs, three are in the immediate vicinity of the South Station site (CSO 064, CSO 065 and CSO 068). The DEIR summarized recent and ongoing efforts by the MWRA to reduce CSOs to Fort Point Channel and Boston Harbor.

The DEIR noted the elevation of each dedicated stormwater outfall, indicating that each outfall is below the highest observed water level in Fort Point Channel (9.6 feet NAVD 88). None of the dedicated stormwater outfall structures have tide gates; plans indicate that CSO 065 does. The DEIR indicated that coastal storm events could affect the functionality of the storm drain outfall to Fort Point Channel on Dorchester Avenue. The existing ground elevation at South Station varies from approximately nine to 16 feet (NAVD 88), meaning that existing "freeboard" ranges from five to 12 feet above the normal daily tidal water levels (MHW). Projected 100-year flood elevations in Fort Point Channel range from 10 to 13 feet (NAVD 88). The DEIR stated that much of the South Station site will be subjected to higher coastal storm tailwater discharge elevations than in the past, eventually returning to draining via gravity once flood levels return to normal.

¹⁰ Preliminary drainage analyses compared Alternative 1 – Transportation Only Improvements with Alternative 3 – Maximum Joint/Private Development. The runoff rates and volumes for Alternative 2 – Minimum Joint/Private Development scenario are anticipated to be the same as those in Alternative 3.

Stormwater from the South Station parcel is collected in closed drainage systems with no associated detention, infiltration or treatment measures. Stormwater from South Station, including tracks and interlockings discharge to either dedicated stormwater outfalls or CSOs. Existing drainage from the USPS parcel, including roof runoff, collects in a closed drainage system and discharges separately from the South Station site to Fort Point Channel. Approximately 1,800 linear feet of track extending into the Cove Interlocking is located within City of Boston's Groundwater Conservation Overlay District (GCOD). However, South Station site itself is outside the GCOD, and on-site improvements do not need to comply with these requirements.

The DEIR also described existing stormwater discharges and infrastructure at each layover facility. Widett Circle is completely impervious with stormwater collected in a series of catch basins located within parking areas and along Widett Circle Road and Foodmart Road. Stormwater from catch basins is collected in a 36-inch storm drain which ties into the overflow portion of a large combined sewer that runs north and south adjacent to the facility, ultimately discharging to Fort Point Channel. There are currently no stormwater detention, infiltration, or treatment facilities at Widett Circle. Readville Yard 2 is located near the Neponset River. The Neponset River is designated by MassDEP as a Class B water and an area south of the site is included in the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern (ACEC). Drainage from Readville Yard 2 discharges to a segment of the Neponset River which is included in MassDEP's *Massachusetts Year 2012 Integrated List of Waters* as a Category 5 water body and impaired for dissolved oxygen, fecal coliform, turbidity, foam/flocs/scum/oil slicks, PCB in fish tissue, debris/floatables/trash, DDT, *e.coli*, and other. In 2002, MassDEP issued a bacterial TMDL for the Neponset River Watershed that includes all segments of the Neponset River. Readville Yard 2 is generally impervious. Existing ballasted tracks include underdrains that discharge via a 12-inch storm drain to the Neponset River. Other site-generated stormwater discharges to a 54-inch storm drain that crosses through the southern portion of the site. Tracks where trains are stored include drip pans which are drained to oil/water separators for treatment prior to discharge to the sanitary sewer system. Similar to Widett Circle, there are currently no stormwater detention, infiltration, or treatment facilities on-site.

Each project site will be designed and constructed in accordance with the MassDEP Stormwater Management Standards (SMS). The DEIR included a brief summary of how the project intends to comply with the SMS, as applicable. Most elements of the SSX project are expected to qualify as redevelopment projects and must meet the redevelopment standards identified in the Wetlands Protection Act regulations. Work proposed at Readville Yard 2 will be required to comply with the SMS in their entirety, as this is not categorized as a redevelopment project.

The DEIR listed non-structural and structural best management practices (BMPs), practices and procedures to mitigate project-related stormwater impacts. Potential non structural BMPs include snow removal and management measures, spill prevention; and source control. The MBTA will develop a detailed operation and maintenance (O&M) plan for each site that addresses specific BMP maintenance measures. The DEIR also described potential structural BMPs that are proposed at each project site. This list also noted those BMPs that may not be appropriate due to identified site constraints (e.g., utility conflicts, unfavorable soil conditions,

etc.,) or those that will not be required to meet stormwater management standards. MassDOT will select BMPs specifically capable of treating urban pollutants and other contributing sources to meet the applicable TMDLs established for Boston Harbor and the Neponset River.

The DEIR indicated that improvements to the existing stormwater management system at the South Station site will be designed in accordance with applicable MassDEP SMS, BWSC standards and design of the stormwater management system for tracks and platforms will be based on the MBTA *Commuter Rail Design Standards Manual*. Similar to BMPs in place at Readville Yard 2, track drainage will include track ballast underlain with a relatively impervious subgrade crowned at each track centerline and drip pans within the rack expansion area. Drip pans will be connected to an oil/water separator prior to discharge to the closed drainage system or sewer system. MassDOT intends to retain the USPS facility closed drainage system to convey roof drainage from the South Station expansion to Fort Point Channel. The existing 81-inch by 81-inch CSO (CSO 065) pipe that crosses Dorchester Avenue and the 64-inch CSO (CSO 064) pipe within Summer Street will be retained and used for drainage connections from South Station. Potential BMPs include deep sump hooded catch basins and proprietary separators to manage Total Suspended Solids (TSS).

The DEIR stated that stormwater management along Dorchester Avenue will be designed based on the MassDOT Project Development Design Guide and will meet the MassDOT Complete Streets guidelines and the City of Boston Complete Streets requirements. The DEIR included an analysis of proposed improvements demonstrating consistency with the Complete Streets initiatives. For all build alternatives, an increase in on-site pervious area is anticipated and low impact design (LID) BMPs such as pervious pavers, bioretention/rain gardens and/or tree box filters are expected to reduce stormwater runoff. The DEIR indicated that stormwater flow rates and runoff volumes at the South Station site will be reduced in all build alternatives compared to the No Build Alternative. While proposed stormwater discharges will continue to be conveyed via CSOs, MassDOT concluded that there will be no impact to the frequency or volume of overflows to the BWSC system due to the anticipated reduction in impervious area and corresponding runoff volumes. Additionally, connections associated with stormwater flows from Dorchester Avenue are expected to tie-in downstream of CSOs, resulting in no impact to the frequency and volume of overflows from the system. Stormwater management BMPs will be utilized to remove TSS and other pollutants from stormwater runoff. The DEIR noted that many BMPs may be impractical to use on-site due to site limitations and the vertical separation between Fort Point Channel and the topography of the site. No new outfalls are proposed.

Stormwater management at each of the layover sites will be designed based on the MassDOT Project Development Design Guide. Locomotive storage areas will include drip pans connected to oil/water separators for pre-treatment prior to connection to the closed drainage system or sewer system. At Widett Circle, proposed stormwater discharges will connect to the existing connection with a 17-foot by 13.5-foot BWSC CSO (CSO 070) that runs under the Widett Circle roadway and discharges into Fort Point Channel. The proposed peak flow rates and runoff volumes are projected to be lower than the No Build Alternative due to an increase in permeable area. The proposed tie-in location is beyond the overflow connection point and should result in no impact on the frequency or volume of overflows from the system. At Readville Yard 2, the existing 54-inch storm drain may need to be relocated based on the

condition of the structure. The expansion of the layover facility will result in an increase of on-site impervious area and a corresponding increase in stormwater peak flow rates. Site-generated stormwater will continue to discharge to the Neponset River via a separate stormwater system. The Readville Yard 2 expansion area will include BMPs to the maximum extent practicable to manage stormwater peak flows and water quality.

The DEIR noted that industrial activities such as those proposed at the layover facilities are regulated under the NPDES Multi-Sector General Permit (MSGP). Compliance with the NPDES MSGP is expected to include requirements such as stormwater effluent limits, monitoring requirements, and other conditions related to post-construction operations at the layover sites.

Water Supply and Wastewater

The DEIR described project-related impacts to water use and wastewater generation. The MWRA provided potable water to the SSX project area, with the BWSC servicing individual properties through its water and wastewater network. Wastewater from BWSC's system is treated at MWRA's Deer Island Wastewater Treatment Facility, which ultimately discharges to Massachusetts Bay. The DEIR did not identify any potential system capacity constraints associated with project's maximum build scenario.

The DEIR described existing water use and wastewater generation conditions at the South Station and layover facility sites, with a description and supporting graphic generally depicting the type, diameter and location of these utilities. The DEIR cited the following existing flow rates:

- *South Station* – 338,950 gallons per day (gpd) wastewater generation and 372,850 gpd water use;
- *Widett Circle* – 13,140 gpd wastewater generation and 14,460 gpd water use; and
- *Readville Yard 2* – 1,950 gpd wastewater generation and 2,150 gpd water use.

The South Station site is surrounded by water and wastewater infrastructure located in adjacent City streets. CSO 065 appears to bisect the property from west to east, located under the existing bus terminal, tracks, and the USPS facility. The eastern part of Widett Circle is bisected by a 20-inch by 16-inch CSO line (CSO 070) and a 66-inch by 92-inch CSO line from the southeast ties into the trunk line on-site. BWSC water mains, sewers and CSOs are also located within Widett Circle and Foodmart Road. The Readville Yard 2 site contains a 10-inch water main that crosses the site to provide water service to the existing facilities and connects the neighborhood south of the site to a 12-inch water main in Truman Highway. Wastewater is discharged from the layover facility to an 8-inch separated sewer main in Wolcott Street.

The DEIR assessed potential water and wastewater impacts at the South Station site by comparing demand and generation estimates in the Maximum Joint/Private Development scenario (Alternative 3) to existing rates. These estimates were provided by use for the South Station terminal and the mixed-use development. Wastewater generation in Alternative 3 was estimated at 750,900 gpd and water demand was estimated at 826,000 gpd, an increase of 122

percent. The DEIR noted that the estimated water usage and wastewater generation at the South Station site would be partially offset by the removal of the USPS facility (22,720 gpd of wastewater and 24,992 gpd of water). Upgrades to existing BWSC water and sewer mains along Atlantic Avenue and Summer Street will be required in Alternative 3. Depending upon project sequencing in Alternative 3, new service connections may be required along Dorchester Avenue. The DEIR did not identify any additional utility connections to the existing infrastructure are part of the project. Projected increases in wastewater generation at the South Station site will require MassDOT to meet inflow and infiltration (I/I) offset requirements established by MassDEP's *Policy on Managing Infiltration and Inflow in MWRA Community Sewer Systems* (BRP 09-01) and with BWSC policy and regulations.

The DEIR indicated that the layover facilities will require sewer connections for the crew building and support shed at each site. The DEIR indicated that only light maintenance activities are proposed at the facilities. Therefore, no industrial wastewater is anticipated to be generated. Proposed wastewater generation and water demand estimates were identified for each layover facility by use type. Wastewater generation at Widett Circle was estimated at 5,850 gpd, with a water demand of 6,440 gpd. The demand estimates for the Widett Circle layover facility are less than existing uses, resulting in a decrease in wastewater generation and water use by 7,290 gpd and 8,020 gpd, respectively. Wastewater generation for Readville Yard 2 expansion area was estimated at 1,560 gpd, with an additional water demand of 1,720 gpd. Total proposed wastewater generation at Readville Yard 2 will increase to 3,510 gpd and water use will increase to 3,870 gpd. The DEIR conceptually identified potential utility tie-in connections at each layover location. At the Widett Circle site, wastewater will discharge to the existing BWSC 15-inch separated sewer in Widett Circle loop road and existing unused mains and services on site will either be removed or abandoned in place. The build condition at Widett Circle will not exceed MassDEP's requirement to provide I/I offsets. However, abandonment of existing infrastructure could reduce the amount of I/I entering the BWSC system. Water service will be provided from one or more connections to the existing BWSC water mains the Widett Circle loop road. At Readville Yard 2 proposed wastewater improvements will include new gravity services to the BWSC utilities and/or internal plumbing connections. Proposed water improvements include relocating the existing water main that bisects the site to prevent it from being covered by proposed buildings. Again, the build condition at Readville Yard 2 will not exceed MassDEP's requirement to provide I/I offsets.

The DEIR identified potential water and wastewater mitigation measures in association with the project. These include efficiency measures to meet MassDOT GreenDOT water and wastewater sustainability goals. To mitigate discharges to CSOs MassDOT intends to provide the required separation from other utilities, including site wastewater systems, when connecting new water mains and connect wastewater discharges to separated sewer systems to the maximum extent practicable. The DEIR generally identified opportunities to meet the I/I offset requirements by improving issues in Dorchester Avenue and the North End. MassDOT should coordinate with MassDEP, BWSC and the MWRA to develop an I/I plan to mitigate wastewater flows on a 4:1 basis in a hydraulically connected sewer system as design advances.

Traffic and Transportation

As noted in the DEIR, the project will provide regional and local transportation and traffic benefits: enhanced transit capacity, regionally and locally to downtown Boston; more efficient train operations; integration of the South Station rail and bus terminals; new pedestrian connections and potential for enhanced waterfront access; new bicycle accommodations; relief of curbside congestion on Atlantic Avenue; improved separation of South Station vehicle traffic and pedestrians/bicyclists; limited parking through the use of shared parking; and restoration of a key roadway connection, Dorchester Avenue.

Public Transit Services

The DEIR provided an overview of the existing and proposed regional and local transportation services utilizing South Station, including existing services, ridership, and capacity, and impacts of proposed ridership upon the public transportation system. Public transportation infrastructure relative to South Station encompasses Amtrak intercity and MBTA commuter rail service, MBTA rapid transit service, MBTA local bus service, and private carrier bus service. The transportation study analyzed project-related impacts for the following scenarios:

- 2012 Existing Condition;
- 2025 and 2035 No Build Condition;
- 2025 and 2035 Alternative 1 Condition;
- 2025 and 2035 Alternative 2, Condition; and
- 2025 and 2035 Alternative 3 Condition.

South Station currently (2012) handles approximately 128,000 daily combined Amtrak, MBTA, and intercity/commuter bus boardings and alightings.

	Amtrak	Commuter Rail	Amtrak and Commuter Rail Total	Red Line	Silver Line	Local Bus	Intercity/Commuter Bus	Total
Existing Conditions	4,100	42,000	46,000	54,000	12,700	2,900	12,200	128,000

The current Amtrak schedule includes 10 weekday roundtrip Acela Express trains between Boston and Washington DC, nine weekday roundtrip Northeast Regional trains between Boston and Newport News, Virginia, and one weekday roundtrip Lake Shore Limited train between Boston and Chicago.

The DEIR also tabulated 2012 weekday MBTA commuter rail boardings and alightings by MBTA route:

MBTA Route	Inbound Alightings at South Station	Outbound Boardings at South Station	Total Boardings & Alightings at South Station
Fairmount Line	364	403	767
Framingham/Worcester Line	3,395	3,802	7,197
Franklin Line	2,759	3,016	5,775
Greenbush Line	1,883	1,934	3,817
Kingston/Plymouth Line	2,468	2,385	4,853
Middleborough/Lakeville Line	2,038	2,263	4,301
Needham Line	1,623	1,894	3,517
Providence/Stoughton Line	5,412	6,075	11,487
Total	19,942	21,772	41,714

The DEIR described potential ridership impacts using data provided by the Central Transportation Planning Staff (CTPS) and Amtrak. The 2035 travel demand forecasts provided by CTPS assume the implementation of transportation projects by 2035, consistent with the currently adopted RTP of the Boston Region Metropolitan Area Planning Organization (MPO). MassDOT also adjusted the CTPS data to include projected Silver Line Gateway ridership, as this is not in the current RTP, and ridership growth on intercity and commuter bus routes, as these are not in tabulated in the CTPS model, expansion of Amtrak intercity rail service, and the South Coast Rail commuter rail extension to New Bedford. I note that while the SSAR project will expand bus terminal capacity, no specific future year plans for the existing private bus carriers were available for use in the analysis. Therefore, intercity/commuter bus service levels were assumed to remain constant between the 2012 Existing Condition and the 2035 Build Alternatives. The analysis also considered pedestrian transfers between modes within South Station using CTPS transfer matrices. These ridership data were provided for each analyzed scenario by transit type (e.g., Amtrak, MBTA Red Line, MBTA local bus, etc.) in the years 2025 and 2035.

2025 Daily Combined South Station Boardings and Alightings:

Joint/Private Development Alternative	Amtrak	MBTA Commuter Rail	Amtrak and Commuter Rail Total*	MBTA Red Line	MBTA Silver Line	MBTA Local Bus	Intercity/ Commuter Bus	Total*
Existing Conditions	4,100	42,000	46,000	54,000	12,700	2,900	12,200	128,000
No Build Alternative	5,200	53,000	58,000	68,000	22,800	3,600	12,700	165,000
Alternative 1	8,100	65,000	74,000	70,000	23,200	3,600	12,500	183,000
Alternative 2	8,100	66,000	74,000	70,000	23,200	3,700	12,700	183,000
Alternative 3	8,100	67,000	75,000	72,000	23,600	3,800	13,100	187,000

2035 Daily Combined South Station Boardings and Alightings:

Joint/Private Development Alternative	Amtrak	MBTA Commuter Rail	Amtrak and Commuter Rail Total ^a	MBTA Red Line	MBTA Silver Line	MBTA Local Bus	Intercity/Commuter Bus	Total ^a
Existing Conditions	4,100	42,000	46,000	54,000	12,700	2,900	12,200	128,000
No Build Alternative	5,500	56,000	61,000	72,000	25,600	3,800	12,800	175,000
Alternative 1	9,300	72,000	81,000	74,000	26,100	3,800	12,600	198,000
Alternative 2	9,300	72,000	81,000	75,000	26,200	3,900	12,800	199,000
Alternative 3	9,300	74,000	83,000	77,000	26,700	4,000	13,300	203,000

As indicated by these ridership forecasts, significant increases in ridership across all modes are anticipated in the No Build Alternative. Additional ridership in the Build Alternatives is directly attributable to the increased transit service facilitated by the expansion of South Station and the air rights development.

The DEIR assessed the impacts of increased ridership at South Station in the Build Alternatives upon future capacity of the MBTA's commuter rail, rapid transit, and local bus routes. This analysis included an assessment of existing and proposed station and platform capacities at South Station and key stations within the MBTA's system's downtown core (i.e., Park Street, Downtown Crossing, State Street, and Government Center). Existing and projected ridership demands for each alternative scenario were compared to available vehicle capacities per the MBTA's *Service Delivery Policy*, the parameters of which were summarized in the DEIR.

Increased ridership on rapid transit or local bus routes attributable to the project is not expected to result in additional crowding impacts that exceed the *Service Delivery Policy* maximum load beyond those already identified in the No Build Alternative. All 2035 Alternatives (No Build and Build), will result in loading on the Silver Line 4 and Silver Line 5 Bus Rapid Transit (BRT) routes anticipated to exceed *Service Delivery Policy* capacity. The DEIR noted that projected overcrowding on the Silver Line 4 and Silver Line 5 routes, however, is due to growth in the No Build Alternative, such as forecasted growth in population, households, and employment, as well as changes in land use and transit services, including increased frequencies on the Fairmount Line and the proposed Silver Line Gateway project, and is not a result of the SSX project.

For commuter rail, the DEIR indicated that 2035 Build Alternative passenger loading on the outbound Canton/Stoughton/South Coast Rail Line is projected to exceed the *Service Delivery Policy's* acceptable level of crowding during the peak evening hour. However, more than sufficient capacity to accommodate the projected passenger load demands will be available within the entire three-hour evening peak period. Adjustments to train schedules could be made to shift peak period trains into the peak hour to mitigate this potential overcrowding.

The DEIR concluded that project-related ridership increases at stations in the downtown core will be imperceptible. At these stations, additional daily boardings and alightings due to the

Build Alternatives are projected to result in a less than one percent increase above 2035 No Build Alternative conditions.

The DEIR included an analysis of pedestrian circulation LOS for the 2012 Existing Condition, the 2035 No Build Condition and the 2035 Alternative 3 Condition. Pedestrian LOS during peak hour ridership periods was evaluated for existing and new commuter and intercity rail platforms, passenger waiting areas adjacent to existing and new platforms (rail head concourse), vertical circulation elements (stairs and escalators), and existing Red Line and Silver Line platforms. This analysis considered the types and locations of trains arriving at South Station (i.e., number of passengers, track location, passenger circulation routes, platform width and length, etc.) in assessing LOS, assuming worst-case scenario to ensure an assessment of maximum potential impact.

This analysis identified worsening LOS compared to the No Build Condition on the existing at-grade commuter and intercity rail platforms in Alternative 3 with poor LOS (LOS E/F) occurring more frequently in Alternative 3 due to the increased number of trains and ridership. Vertical circulation LOS in Alternative 3 is projected to be slightly worse than the No Build Condition, but an acceptable LOS (LOS D) or better is maintained throughout the morning and evening peaks periods. The project will increase pedestrian flows at South Station, with a projected two to four percent increase in daily Silver Line platform activity and an up to six percent increase in passenger activity on South Station's Red Line platforms compared to 2035 No Build Conditions. Compared to the No Build Alternative, Alternative 3 is projected to result in a slightly reduced LOS on the Red Line (LOS D or better) and Silver Line (LOS C or better) platforms during the morning and evening peak hours.

Traffic

The DEIR included a Traffic Impact and Access Study (TIAS) prepared in accordance with EEA/MassDOT Guidelines for EIR/EIS Traffic Impact Assessments. The study area intersections were selected in coordination with the BTB and the BRA.

The study area intersections for the South Station site included the following 21 intersections that were chosen due to their proximity to South Station and the likelihood that they might be affected by the project:

1. Congress Street / Dorchester Avenue
2. Summer Street / Dorchester Avenue
3. Atlantic Avenue / I-93 On-Ramp / Seaport Boulevard
4. Atlantic Avenue / Congress Street
5. Purchase Street / Congress Street
6. Atlantic Avenue / Summer Street
7. Summer Street / Purchase Street / Surface Road
8. Atlantic Avenue / Essex Street
9. Surface Road / Lincoln Street / Essex Street
10. Atlantic Avenue / East Street
11. Atlantic Avenue / Beach Street
12. Kneeland Street / Atlantic Avenue / Frontage Road / I-90 Off-Ramp

13. Kneeland Street / Lincoln Street
14. Kneeland Street / Surface Road
15. South Station Connector / Lincoln Street / I-93 On-Ramp / I-90 and I-93 HOV Ramp
16. Surface Road / South Station Connector
17. Dorchester Avenue / West 2nd Street
18. Dorchester Avenue / West Broadway
19. Dorchester Avenue / West 4th Street
20. Purchase Street / Seaport Boulevard / Oliver Street / I-93 Off-Ramp
21. Congress Street / A Street / Thompson Place

The study area intersections for the layover facility sites include:

1. Frontage Road / Widett Circle Access Road (Widett Circle Layover Facility Site)
2. Widett Circle / Widett Circle Access Road (Widett Circle Layover Facility Site)
3. Hyde Park Avenue / Neponset Valley Parkway / Wolcott Court / Wolcott Square (Readville-Yard 2 Layover Facility Site)
4. Wolcott Court / Layover Driveway (Readville-Yard 2 Layover Facility Site)

The DEIR described existing roadway infrastructure and existing and proposed intersection conditions. MassDOT performed data collection and modeling analyses of intersection operations within the study area and presented intersection and roadway traffic volumes, LOS, volume to capacity ratios and 95th percentile queue lengths for the 2012 Existing Condition, 2025 and 2035 No Build Conditions and 2025 and 2035 conditions for each Build Alternative (Alternatives 1, 2, and 3) in the DEIR. The DEIR summarized known development projects and annual growth rate projections incorporated in to future year (2025 and 2035) analyses. For the Build Alternatives, projected trip generation rates were estimated using the ITE Trip Generation Manual and adjusted to account for mode split, vehicle occupancy, and internal capture per guidance from MassDOT, CTPS, and BTM. Layover facility intersection capacity analyses were identical in each Build Alternative (Alternatives 1, 2, and 3), as layover operations, and resultant traffic generation will not change. To determine if there are existing safety concerns for vehicles, pedestrians or cyclists at study area intersections, MassDOT reviewed the most recently available crash data and compared these rates to MassDOT District 6 averages. All intersections within the study area are below the average crash rate for District 6.

The DEIR indicated that under Existing Conditions (2012) South Station generates approximately 5,400 average daily trips (adt), including 3,400 curbside trips along Atlantic Avenue, 1,400 passenger vehicle trips to/from the high occupancy vehicle (HOV) parking deck, and 600 bus trips to/from the bus terminal.

MassDOT conducted a curbside queue study that indicated that the existing layout along Atlantic Avenue creates curbside congestion at certain peak times of the day, with curb space not meeting peak demand. The DEIR identified the following key issues that contribute to curbside congestion:

- Curbside drop-off/pick-up and taxi activity utilizing the first available curbside slots, leaving the dedicated passenger drop-off/pick-up area adjacent to the bus terminal underutilized;

- Taxis and passenger vehicles using the no stopping zones for curbside drop-off/pick-ups. These no stopping zones are located within intersections along Atlantic Avenue;
- The number of taxis staging for passenger pick-ups in the taxicab pick-up zone (Zone 7) exceeds the dedicated curb capacity and results in the taxis spilling into the street and blocking travel lanes;
- Poor signage, both for wayfinding and designating curbside uses;
- Articulated Silver Line 4 buses takes very wide turns from Essex Street onto Atlantic Avenue impacting traffic flow by requiring the bus to use the entire Atlantic Avenue/Essex Street intersection to maneuver; and
- Frequent jaywalking across Atlantic Avenue.

Furthermore, Atlantic Avenue's one-way street pattern creates circuitous routes to South Station curbside from downtown, resulting in drop-off and pick-up activity in Dewey Square, within the Essex Street intersection, and at the intersection of Summer Street and Dorchester Avenue. The project directly addresses the curbside issues by reopening Dorchester Avenue as a public way and shifting a substantial portion of demand to this roadway segment. The cross-section of the newly opened Dorchester Avenue will accommodate curbside activity along the length of the new headhouse on the southbound side of the newly opened street. This curb space will be designed to accommodate taxicabs, drop-off, pick-up, MBTA buses, and shuttles – providing significant relief of Atlantic Avenue amounting to a 30 percent to 40 percent reduction in curbside traffic. Reopening Dorchester Avenue will also improve traffic flow in the area by absorbing a portion of traffic from A Street, Atlantic Avenue, and Summer Street. These traffic shifts help relieve congestion on these roadways and also create more direct vehicular trips on less congested roadways which benefits regional air quality. In Alternatives 2 and 3, a new service road will be constructed linking the back of the expanded station with the South Station Connector, the existing elevated roadway linking Surface Road and Lincoln Street with the bus terminal and parking deck, providing an additional route for taxicabs and pick-up/drop-off activity to and from I-90 and I-93.

I note that many study area intersections will continue to operate poorly (LOS E or F) in all 2025 and 2035 alternatives (No Build and Build) in the morning and evening peak periods, typical of a downtown environment. The DEIR included a comparative table of these intersection capacities.

Alternative	AM Peak Hour Overall Intersection Capacity		PM Peak Hour Overall Intersection Capacity	
	LOS D or better 2025/2035	LOS E or LOS F 2025/2035	LOS D or better 2025/2035	LOS E or LOS F 2025/2035
No Build Alternative	14/11	7/10	11/9 ^a	10/12
Alternative 1	15 ^a /13 ^a	6/8	12/11	9/10
Alternative 2	15 ^a /13 ^a	6/8	10/9 ^a	11/12
Alternative 3	14 ^a /13 ^a	7/8	9 ^a /9 ^a	12/12

^a The overall LOS rating applies with the exception of one approach, which operates at a lower LOS.

Pedestrian and Bicycle Accommodations

MassDOT conducted pedestrian and bicycle volume counts within the Study Area, noting key routes of travel by each mode. The DEIR also summarized South Station monthly Hubway use for the three most active periods (August, September, and October) and the most popular origin and destination docking stations for South Station Hubway trips.

The reopening of Dorchester Avenue prioritizes pedestrian and bicycle accommodations on the Fort Point Channel side of the roadway, separated from the vehicular curbside activity at the new station headhouse on Dorchester Avenue. MassDOT will extend the Harborwalk by approximately one-half mile along the entire stretch of the Fort Point Channel, closing the last remaining gap in creating a continuous waterfront walkway with seating and landscaping in Downtown Boston. The project includes construction of an approximately one - half mile long new cycle track along Dorchester Avenue that is buffered from traffic and parallel to the newly created pedestrian Harborwalk along the Fort Point Channel. The proposed cycle track will connect with existing bicycle infrastructure and is consistent with future plans by the City, including the South Bay Harbor Trail and the Summer Street Corridor cycle track. The DEIR included a discussion, with existing and proposed conditions graphics demonstrating how public realm improvements will meet Complete Streets Guidelines and provide substantial improvements to pedestrian and bicycle accommodations within the area surrounding South Station.

There are existing Hubway stations in the area on Dorchester Avenue at the end of the South Bay Harbor Trail and on Atlantic Avenue which are anticipated to complement the new cycle track. The project will provide an opportunity to expand Hubway services by creating a second docking location on the east side of South Station. Finally, the new terminal headhouse will include covered, secure bicycle storage facilities.

Traffic Mitigation Measures

The DEIR proposed numerous traffic mitigation measures for build Alternative 1 and Alternatives 2 and 3.

The Proposed roadway mitigation in Alternative 1 includes the following:

- Provide dedicated curbside space for taxicab, passenger drop-off, passenger pick-up, and shuttles along the reopened portion of Dorchester Avenue to address excessive curbside congestion along Atlantic Avenue.
- Remove Atlantic Avenue parking meters. As a near-term mitigation that can be implemented immediately, curbside congestion on Atlantic Avenue would be reduced by eliminating the six parking meters along Atlantic Avenue at Kneeland Street and reprogramming the curb to accommodate drop-off or taxicabs.
- Improve bicycle accommodations on Atlantic Avenue by providing a bicycle lane along the west side of Atlantic Avenue from Kneeland Street to Essex Street.
- Implement intersection upgrades at the following locations to improve traffic flow, reduce queuing, and improve pedestrian and bicycle mobility:

- Atlantic Avenue at Summer Street –implement adjustments to lane assignments and signal timing/phasing. These adjustments include:
 - Restriping the Atlantic Avenue northbound approach, eliminating the shared left-turn/through lane and providing diagonal crossing markings in the intersection;
 - Adding a crosswalk on the westbound approach of the Summer Street/Purchase Street intersection to better accommodate the pedestrian desire line from South Station to Dewey Square;
 - Improving concurrent pedestrian phase timings at Summer Street/Purchase Street intersection to adequately accommodate pedestrians; and
 - Optimizing all intersection signal splits and offsets.
- Purchase Street at Summer Street –add a crosswalk across Summer Street to improve pedestrian crossing.
- Summer Street at Dorchester Avenue – Reopening Dorchester Avenue results in added delays on Dorchester Avenue northbound. Proposed mitigation includes optimizing signal timing and phasing and incorporating bicycle-specific signal equipment, pavement markings, and detection into the intersection layout.
- Surface Road/Essex Street/Lincoln Street – provide additional walk time through pedestrian lead intervals during the concurrent pedestrian phases; install a new crosswalk along the southern east-west crossing from Essex Street to the large median; and optimize the signal timings and splits.
- Congress Street at Dorchester Avenue – optimize signal timing and phasing and increase the pedestrian/bicycle phase to provide adequate clearance time for pedestrians and bicyclists to cross during the exclusive phase.
- Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp – update the MBTA access drive loop detection with the ability to skip the phase if there is no vehicle present and update and optimize intersection phases, splits and offset.
- Dorchester Avenue/West Broadway/Traveler Street – change pedestrian operations to concurrent pedestrian phases, per BTM guidelines and modify the West Broadway westbound approach lane configuration to one left/through and one through/right to better accommodate the vehicle movement onto Traveler Street.
- Dorchester Avenue/West 4th Street – optimize the signal timing splits and offset with Dorchester Avenue/West Broadway/Traveler Street intersection and add concurrent pedestrian walk time.

Alternatives 2 and 3 will require additional roadway mitigation measures to offset the vehicle traffic and parking needs associated with the Joint/Private development. Under these alternatives, all roadway mitigation measures proposed for Alternative 1 will be required, plus the following:

- Implement intersection upgrades at the following locations to improve traffic flow, reduce queuing, and improve pedestrian and bicycle mobility:
 - Atlantic Avenue at Seaport Boulevard – adjust signal timings to improve the Seaport Boulevard approach.
 - Atlantic Avenue at Congress Street – optimize signal timing and phasing.

- Purchase Street at Congress Street – optimize signal timing and phasing.
- Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp – install a new loop detection on the MBTA driveway so driveway phase can be skipped.
- Lincoln Street at the South Station Connector – implement signal timing changes.
- Surface Ramps at the South Station Connector – implement signal timing changes.
- Atlantic Avenue at Congress Street – adjust signal timings to improve the Congress Street approach.
- Atlantic Avenue at Summer Street – adjust and optimize signal timings; eliminate northbound double left conflict.
- Kneeland Street at Lincoln Street - adjust offsets between adjacent intersections for better vehicle progression to minimize queuing.
- Surface Road at Kneeland Street – adjust offsets between adjacent intersections for better progression.

MassDOT has not proposed any traffic mitigation measures at the layover facilities for any of the Build Alternatives, as facility-related traffic trips are expected to be minimal and not contribute to the degradation of intersection traffic.

Transportation Demand Management

The DEIR described the components of a Transportation Demand Management (TDM) program associated with each Build Alternative. TDM measures proposed as part of Alternative 1 include:

- Incorporate bicycle parking in the new headhouse on Dorchester Avenue;
- Construct one-half mile of the Harborwalk adjacent to Fort Point Channel;
- Improve pedestrian connections around and through the South Station site to the neighboring communities of the Leather District, Chinatown, the Downtown/Financial District, and the South Boston Waterfront/Innovation District;
- Provide electronic signage displaying transit schedule information;
- Incorporate curbside space and a shuttle stop for private shuttles along Dorchester Avenue;
- Allow for Hubway to expand its bike share program onto the reopened Dorchester Avenue, and do not preclude an expanded Hubway station in the roadway design phase;
- Work with the City of Boston to improve bicycle accommodations along Atlantic Avenue from Kneeland Street to Summer Street; and
- Participate in the U.S. EPA SmartWay Transport Program to increase energy efficiency and reduce greenhouse gas emissions.

In addition to the TDM commitments proposed in Alternative 1, TDM commitments proposed in Alternatives 2 and 3 include:

- Accommodate electric vehicle charging facilities within the structured parking;

- Charge market rates for off-street parking spaces used by single occupant vehicle (SOV) drivers; and
- Provide car sharing parking (Zipcar or similar program) and carpool/vanpool designated parking spaces in any structured parking facilities.

Monitoring

MassDOT has committed to work with the BTB to conduct a post-development traffic monitoring program. The program will be conducted prior to the start of construction of each phase and repeated six months after the issuance of occupancy certificates.

Air Quality

The project will generate air quality impacts associated with emissions generated by locomotives entering and leaving the South Station terminal and layover facilities, intercity buses from South Station terminal, and vehicular traffic. The DEIR assessed potential project-related air quality impacts utilizing several components: an area-wide impact assessment, which consisted of calculating area-wide project-related pollutant emission inventories; a carbon monoxide (CO) Hot Spot analysis; a particulate matter (PM_{2.5}) Hot Spot analysis, an analysis of Mobile Source Air Toxics (MSATs); an assessment of NO₂ concentrations; an assessment of Air Quality Conformity; and an assessment of construction period impacts.¹¹ MassDOT met with MassDEP prior to the preparation of the DEIR, subsequent to which MassDEP approved the air quality assessment approach for the DEIR. The air quality analysis methodology was comprehensively described in the DEIR.

The DEIR described existing air quality conditions for National Ambient Air Quality Standards (NAAQS) criteria pollutants at the South Station and layover facility sites. The NAAQS, established in conjunction with the federal Clean Air Act (CAA), include ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂) and lead (Pb). Massachusetts is currently in compliance with the 2008 8-hour ozone standard statewide, with the exception of Dukes County. FRA activities must comply with EPA's General Conformity Rule (40 CFR 51 Subpart W). The air quality analysis presented in the DEIR was prepared to demonstrate compliance with the General Conformity Rules.

The DEIR identified project-related criteria pollutants (VOCs, NO_x, PM₁₀, PM_{2.5}, CO and SO₂) at the South Station site for a number of scenarios for comparative purposes. These scenarios included:

- 2012 Existing Conditions;
- 2025 No-Build, Alternative 1, and Alternative 3 Conditions; and
- 2035 No Build, Alternative 1, and Alternative 3 Conditions.¹²

¹¹ MSATs are emitted in both gaseous and particulate form from other vehicles, locomotives, and non-road construction equipment.

¹² MassDOT determined that air quality impacts for Alternative 2 would only be evaluated if violations were predicted for Alternative 3. Violations are not anticipated, so Alternative 2 was not analyzed.

At the layover sites, MassDOT evaluated impacts relative to the No Build and Build Alternative (i.e., Alternative 1). These scenarios were used for each element of the air quality analysis.

Existing regional emissions were provided by source type (i.e., locomotives, motor vehicles, and buses). The analysis demonstrated that the SSX project will not lead to new exceedances of the NAAQS. Decreases in pollutant emissions in the vicinity of South Station are anticipated between 2012 and 2025 due to significant reductions in EPA-mandated pollutant emission factors. Small increases in pollutant emissions in the vicinity of South Station are anticipated between 2025 and 2035 due to the relatively small reductions attributable to EPA emissions factors and an increase in growth of traffic and train volumes. With the exception of SO₂ emissions (increase of 0.02 tons per year), all evaluated criteria pollutant emissions at the South Station site will decrease between the 2012 Existing Condition and the worst-case 2035 Alternative 3 Condition. The analysis identified small increases in pollutant emissions at the layover facilities due to the project, particularly in locations where no layover facilities currently exist, but these will not lead to exceedances of the NAAQS. No mitigation measures are proposed in conjunction with the Build Alternatives for criteria pollutant impacts.

The DEIR included a CO hot spot analysis in accordance with EPA procedures and in consultation with MassDEP. At the South Station site, this analysis evaluated the worst four study area intersections based on LOS analysis, total traffic volume, and geographic coverage. The single worst-case intersection was evaluated for each layover site. All of the studied intersections currently experience maximum 1-hour and 8-hour CO concentrations below corresponding federal and State standards in the existing condition and all future development alternatives. The analysis predicted decreases in CO concentrations in the No Build and Build Alternatives compared to existing conditions due to the projected decrease in motor vehicle CO emissions rates. No mitigation measures are proposed at any of the study area traffic intersections for CO impacts.

A PM_{2.5} hot spot analysis was conducted following EPA's December 2010 guidelines and focused only on the emissions from diesel trains and motor vehicles. The results of this analysis indicated that all modeled 24-hour and annual PM_{2.5} concentrations were well below National and Massachusetts PM_{2.5} standards in all years and alternatives evaluated.

The DEIR air quality analysis consisted of a qualitative comparison of potential project-related MSATs developed using estimates of VOCs and PM_{2.5} emissions as a MSAT surrogate for each SSX alternative. This analysis concluded that in 2025 and 2035, MSATs in Alternative 1 would increase just over 2 percent from the No Build Alternative and MSATs in Alternative 3 would increase just over 4 percent from the No Build Alternative.

According to the DEIR, the project area and the entire state of Massachusetts, is in attainment of the NO₂ standards; therefore, a modeling analysis for NO₂ is not required for this project. However, in response to the scope, the DEIR completed a localized impact assessment of NO₂ emissions using dispersion modeling to disclose potential harmful health effects of transportation-related pollutants emitted by the increase in rail operations due to the increase in the number of railroad tracks at South Station. The analysis concluded that all of the modeled 1-

hour and annual NO₂ concentrations were well below the National and Massachusetts NO₂ standards for all future years and alternatives evaluated.

MassDOT evaluated the potential impacts of diesel particulate matter (DPM) and ultrafine particles (UFPs) in association with the project. According to the DEIR, there are no regulations for either pollutant at the federal or State levels which contain air quality standards, and sufficient data are not available to accurately conduct a quantitative assessment of emissions from the project alternatives. Instead, the DEIR included a qualitative assessment of DPM and UFP emissions in the vicinity of South Station. DPM emissions are anticipated to follow trends of PM_{2.5} emissions from diesel fueled sources. Using PM_{2.5} emissions as a proxy, for each project year Alternative 1 is predicted to produce more DPM emissions than the No Build Alternative and Alternative 3 is predicted to produce more DPM emissions than both the No Build Alternative and Alternative 1. To assess potential impacts from UFPs, the DEIR used fuel consumption in the vicinity of South Station as a surrogate. Similar to DPM emissions, for each project year Alternative 1 is predicted to produce more DPM emissions than the No Build Alternative and Alternative 3 is predicted to produce more UFP emissions than both the No Build Alternative and Alternative 1.

The DEIR described emissions from locomotives and the potential use of locomotive technologies to provide additional air quality benefits to the region or layover and station facilities on a localized level. For the purposes of this assessment, MassDOT assumed that all MBTA trains on the South Coast Rail line and Amtrak trains on the NEC route (Acela and regional) are electric, and all other MBTA commuter rail trains and Amtrak trains on the Inland and Lake Shore Limited routes are diesel powered.

According to the DEIR, EPA's Locomotive Exhaust Emission Standards set upper limits for pollutant emissions based upon the date a locomotive engine is manufactured or remanufactured. These standards limits are categorized in Tiers, with Tier 0 applying to engines manufactured between 1973 and 1992; Tier 1 applying to engines manufactured between 1993 and 2004; Tier 2 applying to engines manufactured between 2005 and 2011; Tier 3 applying to engines manufactured between 2012 and 2014; and Tier 4 standards applying to engines manufactured in 2015 or later. The 2012 Existing Conditions scenario assumed that the typical MBTA locomotive (a F40PH-2C) is in compliance with Tier 1 standards and the typical Amtrak locomotive is in compliance with Tier 0 standards.¹³ The 2025 and 2035 No Build and Build Alternatives assumed that all locomotives are in compliance with Tier 4 standards. This assumption is based on MBTA and Amtrak fleet management plans indicating that the existing fleets will be replaced or rebuilt by 2025 and required to meet Tier 4 standards. Between Tier 1 and Tier 4 emissions reductions are estimated at 82 percent for NO_x, 96 percent for PM, and 75 percent for hydrocarbons.

Amtrak trains along the NEC are electrified; existing MBTA trains and Amtrak inland routes continue to run on diesel. MassDOT is not planning any system-wide electrification processes now or in the foreseeable future (with the potential exception of the current Preferred Alternative for the SCR project) due to current financial and logistical limitations. However, the project will not preclude the possibility of installation of electrified rail, as the project will

¹³ This assumption is based on the diesel locomotives that run on the Lake Shore Limited route. The NEC is electrified.

include clearance and right-of-way designs that will accommodate future electrification infrastructure. Plug-in facilities (shore power) are currently in place at Readville Yard-2. MassDOT will incorporate plug-in facilities at all proposed layover facilities.

Noise and Vibration

The DEIR included a noise and vibration study performed in accordance with the FTA's *Transit Noise and Vibration Impact Assessment* guidance manual. In addition to federal noise and vibration criteria, the DEIR also used the City of Boston Noise Ordinance to assess potential construction period noise impacts. Construction period impacts are discussed in greater detail later in this Certificate. MassDOT collected existing noise levels at the South Station and layover facility sites for both residential and non-residential sensitive receptors and described the primary sources of existing noise (e.g., current layover operations, commuter rail service, etc.).

The DEIR compared predicted noise levels at each noise-sensitive receptor location in the 2035 Build Alternatives with the FTA noise criteria and the estimated change (i.e., increase or decrease) in peak hour noise levels between 2013 and 2035. Train operations were assumed to be the same for all three 2035 Build Alternatives (Alternatives 1, 2, and 3); train operations noise modeling results for Alternative 1 were used in the noise assessment for Alternatives 2 and 3. To determine train-related noise, MassDOT considered train operations by type (diesel or electric locomotive powered), time of day, trainset sizes, location by track number, the presence of intervening noise barriers of buildings, and ground attenuation effects. The analysis indicated that noise impacts from Alternative 1 will occur at a receptor location across the Fort Point Channel (at Necco Street, approximately 950 feet away from the nearest track). The DEIR concluded that due to the removal of the USPS facility, a direct sound propagation path will be created to this sensitive receptor, exceeding the FTA moderate impact criteria. The analysis also identified a moderate impact to 245 Summer Street during the peak-hour noise level (Leq) due to an increase in idle time for Amtrak locomotives at the north end of the station near the building. The joint/private development projects in Alternatives 2 and 3 are expected to entirely enclose the station area and thereby eliminate potential noise impacts to 245 Summer Street and Fort Point Channel. Noise levels inside South Station may increase by 3 to 5 dBA in the 2035 Alternatives 2 and 3, depending on the reverberation characteristics of the enclosed space.

The potential noise impacts at the layover facilities were modeled using a worst-case scenario assuming that all added trains (e.g., 30 trainsets at Widett Circle and 8 trainsets at Readville Yard 2) arrive or leave the facility during the same midday peak hour. Noise impacts at Widett Circle are not projected to exceed FTA criteria as the nearest noise sensitive receptors located along Albany Street are approximately 1,300 feet from the acoustic center of the site. Midday peak hour noise levels at Readville Yard 2 are expected to exceed the FTA moderate impacts criterion at identified residential receptors on Wolcott Street and Riley Road.

The DEIR identified potential noise mitigation measures for the South Station site in Alternative 1 and at Readville Yard 2. At South Station under Alternative 1, MassDOT would install a noise barrier between the easternmost track and Dorchester Avenue to reduce the day-night average sound level (Ldn) across the Fort Point Channel. This noise barrier will be constructed to extend at least three feet above the height of the locomotives to reduce noise

levels by approximately 10 A-weighted decibels (dBA). A noise barrier will also be installed between the building at 245 Summer Street and the train station to reduce the peak-hour Leq levels. At Readville Yard 2, MassDOT will extend the existing noise barrier and berm between the layover facility and Wolcott Street to include the layover facility expansion area. The noise barrier will also be extended to provide noise mitigation to the apartment buildings along Riley Road.

Existing conditions vibration measurements were obtained at four locations at the South Station site: the South Station headhouse; the east side of South Station near Track 13; the west side of South Station near Track 1; and at 245 Summer Street, a building immediately adjacent to the site that operates vibration-sensitive computer equipment in its basement. FTA surface vibration curves were used to predict ground-borne vibration and ground-borne noise levels from transit operations. According to the DEIR, because of the slow speeds at which trains operate when entering and leaving South Station (10 mph or less), typical vibration levels are below the FTA impact criterion of 72 velocity decibels (VdB) for human annoyance. MassDOT conducted a detailed indoor and outdoor vibration measurement assessment at 245 Summer Street using enhanced vibration-monitoring equipment for measuring indoor vibration levels. This analysis identified vibration levels below 60 VdB at a distance of 75 feet from the closest track. These levels are below the FTA outdoor criterion of 65 VdB for buildings with vibration-sensitive equipment. The interior vibration measurements indicated that existing vibration adjacent to the sensitive equipment is due to the mechanical equipment located in the basement and not the trains at South Station. Similar to South Station, trains entering and exiting the layover facilities will operate at low speeds. Therefore, no vibration measurements were conducted at the proposed layover facilities. Potential vibration impacts associated with track switches and crossovers are not anticipated at Widett Circle and Readville Yard 2, as nearby residential receptors are located greater than 130 feet from the switches and thereby assumed to meet the FTA vibration criteria.

Greenhouse Gas Emissions

The DEIR included a GHG analysis prepared in compliance with the MEPA Greenhouse Gas Policy and Protocol ("the GHG Policy"). The GHG Policy requires projects to quantify carbon dioxide (CO₂) emissions and identify measures to avoid, minimize or mitigate such emissions. The GHG analysis quantified the direct and indirect CO₂ emissions associated with the project's energy use (stationary sources) and transportation-related emissions (mobile sources). The GHG analysis estimated stationary source emissions for two project alternatives; Alternative 1 – Transportation Improvements Only and Alternative 3 – Joint/Private Maximum Build.

The GHG analysis evaluated CO₂ emissions for two scenarios as required by the Policy including 1) a Baseline Case and 2) a Mitigation Case. The Baseline Case is designed to meet the Massachusetts Building Code, 9th Edition, with amendments (2012 International Energy Conservation Code (IECC), ASHRAE 90.1-2010), while the Mitigation Case contains energy efficiency design measures in order to meet the anticipated revisions to the Stretch Energy Code

(Stretch Code) as it may be amended in mid-2015 or later.¹⁴ MassDOT met with staff from the MEPA office and the Department of Energy Resources (DOER) prior to performing the GHG analysis to confirm modeling assumptions and methodology and provide clarity on the DEIR scope.

As noted in the DEIR, the City of Boston has adopted the Stretch Code subsequent to its designation as a Green Community under the provisions of the *Green Communities Act of 2008*. Therefore, the project will be required to meet the applicable version of the Stretch Code in effect at the time building permits are sought. The Stretch Code increases the energy efficiency code requirements for new construction (both residential and commercial) and for major residential renovations or additions in municipalities that adopt it. Compliance with the Stretch Code is demonstrated through modeling of energy use for larger buildings, while smaller buildings (less than 100,000 sf) may follow a selected set of “prescriptive” requirements for particular energy efficiency measures. MassDOT intends to meet Stretch Code requirements for the layover facility sites through prescriptive energy measures. As such, no modeling was included in the DEIR.

Direct stationary source CO₂ emissions include those emissions from the facility itself, such as boilers, heaters, and internal combustion engines. Indirect stationary source CO₂ emissions are derived from the consumption of electricity, heat or other cooling from off-site sources, such as electrical utility or district heating and cooling systems. Mobile CO₂ emissions include those emissions associated with vehicle use by employees, vendors, customers and others, and in the case of this project, diesel trains. The GHG Policy requires proponents to use energy modeling software to quantify projected energy usage from stationary sources and energy consumption and mobile source modeling software to predict transportation-related emissions. MassDOT used eQUEST modeling software to assess stationary source emissions and data gathered in conjunction with the study area air quality analysis to determine mobile source CO₂ emissions from locomotives, automobiles/trucks and buses. Emissions factors for automobiles, buses and trucks were determined from references cited in the GHG Policy. Fuel consumption and emissions rates for locomotives were obtained from EPA’s *Locomotive Emissions Standards* EPA-420-R-98-101 (April 1998).

The DEIR provided a general summary of proposed building mitigation measures, mostly focusing on HVAC, lighting, envelope and process categories for the various types of proposed uses (e.g., terminal expansion, hotel and multi-family high-rise. The current preliminary project design does not include modifications to, or ventilation connection with, the existing South Station facilities. The stationary source GHG analysis estimated project-related CO₂ emissions at the South Station site as follows:

- Alternative 1 Baseline = 2,387 tons per year (tpy);
- Alternative 1 Mitigated = 2,192 tpy;
- Alternative 3 Baseline = 7,634 tpy; and
- Alternative 3 Mitigated = 6,736 tpy

¹⁴ MassDOT anticipates that a new Stretch Code (SCII) will be proposed, effective mid-2015 or later. It is anticipated that SCII will require energy use to be between 12 and 15 percent below the baseline of the 2012 IECC requirements.

The reductions in Alternative 1 between the Baseline and Mitigated Conditions were estimated at 195 tpy, or 8.2 percent. The reductions in Alternative 3 between the Baseline and Mitigated Conditions were estimated at 898 tpy, or 11.8 percent. These estimates do not include the potential GHG benefits of renewable energy sources, discussed in further detail later in this section of the Certificate.

The DEIR indicated that depending upon final ownership arrangements, MassDOT may lease space to tenants. In this case, certain energy efficiency measures and operational practices may be implemented during tenant fit-out rather than as part of MassDOT's core and shell design. Tenants would require City of Boston permits for fit-out and will therefore be required to comply with the applicable Stretch Code provisions. The DEIR included a conceptual Tenant Manual with recommendations and requirements for tenant fit-out. The Tenant Manual will require or encourage a commercial tenant to:

- Use variable frequency drives in HVAC distribution systems;
- Reduce lighting power densities in office spaces below Code;
- Design electric wiring and systems compatible with the application of Energy Management Systems and automated lighting controls;
- Use EnergyStar-rated appliances, if available;
- Participate in the state-wide Green Initiatives Recycling Program;
- Implement recycling of construction waste; and
- Promote employee participation in the TDM program.

The DEIR included a calculation of the Energy Use Index (EUI) using United States Energy Information Administration (EIA) Commercial Buildings Energy Consumption Survey (CBECS) EUI values as a benchmark for the EUI resulting from modeling both the Base Case and Build with Improvements scenarios. The DEIR compared the modeled building's EUI to those averages presented in the CBECS. Baseline and Mitigated Case EUIs were generally better than the CBECS averages, with the exception of the terminal building. This discrepancy is most likely due to operational differences between the terminal building and the "public assembly" category identified in the CBECS.

The GHG analysis also evaluated the potential use of on-site renewable energy sources such as wind power, solar or photovoltaic (PV) panels, ground-source heat pumps (GSHPs), district steam energy, and combined heat and power (CHP). Wind turbines and GSHPs were dismissed as potential energy sources for the project due to airspace or below ground conflicts. The DEIR also noted that installation of significant amounts of on-site electric generating capacity may not be feasible due to likely electrical connections through spot networks rather than a radial distribution system. If South Station were served by spot network vaults, any interconnected distributed energy source would be limited to 1/15th of the minimum facility load to prevent excess power from flowing into the network and tripping the network protectors in the vault. This type of connection would also require use of inverter-based equipment. The DEIR concluded that a spot network would preclude all but the smallest on-site CHP systems and would limit PV systems.

A PV capacity analysis was completed using shadow data collected for the South Station site. This shadow analysis identified approximately 70,000 sf of available roof space for solar panel in Alternative 1 and 25,000 sf of available roof space in Alternative 3. The PV capacity analysis assumed that 50 percent of these total roof areas will be impacted by shadows, reducing the effective area available for panel placement to 35,000 sf in Alternative 1 and 12,500 sf in Alternative 3. Alternative 1 could accommodate a 420-kW system (an annual output of 462 MWh), while Alternative 3 could accommodate a 150-kW system (an annual output of 165 MWh). The analysis estimated potential GHG savings and financial feasibility for each PV system assuming both third-party and MassDOT-owned ownership models and State and federal incentives. Third party ownership modeling was determined to be more favorable with shorter payback periods (8 or 9 years). Estimated GHG reductions include 166 tpy in Alternative 1 and 59 tpy in Alternative 3. The PV analysis also estimated thermal generation capabilities for solar hot water (SHW) heating. Alternative 1 was estimated to generate about 42,000 therms per year, offsetting 245 tpy of CO₂, while in Alternative 3, a thermal PV system could generate about 15,000 therms per year, offsetting approximately 88 tpy of CO₂.

The DEIR also identified potential GHG reductions associated with connecting South Station to the existing Veolia district energy system. Steam heat from the facility could be used for domestic hot water production year-round, for building heat during the cooling season, and for power steam-driven absorption chillers for summertime air conditioning. The DEIR noted that using steam from this facility to reduce GHG emissions would be dependent upon the source of steam and the extent of energy losses associated with transmission from Veolia's Kneeland Street Plant and South Station. Veolia uses both CHP systems and conventional boilers to generate steam in this district energy system, the source of which could either provide CO₂ savings or incur a higher CO₂ burden. MassDOT will continue to evaluate renewable energy sources in the FEIR.

The DEIR included a quantification of estimated GHG impacts associated with water and wastewater conveyance and treatment for Alternative 3, the worst-case scenario for development of South Station. In Alternative 3, water-related GHG emissions were estimated at 11.9 tpy and wastewater-related GHG emissions were estimated at 70.3 tpy. Water and wastewater-related GHG emissions for the layover facilities were not calculated per the GHG Policy, as they will not generate flows in excess of 300,000 gpd.

Mobile Sources

Mobile source emissions were evaluated impacts from all transportation sources in the immediate South Station area and locomotive impacts from travel to and from the layover facility sites. The South Station area assessment estimated CO₂ emissions associated with motor vehicles and buses on affected roadways within the project study area and railroad locomotives entering, idling, and leaving South Station in the 2012 Existing Condition, 2025 and 2035 No Build Conditions and 2025 and 2035 Build Condition for Alternatives 1 and 3. These emissions were summarized by type (i.e., locomotives, motor vehicles, intercity buses, and total). The DEIR described various assumptions regarding locomotive type, schedules, throttle notch and fuel rates incorporated into the analysis. I note that the GHG analysis did not tabulate indirect

emissions from Amtrak's electric locomotive service. The FEIR will be required to evaluate these impacts.

The locomotive impacts traveling to and from the layover facilities to the Tower 1 Interlocking were estimated for the 2012 Existing Condition, the 2025/2035 No Build Alternatives and the 2025/2035 Build Alternatives.¹⁵ Layover facility operations were assumed to remain unchanged between 2025 and 2035. The DEIR presented assumptions related to train operations, idling times, and trip length to determine CO₂ emission from both idling and moving trains.

The DEIR also provided net project-related local emissions estimates for 2035 Build Alternatives 1 and 3 and compared project-related emissions to the 2035 No Build Alternative by type (i.e., motor vehicles near South Station, intercity buses near South Station, locomotives near South Station, and locomotives to/from layover sites). These net project-related CO₂ emissions were estimated at 15,467 tpy for Alternative 1 and 15,679 for Alternative 3. These results indicate that the bulk of emissions are generated from trips to and from the layover facilities, with modest reductions (733 tpy) achieved by SSX itself due to reduced congestion and idling time. Emissions totals do not account for the use of electric plug-in facilities which will further reduce locomotive idling emissions and proposed roadway intersection improvements which will reduce vehicle idling and congestion.

Sustainability

The DEIR provided an overview of MassDOT's GreenDOT Policy, a policy designed to promote sustainable economic development; protect the natural environment, and enhance the quality of life in the Commonwealth. Many of the sustainability measures proposed in accordance with the project, including the project's ability to enhance transit service will contribute to reductions in GHG emissions and further the Commonwealth's efforts mandated by the Global Warming Solutions Act and the Commonwealth's transportation mode share goals. The DEIR summarized the project elements' (i.e., headhouse, terminal tracks, Dorchester Avenue, and layover facilities) consistency with the GreenDOT implementation plan.

Historic and Archaeological Resources

The DEIR included an evaluation of the impact of the SSX project on historic architectural and archaeological resources. According to the DEIR, the evaluation of existing conditions and related assessments were conducted in conjunction with the Massachusetts State Historic Preservation Office (SHPO)/MHC, in accordance with Section 106 of the National Historic Preservation Act of 1966 (36 CFR Part 800), as amended, the implementing regulations of the Advisory Council on Historic Preservation (36 CFR 800), and State Register Review procedures (950 CMR 71.00).

In accordance with Section 106, MassDOT established Areas of Potential Effects (APEs) for the South Station site and each proposed layover location. As noted in the DEIR, following

¹⁵ These estimates include trips to all three layover facilities, Widett Circle, BPY and Readville Yard 2 in a worst case scenario (i.e., 30 trains using Widett Circle, 20 trains using BPY, 18 trains (8 new) using Readville Yard 2).

its review of the technical report prepared for the project – *Historic Architectural Resources Technical Report* (October 2014) - MHC concurred with the identification and evaluation of findings, including the APEs.

The DEIR listed historic resources within the South Station APE and noted whether they were listed in the National and/or State Registers of Historic Places (the Registers) or included in the *Inventory of Historic and Archaeological Assets of the Commonwealth* (the Inventory). The following resources are listed on the Registers:

- Fort Point Channel Historic District;
- Leather District;
- Russia Wharf Buildings; and
- South Station Headhouse.

The Commercial Place Historic District and the Fort Point Channel Landmark District are listed in the State Register of Historic Places. The following resources are listed in the Inventory:

- Chester Guild, Hide and Leather Machine Company;
- Chinatown District;
- Federal Reserve Bank of Boston;
- Kneeland Street Steam Heating Plant;
- South End Industrial Area;
- Keystone Building;
- Weld Building;
- USPS General Mail Facility/South Postal Annex;
- MBTA Operations Center Power Substation;
- 245 Summer Street; and
- Gillette.¹⁶

The DEIR noted whether or not properties listed on the Inventory were recommended as National Register-eligible.

The Widett Circle and Readville Yard 2 APEs do not contain historic buildings or structures listed in the Registers. The Widett Circle APE also does not contain any properties listed in the Inventory. A portion of the Readville Yard 2 APE is located within the Readville Industrial Survey Area, which contains two properties listed in the Inventory: Standard Oil Company Depot Complex and Frank Kunkel & Son Hammered Forgings. Previous evaluations of these properties were not recommended as being eligible for the National Register.

The DEIR discussed potential project-related noise and vibration impacts to historic architectural resources. This assessment was expanded in the South Station APE to include potential shadow, wind, and visual impacts. At Widett Circle train operation noise impacts are

¹⁶ The Gillette facility had not been previously surveyed, but MassDOT prepared an inventory form as part of the historic architectural technical report.

predicted to be below FTA impact criteria, construction period noise levels are predicted to not exceed FTA construction noise limits and new vibration will not impact historic properties. Noise impacts are predicted to occur at residences along Wolcott Street and Riley Road, but these impacted properties are not identified as historic properties. Construction period noise levels are not predicted to exceed FTA construction noise limits and new vibration at each site will not impact historic properties within the APE.

Impacts to historic architectural resources associated with the project may be unavoidable. MassDOT will continue to work with MHC and interested parties, such as the Boston Landmarks Commission, to develop appropriate mitigation measures to minimize or mitigate impacts to historic resources.

The DEIR included an assessment of potential impacts to historic resources in the South Station APE for each development alternative (Alternatives 1, 2, and 3). Potential noise, vibration and shadow impacts and proposed mitigation were described previously in this Certificate. The assessment concluded that no adverse visual impacts on historic architectural resource are expected under any development alternative.

MassDOT established archaeological APEs in accordance with Section 106 for the South Station and layover facility sites. The boundary of the APEs for archaeological resources is limited to the area of direct impact for construction activities. MassDOT conducted archival research and a visual field survey to locate and identify visible archaeological sites and sensitive areas where potentially significant belowground resources may be present and affected by the project. This information was used to establish sensitivity rankings (low, moderate, and high) within the SSX archaeological APEs. According to the DEIR, areas assigned moderate or high sensitivities are typically subjected to subsurface testing as part of an intensive (locational) archaeological survey to locate and identify potentially significant sites. The DEIR concluded that given the historic disturbance and use of each APE, assignment of archaeological sensitivity rankings were not warranted. MassDOT recommended no further archaeological investigations associated with the SSX project.

Hazardous Materials

The DEIR provided a summary of potential contamination and hazardous materials issues associated with the South Station and layover facilities sites. The DEIR indicated that MassDOT anticipates encountering some form of contamination as part of project construction given the historic uses within the project area. MassDOT reviewed MassDEP files for assigned Release Tracking Numbers (RTNs) under the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000). The DEIR identified 22 instances of historic release or threat of release into the environment at the South Station site; all RTNs have achieved closure. The DEIR described each RTN and remedial action outcomes (RAOs) and the presence of Memoranda of Understanding (MOUs) or Activity and Use Limitations (AULs). The DEIR acknowledged that initial evaluation of the USPS facility identified the presence of asbestos-containing material (ACM) and other potential sources of hazardous material (e.g., lead paint, mercury-containing equipment, etc.) The DEIR identified 14 instances of historic release or threat of release into the environment at the Widett Circle site; all RTN's have achieved closure. None of the RAOs have

AULs associated with them. Site evaluations of the buildings at Widett Circle have yet to be completed. Finally, the DEIR identified two instances of historic release or threat of release into the environment at the Readville Yard 2 site. One RTN has been closed, while the other, RTN 3-15991, remains open. Site evaluations of the buildings at Readville Yard 2 have yet to be completed.

The open RTN has achieved a Class C-2 RAO, indicating that a condition of No Substantial Hazard exists, but response actions to achieve a Permanent Solution are feasible and required. While this RTN is generally located east of the proposed layover facility, the DEIR indicated that portions of the release site extend onto MBTA/Commonwealth of Massachusetts-owned property. An AUL is proposed that would require maintenance of a geotextile and gravel cover to address residual lead and PCB soil contamination. The proposed remedy may require approval from the EPA. The DEIR noted that site remediation would be an alternative to placement of an AUL on-site.

Construction activities at BPY and Readville Yard 2 could require remediation in compliance with the MCP. The Readville Yard 2 work will require oversight from a Licensed Site Professional (LSP) in conjunction with the Soil Management Plan.

Construction Period

The DEIR described potential construction period impacts associated with the SSX project and outlined proposed mitigation measures to be implemented during the project's construction staging and sequencing. As the project will be undertaken while maintaining rail service to South Station, MassDOT will coordinate rail-related construction activities with the operating railroads including the MBTA and its commuter rail operator, Amtrak, and CSXT. Non-rail-related construction activities will be coordinated with the City of Boston, utility companies, and other public and private entities as necessary. MassDOT envisions that the design of the joint development will be prepared by a private developer, and thus construction-related impacts associated with this portion of the project were not included in the DEIR.

The DEIR included a draft Construction Management Plan (CMP), a draft Construction Waste Management Plan (CWMP) and a potential construction schedule identifying timeframes and durations for various stages of construction activities. The construction schedule assumed the construction of the SSAR project concurrent with the demolition of the USPS facility, with its completion prior to SSX construction. The DEIR described a general construction sequencing plan, with anticipation that construction work at the South Station site and the layover facility sites could advance independently. The layover facility construction is expected to have minimal impact on train operations. The DEIR identified an opportunity to investigate coordination and combination of rail systems' planned maintenance activities with the proposed construction activities to minimize disruptions to train operations.

The DEIR described potential construction period air quality, noise and vibration, site contamination and hazardous material, and utility impacts. The DEIR discussed the proposed content of a CMP designed to include measures to avoid, minimize, and mitigate these aforementioned construction period impacts. The CMP will include construction traffic

management plans (TMPs) for each work zone, prepared in coordination with BTM, to ensure safe vehicular, bicycle, and pedestrian access to South Station and manage traffic within the project study area. The CMP will also include an emissions control plan to address impacts associated with fugitive dust and construction equipment and vehicle exhaust. The DEIR identified potential BMPs and mitigation measures that may be used by the contractor to manage construction-related emissions.

The demolition and construction activity associated with the project is expected to impact the building at 245 Summer Street and the South Station headhouse. While the DEIR indicated that these noise levels are not anticipated to exceed FTA construction noise limits, they are expected to exceed the City of Boston's construction noise limits. Vibration levels are not expected to result in structural damage to nearby buildings, but may exceed FTA human annoyance criterion. A Noise Control Plan will be incorporated into the CMP that includes construction period noise monitoring to determine compliance with FTA and the City of Boston noise limits and methods to mitigate construction-related noise levels, if necessary (e.g. noise barriers of appropriate height, length and location). Vibration measures will be obtained inside the building located at 245 Summer Street to ensure that construction equipment vibration levels do not exceed vibration-sensitive equipment specifications. The DEIR identified a variety of additional noise and vibration control BMPs that may be selected by the contractor.

During construction, dewatering may be required if groundwater is encountered during excavation or if surface water ponds in temporary BMPs or other areas. MassDOT will obtain appropriate permitting approvals from MWRA, MassDEP, or BWSC, as necessary to ensure proper management and disposal of dewatering effluent. MassDOT acknowledged the presence of a BWSC CSO under the USPS facility, indicated that it will employ BMPs to maintain the structural integrity and provide outlet protection of this CSO, including access for continued inspection and maintenance.

Construction at South Station and each layover facility site will require the preparation of a Stormwater Pollution Prevention Plan (SWPPP) in accordance with NPDES Construction General Permit requirements. The SWPPP should identify potential pollutant sources and describe BMPs to be employed for erosion and sedimentation control, temporary stormwater management, dust control, and site stabilization consistent with MassDEP's *Stormwater Handbook* (2008) and MassDOT's *Stormwater Handbook for Highways and Bridges* (2010).

MassDOT will develop contract specifications to ensure consistency with MassDOT's GreenDOT Implementation Plan requirements and project sustainability goals. The DEIR identified the following potential sustainability contract specifications: green fleet encouragement, temporary wood reuse, material purchase location and logistics, recycled paving materials, low-emitting materials, and pest management. Other recycling initiatives may include reuse of granite, recycled content in track-work items, use of reclaimed material, use of alternatives to Portland Cement, and/or use of recycled steel items. Contract specifications will also be developed requiring monitoring and proper utilization of water in the construction process, including measures to minimize losses and encourage reuse. Recycle and recovery apparatus will be required for operations such as dewatering, slurry installations, and drilled caissons.

The project will require the preparation of a CWMP. The project will generate a variety of solid waste associated with building demolition, new and modified track work, and building construction. During preliminary design, MassDOT will conduct a Hazardous Building Material Evaluation at each SSX project site to identify any recognized hazardous building materials. MassDOT will include specifications in project contracts addressing the handling and disposal of asbestos and asphalt, brick and concrete (ABC) in accordance with MassDEP regulations. MassDOT intends to evaluate all materials that leave SSX project site for possible reuse or recycling capabilities, the potential hazardous nature of the material, and final disposal location in accordance with MassDEP regulations. The construction contracts will contain requirements for contractors to maximize the amount and value of materials recovered from the construction and demolition site, including implementing source separation, deconstruction, and other material reuse practices. These contract documents will be written to comply with the goals of the *Massachusetts Solid Waste Plan*.

MassDOT will conduct Phase 1 Environmental Site Assessments (ESAs) at the South Station and layover facility locations. Pending the results of these Phase 1 ESAs, Phase II subsurface investigations may be required to evaluate subsurface contamination and inform the final construction period protocols for managing oil and hazardous materials (OHM), including compliance with the Massachusetts Contingency Plan (MCP) regulations (310 CMR 40.0000).

SCOPE

General

The FEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this scope. The FEIR need not duplicate information provided as part of the DEIR if it remains unchanged as part of the final project presented in the FEIR or is not critical to the evaluation of scope items identified below.

A primary purpose of the scope of the DEIR is to identify alternatives for analysis. Several comments request that the scope for the FEIR be expanded to include additional alternatives that would represent a significant increase in the scope of review and incur substantial additional costs for design, permitting and construction (i.e., study relocation of the headhouse to 245 Summer Street or require MassDOT to advance the NSRL). I decline to expand the scope of the FEIR to incorporate these requests.

Project Description and Permitting

The FEIR should include a detailed description of the project and describe any changes to the project since the filing of the DEIR. The FEIR should include updated site plans, if applicable, for existing and post-development conditions at a legible scale (80-scale or larger) for the South Station Site, Widett Circle and Readville Yard 2. These conceptual plans should include not only on-site work, but any proposed off-site work associated with transportation improvements. The FEIR should include plans at a legible scale clearly depicting each

interlocking (Interlocking 1, Cove and Broad) that will be modified as part of SSX. These graphics should depict existing conditions at each interlocking, environmental or property ownership constraints that may influence their final design, and proposed modifications to trackwork. The FEIR should discuss how the preferred interlocking design will eliminate or reduce delays in a scenario where a locomotive becomes disabled within its trackwork.

If updated ridership projections are available, the FEIR should summarize these changes and discuss how they may affect the overall project. The FEIR should address comments regarding the perceived discrepancy between increases in track layout capacity and future ridership projections.

I note that the No Build and each Build Alternative evaluated in the DEIR assumed the construction of the SSAR project. It is unclear how the project design may be impacted if SSAR does not proceed prior to construction of SSX. The FEIR should include a discussion of how platform lengths, headhouse and concourse circulation and access from the surrounding neighborhood may be altered and how this may affect final project design.

As noted previously, the environmental impacts associated with the BPY layover facility will be reviewed in conjunction with the I-90 Allston Interchange project (EEA # 15278). The FEIR should include an update on the status of this project's funding, design, and MEPA review. If the I-90 Allston Interchange project does not advance in a timely manner and MassDOT wishes to commence use of BPY in a manner beyond that specifically authorized in its agreement with Harvard University, a Notice of Project Change (NPC) may be required for the SSX project.

The FEIR should include an updated discussion of permitting requirements associated with the project and how the project will be constructed in accordance with applicable regulatory performance standards.

Alternatives

The FEIR must include a selection of a Preferred Alternative. This Preferred Alternative should include both South Station improvements (i.e., platforms and track layout, interlocking upgrades, conceptual headhouse design, Dorchester Avenue improvements, and bicycle, pedestrian and intersection improvements) and selected layover facility locations. The FEIR should include the results of the Tier 2 terminal track configurations screening alternatives. The FEIR should describe each modeled alternative, how it will meet Amtrak and the MBTA's future service plans, meet project OTP and delay goals, and allow parallel moves between Tower 1 Interlocking and the terminal. These alternatives should be evaluated based on their impacts to existing infrastructure, construction staging, capital and maintenance costs, and operations with respect to accommodating and coordinating with other SSX project elements, including the station and midday layover facilities, and the SSAR project. The FEIR should clarify how freight operations were incorporated into the evaluation of future service plans and access to and from the layover facilities.

The FEIR should also include an assessment of platform capabilities and berthing abilities, including the number of platforms accessible to each track. The FEIR should note if platforms will not meet established MBTA and Amtrak requirements for longer trainsets. If these standards cannot be met, the FEIR should identify which tracks and platforms will be affected and how this may impact future operations and service capabilities. MassDOT should provide an additional analysis of innovation mechanisms to extend platform lengths. The FEIR should identify which tracks/platforms may implement these techniques and estimated extension lengths. Selection of these techniques should be coordinated with project stakeholders, the FRA, Amtrak and the MBTA.

The FEIR should include a preferred South Station design alternative. The FEIR should describe how the conceptual design is consistent with MassDOT's station design principles, project purpose and need, and established performance objectives. The FEIR should also present a preferred joint/private development alternative, based upon ongoing financial and real estate feasibility analyses.

The FEIR should include an expanded assessment of preferred layover facility operations based upon various combinations and capacities at Widett Circle, BPY, and Readville Yard 2 to support the selection of a Preferred Alternative that meets the project's layover needs. This Preferred Alternative should be informed by the screening analysis, potential environmental impacts, and system operational requirements. This layover facility alternatives analysis should consider how each potential facility will operate and meet expected operational needs either individually or in conjunction with other proposed facilities once integrated into the larger rail system (Amtrak, MBTA, freight) that connects to South Station. The FEIR should specifically address how the location and operations at any of the potential layover facility sites will impact Main Line services for Amtrak, the MBTA and freight services due to necessary train dead-heading and midday storage requirements. The FEIR should also clearly identify proposed maintenance or other rail-related operations that will be undertaken at each layover yard. These activities, and their potential environmental impacts (e.g., industrial wastewater generation, noise impacts), should be accurately reflected in the environmental analyses prepared by MassDOT. The FEIR should clarify if these activities were assumed in the DEIR, and if not, revise analyses accordingly in the FEIR.

The FEIR should include a phasing plan that addresses sequencing and timing of the potential layover facility sites based on operational need. This analysis should consider what available storage capabilities are presently afforded, or could be implemented in a No Build Alternative, to MassDOT at these facilities, noting that use of the layover facility at BPY is subject to an agreement with Harvard University.

I note that the DEIR indicated that public outreach to the residents surrounding the Readville Yard-2 layover facility has yet to be undertaken. MassDOT, in a collaborative effort with the City of Boston, should expand its public outreach specifically to these residents prior to selection of a Preferred Alternative. I expect that the City of Boston will assist MassDOT in facilitating these efforts. Furthermore, the FEIR should include an update on outreach efforts to property owners and potentially displaced business owner at Widett Circle, as the land takings to accommodate this potential facility should inform the determination of a Preferred Alternative.

As part of the FEIR, I encourage MassDOT to consider additional ways to reduce impacts to environmental resources through design modification or the addition of features to further mitigate potential impacts. Additional recommendations provided in this Certificate may result in a modified design that enhances the project's ability to avoid, minimize, or mitigate Damage to the Environment. The FEIR should discuss steps MassDOT has taken to further reduce the impacts of the project since the filing of the DEIR, or, if certain measures are infeasible, the FEIR should discuss why these measures will not be adopted.

The FEIR should describe the interrelationship of the Preferred Alternative with the SSAR project. While each alternative assumes the completion of the SSAR, this project's funding and construction schedule is beyond MassDOT's control. Therefore the FEIR should provide additional analysis of how proposed platform lengths, column placement, passenger waiting areas, and passenger access points are reliant on either action to be undertaken by SSAR or MassDOT and discuss contingencies in MassDOT's Preferred Alternative design if SSAR does not proceed prior to the SSX project.

Land

The FEIR should identify the extent of proposed land takings associated with the project at Widett Circle and Readville Yard 2. The FEIR should characterize the existing conditions on these properties and demonstrate that takings have been limited to the extent practicable given MassDOT's proposed programming needs. The FEIR should discuss MassDOT's legal and regulatory obligations associated with private property takings and describe how MassDOT intends to meet these requirements going forward with the Preferred Alternative.

The FEIR should identify the extent and location of known easements, particularly those associated with water and sewer infrastructure, within the SSX project area. The FEIR should clarify how these easements may impact project construction and operations, and ensure ongoing access to these utilities by the MWRA and/or BWSC for maintenance.

Traffic and Transportation

The FEIR need not include an updated traffic analysis, unless the Preferred Alternative substantively deviates from the Alternatives evaluated in the DEIR with respect to anticipated traffic generation. However, MassDOT should reevaluate the feasibility of additional intersection mitigation measures to further reduce the number of intersections in the study area that currently, or in the future, operate at LOS E and F. If additional mitigation is not proposed, the FEIR should discuss why mitigation measures are infeasible. The FEIR should update proposed TDM measures, traffic-related elements of the proposed CMP, or other relevant traffic mitigation measures as necessary to reflect final design elements of the Preferred Alternative. The FEIR should provide additional data supporting the assumption that approximately 30 to 40 percent of South Station-bound traffic trips will be diverted to a reopened Dorchester Avenue in the Build Alternatives. The FEIR should include graphics identifying proposed routes to and from South Station from key roadways and locations such as South Boston, I-93 north, I-93 south, and the MassPike.

The FEIR should also include conceptual plans at a legible scale for any proposed transportation improvements that clearly identify lane widths, expanded areas of pavement or removal of medians/open space, traffic signals, pedestrian, bicycle, and transit accommodations. This information is necessary to confirm that adequate area is available to ensure the viability of proposed infrastructure improvements and transportation mitigation measures.

The FEIR should include detailed conceptual plans for Dorchester Avenue that clearly indicate the location of and describe available curbside capacity for taxi cabs, MBTA buses, shuttle services, and passenger vehicle drop-off and pick-up. The FEIR should discuss how curbside drop-off/pick-up areas will be accessed and designed to avoid conflict with bus operations, pedestrians and bicyclists. The FEIR should describe how a reopened Dorchester Avenue may be used to reroute MBTA buses to provide more direct bus connections to downtown.

Public Transit

The FEIR should demonstrate that the preferred South Station design will mitigate existing or potential areas of congestion and poor pedestrian LOS, including projected pedestrian congestion on at-grade rail platforms, within the rail head concourse, and connections to the Silver Line and Red Line platforms in the Build Alternatives. MassDOT noted in the DEIR that it will consider the potential for an elevated intercity and commuter rail concourse level that facilitates mid-platform boarding and alighting during normal operations, thereby reducing the overall congestion level on the platforms and concourses.

As noted previously, the project scope will not be expanded to include the NSRL. However, the FEIR should discuss the current planning (State and federal) and funding status for the NSRL and provide additional detail on how the Preferred Alternative will be designed to ensure that its future construction is not precluded. This discussion should include how platform, concourse, headhouse and circulatory routes may be incorporated into potential future access to additional subterranean tracks, or at a minimum, will not preclude construction of future tunnels and support structures.

Pedestrian and Bicycle Accommodations

MassDOT should continue to refine pedestrian and bicycle connection plans between South Station and adjacent streets, the Harborwalk, and through and around South Station to the adjacent neighborhoods (i.e., Fort Point Channel, Seaport District, South Boston, Chinatown, Leather District, etc.). The FEIR should clearly identify these routes and accommodations (e.g., bicycle lanes) and note how the design of the South Station headhouse will enhance these connections. The FEIR should provide additional detail on the conceptual sizing and location of the proposed long-term and short-term bicycle parking, including the anticipated number of bicycle parking spaces based upon mode-share data for South Station.

Transportation Monitoring

The FEIR should clarify elements of the proposed monitoring program, including the types of data to be evaluated, frequency of monitoring, steps to provide further mitigation if anticipated operations and mode share splits are not achieved, and distribution of the reports. As suggested by the Metropolitan Area Planning Council (MAPC), I recommend that MassDOT commit to conducting a monitoring program for all Build Alternatives (Alternatives 1, 2, and 3).

Wetlands and Waterways

The FEIR should identify the location and type of wetlands resource areas on the South Station and layover facility sites, delineated in accordance with the WPA and describe how the project will be constructed in accordance with applicable wetland resource area performance standards. The FEIR should clarify the jurisdiction of the potential isolated vegetated wetland on the Readville Yard 2 site. If alteration of this wetland requires a 401 WQC, the FEIR should discuss how MassDOT will meet the 401 WQC regulations and any applicable performance standards.

The FEIR should discuss the outcomes of the master planning process required in the MHP Phase 2 Decision and the subsequent anticipated MHP Amendment, providing details on the plan components, the design parameters established by the MHP Amendment, public outreach efforts, and other plan aspects. It is anticipated that the master planning process and the MHP Amendment will draw from the City's Fort Point Channel Watersheet Activation Plan that was completed in 2002 to provide a menu of public benefits for development projects along the channel. As noted by the City of Boston and CZM, the Amendment to the MHP must be approved by the EEA Secretary prior to the submission of the FEIR.

The FEIR should include conceptual design plans, graphics and a supporting narrative for the Preferred Alternative that details the location of uses within the building on tidelands and facilities dedicated for public use consistent with c.91 regulatory requirements and/or the MHP Amendment, as applicable. The FEIR should include an updated discussion demonstrating how the South Station site will be designed to meet the c.91 licensing criteria for a non-water-dependent (transportation improvements, joint/private development) and water-dependent (Harborwalk extension) uses.

As noted by CZM, the Alternative 3 shadow analysis performed to demonstrate compliance utilized a preliminary building massing concept. The actual layout of the buildings may change as the development of the site progresses from conceptual to actual. Therefore, to assess all possible shadow impacts of the maximum build out, during the MHP Amendment process, a shadow analysis should be completed using the full envelope of possible Alternative 3 build out. This shadow analysis will result in more shadow impact than would be possible under an actual design, but it will show all of the possible locations where shadow might occur and how much impact is possible with any particular arrangement of buildings at the maximum height. This analysis should be provided for reference in the FEIR.

The SSX project does not currently include a water transportation connection. The FEIR should discuss the feasibility of extending water taxi service to South Station. The DEIR noted that non-navigable portions of Fort Point Channel are located north and south/southwest of the

South Station site, but do not include that portion of the channel directly east of South Station. According to the DEIR, the ACOE has deferred final determination of the navigability status of Fort Point Channel at the South Station site, pending further review. The FEIR should discuss how this determination may impact potential water transportation access to the South Station site.

The FEIR should include an updated discussion of how the project complies with the Public Benefit Determination (301 CMR 13.00) criteria established for non-water-dependent projects located completely or partially within tidelands or landlocked tidelands based upon the selection of Preferred Alternative for the project (South Station site and Widett Circle). Specifically, the FEIR should include a discussion of: the purpose and effect of the project, impact of the project on abutters and the surrounding community, enhancement to the property, benefits to the public trust rights in tidelands, benefits provided through previously obtained municipal permits, community activities on the South Station site, environmental protection and preservation, and public health, safety, and general welfare. At the conclusion of the MEPA process (i.e., in conjunction with a Final EIR), I will issue a Public Benefit Determination in compliance with the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168, sec.8).

Stormwater

The FEIR should include a complete stormwater report, with supporting data and graphics, for the South Station and layover facility sites. This analysis should demonstrate compliance with MassDEP's SMS, as applicable and the guidance presented in the MassDEP comment letter regarding compliance with the redevelopment standards. MassDOT should gather necessary on-site soils and hydrology data to demonstrate the feasibility of surface or subsurface stormwater management BMPs. If feasible, the FEIR should incorporate these BMPs into the stormwater management system design. The FEIR should clarify which proposed BMPs will specifically be implemented within the project to meet the TMDL and Land Uses of Higher Potential Pollutant Load (LUHPPL) requirements. The stormwater management report should include conceptual BMP designs. If climate change adaptation and resiliency measures include designing the stormwater management system to accommodate more frequent and intense storm events, the FEIR should explain how this measure was accounted for in the stormwater management report.

The project includes the use of existing drainage infrastructure. The FEIR should include improved graphics at a legible scale identifying the location of project area stormwater infrastructure (i.e., pipes, easements and outfall locations) and CSO connection locations. The FEIR should describe the condition of the stormwater and CSO pipes and outfalls to Fort Point Channel to ensure the feasibility of their use in conjunction with the project. MassDOT should work with the BWSC to assess the feasibility and potential stormwater management benefit of constructing a dedicated drainage system for the South Station and Readville Yard 2 sites. MassDOT should present the results of this analysis in the FEIR.

The DEIR noted that pervious areas on the eastern and western sections of the Widett Circle site may be suitable for surface stormwater BMPs. The FEIR should report on the

outcome of soil investigations undertaken to determine the infiltration capabilities and overall suitability of the existing soils for the implementation of surface stormwater BMPs. The FEIR should also evaluate the current condition of the 54-inch drainage pipe at Readville Yard 2 and discuss whether it will be relocated in conjunction with the layover facility expansion. Related proposed conditions plans should reflect this infrastructure change, if applicable. The FEIR should include an additional evaluation of the feasibility of surface or subsurface detention, retention, and/or filtration systems at the Readville Yard 2 layover site.

The FEIR should include an assessment of the existing drainage system outfalls to Fort Point Channel to confirm their feasibility for reuse as part of the project, conceivably under a different set of conditions than their original design (e.g., elevated tail water or storms with greater precipitation frequencies).

Climate Change Adaptation

The DEIR identified clear risks to South Station and the Widett Circle layover facility in both increasing sea level rise and hurricane scenarios. While sea level rise will occur incrementally, the risk associated with hurricanes is more acute. The FEIR should discuss how climate change and storm adaptation and resiliency measures will be selected and implemented, either as part of the original project design, or within the design life of the project, with a clear commitment to implementation by MassDOT. MassDOT should consider how adaptable the proposed infrastructure will be in the future, and consider upfront adaptation measures that will be very difficult to implement once the infrastructure is in place. These measures should include, but not limited to, designing the stormwater management system for more intense rain events, installation of tidegates on outfalls, using innovative methods of track manufacturing and installation designed to minimize the buckling effect during extreme heat events, and designing the station and tracks to avoid or withstand flooding impacts associated with hurricanes and the 100-year flood event. If the proponent is considering raising the base level of the site, MassDOT should study the potential flooding impacts to adjacent sites and identify these potential impacts in the FEIR.

As noted in the DEIR, MassDOT, in partnership with FHWA, is conducting a vulnerability assessment project that will identify infrastructure target areas and assets that may be particularly vulnerable to current and future flooding events. The project is composed of seven phases, including: inventory and survey of assets, hydrodynamic analysis, a vulnerability assessment, an adaptation strategy, and is anticipated to result in a final report and presentation by the end of 2014. The FEIR should include a sensitivity analysis comparing the results of this vulnerability assessment and its associated model, the Boston Harbor Flood Risk Model, with that presented in the DEIR to determine if the extent of potential flooding during the evaluated scenarios encompasses a larger than anticipated area. The results of this analysis should be used to guide the selection of appropriate and feasible climate change adaptation and resiliency measures presented in the FEIR.

Finally, the FEIR should provide additional data on the potential depths of inundation within the SSX project area in the 100-year, 100-year plus two feet of sea level rise, and hurricane modeled events. CZM has requested that MassDOT consider a range of flooding

events over the lifetime of the project and provide information about frequency and the expected severity of inundation on the site. Knowing the severity of the anticipated flooding over the design life of the structures during various flooding events will help to inform and identify adaptation strategies.

Water and Wastewater

As requested by MassDEP, the FEIR should include a table further clarifying existing and proposed project-related wastewater flows, including those that may currently be attributable to the USPS facility and those identified as part of the SSAR project.

The FEIR should demonstrate that any proposed changes to the physical configuration, location, and/or hydraulic performance of sewers and outfalls will not affect compliance with Federal Court mandates and regulatory requirements. The DEIR identified potential impacts from sea level rise and coastal storms to CSOs and MWRA facilities indicating that three CSO outlets to Fort Point Channel near the South Station site may require additional mitigation measures to minimize seawater entering back into the CSO lines. The FEIR should describe in further detail the nature, potential scope, and location of these impacts and identify potential migration measures and the anticipated responsible party.

The FEIR should clarify potential water use and wastewater generation at the proposed layover facilities based upon operational programming (e.g., car washing). The FEIR should identify any additional permitting requirements if industrial wastewater discharges are proposed as part of the project and discuss BMPs that could be implemented to reduce water use and wastewater discharges (e.g., use of recycled wash water).

Air Quality

The FEIR should clarify if the air quality analysis conducted in the DEIR considered the potential concentration of air pollutants within the platform and track area at South Station subsequent to the construction of Build Alternatives 2 or 3. If this analysis did not evaluate this condition, the FEIR should include supplemental analyses of criteria pollutants, UFPs and DPM in the Build Condition.

The FEIR should discuss how the preferred station design and South Station platform and track layout will not alter the anticipated noise and vibration characteristics of the site modeled in the DEIR. If the Preferred Alternative will alter these modeling results, the FEIR should include an updated noise and vibration analysis conducted in accordance with FRA and MassDEP requirements to ensure that appropriate mitigation measures are provided.

Conceptual plans in the FEIR should indicate the location, type and elevation of proposed noise barriers within the SSX project areas. The DEIR also noted that noise levels inside South Station may increase by 3 to 5 dBA in the 2035 Alternatives 2 and 3, depending on the reverberation characteristics of the enclosed space. The FEIR should identify how station design elements will provide noise mitigation in interior spaces.

The FEIR should discuss whether MassDOT will implement noise and operational best management practices (BMPs) equal to or more stringent than those currently utilized at other layover facilities along the commuter rail. MassDOT should confirm that a forum for citizen complaint will be implemented as a BMP in the operational plan for any proposed layover facilities and at South Station. The FEIR should identify these proposed BMPs and note any contractual obligations associated with the operator of the MBTA's commuter rail. Specific consideration should be given to the hours of operation at each layover facility, potential idling times of locomotives and proximity to sensitive receptors. The FEIR should include a feasibility assessment of potential mitigation measures, a phasing plan for their implementation, and identification of responsible parties for their construction and maintenance.

Greenhouse Gas Emissions

The FEIR should clarify certain elements of the stationary source and mobile source GHG analyses presented in the DEIR. The FEIR should provide additional analysis, documentation or descriptive narrative as necessary to address the concerns identified below.

The FEIR should include a clear and complete listing of modeling inputs (e.g., R-values, U-values, efficiencies, lighting power density, etc.) for items such as equipment, walls, ceilings, windows, lighting, HVAC units, etc. that were modeled in the Baseline Case and Build with Mitigation Case to allow for an easier comparison with Building Code requirements.

The FEIR should clarify the calculated total energy use estimates for the Joint/Private Development projects. Energy use estimates presented in the DEIR did not identify any energy use reductions between the Baseline and Mitigation Cases for domestic hot water or exterior lighting, and reductions for miscellaneous equipment loads were only applied to residential uses. The FEIR should provide a discussion of these results. The DEIR noted that the preliminary project design did not include modifications to, or ventilation connection with, the existing South Station facilities. The FEIR should confirm if the preferred station design maintains this separation. If not, the GHG analysis may need to be revised to reflect this interconnection. MassDOT should contact the MEPA office prior to undertaking additional analysis if interconnections are proposed.

The FEIR should include additional analysis of technical and economic feasibility of the following potential renewable energy sources:

- Veolia steam network connections, including the use of steam to power absorption chillers;
- Solar PV or solar hot water (SHW) installations; and
- On-site CHP, including CHP-serving absorption chillers.

These analyses should clearly state design assumptions, calculate projected energy savings based upon overall project demand (e.g., domestic water demand, etc.), potential GHG emissions reductions, and describe implementation or permitting challenges.

The FEIR should include at a minimum a commitment to construct buildings to be “solar ready” to facilitate future installation of PV systems. If PV is not financially feasible, I request that MassDOT commit to revisit the PV financial analysis on a regular timetable and to implement PV when the financial outcomes meet specified objectives.

The FEIR should include an updated draft tenant manual to reflect the elements of the Preferred Alternative, the recommendations from MassDEP (if feasible), and any potential modifications to the proposed ownership and/or tenant leasing structure.

The mobile source emissions analysis should be revised to account for indirect electrical use associated with the proposed plug-in facilities at South Station and the layover sites. MassDOT may also choose to evaluate mobile source emissions improvements attributable to reduced idling and congestion associated with the proposed traffic intersection improvements.

The DEIR notes various sustainability benchmarking standards and/or requirements as they apply to MassDOT facilities. The FEIR should clarify which standards MassDOT must adhere to in the final design process and those which are merely informational. The FEIR should clarify how the project intends to meet these standards given, in some cases, the outdated benchmarks (e.g., ASHRAE 90.1-2004 for LEED Plus) compared to current Massachusetts Stretch Code standards. The FEIR should also clarify which sustainable infrastructure rating system MassDOT intends to adopt to ensure the project design meets targeted sustainability goals.

Historic Resources

The FEIR should describe how the preferred station design will mitigate potential impacts to historic resources. In a letter to Michelle Fishburne at the FRA, dated December 23, 2014, the MHC requested that conceptual designs for new construction and/or modification to the South Station headhouse be submitted to MHC for review and comment. This letter also requested that MassDOT include a matrix of potential effects for National Register-Listed or National Register-eligible historic architectural resources with the Preferred Alternative’s APE. The FEIR should provide an update on the Section 106 review process and identify proposed mitigation measures for impacts to historic architectural resources. Interim correspondence and project renderings between the FRA, MHC and/or City historic review authorities should be provided as an appendix for reference.

Hazardous Materials

MassDOT will conduct Phase 1 Environmental Site Assessments (ESAs) on the project properties. If any Recognized Environmental Conditions (RECs) are identified, the FEIR should include a draft site-specific health and safety plan (SSHASP). Upon selection of a Preferred Alternative, MassDOT should conduct any Phase II ESA’s identified subsequent to the Phase 1 ESA process and present the results as part of the FEIR. If a Phase II is required, the FEIR should identify the components of a draft soil and groundwater sampling and analysis program to ensure compliance with the MCP and inform the selection of mitigation measures proposed in conjunction with the project or the construction process. The FEIR should specifically discuss

how MCP-regulated conditions may impact construction techniques (i.e., dewatering, foundation types, etc.) or potential site infrastructure (e.g., groundwater and stormwater management) in the Preferred Alternative.

The FEIR should discuss the potential implications of the AUL on the Readville Yard 2 site. The FEIR should identify the responsible party, plans for remediation, and how compliance with the MCP may impact layover facility design or the construction timeline.

Construction Period

The FEIR should include an evaluation and description of potential construction period access locations and laydown areas for station, rail and layover facilities. I encourage MassDOT to continue to develop staging and construction period access plans in collaboration with the City of Boston, Amtrak, the MBTA and other landowners as required. The FEIR should also describe how Amtrak, MBTA commuter rail and light rail, bus, and freight service will be modified and accommodated during project construction (on a per phase basis) for both the South Station Site and construction of selected layover facilities, as applicable.

I strongly encourage MassDOT to commit to monitoring noise and vibration levels after service starts (with the proposed mitigation in place) to evaluate whether actual noise and vibration levels correspond with the modeled values. MassDOT should indicate how appropriate corrective actions may be determined and implemented if actual values are found to be higher than the projections.

The FEIR should include a revised draft CMP, as necessary, to reflect the elements of the Preferred Alternative. The CMP should specifically discuss provisions for construction worker parking, noting the challenges of a large urban construction site. The revised draft CMP should also identify potential triggers for remedial action based upon construction period monitoring results.

Mitigation

The FEIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include draft Section 61 Findings for each State Agency that will issue permits for the project. The FEIR should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation, updating these elements as necessary from those presented in the DEIR. While local roadway improvements may be memorialized in future TAPAs with the City of Boston, the relationship of the project to state-jurisdictional roadways necessitates that the FEIR clearly indicate the implementation of mitigation measures based upon project phasing, either tying mitigation commitments to specific building projects, floor area thresholds, or traffic/wastewater demand or thresholds, to ensure that measures are in place to mitigate the anticipated impact associated with each development phase.

The project includes a variety of public-realm infrastructure improvements. The FEIR should include a conceptual long-range maintenance plan these public-realm improvements, including identification of responsible parties, to ensure adequate upkeep of these project-related improvements. If a long-term maintenance plan structure is unknown, the FEIR should include a commitment by the MassDOT to work with the City and neighborhood associations to establish a plan.

To ensure that all GHG emissions reduction measures adopted by MassDOT in the Preferred Alternative are actually constructed or performed, I require proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. Specifically, I will require, as a condition of a Certificate approving an FEIR that following completion of each project construction phase MassDOT provide a certification to the MEPA Office signed by an appropriate professional (e.g., engineer, architect, transportation planner, general contractor) indicating that the all of the mitigation measures proposed in the FEIR have been incorporated into the project. Alternatively, MassDOT may certify that equivalent emissions reduction measures that collectively are designed to reduce GHG emissions by the same percentage as the measures outlined in the FEIR, based on the same modeling assumptions, have been adopted. The certification should be supported by plans that clearly illustrate where GHG mitigation measures have been incorporated. For those measures that are operational in nature (i.e. TDM) MassDOT should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving the measures will be obtained. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings included in the FEIR.

Responses to Comments

The FEIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the FEIR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the FEIR beyond what has been expressly identified in this certificate.

Circulation

The Proponent should circulate the FEIR to those parties who commented on the ENF, and/or the DEIR, to any State Agencies from which the Proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. A copy of the FEIR should be made available for review at the nearest neighborhood branches of the Boston Public Library. To save paper and other resources, the Proponent may circulate copies of the FEIR to commenters other than State Agencies in CD-ROM format or post to an online website, although the Proponent should make available a reasonable number of hard copies, to accommodate those without convenient access to a computer to be distributed upon request on a first come, first served basis. The Proponent should send a letter accompanying the CD-ROM or identifying the web address of the online version of the FEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments.

December 31, 2014

Date


Maeve Vallely Bartlett

Comments received:

11/18/2014	Ned Imbrie
11/24/2014	Katherine Green Meyer
12/1/2014	Coleman Hoyt
12/2/2014	Robert J. La Tremouille
12/7/2014	Congressman Michael E. Capuano (Massachusetts 7 th District)
12/12/2014	Steve Hollinger
12/15/2014	City of Boston
12/17/2014	Greater Boston Chamber of Commerce
12/18/2014	Harvard University
12/19/2014	James RePass
12/20/2014	Michael S. Dukakis
12/22/2014	Frank DeMasi
12/22/2014	James G. Grant Co., LLC
12/22/2014	Massachusetts Chapter of the Sierra Club
12/22/2014	New Boston Food Market Development Corporation
12/23/2014	State Representative Frank I. Smizik (15 th Norfolk District)
12/23/2014	Massachusetts Port Authority (Massport)
12/23/2014	Robert L. Beal
12/23/2014	Medical Academic and Scientific Community Organization (MASCO)
12/23/2014	State Senator Bruce Tarr (1 st Essex and Middlesex District)
12/23/2014	Don't Dump on Us - Task Force
12/23/2014	Massachusetts Office of Coastal Zone Management
12/23/2014	Massachusetts Water Resources Authority
12/23/2014	Association for Public Transportation
12/24/2014	Kenneth J. Krause
12/24/2014	Frederick Salvucci
12/24/2014	Joseph Rogers
12/24/2014	Stephen H. Kaiser
12/24/2014	Gerry Pieri
12/24/2014	Brad Bellows
12/24/2014	Adam Castiglioni
12/24/2014	Drew Volpe
12/24/2014	Paola M. Ferrer, Galen M. Nook, Rich Parr, Jessica Roberston (residents of Allston), Anthony D'Isidoro (Allston Civic Association), Matthew Danish (Livable Streets Alliance), Harry Mattison (Charles River Conservancy), and Robert Sloane (WalkBoston)
12/24/2014	State Representative Sean Garballey (Arlington)

12/24/2014 Massachusetts Department of Environmental Protection – Northeast Regional
Office (MassDEP – NERO)
12/24/2014 Fidelity Real Estate Company
12/24/2014 Boston University
12/24/2014 Metropolitan Area Planning Council
12/24/2014 The Boston Harbor Association
12/24/2014 Boston Water and Sewer Commission
12/26/2014 Paola M. Ferrer, Galen M. Nook, Jessica Roberston, Matthew Danish (residents
of Allston), Anthony D’Isidoro (Allston Civic Association), Steve Miller (Livable
Streets Alliance), Harry Mattison (Charles River Conservancy), and Robert
Sloane (WalkBoston) (LATE COMMENT)

MVB/HSJ/hsj