SOUTH STATION
EXPANSION

South Station Expansion Project

Appendix 9 (Part 1) – Traffic Analysis Technical Report

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massDOT
Massachusetts Department of Transportation

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1. Introduction

The Massachusetts Department of Transportation (MassDOT), the Massachusetts Bay Transportation Authority (MBTA), and the National Railroad Passenger Corporation (Amtrak) have for decades identified the expansion of rail capacity at Boston South Station as a crucial transportation need, one that has been articulated in multiple local, regional, state, and Northeast Corridor (NEC)-wide planning documents.[1] In cooperation with the Federal Railroad Administration (FRA), Amtrak, and the MBTA, MassDOT is now pursuing the expansion of South Station to support existing NEC and commuter rail services and to provide for future Amtrak and MBTA service expansions. The current track capacity, layout, and operations of South Station limit the ability to accommodate projected future expanded services. In addition to expanding South Station terminal facilities, the South Station Expansion (SSX) project will also identify a solution to address existing and future intercity and commuter rail service layover needs. The SSX project includes planning, environmental reviews, and preliminary engineering for the five primary elements of the project:

1. **Expand the South Station terminal facilities**, including the addition of up to seven tracks and four platforms and construction of a new passenger concourse and other amenities.
2. **Acquire and demolish the U.S. Postal Service (USPS) General Mail Facility** located on Dorchester Avenue adjacent to South Station, which will provide an approximate 14-acre site on which to expand South Station. (Note that the relocation of the USPS facility will be the subject of a separate environmental review process by others.) Dorchester Avenue will be restored for public and station access.
3. **Create an extension of the Harborwalk along reopened Dorchester Avenue.**
4. **Provide for the possibility of future joint public/private development** adjacent to and over an expanded South Station.
5. **Provide adequate rail vehicle layover space** to address existing and future intercity and commuter rail service needs.

This Traffic Analysis Technical Report has been prepared in support of the Draft Environmental Impact Report (Draft EIR) and Environmental Assessment (EA) for the SSX project, in accordance with the Certificate of the Secretary of the Office of Energy and Environmental Affairs (EEA) on the Environmental Notification Form (ENF) for the SSX project (April 19, 2013), the Massachusetts Environmental Policy Act (MEPA) regulations, 301 CMR 11.00 (revised, May 10, 2013), and the FRA's Procedures for Considering Environmental Impacts, 64 Federal Register (FR) 101 (26 May 1999), pp. 28545-28556.

1.1. Purpose

The purpose of this report is to assess the adequacy of existing and planned transportation infrastructure to accommodate the SSX project. The analyses presented in this report inform the planning, environmental review, and preliminary engineering efforts for the SSX project. This report focuses on external circulation in the vicinity of South Station, to include roadways, intersections, bus stops, pedestrian accommodations, and bicycle facilities.

[1] Documents citing the need for an expanded South Station include: *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), the Massachusetts Department of Transportation *Rail Plan* (2010), the Massachusetts Department of Transportation *Freight Plan* (2010), and the two most recent long range transportation plans of the Boston Region Metropolitan Planning Organization (2007, 2011).

Three related technical reports that address ridership, transit capacity, and internal station pedestrian circulation at South Station have been prepared. Ridership data are provided in Appendix 9 - *Ridership Forecasting Technical Report*. An assessment of area-wide public transportation system demands and capacity is provided in Appendix 9 - *Transit Capacity Technical Report*. Lastly, an assessment of the pedestrian level-of-service on the MBTA's commuter rail and rapid transit facilities at South Station's platforms, waiting areas, and vertical circulation elements is provided in Appendix 9 - *Pedestrian Circulation Analysis Technical Report*.

2. Summary

This section summarizes the SSX project impacts along with mitigation measures associated with the Build Alternatives.

2.1. Summary of Benefits

Overarching benefits of the South Station Expansion project associated with the surrounding roadway network are as follows:

1. **Substantially improved pedestrian experience**. The project includes significant enhancements to the pedestrian realm. The reopening of Dorchester Avenue as a public street presents an opportunity to extend the Harborwalk by approximately one-half mile along the entire stretch of the Fort Point Channel, which would close the last remaining gap in creating a continuous waterfront walkway in Downtown Boston. This stretch of the Fort Point Channel is currently off limits to pedestrians and blocked off by a chain-link fence. In addition to a dedicated pedestrian path, seating and landscaping would also be provided.

2. **New bicycle accommodations**. The project leverages its location as a major bicycle hub by including a substantial commitment to improve bicycle infrastructure in the area. Under the project, the reopened segment of Dorchester Avenue would include a new cycle track that is approximately one-half mile long, buffered from traffic and parallel to the newly created pedestrian Harborwalk along the Fort Point Channel. The proposed cycle track would connect with existing bicycle infrastructure and complements future plans by the City, including the South Bay Harbor Trail and the Summer Street Corridor cycle track. There are existing Hubway bicycle sharing stations in the area on Dorchester Avenue, at the end of the South Bay Harbor Trail, on Atlantic Avenue, and on Summer Street which would complement the new cycle track.

3. **Relief of curbside congestion on Atlantic Avenue**. Curbside congestion along Atlantic Avenue is an issue at certain peak times of the day. The curb space does not meet demands during peak times. Another key issue is the one-way street pattern – getting to the South Station curbside can be circuitous from downtown resulting in haphazard 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 shifting a substantial portion of demand to Dorchester Avenue. 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 could accommodate taxicabs, drop-off, pick-up, MBTA buses, and shuttles – providing significant relief of Atlantic Avenue amounting to a 30 to 40% reduction in curbside traffic.

4. **Improved separation of South Station vehicle traffic and pedestrians/bicyclists**. The project improves the separation of vehicle traffic from non-vehicular traffic. 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. Prioritizing pedestrian and bicycle transportation options are a key element of MassDOT's Healthy Transportation Compact (HTC), which is a significant part of the transportation reform legislation signed into law in 2009.

5. **An aggressive approach to constraining parking and adopting shared parking principles for the project**. Working collaboratively with the Boston Transportation Department (BTD), significantly reduced parking ratios have been adopted to minimize parking and discourage driving to this transit hub. This further advances MassDOT's Healthy Transportation Compact initiative and GreenDOT policies.

    - **In Alternative 1 – Transportation Improvements Only,** there is a net decrease of 242 structured parking spaces on the site associated with the relocation of the USPS. No new or replacement structured parking is provided.

    - **In Alternative 2 – Joint/Private Development Minimum Build**, approximately 235 structured parking spaces are planned on the site to accommodate 660,000 square feet of joint/private development. This represents a net decrease of seven spaces over existing conditions. The location of the parking and the access points are distributed between Dorchester Avenue and the proposed South Station Connector Extension so that there is no single point of concentrated vehicular access/egress. The ENF for the project estimated a need for 693 spaces based on established BTD parking ratios for the downtown/South Station area. The DEIR parking estimate represents a reduction of 458 spaces compared to the ENF, a 66% reduction achieved through coordination with the BTD to establish lower, transit-oriented, parking goals for the joint/private development.

    - **In Alternative 3 – Joint/Private Development Maximum Build**, approximately 507 structured parking spaces are planned on the site to accommodate 2 million square feet of joint/private development. This represents a net increase of 265 spaces over existing conditions. Similar to Alternative 2, the location of the parking and the access points are distributed between Dorchester Avenue and the proposed South Station Connector Extension so that there is no single point of concentrated vehicular access/egress. The ENF for the project estimated a need for 1,593 spaces based on established BTD parking ratios for the downtown/South Station area. The DEIR parking estimate represents a reduction of 1,086 spaces compared to the ENF, a 68% reduction achieved through coordination with the BTD to establish lower, transit-oriented, parking goals for the joint/private development.

6. **A new key roadway connection, Dorchester Avenue, is restored in the core of the city.** Reopening Dorchester Avenue not only benefits South Station by providing much needed curbside space, it also absorbs a portion of traffic from A Street, Atlantic Avenue, and Summer Street. These traffic shifts help relieve congestion on these roadways and also creates more direct vehicular trips on less congested roadways which benefits regional air quality.

2.2. Summary of Impacts and Mitigation

The transportation impacts of the SSX project and associated mitigation measures are summarized in this section. The three Build Alternatives developed and presented in this DEIR are:

- Alternative 1 – Transportation Improvements Only
- Alternative 2 – Joint/Private Development Minimum Build
- Alternative 3 – Joint/Private Development Maximum Build

2.2.1. Alternative 1 – Transportation Improvements Only

Intersection and Roadway Mitigation

Roadway mitigation associated with Alternative 1 is as follows:

- **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.** Reopening Dorchester Avenue to public access presents an opportunity to mitigate the curbside congestion on Atlantic Avenue and better accommodate shuttles that currently serve the South Boston Waterfront/Innovation District. The conceptual layout for Dorchester Avenue will include accommodation for taxicabs, drop-off, pick-up, and shuttles along the newly opened portion of Dorchester Avenue. Doing so would result in a 30 to 40% reduction in the curbside activity 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.** Improve bicycle connectivity into Dewey Square along Atlantic Avenue by providing a bicycle lane along the west side of Atlantic Avenue from Kneeland Street to Essex Street.

- **Implement intersection upgrades.** The following intersection improvements would improve traffic flow, reduce queuing, and improve pedestrian and bicycle mobility:

    - **Atlantic Avenue at Summer Street –** Additional traffic and pedestrians through Dewey Square would result in the need for adjustments to lane assignments and signal timing/phasing. There is an existing conflicting pedestrian crossing that runs concurrently with a dual left-turn vehicular maneuver from Atlantic Avenue onto Summer Street, which is not compliant with traffic engineering standards. Mitigation would include:

        - Eliminating the pedestrian crossing conflict by restriping the Atlantic Avenue northbound approach (convert the shared left-turn/though lane to a through lane) and providing diagonal crossing markings in the intersection;

        - 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 –** Added pedestrians between South Station and the Financial District warrant consideration for a new crosswalk at this intersection. Mitigation includes the addition of a crosswalk across Summer Street on the westbound approach of the Summer Street/Purchase Street intersection where one does not exist today to better accommodate the pedestrian desire line from South Station to Dewey Square.

- **Summer Street at Dorchester Avenue –** Reopening Dorchester Avenue results in added delays on Dorchester Avenue northbound. Mitigation would include optimizing signal timing and phasing and incorporating bicycle-specific signal equipment, pavement markings, and detection into the intersection layout. Signal timings and the intersection offset have been optimized to accommodate the increased vehicle, pedestrian, and bicycle traffic at the intersection.

- **Surface Road/Essex Street/Lincoln Street –** The skewed intersection geometry is not pedestrian or bicycle friendly. Mitigation would include:

  - Providing additional walk time through pedestrian lead intervals during the concurrent pedestrian phases;

  - Providing a more direct east-west pedestrian connection along Essex Street by installing a new crosswalk along the southern east-west crossing from Essex Street to the large median; and

  - Optimizing the signal timings and phasing sequence.

- **Congress Street at Dorchester Avenue –** Reopening Dorchester Avenue and incorporating a cycle track into the intersection results in added delays on Dorchester Avenue northbound. Mitigation would include optimizing signal timing and phasing and incorporating bicycle-specific signal equipment, pavement markings, and detection into the intersection layout.

- **Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp** – Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp is a highly utilized intersection for vehicles entering the city. Currently the MBTA access drive westbound approach accommodates extremely low to no volume (less than five vehicles per hour) during the morning and evening peak hours. Although there is very low volume on this approach, the phase for this approach is triggered every cycle, which also runs with a low volume concurrent pedestrian phase. Proposed mitigation includes updating the MBTA access drive loop detection with the ability to skip the phase if there is no vehicle present. The intersection timing, phases and offset would be updated and optimized to reflect the future traffic needs at this intersection.

- **Dorchester Avenue/West Broadway/Traveler Street –** Reopening Dorchester Avenue would add traffic through this intersection. Currently the signal includes an exclusive pedestrian phase, reducing the time allocated to the heavily utilized vehicle phases. Changing the pedestrian operations to concurrent pedestrian phases, per BTD guidelines, would substantially improve operations. In addition, the West Broadway westbound approach lane configuration could be modified to one left/through and one through/right to better accommodate the vehicle movement onto Traveler Street.

- **Dorchester Avenue/West 4th Street –** Reopening Dorchester Avenue would add traffic through this intersection. Mitigation at this intersection includes optimizing the signal timing and optimizing the offset with Dorchester Avenue/West Broadway/Traveler Street intersection. Additional concurrent pedestrian walk time was added to better accommodate pedestrians at this intersection.

In Alternative 1, for all three layover facility sites, intersection traffic operations would not be degraded as a result of the layover facility operation. This is primarily due to the very low passenger vehicle and service vehicle traffic generation projected for the layover yards. The layover facility sites are projected to generate six or fewer net new vehicle trips during commuter morning and evening peak hours amounting to less than one vehicle trip every 10 minutes. During the midday, traffic generation varies from one vehicle every three minutes to one vehicle every five minutes, depending on the layover site. Therefore, no roadway or traffic signal mitigation would be required as part of the SSX project at any of the three layover facility sites (Widett Circle, Beacon Park Yard, and Readville-Yard 2).

Transportation Demand Management (TDM) Mitigation

Consistent with MassDOT's efforts to reduce automobile dependency through the GreenDOT Policy, Mode Shift Goal, Healthy Transportation Compact, and Healthy Transportation Directive, numerous Transportation Demand Management (TDM) commitments are proposed for the SSX project. TDM commitments for the SSX project for Alternative 1 would be as follows:

- Incorporate bicycle parking in the new headhouse on Dorchester Avenue.
- Participate in the U.S. Environmental Protection Agency (EPA) SmartWay Transport Program to increase energy efficiency and reduce greenhouse gas emissions.
- Provide electronic signage displaying transit schedule information.
- Accommodate curbside space for a shuttle stop along Dorchester Avenue for shuttles that currently serve the South Boston Waterfront/Innovation District.
- Work with the City of Boston to improve bicycle accommodations along Atlantic Avenue from Kneeland Street to Summer Street.
- Prepare a Construction Mitigation Plan (CMP) for BTD to minimize disruption in the area throughout construction.

2.2.2. Alternative 2 - Joint/Private Development Minimum Build and Alternative 3 - Joint/Private Development Maximum Build

Intersection and Roadway Mitigation

In addition to the mitigation proposed in Alternative 1, Alternatives 2 and 3 would require the following additional mitigation to offset the vehicle traffic and parking needs associated with the joint/private development:

- **Implement intersection improvements.** The following signal timing and phasing adjustments would improve traffic flow, reduce queuing, and improve pedestrian mobility:
    - **Atlantic Avenue at Seaport Boulevard –** Adjust signal timings to improve the Seaport Boulevard approach.
    - **Atlantic Avenue at Congress Street –** Added traffic on Atlantic Avenue from South Station contributes to degraded intersection operations. Mitigation would include optimizing signal timing and phasing.
    - **Purchase Street at Congress Street –** Added traffic on Purchase Street to South Station contributes to degraded intersection operations. Mitigation would include optimizing signal timing and phasing.

- **Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp –** This intersection is not operating under an efficient signal timing scheme. Mitigation involves installing 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.

Similar to Alternative 1, for Alternatives 2 and 3, intersection traffic operations at all three layover facility sites would not be degraded as a result of the layover facility operation. This is primarily due to the very low passenger vehicle and service vehicle traffic generation projected for the layover yards. The layover facility sites are projected to generate six or fewer vehicle trips during commuter morning and evening peak hours amounting to less than one vehicle trip every 10 minutes. During the midday, traffic generation varies from one vehicle every three minutes to one vehicle every five minutes, depending on the layover site.

Therefore, no roadway or traffic signal mitigation would be required as part of the SSX project at any of the three layover facility sites.

TDM Mitigation

In addition to the TDM commitments made in Alternative 1, TDM commitments for the SSX project which would apply to Alternative 2 and Alternative 3 are as follows:

- Accommodate electric vehicle charging facilities within the structured parking.
- Charge market rates for off-street parking spaces used by single occupant vehicle (SOV) drivers.
- Provide car sharing parking (Zipcar or similar program) and carpool/vanpool designated parking spaces in any structured parking facilities.
- Work with the BTD to conduct a post-development traffic monitoring program. The program would be conducted prior to the start of construction of each phase and repeated six months after the issuance of occupancy certificates.

3. Regulatory Context

The FRA's *Procedures for Considering Environmental Impacts* (64 Federal Register [FR] 28545 [May 26, 1999] and FRA's *Update to National Environmental Policy Act of 1969 (NEPA) Implementing Procedures* (78 FR 2713 [January 14, 2013]) require an assessment of "the impacts on both passenger and freight transportation, by all modes, from local, regional, national and international perspectives... [and]

include a discussion of both construction period and long-term impacts on vehicular traffic congestion." A summary of other relevant state and local statutes, regulations, and guidance is as follows:

- MEPA Regulations, 301 CMR 11.00;
- MassDOT's *Transportation Impact Assessment (TIA) Guidelines*, March 2014; www.massdot.state.ma.us/Portals/17/docs/DevelopmentReview/TIA_Guidelines_3_13_2014.pdf;
- MassDOT's *Project Development and Design Guide*, 1996; www.massdot.state.ma.us/highway/DoingBusinessWithUs/ManualsPublicationsForms/ProjectDevelopmentDesignGuide.aspx;
- MassDOT's *A Guide on Traffic Analysis Tools*, October 2012; www.mhd.state.ma.us/downloads/trafficMgmt/TrafficAnalysisToolsGuide.pdf
- Boston Transportation Department's *Transportation Access Plan Guidelines*; www.cityofboston.gov/transportation/rules/guidelinesappeal.asp;
- Boston Transportation Department's *Traffic Signal Operations Design Guide (2004); BTD Traffic Signal Design Submission Requirements (2004); BTD Traffic Engineering Standard Plans and Specifications*; www.cityofboston.gov/transportation/trafficspecs;
- City of Boston Complete Streets Guidelines; bostoncompletestreets.org; and
- City of Boston Zoning Code; www.bostonredevelopmentauthority.org/zoning.

The analyses presented in this report have been prepared using traffic engineering principles from the *2010 Highway Capacity Manual* (HCM) [2] which satisfies federal, state, and local requirements for traffic impact assessments. The analyses are compliant with published guidelines for the preparation of traffic impact assessments from the EEA, MassDOT, and the BTD.

4. Methodology

This technical report was prepared by a licensed Professional Engineer (PE) and Professional Traffic Operations Engineer (PTOE) registered in the Commonwealth of Massachusetts. The following steps were taken to conduct the transportation assessment in this technical report:

- **Define the study area.** As an initial step, City officials from the BTD and BRA were contacted to identify key intersections and roadways to be included in the DEIR transportation assessment.
- **Collect data.** Once the intersections and roadway links were identified, the next step involved data collection including manual turning movement counts at intersections, automated traffic recorder counts on key roadway links, collection of traffic signal plans, pedestrian and bicycle counts, public transportation ridership data, and crash data at key intersections.
- **Conduct field observations.** Field reviews and inventories along each study area roadway and intersection were completed. Signal timing and phasing charts from the BTD were obtained and field verified. Observations of loading/service activity and curbside utilization were conducted. Pedestrian flows throughout South Station and Dewey Square were recorded.

[2] Transportation Research Board. *HCM 2010 - Highway Capacity Manual*. http://www.trb.org/Main/Blurbs/164718.aspx.

- **Complete a safety assessment.** Using crash data and traffic volumes, a multimodal safety assessment was conducted for each intersection.
- **Develop a traffic model.** An existing conditions Synchro traffic model was developed for the study area intersections to assess how well the peak demands are handled by the existing infrastructure. A Vissim traffic model was developed for specific areas, such as Atlantic Avenue, to assess how curbside operations influence traffic along Atlantic Avenue.
- **Develop traffic generation and parking rates.** Trip generation, mode share (split of drivers/pedestrians/bicyclists/transit users), vehicle occupancy, and parking ratios were developed through coordination with the BTD and Central Transportation Planning Staff (CTPS).[3] Trip distribution (the number of trips that occur between each origin zone and each destination zone), and trip assignment (the allocation of trips among the paths or routes in the transportation network) for the project were conducted. Any parking associated with the project was minimized to the greatest extent possible to encourage transit use since the project area has robust public transportation options.
- **Prepare a travel demand forecast.** Area-wide planned developments that will influence transportation system demands were identified through coordination with the BRA. Traffic demands and transit ridership for 2025 and 2035 conditions were prepared based on the development of travel demand forecasts provided by CTPS. The CTPS travel demand model forecasts changes in vehicle traffic and ridership based on changes in transit services, land use, population, households, and employment. Forecasts were prepared for 2025 and 2035 conditions, with and without the project.
- **Conduct a traffic operations assessment and transit crowding analysis.** Using the CTPS travel demand forecast, a traffic operations assessment using the Synchro traffic model for existing, 2025, and 2035 conditions with and without the project was prepared. Similarly, a transit analysis that evaluates how ridership increases will affect South Station operations as well as other key stations in the downtown core, including Park Street, Downtown Crossing, State Street, and Government Center, was conducted.
- **Identify mitigation and transportation demand management (TDM) strategies.** Potential mitigation alternatives were identified and evaluated, including improvements to pedestrian, bicycle, and public transit access, as well as a range of roadway geometric and operational improvements for traffic. The analysis demonstrates how any mitigation will enhance walking, bicycling, and public transit access and avoid further degradation to traffic operations. TDM strategies would reduce motor vehicle reliance (especially during peak periods) and shift passengers to travel modes other than motor vehicles; increase the number of passengers in motor vehicles; change the time of travel to periods of lower system demand; and eliminate the need for some trips altogether.

4.1. Study Area Intersections

There are four site areas under consideration including the South Station site and three potential layover facility sites (Widett Circle, Beacon Park Yard, and Readville-Yard 2). The study area intersections were selected in coordination with the BTD and the BRA.

[3] CTPS is the staff to the Metropolitan Planning Organization (MPO) for the Boston region and works with the communities within the region to address issues relating to transportation, land use, and economic development. CTPS develops and maintains the regional transportation demand model.

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 three layover facility sites are as follows:

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. Cambridge Street / Lincoln Street (Beacon Park Yard Layover Facility Site)
4. Hyde Park Avenue / Neponset Valley Parkway / Wolcott Court / Wolcott Square (Readville-Yard 2 Layover Facility Site)
5. Wolcott Court / Layover Driveway (Readville-Yard 2 Layover Facility Site)

5. Existing Conditions

Four sites are under consideration in the SSX project: the South Station site and three layover facility sites consisting of Widett Circle, Beacon Park Yard, and Readville-Yard 2. Figure 1 presents the location of the four SSX project sites. All graphics and figures referenced in this document are provided in Chapter 8 of this technical report. Data and technical analyses summarized in this section are available from MassDOT upon request.

5.1. South Station Site

The South Station site occupies approximately 49 acres located near Chinatown, the Fort Point Channel, and the South Boston Waterfront/Innovation District. The site includes the following: the South Station Rail Terminal, the South Station Bus Terminal, and the USPS General Mail Facility/South Postal Annex, including a portion of Dorchester Avenue fronting the site and running parallel to the Fort Point Channel. The site extends along a portion of the NEC Main Line to the west, extending past Cove Interlocking, and along a portion of the MBTA's Fairmount Line/Old Colony Railroad to the south, extending just past

Broad Interlocking. The site also includes a small park (Rolling Bridge Park), Harborwalk area, and a portion of the Fort Point Channel located at the southern end of the site. The South Station Transportation Center includes transportation infrastructure relative Amtrak intercity and MBTA commuter rail service, MBTA rapid transit service, MBTA local bus service, and private carrier bus service.

The South Station Rail Terminal area currently consists of 13 tracks, eight platforms and a system of track work (also referred to as interlockings) that allow Amtrak and MBTA trains to serve the station from the NEC and Framingham/Worcester Line from the west and the MBTA's Fairmount Line and Old Colony Railroad from the south. In 2025 and 2035, the existing condition at the South Station site assumes the South Station Air Rights (SSAR) project, consisting of an approximately 1.8 million sf mixed-use development to be located directly above the railroad tracks at the South Station headhouse.[4]

5.1.1. South Station Area Infrastructure

Roadways

The primary roadways in the vicinity of South Station are Atlantic Avenue, Dorchester Avenue, Summer Street, and the South Station Connector as described in more detail in this section.

- **Atlantic Avenue** runs north-south from Kneeland Street to Commercial Street and is one-way northbound carrying 13,600 vehicles per day (vpd) in the vicinity of South Station. Atlantic Avenue has three travel lanes and a dedicated on-street bicycle lane from Essex Street to Summer Street. The roadway is owned by MassDOT and maintained by the City of Boston. MassDOT owns the roadway because the I-93 tunnel, which is MassDOT infrastructure, is located below Atlantic Avenue. There is a substantial amount of curbside activity along Atlantic Avenue. Figure 2 illustrates the curbside regulations along Atlantic Avenue which includes taxicab stands (15-spaces), 15-minute pick-up/drop-off zones (16-spaces), resident permit parking (15-spaces), and metered parking (13-spaces). Curbside operations along Atlantic Avenue are described in more detail later in this technical report.
- **Dorchester Avenue** runs north-south from Congress Street in Downtown to Boston's Dorchester neighborhood. Dorchester Avenue has one travel lane in each direction carrying low traffic demands, 3,800 vpd, within the secure USPS area. In Boston, to the north of Summer Street, Dorchester Avenue provides two southbound lanes and one northbound lane. The road is owned by the USPS adjacent to the USPS general mail facility between Summer Street and Foundry Street and is closed to public travel. On-street parking is provided on the east side of the street along the Fort Point Channel. Sidewalks are available on both sides of the road which include the Harborwalk along the Fort Point Channel side.
- **Summer Street** runs east-west and crosses the Fort Point Channel, connecting South Boston with downtown Boston. Crossing the Fort Point Channel, the Summer Street Bridge has two travel lanes in each direction and carries 20,800 vpd. It is owned by the City of Boston and is a highly traveled commuter route between downtown Boston and the South Boston neighborhood. Sidewalks are available on both sides of the street. Adjacent to South Station, there is commercial vehicle curbside loading provided on Summer Street.
- **The South Station Connector** runs east-west from Surface Road to the bus terminal. The South Station Connector has two travel lanes in each direction and carries 5,000 vpd. It falls under the jurisdiction of MassDOT and the MBTA and serves as a primary connection to the bus terminal

[4] The South Station Air Rights (SSAR) Project was approved by the Secretary of the Executive Office of Energy and Environmental Affairs (EEA) in 2006 (EEA Number 3205/9131).

for buses and high occupancy vehicles (HOVs) utilizing the upper parking deck above the bus terminal. The MBTA is the owner and operator of the access ramp into the South Station Transportation Center.

Intersections

As illustrated in Figure 3, the South Station study area includes 21 intersections that were chosen because of their proximity to South Station and the likelihood that they might be affected by the SSX project. These 21 locations were identified with assistance from the BTD and BRA. Engineering field reviews were completed at each intersection and BTD signal timing and phasing plans were obtained for each signalized intersection. The intersection geometries and signal operations are described in detail in this section.

1. **Congress Street at Dorchester Avenue –** The intersection of Congress Street at Dorchester Avenue is a signalized T-intersection that operates under an actuated three-phase traffic signal control running on BTD's Central Coordination system, with an exclusive pedestrian phase. The Dorchester Avenue northbound approach provides one shared left-turn/right-turn lane. The Congress Street eastbound approach provides one through lane and one shared through/right-turn lane. The Congress Street westbound approach provides one shared left-turn/through lane. On-street parking is available on the east side of Dorchester Avenue. Sidewalks and crosswalks are provided on all approaches.

2. **Summer Street at Dorchester Avenue –** The intersection of Summer Street at Dorchester Avenue is a four-way, signalized intersection that operates under an actuated three-phase traffic signal control running on BTD's Central Coordination system, with an exclusive pedestrian phase. The Summer Street eastbound approach provides one shared left-turn/through lane and one shared through/right-turn lane. The Summer Street westbound approach provides one shared left-turn/through lane and one shared through/right-turn lane. The Dorchester Avenue northbound approach provides one shared left-turn/through/right-turn lane. The Dorchester Avenue southbound approach provides one shared left-turn/through/right-turn lane, and a 50-foot right-turn lane. On-street parking is available on the east side of Dorchester Avenue to the north of the intersection. Sidewalks are provided on all approaches and crosswalks are provided on all approaches except across the Dorchester Avenue northbound. MBTA Routes 4, 7, 448, 449, and 459 stop at the northwest corner of the intersection on Summer Street.

3. **Atlantic Avenue at Seaport Boulevard –** The intersection of Atlantic Avenue and the I-93 on-ramp at Seaport Boulevard is a five-way, signalized intersection that operates under an actuated four-phase traffic signal control running on BTD's Central Coordination system, with an exclusive pedestrian phase. The Seaport Boulevard eastbound approach provides a shared left-turn/through lane and one through lane. The Seaport Boulevard westbound approach provides one shared through/slight right-turn lane (onto I-93 North), one shared slight right-turn /right-turn (to Atlantic Avenue) lane, and an exclusive right-turn lane to Atlantic Avenue. The Atlantic Avenue northbound approach provides one shared left-turn (to Seaport Boulevard)/slight left-turn (to I-93 North) lane, one shared slight left-turn/through lane, and one shared through/right-turn lane. A bicycle lane is provided along Atlantic Avenue. Sidewalks and crosswalks are provided on all approaches. MBTA Bus Route 4 stops at the northeast corner of the intersection on Atlantic Avenue.

4. **Atlantic Avenue at Congress Street –** The intersection of Atlantic Avenue at Congress Street is a four-way, signalized intersection that operates under an actuated three-phase traffic signal control running on BTD's Central Coordination system, with concurrent pedestrian movements. The Atlantic Avenue northbound approach provides two through lanes and one shared through/right-turn lane. The Congress Street eastbound approach provides two exclusive left-turn lanes and two through lanes.

The Congress Street westbound approach provides two exclusive right-turn lanes. On-street parking is available on the north side of Congress Street to the east of the intersection. A bicycle lane is provided along Atlantic Avenue. Sidewalks and crosswalks are provided on all approaches. MBTA Bus Route 4 stops at the northeast corner of the intersection on Atlantic Avenue.

5. **Purchase Street at Congress Street –** The intersection of Purchase Street and the I-93 South on-ramp at Congress Street is a five-way, signalized intersection that operates under an actuated three-phase traffic signal control running on BTD's Central Coordination system, with an exclusive pedestrian phase. The Congress Street eastbound approach provides two through lanes, an exclusive slight right-turn lane to I-93, and an exclusive right-turn lane to Purchase Street. The Purchase Street southbound approach provides an exclusive left-turn lane and two through lanes. A bicycle lane is provided along Purchase Street. Sidewalks and crosswalks are provided on all approaches.

6. **Atlantic Avenue at Summer Street (Dewey Square) –** The intersection of Atlantic Avenue at Summer Street is a four-way, signalized intersection that operates under an actuated four-phase traffic signal control running on BTD's Central Coordination system, with an exclusive pedestrian phase followed by concurrent pedestrian phases. The Summer Street eastbound approach provides one shared left-turn/through lane and one through lane. The Summer Street westbound approach operates with two through lanes and one right-turn lane. The Atlantic Avenue northbound approach provides one exclusive left-turn lane, one shared left-turn/through lane, one through lane, and an exclusive right-turn lane. On-street parking is available on the west side of the Atlantic Avenue and the south side of Summer Street east of the intersection. A bicycle lane is provided along Atlantic Avenue. Sidewalks and crosswalks are provided on all approaches.

7. **Purchase Street at Summer Street –** The intersection of Purchase Street at Summer Street and Surface Road is a four-way, signalized intersection coordinated with the adjacent pedestrian signal and operates under an actuated four-phase traffic signal control running on BTD's Central Coordination system, with concurrent pedestrian movements. The Purchase Street southbound approach provides one shared left-turn/through lane, one through lane, and a shared through/right-turn lane. The Summer Street eastbound approach provides one through lane and one exclusive right-turn lane. The Summer Street westbound approach provides one exclusive left-turn lane, one shared left-turn/through lane, and one through lane. The Purchase Street southbound approach is fed upstream from two through lanes on Purchase Street and two through lanes from the I-93 South off-ramp. A bicycle lane is provided along the west side of Purchase Street and Surface Road. Sidewalks and crosswalks are provided on all approaches.

8. **Atlantic Avenue at Essex Street –** The intersection of Atlantic Avenue at Essex Street is a three-way signalized intersection that operates under an actuated three-phase traffic signal control running on BTD's Central Coordination system, with an exclusive pedestrian phase. The Essex Street eastbound approach provides two exclusive left-turn lanes for all vehicles and one exclusive left-turn lane for buses only. The Atlantic Avenue northbound approach provides one shared left-turn/through lane and two through lanes. On-street parking is available on the west side of Atlantic Avenue and a taxi stand is provided on the east side of Atlantic Avenue. The MBTA Silver Line stops on Essex Street. Sidewalks and crosswalks are provided on all approaches.

9. **Surface Road at Essex Street/Lincoln Street –** The intersection of Surface Road at Essex Street and Lincoln Street is a six-way, signalized intersection that operates under an actuated three-phase traffic signal control running on BTD's Central Coordination system, with concurrent pedestrian movements. The Essex Street eastbound approach provides a shared left/slight left-turn (onto I-93 North)/through lane, one shared through/slight right-turn (onto I-93 South) lane, and one exclusive slight right-turn/right-turn lane. The Lincoln Street northbound approach operates with two shared

approach lanes except during the morning when peak hour parking restrictions allow it to operate with three approach lanes. The Surface Road southbound approach provides one shared left-turn/slight left-turn/through lane, one through lane, and one shared through/right-turn lane. On-street parking is available on the east side of Lincoln Street with peak hour restrictions during weekday mornings from 7:00 a.m. until 10:00 a.m. A bicycle lane is provided along the west side of Surface Road. Sidewalks and crosswalks are provided on all approaches.

10. **Atlantic Avenue at East Street –** The intersection of Atlantic Avenue and East Street form an unsignalized T-intersection with stop control on East Street. The East Street eastbound approach provides one left-turn lane. The Atlantic Avenue northbound approach provides three through lanes. On-street parking is available on the north side of East Street and the west side of Atlantic Avenue. A taxi stand is provided on the east side of Atlantic Avenue. Sidewalks are provided along all approaches and a crosswalk is provided across East Street.

11. **Atlantic Avenue at Beach Street –** The intersection of Atlantic Avenue at Beach Street is a signalized T-intersection that operates under an actuated two-phase traffic signal control running on BTD's Central Coordination system with an exclusive pedestrian phase. The Atlantic Avenue northbound approach provides one shared left-turn/through lane and two through lanes. On-street parking is available on Beach Street and the west side of Atlantic Avenue. A taxi stand is provided on the east side of Atlantic Avenue. Sidewalks and crosswalks are provided on all approaches.

12. **Atlantic Avenue at Kneeland Street –** The intersection of Atlantic Avenue at Kneeland Street, Frontage Road, and the I-90 off-ramp is a five-way, signalized intersection that operates under an actuated four-phase traffic signal control running on BTD's Central Coordination system, with concurrent pedestrian movements. The Kneeland Street eastbound approach provides one exclusive left-turn lane and one shared left-turn/through lane. The Kneeland Street westbound approach provides one shared through/right-turn lane. The Frontage Road northbound approach provides one exclusive left-turn lane and one shared left-turn/through lane. The northbound I-90 off-ramp approach provides an exclusive left-turn lane and one shared through/left-turn lane. Crosswalks are provided across all approaches and sidewalks are provided on all approaches except for Frontage Road and the I-90 off-ramp.

13. **Kneeland Street at Lincoln Street –** The intersection of Kneeland Street at Lincoln Street is a four-way, signalized intersection that operates under an actuated four-phase traffic signal control running on BTD's Central Coordination system, with an exclusive pedestrian phase. The Kneeland Street eastbound approach provides one shared left-turn/through lane and one shared through/right-turn lane. The Kneeland Street westbound approach provides one left-turn/through lane, one through lane, and one shared through/right-turn lane. The Lincoln Street northbound approach provides a 200-foot exclusive left-turn lane, one through lane, and one exclusive right-turn lane. During the morning peak hour the northbound Lincoln Street approach operates with an exclusive left-turn lane, one shared left-turn/through and one through/right-turn due to high vehicle demands. On-street parking is available on Lincoln Street north of the intersection. Sidewalks and crosswalks are provided on all approaches.

14. **Surface Road at Kneeland Street –** The intersection of Surface Road at Kneeland Street is a four-way, signalized intersection that operates under an actuated four-phase traffic signal control running on BTD's Central Coordination system, with concurrent pedestrian movements. The Kneeland Street eastbound approach provides two through lanes and one exclusive right-turn lane. The Kneeland Street westbound approach provides one exclusive left-turn lane and two through lanes. The Surface Road southbound approach provides one shared left-turn/through lane, one through lane, and one shared through/right-turn lane. On-street parking and a bus stop for MBTA Bus

Routes 553, 554, 556 and 558, and MBTA Express Bus Routes 501, 504 and 505 are provided on the Surface Road approach to the intersection. A bicycle lane is provided along the west side of Surface Road. A bicycle box that allows bicyclists to pull in front of waiting traffic is provided along the Surface Road southbound approach. Sidewalks and crosswalks are provided on all approaches.

15. **Lincoln Street at South Station Connector –** The intersection of Lincoln Street at South Station Connector and Surface Ramp is a four-way, signalized intersection that operates under an actuated two-phase traffic signal control running on BTD's Central Coordination system, with concurrent pedestrian movements. All approaches provide one shared left-turn/through lane and one shared through/right-turn lane. Sidewalks are provided on Lincoln Street and the north side of the South Station Connector eastbound approach. One crosswalk is provided across the Lincoln Street southbound approach.

16. **Surface Road at South Station Connector –** The intersection of Surface Road at South Station Connector is a three-way, signalized intersection that operates under an actuated two-phase traffic signal control running on BTD's Central Coordination system, with a concurrent pedestrian movement. The South Station Connector westbound approach provides two left-turn lanes. The Surface Road southbound approach provides one shared through/left-turn lane and two through lanes. Sidewalks are provided along the east side of Surface Road and the north side of the South Station Connector with a crosswalk provided across the South Station Connector.

17. **Dorchester Avenue at West 2nd Street –** The intersection of Dorchester Avenue and West 2nd Street form an unsignalized T-intersection with stop control on West 2nd Street. All approaches provide one general purpose lane. Sidewalks are provided along all approaches and a crosswalk is provided across West 2nd Street.

18. **Dorchester Avenue at West Broadway/Traveler Street –** The intersection of Dorchester Avenue at West Broadway and Traveler Street is a four-way, signalized intersection that operates under an actuated four-phase traffic signal control running on BTD's Central Coordination system, with an exclusive pedestrian phase. The Dorchester Avenue northbound approach provides an exclusive left-turn lane, one through lane, and one shared through/right-turn lane. The Dorchester Avenue southbound approach provides one shared left-turn/through lane and a channelized right-turn lane. The Traveler Street eastbound approach provides one exclusive left-turn lane, one through lane, and a channelized right-turn lane. The West Broadway westbound approach provides an exclusive left-turn lane and one shared through/right-turn lane. On-street parking is available on West Broadway and the west side of the Dorchester Avenue northbound approach. Sidewalks and crosswalks are provided on all approaches. The MBTA Broadway Station for the Red Line is located at the southeast corner of the intersection. In addition, MBTA Bus Routes 9, 11, and 47 make stops at this intersection.

19. **Dorchester Avenue at West 4th Street –** The intersection of Dorchester Avenue at West 4th Street is a four-way, signalized intersection that operates under an actuated three-phase traffic signal control running on BTD's Central Coordination system, with concurrent pedestrian movements. The West 4th Street eastbound approach provides one shared left-turn/through lane and an exclusive right-turn lane. The West 4th Street westbound approach provides one shared left-turn/through/right-turn lane. The Dorchester Avenue northbound approach provides an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane. The Dorchester Avenue southbound approach provides a shared left-turn/through lane, one through lane and one 50-foot exclusive right-turn lane. On-street parking is available on Dorchester Avenue and the West 4th Street westbound approach. Bicycle lanes are provided along both sides of Dorchester Avenue approaching West 4th Street from the south. Sidewalks and crosswalks are provided on all approaches.

20. **Purchase Street at I-93 Off-ramp/Seaport Boulevard –** The intersection of Purchase Street and the I-93 South off-ramp at Seaport Boulevard is a five-way, signalized intersection that operates under an actuated four-phase traffic signal control running on BTD's Central Coordination system, with an exclusive pedestrian phase. The Seaport Boulevard westbound approach provides an exclusive left-turn lane and one shared left-turn/through lane. The Purchase Street southbound approach provides two through lanes and one shared through/right-turn lane. The I-93 South off-ramp approach provides one exclusive left-turn lane and one shared through/right-turn lane. A bicycle lane is provided along Purchase Street. Sidewalks and crosswalks are provided on all approaches.

21. **Congress Street at A Street/Thompson Place –** The intersection of Congress Street at A Street and Thompson Place is a four-way, signalized intersection that operates under an actuated five-phase traffic signal control running on BTD's Central Coordination system, with an exclusive pedestrian phase. The Congress Street eastbound approach provides one shared left-turn/through lane, one through lane, and one exclusive right-turn lane. The Congress Street westbound approach provides an exclusive left-turn lane and one shared through/right-turn lane. The A Street northbound approach provides an exclusive left-turn lane and one shared through/right-turn lane. The Thompson Place southbound approach provides one shared left-turn/through/right-turn lane. On-street parking is provided on A Street and the eastbound Congress Street approach. Sidewalks and crosswalks are provided on all approaches.

5.1.2. Traffic Volumes / VMT

Traffic data form the basis for the operational assessment of how well the area roadways handle the traffic demands placed on them. These data, along with roadway geometry and signal operations, are used as inputs into a traffic model for the area that estimates the carrying capacity and rates how the peak period demands are accommodated. Data were collected in September and December 2012 for the study area roadways and intersections. These traffic data are primarily used as the key inputs to the traffic operations analysis and modeling. The traffic data are also used to help establish a baseline travel demand model condition and aid in calibration of the regional model for the localized study area.

The data collection effort involved weekday peak hour turning movement counts (TMCs) from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. at all twenty-one key intersections on September 25 and 26, 2012. Additional counts at select locations were taken in 2013 to confirm that the 2012 counts were still representative of Existing Conditions. These counts involved manually recording turning maneuvers for passenger vehicles, heavy vehicles, pedestrians and bicycles. In addition to TMCs, daily automatic traffic recorder (ATR) data were collected on a typical weekday over a continuous 48-hour period. The ATRs consisted of pressurized tubes placed across the road surface that count vehicles automatically as they pass over the tube. A summary of daily traffic volumes is provided in Table 1 and annotated in Figure 3.

Table 1—South Station Roadway Volumes – December 2012

Roadway	Segment	Number of Lanes	Weekday Daily Traffic (vpd) [a]
Summer Street	East of Atlantic Avenue	4	20,800
Kneeland Street	East of Surface Road	5	16,900
Congress Street	East of Atlantic Avenue	4	15,900
Dorchester Avenue	West 4th Street to West Broadway West Broadway to West 2nd Street North of West 2nd Street	4 2 2	14,600 7,100 3,800
Atlantic Avenue	North of Kneeland Street Total Through traffic only (no curbside stops) Curbside traffic only [b]	3	13,600 11,900 1,700
A Street	South of Congress Street	2	11,600
South Station Connector	East of Surface Road	4	5,000
South Station Bus Terminal Access	HOV Parking Deck (Entrance and Exit) Bus Depot (Entrance and Exit)	1 (in) / 1 (out) 1 (in) / 1 (out)	1,400 600

Source: Automatic Traffic Recorder (ATR) counts conducted in December 2012.
a Weekday daily traffic, expressed in vehicles per day (vpd).
b Curbside traffic includes arriving trips to the curb (1,700 vpd) and departing trips from the curb (1,700 vpd).

As Table 1 indicates, the three most heavily traveled roadways in the immediate vicinity of South Station are Summer Street (20,800 vpd), Kneeland Street (16,900 vpd), and Congress Street (15,900 vpd). As expected, Dorchester Avenue traffic varies significantly because it transitions to a private, secure roadway at the USPS facility. Dorchester Avenue traffic varies from 14,600 vpd approaching West Broadway to 3,800 vpd north of West 2nd Street approaching the USPS security checkpoint. Atlantic Avenue, which accommodates much of the South Station curbside activity and is a gateway to the area from I-93 and I-90, carries 13,600 vpd – slightly lower than the other adjacent roadways due to the fact that it is one-way northbound. The access roadways to the South Station Bus Terminal handle significantly lower traffic demands than the other area roadways. The South Station Connector carries 5,000 vpd, of which 1,400 vpd are headed to/from the HOV parking deck above the bus depot and 600 vpd are buses to/from the bus depot.

Observing how the vehicle traffic demands summarized in Table 1 fluctuate over a typical weekday provides insight into when the peak periods occur and the intensity of traffic during peak and off-peak periods. Figure 4 illustrates the hourly traffic demands along Atlantic Avenue, showing the proportion of through traffic to curbside traffic. While there are other more heavily traveled roadways in the area, focusing on Atlantic Avenue is important for this study since it is a gateway to the area and handles most of the South Station curbside traffic.

As shown in Figure 4, Atlantic Avenue has a distinct morning and afternoon peak corresponding with commuter periods. While the midday period is not as busy as the commuter peak periods, there is still a substantial amount of traffic using Atlantic Avenue. Traffic on Atlantic Avenue peaks between 9:00 to 10:00 a.m. and again from 5:00 to 6 p.m. The morning peak on Atlantic Avenue is higher at over 1,000 vph compared to the afternoon peak of almost 900 vph. Over a typical weekday, 13% of traffic on Atlantic Avenue utilizes the South Station curb (including taxicabs) and 87% is through traffic that does not stop at the curb. The majority of the South Station curbside traffic is comprised of taxicabs.

Figure 5 illustrates the vehicle traffic generation for South Station along Atlantic Avenue and at the South Station Bus Terminal. Overall, South Station generates 5,400 vehicle trips per day which consists of trips to and from South Station. The estimated 5,400 vehicle trips per day generated by South Station include 3,400 curbside trips along Atlantic Avenue (1,700 arriving plus 1,700 departing vehicle trips), 1,400 passenger vehicles to/from the HOV parking deck, and 600 bus trips to/from the bus depot. Similar to the Atlantic Avenue traffic profile, South Station activity spikes in the morning from 9:00 to 10:00 a.m.

However, unlike Atlantic Avenue, there is a dispersed afternoon peak that is not as pronounced as the roadway peak – lasting from approximately 3:00 to 5:00 p.m.

A review of the hourly trends shows that the traffic activity along the Atlantic Avenue curbside and at the South Station Bus Terminal parking deck closely mirror the general traffic trends on Atlantic Avenue with peaks in the morning and afternoon. However, the bus terminal demands are more dispersed and fairly level over the course of the day – there is not much of a spike in activity during peak commuter periods.

Using the TMC data, the overall morning peak hour for the study area occurred between 8:00 a.m. and 9:00 a.m. and the evening peak hour from 5:00 p.m. and 6:00 p.m. The resulting 2012 traffic volume networks are illustrated in Figure 6 for the morning peak hour and Figure 7 for the evening peak hour.

Regional Vehicle Miles Traveled

Vehicle-miles traveled (VMT) is the total number of miles driven by all vehicles within a given time period and geographic area. For example, one vehicle driving one mile equates to one vehicle-mile traveled. VMT is used by regional transportation and environmental agencies for planning purposes as it is an indicator of the travel levels on the roadway system by motor vehicles. VMT is influenced by many factors such as population, employment, transit availability, land use, economic growth, demographics, and even travel costs such as tolls and fuel prices.

The existing VMT for the region was provided by CTPS using the regional travel demand model. The average weekday daily VMT in the CTPS model region for existing conditions is summarized in Table 2. The VMT data summarized in Table 2 represent the area of metropolitan Boston extending to just beyond I-495.

Table 2—Regional VMT- 2012 Existing Conditions

Vehicle Type	2012 Existing Average Weekday Daily Vehicle-Miles Traveled
Auto	97,026,100
Truck	13,483,900
Daily Total	110,510,000

Source: Central Transportation Planning Staff (CTPS).
Note: VMT is presented for the CTPS model region, representing eastern Massachusetts.

On a typical weekday, the study area VMT is 110,510,000 vehicle-miles, comprised of 97,026,100 automobile vehicle-miles and 13,483,900 truck vehicle-miles. Truck travel accounts for approximately 12% of the total VMT in the study area. Attachment E provides details on the CTPS regional travel demand modeling methodology.

5.1.3. Pedestrians

Pedestrian counts were conducted simultaneously with the TMCs on September 25 and 26, 2012. Additional counts at select locations were taken in 2013 to confirm that the 2012 counts were still representative of Existing Conditions. The overall morning peak hour occurred between 8:00 a.m. and 9:00 a.m. and the evening peak hour from 5:00 p.m. to 6:00 p.m. Figure 8 illustrates the morning peak hour pedestrian volumes that occur between 8:00 a.m. and 9:00 a.m. and Figure 9 shows the evening peak hour pedestrian volumes that occur between 5:00 p.m. and 6:00 p.m.

The morning and evening peak hour pedestrian flows between South Station and Dewey Square are illustrated in Figure 10, showing flows to/from the front three doors of South Station. In the morning peak

hour surge, approximately 2,430 pedestrians were observed traveling from the South Station front doors toward Dewey Square Plaza at the street level. In the evening peak hour surge, approximately 2,330 pedestrians were observed traveling from Dewey Square Plaza toward the front doors of South Station at the street level. The majority of pedestrians leaving South Station cross Atlantic Avenue and many of these pedestrians proceed to cross Summer Street headed to the Dewey Square Plaza in very large surges corresponding to commuter rail train arrivals.

Of the pedestrians headed to the Dewey Square Plaza, many do not cross at the crosswalk across Summer Street and choose to cross diagonally, at times using the narrow median as a refuge area to wait for a gap in advancing traffic. The pedestrian behavior from South Station to Dewey Square is significantly influenced by the signal phasing – if the signal phasing is favorable, most pedestrians will cross from South Station to the Dewey Square plaza using the crosswalks. If the signal phasing is not favorable, most pedestrians do not wait for the walk phase and execute a diagonal crossing across Summer Street. This identical pattern, in reverse, occurs in the evening peak. In the evening peak hour, the proportion of diagonal crossing through Dewey Square across Summer Street to South Station is lower because of the presence of food truck vendors. The arrangement of the food truck vendors along the plaza help discourage pedestrians from crossing the street mid-block and direct pedestrians towards the crosswalks at the Summer Street/Atlantic Avenue intersection.

There is no pedestrian access allowed along the private portion of Dorchester Avenue, extending from the gate at the MassDOT Vent Building #1 to the gate just south of the parking area and entrance to the retail portion of USPS facility. Over this portion of the Fort Point Channel, the City's Harborwalk does not exist. This is one of the longest segments of Boston's waterfront without a Harborwalk connection. The Harborwalk is designed to connect the public to Boston Harbor – linking the water's edge to the city's open space system. At the southern portion of the South Station site, the Harborwalk connects to the Rolling Bridge Park and the South Bay Harbor Trail. North of the site, the Harborwalk follows the public portion of Dorchester Avenue north of Summer Street.

5.1.4. Bicyclists

Growth in bicycle transportation in the Boston metropolitan area has increased substantially over past decade. Bicycle counts were conducted simultaneously with the TMCs on September 25 and 26, 2012. The overall morning peak hour occurred between 8:00 a.m. and 9:00 a.m. and the evening peak hour from 5:00 p.m. to 6:00 p.m. Figure 11 illustrates the morning peak hour bicycle volumes and Figure 12 shows the evening peak hour bicycle volumes.

The highest bicycle volumes in the area were observed on Essex Street, with 63 bicycles turning left onto Atlantic Avenue in the morning peak hour, and on Summer Street adjacent to South Station, with 63 bicycles riding westbound in the evening peak hour. A notable number of bicyclists crossed the Fort Point Channel along Summer Street, Congress Street, and Seaport Boulevard. On these three roadways, there were 240 bicyclists in the morning peak hour and 130 bicyclists in the evening. Bicyclists were also observed in both the morning and evening peak hours along Kneeland Street in the vicinity of the I-90/I-93 highway access ramps.

In addition to counting bicyclists, data was obtained from the Hubway bicycle sharing program. Hubway is the area's bicycle sharing system providing more than 1,300 bicycles at 140 stations throughout Boston, Brookline, Cambridge, and Somerville. The Hubway's growing bicycle sharing system has a seasonal bicycle station located along Atlantic Avenue at South Station where 47 bicycle slots are available. Utilization data for the Hubway station at South Station from Hubway's launch in 2011 through the end of the 2013 regular season is summarized in Table 3 for three months of the year (August, September, and October).

Table 3—South Station Monthly Hubway Use (August, September, and October)

Month	2011 Bicycle Trips	2012 Bicycle Trips	2013 Bicycle Trips	% Growth (2011 to 2013)
August	4,010	7,660	8,200	104%
September	4,000	6,240	7,230	81%
October	3,870	5,630	7,200	86%

Source: http://hubwaydatachallenge.org/
Note: Hubway trips represent combined origin and destination trips for the South Station Hubway Station (Station #22).

As Table 3 indicates, the Hubway's South Station location has experienced a notable increase in utilization. Comparing August 2011 to August 2013, use of the Hubway station increased from 4,010 monthly trips to 8,200 monthly trips, an increase of 104%. The most popular destination stations for Hubway bicycle trips that begin at South Station are:

1. TD Garden – Causeway at Portal Park
2. Lewis Wharf – Atlantic Avenue
3. Rowes Wharf – Atlantic Avenue
4. Cross Street at Hanover Street
5. Seaport Hotel
6. Aquarium Station – 200 Atlantic Avenue
7. Boylston Street at Arlington Street
8. Congress Street at Sleeper Street
9. Boston Convention and Exhibition Center
10. Washington Street at Waltham Street

The most popular origin stations for Hubway bicycle trips that end at South Station are:

1. Lewis Wharf – Atlantic Avenue
2. TD Garden – Causeway at Portal Park
3. Aquarium Station – 200 Atlantic Avenue
4. Boylston Street at Arlington Street
5. Cross Street at Hanover Street
6. Congress Street at Sleeper Street
7. Rowes Wharf – Atlantic Avenue
8. Boylston Street at Washington Street
9. Seaport Hotel
10. Boylston Street at Berkeley Street

Figure 13 depicts the entire Hubway system utilization in the downtown area from October 2012 to October 2013 using Hubway information in a GIS database. Figure 13 illustrates the Boston Hubway bicycle sharing stations that experience the most use, including South Station which consistently ranks as the busiest or second busiest station in the entire system, with 59,800 annual bicycle trips beginning or ending at the stop, representing 3 to 5% of the total Hubway system utilization.

5.1.5. Safety

A safety assessment was conducted to help determine if safety concerns exist for vehicles, pedestrians, and/or bicyclists. Crash data were obtained from MassDOT records for the three-year period from January 2010 through December 2012. Crash rates were calculated based on the number of crashes relative to the volume of traffic traveling through the intersection on a daily basis. Rates that exceed MassDOT's average District 6 rate (0.76 for signalized intersections and 0.58 for unsignalized intersections) could indicate safety or geometric issues that warrant further examination.

The analysis of the crash data are summarized in Tables 4 and 5, which present the total number of crashes over three years, the calculated crash rates, and details on each crash (severity, types, roadway conditions, time of day, etc.). Figure 14 illustrates the crash frequencies for the study area intersections.

Table 4—Three Year Crash Analysis Summary (2010 to 2012)

Intersection	Total Crashes (3-year period)	Calculated Crash Rate	Intersection Type	Above / Below District 6 Average Rate[a]
1. Congress Street / Dorchester Avenue	0	0.00	Signalized	Below
2. Summer Street / Dorchester Avenue	9	0.43	Signalized	Below
3. Atlantic Avenue / I-93 On-Ramp / Seaport Boulevard	8	0.23	Signalized	Below
4. Atlantic Avenue / Congress Street	8	0.28	Signalized	Below
5. Purchase Street / Congress Street	14	0.39	Signalized	Below
6. Atlantic Avenue / Summer Street	10	0.39	Signalized	Below
7. Summer Street / Purchase Street / Surface Road	7	0.31	Signalized	Below
8. Atlantic Avenue / Essex Street	10	0.69	Signalized	Below
9. Surface Road / Lincoln Street / Essex Street	13	0.40	Signalized	Below
10. Atlantic Avenue / East Street	5	0.49	Unsignalized	Below
11. Atlantic Avenue / Beach Street	5	0.48	Signalized	Below
12. Atlantic Avenue / Kneeland Street	7	0.40	Signalized	Below
13. Kneeland Street / Lincoln Street	10	0.48	Signalized	Below
14. Surface Road / Kneeland Street	6	0.18	Signalized	Below
15. Lincoln Street / South Station Connector	7	0.54	Signalized	Below
16. Surface Road / South Station Connector	7	0.41	Signalized	Below
17. Dorchester Avenue / West 2nd Street	0	0.00	Unsignalized	Below
18. Dorchester Avenue / West Broadway / Traveler Street	3	0.12	Signalized	Below
19. Dorchester Avenue / West 4th Street	4	0.17	Signalized	Below
20. Purchase Street / I-93 Off-Ramp / Seaport Boulevard	8	0.31	Signalized	Below
21. Congress Street / A Street / Thompson Place	1	0.05	Signalized	Below

Source: MassDOT Crash Data (2010-2012)
a MassDOT crash rates are 0.76 for signalized intersections and 0.58 for unsignalized intersections as of January 2013.
http://www.mhd.state.ma.us

Table 5—Three Year Crash Analysis Detail (2010 to 2012)

	1. Congress Street/ Dorchester Avenue	2. Summer Street/ Dorchester Avenue	3. Atlantic Avenue/ Seaport Boulevard	4. Atlantic Avenue/ Congress Street	5. Purchase Street/ Congress Street
Year					
2010	0	3	4	5	9
2011	0	4	2	1	3
2012	0	2	2	2	2
Total	0	9	8	8	14
Average	0.00	3.00	2.67	2.67	4.67
Collision Type					
Angle	0	2	0	2	6
Head-on	0	0	0	1	0
Rear-end	0	1	4	1	1
Rear-to-Rear	0	0	0	0	0
Sideswipe, opposite direction	0	1	0	1	1
Sideswipe, same direction	0	1	1	2	1
Single vehicle crash	0	4	3	0	1
Unknown	0	0	0	1	1
Not reported	0	0	0	0	3
Total	0	9	8	8	14
Crash Severity					
Fatal injury	0	0	0	0	0
Non-fatal injury	0	5	5	2	6
Property damage only	0	1	3	3	6
Not Reported	0	3	0	3	1
Unknown	0	0	0	0	1
Total	0	9	8	8	14
Time of Day					
Weekday, 7:00 a.m. - 9:00 a.m.	0	2	0	0	1
Weekday, 4:00 p.m. - 6:00 p.m.	0	1	2	0	0
Saturday, 11:00 a.m. - 2:00 p.m.	0	0	1	0	2
Weekday, other time	0	4	3	5	8
Weekend, other time	0	2	2	3	3
Total	0	9	8	8	14
Pavement Conditions					
Dry	0	7	6	5	8
Wet	0	1	0	2	4
Ice	0	0	0	0	0
Snow	0	1	0	1	1
Not reported	0	0	2	0	1
Total	0	9	8	8	14
Non Motorist (Bicycle, Pedestrian)					
Total	0	0	1	1	0

Table 5 (Continued)—Three Year Crash Analysis Detail (2010 to 2012)

	6. Atlantic Avenue/ Summer Street	7. Purchase Street/ Summer Street	8. Atlantic Avenue/ Essex Street	9. Surface Road/ Essex Street / Lincoln Street	10. Atlantic Avenue/ East Street	11. Atlantic Avenue/ Beach Street
Year						
2010	5	3	3	7	2	1
2011	1	2	3	2	1	2
2012	4	2	4	4	2	2
Total	10	7	10	13	5	5
Average	3.33	2.33	3.33	4.33	1.67	1.67
Collision Type						
Angle	1	0	2	2	1	0
Head-on	0	0	1	1	0	1
Rear-end	0	1	3	3	0	2
Rear-to-Rear	0	0	0	0	0	0
Sideswipe, opposite direction	1	0	0	0	0	0
Sideswipe, same direction	4	1	1	1	2	1
Single vehicle crash	2	3	1	4	1	1
Unknown	1	0	1	0	1	0
Not reported	1	2	1	2	0	0
Total	10	7	10	13	5	5
Crash Severity						
Fatal injury	0	0	0	0	0	0
Non-fatal injury	2	2	3	2	2	0
Property damage only	5	2	5	9	1	1
Not Reported	3	2	2	2	2	4
Unknown	0	1	0	0	0	0
Total	10	7	10	13	5	5
Time of Day						
Weekday, 7:00 a.m. - 9:00 a.m.	0	3	1	2	0	0
Weekday, 4:00 p.m. - 6:00 p.m.	1	1	2	2	0	0
Saturday, 11:00 a.m. - 2:00 p.m.	1	1	0	0	1	1
Weekday, other time	6	2	4	3	2	2
Weekend, other time	2	0	3	6	2	2
Total	10	7	10	13	5	5
Pavement Conditions						
Dry	7	5	6	11	4	4
Wet	2	0	2	1	1	1
Snow	0	0	0	1	0	0
Unknown	0	0	0	0	0	0
Not reported	1	2	2	0	0	0
Total	10	7	10	13	5	5
Non Motorist (Bicycle, Pedestrian) Total	2	2	1	4	0	0

Table 5 (Continued)—Three Year Crash Analysis Detail (2010 to 2012)

	12. Atlantic Avenue/ Kneeland Street	13. Kneeland Street/ Lincoln Street	14. Surface Road/ Kneeland Street	15. Lincoln Street/ South Station Connector	16. Surface Ramps/ South Station Connector
Year					
2010	3	3	2	1	3
2011	2	3	2	4	3
2012	2	4	2	2	1
Total	7	10	6	7	7
Average	2.33	3.33	2.00	2.33	2.33
Collision Type					
Angle	2	2	3	0	1
Head-on	1	1	0	0	0
Rear-end	0	0	2	1	2
Rear-to-Rear	0	0	0	0	0
Sideswipe, opposite direction	0	0	0	0	0
Sideswipe, same direction	2	3	0	1	0
Single vehicle crash	2	2	0	5	4
Unknown	0	2	0	0	0
Not reported	0	0	1	0	0
Total	7	10	6	7	7
Crash Severity					
Fatal injury	0	0	0	0	0
Non-fatal injury	5	4	0	0	1
Property damage only	2	1	2	6	5
Not Reported	0	5	4	1	1
Unknown	0	0	0	0	0
Total	7	10	6	7	7
Time of Day					
Weekday, 7:00 a.m. - 9:00 a.m.	0	1	2	1	0
Weekday, 4:00 p.m. - 6:00 p.m.	0	1	0	1	0
Saturday, 11:00 a.m. - 2:00 p.m.	0	1	0	0	0
Weekday, other time	6	4	1	1	6
Weekend, other time	1	3	3	4	1
Total	7	10	6	7	7
Pavement Conditions					
Dry	6	9	4	4	7
Wet	1	1	1	3	0
Not reported	0	0	1	0	0
Total	7	10	6	7	7
Non Motorist (Bicycle, Pedestrian) Total	1	0	0	0	0

Table 5 (Continued)—Three Year Crash Analysis Detail (2010 to 2012)

	17. Dorchester Avenue / West 2nd Street	18. Dorchester Avenue/ West Broadway	19. Dorchester Avenue/ West 4th Street	20. Purchase Street/ I-93 Off-ramp/ Seaport Boulevard	21. Congress Street/ A Street/ Thompson Place
Year					
2010	0	2	2	6	0
2011	0	0	1	2	1
2012	0	1	1	0	0
Total	0	3	4	8	1
Average	0.00	1.00	1.33	2.67	0.33
Collision Type					
Angle	0	2	3	2	0
Head-on	0	0	0	0	0
Rear-end	0	0	0	4	0
Rear-to-Rear	0	0	0	0	0
Sideswipe, opposite direction	0	1	0	0	0
Sideswipe, same direction	0	0	0	0	1
Single vehicle crash	0	0	1	1	0
Unknown	0	0	0	1	0
Not reported	0	0	0	0	0
Total	0	3	4	8	1
Crash Severity					
Fatal injury	0	0	0	0	0
Non-fatal injury	0	1	1	1	0
Property damage only	0	0	2	5	1
Not Reported	0	2	1	2	0
Unknown	0	0	0	0	0
Total	0	3	4	8	1
Time of Day					
Weekday, 7:00 a.m. - 9:00 a.m.	0	0	1	1	0
Weekday, 4:00 p.m. - 6:00 p.m.	0	0	1	0	1
Saturday, 11:00 a.m. - 2:00 p.m.	0	0	0	0	0
Weekday, other time	0	1	2	5	0
Weekend, other time	0	2	0	2	0
Total	0	3	4	8	1
Pavement Conditions					
Dry	0	2	3	5	1
Wet	0	1	1	3	0
Not reported	0	0	0	0	0
Total	0	3	4	8	1
Non Motorist (Bicycle, Pedestrian)					
Total	0	0	1	0	1

Source: MassDOT Crash Data (2010-2012)

As summarized in Tables 4 and 5 and illustrated in Figure 14, the crash data analysis revealed the following noteworthy trends:

- **Crash type and severity.** The majority of crashes were angle, rear-end, and sideswipes that resulted in property damage only. There were no fatal crashes reported. The slow speeds on Atlantic Avenue caused by curbside activity help reduce crash severity along Atlantic Avenue. None of the study area intersections are listed on MassDOT's ranking of the top 200 crash locations statewide.[5]
- **Crash rate.** Within the study area, all intersections fell below the average crash rate for District 6 (0.76 for signalized intersections and 0.58 for unsignalized intersections). This suggests that based on the volume of traffic traveling through the intersections, the crash frequency is below average for this area of the City. The highest crash rate in the study area is 0.69 which occurs at the intersection of Atlantic Avenue and Essex Street where 10 crashes were recorded over three years.
- **Roadway conditions.** The crashes occurred primarily on dry pavement conditions during the weekday outside the peak hours.
- **Crash frequency.** The highest number of crashes occurred at the following five intersections all located along Atlantic Avenue, Kneeland Street, or Purchase Street/Surface Road:
    - Purchase Street / Congress Street – 14 crashes;
    - Surface Road / Essex Street / Lincoln Street – 13 crashes;
    - Atlantic Avenue / Summer Street – 10 crashes;
    - Atlantic Avenue / Essex Street – 10 crashes; and
    - Kneeland Street / Lincoln Street – 10 crashes.
- **Pedestrian/bicycle crashes.** Fourteen crashes occurred between vehicles and non-motorists (cyclists or pedestrians) at the following nine intersections:
    - Atlantic Avenue / Seaport Boulevard (1 crash);
    - Atlantic Avenue / Congress Street (1 crash);
    - Atlantic Avenue / Summer Street (2 crashes);
    - Purchase Street / Summer Street (2 crashes);
    - Atlantic Avenue / Essex Street (1 crash);
    - Surface Road / Essex Street / Lincoln Street (4 crashes);
    - Atlantic Avenue / Kneeland Street (1 crash);
    - Dorchester Avenue / West 4th Street (1 crash); and
    - Congress Street / A Street / Thompson Place (1 crash).

5.1.6. Public Transportation

This section provides an overview of the public transportation services at South Station. This overview includes a discussion of utilization for all modes and carriers at South Station including Amtrak, the MBTA, and intercity/commuter buses.

The South Station Transportation Center is Boston's busiest multimodal transportation hub. South Station is centrally located near the Leather District, Financial District, the Fort Point Channel waterfront, and the Seaport District/South Boston waterfront. South Station is one of the most diversified and integrated multimodal centers in the nation. It is both a rail and bus terminal with service by the National Railroad

[5] Massachusetts Department of Transportation. *2011 Top Crash Locations Report*. September 2013. https://www.massdot.state.ma.us/Portals/8/docs/traffic/CrashData/11TopCrashLocationsRpt.pdf.

Passenger Corporation (Amtrak), the MBTA, and private bus carriers providing intercity and regional connections. South Station has facilities to accommodate bicyclists as well as pedestrians and taxi cab patrons.

All 13 tracks at South Station are fully utilized by Amtrak and the MBTA. Similarly, all 29 bus gates are assigned to one of the eleven private bus companies operating at the bus terminal. As shown in Table 6, South Station currently handles approximately 128,000 daily combined Amtrak, MBTA, and intercity bus boardings and alightings. The majority of the passenger flow at South Station is generated by a combination of Red Line patrons (54,000 combined boardings and alightings per day) and Amtrak/Commuter Rail patrons (46,000 combined boardings and alightings per day).

Table 6—2012 Existing Conditions Daily Combined South Station Boardings and Alightings

	Amtrak	Commuter Rail	Amtrak and Commuter Rail Total [a]	Red Line	Silver Line	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

Source: *Final SSX Ridership Results* provided in Appendix 9 – *Ridership Forecasting Technical Report.*
Note: All results rounded to the nearest 100, except for Commuter Rail, Red Line and Total results which are rounded to the nearest 1,000.
a Total values calculated using precise/unrounded results. As such, the sum of rounded individual ridership results may not add up to the rounded Total ridership results presented in this table.

South Station and the railroad right-of-way are owned by the MBTA, with agreements in place for Amtrak for train dispatching and certain elements of maintenance and operations. Both Amtrak and the MBTA are severely limited in their ability to increase service or offer new services due to the constrained size and configuration of the station and terminal facilities. Regionally, future growth in rail service is anticipated by the MBTA and Amtrak. By the year 2035, Amtrak projects 40 weekday intercity round trips to/from South Station, representing a 100% service increase above its current levels.

While this report provides an overview of public transportation services and demands as they relate to the transportation system assessment, separate technical reports for the SSX project provide detailed analyses of public transportation system ridership and capacity/crowding along each line serving South Station and at downtown area stations. Ridership data are provided in Appendix 9 - *Ridership Forecasting Technical Report*. An assessment of area-wide public transportation system demands and capacity is provided in Appendix 9 - *Transit Capacity Technical Report*.

Amtrak

Amtrak operates the 457-mile NEC between Washington, D.C. and Boston. The MBTA owns the 38 miles between the Massachusetts/Rhode Island border and Boston/South Station.

South Station is a major intercity passenger rail terminal along the Amtrak NEC, and is the northern terminus for Acela Express and Northeast Regional services. It is also the terminus for Amtrak's Lake Shore Limited service between Boston and Chicago. Amtrak's NEC is the busiest railroad corridor in North America, with more than 2,200 trains operating over some portion of the Washington-Boston route each day. Nationally, South Station is Amtrak's sixth busiest terminal in terms of ridership, behind New York City, Washington D.C., Philadelphia, Chicago, and Los Angeles. Approximately 1,360,000 Amtrak passengers traveled through South Station in 2011.[6] Table 7 summarizes Amtrak's service at South Station, which are also depicted in Figure 15.

[6] Amtrak Media Relations. *National Fact Sheet: FY 2011*.

Table 7—Amtrak Service at South Station

Route	Destination	Major Cities Served	Weekday Round Trips	On-Time Performance 2014 / Target
Acela Express	Washington, D.C.	Boston – Providence – New Haven – New York – Philadelphia – Baltimore – Washington, D.C.	10	74% / 95%
Northeast Regional	Newport News / Lynchburg, Virginia	Boston – Providence – New Haven – New York – Philadelphia – Baltimore – Washington, D.C. – Lynchburg/Richmond – Newport News	9	75% / 90%
Lake Shore Limited	Chicago, Illinois	Boston – Albany – Buffalo – Cleveland – Toledo – Chicago	1	39% / 85%

Source: Data for on-time performance is from May 2013 to May 2014, www.amtrak.com . On-time performance targets from *The Northeast Corridor Infrastructure Master Plan (2010).*

The **Acela Express** service runs between South Station and Washington, D.C. It is the fastest train in North America, reaching speeds of 150 miles per hour on sections between South Station and New Haven, Connecticut. It caters to the business traveler between Boston, New York, and Washington, D.C. The service takes an average of seven hours to complete a one-way trip from Boston to Washington, D.C. The Acela Express typically makes 10 daily weekday round trips to/from South Station. Acela Express on-time performance from May 2013 to May 2014 was approximately 74%. The 2030 target for on-time performance for the Acela Express is 95%. Historically, the primary causes of system delays for the Acela Express are weather, track/signal issues, and commuter train interference.

The **Northeast Regional** service runs between South Station and Newport News/Lynchburg, Virginia. The route takes an average of 12.5 hours to complete a one-way trip. The Northeast Regional typically makes nine daily weekday round trips to/from South Station. Northeast Regional on-time performance from May 2013 to May 2014 was approximately 75%. The 2030 target for on-time performance for the Northeast Regional service is 90%. Historically, the primary causes of system delays for the Northeast Regional service were weather, boarding/alighting passenger delays, track/signal issues, and commuter train interference.

The **Lake Shore Limited** runs between South Station and Chicago, Illinois, taking over 22 hours to complete the 959-mile one-way trip. The Lake Shore Limited makes one daily round trip to/from South Station. The Lake Shore Limited on-time performance from May 2013 to May 2014 was approximately 39%. The Fiscal Year 2012 target for on-time performance for the Lake Shore Limited is 85%.[7] Historically, the primary causes of system delays for the Lake Shore Limited service are weather, passenger connectivity delays, track/signal issues, and freight train interference.

MBTA Commuter Rail

The MBTA owns the nation's fifth largest commuter rail system. South Station is the terminus for the portion of the MBTA commuter rail system that serves central and southeastern Massachusetts. There are eight MBTA commuter rail lines serving South Station, illustrated in Figure 16. Each weekday,

[7] Federal Railroad Administration. *Amtrak On-Time Performance (OTP) Reports*, provided to The Committee on Appropriations, United States Senate, December 17, 2008; December 29, 2009; January 21, 2011; January 27, 2012; February 15, 2013.

South Station serves approximately 42,000 commuter rail passenger boardings and alightings, as summarized in Table 8.

Table 8—Existing Weekday MBTA Commuter Rail Boardings and Alightings at South Station

MBTA Route	Inbound Alightings at South Station	Outbound Boardings at South Station	Total Boardings and 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

Source: CTPS, *MBTA Commuter Rail Passenger Count Results*, December 21, 2012.

The nine commuter rail lines that operate at South Station are as follows:

- **Fairmount Line** runs from the Hyde Park neighborhood of Boston to South Station, with intermediate stops in the Mattapan, Dorchester, and Roxbury neighborhoods. On a typical weekday, there are 364 inbound alightings and 403 outbound passenger boardings at South Station.

- **Framingham/Worcester Line** runs from Worcester to South Station, with intermediate stops in Grafton, Westborough, Southborough, Ashland, Framingham, Natick, Wellesley, Newton, and Boston. On a typical weekday, there are 3,395 inbound alightings and 3,802 outbound boardings at South Station.

- **Franklin Line** runs from Franklin to South Station, with intermediate stops in Norfolk, Walpole, Norwood, Westwood, Dedham, and Boston. Three daily Franklin trips run via the Fairmount Line. On a typical weekday, there are 2,759 inbound alightings and 3,016 outbound boardings at South Station.

- **Greenbush Line** runs from Scituate to South Station, with intermediate stops in Cohasset, Hingham, Weymouth, Quincy, and Boston. On a typical weekday, there are 1,883 inbound alightings and 1,934 outbound boardings at South Station.

- **Kingston/Plymouth Line** runs from Kingston to South Station, with intermediate stops in Plymouth, Halifax, Hanson, Whitman, Abington, Weymouth, and Boston. On a typical weekday, there are 2,468 inbound alightings and 2,385 outbound boardings at South Station.

- **Middleborough/Lakeville Line** runs from Lakeville to South Station, with intermediate stops in Bridgewater, Brockton, Randolph, Quincy, and Boston. On a typical weekday, there are 2,038 inbound alightings and 2,263 outbound boardings at South Station.

- **Needham Line** runs from Needham to South Station, with intermediate stops in both Needham and Boston. On a typical weekday, there are 1,623 inbound alightings and 1,894 outbound boardings at South Station.

- **Providence/Stoughton Line** runs from North Kingstown and Providence, Rhode Island to South Station and from Stoughton to South Station. Trains beginning in North Kingstown, Rhode Island make intermediate stops in Warwick and Providence, Rhode Island; Attleboro, Mansfield, Sharon, Canton, Westwood, and Boston. Trains beginning in Stoughton make intermediate stops in Canton, Westwood, and Boston. On a typical weekday, there are 5,412 inbound alightings and 6,075 outbound boardings at South Station.

The minimum weekday span of service for commuter rail is 7:00 a.m. to 10:00 p.m. per the MBTA's *Service Delivery Policy (*the *Policy).* On weekdays, commuter rail trains leave South Station as early as 4:00 a.m. and arrive at South Station as late as 1:30 a.m.[8]

Scheduled commuter rail frequencies vary by route and time of day. Per the *Policy*, the minimum weekday frequency of service for commuter rail is three trips in the peak direction during the AM Peak and PM Peak periods, and one trip in each direction every three hours during all other periods.

MBTA Rapid Transit

The MBTA's rapid transit service at South Station includes the Red Line and the Silver Line bus rapid transit (BRT) service. The Red Line connects communities north and south of Boston with downtown. The Red Line has two branches that serve South Station, both of which begin at Alewife Station in Cambridge and provide service through Cambridge, downtown Boston, South Boston, and a portion of Dorchester. The Ashmont Branch continues further into Dorchester and connects with the Mattapan Line at Ashmont Station. The Braintree Branch runs through Quincy and into Braintree. Figure 17 illustrates the Red Line alignment in the vicinity of South Station, which runs in a tunnel beneath Fort Point Channel and through Dewey Square following Summer Street to the Financial District and into downtown. Existing Red Line ridership at South Station totals approximately 54,000 combined weekday boardings and alightings.[9]

The Silver Line BRT service uses 60-foot dual mode articulated diesel-electric buses (DMAs). The Silver Line 1 and Silver Line 2 serve South Station and provide service to Logan Airport and the Design Center in the Boston Marine Industrial Park, respectively. The Silver Line 4 provides service from South Station (at Essex Street and Atlantic Avenue, across from the existing station headhouse) to Dudley Square. Existing Silver Line ridership at South Station totals approximately 12,700 combined weekday boardings and alightings on the Silver Line 1 and Silver Line 2, and approximately 2,200 combined weekday boardings and alightings on the Silver Line 4, as summarized in Table 9.

[8] Massachusetts Bay Transportation Authority. *Commuter Rail Maps and Schedules*. Accessed April 2014. http://www.mbta.com/schedules_and_maps/rail/.
[9] Appendix 9 - *Ridership Forecasting Technical Report.*

Table 9—Existing Weekday MBTA Bus Rapid Transit Boardings and Alightings at South Station

Route	Total Boardings and Alightings at South Station
Silver Line 1 – Logan Airport – South Station via Waterfront & Silver Line 2– Design Center – South Station via Waterfront	12,700[a]
Silver Line 4 – Dudley Station – South Station at Essex Street via Washington Street	2,208

Source: MBTA ridership counts provided by Greg Strangeways, Fall 2012.
a Per *Final SSX Ridership Results* provided in Appendix 9 - *Ridership Forecasting Technical Report.*

MBTA Local Bus Service

Local bus service connections at South Station include six local bus routes that stop immediately adjacent to the South Station headhouse on Summer Street. Table 10 summarizes existing ridership statistics for the bus routes serving South Station. Bus ridership is illustrated in Figure 18 and Figure 19, showing the level of weekday boardings and alightings at bus stops in the vicinity of South Station.

- **Route 4** provides service between North Station and Tide Street in the Boston Marine Industrial Park via Downtown Boston and the Financial District. The route stops near South Station (at the corner of Summer Street and Dorchester Avenue) when operating from Tide Street to North Station in the mornings and at South Station when operating from North Station to Tide Street in the evenings.

- **Route 7** provides service between City Point in South Boston and Otis Street at Summer Street in the Financial District.

- **Route 11** provides service between City Point in South Boston and Downtown Boston via Bay View. The route traverses South Boston, Downtown Boston, Chinatown, the Theater District, and the Financial District. The route stops at South Station on Summer Street in the outbound direction.

- **Routes 448/449** provide service from Marblehead to Downtown Crossing. Routes 448/449 stop in Swampscott, Lynn, Revere, and Logan Airport before stopping at South Station.

- **Route 459** provides service between Salem Station and Downtown Crossing. The route provides service to Swampscott, Lynn, Saugus, Revere, Logan Airport and South Boston.

Table 10—Existing Weekday MBTA Local Bus Boardings and Alightings at South Station

Route	Total Boardings and Alightings at South Station
Route 4 – North Station – Tide Street via Federal Courthouse & South Station	42
Route 7 – City Point - Otis & Summer Streets via Summer Street & South Station	1,865
Route 11 – City Point - Downtown Bay View Route	405
Route 448 – Marblehead - Downtown Crossing via Paradise Road	19
Route 449 – Marblehead - Downtown Crossing via Paradise Road	11
Route 459 – Salem Depot - Downtown Crossing via Logan Airport & Central Square, Lynn	109

Source: MBTA ridership counts provided by Greg Strangeways, Fall 2012.

Private Intercity/Commuter Bus Service

The bus terminal is located directly over the rail tracks, as illustrated in Figure 20. The bus terminal has a total of 29 gates and is owned by the MBTA with property management services contracted to a private company. The bus terminal includes ticketing, concessions, bus loading/unloading gates, and a commuter platform that serves as a waiting area adjacent to the bus gates. Gates 1 to 25 are accessed via the commuter platform and Gates A1, A2, B1, and B2 are accessed directly from the second floor of the bus terminal. All ticketing is centrally located on the second floor of the bus terminal adjacent to the gates.

Private bus carriers operating out of the bus terminal provide commuter services between South Station and the surrounding Greater Boston area, as well as nearly 24-hour intercity service to locations in New England and beyond, including substantial express service to New York City. The bus terminal is heavily utilized. On a typical weekday, there are approximately 590 combined bus departures and arrivals at the bus terminal, serving 12,200 combined passenger boardings and alightings per day. Annually, there are approximately 100,000 bus departures from South Station.

Table 11 summarizes the intercity bus service at South Station with the arrivals and departures for each company.

Figure 21 depicts the hourly variations in traffic at the bus terminal over the day. The bus depot generates approximately 600 bus trips per day and the upper parking deck generates 1,400 vehicle trips per day.

Table 11—Typical Weekday Intercity Bus Service at South Station

Bus Company	Destination	Average Weekday Arrivals and Departures
Bolt Bus	New York (Pennsylvania Station)	20
Boston Express	Concord, NH Manchester, NH	20
C&J Trailways	Dover, NH	40
Concord Coach Lines	Concord, NH Portland, ME Orono, ME	60
Dattco	Taunton and New Bedford, MA	20
Fung Wah	New York (Chinatown)	30
Greyhound	New York, Cleveland, Hartford	80
Lucky Star	New York (Chinatown)	30
Megabus	CT, ME, VT, NY, NJ, PA, MD, DC	50
Peter Pan/Bonanza	MA, CT, RI, NY, MD, NJ, PA, DE, DC	180
Plymouth and Brockton	Hyannis, MA	40
Plymouth and Brockton	Plymouth, MA	10
Plymouth and Brockton	Provincetown, MA	10

Source: Schedules provided by each bus company, as of September 2013.

There is a 223-space parking deck located directly above the bus terminal. The ramp that provides access to the parking deck is a High Occupancy Vehicle (HOV) ramp designated for two or more passengers. The bus terminal parking is fully utilized during the week – approximately 280 tickets are pulled each day for patrons wanting to park at the 223-space facility. At times, vehicles must be double parked by the valet when there are no available spaces.

The bus terminal parking experiences a significant amount of "pass through" traffic – approximately 200 tickets per day are pulled for pass-through activity, or vehicles with less than 15 minute dwell time. This includes bus terminal patrons who are dropping off or picking up passengers, package delivery, and drivers who are lost and accidently access the bus terminal parking deck before turning around and returning to the public street system. At times, these lost drivers are discouraged by the parking deck entrance gate and have to make a U-turn maneuver back down the one-way access ramp in the wrong direction. The Bus Terminal management added signs and an attendant booth in advance of the access control gates to help prevent this U-turn movement. Occasionally, large tractor-trailer trucks make this mistake, requiring assistance from bus terminal management to maneuver back down the narrow one-way ramp (large trucks cannot physically make the tight left-turn through the control gates into the deck). This confusion all centers around the HOV designation on the bus terminal parking deck ramp.

Given that there is a 15-minute no charge grace period at the parking deck, it is an attractive alternative to Atlantic Avenue for drop-off or pick-up since there is no cost, there is direct access to the regional highway network, and the walk is shorter to the bus depot ticketing area compared to being dropped off at the Atlantic Avenue curb.

5.1.7. Intersection Operations

Level of Service (LOS) is the traffic engineering metric that is used to denote the different operating conditions which occur on a given roadway or intersection under various volume loads. It is a qualitative measure of the effect of a number of factors, including roadway/intersection geometry, speed, and travel delay. LOS provides an index to the operational qualities of a roadway or intersection. Similar to a school report card, LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Typically, an overall LOS D or better is considered acceptable in an urban environment.

For signalized intersections, the analysis considers the operation of each lane or lane group entering the intersection and the LOS designation is for overall conditions at the intersection. For unsignalized intersections, however, the LOS designation considered is for the most critical movement. Table 12 presents the level of service delay threshold criteria as defined in the 2010 Highway Capacity Manual (HCM).

Table 12—Level of Service Criteria

Level of Service	Unsignalized Intersection Control Delay (seconds per vehicle)	Signalized Intersection Control Delay (seconds per vehicle)
LOS A	≤ 10	≤ 10
LOS B	>10 - 15	> 10-20
LOS C	>15 - 25	> 20-35
LOS D	>25 - 35	> 35-55
LOS E	>35 - 50	> 55-80
LOS F	>50	> 80

Source: 2010 Highway Capacity Manual. www.trb.org

Intersection capacity analyses have been conducted using Synchro 6 software as required by BTD. This analysis is based on the HCM methodologies. Tables 13 and 14 summarize the intersection capacity analyses for the morning and evening peak hours under existing conditions. The tables provide detailed level of service ratings, volume to capacity (V/C) ratios, delay, and queue lengths for each intersection lane group.

Table 13—Signalized Intersection Capacity Analysis – 2012 Existing Conditions

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.40	17.8	B	m81	0.53	54.8	D	m193
	Congress Street – EB Thru/Right	0.51	21.1	C	m125	0.42	12.7	B	m244
	Congress Street – WB Left	0.71	47.0	D	m#124	0.53	16.0	B	m39
	Congress Street – WB Thru	0.38	26.7	C	m138	0.28	8.2	A	m59
	Overall Intersection	0.57	23.9	C	-	0.53	18.8	B	-
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.75	27.1	C	339	0.85	29.0	C	#316
	Summer Street – WB Left/Thru/Right	0.49	16.3	B	155	0.60	26.4	C	196
	Dorchester Avenue – NB Left/Thru/Right	0.35	38.0	D	66	0.23	24.6	C	56
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	#400	>1.0	>80.0	F	#428
	Dorchester Avenue – SB Right	0.48	62.4	E	m102	0.36	13.5	B	93
	Overall Intersection	0.93	57.8	E	-	0.96	40.1	D	-
3. Atlantic Avenue at Seaport Boulevard	Seaport Boulevard – EB Left/Thru	0.76	21.0	C	#326	0.53	14.4	B	m#174
	Seaport Boulevard – WB Thru/Right	>1.0	>80.0	F	#446	>1.0	>80.0	F	#528
	Seaport Boulevard – WB Bear Right/ Right	0.51	34.1	C	142	0.97	78.4	E	#343
	Seaport Boulevard – WB Right	0.94	75.5	E	#325	0.99	82.2	F	#358
	Atlantic Avenue – NB Left/Bear Left	>1.0	>80.0	F	m#569	>1.0	>80.0	F	m#625
	Atlantic Avenue – NB Bear Left/Thru/Right	>1.0	>80.0	F	m#695	>1.0	>80.0	F	#712
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
4. Atlantic Avenue at Congress Street	Atlantic Avenue – NB Thru/Right	0.91	20.5	C	m90	0.91	25.0	C	m#210
	Congress Street – EB Left	0.65	38.4	D	155	0.57	40.4	D	173
	Congress Street – EB Thru	0.33	8.2	A	82	0.35	8.6	A	227
	Congress Street – WB Right	0.75	34.2	C	181	0.66	35.0	C	200
	Overall Intersection	0.79	22.5	C	-	0.72	24.6	C	-
5. Purchase Street at Congress Street	Congress Street – EB Thru	0.37	23.3	C	134	0.71	32.0	C	281
	Congress Street – EB Bear Right	0.48	27.4	C	186	>1.0	>80.0	F	#757
	Congress Street – EB Right	0.09	20.9	C	36	0.20	24.3	C	58
	Purchase Street – SB Left	0.51	46.4	D	m226	0.33	5.4	A	m0
	Purchase Street – SB Bear Left/Thru	0.76	30.0	C	m379	>1.0	46.6	D	m#539
	Overall Intersection	0.63	32.2	C	-	>1.0	66.1	E	-
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.59	28.0	C	132	0.55	26.2	C	124
	Summer Street – WB Thru	0.89	62.2	E	#213	0.81	67.5	E	m#230
	Summer Street – WB Right	0.42	72.8	E	m109	0.43	>80.0	F	m155
	Atlantic Avenue – NB Left	>1.0	>80.0	F	m#420	0.62	21.9	C	m116
	Atlantic Avenue – NB Left/Thru	>1.0	>80.0	F	#540	0.89	30.4	C	#319
	Atlantic Avenue – NB Right	0.40	28.2	C	76	0.31	27.5	C	56
	Overall Intersection	>1.0	>80.0	F	-	0.82	43.0	D	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.55	2.0	A	m28	0.54	2.0	A	m18
	Summer Street – EB Thru	0.31	40.0	D	76	0.32	35.9	D	106
	Summer Street – EB Right	0.03	34.9	C	22	0.11	32.7	C	49
	Summer Street – WB Left	>1.0	79.2	E	m#187	0.79	53.2	D	m#192
	Summer Street – WB Left/Thru	>1.0	73.8	E	m#204	0.80	46.6	D	m#195
	Overall Intersection	0.61	29.7	C	-	0.54	19.0	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal
dl one of the approach lanes operates as a default left-turn lane

Table 13 (Continued)—Signalized Intersection Capacity Analysis – 2012 Existing Conditions

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
8. Atlantic Avenue at Essex Street	Essex Street – EB Left	0.71	40.3	D	194	0.46	28.8	C	139
	Atlantic Avenue – NB Left/Thru	0.74	16.4	B	220	0.71	18.2	B	182
	Overall Intersection	0.73	22.9	C	-	0.61	21.7	C	-
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left	0.52	34.2	C	188	>1.0	>80.0	F	#549
	Essex Street – EB Thru/Right	0.42	30.3	C	131	0.52	37.5	D	131
	Lincoln Street – NB Thru//Bear Right/Right	0.70	33.5	C	230	0.68	33.9	C	228
	Surface Road – SB Left/Thru/Right	0.74	23.0	C	m216	0.79	19.3	B	278
	Overall Intersection	0.65	29.0	C	-	0.87	53.2	D	-
11. Atlantic Avenue at Beach Street	Atlantic Avenue – NB Left/Thru	0.59	2.5	A	m21	0.38	5.1	A	m76
	Overall Intersection	0.59	2.5	A	-	0.38	5.1	A	-
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.83	48.0	D	m#256	0.77	38.4	D	197
	Kneeland Street – EB Left/Thru	0.75	39.9	D	m#232	0.70	32.8	C	188
	MBTA Access Drive – WB Thru/Right	0.00	0.0	A	-	0.04	37.9	D	5
	Frontage Road – NB Left	0.78	31.0	C	#466	0.86	50.5	D	#340
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#870	0.49	30.8	C	175
	I-90 Off-Ramp– NB Left	0.29	12.1	B	132	0.48	15.2	B	218
	I-90 Off-Ramp – NB Left/Thru	0.95	>80.0	F	#271	0.96	74.3	E	#371
	Overall Intersection	>1.0	66.7	E	-	0.75	41.5	D	-
13. Kneeland Street at Lincoln Street	Kneeland Street – EB Left/Thru/Right	0.54	11.2	B	m27	0.46	19.0	B	m217
	Kneeland Street – WB Left/Thru/Right	0.67	52.6	D	210	0.50	49.7	D	m177
	Lincoln Street – NB Left	0.75	32.4	C	#441	0.93	69.1	E	#318
	Lincoln Street – NB Left/Thru/Right	0.75	27.5	C	#381	0.49	29.2	C	110
	Overall Intersection	0.69	33.3	C	-	0.60	38.2	D	-
14. Surface Road at Kneeland Street	Kneeland Street – EB Thru	0.38	28.1	C	128	0.42	24.2	C	210
	Kneeland Street – EB Right	0.09	24.9	C	40	0.23	22.3	C	74
	Kneeland Street – WB Left	0.13	8.7	A	m36	0.35	11.2	B	m103
	Kneeland Street – WB Thru	0.32	8.4	A	178	0.29	10.0	B	m168
	Surface Road – SB Left/Thru/Right	0.62	>80.0	F	251	>1.0	>80.0	F	#414
	Overall Intersection	0.41	61.4	E	-	0.66	59.3	E	-
15. Lincoln Street at South Station Connector	South Station Connector – EB Left/Thru/Right	0.08	46.4	D	18	0.12	42.8	D	23
	South Station Connector – WB Left/Thru/Right	0.14	36.3	D	30	0.22	28.6	C	52
	Surface Ramp – NB Left/Thru/Right	0.46	4.8	A	132	0.32	7.8	A	101
	Lincoln Street – SB Left/Thru/Right	0.03	7.1	A	m8	0.11	12.5	B	70
	Overall Intersection	0.40	7.6	A	-	0.29	17.9	B	-
16. Surface Road at South Station Connector	South Station Connector – WB Left	0.38	53.3	D	47	0.52	62.1	E	80
	Surface Ramp– SB Left/Thru	0.15	0.6	A	m9	0.36	0.9	A	m19
	Overall Intersection	0.17	8.1	A	-	0.37	7.6	A	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 13 (Continued)—Signalized Intersection Capacity Analysis – 2012 Existing Conditions

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#660	0.82	35.6	D	m#264
	Dorchester Avenue – NB Thru/Right	0.13	12.8	B	m49	0.05	14.8	B	m26
	Dorchester Avenue – SB Left/Thru	0.82	68.8	E	#145	>1.0	>80.0	F	#297
	Dorchester Avenue – SB Right	0.12	29.0	C	38	0.19	26.8	C	56
	Traveler Street – EB Left	0.87	67.2	E	#250	0.29	24.1	C	86
	Traveler Street – EB Thru	0.47	23.2	C	232	0.69	32.0	C	#380
	Traveler Street – EB Right	0.16	20.1	C	44	0.39	19.8	B	49
	West Broadway – WB Left	0.25	20.7	C	63	0.43	30.4	C	#130
	West Broadway – WB Thru/Right	0.84	39.6	D	#387	0.47	26.4	C	195
	Overall Intersection	>1.0	>80.0	F	-	0.90	41.1	D	-
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	0.74	45.2	D	#170	0.43	29.3	C	135
	West 4th Street – EB Right	0.06	24.1	C	24	0.10	24.0	C	38
	West 4th Street – WB Left/Thru/Right	0.82	45.4	D	#315	0.70	36.7	D	240
	Dorchester Avenue – NB Left	>1.0	73.4	E	#619	0.80	27.4	C	#156
	Dorchester Avenue – NB Thru	0.37	7.6	A	113	0.19	6.7	A	57
	Dorchester Avenue – NB Right	0.00	5.3	A	2	0.00	5.7	A	2
	Dorchester Avenue – SB Left/Thru	0.25	14.7	B	m53	0.61	20.4	C	m171
	Dorchester Avenue – SB Right	0.16	23.4	C	m28	0.15	29.5	C	m41
	Overall Intersection	1.00	36.6	D	-	0.77	23.4	C	-
20. Purchase Street at I-93 Off-Ramp / Seaport Boulevard	I-93 Off-Ramp – SB Left	0.70	8.9	A	386	0.48	13.7	B	241
	I-93 Off-Ramp – SB Thru/Right	0.75	33.7	C	#374	0.59	36.7	D	172
	Seaport Boulevard – WB Left	0.95	58.1	E	m151	0.31	27.4	C	m74
	Seaport Boulevard – WB Left/Thru	0.97	61.9	E	m164	0.30	27.2	C	m73
	Purchase Street – SB Thru/Right	0.62	29.0	C	223	>1.0	65.0	E	#500
	Overall Intersection	0.78	29.9	C	-	0.61	47.0	D	-
21. Congress Street at A Street / Thompson Place	Congress Street – EB Left/Thru	0.52	25.4	C	113	0.37	17.0	B	170
	Congress Street – EB Right	0.17	24.9	C	59	0.21	6.7	A	31
	Congress Street – WB Left	0.80	36.8	D	#409	0.68	40.2	D	201
	Congress Street – WB Thru/Right	0.32	7.5	A	130	0.23	6.2	A	87
	A Street – NB Left/Thru	0.93	>80.0	F	#211	0.99	>80.0	F	#225
	A Street – NB Right	0.11	14.4	B	27	0.21	24.0	C	47
	Thompson Place – SB Left/Thru/Right	0.15	40.0	D	34	0.17	40.2	D	43
	Overall Intersection	0.64	30.7	C	-	0.49	27.7	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 14—Unsignalized Intersection Capacity Analysis – 2012 Existing Conditions

Unsignalized Intersection	Lane Group	Morning Peak Hour			Evening Peak Hour		
		V/C[a]	Delay[b]	LOS[c]	V/C[a]	Delay[b]	LOS[c]
10. Atlantic Avenue at East Street	East Street - EB	0.11	14.1	B	0.08	11.9	B
17. Dorchester Avenue at West 2nd Street	West 2nd Street – WB	0.52	18.4	C	0.61	20.7	C
	Dorchester Avenue - NB	0.19	0.0	A	0.09	0.0	A
	Dorchester Avenue - SB	0.03	3.2	A	0.02	1.1	A

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service

Typical of a busy downtown area, there are high levels of vehicle, pedestrian, and bicycle activity in the study area during the morning and evening peak hours coinciding with commuter traffic. Varying factors such as curbside loading and stopping, construction activity, vehicles blocking intersections and jaywalking degrade traffic operations on a day-to-day basis which is typical of a downtown area.

In existing conditions, both unsignalized intersections in the study area operate at LOS D or better during the morning and evening peak hours. The majority of signalized intersections operate at an overall LOS D or better during the morning and evening peak hours except for the following eight intersections:

- **Summer Street at Dorchester Avenue (AM peak hour)** – This intersection operates at an overall LOS E in the morning peak hour and an overall LOS D in the evening peak hour. Dorchester Avenue southbound experiences the greatest delay due to a heavy southbound permitted left-turn on to Summer Street. The amount of green time allocated to the Dorchester Avenue approaches does not allow for vehicle queues to clear.

- **Atlantic Avenue at Seaport Boulevard (AM and PM peak hours) –** This intersection operates at an overall LOS F during both the morning and evening peak hours. Congested conditions on I-93 during the peak hours result in delays on the I-93 on-ramp which impact the intersection operations. On the westbound Seaport Boulevard approach, unclear traffic regulations result in vehicles making illegal turns and/or cutting off other vehicles when they realize the error. Pedestrians have an exclusive pedestrian phase, but typically choose to cross concurrently with Atlantic Avenue traffic which increases traffic delays.

- **Purchase Street at Congress Street (PM peak hour) –** This intersection operates at an overall LOS C during the morning peak hour and an overall LOS E during the evening peak hour. Observed conditions in the evening are often worse than the model reports when the I-93/I-90 ramps back into the intersection and create congestion. On the eastbound Congress Street approach, drivers use the two right lanes to merge onto the I-90/I-93 ramp despite traffic regulations. This back-up results in added delays to the Purchase Street and Congress Street corridors.

- **Atlantic Avenue at Summer Street (AM peak hour) –** This intersection operates at an overall LOS F in the morning peak hour and an overall LOS D during the evening peak hour. During the morning peak hour, Atlantic Avenue is heavily used by commuters from I-90 Eastbound and I-93 Northbound. In addition, the westbound Summer Street approach experiences a heavy traffic demand from the east. Atlantic Avenue provides for three lanes of travel, but during peak hours the curbside activity often reduces the capacity of Atlantic Avenue. Taxis and passenger car drop-offs and pick-ups on Atlantic Avenue negatively affect traffic operations when double or triple parked. During the peak hour, commuters that take public transit into South Station disperse in groups causing conflicts when they cross the street and force traffic to yield. Atlantic Avenue

provides two left turn lanes, but is hindered by concurrent pedestrian operations and over 3,750 pedestrians traversing the intersection during the peak hours.

- **Atlantic Avenue at Kneeland Street (AM peak hour) –** This intersection operates at an overall LOS E during the morning peak hour and an overall LOS D during the evening peak hour. During the morning peak hour, there are heavy volumes exiting the I-93 Northbound Frontage Road and I-90 Eastbound contributing to congestion and delay at this intersection.
- **Surface Road at Kneeland Street (PM peak hour) –** This intersection operates at an overall LOS D during the morning peak hour and an overall LOS E during the evening peak hour when traffic on I-93/I-90 is highest. Surface Road processes over 550 more vehicles in the evening peak hour and is allotted less green time compared to the morning peak hour, which causes the increased delay. The increased green time given to Kneeland Street is to ensure upstream and downstream intersections are not blocked.
- **Dorchester Avenue at West Broadway (AM and PM peak hour) –** This intersection operates at an overall LOS F in both the morning and evening peak hours. Dorchester Avenue is allotted the majority of the cycle length which causes higher delays on West Broadway and Traveler Street. The West Broadway and Traveler Street left-turns are not protected and must yield to on-coming traffic which causes few left turns to process during each cycle. The exclusive pedestrian phase, activated on a button push, is regularly called during the peak hours adding to the overall intersection delay for vehicles.
- **Dorchester Avenue at West 4th Street (AM and PM peak hour) –** This intersection operates at an overall LOS F in both the morning and evening peak hours. Dorchester Avenue is allocated the majority of the cycle length which causes higher delays on West 4th Street. Both West 4th Street approaches provide a shared left-turn/through lane without any allotted time for protected lefts which causes additional backups on West 4th Street.

5.1.8. Curbside Operations

Curbside activity along Atlantic Avenue has a major influence on traffic flow. There are times when vehicles are double parked along the curb blocking through lanes along Atlantic Avenue toward Dewey Square. As discussed earlier in this report, Figure 2 presents the curbside regulations in the vicinity of South Station.

A curbside queue study was conducted on Atlantic Avenue between Kneeland Street and Summer Street, adjacent to South Station. Data were collected on September 18, 2012 from 8:00 a.m. to 10:00 a.m. and noon to 1:00 p.m., and on September 20, 2012 from 4:00 p.m. to 6:00 p.m. The queues were recorded in five-minute increments at eight defined curbside zones extending from Summer Street to Kneeland Street. Curbside regulations vary in these sections and include passenger pick-up/drop-off, taxi stands, food pick-up, metered parking and no stopping. Table 15 summarizes the curbside activity by zone.

Table 15—Atlantic Avenue Curbside Maximum Observed Queues

	Zone 1 No Stopping (Summer to Essex Street)	Zone 2 No Stopping (Essex Street)	Zone 3 Food Pick Up	Zone 4 Taxicab Stand 1	Zone 5 Drop-off / Pick-up	Zone 6 No Stopping (Beach Street)	Zone 7 Taxicab Stand 2	Zone 8 Metered Parking
Number of Spaces Available	0	0	1	11	13	0	4	6
Maximum Observed Queues:								
8:00 a.m. to 9:00 a.m.	1[a]	2[a]	1	8	1	1[a]	5[a]	6
9:00 a.m. to 10:00 a.m.	1[a]	2[a]	1	12[a]	5	3[a]	6[a]	6
noon to 1:00 p.m.	1[a]	1[a]	1	12[a]	1	6[a]	10[a]	7[a]
4:00 p.m. to 5:00 p.m.	3[a]	3[a]	1	10	9	3[a]	7[a]	6
5:00 p.m. to 6:00 p.m.	1[a]	2[a]	1	11	8	4[a]	6[a]	6

Source: Data collected on September 18, 2012 from 8:00 to 10:00 a.m., and noon to 1:00 p.m. and September 20, 2012 from 4:00 p.m. to 6:00 p.m.

a Demand exceeds capacity; curbside activity may spill into the general purpose lane on Atlantic Avenue.

From the curbside queue study, the maximum observed queue of 42 vehicles occurred in the evening peak hour, with approximately 20% of these vehicles dropping-off or picking-up passengers illegally either in a curbside zone that they were not supposed to stop in or by double parking on Atlantic Avenue.

Figure 22 illustrates the Atlantic Avenue curb-side traffic generation along the South Station curb. South Station generates approximately 3,400 daily trips along the Atlantic Avenue curbside (1,700 arriving plus 1,700 departing trips). The 3,400 daily trips include 1,900 taxicab trips and 1,500 trips made by non-taxicabs such as passenger vehicles and commercial delivery vehicles - all competing for limited curb space along Atlantic Avenue. On a typical weekday, taxicab activity accounts for 56% of the traffic using the South Station curb along Atlantic Avenue.

Unlike traditional commuter peak periods, the curbside activity at South Station peaks in the late morning timeframe, from 10:00 a.m. to 11:00 a.m. where there are over 300 vehicles arriving and departing from the curb. Curbside traffic subsides during the midday and increases again from 3:00 p.m. to 6:00 p.m. After 6:00 p.m., curbside traffic associated with South Station drops substantially.

During the peak hours, congestion on Atlantic Avenue is caused by heavy commuter traffic volumes which is exacerbated by the curbside activity. Figure 23 summarizes the following curbside operational issues:

- **Curbside drop-off/pick-up and taxi activity.** The majority of drop-offs occur on the first block of Atlantic Avenue between Kneeland Street and Beach Street (Zone 6, 7, and 8) when drivers first encounter South Station and attempt to find the first available curbside slot – utilizing the taxicab zone (Zone 7). As a result, the dedicated passenger drop-off/pick-up area adjacent to the bus terminal (Zone 13) is underutilized since many patrons have already stopped before reaching this designated drop-off/pick-up zone. In addition, the signage is confusing in this area and gives the impression that the area is a no stopping zone.
- **Stopping in no stopping zones.** Taxis and passenger vehicles were both observed using the no stopping zones for curbside drop-off/pick-ups. These no stopping zones are located within intersections along Atlantic Avenue.

- **Taxicab pick-up zone (Zone 7).** The number of taxis staging for passenger pick-ups exceeds the dedicated curb capacity and results in the taxis spilling into the street and blocking travel lanes. As mentioned previously, it is common for non-taxicabs to use this area which exacerbates the issue of lane blocking along Atlantic Avenue.
- **Silver Line Bus turns (Silver Line 4).** The articulated Silver Line 4 bus takes very wide turns from Essex Street onto Atlantic Avenue which impact traffic flow by requiring the bus to use the entire Atlantic Avenue/Essex Street intersection to maneuver. It is difficult and time consuming for the Silver Line bus to make this maneuver in heavy traffic conditions.
- **Jaywalking**. Pedestrians regularly jaywalk across Atlantic Avenue. This, coupled with the frequency of drop-offs happening in the middle lane, creates an environment where pedestrians are weaving in and around moving traffic.

Overall, the curbside designations along Atlantic Avenue are complicated by the spatial separation between the rail and bus terminals at South Station – there is a need for two distinct taxicab zones separated by a 15-minute drop-off/pick-up zone. The signage on Atlantic Avenue is not clear and areas that are official drop-off zones have signs that appear to designate them as no stopping allowed.

Along the sidewalk, there is unclear wayfinding for pedestrians arriving at South Station. Pedestrians are unsure where they should pick-up taxis and how to connect to the Red Line, Silver Line, Commuter Rail, Amtrak and bus services. Adding to the confusion, the sidewalk on Atlantic Avenue experiences heavy bicycle activity due to the Hubway bicycle sharing services. All signs along Atlantic Avenue are positioned toward the street and are not visible to pedestrians from South Station searching for ground transportation.

5.2. Layover Facility Sites

Three layover facility sites are under consideration in the SSX project: Widett Circle, Beacon Park Yard, and Readville-Yard 2. Figure 1 located at the end of this report presents the location of these three layover facility sites in relation to South Station.

5.2.1. Sites

Widett Circle

Figure 24 illustrates the Widett Circle layover facility site boundary. The Widett Circle site, totaling approximately 29.4 acres, is located in South Boston along the MBTA's Fairmount Line, approximately one track-mile from South Station. It is comprised of two parcels, primarily in private ownership: Cold Storage and Widett Circle. Cold Storage, approximately 6.6 acres, located primarily at 100 Widett Circle, currently houses a temperature controlled food storage and distribution facility, owned by Art Mortgage Borrower Propco 2006-2 LP, and used by Americold/Crocker & Winsor Seafoods. The building has an active rail siding served by CSX Transportation, Inc. (CSXT) with space for six freight cars. A change in ownership of the Cold Storage parcel within the Widett Circle site is anticipated. In October 2013, Celtic Recycling, LLC received approval from the Massachusetts EEA No. 15070 to renovate and convert existing facilities at the Cold Storage parcel into a material recycling facility. Widett Circle, located primarily at 1 and 2 Foodmart Road, is owned by The New Boston Food Market Development Corporation and is made up of approximately 30 units leased to multiple businesses in the food processing, food storage, and food logistics industry. Created as an Urban Renewal Corporation, the property is tax-exempt under Massachusetts General Law (MGL) Chapter 121A (760 CMR 25). With the exception of an area of commercial land use in the northern portion of the site, the City of Boston

identifies the larger Widett Circle site primarily as exempt/institutional, as the majority of businesses are tax-exempt, Chapter 121A properties.

Beacon Park Yard

Figure 25 illustrates the Beacon Park Yard layover facility site. The Beacon Park Yard site, totaling approximately 30 acres, is located in Allston along the MBTA's Worcester Line approximately 3.8 track miles from South Station. The site served for many years as a major freight rail yard and intermodal terminal in Boston for CSXT, which recently relocated to central Massachusetts. It contains a number of buildings that formerly supported various railroad functions, including a freight rail yard, bulk transfer facility, intermodal facility, and engine facility. Beacon Park Yard is owned by Harvard University and remains encumbered by CSXT's operating rights. An agreement in principal has been reached between Harvard and MassDOT to use approximately 22 acres of Beacon Park Yard for a new commuter rail layover, maintenance facility and rail station.

MassDOT intends to expand layover capacity to the west and south of South Station to provide a more-balanced mix of layover sites. MassDOT has identified the preferred location in the west as Beacon Park Yard.

Readville-Yard 2

Figure 26 illustrates the MBTA's Readville-Yard 2 layover facility site. Readville - Yard 2, totaling approximately 17.4 acres, is located in the Readville section of Hyde Park, at the intersection of the NEC and the MBTA's Fairmount Line, approximately 8.8 track-miles from South Station. Owned by the MBTA, Readville - Yard 2 is a maintenance repair facility and the largest layover yard used by the MBTA for its south side commuter service. The layover yard has a total of 12 tracks, 10 of which are used for storage and two of which are used for switching and movement of trains. Additionally, the building on site has three tracks for maintenance functions. The yard also contains several railroad support structures. The MBTA currently uses Readville – Yard 2 for midday layover storage of 10 trainsets of variable lengths.

5.2.2. Site Access/Egress

The study area intersections for the three layover facility sites are illustrated inFigure 27 and are as follows:

- **Widett Circle:**
  - **Frontage Road / Widett Circle Access Road** is a signalized intersection with Frontage Road one-way northbound and Widett Circle Access Road as the westbound approach. Frontage Road provides three through lanes with a channelized right turn lane to Widett Circle. Widett Circle Access Road has a one lane approach that is right turn only. A triangular median divides the inbound and outbound Access Road at the intersection. A crosswalk traverses the median and allows for pedestrians to cross Widett Circle Access Road. A pedestrian signal is provided on the east crosswalk, when crossing the Access Road exit.
  - **Widett Circle / Widett Circle Access Road** is an unsignalized T-intersection. Widett Circle is free flowing through the intersection, providing one general purpose lane in both the eastbound and westbound directions. Widett Circle Access Road provides a single general purpose lane in each direction. The Access Road approach is stop controlled. There is a sidewalk on the northbound side of the Access Road leading into Widett Circle.

- **Beacon Park Yard:**
  - **Cambridge Street / Lincoln Street** is a four-legged signalized intersection. The Cambridge Street/Lincoln Street intersection was assessed in the vicinity of Beacon Park Yard. The existing access point to the layover yard is through the Cambridge Street/Lincoln Street intersection. The future access point would shift as a result of the I-90 highway realignment to accommodate open road tolling which is currently being evaluated by MassDOT. The Lincoln Street southbound approach consists of a single general purpose lane. Cambridge Street runs east/west with the eastbound direction having four lanes, a left, two through lanes and a through/right lane. The westbound direction has three lanes, a left, one through and a through/right. Crosswalks are present across the north and east approaches allowing pedestrians to cross Lincoln Street and Cambridge Street, although there are no pedestrian signals.
- **Readville-Yard 2:**
  - **Hyde Park Avenue / Neponset Valley Parkway / Wolcott Court / Wolcott Square** is a five-legged signalized intersection. Hyde Park Avenue runs through the intersection in the southeast bound and northbound directions. The southeast bound direction has three lanes, a left/through and one general purpose lane, with a third lane designated as a bus stop/bus only lane. Hyde Park Avenue northbound is a single general purpose lane. The southbound approach, Wolcott Court, has a channelized right turn lane and one shared left/through lane. Neponset Valley Parkway has one general purpose lane in the westbound direction. Wolcott Square roadway has a single general purpose lane in the eastbound direction. Crosswalks and pedestrian signals are provided at all approaches.
  - **Wolcott Court / Layover Driveway** is a three-legged, unsignalized intersection. Wolcott Court northbound is free flowing providing a single general purpose lane. Wolcott Court westbound has a single, stop controlled, general purpose lane. The layover driveway has a single purpose lane that is stop controlled. There are no pedestrian accommodations at this location.

5.2.3. Traffic Volumes/Operations

Traffic data were collected at the three layover facility sites to assess how well the site driveways handle traffic entering and exiting the facilities. Manual TMC's were conducted during the morning (7:00 a.m. to 9:00 a.m.), midday (noon to 2:00 p.m.), and evening (4:00 p.m. to 6:00 p.m.), peak periods. Unlike the South Station area intersections, a midday condition was considered since the layover sites are expected to be more active during the midday than during peak commuter periods. During the morning and evening peak hours, most trains will be in service and not dwelling at the layover yard.

Existing peak hour traffic volumes are shown in Figures 28, 29, and 30 for the morning, midday, and evening peaks hours, respectively. Detailed LOS tables for the morning, midday, and evening peak periods for signalized and unsignalized intersections are presented in Tables 16 through 21.

Operations at Widett Circle show overall intersection LOS A at the signalized Frontage Road/Widett Circle Access Road intersection during all peak hours. The Widett Circle Access Road experiences LOS C during all peak hours. The unsignalized intersection of Widett Circle and Widett Circle Access Road operates at LOS A throughout the day, with all approaches also operating at LOS A.

Beacon Park Yard at Cambridge Street and Lincoln Street operates at an overall intersection LOS C or better during all peak hours. With the exception of the Cambridge Street eastbound approach, individual approaches operate at LOS D or better which is considered acceptable operating conditions within the

city. The Cambridge Street eastbound U-turn/left-turn lane, operates at LOS E during the morning peak period and LOS F during the evening peak period.

The Readville-Yard 2 signalized intersection of Hyde Park Avenue/Neponset Valley Parkway/Wolcott Court/Wolcott Square operates at an overall LOS C during the morning peak period. All intersection approaches operate at LOS D or better. During the midday, an overall LOS B is experienced. The evening peak period operates at an overall LOS D. The Neponset Valley Parkway westbound approach operates at a LOS E during the evening peak hour; all other approaches operate at LOS D or better. The unsignalized intersection of Wolcott Court/Wolcott Street/Layover Driveway operates at LOS A throughout the day, with all approaches also operating at LOS A.

Table 16—Signalized Intersection Capacity Analysis – Layover Facility Weekday Morning Peak Hour

Signalized Intersection	Lane Group	2012 Existing Conditions			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	0.78	78.2	E	#86
	Cambridge Street – EB Thru/Right	0.47	6.5	A	260
	Cambridge Street – WB U-Turn/Left	0.09	49.4	D	9
	Cambridge Street – WB Thru/Right	0.41	12.7	B	222
	Lincoln Street – NB Left/Thru/Right	0.02	36.2	D	6
	Lincoln Street – SB Left	0.69	47.5	D	143
	Lincoln Street – SB Thru/Right	0.05	36.3	D	36
	Overall Intersection	0.55	12.8	B	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.44	33.7	C	70
	Frontage Road – NB Thru/Right	0.54	4.5	A	189
	Overall Intersection	0.53	5.9	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.37	36.8	D	46
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	0.76	19.2	B	#771
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.62	38.7	D	93
	Wolcott Court – SB Left/Thru/Right	0.71	46.2	D	#107
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	0.59	13.9	B	#376
	Overall Intersection	0.71	20.4	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 17—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Morning Peak Hour

Unsignalized Intersection	Lane Group	2012 Existing Conditions			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.03	0.0	A	0
	Widett Circle – WB Left/Thru	0.06	7.0	A	5
	Widett Circle Access Road – NB Left/Right	0.13	9.4	A	11
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.01	7.3	A	1
	Wolcott Court – NB Thru/Right	0.04	9.1	A	3
	Layover Driveway – SB Left/Thru	0.02	9.3	A	1

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet

Table 18—Signalized Intersection Capacity Analysis – Layover Facility Weekday Midday Peak Hour

Signalized Intersection	Lane Group	2012 Existing Conditions			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	>1.0	>80.0	F	#170
	Cambridge Street – EB Thru/Right	0.25	2.3	A	75
	Cambridge Street – WB U-Turn/Left	-	-	-	-
	Cambridge Street – WB Thru/Right	0.42	20.4	C	176
	Lincoln Street – NB Left/Thru/Right	0.01	40.3	D	10
	Lincoln Street – SB Left	0.64	50.1	D	104
	Lincoln Street – SB Thru/Right	0.05	40.5	D	41
	Overall Intersection	0.88	28.9	C	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.44	30.0	C	56
	Frontage Road – NB Thru/Right	0.40	3.7	A	118
	Overall Intersection	0.41	6.2	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.44	32.3	C	37
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	0.42	8.5	A	198
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.35	29.2	C	49
	Wolcott Court – SB Left/Thru/Right	0.44	29.7	C	53
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	0.36	7.6	A	105
	Overall Intersection	0.43	12.1	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet

Table 19—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Midday Peak Hour

Unsignalized Intersection	Lane Group	2012 Existing Conditions			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.02	0.0	A	0
	Widett Circle – WB Left/Thru	0.11	7.5	A	9
	Widett Circle Access Road – Left/Right	0.14	9.6	A	12
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.02	7.3	A	1
	Wolcott Court – NB Thru/Right	0.06	9.1	A	5
	Layover Driveway – SB Left/Thru	0.02	9.5	A	1

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet

Table 20—Signalized Intersection Capacity Analyses – Layover Facility Weekday Evening Peak Hour

Signalized Intersection	Lane Group	2012 Existing Conditions			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	>1.0	>80.0	F	#220
	Cambridge Street – EB Thru/Right	0.44	8.9	A	267
	Cambridge Street – WB U-Turn/Left	0.20	49.8	D	17
	Cambridge Street – WB Thru/Right	0.68	24.1	C	322
	Lincoln Street – NB Left/Thru/Right	-	-	-	-
	Lincoln Street – SB Left	0.79	49.1	D	182
	Lincoln Street – SB Thru/Right	0.05	31.5	C	0
	Overall Intersection	0.94	30.9	C	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.33	26.6	C	77
	Frontage Road – NB Thru/Right	0.36	4.1	A	91
	Overall Intersection	0.36	6.9	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.45	38.2	D	43
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	>1.0	64.9	E	#699
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.41	37.1	D	58
	Wolcott Court – SB Left/Thru/Right	0.61	42.6	D	86
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	0.93	41.5	D	#393
	Overall Intersection	0.87	49.9	D	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 21—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Evening Peak Hour

Unsignalized Intersection	Lane Group	2012 Existing Conditions			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.02	0.0	A	0
	Widett Circle – WB Left/Thru	0.10	7.5	A	8
	Widett Circle Access Road – Left/Right	0.06	9.2	A	5
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.01	7.2	A	1
	Wolcott Court – NB Thru/Right	0.03	8.8	A	3
	Layover Driveway – SB Left/Thru	0.04	9.5	A	3

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet

5.2.4. Layover Facility Safety Review

A safety assessment was conducted to help determine if safety concerns exist for vehicles, pedestrians, and/or bicyclists. Crash data for the three layover facility sites were obtained from MassDOT records for the three-year period from January 2010 through December 2012. Crash rates were calculated based on the number of crashes relative to the volume of traffic traveling through the intersection on a daily basis. Rates that exceed MassDOT's average District 6 rate (0.76 for signalized intersections and 0.58 for unsignalized intersections) could indicate safety or geometric issues that warrant further examination.

The analysis of the crash data are summarized in Tables 22 and 23, which present the total number of crashes over three years, the calculated crash rates, and details on each crash (severity, types, roadway conditions, time of day, etc.).

The study intersection of Lincoln Street at Cambridge Street at Beacon Park Yard had five reported crashes within the last three years (2010 to 2012). Of the five crashes, three caused non-fatal injuries and two caused property damage only. Three occurred during dry weather conditions while the other two occurred during wet conditions. One crash occurred during the traditional morning peak period, 7:00 a.m. – 9:00 p.m. and the remaining crashes occurred during off-peak periods.

There were four reported crashes at Widett Circle at the Frontage Road and Widett Circle Access Road intersection. One crash caused non-fatal injuries while the other three caused property damage. All of the crashes occurred under dry weather conditions. Only one crash occurred during the weekday evening peak period between 4:00 p.m. and 6:00 p.m.; all other crashes occurred during weekday off-peak periods. No crashes were reported at the Widett Circle and Widett Circle Access Road intersection.

The study intersection of Hyde Park Avenue/Neponset Valley Parkway/Wolcott Court/Wolcott Square at the Readville-Yard 2 location had seven reported crashes. Four of the seven crashes caused non-fatal injuries while the other three caused property damage. Two crashes occurred during the traditional evening peak period between 4:00 p.m. and 6:00 p.m. A total of six crashes occurred during dry pavement conditions while one crash occurred during wet pavement conditions. No crashes were reported at Wolcott Court and the Layover Driveway intersection.

The three layover facility sites are located in MassDOT District 6. The average intersection crash rate for District 6 signalized intersections is 0.76 crashes per million entering vehicles (MEV). The average for unsignalized intersections in District 6 is 0.58 crashes per MEV. Over the three year period, all intersections within the Study Area had lower crash rates than the district and state average, suggesting that none of the intersections experienced an excessive frequency of crashes. None of the intersections are listed as high crash locations by MassDOT.

Table 22—Layover Facility Sites - Three Year Crash Analysis Summary (2010 to 2012)

Intersection	Total Crashes (3-year period)	Calculated Crash Rate	Intersection Type	Above / Below District 6 Average Rate[a]
1. Cambridge Street / Lincoln Street	5	0.13	Signalized	Below
2. Frontage Road / Widett Circle Access Road	4	0.26	Signalized	Below
3. Widett Circle / Widett Circle Access Road	0	0.00	Unsignalized	Below
4. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Court / Wolcott Square	7	0.35	Signalized	Below
5. Wolcott Court / Layover Driveway	0	0.00	Unsignalized	Below

Source: MassDOT Crash Data (2010-2012)

a MassDOT crash rates are 0.76 for signalized intersections and 0.58 for unsignalized intersections as of January 2013.

Table 23—Layover Facility - Site Safety Review – 2010 to 2012

	1. Cambridge Street / Lincoln Street	2. Frontage Road / Widett Circle Access Road	3. Widett Circle / Widett Circle Access Road	4. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	5. Wolcott Ct / Layover Driveway
Year					
2010	3	1	0	2	0
2011	2	3	0	3	0
2012	0	0	0	2	0
Total	5	4	0	7	0
Average	1.67	1.33	0	2.33	0
Collision Type					
Angle	1	2	0	1	0
Head-on	0	0	0	0	0
Rear-end	3	2	0	2	0
Rear-to-Rear	0	0	0	0	0
Sideswipe, opposite direction	0	0	0	0	0
Sideswipe, same direction	0	0	0	0	0
Single vehicle crash	1	0	0	4	0
Unknown	0	0	0	0	0
Not reported	0	0	0	0	0
Total	5	4	0	7	0
Crash Severity					
Fatal injury	0	0	0	0	0
Non-fatal injury	3	1	0	4	0
Property damage only	2	3	0	3	0
Not Reported	0	0	0	0	0
Unknown	0	0	0	0	0
Total	5	4	0	7	0
Time of Day					
Weekday, 7:00 a.m. - 9:00 a.m.	1	0	0	0	0
Weekday, 4:00 p.m. - 6:00 p.m.	0	1	0	2	0
Saturday, 11:00 a.m. - 2:00 p.m.	0	0	0	1	0
Weekday, other time	2	3	0	4	0
Weekend, other time	2	0	0	0	0
Total	5	4	0	7	0
Pavement Conditions					
Dry	3	4	0	6	0
Wet	2	0	0	1	0
Ice	0	0	0	0	0
Snow	0	0	0	0	0
Not reported	0	0	0	0	0
Total	5	4	0	7	0
Non Motorist (Bicycle, Pedestrian)					
Total	1	0	0	1	0

Source: MassDOT Crash Data (2010-2012)

As summarized in Tables 22 and 23, the crash data analysis revealed the following noteworthy trends:

- **Crash type and severity.** The majority of crashes were angle, rear-end, and single vehicle crashes that resulted in property damage only. There were no fatal crashes recorded. None of the intersections are listed on MassDOT's ranking of the top 200 crash locations statewide[10].
- **Crash rate.** Within the study area, all intersections fell below the average crash rate for District 6 (0.76 for signalized intersections and 0.58 for unsignalized intersections). This suggests that based on the volume of traffic traveling through the intersections, the crash frequency is below average compared to city-wide rates. The highest crash rate at the layover facility sites was 0.35 which occurs at Widett Circle at the intersection of Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Court / Wolcott Square where seven crashes were recorded over three years.
- **Roadway conditions.** The crashes occurred primarily on dry pavement conditions during the weekday outside the peak hours.
- **Pedestrian/bicycle crashes.** Two crashes occurred between vehicles and non-motorists (cyclists or pedestrians). Once crash occurred at Beacon Park Yard at the intersection of Cambridge Street and Lincoln Street. The second crash occurred at Widett Circle at the intersection of Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Court / Wolcott Square.

6. Project Impacts

This section provides an assessment of the transportation system impacts of the SSX Project both without and with the proposed project (i.e., No Build and Build Alternatives, respectively). Data and analyses presented in this section are available from MassDOT upon request. Future conditions were analyzed for a projected 2025 Opening Year and a 2035 Build Year. These future conditions represent a 13-year planning horizon from the baseline existing conditions (2012) to opening year (year 2025) and a 23-year planning horizon from existing (2012) to the build, or design, year (year 2035). Future conditions in the 2025 Opening Year and 2035 Build Year were analyzed for the following alternatives:

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

6.1. Introduction

MassDOT conducted multiple alternatives analyses for the SSX project. Alternatives were evaluated and ranked according to the SSX project's purpose and need, performance objectives, and transportation-related goals. As applicable, alternatives were analyzed with respect to environmental considerations.

Terminal expansion alternatives consist of track configuration alternatives. Track configuration alternatives focus on various layouts at the South Station terminal area, within the footprint of existing Tower 1 Interlocking and the terminal approach. Track configuration alternatives would occupy the same general area and would not differ relative to environmental considerations. Therefore, the environmental impact evaluations presented in Section 6 address two sets of alternatives for the SSX project:

- Joint/private development alternatives at the South Station site; and
- Layover facility site alternatives.

[10] Massachusetts Department of Transportation. *2011 Top Crash Locations Report.* September 2013. https://www.massdot.state.ma.us/Portals/8/docs/traffic/CrashData/11TopCrashLocationsRpt.pdf.

6.2. No Build Alternative

The 2025 and 2035 No Build Alternative represents a future baseline condition against which the Build Alternatives were compared. In the No Build Alternative, the South Station site would continue to be occupied by the South Station Rail Terminal, South Station Bus Terminal and the USPS General Mail Facility/South Postal Annex. Dorchester Avenue would continue as a privately-owned, predominantly privately-used way, and there would be no public access to the waterway at the South Station site.

With the No Build Alternative, there would be no private development associated with South Station beyond the development previously approved by the Massachusetts EEA: the South Station Air Rights (SSAR) project. The SSAR project was approved by the Secretary of EEA in 2006 (EEA Number 3205/9131) as an approximate 1.8 million sf mixed-use development to be located directly above the railroad tracks at the South Station headhouse. The SSAR project also includes a horizontally expanded bus terminal of approximately 70,000 square feet, pedestrian connections from the train station concourse and platforms to the expanded bus terminal, and a 3-level parking garage with 775 spaces located above the bus terminal.

For the transportation systems assessment, the No Build Alternative accounts for:

- Developments in the area that will be constructed before the design year and thus will be generating traffic demand that must be added to the roadway network;
- General background growth associated with overall population and employment trends in the study area and surrounding region;
- Infrastructure improvements that will be constructed before the design year to include roadway upgrades and transit system enhancements; and
- Additional transit system ridership and the resulting street-level pedestrian demands that are a result of the area developments, infrastructure improvements, population/employment growth, and transit system enhancements.

6.2.1. No Build Alternative – South Station Assumptions

Coordination with the City of Boston and CTPS helped establish growth projections and identify area-wide developments that are underway, approved, or under BRA review. Land use assumptions for the South Station area were approved by the BRA and CTPS for the Boston region, and include a number of development projects that were assumed to occur before the 2035 Build Year as summarized in Table 24 — South Station Area Background Development Projects.

As an initial step, for the projects listed in Table 24, traffic volumes were taken directly from the relevant environmental documents or projected in cases where traffic impact assessments were not conducted. As a second step, an annualized growth rate was applied to the 2012 Existing Condition peak hour traffic volumes to account for future traffic growth in the Study Area that might occur in addition to the project-specific growth. This annualized growth rate accounts for increases in population, jobs, and area development projects that cannot be specifically defined at this time. A background growth rate of 0.5% per year was used, which is typically required in the city of Boston for traffic forecasts and is consistent with other area traffic analyses and CTPS projections for the area.

Table 24—South Station Area Background Development Projects

Project	Land-Use	Size
Millennium Tower and Burnham Building	Mixed-Use (Residential, Office, Retail, Health Club/Spa, Restaurant, Parking)	1,185,000 SF
Millennium Place	Mixed-Use (Residential, Retail, Parking)	265 Residential Units 12,000 SF Retail
Parcel P-7a	Mixed-Use (Residential, Retail)	100,885 SF
45 Stuart Street	Residential	390,000 SF
Kensington Place	Mixed-Use (Residential, Retail/Office)	407,000 SF
120 Kingston Street	Residential	332,370 SF
Hong Lok House (Essex Street)	Residential	62,218 SF
Oxford Ping on Affordable Housing Project	Residential	56,400 SF
Fan Pier - Vertex	Office	1 Million SF
381 Congress Street	Residential	43,700 SF
100 Acres Project (remaining build-out)	Mixed-Use (Residential, Office, Retail/Entertainment, Cultural/Education, Hotel)	5 Million SF
One Greenway	Mixed-Use (Residential, Retail)	325 Residential Units 5,500 SF Retail, 6,000 SF Community
South Station Air Rights	Mixed-Use (Office, Hotel, R&D)	1.8 Million SF
InkBlock	Mixed-Use (Residential, Retail)	548,900 SF
275 Albany Street	Mixed-Use (Residential, Hotel, Retail)	330,000 SF (Excluding Parking)
Seaport Square	Mixed-Use (Residential, Office, Retail/Entertainment, Cultural/Education, Hotel)	6.5 Million SF
Fan Pier	Mixed-Use (Residential, Office, Hotel, Retail, Cultural/Education)	3.3 Million SF
Pier 4	Mixed-Use (Residential, Hotel, Office, Retail/Restaurant)	1.0 Million SF
368 Congress Street	Hotel, Retail	120 Rooms 6,000 SF Retail
316-322 Summer Street	Office, Retail/Restaurant	140,000 SF
399 Congress Street	Residential, Retail, Extended Stay Hotel	360 Residential Units, 1,700 SF Retail, 28 Rooms
Congress Street Hotel	Hotel, residential, and ground floor retail	372,000 SF
49-63 Melcher Street	Office and ground floor retail	221,500 SF
319 A Street Rear	Residential	268,500 SF
Eleven West Broadway	Residential and retail	5,000 SF Retail, 64 Residential Units
One Channel Center	Office, Parking, Park	901,430 SF
Convention Center Phase 2	Hotel with ground floor retail	337,300 SF
Seaport Square – Parcel A	Hotel	81,600 SF
22-26 West Broadway	Mixed-Use (Residential, Retail)	31 Residential Units, 3,834 SF Retail

Source: Boston Redevelopment Authority as of October 2012

To estimate the increase in transit system ridership to the year 2035, travel demand forecasts were provided by CTPS which account for proposed transit projects consistent with the currently adopted Long Range Transportation Plan (RTP). All of the adopted transit projects from the 2035 RTP were included in

the SSX project. Unless otherwise noted, any potential transportation projects not included in the currently adopted RTP are not accounted for in the travel demand forecasts.

Appendix 9 - *Ridership Forecasting Technical Report* provides details on the resulting transit system ridership increases. Attachment E includes CTPS's travel demand modeling methodology and assumptions.

Table 25 summarizes the transit ridership increases at South Station that would occur in the 2025 Opening Year and 2035 Build Year scenarios for the No Build Alternative compared to Existing Conditions. Projected ridership growth between Existing Conditions and the No Build Alternative is a result of forecasted growth in population, households, and employment, as well as changes in land use and transit services.

Table 25—South Station Weekday Daily Combined Boardings and Alightings – No Build Alternative

	Amtrak	Commuter Rail	Amtrak and Commuter Rail Total [a]	Red Line	Silver Line	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
2025 No Build Alternative	5,200	53,000	58,000	68,000	22,800	3,600	12,700	165,000
2035 No Build Alternative	5,500	56,000	61,000	72,000	25,600	3,800	12,800	175,000

Source: *Final SSX Ridership Results* provided in Appendix 9 - *Ridership Forecasting Technical Report*.
Note: All results rounded to the nearest 100, except for Commuter Rail, Red Line and Total results, which are rounded to the nearest 1,000.
a Total values are calculated using precise/unrounded results. As such, the sum of rounded individual ridership results may not add up to the rounded Total ridership results presented in this table.

In the No Build Alternative, increased frequencies on the Fairmount Line would contribute to the projected growth in commuter rail ridership at South Station. The proposed Silver Line Gateway project,[11] combined with projected land use changes along the various Silver Line corridors, would result in substantial increases to Silver Line ridership at South Station between Existing Conditions and the No Build Alternative.

Total weekday daily ridership at South Station in the 2025 No Build Alternative is forecasted to be 165,000 combined boardings and alightings, a 29% increase over 2012 Existing Conditions. The forecasted ridership level in the 2035 No Build Alternative is 175,000 combined boardings and alightings, a 37% increase over 2012 Existing Conditions.

6.2.2. No Build Alternative – Layover Facility Assumptions

Widett Circle

In the No Build Alternative, it is anticipated the existing parcels would continue in private ownership, and the site would continue to be used for industrial/heavy industrial land uses. In October 2013, Celtic Recycling, LLC received approval from the Massachusetts EEA to renovate and convert existing facilities at the Cold Storage site, located at 100 Widett Circle, into a material recycling facility.

[11] The proposed Silver Line Gateway project will extend Silver Line BRT service from the Seaport District to Chelsea via East Boston. From South Station, the proposed Silver Line Gateway route will follow the existing Silver Line route into the Seaport District, connect to the Blue Line and East Boston neighborhoods at Airport Station, and then continue into Chelsea where the route will travel in a new dedicated busway serving four new stations at Eastern Avenue, Box District, Downtown Chelsea, and Mystic Mall.

Beacon Park Yard

In the No Build Alternative, the Beacon Park Yard site would remain largely the same as today, with the exception of highway reconfiguration of the Massachusetts Turnpike to the north of the site and MBTA Worcester Line track improvements to the south of the site.

Readville-Yard 2

In the No Build Alternative, MassDOT would continue to use Readville-Yard 2 as its maintenance repair facility and largest layover yard for its south side service. It is anticipated that MassDOT would continue to utilize this facility for layover for 10 eight-car trainsets to support South Station operations.

6.2.3. South Station Intersection Capacity Analysis – 2025 No Build Alternative

Intersection capacity analyses were conducted using Synchro 6 software as required by BTD. This analysis is based on the HCM methodologies. Tables 26 and 27 summarize the intersection capacity analyses for the morning and evening peak hours in the 2025 No Build Alternative. The tables provide detailed level of service ratings, volume to capacity ratios, delay, and queue lengths for each intersection lane group. Detailed traffic networks are available upon request from MassDOT.

Table 26—Signalized Intersection Capacity Analysis – 2025 No Build Alternative

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.42	18.7	B	m85	0.78	60.1	E	m243
	Congress Street – EB Thru/Right	0.64	24.3	C	m158	0.55	13.1	B	m306
	Congress Street – WB Left	>1.0	>80.0	F	m#167	0.42	12.1	B	m24
	Congress Street – WB Thru	0.47	29.0	C	m163	0.34	8.5	A	m66
	Overall Intersection	0.79	32.9	C	-	0.62	21.1	C	-
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.83	29.2	C	m384	>1.0	59.2	E	m#379
	Summer Street – WB Left/Thru/Right	0.57	18.0	B	195	0.78	32.8	C	266
	Dorchester Avenue – NB Left/Thru/Right	0.48	44.1	D	73	0.28	25.6	C	62
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	m#429	>1.0	>80.0	F	#484
	Dorchester Avenue – SB Right	0.57	67.6	E	m102	0.26	9.5	A	47
	Overall Intersection	>1.0	76.1	E	-	>1.0	61.1	E	-
3. Atlantic Avenue at Seaport Boulevard	Seaport Boulevard – EB Left/Thru	>1.0	>80.0	F	m#512	0.98	35.1	D	m#437
	Seaport Boulevard – WB Thru/Right	>1.0	>80.0	F	#521	>1.0	>80.0	F	#683
	Seaport Boulevard – WB Bear Right/ Right	1.00	>80.0	F	#347	>1.0	>80.0	F	#483
	Seaport Boulevard – WB Right	>1.0	>80.0	F	#377	>1.0	>80.0	F	#500
	Atlantic Avenue – NB Left/Bear Left	>1.0	>80.0	F	m#602	>1.0	>80.0	F	m#725
	Atlantic Avenue – NB Bear Left/Thru/Right	>1.0	>80.0	F	m#500	>1.0	>80.0	F	m#885
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
4. Atlantic Avenue at Congress Street	Atlantic Avenue – NB Thru/Right	>1.0	33.3	C	m97	>1.0	>80.0	F	m#317
	Congress Street – EB Left	0.83	41.9	D	m#189	0.65	42.7	D	m190
	Congress Street – EB Thru	0.40	6.9	A	m84	0.43	10.5	B	m308
	Congress Street – WB Right	0.88	43.3	D	#263	0.89	46.6	D	#266
	Overall Intersection	0.92	29.8	C	-	0.90	51.5	D	-
5. Purchase Street at Congress Street	Congress Street – EB Thru	0.48	25.1	C	180	0.82	36.8	D	342
	Congress Street – EB Bear Right	0.51	28.1	C	199	>1.0	>80.0	F	#817
	Congress Street – EB Right	0.11	21.2	C	40	0.24	24.9	C	73
	Purchase Street – SB Left	0.78	37.3	D	m354	0.54	5.8	A	m0
	Purchase Street – SB Bear Left/Thru	0.89	35.0	D	m431	>1.0	63.7	E	m395
	Overall Intersection	0.71	32.2	C	-	>1.0	75.9	E	-
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.78	31.1	C	162	0.88	42.1	D	173
	Summer Street – WB Thru	>1.0	>80.0	F	#400	0.87	73.7	E	m#218
	Summer Street – WB Right	0.56	68.6	E	m#139	0.49	>80.0	F	m147
	Atlantic Avenue – NB Left	>1.0	>80.0	F	m#409	0.63	23.4	C	m112
	Atlantic Avenue – NB Left/Thru	>1.0	>80.0	F	#598	>1.0	51.3	D	m#415
	Atlantic Avenue – NB Right	0.45	29.4	C	m33	0.35	27.6	C	m40
	Overall Intersection	>1.0	>80.0	F	-	0.95	54.0	D	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.66	2.1	A	m27	0.63	2.5	A	m31
	Summer Street – EB Thru	0.47	44.1	D	106	0.52	40.6	D	165
	Summer Street – EB Right	0.05	35.3	D	30	0.33	36.7	D	104
	Summer Street – WB Left	>1.0	>80.0	F	m94	0.80	52.6	D	m#180
	Summer Street – WB Left/Thru	>1.0	>80.0	F	m102	0.82	46.1	D	m#185
	Overall Intersection	0.73	48.0	D	-	0.64	19.3	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal
dl one of the approach lanes operates as a default left-turn lane

Table 26 (Continued)—Signalized Intersection Capacity Analysis – 2025 No Build Alternative

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
8. Atlantic Avenue at Essex Street	Essex Street – EB Left	0.77	43.1	D	213	0.50	29.4	C	151
	Atlantic Avenue – NB Left/Thru	0.82	18.2	B	285	0.86	24.5	C	#299
	Overall Intersection	0.80	24.8	C	-	0.71	26.0	C	-
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left/Thru	0.71	37.0	D	234	>1.0	>80.0	F	#662
	Essex Street – EB Bear Right/Right	0.68	41.5	D	234	>1.0	>80.0	F	#738
	Lincoln Street – NB Thru//Bear Right/Right	0.81	37.3	D	276	>1.0	>80.0	F	#462
	Surface Road – SB Left/Thru/Right	0.94	33.4	C	m#288	0.90	25.7	C	#355
	Overall Intersection	0.82	36.0	D	-	>1.0	>80.0	F	-
11. Atlantic Avenue at Beach Street	Atlantic Avenue – NB Left/Thru	0.68	3.2	A	m43	0.42	5.8	A	m81
	Overall Intersection	0.68	3.2	A	-	0.42	5.8	A	-
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.90	54.4	D	m#274	0.82	41.2	D	218
	Kneeland Street – EB Left/Thru	0.93	59.4	E	m#316	0.75	33.7	C	208
	MBTA Access Drive – WB Thru/Right	0.01	37.7	D	0	0.04	37.9	D	5
	Frontage Road – NB Left	0.93	49.6	D	#596	>1.0	>80.0	F	#476
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#962	0.54	31.8	C	190
	I-90 Off-Ramp– NB Left	0.32	12.5	B	145	0.55	16.9	B	250
	I-90 Off-Ramp – NB Left/Thru	>1.0	>80.0	F	#389	>1.0	>80.0	F	#436
	Overall Intersection	1.00	>80.0	F	-	0.89	67.9	E	-
13. Kneeland Street at Lincoln Street	Kneeland Street – EB Left/Thru/Right	0.63	13.5	B	m34	0.53	19.8	B	m242
	Kneeland Street – WB Left/Thru/Right	0.79	54.2	D	m221	0.61	50.4	D	m183
	Lincoln Street – NB Left	0.87	42.1	D	#519	>1.0	>80.0	F	m#430
	Lincoln Street – NB Left/Thru/Right	0.88	34.3	C	#460	0.70	34.9	C	m87
	Overall Intersection	0.81	37.8	D	-	0.75	55.5	E	-
14. Surface Road at Kneeland Street	Kneeland Street – EB Thru	0.44	29.1	C	150	0.49	26.4	C	#252
	Kneeland Street – EB Right	0.13	25.5	C	47	0.26	23.8	C	80
	Kneeland Street – WB Left	0.17	9.0	A	m40	0.45	11.9	B	m116
	Kneeland Street – WB Thru	0.36	9.3	A	m220	0.36	9.6	A	m195
	Surface Road – SB Left/Thru/Right	0.91	70.1	E	m#216	>1.0	>80.0	F	m#463
	Overall Intersection	0.52	35.2	D	-	0.76	>80.0	F	-
15. Lincoln Street at South Station Connector	South Station Connector – EB Left/Thru/Right	0.45	50.4	D	95	0.19	69.5	E	67
	South Station Connector – WB Left/Thru/Right	0.32	38.9	D	59	1.00	72.8	E	#275
	Surface Ramp – NB Left/Thru/Right	0.56	5.6	A	174	0.39	8.4	A	126
	Lincoln Street – SB Left/Thru/Right	0.04	5.9	A	m7	0.12	10.7	B	60
	Overall Intersection	0.54	14.1	B	-	0.57	38.3	D	-
16. Surface Road at South Station Connector	South Station Connector – WB Left	0.45	41.3	D	58	0.75	60.6	E	m115
	Surface Ramp– SB Left/Thru	0.23	0.9	A	m14	0.45	4.4	A	m168
	Overall Intersection	0.25	7.2	A	-	0.51	15.8	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 26 (Continued)—Signalized Intersection Capacity Analysis – 2025 No Build Alternative

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#587	0.96	61.6	E	m#224
	Dorchester Avenue – NB Thru/Right	0.17	12.5	B	m59	0.08	15.2	B	m35
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	#229	>1.0	>80.0	F	#365
	Dorchester Avenue – SB Right	0.14	29.3	C	39	0.29	28.5	C	73
	Traveler Street – EB Left	0.97	>80.0	F	#217	0.35	25.9	C	#112
	Traveler Street – EB Thru	0.61	25.2	C	#342	0.83	40.4	D	#487
	Traveler Street – EB Right	0.17	20.2	C	45	0.42	20.1	C	50
	West Broadway – WB Left	0.32	21.7	C	#86	0.67	52.1	D	#136
	West Broadway – WB Thru/Right	0.88	42.3	D	#413	0.56	28.8	C	#271
	Overall Intersection	>1.0	>80.0	F	-	>1.0	58.8	E	-
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	>1.0	>80.0	F	#306	0.62	35.8	D	179
	West 4th Street – EB Right	0.06	24.2	C	25	0.11	24.0	C	40
	West 4th Street – WB Left/Thru/Right	0.90	53.9	D	#361	0.99	69.8	E	#411
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#686	0.92	44.8	D	#204
	Dorchester Avenue – NB Thru	0.40	7.9	A	127	0.22	6.9	A	65
	Dorchester Avenue – NB Right	0.00	5.3	A	2	0.00	5.7	A	2
	Dorchester Avenue – SB Left/Thru	0.28	16.1	B	m54	0.70	22.4	C	m194
	Dorchester Avenue – SB Right	0.20	22.5	C	m30	0.21	21.4	C	m58
	Overall Intersection	>1.0	55.2	E	-	0.94	33.1	C	-
20. Purchase Street at I-93 Off-Ramp, / Seaport Boulevard	I-93 Off-Ramp – SB Left	0.99	36.9	D	#1062	0.78	21.4	C	504
	I-93 Off-Ramp – SB Thru/Right	0.97	62.0	E	#571	0.62	32.8	C	246
	Seaport Boulevard – WB Left	>1.0	69.1	E	m149	0.36	27.3	C	m70
	Seaport Boulevard – WB Left/Thru	>1.0	>80.0	F	m165	0.37	27.3	C	m76
	Purchase Street – SB Thru/Right	0.74	32.0	C	276	>1.0	>80.0	F	#583
	Overall Intersection	>1.0	46.7	D	-	0.79	>80.0	F	-
21. Congress Street at A Street / Thompson Place	Congress Street – EB Left/Thru	0.89	43.7	D	#207	>1.0	>80.0	F	m#330
	Congress Street – EB Right	0.20	29.5	C	79	0.25	19.4	B	m50
	Congress Street – WB Left	>1.0	>80.0	F	#718	0.74	32.6	C	353
	Congress Street – WB Thru/Right	0.41	8.2	A	176	0.34	6.8	A	134
	A Street – NB Left/Thru	>1.0	>80.0	F	#350	>1.0	>80.0	F	#402
	A Street – NB Right	0.10	14.2	B	26	0.31	16.7	B	50
	Thompson Place – SB Left/Thru/Right	0.34	43.6	D	65	0.51	48.1	D	106
	Overall Intersection	1.00	>80.0	F	-	0.94	77.8	E	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 27—Unsignalized Intersection Capacity Analysis – 2025 No Build Alternative

Unsignalized Intersection	Lane Group	Morning Peak Hour			Evening Peak Hour		
		V/C[a]	Delay[b]	LOS[c]	V/C[a]	Delay[b]	LOS[c]
10. Atlantic Avenue at East Street	East Street - EB	0.14	16.3	C	0.10	12.8	B
17. Dorchester Avenue at West 2nd Street	West 2nd Street – WB	0.65	24.7	C	0.98	>50.0	F
	Dorchester Avenue - NB	0.22	0.0	A	0.11	0.0	A
	Dorchester Avenue - SB	0.03	2.5	A	0.02	1.0	A

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service

The study area experiences high levels of vehicle, pedestrian, and bicycle activity during the morning and evening peak hours coinciding with commuter traffic. Varying factors such as curbside loading and stopping, construction activity, vehicles blocking intersections and jaywalking degrade traffic operations on a day-to-day basis.

In 2025 No Build conditions, all unsignalized intersections in the study area operate at an overall LOS C or better during the morning, and evening peak hours, except for the westbound approach at the intersection of Dorchester Avenue and West 2nd Street which operates at an LOS F. The following signalized intersections operate at an overall LOS E or worse during the morning and evening peak hours:

- **Summer Street at Dorchester Avenue (AM and PM peak hours)** – This intersection operates at an overall LOS E during both the morning and evening peak hours. Dorchester Avenue southbound would experience the highest delay due to a heavy southbound permitted left-turn on to Summer Street. The amount of green time allocated to the Dorchester Avenue approaches does not allow for vehicle queues to clear. During the evening peak hour, Summer Street eastbound would experience higher delays due to heavy permitted left-turn traffic onto Dorchester Avenue.
- **Atlantic Avenue at Seaport Boulevard (AM and PM peak hours) –** This intersection operates at an overall LOS F during both the morning and evening peak hours. Congested conditions on I-93 during the peak hours result in delays on the I-93 on-ramp which impact the intersection operations. On the westbound Seaport Boulevard approach, unclear traffic regulations result in vehicles making illegal turns and/or cutting off other vehicles when they realize the error. Pedestrians have an exclusive pedestrian phase, but typically chose to cross concurrently with Atlantic Avenue traffic which increases traffic delays.
- **Purchase Street at Congress Street (PM peak hour) –** This intersection operates at an overall LOS C during the morning peak hour and an overall LOS E during the evening peak hour. Observed conditions in the evening are often worse than the model reports when the I-93/I-90 ramps back into the intersection and create congestion. On the eastbound Congress Street approach, drivers use the two right lanes to merge onto the I-90/I-93 ramp despite traffic regulations. This back-up results in added delays to the Purchase Street and Congress Street corridors.
- **Atlantic Avenue at Summer Street (AM peak hour) –** This intersection operates at an overall LOS F during the morning peak hour and an overall LOS D during the evening peak hour. During the peak hours, Atlantic Avenue is heavily used by commuters from I-90 Eastbound and I-93 Northbound. In addition, the westbound Summer Street approach would carry higher traffic demands from the east. Atlantic Avenue provides for three lanes of travel, but during peak hours the curbside activity often reduces the capacity of Atlantic Avenue. Taxis and passenger car drop-offs and pick-ups on Atlantic Avenue negatively affect traffic operations when double or triple parked. During the peak hours, commuters that take public transit into South Station disperse in groups causing conflicts when they cross the street and force traffic to yield. Atlantic Avenue provides two left turn lanes, but is hindered by concurrent pedestrian operations and over 3,750 pedestrians traversing the intersection during the peak hours.
- **Surface Road at Essex Street and Lincoln Street (AM and PM peak hours) –** This intersection operates at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. During the morning and evening peak hours heavy southbound traffic amounts to high delays. Vehicles heading eastbound from Essex Street onto I-93 Northbound experience high delays due the amount of green time allocated to the movement.
- **Atlantic Avenue at Kneeland Street (AM and PM peak hours) –** This intersection operates at an overall LOS F during the morning peak hour and an overall LOS E during the evening peak

hour. There are heavy volumes exiting the I-93 Northbound Frontage Road and I-90 Eastbound contributing to congestion and delay at this intersection. High volumes on Kneeland Street turning left onto Atlantic Avenue also contribute to congestion and delays.

- **Kneeland Street at Lincoln Street (PM peak hour) –** This intersection operates at an overall LOS D during the morning peak hour and an overall LOS E during the evening peak hour. Lincoln Street northbound left volume is high and would experience spillback due to long queues on the Kneeland Street westbound approach at the intersection of Surface Road and Kneeland Street.
- **Surface Road at Kneeland Street (PM peak hour) –** This intersection operates at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour when traffic getting on I-93/I-90 are highest. High southbound traffic causes high delays leading to an intersection LOS F.
- **Dorchester Avenue at West Broadway (AM and PM peak hours) –** This intersection operates at an overall LOS F in the morning peak hour and an overall LOS E in the evening peak hour. Dorchester Avenue is allotted the majority of the cycle length which would result in higher delays on West Broadway and Traveler Street. The West Broadway and Traveler Street left-turns are not protected and must yield to on-coming traffic which causes few left turns to process during each cycle. The exclusive pedestrian phase, activated on a button push, is regularly called during the peak hours adding to the overall intersection delay for vehicles.
- **Dorchester Avenue at West 4th Street (AM peak hour) –** This intersection operates at an overall LOS E in the morning peak hour and overall LOS C in the evening peak hour. Dorchester Avenue is allocated the majority of the cycle length which would result in higher delays on West 4th Street. Both West 4th Street approaches provide a shared left-turn/through lane without any allotted time for protected lefts which causes additional backups on West 4th Street.
- **Purchase Street at I-93 Off-Ramp and Seaport Boulevard (PM peak hour) –** This intersection operates at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Heavy southbound traffic from Purchase Street and the I-93 Off-Ramp amount to long queues and high delays. An excessive amount of green time is allocated to the Seaport Boulevard westbound movements adding to the delays experienced by southbound traffic.
- **Congress Street at A Street / Thompson Place (AM and PM peak hours) –** This intersection operates at an overall LOS F during the morning peak hour and an LOS E during the evening peak hour. During the morning peak hour heavy westbound traffic turning left onto A Street causes the high delay resulting in an overall LOS F. During the evening peak hour, traffic turning left from A Street onto Congress Street experience high delays due to a short green time where only a few cars can pass through the intersection.

6.2.4. South Station Intersection Capacity Analysis – 2035 No Build Alternative

Tables 28 and 29 summarize the intersection capacity analyses for the morning and evening peak hours in the 2035 No Build Alternative. Detailed traffic networks are available upon request from MassDOT.

Table 28—Signalized Intersection Capacity Analysis – 2035 No Build Alternative

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.44	19.8	B	m92	0.81	59.8	E	m238
	Congress Street – EB Thru/Right	0.67	24.7	C	m165	0.58	13.3	B	m321
	Congress Street – WB Left	>1.0	>80.0	F	m#182	0.48	13.6	B	m26
	Congress Street – WB Thru	0.49	29.2	C	m168	0.35	8.5	A	m68
	Overall Intersection	0.89	38.8	D	-	0.65	21.1	C	-
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.89	32.6	C	m407	>1.0	>80.0	F	m#397
	Summer Street – WB Left/Thru/Right	0.61	18.7	B	210	0.83	36.0	D	287
	Dorchester Avenue – NB Left/Thru/Right	0.58	51.0	D	82	0.32	26.8	C	68
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	m#440	>1.0	>80.0	F	#519
	Dorchester Avenue – SB Right	0.62	68.3	E	m102	0.29	9.8	A	49
	Overall Intersection	>1.0	>80.0	F	-	>1.0	77.5	E	-
3. Atlantic Avenue at Seaport Boulevard	Seaport Boulevard – EB Left/Thru	>1.0	>80.0	F	m#514	>1.0	45.7	D	m#456
	Seaport Boulevard – WB Thru/Right	>1.0	>80.0	F	#552	>1.0	>80.0	F	#748
	Seaport Boulevard – WB Bear Right/ Right	>1.0	>80.0	F	#362	>1.0	>80.0	F	#506
	Seaport Boulevard – WB Right	>1.0	>80.0	F	#403	>1.0	>80.0	F	#522
	Atlantic Avenue – NB Left/Bear Left	>1.0	>80.0	F	m#602	>1.0	>80.0	F	m#750
	Atlantic Avenue – NB Bear Left/Thru/Right	>1.0	>80.0	F	m#533	>1.0	>80.0	F	m#915
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
4. Atlantic Avenue at Congress Street	Atlantic Avenue – NB Thru/Right	>1.0	52.1	D	m98	>1.0	>80.0	F	m#317
	Congress Street – EB Left	0.86	43.6	D	m#193	0.68	43.2	D	m194
	Congress Street – EB Thru	0.42	6.7	A	m85	0.45	10.8	B	m321
	Congress Street – WB Right	0.92	48.2	D	#281	0.92	51.2	D	#286
	Overall Intersection	0.96	38.9	D	-	0.94	60.0	E	-
5. Purchase Street at Congress Street	Congress Street – EB Thru	0.50	25.5	C	188	0.86	39.3	D	#387
	Congress Street – EB Bear Right	0.53	28.8	C	211	>1.0	>80.0	F	#867
	Congress Street – EB Right	0.12	21.3	C	41	0.27	25.4	C	83
	Purchase Street – SB Left	0.85	38.7	D	m36	0.53	6.5	A	m0
	Purchase Street – SB Bear Left/Thru	0.94	37.5	D	m#445	>1.0	>80.0	F	m402
	Overall Intersection	0.75	33.7	C	-	>1.0	>80.0	F	-
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.83	33.9	C	172	0.92	46.7	D	#195
	Summer Street – WB Thru	>1.0	>80.0	F	m#418	0.91	76.0	E	m#222
	Summer Street – WB Right	0.61	69.4	E	m#158	0.55	>80.0	F	m145
	Atlantic Avenue – NB Left	>1.0	>80.0	F	m#410	0.67	25.6	C	m116
	Atlantic Avenue – NB Left/Thru	>1.0	>80.0	F	m#630	>1.0	69.4	E	m#424
	Atlantic Avenue – NB Right	0.47	30.2	C	m28	0.37	28.7	C	m38
	Overall Intersection	>1.0	>80.0	F	-	1.00	60.9	E	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.69	2.3	A	m27	0.66	2.6	A	m32
	Summer Street – EB Thru	0.48	44.7	D	110	0.53	41.2	D	170
	Summer Street – EB Right	0.05	35.3	D	30	0.38	37.7	D	115
	Summer Street – WB Left	>1.0	>80.0	F	m94	0.84	54.7	D	m#184
	Summer Street – WB Left/Thru	>1.0	>80.0	F	m103	0.86	47.6	D	m#189
	Overall Intersection	0.76	57.1	E	-	0.67	20.0	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 28 (Continued)—Signalized Intersection Capacity Analysis – 2035 No Build Alternative

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
8. Atlantic Avenue at Essex Street	Essex Street – EB Left	0.81	45.4	D	#226	0.53	29.9	C	160
	Atlantic Avenue – NB Left/Thru	0.86	19.4	B	298	0.90	27.7	C	#332
	Overall Intersection	0.84	26.3	C	-	0.74	28.4	C	-
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left/Thru	0.75	38.4	D	247	>1.0	>80.0	F	#696
	Essex Street – EB Bear Right/Right	0.58	37.4	D	199	>1.0	>80.0	F	#776
	Lincoln Street – NB Thru//Bear Right/Right	0.85	39.2	D	293	>1.0	>80.0	F	#491
	Surface Road – SB Left/Thru/Right	0.98	38.5	D	m#331	0.94	29.3	C	#428
	Overall Intersection	0.86	38.6	D	-	>1.0	>80.0	F	-
11. Atlantic Avenue at Beach Street	Atlantic Avenue – NB Left/Thru	0.71	3.2	A	m43	0.44	5.9	A	m83
	Overall Intersection	0.71	3.2	A	-	0.44	5.9	A	-
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.90	53.8	D	m#285	0.85	44.6	D	#238
	Kneeland Street – EB Left/Thru	0.94	58.2	E	m#327	0.77	35.6	D	223
	MBTA Access Drive – WB Thru/Right	0.01	37.7	D	0	0.04	37.9	D	5
	Frontage Road – NB Left	0.99	65.2	E	#633	>1.0	>80.0	F	#499
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#1023	0.57	32.8	C	200
	I-90 Off-Ramp– NB Left	0.34	13.1	B	153	0.58	17.7	B	264
	I-90 Off-Ramp – NB Left/Thru	>1.0	>80.0	F	#409	>1.0	>80.0	F	#466
	Overall Intersection	>1.0	>80.0	F	-	0.93	77.8	E	-
13. Kneeland Street at Lincoln Street	Kneeland Street – EB Left/Thru/Right	0.65	13.9	B	m35	0.56	20.3	C	m253
	Kneeland Street – WB Left/Thru/Right	0.83	55.1	E	m223	0.65	50.5	D	m187
	Lincoln Street – NB Left	0.91	48.1	D	#550	>1.0	>80.0	F	m#454
	Lincoln Street – NB Left/Thru/Right	0.92	39.1	D	#492	0.73	36.0	D	m91
	Overall Intersection	0.85	40.6	D	-	0.78	59.4	E	-
14. Surface Road at Kneeland Street	Kneeland Street – EB Thru	0.46	29.4	C	157	0.52	27.3	C	#272
	Kneeland Street – EB Right	0.14	25.6	C	49	0.28	24.4	C	83
	Kneeland Street – WB Left	0.17	8.9	A	m39	0.48	12.2	B	m120
	Kneeland Street – WB Thru	0.37	9.6	A	m220	0.38	9.5	A	m205
	Surface Road – SB Left/Thru/Right	0.53	>80.0	F	m#217	>1.0	>80.0	F	m#468
	Overall Intersection	0.54	59.2	E	-	0.80	>80.0	F	-
15. Lincoln Street at South Station Connector	South Station Connector – EB Left/Thru/Right	0.46	50.4	D	96	0.20	72.9	E	70
	South Station Connector – WB Left/Thru/Right	0.33	39.1	D	61	>1.0	79.5	E	#283
	Surface Ramp – NB Left/Thru/Right	0.58	5.9	A	189	0.41	8.6	A	134
	Lincoln Street – SB Left/Thru/Right	0.05	5.9	A	m7	0.13	10.3	B	60
	Overall Intersection	0.56	14.1	B	-	0.59	40.5	D	-
16. Surface Road at South Station Connector	South Station Connector – WB Left	0.45	41.2	D	58	0.76	60.1	E	m115
	Surface Ramp– SB Left/Thru	0.24	0.9	A	m14	0.47	4.9	A	m178
	Overall Intersection	0.26	7.1	A	-	0.53	15.9	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 28 (Continued)—Signalized Intersection Capacity Analysis – 2035 No Build Alternative

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#633	>1.0	>80.0	F	m#276
	Dorchester Avenue – NB Thru/Right	0.18	12.4	B	m58	0.08	15.1	B	m35
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	#237	>1.0	>80.0	F	#386
	Dorchester Avenue – SB Right	0.15	29.4	C	40	0.30	28.7	C	75
	Traveler Street – EB Left	>1.0	>80.0	F	#240	0.38	26.9	C	#124
	Traveler Street – EB Thru	0.67	28.3	C	#396	0.87	44.0	D	#515
	Traveler Street – EB Right	0.18	20.2	C	46	0.44	20.3	C	51
	West Broadway – WB Left	0.39	25.5	C	#105	0.81	75.8	E	#144
	West Broadway – WB Thru/Right	0.97	59.5	E	#469	0.59	29.6	C	#290
	Overall Intersection	>1.0	>80.0	F	-	>1.0	67.7	E	-
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	>1.0	>80.0	F	#332	0.68	38.6	D	191
	West 4th Street – EB Right	0.06	24.2	C	25	0.11	24.1	C	41
	West 4th Street – WB Left/Thru/Right	0.94	61.8	E	#390	>1.0	>80.0	F	#435
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#735	1.00	65.1	E	#237
	Dorchester Avenue – NB Thru	0.42	8.1	A	136	0.23	6.9	A	68
	Dorchester Avenue – NB Right	0.00	5.3	A	2	0.00	5.7	A	2
	Dorchester Avenue – SB Left/Thru	0.30	16.2	B	m54	0.73	23.1	C	m206
	Dorchester Avenue – SB Right	0.23	20.3	C	m34	0.24	20.3	C	m65
	Overall Intersection	>1.0	69.1	E	-	>1.0	38.0	D	-
20. Purchase Street at I-93 Off-Ramp, / Seaport Boulevard	I-93 Off-Ramp – SB Left	>1.0	47.6	D	#1129	0.80	22.8	C	538
	I-93 Off-Ramp – SB Thru/Right	>1.0	72.2	E	#603	0.65	33.6	C	257
	Seaport Boulevard – WB Left	>1.0	>80.0	F	m153	0.38	27.5	C	m66
	Seaport Boulevard – WB Left/Thru	>1.0	>80.0	F	m168	0.38	27.5	C	m71
	Purchase Street – SB Thru/Right	0.78	33.1	C	292	>1.0	>80.0	F	#620
	Overall Intersection	>1.0	56.4	E	-	0.82	>80.0	F	-
21. Congress Street at A Street / Thompson Place	Congress Street – EB Left/Thru	0.93	49.2	D	#222	>1.0	>80.0	F	m#346
	Congress Street – EB Right	0.21	29.9	C	82	0.26	18.6	B	m48
	Congress Street – WB Left	>1.0	>80.0	F	#752	0.77	33.8	C	#377
	Congress Street – WB Thru/Right	0.43	8.4	A	187	0.35	6.9	A	140
	A Street – NB Left/Thru	>1.0	>80.0	F	#362	>1.0	>80.0	F	#416
	A Street – NB Right	0.10	14.3	B	26	0.32	16.8	B	50
	Thompson Place – SB Left/Thru/Right	0.35	43.8	D	66	0.53	48.8	D	109
	Overall Intersection	>1.0	>80.0	F	-	0.97	>80.0	F	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 29—Unsignalized Intersection Capacity Analysis – 2035 No Build Alternative

Unsignalized Intersection	Lane Group	Morning Peak Hour			Evening Peak Hour		
		V/C[a]	Delay[b]	LOS[c]	V/C[a]	Delay[b]	LOS[c]
10. Atlantic Avenue at East Street	East Street - EB	0.15	17.0	C	0.10	12.8	B
17. Dorchester Avenue at West 2nd Street	West 2nd Street – WB	0.70	28.8	D	>1.0	>50.0	F
	Dorchester Avenue - NB	0.23	0.0	A	0.12	0.0	A
	Dorchester Avenue - SB	0.03	2.6	A	0.02	1.0	A

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service

The study area experiences high levels of vehicle, pedestrian, and bicycle activity during the morning and evening peak hours coinciding with commuter traffic. Varying factors such as curbside loading and stopping, construction activity, vehicles blocking intersections and jaywalking degrade traffic operations on a day-to-day basis.

In 2035 No Build conditions, the following intersections operate at an overall LOS E or worse during the morning and evening peak hours:

- **Summer Street at Dorchester Avenue (AM and PM peak hours)** – This intersection operates at an overall LOS F during the morning peak hour and an overall LOS E during the evening peak hours. Dorchester Avenue southbound would experience higher delay due to a heavy southbound permitted left-turn on to Summer Street. The amount of green time allocated to the Dorchester Avenue approaches does not allow for vehicle queues to clear. During the evening peak hour, Summer Street eastbound would experience higher delays due to heavy permitted left-turn traffic onto Dorchester Avenue.
- **Atlantic Avenue at Seaport Boulevard (AM and PM peak hours)** – This intersection operates at an overall LOS F during both the morning and evening peak hours. Congested conditions on I-93 during the peak hours result in delays on the I-93 on-ramp which impact the intersection operations. On the Seaport Boulevard westbound approach, unclear traffic regulations result in vehicles making illegal turns and/or cutting off other vehicles when they realize the error. Pedestrians have an exclusive pedestrian phase, but typically chose to cross concurrently with Atlantic Avenue traffic which increases traffic delays.
- **Atlantic Avenue at Congress Street (PM peak hour)** – This intersection operates at an overall LOS E during the evening peak hour. Evening delays are due to high volumes heading northbound on Atlantic Avenue.
- **Purchase Street at Congress Street (PM peak hour)** – This intersection operates at an overall LOS E during the evening peak hour. Observed conditions in the evening are often worse than the model reports when the I-93/I-90 ramps back into the intersection and create congestion. On the eastbound Congress Street approach drivers use the two right lanes to merge onto the I-90/I-93 ramp despite traffic regulations. This back-up results in added delays to the Purchase Street and Congress Street corridors.
- **Atlantic Avenue at Summer Street (AM and PM peak hours)** – This intersection operates at an overall LOS F during the morning peak hour and an overall LOS E during the evening peak hour. During the peak hours Atlantic Avenue is heavily used by commuters from I-90 Eastbound and I-93 Northbound. In addition, the westbound Summer Street approach would experience higher traffic demands from the east. Atlantic Avenue provides for three lanes of travel, but during peak hours the curbside activity often reduces the capacity of Atlantic Avenue. Taxis and

passenger car drop-offs and pickups on Atlantic Avenue negatively affect traffic operations when double or triple parked. During the peak hours, commuters that take public transit into South Station disperse in groups causing conflicts when they cross the street and force traffic to yield. Atlantic Avenue provides two left turn lanes, but is hindered by concurrent pedestrian operations and over 3,750 pedestrians traversing the intersection during the peak hours.

- **Purchase Street at Summer Street (AM peak hour)** – This intersection operates at an overall LOS E during the morning peak hour and an overall LOS B during the evening peak hour. During the morning peak hour there is heavy volume heading westbound and due to a short allocated green time not all queued vehicles have time to clear the intersection.
- **Surface Road at Essex Street and Lincoln Street (AM and PM peak hours)** – This intersection operates at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Heavy evening traffic heading eastbound from Essex Street onto I-93 Northbound experience high delays due to the amount of green time allocated to the movement.
- **Atlantic Avenue at Kneeland Street (AM and PM peak hours)** – This intersection operates at an overall LOS F during the morning peak hour and an overall LOS E during the evening peak hour. There are heavy volumes exiting the I-93 Northbound Frontage Road and I-90 Eastbound contributing to congestion and delay at this intersection. High volumes on Kneeland Street turning left onto Atlantic Avenue also contribute to congestion and delays.
- **Kneeland Street at Lincoln Street (PM peak hour)** – This intersection operates at an overall LOS D during the morning peak hour and an overall LOS E during the evening peak hour. Lincoln Street northbound would experience higher evening volumes turning left onto Kneeland Street. Delays are caused by spillback due to long queues on the Kneeland Street westbound approach at the intersection of Surface Road and Kneeland Street which impact the Lincoln Street northbound left turning movement.
- **Surface Road at Kneeland Street (PM peak hour)** – This intersection operates at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour when traffic getting on I-93/I-90 are highest.
- **Dorchester Avenue at West Broadway (AM and PM peak hours)** – This intersection operates at an overall LOS F in the morning peak hour and an overall LOS E in the evening peak hour. Dorchester Avenue is allotted the majority of the cycle length which would result in higher delays on West Broadway and Traveler Street. The West Broadway and Traveler Street left-turns are not protected and must yield to on-coming traffic which causes few left turns to process during each cycle. The exclusive pedestrian phase, activated on a button push, is regularly called during the peak hours adding to the overall intersection delay for vehicles.
- **Dorchester Avenue at West 4th Street (AM and PM peak hours)** – This intersection operates at an overall LOS E in the morning peak hour and an overall LOS D in the evening peak hour. Dorchester Avenue is allocated the majority of the cycle length which would result in higher delays on West 4th Street. Both West 4th Street approaches provide a shared left-turn/through lane without any allotted time for protected lefts which causes additional backups on West 4th Street.
- **Purchase Street at I-93 Off-Ramp and Seaport Boulevard (AM and PM peak hours)** – This intersection operates at an overall LOS E during the morning peak hour and an overall LOS F during the evening peak hour. Heavy southbound traffic from Purchase Street and the I-93 Off-Ramp amount to long queues and high delays. An excessive amount of green time is allocated to

the Seaport Boulevard westbound movements adding to the delays experienced by southbound traffic.

- **Congress Street at A Street / Thompson Place (AM and PM peak hours)** – This intersection operates at an overall LOS F during both morning and evening peak hours. During the morning peak hour heavy westbound traffic turning left onto A Street causes high delays resulting in an overall LOS F. During the evening peak hour, traffic turning left from A Street onto Congress Street experience high delays due to a short green time where only a few cars can pass through the intersection.

6.2.5. Layover Facility Intersection Capacity Analysis – 2025 No Build Alternative

Similar to the South Station site, coordination with the City of Boston and CTPS resulted in growth projections for the layover facility sites. Intersection capacity analyses were conducted using Synchro 6 software as required by BTD. This analysis is based on the HCM methodologies. Tables 30 through 35 summarize the intersection capacity analyses for the morning, midday, and evening peak hours in the 2025 No Build Alternative. The tables provide detailed level of service ratings, volume to capacity ratios, delay, and queue lengths for each intersection lane group. Detailed traffic networks are available upon request from MassDOT.

Operations at Widett Circle show overall intersection LOS A at both study area intersections during all peak hours.

Beacon Park Yard at Cambridge Street and Lincoln Street operates at an overall intersection LOS D or better during all peak hours.

The Readville-Yard 2 signalized intersection of Hyde Park Avenue/Neponset Valley Parkway/Wolcott Court/Wolcott Square operates at an overall LOS C or better during the morning and midday peak periods. The evening peak period operates at an overall LOS F. The Neponset Valley Parkway westbound approach and the Hyde Park Avenue southbound approach operate at LOS F during the evening peak hour. All other approaches operate at LOS D or better. The unsignalized intersection of Wolcott Court/Wolcott Street/Layover Driveway operates at LOS A throughout the day, with all approaches also operating at LOS A.

Table 30—Signalized Intersection Capacity Analysis – Layover Facility Weekday Morning Peak Hour 2025 No Build Alternative

Signalized Intersection	Approach	2025 No Build Alternative – AM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	0.82	>80.0	F	#96
	Cambridge Street – EB Thru/Right	0.55	7.8	A	338
	Cambridge Street – WB U-Turn/Left	0.09	49.4	D	9
	Cambridge Street – WB Thru/Right	0.59	15.9	B	347
	Lincoln Street – NB Left/Thru/Right	0.02	35.1	D	6
	Lincoln Street – SB Left	0.72	48.3	D	156
	Lincoln Street – SB Thru/Right	0.05	35.3	D	37
	Overall Intersection	0.66	14.8	B	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.50	34.2	C	80
	Frontage Road – NB Thru/Right	0.65	5.7	A	276
	Overall Intersection	0.63	6.9	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.42	37.2	D	49
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	0.91	30.1	C	#969
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.65	40.6	D	98
	Wolcott Court – SB Left/Thru/Right	0.75	50.6	D	#117
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	0.78	19.3	B	#494
	Overall Intersection	0.84	27.6	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 31—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Morning Peak Hour 2025 No Build Alternative

Unsignalized Intersection	Approach	2025 No Build Alternative – AM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.03	0.0	A	0
	Widett Circle – WB Left/Thru	0.06	7.0	A	5
	Widett Circle Access Road – NB Left/Right	0.14	9.4	A	12
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.01	7.3	A	1
	Wolcott Court – NB Thru/Right	0.05	9.1	A	4
	Layover Driveway – SB Left/Thru	0.02	9.3	A	1

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet

Table 32—Signalized Intersection Capacity Analysis – Layover Facility Weekday Midday Peak Hour 2025 No Build Alternative

Signalized Intersection	Approach	2025 No Build Alternative - Midday			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	>1.0	>80.0	F	#187
	Cambridge Street – EB Thru/Right	0.27	2.8	A	83
	Cambridge Street – WB U-Turn/Left	-	-	-	-
	Cambridge Street – WB Thru/Right	0.44	20.1	C	189
	Lincoln Street – NB Left/Thru/Right	0.01	38.5	D	10
	Lincoln Street – SB Left	0.57	44.2	D	108
	Lincoln Street – SB Thru/Right	0.06	38.8	D	41
	Overall Intersection	0.88	31.6	C	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.49	28.1	C	77
	Frontage Road – NB Thru/Right	0.50	5.5	A	171
	Overall Intersection	0.50	7.5	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.47	31.9	C	39
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	0.51	9.5	A	254
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.38	28.9	C	51
	Wolcott Court – SB Left/Thru/Right	0.47	29.4	C	55
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	0.45	8.4	A	143
	Overall Intersection	0.50	12.3	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 33—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Midday Peak Hour 2025 No Build Alternative

Unsignalized Intersection	Approach	2025 No Build Alternative - Midday			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.02	0.0	A	0
	Widett Circle – WB Left/Thru	0.11	7.6	A	9
	Widett Circle Access Road – NB Left/Right	0.15	9.7	A	13
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.02	7.3	A	1
	Wolcott Court – NB Thru/Right	0.06	9.1	A	5
	Layover Driveway – SB Left/Thru	0.02	9.5	A	2

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet

Table 34—Signalized Intersection Capacity Analysis – Layover Facility Weekday Evening Peak Hour 2025 No Build Alternative

Signalized Intersection	Approach	2025 No Build Alternative – PM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	>1.0	>80.0	F	#233
	Cambridge Street – EB Thru/Right	0.63	13.2	B	406
	Cambridge Street – WB U-Turn/Left	0.20	49.8	D	17
	Cambridge Street – WB Thru/Right	0.88	30.9	C	467
	Lincoln Street – NB Left/Thru/Right	-	-	-	-
	Lincoln Street – SB Left	0.87	55.4	E	247
	Lincoln Street – SB Thru/Right	0.06	28.4	C	0
	Overall Intersection	>1.0	35.3	D	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.45	27.4	C	101
	Frontage Road – NB Thru/Right	0.44	4.8	A	130
	Overall Intersection	0.44	7.4	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.48	38.5	D	45
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	>1.0	>80.0	F	#970
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.44	37.2	D	62
	Wolcott Court – SB Left/Thru/Right	0.65	44.7	D	90
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	>1.0	>80.0	F	#528
	Overall Intersection	>1.0	>80.0	F	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 35—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Evening Peak Hour 2025 No Build Alternative

Unsignalized Intersection	Approach	2025 No Build Alternative – PM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.02	0.0	A	0
	Widett Circle – WB Left/Thru	0.10	7.5	A	9
	Widett Circle Access Road – Left/Right	0.07	9.2	A	6
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.02	7.2	A	1
	Wolcott Court – NB Thru/Right	0.03	8.8	A	3
	Layover Driveway – SB Left/Thru	0.04	9.5	A	3

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet

6.2.6. Layover Facility Intersection Capacity Analysis – 2035 No Build Alternative

Tables 36 through 41 summarize the intersection capacity analyses for the morning, midday, and evening peak hours in the 2035 No Build Alternative. Detailed traffic networks are available upon request from MassDOT.

Operations at Widett Circle show overall intersection LOS A at both study area intersections during all peak hours.

Beacon Park Yard at Cambridge Street and Lincoln Street operates at an overall intersection LOS D or better during all peak hours.

The Readville-Yard 2 signalized intersection of Hyde Park Avenue/Neponset Valley Parkway/Wolcott Court/Wolcott Square operates at an overall LOS B or better during the midday peak periods. The morning and evening peak periods operate at an overall LOS E and F, respectively. The Neponset Valley Parkway westbound approach operates at LOS E in the morning peak and LOS F in the evening peak hour. The Hyde Park Avenue southbound approach operates at LOS F during the evening peak hour. All other approaches operate at LOS D or better.

The unsignalized intersection of Wolcott Court/Wolcott Street/Layover Driveway operates at LOS A throughout the day, with all approaches also operating at LOS A.

Table 36—Signalized Intersection Capacity Analysis – Layover Facility Weekday Morning Peak Hour 2035 No Build Alternative

Signalized Intersection	Approach	2035 No Build Alternative – AM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	0.86	>80.0	F	#105
	Cambridge Street – EB Thru/Right	0.58	8.4	A	372
	Cambridge Street – WB U-Turn/Left	0.09	49.4	D	9
	Cambridge Street – WB Thru/Right	0.66	18.9	B	372
	Lincoln Street – NB Left/Thru/Right	0.02	34.6	C	6
	Lincoln Street – SB Left	0.72	48.2	D	162
	Lincoln Street – SB Thru/Right	0.06	34.8	C	37
	Overall Intersection	0.71	16.5	B	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.54	35.1	D	87
	Frontage Road – NB Thru/Right	0.75	7.3	A	395
	Overall Intersection	0.72	8.4	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.43	36.9	D	51
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	>1.0	75.4	E	#1163
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.63	37.5	D	102
	Wolcott Court – SB Left/Thru/Right	0.72	44.4	D	#125
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	>1.0	53.6	D	#588
	Overall Intersection	0.96	61.6	E	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 37—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Morning Peak Hour 2035 No Build Alternative

Unsignalized Intersection	Approach	2035 No Build Alternative – AM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.03	0.0	A	0
	Widett Circle – WB Left/Thru	0.07	7.0	A	5
	Widett Circle Access Road – NB Left/Right	0.15	9.6	A	14
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.01	7.3	A	1
	Wolcott Court – NB Thru/Right	0.05	9.1	A	4
	Layover Driveway – SB Left/Thru	0.02	9.3	A	2

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet

Table 38—Signalized Intersection Capacity Analysis – Layover Facility Weekday Midday Peak Hour 2035 No Build Alternative

Signalized Intersection	Approach	2035 No Build Alternative - Midday			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	>1.0	>80.0	F	#196
	Cambridge Street – EB Thru/Right	0.29	2.9	A	91
	Cambridge Street – WB U-Turn/Left	-	-	-	-
	Cambridge Street – WB Thru/Right	0.46	20.3	C	200
	Lincoln Street – NB Left/Thru/Right	0.01	38.2	D	10
	Lincoln Street – SB Left	0.59	44.4	D	113
	Lincoln Street – SB Thru/Right	0.06	38.5	D	42
	Overall Intersection	0.92	33.1	C	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.54	28.8	C	89
	Frontage Road – NB Thru/Right	0.59	6.6	A	231
	Overall Intersection	0.58	8.4	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.49	31.2	C	40
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	0.60	10.9	B	320
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.40	28.2	C	54
	Wolcott Court – SB Left/Thru/Right	0.50	28.8	C	58
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	0.53	9.4	A	#223
	Overall Intersection	0.57	13.0	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 39—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Midday Peak Hour 2035 No Build Alternative

Unsignalized Intersection	Approach	2035 No Build Alternative - Midday			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.02	0.0	A	0
	Widett Circle – WB Left/Thru	0.12	7.5	A	10
	Widett Circle Access Road – NB Left/Right	0.16	9.7	A	14
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.02	7.3	A	2
	Wolcott Court – NB Thru/Right	0.07	9.2	A	5
	Layover Driveway – SB Left/Thru	0.02	9.5	A	1

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet

Table 40—Signalized Intersection Capacity Analysis – Layover Facility Weekday Evening Peak Hour 2035 No Build Alternative

Signalized Intersection	Approach	2035 No Build Alternative – PM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	>1.0	>80.0	F	#242
	Cambridge Street – EB Thru/Right	0.66	14.3	B	441
	Cambridge Street – WB U-Turn/Left	0.25	50.0	D	20
	Cambridge Street – WB Thru/Right	0.91	33.6	C	#505
	Lincoln Street – NB Left/Thru/Right	-	-	-	-
	Lincoln Street – SB Left	0.88	56.0	E	258
	Lincoln Street – SB Thru/Right	0.06	27.8	C	0
	Overall Intersection	>1.0	37.5	D	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.52	27.9	C	118
	Frontage Road – NB Thru/Right	0.51	5.6	A	175
	Overall Intersection	0.51	8.0	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.53	39.3	D	48
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	>1.0	>80.0	F	#1080
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.44	37.2	D	62
	Wolcott Court – SB Left/Thru/Right	0.69	47.9	D	94
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	>1.0	>80.0	F	#663
	Overall Intersection	>1.0	>80.0	F	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 41—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Evening Peak Hour 2035 No Build Alternative

Unsignalized Intersection	Approach	2035 No Build Alternative – PM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.02	0.0	A	0
	Widett Circle – WB Left/Thru	0.11	7.5	A	9
	Widett Circle Access Road – Left/Right	0.07	9.2	A	6
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.02	7.2	A	1
	Wolcott Court – NB Thru/Right	0.04	8.8	A	3
	Layover Driveway – SB Left/Thru	0.04	9.5	A	3

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet

6.3. Alternative 1 - Transportation Improvements Only

Alternative 1 would include the previously-approved private development described in the No Build Alternative. In addition, South Station would be expanded onto the adjacent 14-acre USPS property. MassDOT would acquire and demolish the USPS General Mail Facility/South Postal Annex. The existing South Station Terminal, totaling approximately 210,000 square feet (sf), would be expanded by approximately 403,000 square feet, consisting of an expanded passenger concourse and passenger support services. Capacity improvements would include construction of seven new tracks and four platforms (including widening of one existing platform), for a total of 20 tracks and 11 platforms. Tower 1 Interlocking, as well as four approach interlockings, would be reconstructed and/or reconfigured. With Alternative 1, South Station expansion and development would be in accordance with Chapter 91 standards for non-water-dependent infrastructure facilities and city zoning requirements. With Alternative 1, no provision would be made for future private development as part of the SSX project. Figure 31 illustrates the Alternative 1 concept.

Dorchester Avenue would be restored for public and station access. Restoration of Dorchester Avenue would reconnect Dorchester Avenue to Summer Street as a public way. It would include landscaping and improved pedestrian and cycling connections and facilities (including adjacent sidewalks and crosswalks). Restoration also would include construction of an extension of the Harborwalk along reopened Dorchester Avenue. Figure 32 depicts the Dorchester Avenue typical cross-section.

Alternative 1 would include construction of additional layover facilities at a minimum of two sites.

6.3.1. Alternative 1- South Station Assumptions

Alternative 1 is depicted in Figure 31. With the relocation of the USPS facility, Dorchester Avenue is reopened and an extension of the Harborwalk is provided along the Fort Point Channel. A new station headhouse is provided along Dorchester Avenue which would absorb 30 to 40% of the curbside activity from Atlantic Avenue.

Table 42 summarizes the transit ridership increases at South Station that would occur in the 2025 Opening Year and 2035 Build Year scenarios for Alternative 1, compared to Existing Conditions and the No Build Alternative.

Table 42—South Station Weekday Daily Combined Boardings and Alightings –Alternative 1

	Amtrak	Commuter Rail	Amtrak and Commuter Rail Total [a]	Red Line	Silver Line	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
2025 No Build Alternative	5,200	53,000	58,000	68,000	22,800	3,600	12,700	165,000
2035 No Build Alternative	5,500	56,000	61,000	72,000	25,600	3,800	12,800	175,000
2025 Alternative 1 - Transportation Improvements Only	8,100	65,000	74,000	70,000	23,200	3,600	12,500	183,000
2035 Alternative 1 - Transportation Improvements Only	9,300	72,000	81,000	74,000	26,100	3,800	12,600	198,000

Source: *Final SSX Ridership Results* provided in Appendix 9 - *Ridership Forecasting Technical Report*.
Note: All results rounded to the nearest 100, except for Commuter Rail, Red Line and Total results, which are rounded to the nearest 1,000.
a Total values are calculated using precise/unrounded results. As such, the sum of rounded individual ridership results may not add up to the rounded Total ridership results presented in this table.

In the 2025 Opening Year, Alternative 1 would increase daily Amtrak and commuter rail boardings and alightings at South Station by approximately 28% compared to the No Build Alternative. In the 2035 Build Year, Alternative 1 would increase daily Amtrak and commuter rail boardings and alightings at South Station by approximately 33% compared to the No Build Alternative.

Trip generation for Alternative 1 was developed in accordance with BTD guidelines and the Institute of Transportation Engineers (ITE) Trip Generation Manual. Alternative 1 involves new tracks, the relocation of the USPS facility, and the reopening of Dorchester Avenue between Summer Street and Foundry Street. This will provide a new public connection which would result in shifted traffic patterns, primarily on A Street, Summer Street, and Atlantic Avenue. The addition of new tracks and higher ridership would translate into an increase in taxicab trips and passenger pick-up and drop-off activity. Traffic within the area was distributed based on these anticipated traffic pattern changes.

Alternative 1 would not provide new or replacement structured parking; as a result, there would be a net decrease of 242 structured parking spaces on the site due to the relocation of the USPS facility.

6.3.2. Alternative 1- Layover Facility Assumptions

Conceptual site plans for the three layover facility sites under consideration for Alternative 1 are illustrated in Figures 33 through 35. Trip generation for the layover sites was estimated by reviewing the layover facility site programming, parking, and the vehicle service activities for each layover facility site. These estimates were custom to each alternative site and were based on the layover site program summarized in Table 43.

Table 43—Layover Facility Sites - Net-New Program

	Widett Circle	Beacon Park Yard	Readville-Yard 2
New Crew Building (SF)	30,000	24,200	8,000
New Support Shed (SF)	7,600	6,300	2,000
New Trainsets	30	20	8

While the layover facility sites do not generate traffic associated with staff and crew vehicles because these personnel arrive and depart on the trains themselves, there are service needs and deliveries expected throughout the course of the day. Primary vehicle traffic associated with the layover sites includes parts deliveries, fuel deliveries, mechanical employees, and security. Crew amenities such as restrooms, vending machines, and waiting areas are provided so that crew members laying over during the day will remain on-site with the trains. Crews are expected to board trains at the rail terminus or at South Station, not at the layover yards. The resulting net new vehicle trip generation is presented in Table 44 for the morning, midday, and evening peak hours.

Table 44—Vehicle Trip Generation Estimate – Net New Vehicle Trips

	AM Peak Hour			Midday Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Widett Circle	2	2	4	12	12	24	2	2	4
Beacon Park Yard	3	3	6	13	13	26	3	3	6
Readville-Yard 2	1	1	2	7	7	14	1	1	2

As summarized in Table 44, the new trip generation at the layover facility sites is very low. Overall, the layover facility sites would generate six or fewer net new vehicle trips during commuter morning and evening peak hours amounting to less than 1 vehicle trip every 10 minutes. The midday peak hour is the highest generator with 26 trips at Beacon Park Yard, 24 trips at Widett Circle, and 14 trips at Readville-Yard 2. Midday layover facility traffic generation amounts to approximately one vehicle trip every three minutes.

The existing access to Widett Circle and Readville-Yard 2 does not change in Alternative 1. At Beacon Park Yard, access to the yard is currently located at the intersection of Cambridge Street and Lincoln Street and passes beneath Interstate 90. Future access to the yard may be relocated to the eastern end of the yard, intersecting with future roads (pending completion of other future MassDOT and Harvard University improvement projects). At this time, since the street configuration is not known, traffic to the layover facility was added to the existing intersection at Lincoln Street. This is a conservative approach because in actuality only a portion of the traffic would pass through the intersection if the access drive is shifted to the eastern end of the yard. At some point in the future, this driveway location could change pending the efforts to relocate the highway. Regardless of location, the layover yard traffic generation is very low and not expected to have a noticeable influence regardless of the exact driveway location along Cambridge Street.

6.3.3. South Station Intersection Capacity Analysis – 2025 Alternative 1

Tables 45 and 46 summarize the intersection capacity analyses for the South Station intersections in 2025 Alternative 1. Detailed traffic networks are available upon request from MassDOT.

Table 45—Signalized Intersection Capacity Analysis – 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.67	33.8	C	288	>1.0	>80.0	F	#516
	Congress Street – EB Thru/Right	0.55	24.0	C	m133	0.46	17.3	B	m275
	Congress Street – WB Left	0.94	>80.0	F	m#174	0.38	14.7	B	m34
	Congress Street – WB Thru	0.33	32.4	C	m160	0.22	9.8	A	m65
	Overall Intersection	0.82	33.6	C	-	0.66	46.6	D	-
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.63	7.7	A	m100	0.54	6.6	A	m60
	Summer Street – WB Left/Thru/Right	0.35	9.8	A	116	0.40	13.5	B	147
	Dorchester Avenue – NB Left	1.00	>80.0	F	#145	0.78	45.5	D	125
	Dorchester Avenue - NB Thru/Right	0.45	30.0	C	148	0.37	22.4	C	132
	Dorchester Avenue – SB Left	0.88	67.0	E	m#246	0.97	60.9	E	#246
	Dorchester Avenue – SB Thru/Right	0.77	47.8	D	m331	0.64	18.4	B	250
	Overall Intersection	0.75	26.3	C	-	0.72	21.1	C	-
3. Atlantic Avenue at Seaport Boulevard	Seaport Boulevard – EB Left/Thru	>1.0	>80.0	F	m#512	0.98	35.1	D	m#437
	Seaport Boulevard – WB Thru/Right	>1.0	>80.0	F	#556	>1.0	>80.0	F	#841
	Seaport Boulevard – WB Bear Right/ Right	>1.0	>80.0	F	#352	>1.0	>80.0	F	#475
	Seaport Boulevard – WB Right	>1.0	>80.0	F	#376	>1.0	>80.0	F	#489
	Atlantic Avenue – NB Left/Bear Left	>1.0	>80.0	F	m#580	>1.0	>80.0	F	m#620
	Atlantic Avenue – NB Bear Left/Thru/Right	>1.0	>80.0	F	m#600	>1.0	>80.0	F	m#924
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
4. Atlantic Avenue at Congress Street	Atlantic Avenue – NB Thru/Right	0.93	23.5	C	m98	>1.0	68.5	E	m#318
	Congress Street – EB Left	0.83	42.3	D	m#192	0.65	41.8	D	m189
	Congress Street – EB Thru	0.39	7.0	A	m82	0.42	9.9	A	277
	Congress Street – WB Right	>1.0	78.3	E	#334	>1.0	>80.0	F	m#277
	Overall Intersection	0.94	33.5	C	-	1.00	56.9	E	-
5. Purchase Street at Congress Street	Congress Street – EB Thru	0.47	24.9	C	174	0.82	36.6	D	339
	Congress Street – EB Bear Right	0.51	28.1	C	199	>1.0	>80.0	F	#817
	Congress Street – EB Right	0.11	21.2	C	40	0.24	24.9	C	72
	Purchase Street – SB Left	0.76	36.6	D	m339	0.50	5.9	A	m0
	Purchase Street – SB Bear Left/Thru	0.89	34.7	C	m430	>1.0	74.6	E	m404
	Overall Intersection	0.71	31.9	C	-	>1.0	78.5	E	-
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.79	32.2	C	164	0.88	42.8	D	173
	Summer Street – WB Thru	>1.0	>80.0	F	m#410	0.86	44.4	D	#210
	Summer Street – WB Right	0.56	32.9	C	m61	0.47	22.5	C	m#40
	Atlantic Avenue – NB Left	>1.0	>80.0	F	m#387	0.55	19.7	B	m103
	Atlantic Avenue – NB Left/Thru	>1.0	>80.0	F	#526	0.94	35.1	D	#390
	Atlantic Avenue – NB Right	0.43	35.3	D	48	0.32	26.9	C	m50
	Overall Intersection	>1.0	>80.0	F	-	0.91	35.2	D	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.66	2.2	A	m28	0.63	2.4	A	m31
	Summer Street – EB Thru	0.45	43.7	D	104	0.50	40.2	D	161
	Summer Street – EB Right	0.05	35.3	D	30	0.39	37.9	D	116
	Summer Street – WB Left	>1.0	>80.0	F	m98	0.76	49.6	D	m170
	Summer Street – WB Left/Thru	>1.0	>80.0	F	m106	0.77	43.6	D	m177
	Overall Intersection	0.74	50.3	D	-	0.63	18.3	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 45 (Continued)—Signalized Intersection Capacity Analysis – 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
8. Atlantic Avenue at Essex Street	Essex Street – EB Left	0.76	42.7	D	211	0.49	29.3	C	148
	Atlantic Avenue – NB Left/Thru	0.75	16.4	B	220	0.77	20.8	C	231
	Overall Intersection	0.76	23.8	C	-	0.65	23.5	C	-
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left/Thru	0.71	36.8	D	232	>1.0	>80.0	F	#662
	Essex Street – EB Bear Right/Right	0.55	36.5	D	189	>1.0	>80.0	F	#758
	Lincoln Street – NB Thru//Bear Right/Right	0.81	37.2	D	276	>1.0	>80.0	F	#462
	Surface Road – SB Left/Thru/Right	0.92	31.3	C	m271	0.86	32.8	C	352
	Overall Intersection	0.81	34.8	C	-	>1.0	>80.0	F	-
11. Atlantic Avenue at Beach Street	Atlantic Avenue – NB Left/Thru	0.63	2.1	A	m31	0.38	5.3	A	m73
	Overall Intersection	0.63	2.1	A	-	0.38	5.3	A	-
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.86	49.3	D	m#256	0.78	36.0	D	193
	Kneeland Street – EB Left/Thru	0.90	53.6	D	m#298	0.70	30.8	C	183
	MBTA Access Drive – WB Thru/Right	0.01	37.7	D	0	0.04	37.9	D	5
	Frontage Road – NB Left	0.95	54.0	D	#603	>1.0	>80.0	F	#483
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#951	0.51	30.6	C	187
	I-90 Off-Ramp– NB Left	0.33	12.6	B	145	0.56	16.5	B	250
	I-90 Off-Ramp – NB Left/Thru	0.88	79.5	E	#245	0.95	73.0	E	#348
	Overall Intersection	0.92	>80.0	F	-	0.83	56.9	E	-
13. Kneeland Street at Lincoln Street	Kneeland Street – EB Left/Thru/Right	0.61	13.1	B	m32	0.67	48.5	D	m264
	Kneeland Street – WB Left/Thru/Right	0.79	54.2	D	m219	0.82	57.1	E	m183
	Lincoln Street – NB Left	0.86	41.3	D	#519	0.64	28.5	C	m#323
	Lincoln Street – NB Left/Thru/Right	0.87	33.5	C	#460	0.65	24.6	C	m#284
	Overall Intersection	0.80	37.5	D	-	0.71	43.0	D	-
14. Surface Road at Kneeland Street	Kneeland Street – EB Thru	0.44	29.1	C	149	0.58	31.8	C	202
	Kneeland Street – EB Right	0.13	25.5	C	47	0.27	27.6	C	68
	Kneeland Street – WB Left	0.17	8.9	A	m40	0.26	3.4	A	m19
	Kneeland Street – WB Thru	0.36	9.2	A	m221	0.26	1.5	A	m22
	Surface Road – SB Left/Thru/Right	0.88	67.2	E	m211	>1.0	>80.0	F	m#505
	Overall Intersection	0.51	34.2	C	-	0.73	>80.0	F	-
15. Lincoln Street at South Station Connector	South Station Connector – EB Left/Thru/Right	0.45	52.7	D	96	0.19	48.5	D	67
	South Station Connector – WB Left/Thru/Right	0.32	38.9	D	59	1.00	73.3	E	#276
	Surface Ramp – NB Left/Thru/Right	0.56	5.6	A	173	0.39	8.4	A	126
	Lincoln Street – SB Left/Thru/Right	0.04	6.0	A	m8	0.12	13.7	B	m54
	Overall Intersection	0.54	14.4	B	-	0.57	35.5	D	-
16. Surface Road at South Station Connector	South Station Connector – WB Left	0.45	41.3	D	58	0.75	60.5	E	m114
	Surface Ramp– SB Left/Thru	0.23	0.7	A	m11	0.45	10.6	B	m140
	Overall Intersection	0.25	7.0	A	-	0.50	20.8	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 45 (Continued)—Signalized Intersection Capacity Analysis – 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#616	>1.0	>80.0	F	m#329
	Dorchester Avenue – NB Thru/Right	0.36	13.8	B	m123	0.25	14.9	B	m100
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	#528	>1.0	>80.0	F	#741
	Dorchester Avenue – SB Right	0.13	29.1	C	39	0.34	29.4	C	58
	Traveler Street – EB Left	0.92	>80.0	F	#213	0.36	26.9	C	#116
	Traveler Street – EB Thru	0.64	27.5	C	#374	0.80	38.3	D	#473
	Traveler Street – EB Right	0.17	20.2	C	45	0.41	19.9	B	61
	West Broadway – WB Left	0.36	24.1	C	#93	0.65	46.7	D	#130
	West Broadway – WB Thru/Right	0.94	52.4	D	#449	0.67	32.7	C	#266
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	>1.0	>80.0	F	#301	0.70	40.1	D	177
	West 4th Street – EB Right	0.06	24.2	C	25	0.13	24.4	C	33
	West 4th Street – WB Left/Thru/Right	0.90	53.9	D	#361	0.98	68.2	E	#425
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#660	>1.0	>80.0	F	#257
	Dorchester Avenue – NB Thru	0.49	8.7	A	164	0.32	7.7	A	100
	Dorchester Avenue – NB Right	0.00	5.3	A	2	0.00	5.7	A	2
	Dorchester Avenue – SB Left/Thru	0.52	23.3	C	m68	>1.0	>80.0	F	m219
	Dorchester Avenue – SB Right	0.21	36.0	D	m28	0.26	30.3	C	m50
	Overall Intersection	>1.0	60.7	E	-	>1.0	67.9	E	-
20. Purchase Street at I-93 Off-Ramp, / Seaport Boulevard	I-93 Off-Ramp – SB Left	0.99	36.9	D	#1062	0.78	21.4	C	504
	I-93 Off-Ramp – SB Thru/Right	0.97	62.0	E	#568	0.64	33.3	C	247
	Seaport Boulevard – WB Left	>1.0	68.9	E	m143	0.36	27.1	C	m56
	Seaport Boulevard – WB Left/Thru	>1.0	78.5	E	m154	0.36	27.1	C	m60
	Purchase Street – SB Thru/Right	0.74	32.0	C	275	>1.0	>80.0	F	#580
	Overall Intersection	>1.0	46.0	D	-	0.79	>80.0	F	-
21. Congress Street at A Street / Thompson Place	Congress Street – EB Left/Thru	0.88	47.1	D	#203	>1.0	>80.0	F	m#316
	Congress Street – EB Right	0.08	14.9	B	m24	0.12	16.0	B	m32
	Congress Street – WB Left	>1.0	>80.0	F	#718	0.74	32.6	C	353
	Congress Street – WB Thru/Right	0.41	8.2	A	173	0.34	6.8	A	133
	A Street – NB Left/Thru	0.93	>80.0	F	#212	>1.0	>80.0	F	#252
	A Street – NB Right	0.10	14.2	B	26	0.31	16.7	B	50
	Thompson Place – SB Left/Thru/Right	0.34	43.6	D	65	0.51	48.1	D	106
	Overall Intersection	0.93	66.6	E	-	0.87	51.8	D	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 46—Unsignalized Intersection Capacity Analysis – 2025 Alternative 1

Unsignalized Intersection	Lane Group	Morning Peak Hour			Evening Peak Hour		
		V/C[a]	Delay[b]	LOS[c]	V/C[a]	Delay[b]	LOS[c]
10. Atlantic Avenue at East Street	East Street - EB	0.14	16.2	C	0.12	14.2	B
17. Dorchester Avenue at West 2nd Street	West 2nd Street – WB	>1.0	>80.0	F	>1.0	>50.0	F
	Dorchester Avenue - NB	0.33	0.0	A	0.25	0.0	A
	Dorchester Avenue - SB	0.08	2.4	A	0.05	1.3	A

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service

For Alternative 1, all unsignalized intersections in the study area operate at an overall LOS C or better during the morning and evening peak hours, except for the westbound approach at the intersection of Dorchester Avenue and West 2nd Street which operates at LOS F. The following signalized intersections operate at an overall LOS E or worse during the morning and evening peak hours:

- **Summer Street at Dorchester Avenue (AM and PM peak hours)** – This intersection operates at an overall LOS C during both the morning and evening peak, an improvement from the no build conditions with overall intersection operation at LOS E during both peak hours. This improvement is due to the opening of Dorchester Avenue to public use which alleviates the Dorchester Avenue southbound left turn movement by allowing vehicles to continue to travel southbound on Dorchester Avenue.
- **Atlantic Avenue at Seaport Boulevard (AM and PM peak hours) –** This intersection operates at an overall LOS F during both the morning and evening peak hours. Congested conditions on I-93 during the peak hours result in delays on the I-93 on-ramp which impacts the intersection operations. On the westbound Seaport Boulevard approach, unclear traffic regulations result in vehicles making illegal turns. Pedestrians have an exclusive pedestrian phase, but typically chose to cross concurrently with Atlantic Avenue traffic which increases traffic delays.
- **Atlantic Avenue at Congress Street (PM peak hour) –** This intersection operates at an overall LOS C during the morning peak hour and an overall LOS E during the evening peak hour. Evening delays are due to high volumes heading eastbound.
- **Purchase Street at Congress Street (PM peak hour) –** This intersection operates at an overall LOS C during the morning peak hour and an overall LOS E during the evening peak hour. Observed conditions in the evening are often worse than the model reports when the I-93/I-90 ramps back into the intersection and create congestion. On the esstbound Congress Street approach drivers use the two right lanes to merge onto the I-90/I-93 ramp despite traffic regulations. This back-up results in added delays to the Purchase Street and Congress Street corridors.
- **Atlantic Avenue at Summer Street (AM peak hour) –** This intersection operates at an overall LOS F during the morning peak hour and an overall LOS D during the evening peak hour. During the peak hours Atlantic Avenue is heavily used by commuters from I-90 Eastbound and I-93 Northbound. In addition, the westbound Summer Street approach experiences a heavy traffic demand from the east. Atlantic Avenue provides for three lanes of travel, but during peak hours the curbside activity often reduces the capacity of Atlantic Avenue. Taxis and passenger car drop-offs and pickups on Atlantic Avenue negatively affect traffic operations when double or triple parked. During the peak hours commuters that take public transit into South Station disperse in groups causing conflicts when they cross the street and force traffic to yield. Atlantic Avenue

provides two left turn lanes, but is hindered by concurrent pedestrian operations and over 3,750 pedestrians traversing the intersection during the peak hours.

- **Surface Road at Essex Street & Lincoln Street (AM and PM peak hours) –** This intersection operates at an overall LOS C during the morning peak hour and an overall LOS F during the evening peak hour. During the morning and evening peak hours heavy southbound traffic amounts to high delays. Vehicles heading eastbound from Essex Street onto I-93 Northbound experience high delays due the amount of green time allocated to the movement.
- **Atlantic Avenue at Kneeland Street (AM and Pm peak hours) -** This intersection operates at an overall LOS F during the morning peak hour and an overall LOS E during the evening peak hour. There are heavy volumes exiting the I-93N Frontage Road and I-90E contributing to congestion and delay at this intersection. High volumes on Kneeland Street turning left onto Atlantic Avenue also contribute to congestion and delays.
- **Surface Road at Kneeland Street (PM peak hour) –** This intersection operates at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour when traffic getting on I-93/I-90 are highest. High southbound traffic causes high delays leading to an intersection LOS F.
- **Dorchester Avenue at West Broadway (AM and PM peak hours) –** This intersection operates at an overall LOS F during the morning and evening peak hours. Dorchester Avenue is allotted the majority of the cycle length which causes major delays on West Broadway and Traveler Street. The West Broadway and Traveler Street left-turns are not protected and must yield to on-coming traffic which causes few left turns to process during each cycle. The exclusive pedestrian phase, activated by push button, is regularly called during the peak hours adding to the overall intersection delay for vehicles. There are also high volumes of traffic traveling through the Dorchester Avenue corridor in which the roadway does not have capacity to handle.
- **Dorchester Avenue at West 4th Street (AM peak hour) –** This intersection operates at an overall LOS E in the morning and evening peak hour. Dorchester Avenue is allocated the majority of the cycle length which causes major delays on West 4th Street. Both West 4th Street approaches provide a shared left-turn/through lane without any allotted time for protected lefts which causes additional backups on West 4th Street. There are also high volumes of traffic traveling through the Dorchester Avenue corridor in which the roadway does not have capacity to handle.
- **Purchase Street at I-93 Off-Ramp & Seaport Boulevard (PM peak hour) –** This intersection operates at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Heaving southbound traffic from Purchase Street and I-93 Off-Ramp amount to long queues and high delays. An excessive amount of green time is allocated the Seaport Boulevard westbound movements adding to the delays experienced by southbound traffic.
- **Congress Street at A Street / Thompson Place (AM and PM peak hours) –** This intersection operates at an overall LOS E during the morning peak hour and an LOS D during the evening peak hour. During the morning peak hour heavy westbound traffic turning left onto A Street causes the high delay resulting in an overall LOS E. During the evening peak hour traffic turning left from A Street onto Congress Street experience high delays due to a short green time where only a few cars can pass through the intersection. This is an improvement from the no build conditions due to a portion of traffic being rerouted from A Street onto Dorchester Avenue.

6.3.4. South Station Intersection Capacity Analysis – 2035 Alternative 1

Tables 47 and 48 summarize the intersection capacity analyses for the South Station intersections for 2035 Alternative 1. Detailed traffic networks are available upon request from MassDOT.

Table 47—Signalized Intersection Capacity Analysis – 2035 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.70	35.1	D	304	>1.0	>80.0	F	#535
	Congress Street – EB Thru/Right	0.59	24.3	C	m130	0.49	16.6	B	m290
	Congress Street – WB Left	>1.0	>80.0	F	m#192	0.45	16.7	B	m36
	Congress Street – WB Thru	0.35	32.4	C	m165	0.24	9.8	A	m68
	Overall Intersection	0.91	37.4	D	-	0.70	49.2	D	-
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.66	7.8	A	m105	0.54	7.6	A	m58
	Summer Street – WB Left/Thru/Right	0.38	10.1	B	124	0.44	15.3	B	157
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#156	0.75	40.2	D	#149
	Dorchester Avenue - Thru/Right	0.47	30.5	C	154	0.37	20.8	C	138
	Dorchester Avenue – SB Left/Thru	0.97	>80.0	F	m#266	0.97	56.9	E	#268
	Dorchester Avenue – SB Right	0.78	48.3	D	m330	0.62	15.7	B	245
	Overall Intersection	0.81	28.9	C	-	0.73	21.1	C	-
3. Atlantic Avenue at Seaport Boulevard	Seaport Boulevard – EB Left/Thru	>1.0	>80.0	F	m#514	>1.0	45.7	D	m#456
	Seaport Boulevard – WB Thru/Right	>1.0	>80.0	F	#583	>1.0	>80.0	F	#879
	Seaport Boulevard – WB Bear Right/ Right	>1.0	>80.0	F	#371	>1.0	>80.0	F	#497
	Seaport Boulevard – WB Right	>1.0	>80.0	F	#397	>1.0	>80.0	F	#513
	Atlantic Avenue – NB Left/Bear Left	>1.0	>80.0	F	m#581	>1.0	>80.0	F	m#632
	Atlantic Avenue – NB Bear Left/Thru/Right	>1.0	>80.0	F	m#605	>1.0	>80.0	F	m#943
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
4. Atlantic Avenue at Congress Street	Atlantic Avenue – NB Thru/Right	0.98	26.9	C	m97	>1.0	>80.0	F	m#318
	Congress Street – EB Left	0.86	44.1	D	m#195	0.68	42.5	D	m193
	Congress Street – EB Thru	0.40	6.8	A	m84	0.44	10.3	B	m305
	Congress Street – WB Right	>1.0	>80.0	F	#355	>1.0	>80.0	F	m#291
	Overall Intersection	0.99	37.6	D	-	>1.0	68.2	E	-
5. Purchase Street at Congress Street	Congress Street – EB Thru	0.49	25.2	C	183	0.86	39.1	D	#386
	Congress Street – EB Bear Right	0.53	28.8	C	211	>1.0	>80.0	F	#867
	Congress Street – EB Right	0.12	21.2	C	41	0.27	25.4	C	82
	Purchase Street – SB Left	0.83	37.5	D	m374	0.59	6.7	A	m0
	Purchase Street – SB Bear Left/Thru	0.93	37.1	D	m#441	>1.0	>80.0	F	m412
	Overall Intersection	0.74	33.3	C	-	>1.0	>80.0	F	-
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.85	35.4	D	#174	0.93	48.2	D	#193
	Summer Street – WB Thru	>1.0	>80.0	F	m#422	0.90	47.6	D	#230
	Summer Street – WB Right	0.61	34.6	C	m66	0.54	23.3	C	m#58
	Atlantic Avenue – NB Left	>1.0	>80.0	F	m#401	0.54	20.6	C	m96
	Atlantic Avenue – NB Left/Thru	>1.0	>80.0	F	#580	0.99	46.7	D	#418
	Atlantic Avenue – NB Right	0.45	35.5	D	m45	0.33	28.3	C	m48
	Overall Intersection	>1.0	>80.0	F	-	0.96	41.0	D	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.69	2.4	A	m28	0.66	2.6	A	m32
	Summer Street – EB Thru	0.47	44.1	D	106	0.52	40.8	D	167
	Summer Street – EB Right	0.05	35.3	D	30	0.42	38.8	D	126
	Summer Street – WB Left	>1.0	>80.0	F	m98	0.81	51.1	D	m173
	Summer Street – WB Left/Thru	>1.0	>80.0	F	m107	0.82	44.4	D	m#181
	Overall Intersection	0.76	60.3	E	-	0.66	18.8	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 47 (Continued)—Signalized Intersection Capacity Analysis – 2035 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
8. Atlantic Avenue at Essex Street	Essex Street – EB Left	0.80	44.9	D	224	0.52	29.8	C	157
	Atlantic Avenue – NB Left/Thru	0.79	17.1	B	257	0.81	22.5	C	263
	Overall Intersection	0.80	25.0	C	-	0.69	24.8	C	-
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left/Thru	0.78	39.9	D	261	>1.0	>80.0	F	#696
	Essex Street – EB Bear Right/Right	0.58	37.4	D	199	>1.0	>80.0	F	#776
	Lincoln Street – NB Thru//Bear Right/Right	0.84	39.2	D	293	>1.0	>80.0	F	#488
	Surface Road – SB Left/Thru/Right	0.96	35.1	D	m#297	0.96	45.2	D	#488
	Overall Intersection	0.86	37.6	D	-	>1.0	>80.0	F	-
11. Atlantic Avenue at Beach Street	Atlantic Avenue – NB Left/Thru	0.66	2.1	A	m31	0.39	5.4	A	m75
	Overall Intersection	0.66	2.1	A	-	0.39	5.4	A	-
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.90	55.4	E	m#271	0.79	37.1	D	204
	Kneeland Street – EB Left/Thru	0.94	60.1	E	m#309	0.72	31.3	C	196
	MBTA Access Drive – WB Thru/Right	0.01	37.7	D	0	0.04	37.9	D	5
	Frontage Road – NB Left	1.00	65.3	E	#639	>1.0	>80.0	F	#506
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#1011	0.55	31.6	C	197
	I-90 Off-Ramp– NB Left	0.34	12.8	B	153	0.59	17.5	B	264
	I-90 Off-Ramp – NB Left/Thru	0.92	>80.0	F	#258	>1.0	>80.0	F	#371
	Overall Intersection	0.97	>80.0	F	-	0.86	65.2	E	-
13. Kneeland Street at Lincoln Street	Kneeland Street – EB Left/Thru/Right	0.63	13.4	B	m33	0.68	48.0	D	m231
	Kneeland Street – WB Left/Thru/Right	0.83	54.9	D	m223	0.83	56.9	E	m186
	Lincoln Street – NB Left	0.91	47.8	D	#548	0.70	32.2	C	m#351
	Lincoln Street – NB Left/Thru/Right	0.92	39.0	D	#491	0.71	27.3	C	m#315
	Overall Intersection	0.84	40.5	D	-	0.75	43.9	D	-
14. Surface Road at Kneeland Street	Kneeland Street – EB Thru	0.46	29.4	C	156	0.61	32.4	C	212
	Kneeland Street – EB Right	0.14	25.6	C	49	0.28	27.8	C	71
	Kneeland Street – WB Left	0.17	9.0	A	m40	0.28	4.5	A	m23
	Kneeland Street – WB Thru	0.37	9.7	A	m222	0.27	1.6	A	m24
	Surface Road – SB Left/Thru/Right	0.92	69.8	E	m#213	>1.0	>80.0	F	m#503
	Overall Intersection	0.54	35.0	C	-	0.78	>80.0	F	-
15. Lincoln Street at South Station Connector	South Station Connector – EB Left/Thru/Right	0.46	52.8	D	97	0.20	51.3	D	70
	South Station Connector – WB Left/Thru/Right	0.33	39.1	D	61	>1.0	80.0	F	#283
	Surface Ramp – NB Left/Thru/Right	0.58	5.9	A	188	0.41	8.6	A	133
	Lincoln Street – SB Left/Thru/Right	0.05	6.0	A	m8	0.13	13.3	B	m54
	Overall Intersection	0.56	14.4	B	-	0.59	37.6	D	-
16. Surface Road at South Station Connector	South Station Connector – WB Left	0.45	41.2	D	59	0.76	60.1	E	m115
	Surface Ramp– SB Left/Thru	0.24	0.7	A	m11	0.47	10.8	B	m146
	Overall Intersection	0.26	7.0	A	-	0.53	20.6	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 47 (Continued)—Signalized Intersection Capacity Analysis – 2035 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#693	>1.0	>80.0	F	m#349
	Dorchester Avenue – NB Thru/Right	0.37	13.8	B	m126	0.26	14.9	B	m101
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	#537	>1.0	>80.0	F	#760
	Dorchester Avenue – SB Right	0.14	29.2	C	40	0.36	29.8	C	62
	Traveler Street – EB Left	>1.0	>80.0	F	#226	0.40	28.6	C	#131
	Traveler Street – EB Thru	0.67	28.3	C	#396	0.84	41.3	D	#502
	Traveler Street – EB Right	0.18	20.2	C	46	0.43	20.1	C	65
	West Broadway – WB Left	0.39	25.5	C	#105	0.77	62.0	E	#137
	West Broadway – WB Thru/Right	0.98	62.1	E	#477	0.71	34.2	C	#285
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	>1.0	>80.0	F	#327	0.76	44.1	D	#189
	West 4th Street – EB Right	0.06	24.2	C	25	0.16	24.8	C	39
	West 4th Street – WB Left/Thru/Right	0.94	61.8	E	#390	>1.0	77.0	E	#447
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#706	>1.0	>80.0	F	#287
	Dorchester Avenue – NB Thru	0.51	9.0	A	175	0.34	7.8	A	104
	Dorchester Avenue – NB Right	0.00	5.3	A	2	0.00	5.7	A	2
	Dorchester Avenue – SB Left/Thru	0.54	23.3	C	m71	>1.0	>80.0	F	m228
	Dorchester Avenue – SB Right	0.23	31.1	C	m31	0.28	28.2	C	m56
	Overall Intersection	>1.0	73.6	E	-	>1.0	>80.0	F	-
20. Purchase Street at I-93 Off-Ramp, / Seaport Boulevard	I-93 Off-Ramp – SB Left	>1.0	47.6	D	#1129	0.80	22.8	C	538
	I-93 Off-Ramp – SB Thru/Right	>1.0	72.9	E	#602	0.66	34.1	C	257
	Seaport Boulevard – WB Left	>1.0	>80.0	F	m147	0.38	27.5	C	m57
	Seaport Boulevard – WB Left/Thru	>1.0	>80.0	F	m158	0.37	27.4	C	m60
	Purchase Street – SB Thru/Right	0.77	33.0	C	290	>1.0	>80.0	F	#616
	Overall Intersection	>1.0	55.7	E	-	0.82	>80.0	F	-
21. Congress Street at A Street / Thompson Place	Congress Street – EB Left/Thru	0.92	52.8	D	#219	>1.0	>80.0	F	m#333
	Congress Street – EB Right	0.09	14.9	B	m26	0.13	14.9	B	m28
	Congress Street – WB Left	>1.0	>80.0	F	#752	0.77	33.8	C	#377
	Congress Street – WB Thru/Right	0.43	8.3	A	183	0.35	6.9	A	140
	A Street – NB Left/Thru	0.98	>80.0	F	#227	>1.0	>80.0	F	#264
	A Street – NB Right	0.10	14.3	B	26	0.32	16.8	B	50
	Thompson Place – SB Left/Thru/Right	0.35	43.8	D	66	0.53	48.8	D	109
	Overall Intersection	0.97	74.3	E	-	0.90	56.8	E	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 48—Unsignalized Intersection Capacity Analysis – 2035 Alternative 1

Unsignalized Intersection	Lane Group	Morning Peak Hour			Evening Peak Hour		
		V/C[a]	Delay[b]	LOS[c]	V/C[a]	Delay[b]	LOS[c]
10. Atlantic Avenue at East Street	East Street - EB	0.15	16.8	C	0.12	14.4	B
17. Dorchester Avenue at West 2nd Street	West 2nd Street – WB	>1.0	>50.0	F	>1.0	>50.0	F
	Dorchester Avenue - NB	0.35	0.0	A	0.25	0.0	A
	Dorchester Avenue - SB	0.08	2.5	A	0.05	1.4	A

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service

For 2035 Alternative 1, all unsignalized intersections in the study area operate at an overall LOS D or better during the morning and evening peak hours, except for the westbound approach at the intersection of Dorchester Avenue and West 2nd Street which operates at LOS F during the evening peak. The following signalized intersections operate at an overall LOS E or worse during the morning and evening peak hours:

- **Summer Street at Dorchester Avenue (AM and PM peak hours)** – This intersection operates at an overall LOS C during the morning and evening peak hours, an improvement over no build conditions. This improvement is due to the opening of Dorchester Avenue to public use which alleviates the Dorchester Avenue southbound left turn movement by allowing vehicles to continue to travel southbound on Dorchester Avenue. Dorchester Avenue southbound experiences the greatest delay due to a heavy southbound permitted left-turn on to Summer Street. The amount of green time allocated to the Dorchester Avenue approaches does not allow for vehicle queues to clear.
- **Atlantic Avenue at Seaport Boulevard (AM and PM peak hours) –** This intersection operates at an overall LOS F during both the morning and evening peak hours. Congested conditions on I-93 during the peak hours result in delays on the I-93 on-ramp which impacts the intersection operations. On the Seaport Boulevard westbound approach, unclear traffic regulations result in vehicles making illegal turns and/or cutting off other vehicles when they realize the error. Pedestrians have an exclusive pedestrian phase, but typically chose to cross concurrently with Atlantic Avenue traffic which increases traffic delays.
- **Atlantic Avenue at Congress Street (PM peak hour) –** This intersection operates at an overall LOS D during the morning peak hour and an overall LOS E during the evening peak hour. Evening delays are due to high volumes heading eastbound.
- **Purchase Street at Congress Street (PM peak hour) –** This intersection operates at an overall LOS C during the morning peak hour and an overall LOS F during the evening peak hour. Observed conditions in the evening are often worse than the model reports when the I-93/I-90 ramps back into the intersection and create congestion. On the westbound Congress Street approach drivers use the two right lanes to merge onto the I-90/I-93 ramp despite traffic regulations. This back-up results in added delays to the Purchase Street and Congress Street corridors.
- **Atlantic Avenue at Summer Street (AM and PM peak hours) –** This intersection operates at an overall LOS F during the morning peak hour and an overall LOS D during the evening peak hour. During the peak hours Atlantic Avenue is heavily used by commuters from I-90 Eastbound and I-93 Northbound. In addition, the westbound Summer Street approach experiences a heavy traffic demand from the east. Atlantic Avenue provides for three lanes of travel, but during peak hours the curbside activity often reduces the capacity of Atlantic Avenue. Taxis and passenger car

drop-offs and pickups on Atlantic Avenue negatively affect traffic operations when double or triple parked. During the peak hours commuters that take public transit into South Station disperse in groups causing conflicts when they cross the street midblock requiring traffic to yield. Atlantic Avenue provides two left turn lanes, but is hindered by concurrent pedestrian operations and over 3,750 pedestrians traversing the intersection during the peak hours.

- **Purchase Street at Summer Street (AM peak hour) –** This intersection operates at an overall LOS E during the morning peak hour and an overall LOS B during the evening peak hour. During the morning peak hour there is heavy volume heading westbound and due to a short allocated green time not all queued vehicles have time to clear the intersection.
- **Surface Road at Essex Street & Lincoln Street (PM peak hours) –** This intersection operates at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Heavy evening traffic heading eastbound from Essex Street onto I-93 Northbound experience high delays due to the amount of green time allocated to the movement.
- **Atlantic Avenue at Kneeland Street (AM and PM peak hours) -** This intersection operates at an overall LOS F during the morning peak hour and an overall LOS E during the evening peak hour. There are heavy volumes exiting the I-93 Northbound Frontage Road and I-90 Eastbound contributing to congestion and delay at this intersection. High volumes on Kneeland Street turning left onto Atlantic Avenue also contribute to congestion and delays.
- **Kneeland Street at Lincoln Street (PM peak hour) –** This intersection operates at an overall LOS D during the morning and evening peak hours. An improvement from the no build condition, some South Station traffic traveling on Kneeland Street and Lincoln Street can use Dorchester Avenue, alleviating Atlantic Avenue and the subsequent travel patterns to Atlantic Avenue. Lincoln Street northbound experiences high evening volumes turning left onto Kneeland Street. Delays are cause by spillback due to long queues on the Kneeland Street westbound approach at the intersection of Surface Road and Kneeland Street which impact the Lincoln Street northbound left turning movement.
- **Surface Road at Kneeland Street (PM peak hour) –** This intersection operates at an overall LOS C during the morning peak hour and an overall LOS F during the evening peak hour when traffic getting on I-93/I-90 are highest.
- **Dorchester Avenue at West Broadway (AM and PM peak hours) –** This intersection operates at an overall LOS F in the morning and evening peak hours. Dorchester Avenue is allotted the majority of the cycle length which causes major delays on West Broadway and Traveler Street. The West Broadway and Traveler Street left-turns are not protected and must yield to on-coming traffic which causes few left turns to process during each cycle. The exclusive pedestrian phase, activated on a button push, is regularly called during the peak hours adding to the overall intersection delay for vehicles. There are also high volumes of traffic traveling through the Dorchester Avenue corridor in which the roadway does not have capacity to handle.
- **Dorchester Avenue at West 4th Street (AM and PM peak hours) –** This intersection operates at an overall LOS E in the morning peak hour and an overall LOS F in the evening peak hour. Dorchester Avenue is allocated the majority of the cycle length which causes delays on West 4th Street. Both West 4th Street approaches provide a shared left-turn/through lane without any allotted time for protected lefts which causes additional backups on West 4th Street. The increasing northbound left turning movement traffic also accounts for major delays to the intersection.
- **Purchase Street at I-93 Off-Ramp & Seaport Boulevard (AM and PM peak hours) –** This intersection operates at an overall LOS E during the morning peak hour and an overall LOS F

during the evening peak hour. Heaving southbound traffic from Purchase Street and I-93 Off-Ramp amount to long queues and high delays. An excessive amount of green time is allocated the Seaport Boulevard westbound movements adding to the delays experienced by southbound traffic.

- **Congress Street at A Street / Thompson Place (AM and PM peak hours) –** This intersection operates at an overall LOS E during both morning and evening peak hours. During the morning peak hour heavy westbound traffic turning left onto A Street causes high delays resulting in an overall LOS F. During the evening peak hour, traffic turning left from A Street onto Congress Street experience high delays due to a short green time where only a few cars can pass through the intersection. This is an improvement from the no build conditions due some traffic being rerouted from A Street onto Dorchester Avenue.

6.3.5. Layover Facility Intersection Capacity Analysis – 2025 Alternative 1

Tables 49 through 54 summarize the intersection capacity analyses for the layover facility intersections for 2025 Alternative 1. Detailed traffic networks are available upon request from MassDOT.

For all three proposed layover sites, all turning movements to and from the layover facility site driveways would operate at acceptable levels (LOS D or better) during the three peak periods analyzed – morning peak, midday, and evening peak. Intersection traffic operations would not be degraded as a result of the layover facility operation at any of the three potential layover facility sites. This is primarily due to the very low passenger vehicle and service vehicle traffic demands projected to occur to and from the layover yard.

Table 49—Signalized Intersection Capacity Analysis – Layover Facility Weekday Morning Peak Hour 2025 Alternative 1

Signalized Intersection	Approach	2025 Alternative 1 – AM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	0.82	>80.0	F	#96
	Cambridge Street – EB Thru/Right	0.55	7.9	A	344
	Cambridge Street – WB U-Turn/Left	0.12	49.5	D	11
	Cambridge Street – WB Thru/Right	0.60	16.1	B	352
	Lincoln Street – NB Left/Thru/Right	0.03	35.2	D	9
	Lincoln Street – SB Left	0.72	48.8	D	156
	Lincoln Street – SB Thru/Right	0.05	35.3	D	37
	Overall Intersection	0.66	14.9	B	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.51	34.5	C	81
	Frontage Road – NB Thru/Right	0.65	5.7	A	279
	Overall Intersection	0.63	6.9	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.39	37.0	D	47
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	0.91	30.3	C	#971
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.65	40.1	D	98
	Wolcott Court – SB Left/Thru/Right	0.76	51.6	D	#119
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	0.78	19.3	B	#495
	Overall Intersection	0.84	27.7	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 50—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Morning Peak Hour 2025 Alternative 1

Unsignalized Intersection	Approach	2025 Alternative 1 – AM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.03	0.0	A	0
	Widett Circle – WB Left/Thru	0.06	7.1	A	5
	Widett Circle Access Road – NB Left/Right	0.15	9.5	A	13
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.01	7.3	A	1
	Wolcott Court – NB Thru/Right	0.05	9.1	A	4
	Layover Driveway – SB Left/Thru	0.02	9.3	A	2

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet

Table 51—Signalized Intersection Capacity Analysis – Layover Facility Weekday Midday Peak Hour 2025 Alternative 1

Signalized Intersection	Approach	2025 Alternative 1 - Midday			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	>1.0	>80.0	F	#187
	Cambridge Street – EB Thru/Right	0.29	4.4	A	127
	Cambridge Street – WB U-Turn/Left	0.26	51.7	D	15
	Cambridge Street – WB Thru/Right	0.44	20.1	C	189
	Lincoln Street – NB Left/Thru/Right	0.06	38.7	D	26
	Lincoln Street – SB Left	0.58	44.2	D	108
	Lincoln Street – SB Thru/Right	0.06	38.7	D	41
	Overall Intersection	0.88	31.8	C	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.53	28.4	C	85
	Frontage Road – NB Thru/Right	0.52	5.9	A	183
	Overall Intersection	0.52	8.0	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.47	30.8	C	39
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	0.52	9.6	A	256
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.39	27.9	C	52
	Wolcott Court – SB Left/Thru/Right	0.50	28.6	C	58
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	0.45	8.4	A	145
	Overall Intersection	0.51	12.3	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 52—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Midday Peak Hour 2025 Alternative 1

Unsignalized Intersection	Approach	2025 Alternative 1 - Midday			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.02	0.0	A	0
	Widett Circle – WB Left/Thru	0.13	7.6	A	11
	Widett Circle Access Road – NB Left/Right	0.17	9.8	A	15
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.02	7.3	A	1
	Wolcott Court – NB Thru/Right	0.08	9.3	A	6
	Layover Driveway – SB Left/Thru	0.05	9.6	A	4

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet

Table 53—Signalized Intersection Capacity Analysis – Layover Facility Weekday Evening Peak Hour 2025 Alternative 1

Signalized Intersection	Approach	2025 Alternative 1 – PM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	>1.0	>80.0	F	#233
	Cambridge Street – EB Thru/Right	0.63	13.3	B	409
	Cambridge Street – WB U-Turn/Left	0.23	50.0	D	19
	Cambridge Street – WB Thru/Right	0.88	30.9	C	467
	Lincoln Street – NB Left/Thru/Right	0.01	27.9	C	8
	Lincoln Street – SB Left	0.87	54.6	D	247
	Lincoln Street – SB Thru/Right	0.06	28.3	C	0
	Overall Intersection	>1.0	35.2	D	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.46	27.4	C	103
	Frontage Road – NB Thru/Right	0.44	4.9	A	132
	Overall Intersection	0.44	7.5	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.48	38.5	D	45
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	>1.0	>80.0	F	#971
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.44	37.2	D	62
	Wolcott Court – SB Left/Thru/Right	0.66	46.1	D	91
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	>1.0	>80.0	F	#528
	Overall Intersection	>1.0	>80.0	F	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 54—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Evening Peak Hour 2025 Alternative 1

Unsignalized Intersection	Approach	2025 Alternative 1 – PM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.02	0.0	A	0
	Widett Circle – WB Left/Thru	0.11	7.5	A	9
	Widett Circle Access Road – Left/Right	0.07	9.2	A	6
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.02	7.2	A	1
	Wolcott Court – NB Thru/Right	0.04	8.8	A	3
	Layover Driveway – SB Left/Thru	0.04	9.5	A	3

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet

6.3.6. Layover Facility Intersection Capacity Analysis – 2035 Alternative 1

Tables 55 through 60 summarize the intersection capacity analyses for the layover facility intersections for 2035 Alternative 1. Detailed traffic networks are available upon request from MassDOT.

For all three proposed layover sites, all turning movements to and from the layover facility site driveways would operate at acceptable levels (LOS D or better) during the three peak periods analyzed – morning peak, midday, and evening peak. Intersection traffic operations would not be degraded as a result of the layover facility operation at any of the three potential layover facility sites. This is primarily due to the very low passenger vehicle and service vehicle traffic demands projected to occur to and from the layover yard.

Table 55—Signalized Intersection Capacity Analysis – Layover Facility Weekday Morning Peak Hour 2035 Alternative 1

Signalized Intersection	Approach	2035 Alternative 1 – AM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	0.86	>80.0	F	#106
	Cambridge Street – EB Thru/Right	0.58	8.5	A	378
	Cambridge Street – WB U-Turn/Left	0.12	49.5	D	11
	Cambridge Street – WB Thru/Right	0.66	18.8	B	372
	Lincoln Street – NB Left/Thru/Right	0.03	34.6	C	9
	Lincoln Street – SB Left	0.73	48.6	D	162
	Lincoln Street – SB Thru/Right	0.06	34.8	C	37
	Overall Intersection	0.71	16.5	B	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.55	35.0	D	88
	Frontage Road – NB Thru/Right	0.76	7.3	A	398
	Overall Intersection	0.72	8.4	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.43	36.9	D	51
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	>1.0	75.8	E	#1164
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.62	37.4	D	102
	Wolcott Court – SB Left/Thru/Right	0.72	45.1	D	#127
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	>1.0	53.9	D	#588
	Overall Intersection	0.96	61.9	E	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 56—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Morning Peak Hour 2035 Alternative 1

Unsignalized Intersection	Approach	2035 Alternative 1 – AM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.03	0.0	A	0
	Widett Circle – WB Left/Thru	0.07	7.1	A	5
	Widett Circle Access Road – NB Left/Right	0.16	9.6	A	14
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.01	7.3	A	1
	Wolcott Court – NB Thru/Right	0.05	9.1	A	4
	Layover Driveway – SB Left/Thru	0.02	9.3	A	2

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet

Table 57—Signalized Intersection Capacity Analysis – Layover Facility Weekday Midday Peak Hour 2035 Alternative 1

Signalized Intersection	Approach	2035 Alternative 1 - Midday			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	>1.0	>80.0	F	#197
	Cambridge Street – EB Thru/Right	0.31	4.5	A	137
	Cambridge Street – WB U-Turn/Left	0.26	51.7	D	15
	Cambridge Street – WB Thru/Right	0.46	20.3	C	200
	Lincoln Street – NB Left/Thru/Right	0.06	38.4	D	26
	Lincoln Street – SB Left	0.59	44.7	D	113
	Lincoln Street – SB Thru/Right	0.06	38.5	D	42
	Overall Intersection	0.92	33.8	C	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.58	29.7	C	98
	Frontage Road – NB Thru/Right	0.60	7.0	A	234
	Overall Intersection	0.60	9.0	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.49	32.8	C	40
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	0.60	11.0	B	323
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.41	29.5	C	55
	Wolcott Court – SB Left/Thru/Right	0.53	30.9	C	61
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	0.54	9.6	A	#227
	Overall Intersection	0.57	13.4	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 58—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Midday Peak Hour 2035 Alternative 1

Unsignalized Intersection	Approach	2035 Alternative 1 - Midday			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.02	0.0	A	0
	Widett Circle – WB Left/Thru	0.13	7.6	A	11
	Widett Circle Access Road – NB Left/Right	0.18	9.8	A	16
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.02	7.3	A	1
	Wolcott Court – NB Thru/Right	0.08	9.3	A	7
	Layover Driveway – SB Left/Thru	0.05	9.7	A	4

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet

Table 59—Signalized Intersection Capacity Analysis – Layover Facility Weekday Evening Peak Hour 2035 Alternative 1

Signalized Intersection	Approach	2035 Alternative 1 – PM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Beacon Park Yard					
1. Cambridge Street / Lincoln Street	Cambridge Street – EB U-Turn/Left	>1.0	>80.0	F	#242
	Cambridge Street – EB Thru/Right	0.66	14.4	B	445
	Cambridge Street – WB U-Turn/Left	0.26	50.0	D	22
	Cambridge Street – WB Thru/Right	0.91	33.6	C	#505
	Lincoln Street – NB Left/Thru/Right	0.01	27.4	C	8
	Lincoln Street – SB Left	0.88	56.0	E	258
	Lincoln Street – SB Thru/Right	0.06	27.8	C	0
	Overall Intersection	>1.0	37.5	D	-
Widett Circle					
2. Frontage Road / Widett Circle Access Road	Widett Circle Access Road – WB Right	0.52	27.9	C	119
	Frontage Road – NB Thru/Right	0.51	5.7	A	176
	Overall Intersection	0.51	8.0	A	-
Readville-Yard 2					
3. Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square	Wolcott Square – EB Hard Left/Left/Thru/Right\	0.53	39.3	D	48
	Neponset Valley Pkwy – WB Left/Slight Left/Thru/Right	>1.0	>80.0	F	#1082
	Hyde Park Avenue – NB Left/Slight Left/Thru/Right	0.44	37.2	D	62
	Wolcott Court – SB Left/Thru/Right	0.69	48.7	D	95
	Hyde Park Avenue – SEB Left/Thru/Right/Hard Right	>1.0	>80.0	F	#663
	Overall Intersection	>1.0	>80.0	F	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles

Table 60—Unsignalized Intersection Capacity Analysis – Layover Facility Weekday Evening Peak Hour 2035 Alternative 1

Unsignalized Intersection	Approach	2035 Alternative 1 – PM Peak			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]
Widett Circle					
4. Widett Circle / Widett Circle Access Road	Widett Circle – EB Thru/Right	0.02	0.0	A	0
	Widett Circle – WB Left/Thru	0.11	7.5	A	9
	Widett Circle Access Road – Left/Right	0.07	9.2	A	6
Readville-Yard 2					
5. Wolcott Court / Wolcott Street / Layover Driveway	Wolcott Street – WB Left/Right	0.02	7.2	A	1
	Wolcott Court – NB Thru/Right	0.04	8.8	A	3
	Layover Driveway – SB Left/Thru	0.04	9.5	A	3

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet

6.4. Alternative 2 – Joint/ Private Development Minimum Build

Alternative 2 would include all of the same project elements as those proposed in Alternative 1, as well as provisions for future private development by incorporating appropriate structural foundations into the overall station and track design.

In Alternative 2, the potential for future private development at the South Station site would comply with existing state and local regulations. Future private development would occur in conformance with the existing Chapter 91 regulations as well as with the Fort Point Downtown Municipal Harbor Planning Area requirements and the Massachusetts Coastal Zone Management Program. Future private development with Alternative 2 could include approximately 660,000 square feet of mixed-use development along Dorchester Avenue, consisting of residential, office, and commercial uses, including retail and hotel uses, with building heights ranging up to approximately 12 stories. Development could include approximately 235 parking spaces. Alternative 2 would include an extension of the South Station Connector connecting to the back of the joint/private development.

Figure 36 presents the Alternative 2 concept plan. The Dorchester Avenue typical cross-section for Alternative 1 (refer to Figure 31) also applies to Alternative 2. The conceptual site plans for the three layover facility sites for Alternative 2 are identical to Alternative 1 (refer to Figures 33 through 35).

6.4.1. Alternative 2- South Station Assumptions

Table 61 summarizes the transit ridership increases at South Station that would occur in the 2025 Opening Year and 2035 Build Year scenarios for Alternative 2, compared to Existing Conditions, the No Build Alternative, and Alternative 1.

Table 61—South Station Weekday Daily Combined Boardings and Alightings – Alternative 2

	Amtrak	Commuter Rail	Amtrak and Commuter Rail Total [a]	Red Line	Silver Line	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
2025 No Build Alternative	5,200	53,000	58,000	68,000	22,800	3,600	12,700	165,000
2035 No Build Alternative	5,500	56,000	61,000	72,000	25,600	3,800	12,800	175,000
2025 Alternative 2 - Joint/ Private Development Minimum Build	8,100	66,000	74,000	70,000	23,200	3,700	12,700	183,000
2035 Alternative 2 - Joint/ Private Development Minimum Build	9,300	72,000	81,000	75,000	26,200	3,900	12,800	199,000

Source: *Final SSX Ridership Results* provided in Appendix 9 - *Ridership Forecasting Technical Report*.
Note: All results rounded to the nearest 100, except for Commuter Rail, Red Line and Total results, which are rounded to the nearest 1,000.
a Total values are calculated using precise/unrounded results. As such, the sum of rounded individual ridership results may not add up to the rounded Total ridership results presented in this table.

In the 2025 Opening Year, Alternative 2 would increase daily Amtrak and commuter rail boardings and alightings at South Station by approximately 28% compared to the No Build Alternative. In the 2035 Build Year, Alternative 2 would increase daily Amtrak and commuter rail boardings and alightings at South Station by approximately 33% compared to the No Build Alternative.

Consistent with BTD guidelines, trips were estimated using the ITE Trip Generation Manual. The ITE manual yields 'unadjusted' vehicle trips, meaning that these trips do not reflect alternative modes of transportation such as walking, bicycling, and transit. The following ITE land use codes (LUC) were used:

- LUC 220 (Apartments) – was used to estimate residential trips.
- LUC 820 (Shopping Center) – was used to estimate retail trips.
- LUC 710 (Office) – was used to estimate trips associated with the office space being proposed.
- LUC 310 (Hotel) – was used to estimate trips associated with the hotel space being proposed.

The raw ITE trip generation rates were adjusted to account for mode split, vehicle occupancy (VOR), and internal capture resulting from the co-location of complimentary uses such as office and residential in a transit-oriented environment.

Table 62 summarizes the resulting vehicle trips that would be generated in Alternative 2 by the joint/private development.

Table 62—Alternative 2 – Net New Vehicular Trip Generation Estimate

	Entering Trips	Exiting Trips	Total Trips
Weekday AM Peak Hour	175	65	240
Weekday PM Peak Hour	155	245	400
Weekday Daily	1,585	1,585	3,170

As summarized in Table 62, Alternative 2 would generate 240 net-new vehicle trips during the weekday morning peak hour and 400 net-new vehicle trips in the evening peak hour. Over the entire weekday, Alternative 2 would generate 3,170 vehicle trips.

6.4.2. Alternative 2- Layover Facility Assumptions

Trip generation for the layover sites was estimated by reviewing the layover facility site programming, parking, and the vehicle service activities for each layover facility site. The layover facility assumptions and trip generation methodology for Alternative 2 is the same as Alternative 1.

6.4.3. South Station Intersection Capacity Analysis – 2025 Alternative 2

Tables 63 and 64 summarize the intersection capacity analyses for the South Station intersections for 2025 Alternative 2. Detailed traffic networks are available upon request from MassDOT.

Table 63—Signalized Intersection Capacity Analysis – 2025 Alternative 2

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.70	35.9	D	303	>1.0	>80.0	F	#598
	Congress Street – EB Thru/Right	0.56	24.3	C	m132	0.47	17.8	B	m283
	Congress Street – WB Left	>1.0	>80.0	F	m#188	0.44	16.7	B	m38
	Congress Street – WB Thru	0.33	32.5	C	m161	0.22	9.8	A	m66
	Overall Intersection	0.88	36.2	D	-	0.71	63.8	E	-
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.67	8.1	A	m107	0.62	8.1	A	m71
	Summer Street – WB Left/Thru/Right	0.36	9.9	A	117	0.42	15.1	B	150
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#162	0.77	43.3	D	#147
	Dorchester Avenue – NB Thru/Right	0.49	30.9	C	161	0.44	21.7	C	168
	Dorchester Avenue – SB Left	0.93	75.5	E	m#249	>1.0	74.4	E	#214
	Dorchester Avenue – SB Thru/Right	0.82	50.4	D	m#357	0.66	17.0	B	301
	Overall Intersection	0.84	30.5	C	-	0.79	22.8	C	-
3. Atlantic Avenue at Seaport Boulevard	Seaport Boulevard – EB Left/Thru	>1.0	>80.0	F	m#512	0.98	35.1	D	m#437
	Seaport Boulevard – WB Thru/Right	>1.0	>80.0	F	#556	>1.0	>80.0	F	#841
	Seaport Boulevard – WB Bear Right/ Right	>1.0	>80.0	F	#352	>1.0	>80.0	F	#475
	Seaport Boulevard – WB Right	>1.0	>80.0	F	#376	>1.0	>80.0	F	#489
	Atlantic Avenue – NB Left/Bear Left	>1.0	>80.0	F	m#582	>1.0	>80.0	F	m#620
	Atlantic Avenue – NB Bear Left/Thru/Right	>1.0	>80.0	F	m#598	>1.0	>80.0	F	m#925
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
4. Atlantic Avenue at Congress Street	Atlantic Avenue – NB Thru/Right	0.93	23.9	C	m96	>1.0	73.4	E	m#317
	Congress Street – EB Left	0.83	42.1	D	m#186	0.65	42.0	D	m189
	Congress Street – EB Thru	0.40	6.9	A	m84	0.43	10.3	B	298
	Congress Street – WB Right	>1.0	>80.0	F	#344	>1.0	>80.0	F	m#280
	Overall Intersection	0.95	34.8	C	-	>1.0	67.0	E	-
5. Purchase Street at Congress Street	Congress Street – EB Thru	0.47	24.9	C	175	0.82	36.6	D	339
	Congress Street – EB Bear Right	0.51	28.1	C	199	>1.0	>80.0	F	#817
	Congress Street – EB Right	0.11	21.2	C	41	0.24	24.9	C	73
	Purchase Street – SB Left	0.80	37.7	D	m352	0.54	6.9	A	m0
	Purchase Street – SB Bear Left/Thru	0.91	35.9	D	m432	>1.0	74.6	E	m400
	Overall Intersection	0.72	32.7	C	-	>1.0	77.9	E	-
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.81	33.1	C	167	0.90	44.3	D	176
	Summer Street – WB Thru	>1.0	>80.0	F	m#403	0.87	43.8	D	m#212
	Summer Street – WB Right	0.57	32.5	C	m52	0.48	21.3	C	m40
	Atlantic Avenue – NB Left	>1.0	>80.0	F	m#390	0.55	20.7	C	m101
	Atlantic Avenue – NB Left/Thru	>1.0	>80.0	F	#545	0.96	38.7	D	#400
	Atlantic Avenue – NB Right	0.47	38.0	D	m47	0.36	28.3	C	m51
	Overall Intersection	>1.0	>80.0	F	-	0.93	36.6	D	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.68	2.3	A	m28	0.64	2.5	A	m31
	Summer Street – EB Thru	0.45	43.7	D	104	0.51	40.3	D	162
	Summer Street – EB Right	0.05	35.3	D	30	0.39	38.1	D	118
	Summer Street – WB Left	>1.0	>80.0	F	m98	0.77	49.8	D	m171
	Summer Street – WB Left/Thru	>1.0	>80.0	F	m107	0.78	43.7	D	m177
	Overall Intersection	0.75	51.8	D	-	0.64	18.3	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 63 (Continued)—Signalized Intersection Capacity Analysis – 2025 Alternative 2

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
8. Atlantic Avenue at Essex Street	Essex Street – EB Left	0.77	43.1	D	213	0.51	29.7	C	155
	Atlantic Avenue – NB Left/Thru	0.78	16.5	B	246	0.81	22.7	C	258
	Overall Intersection	0.78	23.8	C	-	0.68	25.0	C	-
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left/Thru	0.71	37.0	D	234	>1.0	>80.0	F	#662
	Essex Street – EB Bear Right/Right	0.56	36.7	D	192	>1.0	>80.0	F	#745
	Lincoln Street – NB Thru/Bear Right/Right	0.81	37.5	D	278	>1.0	>80.0	F	#521
	Surface Road – SB Left/Thru/Right	0.95	34.5	C	m#302	0.87	33.6	C	358
	Overall Intersection	0.83	36.1	D	-	>1.0	>80.0	F	-
11. Atlantic Avenue at Beach Street	Atlantic Avenue – NB Left/Thru	0.65	2.0	A	m17	0.39	5.1	A	m72
	Overall Intersection	0.65	2.0	A	-	0.39	5.1	A	-
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.94	64.3	E	m#296	0.80	38.2	D	203
	Kneeland Street – EB Left/Thru	0.86	47.9	D	m#277	0.72	32.5	C	194
	MBTA Access Drive – WB Thru/Right	0.01	37.7	D	0	0.04	37.9	D	5
	Frontage Road – NB Left	0.96	55.5	E	#603	>1.0	>80.0	F	#483
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#990	0.59	32.6	C	214
	I-90 Off-Ramp– NB Left	0.34	12.9	B	152	0.58	17.1	B	261
	I-90 Off-Ramp – NB Left/Thru	0.88	79.5	E	#245	0.95	73.0	E	#348
	Overall Intersection	0.95	>80.0	F	-	0.84	57.8	E	-
13. Kneeland Street at Lincoln Street	Kneeland Street – EB Left/Thru/Right	0.61	12.9	B	m31	0.66	48.3	D	m260
	Kneeland Street – WB Left/Thru/Right	0.82	54.9	D	m222	0.83	56.8	E	m186
	Lincoln Street – NB Left	0.88	43.2	D	#530	0.70	31.2	C	m#337
	Lincoln Street – NB Left/Thru/Right	0.89	35.3	D	#471	0.71	26.5	C	m#298
	Overall Intersection	0.82	38.7	D	-	0.74	43.3	D	-
14. Surface Road at Kneeland Street	Kneeland Street – EB Thru	0.44	29.1	C	150	0.58	31.9	C	204
	Kneeland Street – EB Right	0.13	25.5	C	47	0.27	27.6	C	68
	Kneeland Street – WB Left	0.17	8.9	A	m39	0.26	3.8	A	m19
	Kneeland Street – WB Thru	0.36	9.3	A	m211	0.26	1.6	A	m22
	Surface Road – SB Left/Thru/Right	0.95	74.7	E	m#231	>1.0	>80.0	F	m#527
	Overall Intersection	0.53	36.6	D	-	0.74	>80.0	F	-
15. Lincoln Street at South Station Connector	South Station Connector – EB Left/Thru/Right	0.57	55.5	E	117	0.24	49.7	D	80
	South Station Connector – WB Left/Thru/Right	0.39	40.3	D	69	>1.0	>80.0	F	#377
	Surface Ramp – NB Left/Thru/Right	0.57	5.7	A	180	0.39	8.4	A	126
	Lincoln Street – SB Left/Thru/Right	0.06	5.6	A	m9	0.14	13.5	B	m58
	Overall Intersection	0.57	16.3	B	-	0.65	69.8	E	-
16. Surface Road at South Station Connector	South Station Connector – WB Left	0.48	38.6	D	60	0.84	55.7	E	m116
	Surface Ramp– SB Left/Thru	0.24	0.8	A	m11	0.47	12.0	B	m143
	Overall Intersection	0.27	7.1	A	-	0.54	22.3	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 63 (Continued)—Signalized Intersection Capacity Analysis – 2025 Alternative 2

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#658	>1.0	>80.0	F	m#327
	Dorchester Avenue – NB Thru/Right	0.36	13.9	B	m125	0.26	15.2	B	m103
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	#550	>1.0	>80.0	F	#813
	Dorchester Avenue – SB Right	0.14	29.2	C	40	0.43	31.3	C	82
	Traveler Street – EB Left	0.97	>80.0	F	#221	0.38	27.7	C	#126
	Traveler Street – EB Thru	0.64	27.5	C	#375	0.80	38.6	D	#477
	Traveler Street – EB Right	0.17	20.2	C	45	0.41	19.9	B	61
	West Broadway – WB Left	0.36	24.2	C	#93	0.66	47.2	D	#130
	West Broadway – WB Thru/Right	0.95	53.8	D	#453	0.68	33.1	C	#270
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	>1.0	>80.0	F	#306	0.76	44.9	D	#191
	West 4th Street – EB Right	0.06	24.2	C	25	0.14	24.4	C	34
	West 4th Street – WB Left/Thru/Right	0.90	53.9	D	#361	0.98	68.2	E	#425
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#661	>1.0	>80.0	F	#260
	Dorchester Avenue – NB Thru	0.49	8.8	A	165	0.33	7.7	A	101
	Dorchester Avenue – NB Right	0.00	5.3	A	2	0.00	5.7	A	2
	Dorchester Avenue – SB Left/Thru	0.52	23.5	C	m68	>1.0	>80.0	F	m212
	Dorchester Avenue – SB Right	0.23	34.7	C	m30	0.32	30.3	C	m60
	Overall Intersection	>1.0	61.5	E	-	>1.0	71.6	E	-
20. Purchase Street at I-93 Off-Ramp, / Seaport Boulevard	I-93 Off-Ramp – SB Left	0.99	36.9	D	#1062	0.78	21.4	C	504
	I-93 Off-Ramp – SB Thru/Right	>1.0	72.8	E	#602	0.66	34.1	C	257
	Seaport Boulevard – WB Left	>1.0	68.9	E	m142	0.36	27.2	C	m56
	Seaport Boulevard – WB Left/Thru	>1.0	>80.0	F	m157	0.36	27.2	C	m60
	Purchase Street – SB Thru/Right	0.75	32.2	C	279	>1.0	>80.0	F	#595
	Overall Intersection	>1.0	48.8	D	-	0.80	>80.0	F	-
21. Congress Street at A Street / Thompson Place	Congress Street – EB Left/Thru	0.89	48.6	D	#208	>1.0	>80.0	F	m#321
	Congress Street – EB Right	0.08	15.0	B	m22	0.12	16.4	B	m28
	Congress Street – WB Left	>1.0	>80.0	F	#718	0.74	32.6	C	353
	Congress Street – WB Thru/Right	0.41	8.2	A	175	0.34	6.9	A	136
	A Street – NB Left/Thru	0.93	>80.0	F	#212	>1.0	>80.0	F	#252
	A Street – NB Right	0.10	14.2	B	26	0.31	16.7	B	50
	Thompson Place – SB Left/Thru/Right	0.34	43.6	D	65	0.51	48.1	D	106
	Overall Intersection	0.93	66.7	E	-	0.88	54.0	D	-
22. SS Bus Ramps / South Station Connector Extension	South Station Connector Extension – WB Left/Right	0.20	14.7	B	29	0.44	14.3	B	60
	SS Bus Ramps – NB Thru/Right	0.24	3.6	A	26	0.09	3.9	A	14
	SS Bus Ramps – SB Left/Thru	0.08	3.0	A	11	0.36	5.2	A	61
	Overall Intersection	0.23	4.4	A	-	0.38	6.6	A	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 64—Unsignalized Intersection Capacity Analysis – 2025 Alternative 2

Unsignalized Intersection	Lane Group	Morning Peak Hour V/C[a]	Morning Peak Hour Delay[b]	Morning Peak Hour LOS[c]	Evening Peak Hour V/C[a]	Evening Peak Hour Delay[b]	Evening Peak Hour LOS[c]
10. Atlantic Avenue at East Street	East Street - EB	0.14	16.6	C	0.11	14.2	B
17. Dorchester Avenue at West 2nd Street	West 2nd Street – WB	>1.0	>50.0	F	>1.0	>50.0	F
	Dorchester Avenue - NB	0.34	0.0	A	0.26	0.0	A
	Dorchester Avenue - SB	0.08	2.3	A	0.05	1.4	A
23. South Station Connector Extension / Loop Road	South Station Connector Extension – EB	0.08	0.0	A	0.05	0.0	A
	South Station Connector Extension – WB	0.00	0.0	A	0.03	0.0	A
	Loop Road - SB	0.04	8.5	A	0.11	8.9	A
24. South Station Connector Extension / Loop Road	South Station Connector Extension – EB	0.05	7.3	A	0.05	7.3	A
		0.00	0.0	A	0.00	0.0	A
26. JD 1+2 / Dorchester Ave	JD 1+2 – EB	0.05	11.5	B	0.12	13.1	B
	Dorchester Ave – NB	0.00	0.2	A	0.01	0.5	A
	Dorchester Ave – SB	0.20	0.0	A	0.27	0.0	A
27. JD 3 / Connector Road	JD 3 – WB	0.01	8.7	A	0.00	8.7	A
	Connector Road – NB	0.05	0.0	A	0.05	0.0	A
28. JD 4 / Connector Road	JD 4 – WB	0.02	9.7	A	0.11	10.0	B
	Connector Road – NB	0.02	2.8	A	0.02	2.6	A
29. JD 5 / Dorchester Ave	JD 5 – EB	0.02	11.8	B	0.18	15.9	C
	Dorchester Ave – NB	0.00	0.2	A	0.01	0.3	A
	Dorchester Ave – SB	0.23	0.0	A	0.30	0.0	A
30. South Station Bus Access / JD 6	South Station Bus Access – EB	0.08	0.0	A	0.05	0.0	A
	South Station Bus Access – WB	0.00	0.0	A	0.00	0.0	A
	JD 6 – NB	0.01	9.1	A	0.05	9.1	A

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service

The study area experiences higher levels of vehicle, pedestrian, and bicycle activity during the morning and evening peak hours coinciding with commuter traffic. Varying factors such as curbside loading and stopping, construction activity, vehicles blocking intersections and jaywalking degrade traffic operations on a day-to-day basis.

For 2025 Alternative 2, all unsignalized intersections in the study area would operate at an overall LOS D or better during the morning and evening peak hours, except for the westbound approach at the intersection of Dorchester Avenue and West 2nd Street; this approach would operate at LOS F during the morning and evening peak hours. The majority of signalized intersections operate at an overall LOS E or worse during the morning and evening peak hours:

- **Congress Street at Dorchester Avenue (PM peak hour)** – This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS E during the evening peak hour. With the reopening of Dorchester Avenue, the northbound approach would carry higher volumes, with inadequate green time allocated to this approach under current signal operations.
- **Atlantic Avenue at Seaport Boulevard (AM and PM peak hours) –** This intersection would operate at an overall LOS F during both the morning and evening peak hours. Congested conditions on I-93 during the peak hours result in delays on the I-93 on-ramp which impact the intersection operations. On the Seaport Boulevard westbound approach, unclear traffic regulations result in vehicles making illegal turns and/or cutting off other vehicles when they realize the error. Pedestrians have an exclusive pedestrian phase, but typically chose to cross concurrently with Atlantic Avenue traffic which increases traffic delays.

- **Atlantic Avenue at Congress Street (PM peak hour) –** This intersection would operate at an overall LOS C during the morning peak hour and an overall LOS E during the evening peak hour. Evening delays are due to high volumes heading westbound turning right onto Atlantic Avenue.
- **Purchase Street at Congress Street (PM peak hour) –** This intersection would operate at an overall LOS C during the morning peak hour and an overall LOS E during the evening peak hour. Observed conditions in the evening are often worse than the model reports when the I-93/I-90 ramps back into the intersection and create congestion. On the eastbound Congress Street approach drivers use the two right lanes to merge onto the I-90/I-93 ramp despite traffic regulations. This back-up results in added delays to the Purchase Street and Congress Street corridors.
- **Atlantic Avenue at Summer Street (AM peak hour) –** This intersection would operate at an overall LOS F during the morning peak hour and an overall LOS D during the evening peak hour. During the peak hours Atlantic Avenue is heavily used by commuters from I-90 Eastbound and I-93 Northbound. In addition, the westbound Summer Street approach would handle higher traffic demands from the east. Atlantic Avenue provides for three lanes of travel, but during peak hours the curbside activity often reduces the capacity of Atlantic Avenue. Taxis and passenger car drop-offs and pickups on Atlantic Avenue negatively affect traffic operations when double or triple parked. During the peak hours, commuters that take public transit into South Station disperse in groups causing conflicts when they cross the street and force traffic to yield. Atlantic Avenue provides two left turn lanes, but is hindered by concurrent pedestrian operations and over 3,750 pedestrians traversing the intersection during the peak hours.
- **Surface Road at Essex Street and Lincoln Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Heavy evening traffic heading eastbound from Essex Street onto I-93 Northbound experience high delays due to the amount of green time allocated to the movement.
- **Atlantic Avenue at Kneeland Street (AM and PM peak hours) –** This intersection would operate at an overall LOS F during the morning peak hour and an LOS E during the evening peak. There are heavy volumes exiting the I-93 Northbound Frontage Road and I-90 Eastbound contributing to congestion and delay at this intersection. High volumes on Kneeland Street turning left onto Atlantic Avenue also contribute to congestion and delays.
- **Surface Road at Kneeland Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour when traffic getting on I-93/I-90 is highest.
- **SS Bus Ramps at I-90/I93 HOV Lanes and I-93 Off-Ramps (PM peak hour)** – This intersection would operate at an overall LOS B in the morning peak period and an overall LOS E during the evening peak hour. With high westbound volumes, particularly turning left, this approach would experience higher delays.
- **Dorchester Avenue at West Broadway (AM and PM peak hours) –** This intersection would operate at an overall LOS F in both the morning and evening peak hours. Dorchester Avenue is allotted the majority of the cycle length which causes delays on West Broadway and Traveler Street. The West Broadway and Traveler Street left-turns are not protected and must yield to on-coming traffic which causes few left turns to process during each cycle. The exclusive pedestrian phase, activated on a button push, is regularly called during the peak hours adding to the overall intersection delay for vehicles. With the reopening of Dorchester Avenue and new development within South Station, an increase in traffic through the Dorchester Avenue corridor would result in higher delays on the north and southbound approaches.

- **Dorchester Avenue at West 4th Street (AM and PM peak hours) –** This intersection would operate at an overall LOS E in both the morning and evening peak hours. Dorchester Avenue is allocated the majority of the cycle length which would result in higher delays on West 4th Street. Both West 4th Street approaches provide a shared left-turn/through lane without any allotted time for protected lefts which causes additional backups on West 4th Street. With the reopening of Dorchester Avenue and new development within South Station an increase in traffic through the Dorchester Avenue corridor would result in higher delays on the north and southbound approaches.
- **Purchase Street at I-93 Off-Ramp and Seaport Boulevard (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Heavy southbound traffic from Purchase Street and the I-93 Off-Ramp amount to long queues and high delays. An excessive amount of green time is allocated to the Seaport Boulevard westbound movements adding to the delays experienced by southbound traffic.
- **Congress Street at A Street / Thompson Place (AM peak hour) –** This intersection would operate at an overall LOS E during the morning peak hour and LOS D during the evening peak hour. During the morning peak hour heavy westbound traffic turning left onto A Street causes high delays resulting in an overall LOS E.

6.4.4. South Station Intersection Capacity Analysis – 2035 Alternative 2

Tables 65 and 66 summarize the intersection capacity analyses for the South Station intersections for 2035 Alternative 2. Detailed traffic networks are available upon request from MassDOT.

Table 65—Signalized Intersection Capacity Analysis, 2035 Alternative 2

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.73	37.1	D	319	>1.0	>80.0	F	#620
	Congress Street – EB Thru/Right	0.60	24.4	C	m131	0.50	16.8	B	m290
	Congress Street – WB Left	>1.0	>80.0	F	m#204	0.51	19.7	B	m41
	Congress Street – WB Thru	0.35	32.4	C	m166	0.24	9.8	A	m69
	Overall Intersection	0.98	40.6	D	-	0.75	67.5	E	-
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.70	8.3	A	m114	0.66	8.8	A	m74
	Summer Street – WB Left/Thru/Right	0.38	10.1	B	125	0.44	15.4	B	162
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#173	0.86	57.9	E	#167
	Dorchester Avenue – NB Thru/Right	0.51	31.3	C	165	0.46	21.9	C	173
	Dorchester Avenue – SB Left	>1.0	>80.0	F	m#271	>1.0	>80.0	F	#249
	Dorchester Avenue – SB Thru/Right	0.84	51.0	D	m#354	0.68	17.5	B	305
	Overall Intersection	0.90	34.3	C	-	0.86	27.8	C	-
3. Atlantic Avenue at Seaport Boulevard	Seaport Boulevard – EB Left/Thru	>1.0	>80.0	F	m#514	>1.0	45.7	D	m#456
	Seaport Boulevard – WB Thru/Right	>1.0	>80.0	F	#583	>1.0	>80.0	F	#879
	Seaport Boulevard – WB Bear Right/ Right	>1.0	>80.0	F	#371	>1.0	>80.0	F	#497
	Seaport Boulevard – WB Right	>1.0	>80.0	F	#397	>1.0	>80.0	F	#513
	Atlantic Avenue – NB Left/Bear Left	>1.0	>80.0	F	m#584	>1.0	>80.0	F	m#662
	Atlantic Avenue – NB Bear Left/Thru/Right	>1.0	>80.0	F	m#605	>1.0	>80.0	F	m#985
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
4. Atlantic Avenue at Congress Street	Atlantic Avenue – NB Thru/Right	0.98	27.5	C	m97	>1.0	72.5	E	m#293
	Congress Street – EB Left	0.86	43.8	D	m#191	0.65	42.0	D	m185
	Congress Street – EB Thru	0.41	6.8	A	m86	0.43	10.3	B	m293
	Congress Street – WB Right	>1.0	>80.0	F	#365	>1.0	>80.0	F	m#267
	Overall Intersection	1.00	39.2	D	-	>1.0	66.4	E	-
5. Purchase Street at Congress Street	Congress Street – EB Thru	0.49	25.2	C	183	0.86	39.1	D	#386
	Congress Street – EB Bear Right	0.53	28.8	C	211	>1.0	>80.0	F	#867
	Congress Street – EB Right	0.12	21.3	C	41	0.27	25.4	C	83
	Purchase Street – SB Left	0.87	39.4	D	m386	0.58	7.8	A	m0
	Purchase Street – SB Bear Left/Thru	0.95	38.7	D	m#477	>1.0	>80.0	F	m408
	Overall Intersection	0.75	34.4	C	-	>1.0	>80.0	F	-
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.86	36.7	D	#183	0.94	50.6	D	#203
	Summer Street – WB Thru	>1.0	>80.0	F	m#415	0.91	48.0	D	m#227
	Summer Street – WB Right	0.62	34.4	C	m60	0.55	24.4	C	m#57
	Atlantic Avenue – NB Left	>1.0	>80.0	F	m#389	0.55	21.3	C	m94
	Atlantic Avenue – NB Left/Thru	>1.0	>80.0	F	#583	>1.0	51.6	D	m#417
	Atlantic Avenue – NB Right	0.49	37.7	D	m42	0.37	29.4	C	m49
	Overall Intersection	>1.0	>80.0	F	-	0.98	43.2	D	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.71	2.5	A	m28	0.67	2.6	A	m32
	Summer Street – EB Thru	0.47	44.1	D	106	0.53	41.0	D	169
	Summer Street – EB Right	0.05	35.3	D	30	0.43	39.0	D	127
	Summer Street – WB Left	>1.0	>80.0	F	m98	0.81	51.0	D	m173
	Summer Street – WB Left/Thru	>1.0	>80.0	F	m107	0.83	44.5	D	m181
	Overall Intersection	0.78	60.8	E	-	0.67	18.8	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 65 (Continued)—Signalized Intersection Capacity Analysis, 2035 Alternative 2

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
8. Atlantic Avenue at Essex Street	Essex Street – EB Left	0.81	45.3	D	225	0.54	30.2	C	163
	Atlantic Avenue – NB Left/Thru	0.82	17.2	B	269	0.84	24.8	C	289
	Overall Intersection	0.81	25.0	C	-	0.72	26.6	C	-
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left/Thru	0.75	38.4	D	247	>1.0	>80.0	F	#696
	Essex Street – EB Bear Right/Right	0.59	37.6	D	201	>1.0	>80.0	F	#785
	Lincoln Street – NB Thru/Bear Right/Right	0.85	39.5	D	295	>1.0	>80.0	F	#549
	Surface Road – SB Left/Thru/Right	0.99	40.6	D	m#338	0.92	36.8	D	#415
	Overall Intersection	0.86	39.6	D	-	>1.0	>80.0	F	-
11. Atlantic Avenue at Beach Street	Atlantic Avenue – NB Left/Thru	0.68	2.1	A	m17	0.41	5.2	A	m75
	Overall Intersection	0.68	2.1	A	-	0.41	5.2	A	-
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.93	59.1	E	m#308	0.81	39.4	D	215
	Kneeland Street – EB Left/Thru	0.85	45.1	D	m#288	0.73	32.9	C	206
	MBTA Access Drive – WB Thru/Right	0.01	37.7	D	0	0.04	37.9	D	5
	Frontage Road – NB Left	>1.00	76.2	E	#639	>1.0	>80.0	F	#506
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#1050	0.63	34.0	C	#226
	I-90 Off-Ramp– NB Left	0.37	13.8	B	161	0.61	18.3	B	276
	I-90 Off-Ramp – NB Left/Thru	0.92	>80.0	F	#258	1.00	>80.0	F	#371
	Overall Intersection	1.00	>80.0	F	-	0.87	66.4	E	-
13. Kneeland Street at Lincoln Street	Kneeland Street – EB Left/Thru/Right	0.63	13.2	B	m32	0.68	48.6	D	m262
	Kneeland Street – WB Left/Thru/Right	0.86	55.5	E	m221	0.84	56.7	E	m189
	Lincoln Street – NB Left	0.93	50.9	D	#563	0.77	35.9	D	m#365
	Lincoln Street – NB Left/Thru/Right	0.94	41.4	D	#504	0.78	29.9	C	m#328
	Overall Intersection	0.86	42.1	D	-	0.78	44.9	D	-
14. Surface Road at Kneeland Street	Kneeland Street – EB Thru	0.46	29.4	C	156	0.61	32.5	C	215
	Kneeland Street – EB Right	0.14	25.6	C	49	0.28	27.8	C	70
	Kneeland Street – WB Left	0.17	8.9	A	m38	0.28	4.8	A	m23
	Kneeland Street – WB Thru	0.37	9.6	A	m211	0.27	1.6	A	m25
	Surface Road – SB Left/Thru/Right	0.98	>80.0	F	m#234	>1.0	>80.0	F	m#543
	Overall Intersection	0.55	38.0	D	-	0.79	>80.0	F	-
15. Lincoln Street at South Station Connector	South Station Connector – EB Left/Thru/Right	0.57	55.5	E	118	0.25	53.0	D	82
	South Station Connector – WB Left/Thru/Right	0.40	40.5	D	70	>1.0	>80.0	F	#385
	Surface Ramp – NB Left/Thru/Right	0.59	6.0	A	194	0.41	8.6	A	133
	Lincoln Street – SB Left/Thru/Right	0.06	5.6	A	m9	0.15	13.0	B	m57
	Overall Intersection	0.59	16.3	B	-	0.67	73.4	E	-
16. Surface Road at South Station Connector	South Station Connector – WB Left	0.49	38.9	D	61	0.85	55.3	E	m117
	Surface Ramp– SB Left/Thru	0.25	0.9	A	m11	0.49	12.7	B	m148
	Overall Intersection	0.28	7.2	A	-	0.56	22.5	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 65 (Continued)—Signalized Intersection Capacity Analysis, 2035 Alternative 2

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#692	>1.0	>80.0	F	m#346
	Dorchester Avenue – NB Thru/Right	0.38	13.9	B	m128	0.27	15.1	B	m106
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	#561	>1.0	>80.0	F	#835
	Dorchester Avenue – SB Right	0.14	29.3	C	40	0.45	32.0	C	90
	Traveler Street – EB Left	>1.0	>80.0	F	#232	0.42	29.3	C	#139
	Traveler Street – EB Thru	0.67	28.4	C	#397	0.84	41.5	D	#503
	Traveler Street – EB Right	0.18	20.2	C	46	0.43	20.1	C	65
	West Broadway – WB Left	0.40	25.6	C	#106	0.77	63.1	E	#137
	West Broadway – WB Thru/Right	0.99	63.9	E	#481	0.71	34.4	C	#287
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	>1.0	>80.0	F	#332	0.81	49.8	D	#214
	West 4th Street – EB Right	0.06	24.2	C	25	0.16	24.8	C	40
	West 4th Street – WB Left/Thru/Right	0.94	61.8	E	#390	>1.0	77.0	E	#447
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#707	>1.0	>80.0	F	#291
	Dorchester Avenue – NB Thru	0.51	9.0	A	176	0.34	7.8	A	106
	Dorchester Avenue – NB Right	0.00	5.3	A	2	0.00	5.7	A	2
	Dorchester Avenue – SB Left/Thru	0.54	23.6	C	m70	>1.0	>80.0	F	m222
	Dorchester Avenue – SB Right	0.26	30.8	C	m34	0.34	28.4	C	m65
	Overall Intersection	>1.0	74.3	E	-	>1.0	>80.0	F	-
20. Purchase Street at I-93 Off-Ramp, / Seaport Boulevard	I-93 Off-Ramp – SB Left	>1.0	47.6	D	#1129	0.80	22.8	C	538
	I-93 Off-Ramp – SB Thru/Right	>1.0	>80.0	F	#633	0.68	35.1	D	268
	Seaport Boulevard – WB Left	>1.0	>80.0	F	m146	0.38	27.6	C	m56
	Seaport Boulevard – WB Left/Thru	>1.0	>80.0	F	m162	0.38	27.5	C	m60
	Purchase Street – SB Thru/Right	0.78	33.4	C	295	>1.0	>80.0	F	#631
	Overall Intersection	>1.0	58.6	E	-	0.83	>80.0	F	-
21. Congress Street at A Street / Thompson Place	Congress Street – EB Left/Thru	0.93	54.4	D	#222	>1.0	>80.0	F	m#335
	Congress Street – EB Right	0.09	14.6	B	m25	0.13	16.0	B	m28
	Congress Street – WB Left	>1.0	>80.0	F	#752	0.77	33.8	C	#377
	Congress Street – WB Thru/Right	0.43	8.4	A	186	0.36	7.0	A	143
	A Street – NB Left/Thru	0.98	>80.0	F	#227	>1.0	>80.0	F	#264
	A Street – NB Right	0.10	14.3	B	26	0.32	16.8	B	50
	Thompson Place – SB Left/Thru/Right	0.35	43.8	D	66	0.53	48.8	D	109
	Overall Intersection	0.97	74.4	E	-	0.91	59.2	E	-
22. SS Bus Ramps / South Station Connector Extension	South Station Connector Extension – WB Left/Right	0.22	14.6	B	31	0.46	14.4	B	62
	SS Bus Ramps – NB Thru/Right	0.25	3.7	A	27	0.09	3.9	A	14
	SS Bus Ramps – SB Left/Thru	0.08	3.0	A	11	0.36	5.2	A	59
	Overall Intersection	0.24	4.6	A	-	0.39	6.7	A	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 66—Unsignalized Intersection Capacity Analysis, 2035 Alternative 2

Unsignalized Intersection	Lane Group	Morning Peak Hour			Evening Peak Hour		
		V/C[a]	Delay[b]	LOS[c]	V/C[a]	Delay[b]	LOS[c]
10. Atlantic Avenue at East Street	East Street - EB	0.15	17.2	C	0.12	14.3	B
17. Dorchester Avenue at West 2nd Street	West 2nd Street – WB	>1.0	>80.0	F	>1.0	>50.0	F
	Dorchester Avenue - NB	0.35	0.0	A	0.27	0.0	A
	Dorchester Avenue - SB	0.09	2.5	A	0.05	1.4	A
23. South Station Connector Extension / Loop Road	South Station Connector Extension – EB	0.08	0.0	A	0.05	0.0	A
	South Station Connector Extension – WB	0.00	0.0	A	0.03	0.0	A
	Loop Road - SB	0.05	8.5	A	0.11	9.0	A
24. South Station Connector Extension / Loop Road	South Station Connector Extension – EB	0.05	7.3	A	0.05	7.3	A
	Connector Road – NB	0.00	0.0	A	0.00	0.0	A
26. JD 1+2 / Dorchester Ave	JD 1+2 – EB	0.05	11.5	B	0.12	13.2	B
	Dorchester Ave – NB	0.00	0.2	A	0.01	0.5	A
	Dorchester Ave – SB	0.20	0.0	A	0.27	0.0	A
27. JD 3 / Connector Road	JD 3 – WB	0.01	8.7	A	0.00	8.7	A
	Connector Road – NB	0.05	0.0	A	0.05	0.0	A
28. JD 4 / Connector Road	JD 4 – WB	0.02	9.8	A	0.11	10.1	B
	Connector Road – NB	0.02	3.1	A	0.02	2.9	A
29. JD 5 / Dorchester Ave	JD 5 – EB	0.02	11.9	B	0.18	16.3	C
	Dorchester Ave – NB	0.00	0.2	A	0.01	0.3	A
	Dorchester Ave – SB	0.23	0.0	A	0.31	0.0	A
30. South Station Bus Access / JD 6	South Station Bus Access – EB	0.08	0.0	A	0.05	0.0	A
	South Station Bus Access – WB	0.00	0.0	A	0.00	0.0	A
	JD 6 – NB	0.01	9.1	A	0.05	9.2	A

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service

The study area experiences high levels of vehicle, pedestrian, and bicycle activity during the morning and evening peak hours coinciding with commuter traffic. Varying factors such as curbside loading and stopping, construction activity, vehicles blocking intersections and jaywalking degrade traffic operations on a day-to-day basis.

For 2035 Alternative 2, all unsignalized intersections in the study area operate at an overall LOS D or better during the morning and evening peak hours, except for the westbound approach at the intersection of Dorchester Avenue and West 2nd Street; this approach operates at an LOS F during the morning and evening peak hours. The majority of signalized intersections operate at an overall LOS E or worse during the morning and evening peak hours:

- **Congress Street at Dorchester Avenue (PM peak hour)** – This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS E during the evening peak hour. With the reopening of Dorchester Avenue, the northbound approach would experience higher volumes, with inadequate green time allocated to this approach under current signal timing.
- **Atlantic Avenue at Seaport Boulevard (AM and PM peak hours) –** This intersection would operate at an overall LOS F during both the morning and evening peak hours. Congested conditions on I-93 during the peak hours result in delays on the I-93 on-ramp which impact the intersection operations. On the Seaport Boulevard westbound approach, unclear traffic regulations result in vehicles making illegal turns and/or cutting off other vehicles when they realize the error. Pedestrians have an exclusive pedestrian phase, but typically chose to cross concurrently with Atlantic Avenue traffic which increases traffic delays.

- **Atlantic Avenue at Congress Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS E during the evening peak hour. Evening delays are due to high volumes heading northbound on Atlantic Avenue, and westbound on Congress Street turning right onto Atlantic Avenue.
- **Purchase Street at Congress Street (PM peak hour) –** This intersection would operate at an overall LOS C during the morning peak hour and an overall LOS F during the evening peak hour. Observed conditions in the evening are often worse than the model reports when the I-93/I-90 ramps back into the intersection and create congestion. On the eastbound Congress Street approach drivers use the two right lanes to merge onto the I-90/I-93 ramp despite traffic regulations. This back-up results in added delays to the Purchase Street and Congress Street corridors.
- **Atlantic Avenue at Summer Street (AM peak hour) –** This intersection would operate at an overall LOS F during the morning peak hour and an overall LOS D during the evening peak hour. During the peak hours Atlantic Avenue is heavily used by commuters from I-90 Eastbound and I-93 Northbound. In addition, the westbound Summer Street approach would carry higher traffic demands from the east. Atlantic Avenue provides for three lanes of travel, but during peak hours the curbside activity often reduces the capacity of Atlantic Avenue. Taxis and passenger car drop-offs and pick-ups on Atlantic Avenue negatively affect traffic operations when double or triple parked. During the peak hours, commuters that take public transit into South Station disperse in groups causing conflicts when they cross the street and force traffic to yield. Atlantic Avenue provides two left turn lanes, but is hindered by concurrent pedestrian operations and over 3,750 pedestrians traversing the intersection during the peak hours.
- **Purchase Street at Summer Street (AM peak hour) –** This intersection would operate at an overall LOS E during the morning peak hour and LOS B during the evening peak hour. Increased traffic from the South Station developments cause increases to Summer Street westbound left movement increasing approach delays and subsequently overall intersection delays.
- **Surface Road at Essex Street and Lincoln Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Heavy evening traffic heading eastbound from Essex Street onto I-93 Northbound experience high delays due to the amount of green time allocated to the movement.
- **Atlantic Avenue at Kneeland Street (AM and PM peak hours) –** This intersection would operate at an overall LOS F during the morning peak hour and LOS E during the evening peak hour. There are heavy volumes exiting the I-93 Northbound Frontage Road and I-90 Eastbound contributing to congestion and delay at this intersection. High volumes on Kneeland Street turning left onto Atlantic Avenue also contribute to congestion and delays.
- **Surface Road at Kneeland Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour when traffic getting on I-93/I-90 are highest.
- **South Station Bus Ramps at I-90/I93 HOV Lanes and I-93 Off-Ramps (PM peak hour)** – This intersection operates at an overall LOS B in the morning peak period and an overall LOS E during the evening peak hour. With high westbound volumes, particularly turning left, this approach would experience higher delays.
- **Dorchester Avenue at West Broadway (AM and PM peak hours) –** This intersection would operate at an overall LOS F in both the morning and evening peak hours. Dorchester Avenue is allotted the majority of the cycle length which causes delays on West Broadway and Traveler Street. The West Broadway and Traveler Street left-turns are not protected and must yield to on-

coming traffic which causes few left turns to process during each cycle. The exclusive pedestrian phase, activated on a button push, is regularly called during the peak hours adding to the overall intersection delay for vehicles. With the reopening of Dorchester Avenue and new development within South Station, an increase in traffic through the Dorchester Avenue corridor would result in higher delays on the north and southbound approaches.

- **Dorchester Avenue at West 4th Street (AM and PM peak hours) –** This intersection would operate at an overall LOS E/F in the morning and evening peak hours. Dorchester Avenue is allocated the majority of the cycle length which would result in higher delays on West 4th Street. Both West 4th Street approaches provide a shared left-turn/through lane without any allotted time for protected lefts which causes additional backups on West 4th Street. With the reopening of Dorchester Avenue and new development within South Station, an increase in traffic through the Dorchester Avenue corridor would result in higher delays on the north and southbound approaches
- **Purchase Street at I-93 Off-Ramp and Seaport Boulevard (AM and PM peak hours) –** This intersection would operate at an overall LOS E during the morning peak hour and an overall LOS F during the evening peak hour. Heavy southbound traffic from Purchase Street and the I-93 Off-Ramp amount to long queues and high delays. An excessive amount of green time is allocated to the Seaport Boulevard westbound movements adding to the delays experienced by southbound traffic.
- **Congress Street at A Street / Thompson Place (AM and PM peak hours) –** This intersection would operate at an overall LOS E during both morning and evening peak hours. During the morning peak hour, heavy westbound traffic turning left onto A Street causes high delays resulting in an overall LOS E. During the evening peak hour, traffic turning left from A Street onto Congress Street experience high delays due to a short green time where only a few cars can pass through the intersection.

6.4.5. Layover Facility Intersection Capacity Analysis – 2025 Alternative 2

The intersection capacity analyses for the layover facility sites intersections for 2025 Alternative 2 are identical to 2025 Alternative 1 as summarized in Section 6.3.5 and Tables 49 through 54.

For all three proposed layover sites, all turning movements to and from the layover facility site driveways operate at acceptable levels (LOS D or better) during the three peak periods analyzed – morning peak, midday, and evening peak. Intersection traffic operations would not be degraded as a result of the layover facility operation at any of the three potential layover facility sites. This is primarily due to the very low passenger vehicle and service vehicle traffic demands projected to occur to and from the layover yard.

LOS E/F conditions at the intersection of Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square at the Readville-Yard 2 layover facility do not occur within lane groups that provide access to or egress from the layover yard.

6.4.6. Layover Facility Intersection Capacity Analysis – 2035 Alternative 2

The intersection capacity analyses for the layover facilities intersections for 2035 Alternative 2 are identical to 2035 Alternative 1 as summarized in Section 6.3.6 and Tables 55 through 60.

For all three proposed layover sites, all turning movements to and from the layover facility site driveways would operate at acceptable levels (LOS D or better) during the three peak periods analyzed – morning peak, midday, and evening peak. Intersection traffic operations would not be degraded as a result of the

layover facility operation at any of the three potential layover facility sites. This is primarily due to the very low passenger vehicle and service vehicle traffic demands projected to occur to and from the layover yard.

LOS E/F conditions at the intersection of Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square at the Readville-Yard 2 layover facility do not occur within lane groups that provide access to or egress from the layover yard.

6.5. Alternative 3 – Joint/ Private Development Maximum Build

Alternative 3 would include all of the same project elements as those proposed in Alternative 1, as well as provisions for future private development by incorporating appropriate structural foundations into the overall station and track design.

In Alternative 3, the maximum potential for future private development at the South Station complex would be limited by the Federal Aviation Administration's (FAA's) maximum building height limits, pursuant to the Terminal Instrument Procedures (TERPS) regulations applicable to Boston Logan International Airport. Accordingly, building heights would be limited to approximately 290 feet. Alternative 3 would require an amendment to the Municipal Harbor Plan, modifying applicable Chapter 91 regulations. No development would likely occur over the secondary headhouse and portions of track interlocking.

In Alternative 3, the potential for future private development at the South Station site could include approximately 2 million square feet of mixed-use development along Dorchester Avenue, consisting of residential, office, and commercial uses, including retail and hotel uses, with building heights up to approximately 21 stories. Development could include approximately 506 parking spaces. Alternative 3 would include an extension of the South Station Connector which would link to the back of the joint/private development.

Figure 37 presents the Alternative 3 concept plan. The Dorchester Avenue typical cross-section for Alternative 1 (refer to Figure 31) also applies to Alternative 3. The conceptual site plans for the three layover facility sites for Alternative 3 are identical to Alternatives 1 and 2 (refer to Figures 33 through 35).

6.5.1. Alternative 3 – South Station Assumptions

Table 67 summarizes the transit ridership increases at South Station that would occur in the 2025 Opening Year and 2035 Build Year scenarios for Alternative 3, compared to Existing Conditions, the No Build Alternative, Alternative 1, and Alternative 2.

Table 67—South Station Weekday Daily Combined Boardings and Alightings – Alternative 3

	Amtrak	Commuter Rail	Amtrak and Commuter Rail Total [a]	Red Line	Silver Line	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
2025 No Build Alternative	5,200	53,000	58,000	68,000	22,800	3,600	12,700	165,000
2035 No Build Alternative	5,500	56,000	61,000	72,000	25,600	3,800	12,800	175,000
2025 Alternative 3 - Joint/ Private Development Maximum Build	8,100	67,000	75,000	72,000	23,600	3,800	13,100	187,000
2035 Alternative 3 - Joint/ Private Development Maximum Build	9,300	74,000	83,000	77,000	26,700	4,000	13,300	203,000

Source: *Final SSX Ridership Results* provided in Appendix 9 - *Ridership Forecasting Technical Report*.
Note: All results rounded to the nearest 100, except for Commuter Rail, Red Line and Total results, which are rounded to the nearest 1,000
a Total values are calculated using precise/unrounded results. As such, the sum of rounded individual ridership results may not add up to the rounded Total ridership results presented in this table.

In the 2025 Opening Year, Alternative 3 would increase daily Amtrak and commuter rail boardings and alightings at South Station by approximately 29% compared to the No Build Alternative. In the 2035 Build Year, Alternative 3 would increase daily Amtrak and commuter rail boardings and alightings at South Station by approximately 36% compared to the No Build Alternative.

Consistent with BTD guidelines, trips were estimated using the ITE Trip Generation Manual. The ITE manual yields 'unadjusted' vehicle trips, meaning that these trips do not reflect alternative modes of transportation such as walking, bicycling, and transit. The following ITE LUC were used:

- LUC 220 (Apartments) – was used to estimate residential trips.
- LUC 820 (Shopping Center) – was used to estimate retail trips.
- LUC 710 (Office) – was used to estimate trips associated with the office space being proposed.
- LUC 310 (Hotel) – was used to estimate trips associated with the hotel space being proposed.

The raw ITE trip generation rates were adjusted to account for mode split, vehicle occupancy (VOR), and internal capture resulting from the co-location of complimentary uses such as office and residential in a transit-oriented environment.

Table 68 summarizes the resulting vehicle trips that would be generated in Alternative 3 by the joint/private development.

Table 68—Alternative 3 – Net New Vehicular Trip Generation Estimate

	Entering Trips	Exiting Trips	Total Trips
Weekday AM Peak Hour	595	190	785
Weekday PM Peak Hour	270	575	845
Weekday Daily	3,260	3,260	6,520

As summarized in Table 68, Alternative 3 would generate 785 net-new vehicle trips during the weekday morning peak hour and 845 net-new vehicle trips in the evening peak hour. This amounts to approximately one new vehicle trip per minute. Over the entire weekday, Alternative 2 would generate 6,520 vehicle trips.

6.5.2. Alternative 3 ï Layover Facility Assumptions

Trip generation for the layover sites was estimated by reviewing the layover facility site programming, parking, and the vehicle service activities for each layover facility site. The layover facility assumptions and trip generation methodology for Alternative 3 is the same as Alternatives 1 and 2.

6.5.3. South Station Intersection Capacity Analysis – 2025 Alternative 3

Tables 69 and 70 summarize the intersection capacity analyses for the South Station intersections for 2025 Alternative 3. Detailed traffic networks are available upon request from MassDOT.

Table 69—Signalized Intersection Capacity Analysis – 2025 Alternative 3

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.75	39.2	D	m326	>1.0	>80.0	F	#716
	Congress Street – EB Thru/Right	0.58	24.7	C	m132	0.48	18.1	B	m286
	Congress Street – WB Left	>1.0	>80.0	F	m#220	0.48	18.0	B	m41
	Congress Street – WB Thru	0.33	32.6	C	m162	0.22	9.9	A	m66
	Overall Intersection	>1.0	44.8	D	-	0.78	>80.0	F	-
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.77	8.9	A	m136	0.66	8.6	A	m77
	Summer Street – WB Left/Thru/Right	0.37	10.0	B	123	0.42	15.1	B	151
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#196	0.85	58.0	E	#161
	Dorchester Avenue – NB Thru/Right	0.55	32.5	C	181	0.57	23.8	C	220
	Dorchester Avenue – SB Left	>1.0	>80.0	F	m#254	>1.0	>80.0	F	#277
	Dorchester Avenue – SB Thru/Right	0.95	64.1	E	m#434	0.69	18.1	B	338
	Overall Intersection	>1.0	49.1	D	-	0.92	34.5	C	-
3. Atlantic Avenue at Seaport Boulevard	Seaport Boulevard – EB Left/Thru	>1.0	>80.0	F	m#512	0.98	35.1	D	m#437
	Seaport Boulevard – WB Thru/Right	>1.0	>80.0	F	#556	>1.0	>80.0	F	#841
	Seaport Boulevard – WB Bear Right/ Right	>1.0	>80.0	F	#352	>1.0	>80.0	F	#475
	Seaport Boulevard – WB Right	>1.0	>80.0	F	#376	>1.0	>80.0	F	#489
	Atlantic Avenue – NB Left/Bear Left	>1.0	>80.0	F	m#585	>1.0	>80.0	F	m#623
	Atlantic Avenue – NB Bear Left/Thru/Right	>1.0	>80.0	F	m#602	>1.0	>80.0	F	m#930
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
4. Atlantic Avenue at Congress Street	Atlantic Avenue – NB Thru/Right	0.94	24.4	C	m97	>1.0	79.5	E	m#315
	Congress Street – EB Left	0.83	41.5	D	m171	0.65	42.0	D	m190
	Congress Street – EB Thru	0.42	6.9	A	m90	0.44	10.5	B	308
	Congress Street – WB Right	>1.0	>80.0	F	#363	>1.0	>80.0	F	m#279
	Overall Intersection	0.97	37.1	D	-	>1.0	>80.0	F	-
5. Purchase Street at Congress Street	Congress Street – EB Thru	0.47	24.9	C	176	0.82	36.6	D	339
	Congress Street – EB Bear Right	0.51	28.1	C	199	>1.0	>80.0	F	#817
	Congress Street – EB Right	0.12	21.2	C	41	0.24	24.9	C	73
	Purchase Street – SB Left	0.89	42.7	D	m#53	0.56	7.4	A	m0
	Purchase Street – SB Bear Left/Thru	0.94	38.6	D	m437	>1.0	74.7	E	m398
	Overall Intersection	0.74	35.3	D	-	>1.0	77.4	E	-
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.86	36.3	D	#183	0.91	45.2	D	#180
	Summer Street – WB Thru	>1.0	>80.0	F	m#374	0.87	43.8	D	m#206
	Summer Street – WB Right	0.59	30.2	C	m44	0.49	21.2	C	m40
	Atlantic Avenue – NB Left	>1.0	>80.0	F	m#357	0.56	21.2	C	m98
	Atlantic Avenue – NB Left/Thru	>1.0	>80.0	F	m#550	0.98	43.6	D	m#406
	Atlantic Avenue – NB Right	0.74	41.9	D	m#467	0.39	29.3	C	m51
	Overall Intersection	>1.0	>80.0	F	-	0.95	38.4	D	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.73	2.7	A	m28	0.65	2.5	A	m31
	Summer Street – EB Thru	0.45	43.7	D	104	0.51	40.5	D	164
	Summer Street – EB Right	0.05	35.3	D	30	0.40	38.2	D	119
	Summer Street – WB Left	>1.0	>80.0	F	m97	0.78	50.1	D	m171
	Summer Street – WB Left/Thru	>1.0	>80.0	F	m107	0.79	43.8	D	m178
	Overall Intersection	0.78	52.8	D	-	0.65	18.3	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 69 (Continued)—Signalized Intersection Capacity Analysis, 2025 Alternative 3

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
8. Atlantic Avenue at Essex Street	Essex Street – EB Left	0.79	44.1	D	220	0.53	30.0	C	161
	Atlantic Avenue – NB Left/Thru	0.84	18.4	B	280	0.84	24.4	C	278
	Overall Intersection	0.83	25.3	C	-	0.71	26.2	C	-
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left/Thru	0.72	37.2	D	236	>1.0	>80.0	F	#662
	Essex Street – EB Bear Right/Right	0.57	37.0	D	195	>1.0	>80.0	F	#753
	Lincoln Street – NB Thru/Bear Right/Right	0.82	38.0	D	282	>1.0	>80.0	F	#598
	Surface Road – SB Left/Thru/Right	>1.0	48.0	D	m#364	0.89	34.5	C	#369
	Overall Intersection	0.86	41.8	D	-	>1.0	>80.0	F	-
11. Atlantic Avenue at Beach Street	Atlantic Avenue – NB Left/Thru	0.70	2.0	A	m16	0.41	4.9	A	m72
	Overall Intersection	0.70	2.0	A	-	0.41	4.9	A	-
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.94	62.7	E	m#321	0.82	40.6	D	m214
	Kneeland Street – EB Left/Thru	0.85	47.0	D	m#300	0.74	33.9	C	m205
	MBTA Access Drive – WB Thru/Right	0.01	37.7	D	0	0.04	37.9	D	5
	Frontage Road – NB Left	1.00	69.4	E	#603	>1.0	>80.0	F	#483
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#1092	0.64	34.4	C	#243
	I-90 Off-Ramp– NB Left	0.39	14.3	B	168	0.60	18.0	B	270
	I-90 Off-Ramp – NB Left/Thru	0.88	79.5	E	#245	0.95	73.0	E	#348
	Overall Intersection	>1.0	>80.0	F	-	0.84	59.8	E	-
13. Kneeland Street at Lincoln Street	Kneeland Street – EB Left/Thru/Right	0.60	12.6	B	m30	0.66	48.2	D	m254
	Kneeland Street – WB Left/Thru/Right	0.88	56.9	E	m223	0.83	56.2	E	m189
	Lincoln Street – NB Left	0.93	50.7	D	m#559	0.78	34.3	C	m#343
	Lincoln Street – NB Left/Thru/Right	0.94	41.6	D	#500	0.79	28.9	C	m#310
	Overall Intersection	0.87	42.6	D	-	0.77	43.8	D	-
14. Surface Road at Kneeland Street	Kneeland Street – EB Thru	0.44	29.1	C	150	0.59	31.9	C	204
	Kneeland Street – EB Right	0.14	25.6	C	47	0.27	27.7	C	69
	Kneeland Street – WB Left	0.17	8.7	A	m36	0.26	4.2	A	m19
	Kneeland Street – WB Thru	0.36	9.3	A	m188	0.26	1.6	A	m23
	Surface Road – SB Left/Thru/Right	>1.0	>80.0	F	m#274	>1.0	>80.0	F	m#542
	Overall Intersection	0.57	47.8	D	-	0.75	>80.0	F	-
15. Lincoln Street at South Station Connector	South Station Connector – EB Left/Thru/Right	0.80	65.9	E	158	0.30	50.9	D	67
	South Station Connector – WB Left/Thru/Right	0.57	45.8	D	92	>1.0	>80.0	F	#511
	Surface Ramp – NB Left/Thru/Right	0.59	6.0	A	193	0.40	8.4	A	127
	Lincoln Street – SB Left/Thru/Right	0.09	5.3	A	m11	0.16	13.5	B	m61
	Overall Intersection	0.63	21.4	C	-	0.75	>80.0	F	-
16. Surface Road at South Station Connector	South Station Connector – WB Left	0.54	34.6	C	63	1.00	64.0	E	m118
	Surface Ramp– SB Left/Thru	0.28	1.5	A	m11	0.49	13.3	B	m146
	Overall Intersection	0.31	7.8	A	-	0.59	27.2	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 69 (Continued)—Signalized Intersection Capacity Analysis, 2025 Alternative 3

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#654	>1.0	>80.0	F	m#324
	Dorchester Avenue – NB Thru/Right	0.38	14.1	B	m128	0.27	15.3	B	m106
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	#591	>1.0	>80.0	F	#917
	Dorchester Avenue – SB Right	0.15	29.4	C	41	0.55	34.9	C	119
	Traveler Street – EB Left	>1.0	>80.0	F	#239	0.40	28.2	C	#132
	Traveler Street – EB Thru	0.64	27.6	C	#377	0.81	38.8	D	#479
	Traveler Street – EB Right	0.17	20.2	C	45	0.41	19.9	B	61
	West Broadway – WB Left	0.36	24.2	C	#93	0.66	47.8	D	#130
	West Broadway – WB Thru/Right	0.95	55.4	E	#457	0.69	33.3	C	#273
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	>1.0	>80.0	F	#323	0.79	48.1	D	#207
	West 4th Street – EB Right	0.06	24.2	C	25	0.14	24.5	C	35
	West 4th Street – WB Left/Thru/Right	0.90	53.9	D	#361	0.98	68.2	E	#425
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#661	>1.0	>80.0	F	#264
	Dorchester Avenue – NB Thru	0.49	8.8	A	167	0.33	7.7	A	102
	Dorchester Avenue – NB Right	0.00	5.3	A	2	0.00	5.7	A	2
	Dorchester Avenue – SB Left/Thru	0.52	24.0	C	m66	>1.0	>80.0	F	m203
	Dorchester Avenue – SB Right	0.27	33.5	C	m34	0.40	30.2	C	m72
	Overall Intersection	>1.0	64.6	E	-	>1.0	76.2	E	-
20. Purchase Street at I-93 Off-Ramp / Seaport Boulevard	I-93 Off-Ramp – SB Left	0.99	36.9	D	#1062	0.78	21.4	C	504
	I-93 Off-Ramp – SB Thru/Right	>1.0	>80.0	F	#677	0.67	34.8	C	265
	Seaport Boulevard – WB Left	>1.0	69.0	E	m141	0.36	27.4	C	m54
	Seaport Boulevard – WB Left/Thru	>1.9	>80.0	F	m164	0.37	27.4	C	m58
	Purchase Street – SB Thru/Right	0.78	33.0	C	291	>1.0	>80.0	F	#605
	Overall Intersection	>1.0	56.0	E	-	0.80	>80.0	F	-
21. Congress Street at A Street / Thompson Place	Congress Street – EB Left/Thru	0.91	51.0	D	#214	>1.0	>80.0	F	m#324
	Congress Street – EB Right	0.08	15.2	B	m19	0.12	17.8	B	m26
	Congress Street – WB Left	>1.0	>80.0	F	#718	0.74	32.6	C	353
	Congress Street – WB Thru/Right	0.43	8.3	A	182	0.35	6.9	A	139
	A Street – NB Left/Thru	0.93	>80.0	F	#212	>1.0	>80.0	F	#525
	A Street – NB Right	0.10	14.2	B	26	0.31	16.7	B	50
	Thompson Place – SB Left/Thru/Right	0.34	43.6	D	65	0.51	48.1	D	106
	Overall Intersection	0.94	66.8	E	-	0.89	57.6	E	-
22. SS Bus Ramps / South Station Connector Extension	South Station Connector Extension – WB Left/Right	0.38	14.5	B	50	0.68	15.6	B	109
	SS Bus Ramps – NB Thru/Right	0.34	4.7	A	37	0.12	5.8	A	20
	SS Bus Ramps – SB Left/Thru	0.09	3.6	A	14	0.43	7.7	A	79
	Overall Intersection	0.35	5.9	A	-	0.53	9.7	A	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 70—Unsignalized Intersection Capacity Analysis, 2025 Alternative 3

Unsignalized Intersection	Lane Group	Morning Peak Hour V/C[a]	Morning Peak Hour Delay[b]	Morning Peak Hour LOS[c]	Evening Peak Hour V/C[a]	Evening Peak Hour Delay[b]	Evening Peak Hour LOS[c]
10. Atlantic Avenue at East Street	East Street - EB	0.15	17.5	C	0.11	14.2	B
17. Dorchester Avenue at West 2nd Street	West 2nd Street – WB	>1.0	>80.0	F	>1.0	>50.0	F
	Dorchester Avenue - NB	0.36	0.0	A	0.27	0.0	A
	Dorchester Avenue - SB	0.08	2.3	A	0.05	1.4	A
23. South Station Connector Extension / Loop Road	South Station Connector Extension – EB	0.21	0.0	A	0.09	0.0	A
	South Station Connector Extension – WB	0.01	0.0	A	0.08	0.0	A
	Loop Road - SB	0.09	8.8	A	0.22	10.0	B
24. South Station Connector Extension / Loop Road	South Station Connector Extension – EB	0.12	7.5	A	0.08	7.4	A
	Connector Road – NB	0.00	0.0	A	0.00	0.0	A
26. JD 1+2 / Dorchester Ave	JD 1+2 – EB	0.14	12.7	B	0.20	15.5	C
	Dorchester Ave – NB	0.01	0.3	A	0.02	0.7	A
	Dorchester Ave – SB	0.23	0.0	A	0.34	0.0	A
27. JD 3 / Connector Road	JD 3 – WB	0.06	9.5	A	0.02	8.9	A
	Connector Road – NB	0.11	0.0	A	0.07	0.0	A
28. JD 4 / Connector Road	JD 4 – WB	0.04	10.8	B	0.22	11.1	B
	Connector Road – NB	0.04	2.5	A	0.03	3.0	A
29. JD 5 / Dorchester Ave	JD 5 – EB	0.08	14.2	B	0.61	28.9	D
	Dorchester Ave – NB	0.03	1.1	A	0.01	0.5	A
	Dorchester Ave – SB	0.35	0.0	A	0.33	0.0	A
30. South Station Bus Access / JD 6	South Station Bus Access – EB	0.21	0.0	A	0.09	0.0	A
	South Station Bus Access – WB	0.00	0.0	A	0.00	0.0	A
	JD 6 – NB	0.03	10.2	B	0.15	10.0	A

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service

The study area experiences higher levels of vehicle, pedestrian, and bicycle activity during the morning and evening peak hours coinciding with commuter traffic. Varying factors such as curbside loading and stopping, construction activity, vehicles blocking intersections and jaywalking degrade traffic operations on a day-to-day basis.

For 2025 Alternative 3, all unsignalized intersections in the study area would operate at an overall LOS D or better during the morning and evening peak hours, except for the westbound approach at the intersection of Dorchester Avenue and West 2nd Street; this approach would operate at LOS F during the morning and evening peak hours. The majority of signalized intersections would operate at an overall LOS E or worse during the morning and evening peak hours:

- **Congress Street at Dorchester Avenue (PM peak hour)** – This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. With the reopening of Dorchester Avenue, the northbound approach would experience high volumes, with inadequate green time allocated to this approach under current signal timing.
- **Atlantic Avenue at Seaport Boulevard (AM and PM peak hours) –** This intersection would operate at an overall LOS F during both the morning and evening peak hours. Congested conditions on I-93 during the peak hours result in delays on the I-93 on-ramp which impact the intersection operations. On the Seaport Boulevard westbound approach, unclear traffic regulations result in vehicles making illegal turns and/or cutting off other vehicles when they

realize the error. Pedestrians have an exclusive pedestrian phase, but typically chose to cross concurrently with Atlantic Avenue traffic which increases traffic delays.

- **Atlantic Avenue at Congress Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Evening delays are due to high northbound volumes on Atlantic Avenue and high volumes heading westbound on Congress Street turning right onto Atlantic Avenue.
- **Purchase Street at Congress Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS E during the evening peak hour. Observed conditions in the evening are often worse than the model reports when the I-93/I-90 ramps back into the intersection and create congestion. On the eastbound Congress Street approach drivers use the two right lanes to merge onto the I-90/I-93 ramp despite traffic regulations. This back-up results in added delays to the Purchase Street and Congress Street corridors.
- **Atlantic Avenue at Summer Street (AM peak hour) –** This intersection would operate at an overall LOS F during the morning peak hour and an overall LOS D during the evening peak hour. During the peak hours Atlantic Avenue is heavily used by commuters from I-90 Eastbound and I-93 Northbound. In addition, the westbound Summer Street approach would experience a heavy traffic demand from the east. Atlantic Avenue provides for three lanes of travel, but during peak hours the curbside activity often reduces the capacity of Atlantic Avenue. Taxis and passenger car drop-offs and pickups on Atlantic Avenue negatively affect traffic operations when double or triple parked. During the peak hours, commuters that take public transit into South Station disperse in groups causing conflicts when they cross the street and force traffic to yield. Atlantic Avenue provides two left turn lanes, but is hindered by concurrent pedestrian operations and over 3,750 pedestrians traversing the intersection during the peak hours.
- **Surface Road at Essex Street and Lincoln Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Heavy evening traffic heading eastbound from Essex Street onto I-93 Northbound experience high delays due to the amount of green time allocated to the movement.
- **Atlantic Avenue at Kneeland Street (AM and PM peak hours) –** This intersection would operate at an overall LOS F during the morning peak hour and LOS E during the evening peak hour. There are heavy volumes exiting the I-93 Northbound Frontage Road and I-90 Eastbound contributing to congestion and delay at this intersection. High volumes on Kneeland Street turning left onto Atlantic Avenue also contribute to congestion and delays.
- **Surface Road at Kneeland Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour when traffic getting on I-93/I-90 are highest.
- **South Station Bus Ramps at I-90/I93 HOV Lanes and I-93 Off-Ramps (PM peak hour)** – This intersection would operate at an overall LOS C in the morning peak period and an overall LOS F during the evening peak hour. With high westbound volumes, particularly turning left, this approach would experience high delays.
- **Dorchester Avenue at West Broadway (AM and PM peak hours) –** This intersection would operate at an overall LOS F in both the morning and evening peak hours. Dorchester Avenue is allotted the majority of the cycle length which causes delays on West Broadway and Traveler Street. The West Broadway and Traveler Street left-turns are not protected and must yield to on-coming traffic which causes few left turns to process during each cycle. The exclusive pedestrian phase, activated on a button push, is regularly called during the peak hours adding to the overall

intersection delay for vehicles. With the reopening of Dorchester Avenue and new development within South Station, an increase in traffic through the Dorchester Avenue corridor would result in higher delays on the north and southbound approaches.

- **Dorchester Avenue at West 4th Street (AM and PM peak hours) –** This intersection would operate at an overall LOS E in both the morning and evening peak hours. Dorchester Avenue is allocated the majority of the cycle length which causes higher delays on West 4th Street. Both West 4th Street approaches provide a shared left-turn/through lane without any allotted time for protected lefts which causes additional backups on West 4th Street. With the reopening of Dorchester Avenue and new development within South Station, an increase in traffic through the Dorchester Avenue corridor would result in higher delays on the north and southbound approaches.
- **Purchase Street at I-93 Off-Ramp and Seaport Boulevard (AM and PM peak hours) –** This intersection would operate at an overall LOS E during the morning peak hour and an overall LOS F during the evening peak hour. Heavy southbound traffic from Purchase Street and the I-93 Off-Ramp amount to long queues and high delays. An excessive amount of green time is allocated to the Seaport Boulevard westbound movements adding to the delays experienced by southbound traffic.
- **Congress Street at A Street / Thompson Place (AM and PM peak hours) –** This intersection would operate at an overall LOS E during both morning and evening peak hours. During the morning peak hour, heavy westbound traffic turning left onto A Street causes high delays resulting in an overall LOS E. During the evening peak hour, traffic turning left from A Street onto Congress Street experience high delays due to a short green time where only a few cars can pass through the intersection.

6.5.4. South Station Intersection Capacity Analysis – 2035 Alternative 3

Tables 71 and 72 summarize the intersection capacity analyses for the South Station intersections for 2035 Alternative 3. Detailed traffic networks are available upon request from MassDOT.

Table 71—Signalized Intersection Capacity Analysis, 2035 Alternative 3

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.78	40.4	D	m#339	>1.0	>80.0	F	m#731
	Congress Street – EB Thru/Right	0.62	24.8	C	m134	0.51	17.2	B	m301
	Congress Street – WB Left	>1.0	>80.0	F	m#240	0.56	22.8	C	m46
	Congress Street – WB Thru	0.35	32.6	C	m167	0.24	9.8	A	m69
	Overall Intersection	>1.0	52.6	D	-	0.84	>80.0	F	-
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.81	9.3	A	m148	0.70	9.5	A	m107
	Summer Street – WB Left/Thru/Right	0.39	10.2	B	134	0.45	15.5	B	166
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#202	0.94	>80.0	F	#179
	Dorchester Avenue – NB Thru/Right	0.57	32.9	C	186	0.58	24.1	C	227
	Dorchester Avenue – SB Left	>1.0	>80.0	F	m#273	>1.0	>80.0	F	#310
	Dorchester Avenue – SB Thru/Right	0.97	65.7	E	m#428	0.71	18.0	B	317
	Overall Intersection	>1.0	52.6	D	-	1.00	42.4	D	-
3. Atlantic Avenue at Seaport Boulevard	Seaport Boulevard – EB Left/Thru	>1.0	>80.0	F	m#514	>1.0	45.7	D	m#456
	Seaport Boulevard – WB Thru/Right	>1.0	>80.0	F	#583	>1.0	>80.0	F	#879
	Seaport Boulevard – WB Bear Right/ Right	>1.0	>80.0	F	#371	>1.0	>80.0	F	#497
	Seaport Boulevard – WB Right	>1.0	>80.0	F	#397	>1.0	>80.0	F	#513
	Atlantic Avenue – NB Left/Bear Left	>1.0	>80.0	F	m#585	>1.0	>80.0	F	m#637
	Atlantic Avenue – NB Bear Left/Thru/Right	>1.0	>80.0	F	m#609	>1.0	>80.0	F	m#950
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
4. Atlantic Avenue at Congress Street	Atlantic Avenue – NB Thru/Right	0.99	28.8	C	m97	>1.0	>80.0	F	m#315
	Congress Street – EB Left	0.86	43.0	D	m173	0.68	42.7	D	m194
	Congress Street – EB Thru	0.44	6.8	A	m91	0.46	10.9	B	m323
	Congress Street – WB Right	>1.0	>80.0	F	#382	>1.0	>80.0	F	m#294
	Overall Intersection	>1.0	42.2	D	-	>1.0	>80.0	F	-
5. Purchase Street at Congress Street	Congress Street – EB Thru	0.49	25.3	C	184	0.86	39.1	D	#386
	Congress Street – EB Bear Right	0.53	28.8	C	211	>1.0	>80.0	F	#867
	Congress Street – EB Right	0.12	21.3	C	41	0.27	25.4	C	83
	Purchase Street – SB Left	0.96	48.0	D	m#79	0.60	8.4	A	m0
	Purchase Street – SB Bear Left/Thru	0.99	43.3	D	m#468	>1.0	>80.0	F	m405
	Overall Intersection	0.77	38.7	D	-	>1.0	>80.0	F	-
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.91	41.9	D	#215	0.95	51.3	D	#208
	Summer Street – WB Thru	>1.0	>80.0	F	m#386	0.92	48.2	D	m#224
	Summer Street – WB Right	0.63	31.2	C	m47	0.56	25.3	C	m#55
	Atlantic Avenue – NB Left	>1.0	>80.0	F	m#359	0.55	22.2	C	m91
	Atlantic Avenue – NB Left/Thru	>1.0	>80.0	F	m#564	>1.0	58.1	E	m#414
	Atlantic Avenue – NB Right	0.82	43.4	D	m#463	0.40	32.1	C	m51
	Overall Intersection	>1.0	>80.0	F	-	0.99	45.8	D	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.76	2.9	A	m28	0.68	2.6	A	m32
	Summer Street – EB Thru	0.47	44.1	D	106	0.53	41.1	D	169
	Summer Street – EB Right	0.05	35.3	D	30	0.43	39.1	D	129
	Summer Street – WB Left	>1.0	>80.0	F	m97	0.82	51.5	D	m173
	Summer Street – WB Left/Thru	>1.0	>80.0	F	m106	0.83	44.7	D	m181
	Overall Intersection	0.81	61.9	E	-	0.68	18.8	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 71 (Continued)—Signalized Intersection Capacity Analysis, 2035 Alternative 3

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
8. Atlantic Avenue at Essex Street	Essex Street – EB Left	0.83	46.7	D	#239	0.56	30.5	C	169
	Atlantic Avenue – NB Left/Thru	0.88	20.3	C	297	0.87	27.1	C	#306
	Overall Intersection	0.86	27.3	C	-	0.74	28.2	C	-
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left/Thru	0.75	38.7	D	251	>1.0	>80.0	F	#696
	Essex Street – EB Bear Right/Right	0.60	38.0	D	206	>1.0	>80.0	F	#792
	Lincoln Street – NB Thru//Bear Right/Right	0.86	40.2	D	#302	>1.0	>80.0	F	#625
	Surface Road – SB Left/Thru/Right	>1.0	60.0	E	m#382	0.93	38.2	D	#428
	Overall Intersection	0.89	47.7	D	-	>1.0	>80.0	F	-
11. Atlantic Avenue at Beach Street	Atlantic Avenue – NB Left/Thru	0.73	2.1	A	m16	0.43	5.0	A	m75
	Overall Intersection	0.73	2.1	A	-	0.43	5.0	A	-
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.94	59.7	E	m#329	0.84	42.2	D	m222
	Kneeland Street – EB Left/Thru	0.85	45.0	D	m#307	0.75	34.8	C	m213
	MBTA Access Drive – WB Thru/Right	0.01	37.7	D	0	0.04	37.9	D	5
	Frontage Road – NB Left	>1.0	>80.0	F	#639	>1.0	>80.0	F	#506
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#1152	0.68	36.2	D	#261
	I-90 Off-Ramp– NB Left	0.41	15.1	B	176	0.63	19.1	B	288
	I-90 Off-Ramp – NB Left/Thru	0.92	>80.0	F	#258	1.00	>80.0	F	#371
	Overall Intersection	>1.0	>80.0	F	-	0.88	67.7	E	-
13. Kneeland Street at Lincoln Street	Kneeland Street – EB Left/Thru/Right	0.62	12.4	B	m32	0.67	48.7	D	m262
	Kneeland Street – WB Left/Thru/Right	0.89	56.0	E	m224	0.84	56.2	E	m192
	Lincoln Street – NB Left	1.00	65.7	E	m#584	0.85	40.4	D	m#365
	Lincoln Street – NB Left/Thru/Right	>1.0	57.2	E	#527	0.86	33.6	C	m#335
	Overall Intersection	0.91	49.7	D	-	0.81	45.9	D	-
14. Surface Road at Kneeland Street	Kneeland Street – EB Thru	0.46	29.4	C	157	0.62	32.6	C	215
	Kneeland Street – EB Right	0.14	25.6	C	48	0.28	27.9	C	71
	Kneeland Street – WB Left	0.17	8.7	A	m36	0.28	5.1	A	m19
	Kneeland Street – WB Thru	0.38	9.7	A	m190	0.27	1.8	A	m24
	Surface Road – SB Left/Thru/Right	>1.0	>80.0	F	m#274	>1.0	>80.0	F	m#549
	Overall Intersection	0.59	50.7	D	-	0.80	>80.0	F	-
15. Lincoln Street at South Station Connector	South Station Connector – EB Left/Thru/Right	0.81	66.2	E	160	0.31	53.0	D	95
	South Station Connector – WB Left/Thru/Right	0.58	46.4	D	93	>1.0	>80.0	F	#518
	Surface Ramp – NB Left/Thru/Right	0.62	6.3	A	210	0.41	8.6	A	134
	Lincoln Street – SB Left/Thru/Right	0.10	5.4	A	m11	0.17	13.0	B	m60
	Overall Intersection	0.65	21.4	C	-	0.77	>80.0	F	-
16. Surface Road at South Station Connector	South Station Connector – WB Left	0.55	34.7	C	64	>1.0	67.4	E	m118
	Surface Ramp– SB Left/Thru	0.29	1.7	A	m14	0.51	13.9	B	m150
	Overall Intersection	0.32	7.8	A	-	0.61	28.2	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d 95th percentile queue length, expressed in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
m Volume for 95th percentile queue is metered by upstream signal

Table 71 (Continued)—Signalized Intersection Capacity Analysis, 2035 Alternative 3

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#689	>1.0	>80.0	F	m#345
	Dorchester Avenue – NB Thru/Right	0.39	14.1	B	m133	0.28	15.3	B	m108
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	#601	>1.0	>80.0	F	#941
	Dorchester Avenue – SB Right	0.15	29.5	C	41	0.58	36.0	D	129
	Traveler Street – EB Left	>1.0	>80.0	F	#220	0.44	29.9	C	#143
	Traveler Street – EB Thru	0.67	28.4	C	#398	0.84	41.8	D	#505
	Traveler Street – EB Right	0.18	20.2	C	46	0.43	20.1	C	65
	West Broadway – WB Left	0.40	25.7	C	#106	0.78	64.2	E	#137
	West Broadway – WB Thru/Right	1.00	66.7	E	#489	0.72	34.8	C	#290
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	>1.0	>80.0	F	#346	0.86	55.9	E	#226
	West 4th Street – EB Right	0.06	24.2	C	25	0.17	24.9	C	41
	West 4th Street – WB Left/Thru/Right	0.94	61.8	E	#390	>1.0	77.0	E	#447
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#707	>1.0	>80.0	F	#295
	Dorchester Avenue – NB Thru	0.52	9.1	A	178	0.34	7.8	A	106
	Dorchester Avenue – NB Right	0.00	5.3	A	2	0.00	5.7	A	2
	Dorchester Avenue – SB Left/Thru	0.54	24.1	C	m68	>1.0	>80.0	F	m211
	Dorchester Avenue – SB Right	0.30	30.8	C	m39	0.43	28.9	C	m76
	Overall Intersection	>1.0	77.8	E	-	>1.0	>80.0	F	-
20. Purchase Street at I-93 Off-Ramp / Seaport Boulevard	I-93 Off-Ramp – SB Left	>1.0	47.6	D	#1129	0.80	22.8	C	538
	I-93 Off-Ramp – SB Thru/Right	>1.0	>80.0	F	#711	0.70	35.8	D	#278
	Seaport Boulevard – WB Left	>1.0	>80.0	F	m144	0.38	27.7	C	m55
	Seaport Boulevard – WB Left/Thru	>1.0	>80.0	F	m167	0.38	27.7	C	m60
	Purchase Street – SB Thru/Right	0.81	34.4	C	308	>1.0	>80.0	F	#641
	Overall Intersection	>1.0	66.5	E	-	0.84	>80.0	F	-
21. Congress Street at A Street / Thompson Place	Congress Street – EB Left/Thru	0.95	57.1	E	#228	>1.0	>80.0	F	m#341
	Congress Street – EB Right	0.09	14.3	B	m21	0.13	16.8	B	m25
	Congress Street – WB Left	>1.0	>80.0	F	#752	0.77	33.8	C	#377
	Congress Street – WB Thru/Right	0.44	8.5	A	194	0.36	7.0	A	145
	A Street – NB Left/Thru	0.98	>80.0	F	#227	>1.0	>80.0	F	#264
	A Street – NB Right	0.10	14.3	B	26	0.32	16.8	B	50
	Thompson Place – SB Left/Thru/Right	0.35	43.8	D	66	0.53	48.8	D	109
	Overall Intersection	0.98	74.4	E	-	0.92	63.1	E	-
22. SS Bus Ramps / South Station Connector Extension	South Station Connector Extension – WB	0.39	14.5	B	51	0.68	15.7	B	111
	Left/Right	0.34	4.8	A	37	0.12	5.8	A	20
	SS Bus Ramps – NB Thru/Right	0.09	3.6	A	14	0.43	7.8	A	76
	SS Bus Ramps – SB Left/Thru								
	Overall Intersection	0.35	6.0	A	-	0.53	9.9	A	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound.
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 72—Unsignalized Intersection Capacity Analysis, 2035 Alternative 3

Unsignalized Intersection	Lane Group	Morning Peak Hour V/C[a]	Morning Peak Hour Delay[b]	Morning Peak Hour LOS[c]	Evening Peak Hour V/C[a]	Evening Peak Hour Delay[b]	Evening Peak Hour LOS[c]
10. Atlantic Avenue at East Street	East Street - EB	0.16	18.2	C	0.12	14.2	B
17. Dorchester Avenue at West 2nd Street	West 2nd Street – WB	>1.0	>50.0	F	>1.0	>50.0	F
	Dorchester Avenue - NB	0.37	0.0	A	0.27	0.0	A
	Dorchester Avenue - SB	0.09	2.4	A	0.06	1.5	A
23. South Station Connector Extension / Loop Road	South Station Connector Extension – EB	0.21	0.0	A	0.09	0.0	A
	South Station Connector Extension – WB	0.01	0.0	A	0.08	0.0	A
	Loop Road - SB	0.10	8.8	A	0.23	10.1	B
24. South Station Connector Extension / Loop Road	South Station Connector Extension – EB	0.12	7.5	A	0.08	7.4	A
	Connector Road – NB	0.00	0.0	A	0.00	0.0	A
26. JD 1+2 / Dorchester Ave	JD 1+2 – EB	0.14	12.8	B	0.21	15.7	C
	Dorchester Ave – NB	0.01	0.3	A	0.02	0.7	A
	Dorchester Ave – SB	0.23	0.0	A	0.34	0.0	A
27. JD 3 / Connector Road	JD 3 – WB	0.06	9.5	A	0.02	8.9	A
	Connector Road – NB	0.12	0.0	A	0.08	0.0	A
28. JD 4 / Connector Road	JD 4 – WB	0.04	10.9	B	0.22	11.2	B
	Connector Road – NB	0.05	2.6	A	0.03	3.2	A
29. JD 5 / Dorchester Ave	JD 5 – EB	0.09	14.4	B	0.63	30.7	D
	Dorchester Ave – NB	0.03	1.0	A	0.01	0.5	A
	Dorchester Ave – SB	0.36	0.0	A	0.34	0.0	A
30. South Station Bus Access / JD 6	South Station Bus Access – EB	0.21	0.0	A	0.09	0.0	A
	South Station Bus Access – WB	0.00	0.0	A	0.00	0.0	A
	JD 6 – NB	0.03	10.2	B	0.16	10.0	B

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service

The study area would experience increased levels of vehicle, pedestrian, and bicycle activity during the morning and evening peak hours coinciding with commuter traffic. Varying factors such as curbside loading and stopping, construction activity, vehicles blocking intersections and jaywalking degrade traffic operations on a day-to-day basis.

For 2035 Alternative 3, all unsignalized intersections in the study area would operate at an overall LOS D or better during the morning and evening peak hours, except for the westbound approach at the intersection of Dorchester Avenue and West 2nd Street; this approach would operate at LOS F during the morning and evening peak hours. The majority of signalized intersections would operate at an overall LOS E or worse during the morning and evening peak hours:

- **Congress Street at Dorchester Avenue (PM peak hour)** – This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. With the reopening of Dorchester Avenue, the northbound approach would carry higher volumes, with inadequate green time allocated to this approach under current signal timing.
- **Atlantic Avenue at Seaport Boulevard (AM and PM peak hours) –** This intersection would operate at an overall LOS F during both the morning and evening peak hours. Congested conditions on I-93 during the peak hours result in delays on the I-93 on-ramp which impact the intersection operations. On the Seaport Boulevard westbound approach, unclear traffic regulations result in vehicles making illegal turns and/or cutting off other vehicles when they

realize the error. Pedestrians have an exclusive pedestrian phase, but typically chose to cross concurrently with Atlantic Avenue traffic which increases traffic delays.

- **Atlantic Avenue at Congress Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Evening delays are due to high northbound volumes on Atlantic Avenue and high westbound volumes on Congress Street turning right onto Atlantic Avenue.
- **Purchase Street at Congress Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Observed conditions in the evening are often worse than the model reports when the I-93/I-90 ramps back into the intersection and create congestion. On the eastbound Congress Street approach drivers use the two right lanes to merge onto the I-90/I-93 ramp despite traffic regulations. This back-up results in added delays to the Purchase Street and Congress Street corridors.
- **Atlantic Avenue at Summer Street (AM peak hour) –** This intersection would operate at an overall LOS F during the morning peak hour and an overall LOS D during the evening peak hour. During the peak hours Atlantic Avenue is heavily used by commuters from I-90 Eastbound and I-93 Northbound. In addition, the westbound Summer Street approach would carry higher traffic demands from the east. Atlantic Avenue provides for three lanes of travel, but during peak hours the curbside activity often reduces the capacity of Atlantic Avenue. Taxis and passenger car drop-offs and pickups on Atlantic Avenue negatively affect traffic operations when double or triple parked. During the peak hours, commuters that take public transit into South Station disperse in groups causing conflicts when they cross the street and force traffic to yield. Atlantic Avenue provides two left turn lanes, but is hindered by concurrent pedestrian operations and over 3,750 pedestrians traversing the intersection during the peak hours.
- **Purchase Street at Summer Street (AM peak hour) –** This intersection would operate at an overall LOS E during the morning peak hour and LOS B during the evening peak hour. Increased traffic from the South Station developments cause increases to Summer Street westbound left movement increasing approach delays and subsequently overall intersection delays.
- **Surface Road at Essex Street and Lincoln Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour. Heavy evening traffic heading eastbound from Essex Street onto I-93 Northbound experience high delays due to the amount of green time allocated to the movement.
- **Atlantic Avenue at Kneeland Street (AM and PM peak hours) –** This intersection would operate at an overall LOS F during the morning peak hour and LOS E during the evening peak hour. There are heavy volumes exiting the I-93 Northbound Frontage Road and I-90 Eastbound contributing to congestion and delay at this intersection. High volumes on Kneeland Street turning left onto Atlantic Avenue also contribute to congestion and delays.
- **Surface Road at Kneeland Street (PM peak hour) –** This intersection would operate at an overall LOS D during the morning peak hour and an overall LOS F during the evening peak hour when traffic getting on I-93/I-90 are highest.
- **South Station Bus Ramps at I-90/I93 HOV Lanes and I-93 Off-Ramps (PM peak hour)** – This intersection would operate at an overall LOS C in the morning peak period and an overall LOS F during the evening peak hour. With high westbound volumes, particularly turning left, this approach would experience high delays.
- **Dorchester Avenue at West Broadway (AM and PM peak hours) –** This intersection would operate at an overall LOS F in both the morning and evening peak hours. Dorchester Avenue is

allotted the majority of the cycle length which causes delays on West Broadway and Traveler Street. The West Broadway and Traveler Street left-turns are not protected and must yield to on-coming traffic which causes few left turns to process during each cycle. The exclusive pedestrian phase, activated on a button push, is regularly called during the peak hours adding to the overall intersection delay for vehicles. With the reopening of Dorchester Avenue and new development within South Station, an increase in traffic through the Dorchester Avenue corridor would result in higher delays on the north and southbound approaches.

- **Dorchester Avenue at West 4th Street (AM and PM peak hours) –** This intersection would operate at an overall LOS E in the morning peak hour and LOS F in the evening peak hour. Dorchester Avenue is allocated the majority of the cycle length which causes higher delays on West 4th Street. Both West 4th Street approaches provide a shared left-turn/through lane without any allotted time for protected lefts which causes additional backups on West 4th Street. With the reopening of Dorchester Avenue and new development within South Station, an increase in traffic through the Dorchester Avenue corridor would result in higher delays on the north and southbound approaches.
- **Purchase Street at I-93 Off-Ramp and Seaport Boulevard (AM and PM peak hours) –** This intersection would operate at an overall LOS E during the morning peak hour and an overall LOS F during the evening peak hour. Heavy southbound traffic from Purchase Street and the I-93 Off-Ramp amount to long queues and high delays. An excessive amount of green time is allocated to the Seaport Boulevard westbound movements adding to the delays experienced by southbound traffic.
- **Congress Street at A Street / Thompson Place (AM and PM peak hours) –** This intersection would operate at an overall LOS E during both morning and evening peak hours. During the morning peak hour heavy westbound traffic turning left onto A Street causes high delays resulting in an overall LOS E. During the evening peak hour, traffic turning left from A Street onto Congress Street experience high delays due to a short green time where only a few cars can pass through the intersection.

6.5.5. Layover Facility Intersection Capacity Analysis – 2025 Alternative 3

The intersection capacity analyses for the layover facility intersections for 2025 Alternative 3 are identical to 2025 Alternative 1 as summarized in Section 6.3.5 and Tables 49 through 55.

For all three proposed layover sites, all turning movements to and from the layover facility site driveways would operate at acceptable levels (LOS D or better) during the three peak periods analyzed – morning peak, midday, and evening peak. Intersection traffic operations would not be degraded as a result of the layover facility operation at any of the three potential layover facility sites. This is primarily due to the very low passenger vehicle and service vehicle traffic demands projected to occur to and from the layover yard.

LOS E/F conditions at the intersection of Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square at the Readville-Yard 2 layover facility do not occur within lane groups that provide access to or egress from the layover yard.

6.5.6. Layover Facility Intersection Capacity Analysis – 2035 Alternative 3

The intersection capacity analyses for the layover facility intersections for 2035 Alternative 3 are identical to 2035 Alternative 1 as summarized in Section 6.3.6 and Tables 55 through 60.

For all three proposed layover sites, all turning movements to and from the layover facility site driveways would operate at acceptable levels (LOS D or better) during the three peak periods analyzed – morning peak, midday, and evening peak. Intersection traffic operations would not be degraded as a result of the layover facility operation at any of the three potential layover facility sites. This is primarily due to the very low passenger vehicle and service vehicle traffic demands projected to occur to and from the layover yard.

LOS E/F conditions at the intersection of Hyde Park Avenue / Neponset Valley Pkwy / Wolcott Ct / Wolcott Square at the Readville-Yard 2 layover facility do not occur within lane groups that provide access to or egress from the layover yard.

7. Proposed Mitigation/Consistency with Regulatory Requirements

This section identifies and discusses appropriate transportation improvements and mitigation measures to minimize the potential negative impacts resulting from the SSX project. Project-related impacts were determined as those impacts resulting from the Build Alternatives, above and beyond impacts that would otherwise occur in the No Build Alternative.

7.1. TDM Mitigation Commitments

Consistent with MassDOT's efforts to reduce automobile dependency through the GreenDOT Policy, Mode Shift Goal, Healthy Transportation Compact, and Healthy Transportation Directive, several TDM commitments are proposed for the SSX project. TDM commitments for the SSX project which would apply to Alternative 1 – Transportation Improvements Only, are as follows:

- Incorporate bicycle parking in the new headhouse on Dorchester Avenue.
- Construct of one-half mile of Harborwalk adjacent to Fort Point Channel, which would close the last remaining gap in Downtown Boston in a continuous waterfront walkway.
- 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.
- Participate in the EPA SmartWay Transport Program to increase energy efficiency and reduce greenhouse gas emissions.
- Provide electronic signage displaying transit schedule information.
- Incorporate curbside space and accommodate a shuttle stop along Dorchester Avenue.
- Work with the City of Boston to improve bicycle accommodations along Atlantic Avenue from Kneeland Street to Summer Street.
- Prepare a CMP for BTD to minimize disruption in the area throughout construction.

In addition to the TDM commitments made for Alternative 1, TDM commitments for the SSX project which would apply to Alternative 2 and Alternative 3 are as follows:

- Accommodate electric vehicle charging facilities within the structured parking. Charge market rates for off-street parking spaces used by single occupant vehicle (SOV) drivers.
- Provide car sharing parking (Zipcar or similar program) and carpool/vanpool designated parking spaces in any structured parking facilities.
- Work with the BTD to conduct a post-development traffic monitoring program. The program would be conducted prior to the start of construction of each phase and repeated six months after the issuance of occupancy certificates.

7.2. Alternative 1 – Transportation Improvements Only: Roadway and Intersection Mitigation

In Alternative 1, for all three layover facility sites, intersection traffic operations would not be degraded as a result of the layover facility operation. This is primarily due to the very low passenger vehicle and service vehicle traffic generation projected for the layover yards. Therefore, no roadway or traffic signal mitigation would be required as part of the SSX project at any of the three layover facility sites.

At South Station, roadway and intersection mitigation associated with Alternative 1 is described in the following sections.

7.2.1. Atlantic Avenue Corridor

Of primary importance is the need to address the curbside congestion on Atlantic Avenue. Reopening Dorchester Avenue to public access presents an opportunity to mitigate the curbside congestion on Atlantic Avenue and better accommodate shuttles to/from the South Boston Waterfront/Innovation District. The conceptual layout for Dorchester Avenue will include accommodation for taxicabs, drop-off, pick-up, and shuttles along the newly opened portion of Dorchester Avenue. Doing so would result in a 30 to 40% reduction in the curbside activity along Atlantic Avenue. 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.

In addition to addressing the curbside congestion on Atlantic Avenue, the SSX project proposes to improve bicycle connectivity into Dewey Square along Atlantic Avenue by working with the city to provide a bicycle lane along the west side of Atlantic Avenue from Kneeland Street to Essex Street.

7.2.2. Atlantic Avenue at Summer Street (Dewey Square)

Added traffic and pedestrians through Dewey Square would result in the need for adjustments to lane assignments and signal timing/phasing. There is an existing conflicting pedestrian crossing that runs concurrently with a dual left-turn maneuver from Atlantic Avenue onto Summer Street, which creates pedestrian crossing conflicts with dual left-turn vehicles. Proposed intersection mitigation is as follows:

- Restripe the Atlantic Avenue northbound approach, eliminating the shared left-turn/thought lane and provide diagonal crossing markings in the intersection;
- To better accommodate the pedestrian desire line from South Station to Dewey Square, add a crosswalk on the westbound approach of the Summer Street/Purchase Street intersection where one does not exist today;
- Improve concurrent pedestrian phase timings at Summer Street/Purchase Street intersection to adequately accommodate pedestrians; and
- Optimize all intersection timings and offsets.

Tables 73 and 74 compare the morning and evening LOS benefits of the proposed mitigation.

Table 73—Dewey Square – 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.79	32.2	C	164	0.88	42.8	D	173
	Summer Street – WB Thru	>1.0	>80.0	F	m#410	0.86	44.4	D	#210
	Summer Street – WB Right	0.56	32.9	C	m61	0.47	22.5	C	m#40
	Atlantic Avenue – NB Left	>1.0	>80.0	F	m#387	0.55	19.7	B	m103
	Atlantic Avenue – NB Left/Thru	>1.0	>80.0	F	#526	0.94	35.1	D	#390
	Atlantic Avenue – NB Right	0.43	35.3	D	48	0.32	26.9	C	m50
	Overall Intersection	>1.0	>80.0	F	-	0.91	35.2	D	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.66	2.2	A	m28	0.63	2.4	A	m31
	Summer Street – EB Thru	0.45	43.7	D	104	0.50	40.2	D	161
	Summer Street – EB Right	0.05	35.3	D	30	0.39	37.9	D	116
	Summer Street – WB Left	>1.0	>80.0	F	m98	0.76	49.6	D	m170
	Summer Street – WB Left/Thru	>1.0	>80.0	F	m106	0.77	43.6	D	m177
	Overall Intersection	0.74	50.3	D	-	0.63	18.3	B	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 74—Dewey Square – 2025 Alternative 1 Mitigated

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
6. Atlantic Avenue at Summer Street	Summer Street – EB Left/Thru	0.85	46.4	D	#240	0.89	36.7	D	#167
	Summer Street – WB Thru	0.99	73.1	E	m#270	0.86	51.6	D	#215
	Summer Street – WB Right	0.39	50.4	D	m82	0.37	49.3	D	93
	Atlantic Avenue – NB Left	0.94	44.4	D	m#403	0.38	27.1	C	m132
	Atlantic Avenue – NB Thru	1.00	46.2	D	#400	0.96	51.4	D	#390
	Atlantic Avenue – NB Right	0.43	23.6	C	48	0.32	62.8	E	m112
	Overall Intersection	0.98	47.8	D	-	0.93	48.1	D	-
7. Purchase Street at Summer Street	Purchase Street – SB Left/Thru/Right	0.66	2.2	A	m28	0.64	2.6	A	36
	Summer Street – EB Thru	0.43	41.9	D	103	0.40	33.5	C	150
	Summer Street – EB Right	0.08	35.1	D	30	0.47	37.6	D	120
	Summer Street – WB Left	0.83	25.8	C	m68	0.64	19.4	B	m62
	Summer Street – WB Left/Thru	>1.0	46.3	D	m#159	0.58	9.0	A	m42
	Overall Intersection	0.77	18.0	B	-	0.64	9.5	A	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Overall, vehicle LOS and pedestrian flow improve with the implementation of the proposed mitigation. During the morning peak hour Atlantic Avenue/Summer Street intersection improves from overall LOS F to LOS D and Purchase Street/Summer Street intersection improves from an LOS D to LOS B. The Summer Street westbound approach improves from an LOS F to LOS C/D due to re-optimizing the intersection offset. A major concern at this intersection is the long queue that forms and causes spillback into the Atlantic Street/Summer Street intersection. By adjusting the two intersection offsets to allow a

seamless transition through the Summer Street corridor, the Summer Street westbound queue is reduced, thereby reducing the occurrence of spillback into the Atlantic Avenue/Summer Street intersection.

During the evening peak hour Atlantic Avenue at Summer Street maintains an acceptable overall LOS D. Purchase Street at Summer Street improves from an overall LOS B to LOS A and the Purchase Street/I-93 Off-Ramp intersection improves from an LOS E to LOS D.

At the Summer Street and Atlantic Avenue intersection, the conversion of the Atlantic Avenue northbound double left to a single left-only lane will reduce vehicle and pedestrian conflicts. The diagonal pedestrian crossing is not changed. The pedestrian movement across Summer Street is improved by eliminating the conflict of pedestrians crossing Summer Street concurrently with the northbound dual left-turn vehicular movement. This will improve vehicular traffic as vehicles turning left will have a protected movement and through vehicles will now have two designated through lanes.

Pedestrian improvements made at the Summer Street and Purchase Street intersection improve the pedestrian flow through Dewey Square by dispersing pedestrians amongst two intersections. Currently there is no crosswalk on the east approach across Summer Street westbound. By installing this crosswalk and providing adequate crossing time for concurrent pedestrian phases, pedestrians will have an easier time traversing the large intersection.

7.2.3. Surface Road at Essex Street and Lincoln Street

The intersection of Surface Road at Essex Street and Lincoln Street does not currently meet pedestrian desire lines and is confusing for pedestrians navigating the wide open, auto-oriented intersection. Many of the pedestrian crossings involve crossing multiple approaches and pedestrian timings are concurrent with long crossing lengths. Mitigation improvements to this intersection include:

- Provide additional walk time through pedestrian lead intervals during the concurrent pedestrian phases;
- Provide a more direct east-west pedestrian connection along Essex Street by installing a new crosswalk along the southern east-west crossing from Essex Street to the large median; and
- Optimize the signal timings and phasings.

Tables 75 and 76 compare the morning and evening LOS benefits of the proposed mitigation.

Table 75—Surface Road at Essex Street and Lincoln Street – 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left/Thru	0.71	36.8	D	232	>1.0	>80.0	F	#662
	Essex Street – EB Bear Right/Right	0.55	36.5	D	189	>1.0	>80.0	F	#758
	Lincoln Street – NB Thru//Bear Right/Right	0.81	37.2	D	276	>1.0	>80.0	F	#462
	Surface Road – SB Left/Thru/Right	0.92	31.3	C	m271	0.86	32.8	C	352
	Overall Intersection	0.81	34.8	C	-	>1.0	>80.0	F	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 76—Surface Road at Essex Street and Lincoln Street – 2025 Alternative 1 Mitigated

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
9. Surface Road at Essex Street / Lincoln Street	Essex Street – EB Left/Bear Left/Thru	0.86	49.0	D	#287	>1.0	>80.0	F	#642
	Essex Street – EB Bear Right/Right	0.28	11.4	B	89	0.70	19.6	B	350
	Lincoln Street – NB Thru//Bear Right/Right	0.81	37.2	D	276	>1.0	>80.0	F	#454
	Surface Road – SB Left/Thru/Right	0.81	14.7	B	m223	0.93	48.7	D	#400
	Overall Intersection	0.82	28.7	B	-	>1.0	73.9	E	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

With the addition of the pedestrian lead intervals, and by optimizing the signal phasing, the overall intersection vehicle LOS improves for both the morning and evening peak hours. Pedestrian accommodations are also improved with the addition of the new crosswalk and the increased pedestrian walk time.

7.2.4. Summer Street at Dorchester Avenue

In Alternative 1, Dorchester Avenue will reopen to public, providing a new connection. With the opening of Dorchester Avenue and the new South Station entrance on Dorchester Avenue, pedestrian and bicycle activity is expected to increase at the intersection of Dorchester Avenue and Summer Street. To accommodate this increase, an exclusive pedestrian/bicycle phase has been implemented. Signal timings and the intersection offset have been optimized to accommodate the increased vehicle, pedestrian, and bicycle traffic at the intersection. Tables 77 and 78 compare the morning and evening LOS benefits of the proposed mitigation.

Table 77—Summer Street at Dorchester Avenue – 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.63	7.7	A	m100	0.54	6.6	A	m60
	Summer Street – WB Left/Thru/Right	0.35	9.8	A	116	0.40	13.5	B	147
	Dorchester Avenue – NB Left	1.00	>80.0	F	#145	0.78	45.5	D	125
	Dorchester Avenue - NB Thru/Right	0.45	30.0	C	148	0.37	22.4	C	132
	Dorchester Avenue – SB Left	0.88	67.0	E	m#246	0.97	60.9	E	#246
	Dorchester Avenue – SB Thru/Right	0.77	47.8	D	m331	0.64	18.4	B	250
	Overall Intersection	0.75	26.3	C	-	0.72	21.1	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 78—Summer Street at Dorchester Avenue – 2025 Alternative 1 Mitigated

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
2. Summer Street at Dorchester Avenue	Summer Street – EB Left/Thru/Right	0.91	35.8	D	m#421	0.71	14.8	B	#342
	Summer Street – WB Left/Thru/Right	0.49	21.5	C	201	0.49	21.3	C	212
	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#116	0.47	18.0	B	87
	Dorchester Avenue - NB Thru/Right	0.47	35.8	D	139	0.29	14.9	B	87
	Dorchester Avenue – SB Left	0.92	>80.0	F	m#212	0.68	35.5	D	258
	Dorchester Avenue – SB Thru/Right	0.79	55.7	E	m310	0.50	28.8	C	296
	Overall Intersection	0.98	26.3	D	-	0.70	21.7	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Although vehicle operations will decrease slightly during the morning and evening peak hours, the intersection will continue to operate at an acceptable LOS D in the morning and LOS C in the evening. Pedestrian safety and flow to and from South Station would notably improve with the mitigation proposed at this intersection.

7.2.5. Congress Street at Dorchester Avenue

Reopening Dorchester Avenue and incorporating a cycle track into the intersection results in added delays on Dorchester Avenue northbound. Mitigation would include optimizing signal timing and phasing and incorporating bicycle-specific signal equipment, pavement markings, and detection into the intersection layout. Tables 79 and 80 compare the morning and evening LOS benefits of the proposed mitigation.

Table 79—Congress Street at Dorchester Avenue – 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	V/C[c]	Delay[d]	V/C	Delay	V/C	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.67	33.8	C	288	>1.0	>80.0	F	#516
	Congress Street – EB Thru/Right	0.55	24.0	C	m133	0.46	17.3	B	m275
	Congress Street – WB Left	0.94	>80.0	F	m#174	0.38	14.7	B	m34
	Congress Street – WB Thru	0.33	32.4	C	m160	0.22	9.8	A	m65
	Overall Intersection	0.82	33.6	C	-	0.66	46.6	D	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 80—Congress Street at Dorchester Avenue – 2025 Alternative 1 Mitigated

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
1. Congress Street at Dorchester Avenue	Dorchester Avenue – NB Left/Right	0.85	49.8	D	m#368	0.84	48.3	D	m#430
	Congress Street – EB Thru/Right	0.50	6.5	A	m17	0.58	8.9	A	m89
	Congress Street – WB Left	0.78	43.7	D	m#152	0.64	38.0	D	m#89
	Congress Street – WB Thru	0.30	12.7	B	m73	0.28	14.8	B	m76
	Overall Intersection	0.80	21.0	C	-	0.72	21.3	C	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Under mitigated conditions, the morning peak hour maintains an overall LOS C with a decrease in overall delay by more than 10 seconds. The Congress Street westbound approach improves from an LOS F to an LOS D. The Dorchester Avenue northbound approach degrades slightly from an LOS C to LOS D as a result of the reallocation of signal time to the Congress Street westbound movement as well as the exclusive pedestrian phase clearance time. The evening peak hour improves from an overall LOS D to LOS C for 2025 TIO mitigated condition. By optimizing signal timings and the intersection offset, the cycle length time was better allocated to the heavier volume movements and reduced the Dorchester Avenue northbound approach lane group form and LOS F to an LOS D. Pedestrians also benefit with an increase in clearance time during the exclusive pedestrian phase.

7.2.6. Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp

Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp is a highly utilized intersection for vehicles entering the city. Currently the MBTA access drive westbound approach accommodates extremely low to no volume (less than five vehicles per hour) during the morning and evening peak hours. Although there is very low volume on this approach, the phase for this approach is triggered every cycle, which also runs with a low volume concurrent pedestrian phase. This limits the amount of time allocated to the other approaches with heavy volumes and increase the overall intersection delay. Proposed mitigation includes updating the MBTA access drive loop detection with the ability to skip the phase if there is no vehicle present. The intersection timing, phases and offset would be updated and optimized to reflect the future traffic needs at this intersection. Tables 81 and 82 compare the morning and evening LOS benefits of the proposed mitigation.

Table 81—Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp– 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.86	49.3	D	m#256	0.78	36.0	D	193
	Kneeland Street – EB Left/Thru	0.90	53.6	D	m#298	0.70	30.8	C	183
	MBTA Access Drive – WB Thru/Right	0.01	37.7	D	0	0.04	37.9	D	5
	Frontage Road – NB Left	0.95	54.0	D	#603	>1.0	>80.0	F	#483
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#951	0.51	30.6	C	187
	I-90 Off-Ramp– NB Left	0.33	12.6	B	145	0.56	16.5	B	250
	I-90 Off-Ramp – NB Left/Thru	0.88	79.5	E	#245	0.95	73.0	E	#348
	Overall Intersection	0.92	>80.0	F	-	0.83	56.9	E	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 82—Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp – 2025 Alternative 1 Mitigated

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
12. Atlantic Avenue at Kneeland Street	Kneeland Street – EB Left	0.76	35.3	D	m144	0.69	38.4	D	189
	Kneeland Street – EB Left/Thru	0.70	32.4	C	m138	0.63	36.1	D	187
	MBTA Access Drive – WB Thru/Right	0.01	42.5	D	0	0.06	42.8	D	5
	Frontage Road – NB Left	0.85	39.6	D	#613	>1.0	>80.0	F	#462
	Frontage Road – NB Thru/Right	>1.0	>80.0	F	#995	0.51	33.8	C	187
	I-90 Off-Ramp– NB Left	0.76	47.3	D	#269	0.80	39.2	D	#346
	I-90 Off-Ramp – NB Left/Thru	0.80	52.2	D	#291	0.86	45.1	D	#385
	Overall Intersection	0.99	75.2	E	-	0.86	48.8	D	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Under mitigated conditions, the morning peak hour improved from an overall LOS F to an overall LOS E and the evening peak hour improves from an overall LOS E to an LOS D. Pedestrian safety improves with the reduction of pedestrian/vehicle conflicts when concurrent pedestrian phases run during lower volume vehicle movements. The proposed mitigation improves the operation of the Atlantic Avenue/Kneeland Street intersection to better accommodate the growing vehicle and pedestrian traffic in the area.

7.2.7. Dorchester Avenue at West Broadway/Traveler Street

In Alternative 1, Dorchester Avenue will reopen to the public providing a new public connection. The Dorchester Avenue at West Broadway and Traveler Street intersection already experiences poor LOS and high vehicle and pedestrian delays. Due to the long signal cycle length, many pedestrians cross the intersection during gaps in traffic and do not wait for the exclusive pedestrian phase. Currently the signal includes an exclusive pedestrian phase, reducing the time allocated to the heavily utilized vehicle phases. Changing the pedestrian operations to concurrent pedestrian phases, per BTD guidelines, would substantially improve operations and give pedestrians more crossing opportunities during the signal cycle. In addition, the West Broadway westbound approach lane configuration could be modified to one

left/through and one through/right to better accommodate the vehicle movement onto Traveler Street. Tables 83 and 84 compare the morning and evening LOS benefits of the proposed mitigation.

Table 83—Dorchester Avenue at West Broadway/Traveler Street – 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	>1.0	>80.0	F	m#616	>1.0	>80.0	F	m#329
	Dorchester Avenue – NB Thru/Right	0.36	13.8	B	m123	0.25	14.9	B	m100
	Dorchester Avenue – SB Left/Thru	>1.0	>80.0	F	#528	>1.0	>80.0	F	#741
	Dorchester Avenue – SB Right	0.13	29.1	C	39	0.34	29.4	C	58
	Traveler Street – EB Left	0.92	>80.0	F	#213	0.36	26.9	C	#116
	Traveler Street – EB Thru	0.64	27.5	C	#374	0.80	38.3	D	#473
	Traveler Street – EB Right	0.17	20.2	C	45	0.41	19.9	B	61
	West Broadway – WB Left	0.36	24.1	C	#93	0.65	46.7	D	#130
	West Broadway – WB Thru/Right	0.94	52.4	D	#449	0.67	32.7	C	#266
	Overall Intersection	>1.0	>80.0	F	-	>1.0	>80.0	F	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 84—Dorchester Avenue at West Broadway/Traveler Street – 2025 Alternative 1 Mitigated

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
18. Dorchester Avenue at West Broadway / Traveler Street	Dorchester Avenue – NB Left	0.98	71.5	E	m#485	0.82	43.4	D	m#249
	Dorchester Avenue – NB Thru/Right	0.45	19.9	B	m73	0.27	12.1	B	m108
	Dorchester Avenue – SB Left/Thru	0.91	52.1	D	m#365	1.00	57.4	E	#586
	Dorchester Avenue – SB Right	0.20	22.2	C	m31	0.51	19.0	B	116
	Traveler Street – EB Left	0.92	>80.0	F	#190	0.51	42.3	D	90
	Traveler Street – EB Thru	0.80	40.3	D	#382	0.94	64.1	E	#466
	Traveler Street – EB Right	0.25	9.8	A	70	0.81	28.7	C	#456
	West Broadway – WB Left/Thru/Right	1.00	72.3	E	#242	>1.0	>80.0	F	#138
	Overall Intersection	0.99	49.5	D	-	>1.0	45.0	D	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Under mitigated conditions, the overall LOS improves from LOS F to LOS D in both the morning and evening peak hours. By switching from an exclusive pedestrian phase to concurrent pedestrian phases, LOS is improved. Dorchester Avenue northbound left movement is a particularly heavy during the morning peak hour and improves from an LOS F to LOS D under mitigated conditions, due to increased phase time allocated to this movement. Dorchester Avenue southbound left/through movement also improves greatly from LOS F to LOS D in the morning and from LOS F to LOS E in the evening.

7.2.8. Dorchester Avenue at West 4th Street

Similar to the Dorchester Avenue at West Broadway and Traveler Street intersection, Dorchester Avenue at West 4th Street would experience an increase in traffic due to the reopening of Dorchester Avenue to the north. Mitigation at this intersection includes optimizing the signal timing and optimizing the offset

with Dorchester Avenue/West Broadway/Traveler Street intersection. Additional concurrent pedestrian walk time was added to better accommodate pedestrians at this intersection. Tables 85 and 86 compare the morning and evening LOS benefits of the proposed mitigation.

Table 85—Dorchester Avenue at West 4th Street – 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	>1.0	>80.0	F	#301	0.70	40.1	D	177
	West 4th Street – EB Right	0.06	24.2	C	25	0.13	24.4	C	33
	West 4th Street – WB Left/Thru/Right	0.90	53.9	D	#361	0.98	68.2	E	#425
	Dorchester Avenue – NB Left	>1.0	>80.0	F	#660	>1.0	>80.0	F	#257
	Dorchester Avenue – NB Thru	0.49	8.7	A	164	0.32	7.7	A	100
	Dorchester Avenue – NB Right	0.00	5.3	A	2	0.00	5.7	A	2
	Dorchester Avenue – SB Left/Thru	0.52	23.3	C	m68	>1.0	>80.0	F	m219
	Dorchester Avenue – SB Right	0.21	36.0	D	m28	0.26	30.3	C	m50
	Overall Intersection	>1.0	60.7	E	-	>1.0	67.9	E	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

Table 86—Dorchester Avenue at West 4th Street – 2025 Alternative 1

Signalized Intersection	Lane Group	Morning Peak Hour				Evening Peak Hour			
		V/C[a]	Delay[b]	LOS[c]	95% Q[d]	V/C	Delay	LOS	95% Q
19. Dorchester Ave at West 4th Street	West 4th Street – EB Left/Thru	0.95	71.0	E	237	0.63	37.4	D	184
	West 4th Street – EB Right	0.06	25.1	C	24	0.12	25.4	C	32
	West 4th Street – WB Left/Thru/Right	0.83	44.3	D	312	0.91	56.4	E	#436
	Dorchester Avenue – NB Left	>1.0	60.8	E	#600	>1.0	>80.0	F	#322
	Dorchester Avenue – NB Thru	0.50	9.7	A	225	0.33	9.1	A	116
	Dorchester Avenue – NB Right	0.00	6.5	A	3	0.00	6.9	A	2
	Dorchester Avenue – SB Left/Thru	>1.0	78.1	E	m#231	>1.0	>80.0	F	m#474
	Dorchester Avenue – SB Right	0.29	10.9	B	m22	0.36	11.7	B	m27
	Overall Intersection	>1.0	42.7	D	-	>1.0	74.4	E	-

Note: NB = northbound. SB = southbound. EB = eastbound. WB = westbound
a V/C = volume to capacity ratio
b Delay = Average delay in seconds per vehicle
c LOS = Level-of-Service
d Queue length in feet
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal

During the morning peak hour, the overall intersection LOS improves from LOS E to LOS D. The evening peak hour slightly increases in overall intersection delay but maintains an overall LOS E.

7.3. Alternative 2 – Joint/Private Development Minimum Build and Alternative 3 – Joint/Private Development Maximum Build: Roadway Mitigation

Similar to Alternative 1, no roadway or traffic signal mitigation would be required as part of the SSX project at any of the three layover facility sites due to the very low traffic generation.

At South Station, in addition to the mitigation proposed for Alternative 1, Alternatives 2 and 3 would require additional mitigation to offset the vehicle traffic and parking needs associated with the joint/private development.

- **Implement intersection improvements.** The following signal timing and phasing adjustments would improve traffic flow, reduce queuing, and improve pedestrian crossings:
    - **Atlantic Avenue at Seaport Boulevard –** Adjust signal timings to improve the Seaport Boulevard approach.
    - **Atlantic Avenue at Congress Street –** Added traffic on Atlantic Avenue from South Station contributes to degraded intersection operations. Mitigation would include optimizing signal timing and phasing.
    - **Purchase Street at Congress Street –** Added traffic on Purchase Street to South Station contributes to degraded intersection operations. Mitigation would include optimizing signal timing and phasing.
    - **Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp –** This intersection is not operating under an efficient signal timing scheme. Mitigation involves installing 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.

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8. Figures

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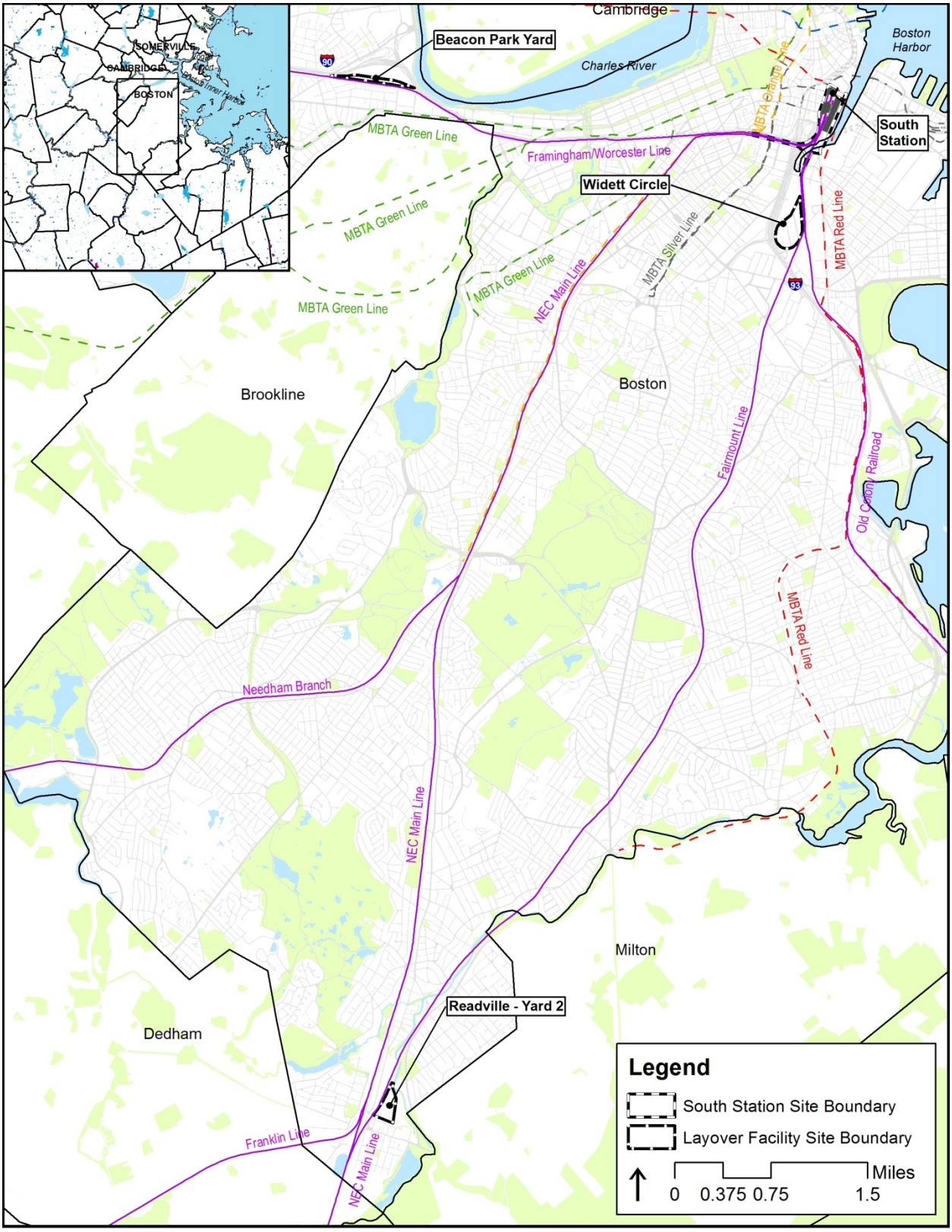

Figure 1—SSX Project Site Boundaries

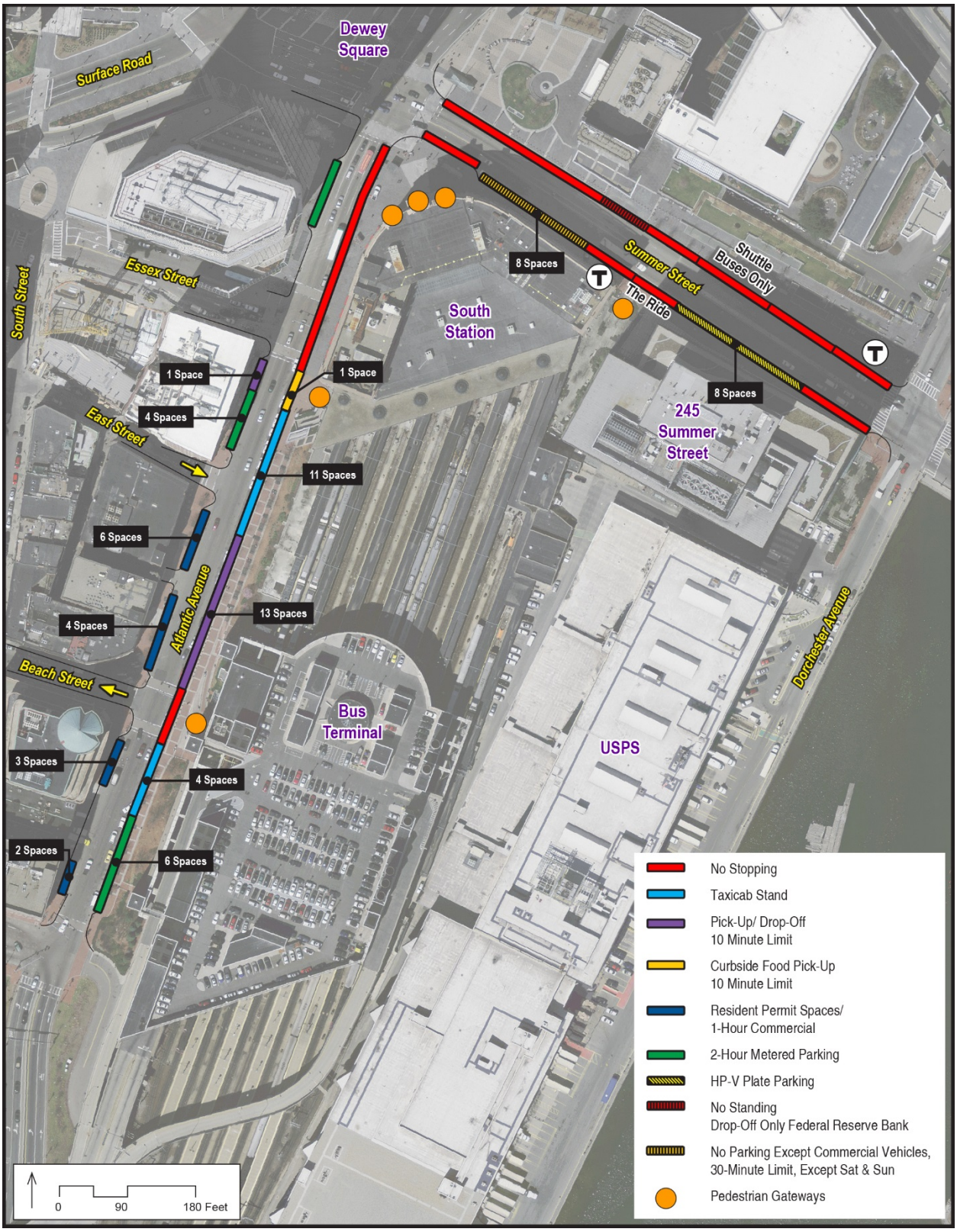

Figure 2—South Station Curbside Regulations

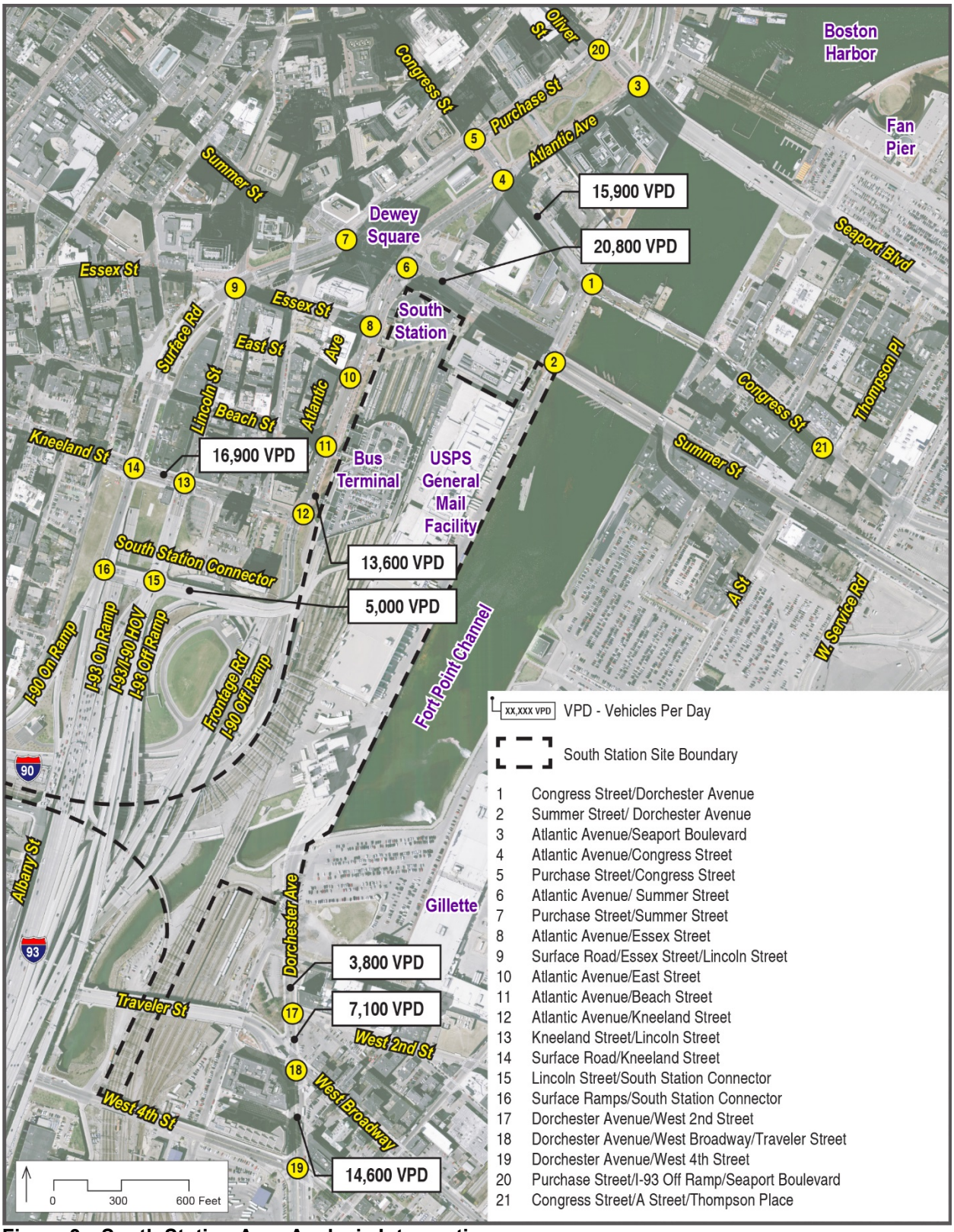

Figure 3—South Station Area Analysis Intersections

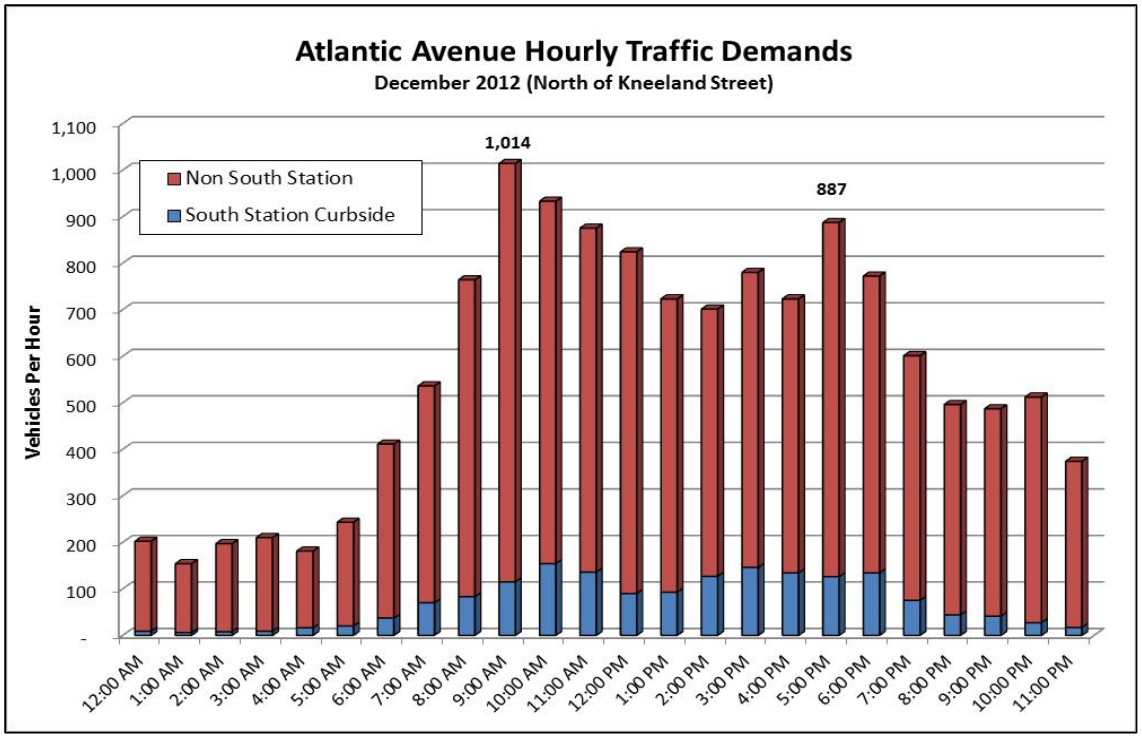

Figure 4—Atlantic Avenue Hourly Traffic Demands

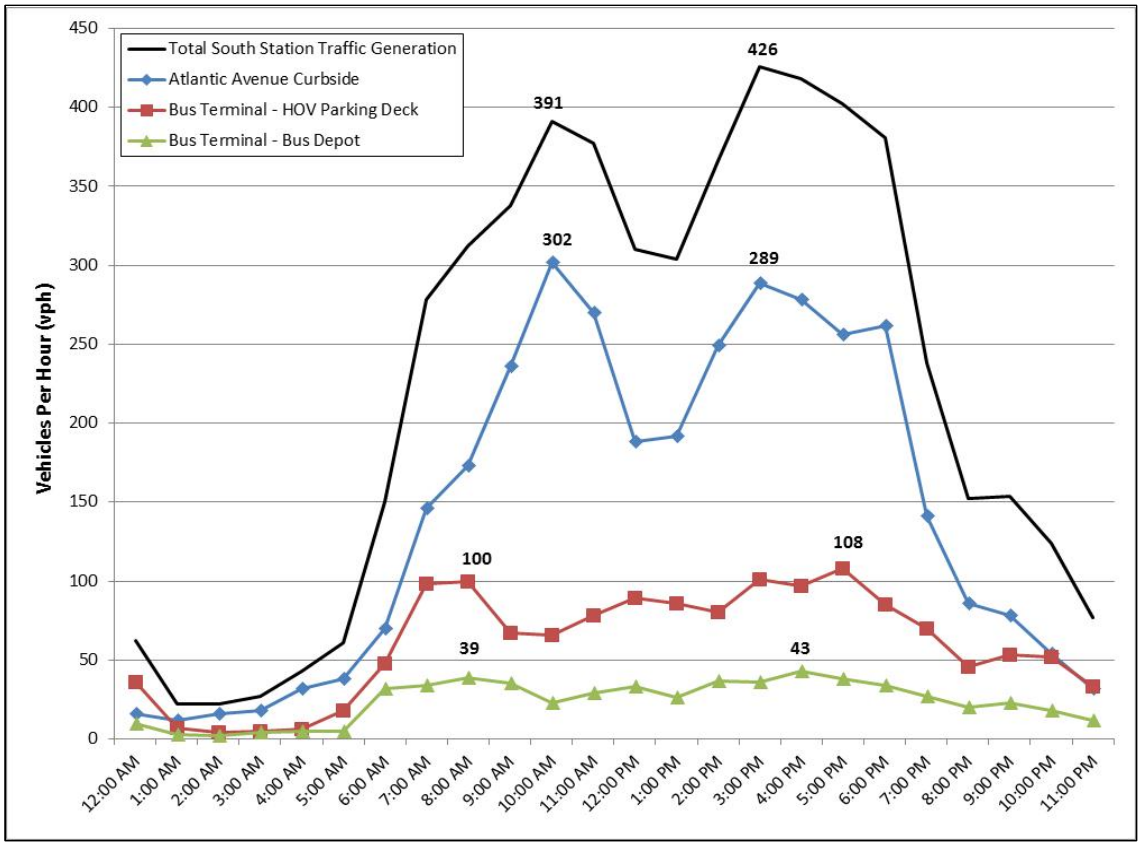

Figure 5—South Station Vehicle Traffic Generation

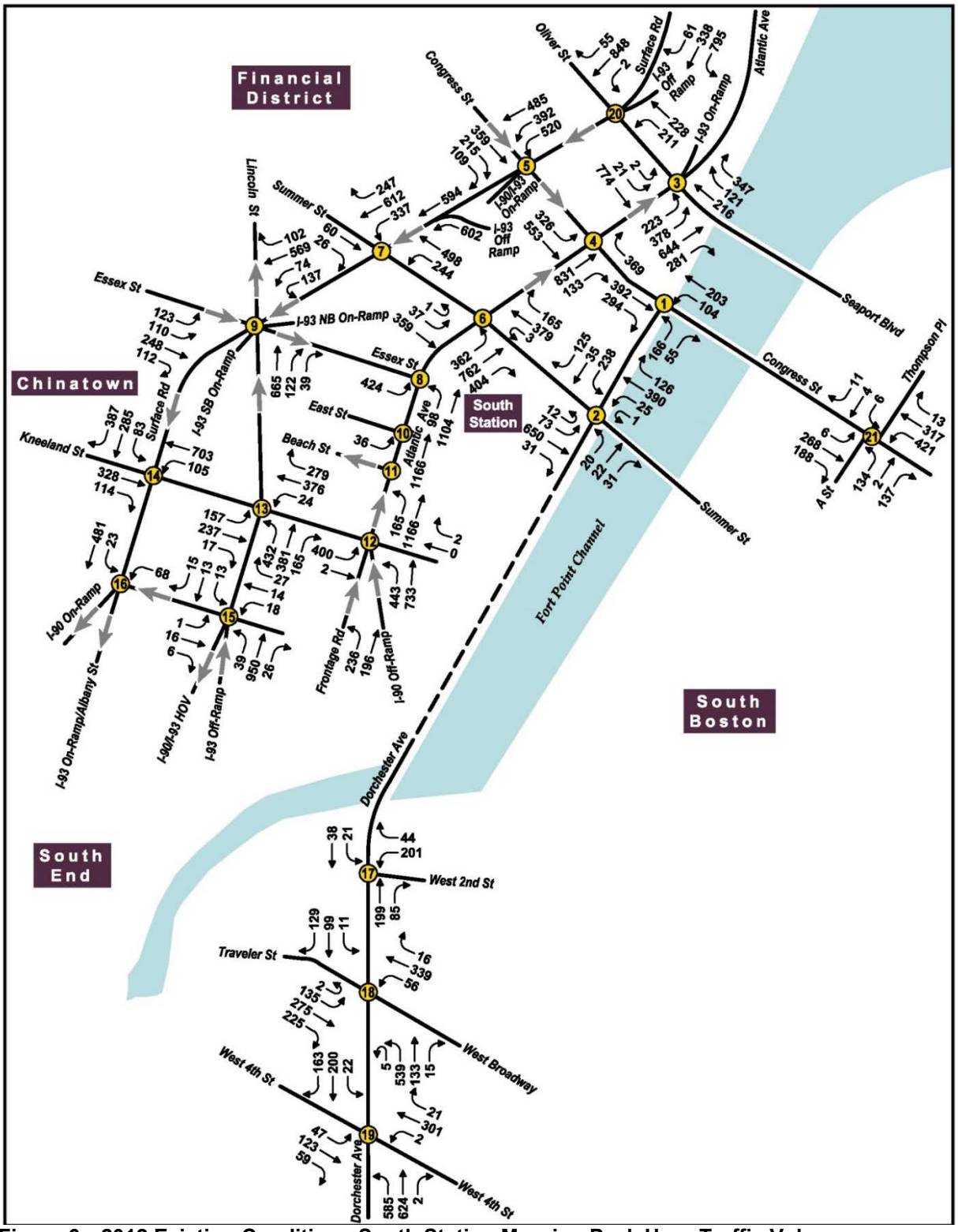

Figure 6—2012 Existing Condition - South Station Morning Peak Hour Traffic Volumes

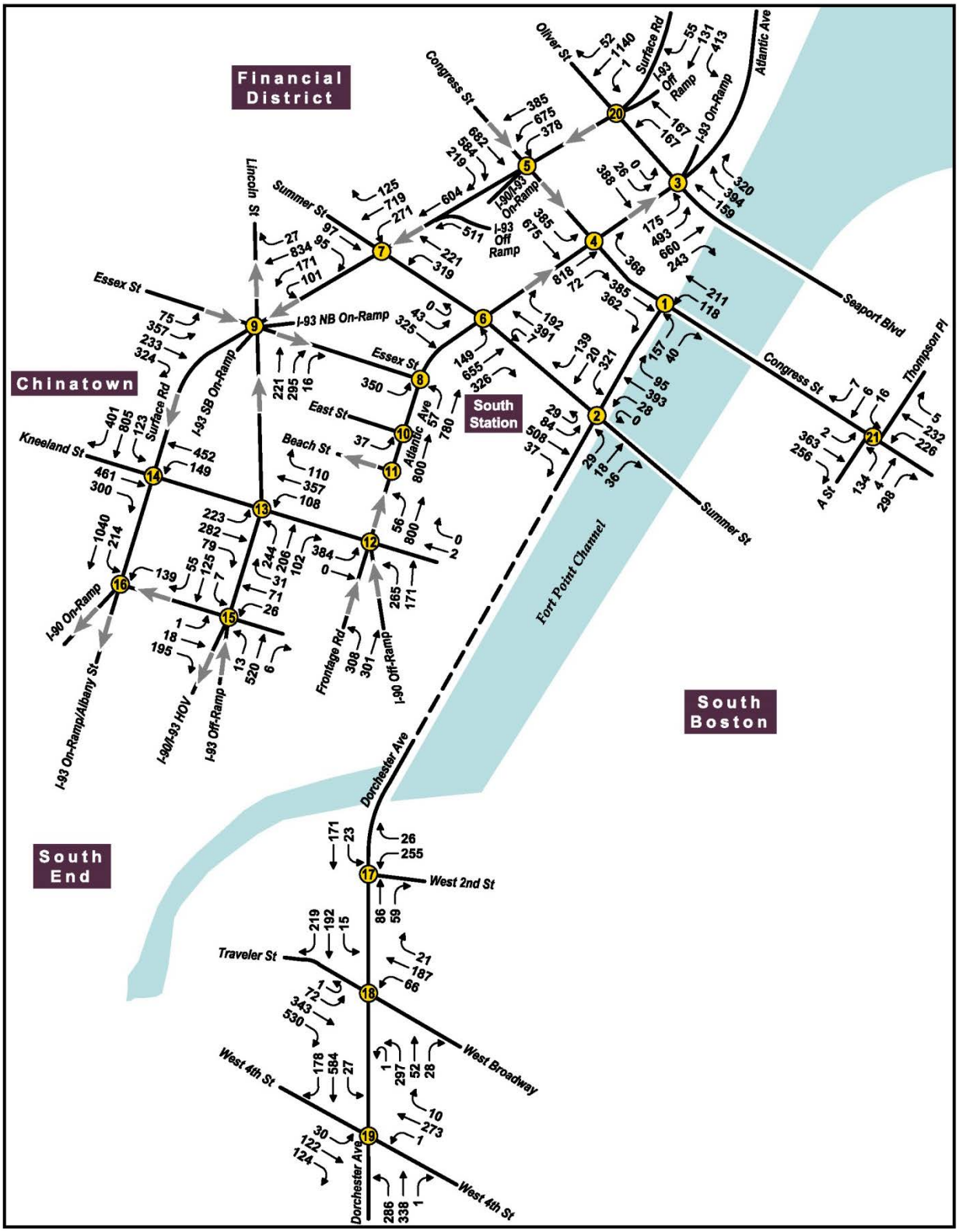

Figure 7—2012 Existing Condition - South Station Evening Peak Hour Traffic Volumes

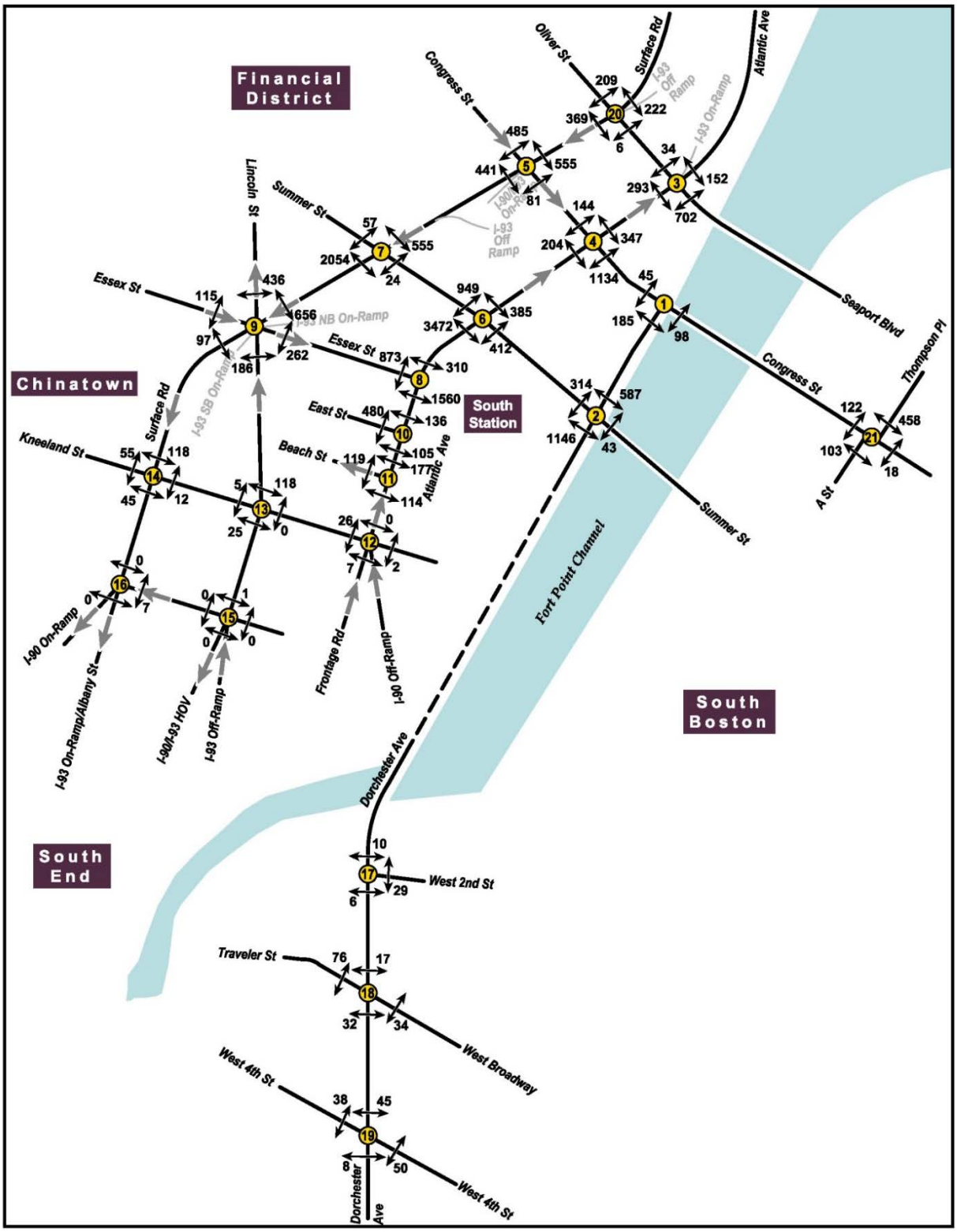

Figure 8—2012 Existing Condition - South Station Morning Peak Hour Pedestrian Volumes

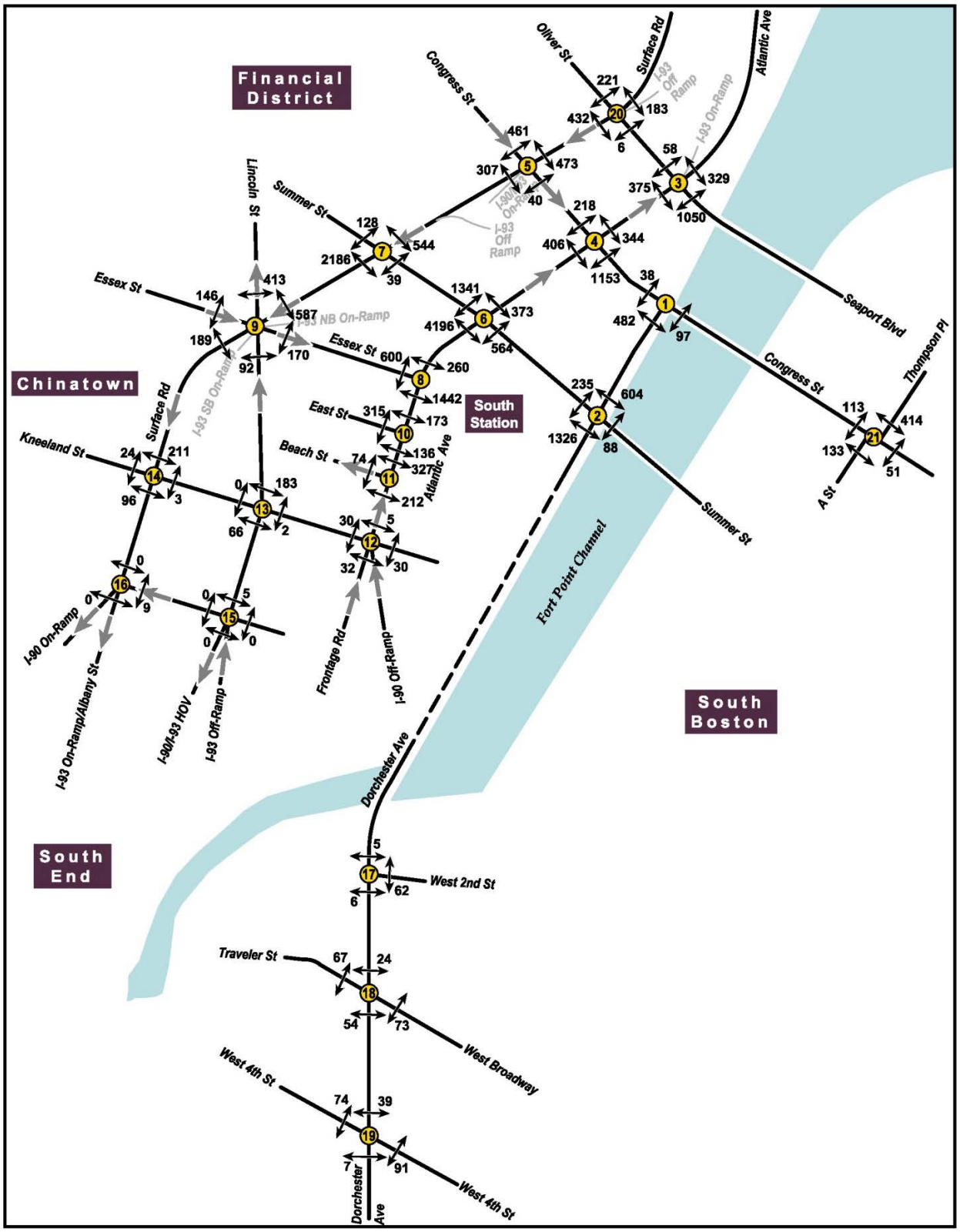

Figure 9—2012 Existing Condition - South Station Evening Peak Hour Pedestrian Volumes

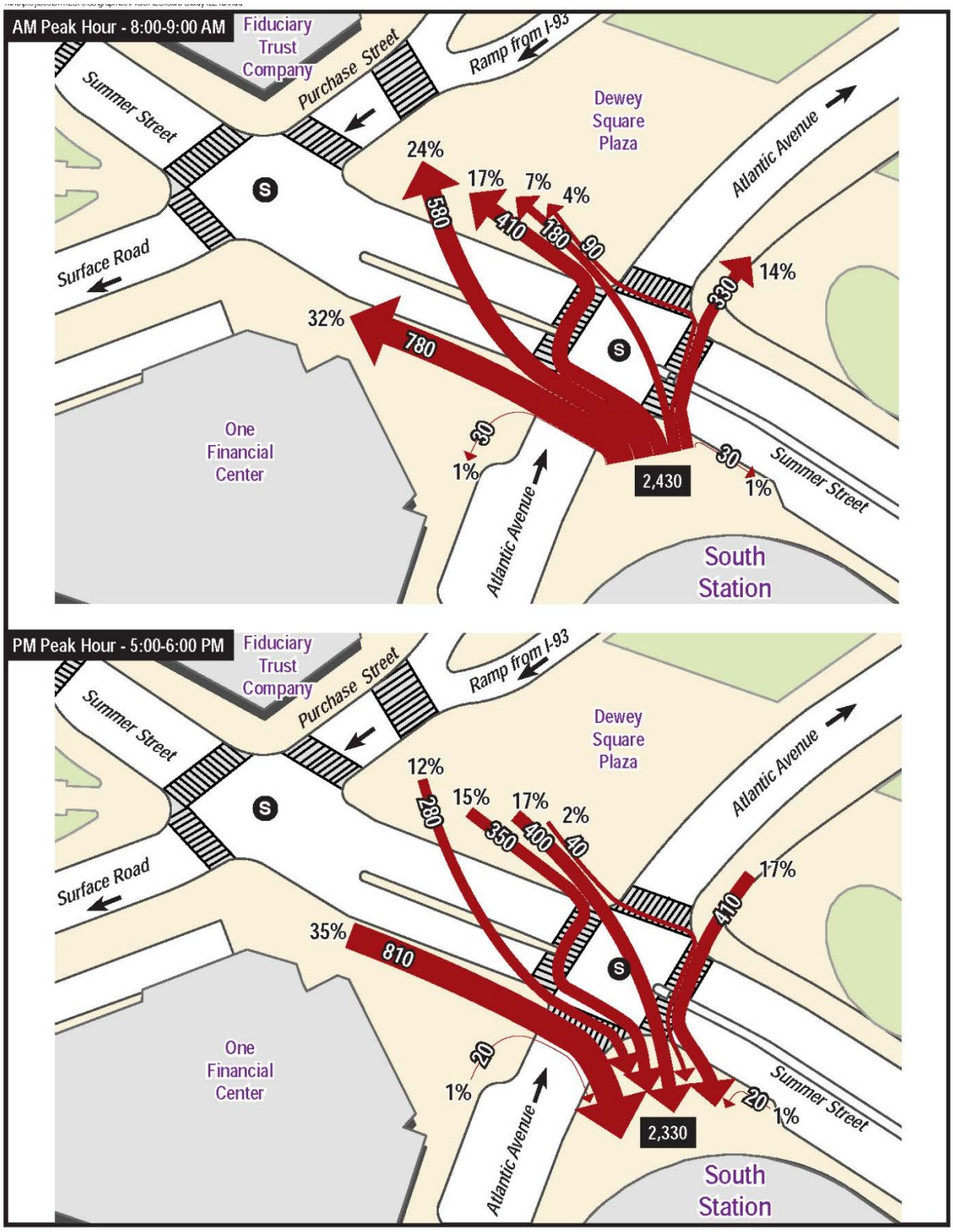

Figure 10—Dewey Square Pedestrian Desire Lines

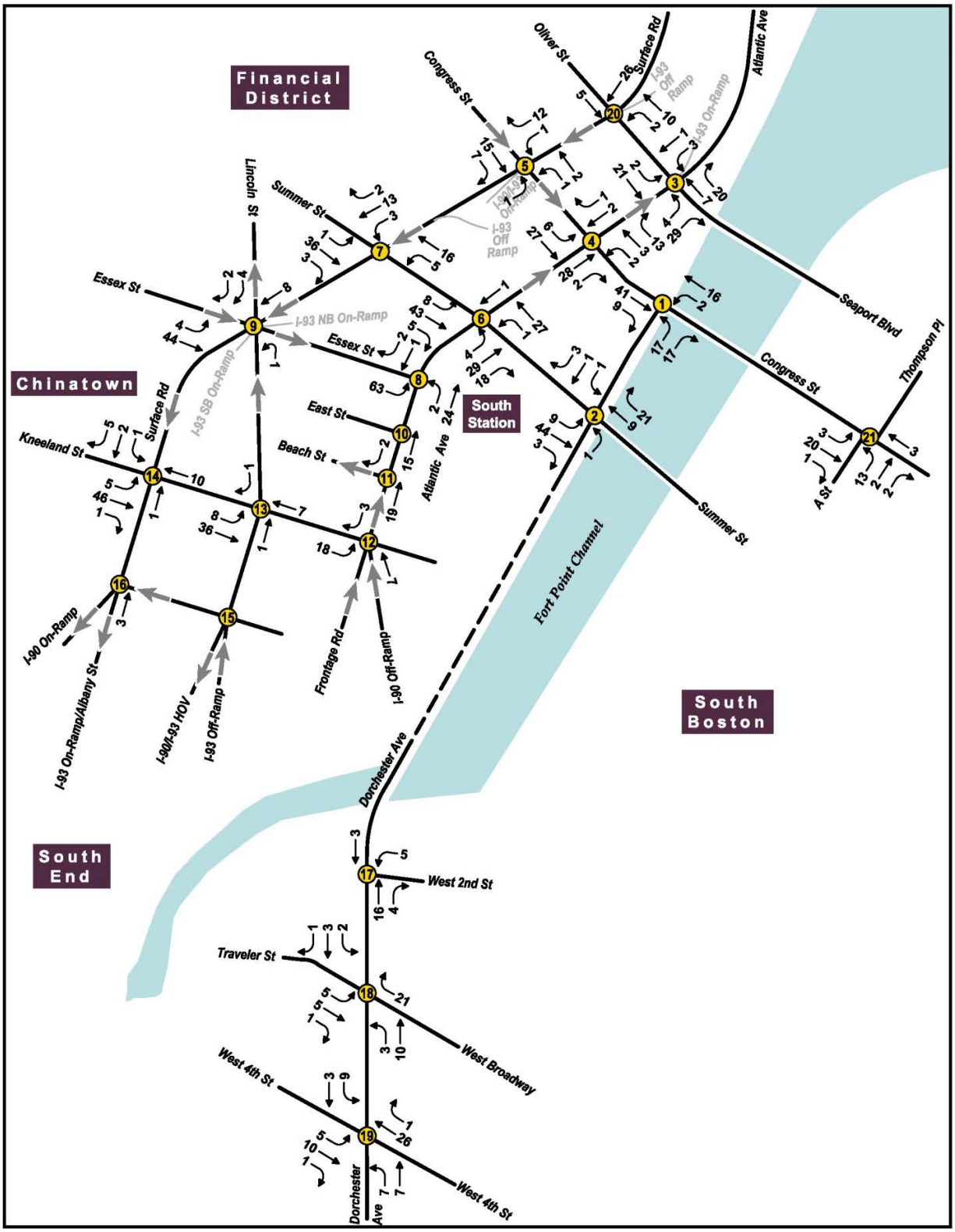

Figure 11—2012 Existing Condition - South Station Morning Peak Hour Bicycle Volumes

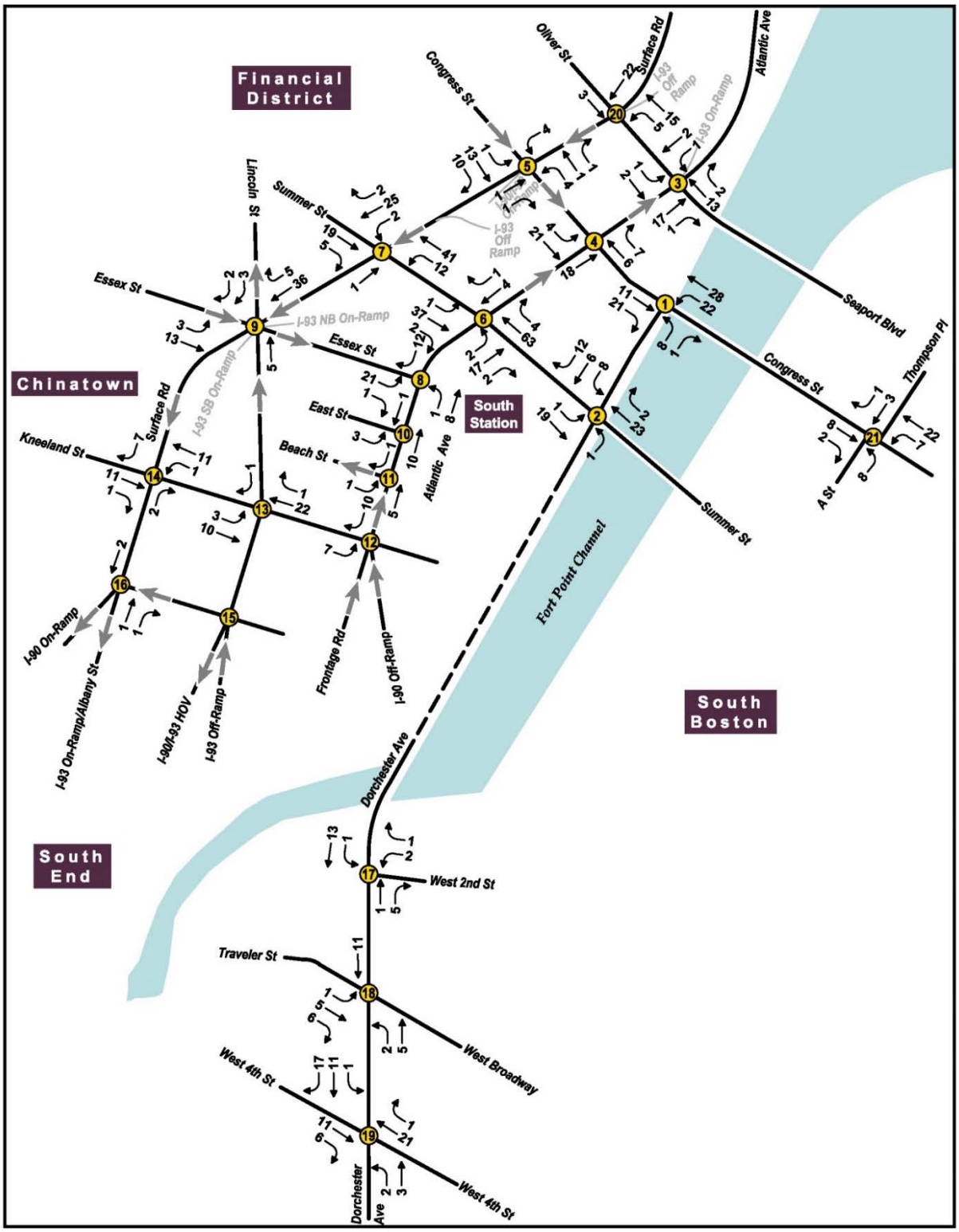

Figure 12—2012 Existing Condition - South Station Evening Peak Hour Bicycle Volumes

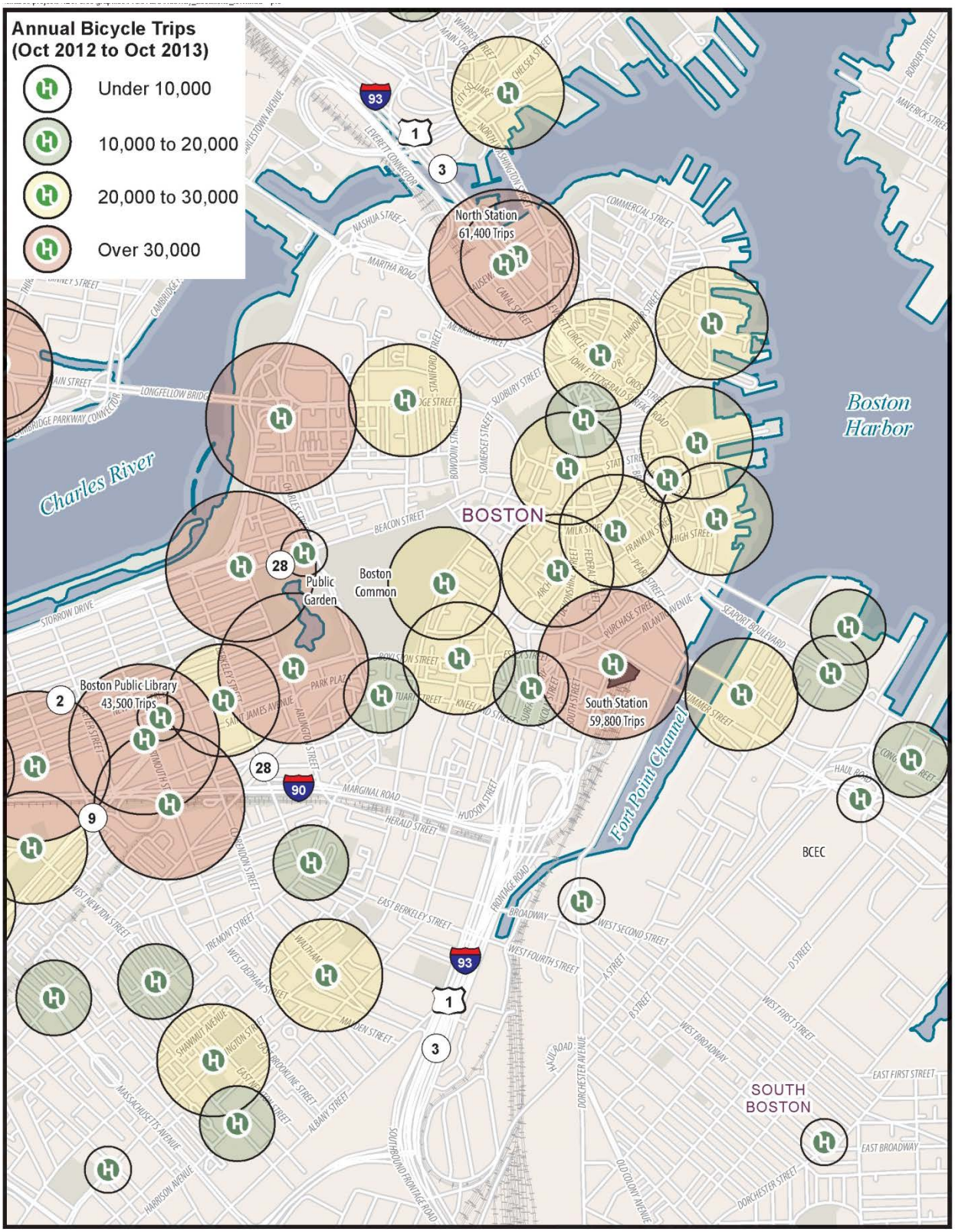

Figure 13—South Station Area Hubway Utilization – 2012 to 2013

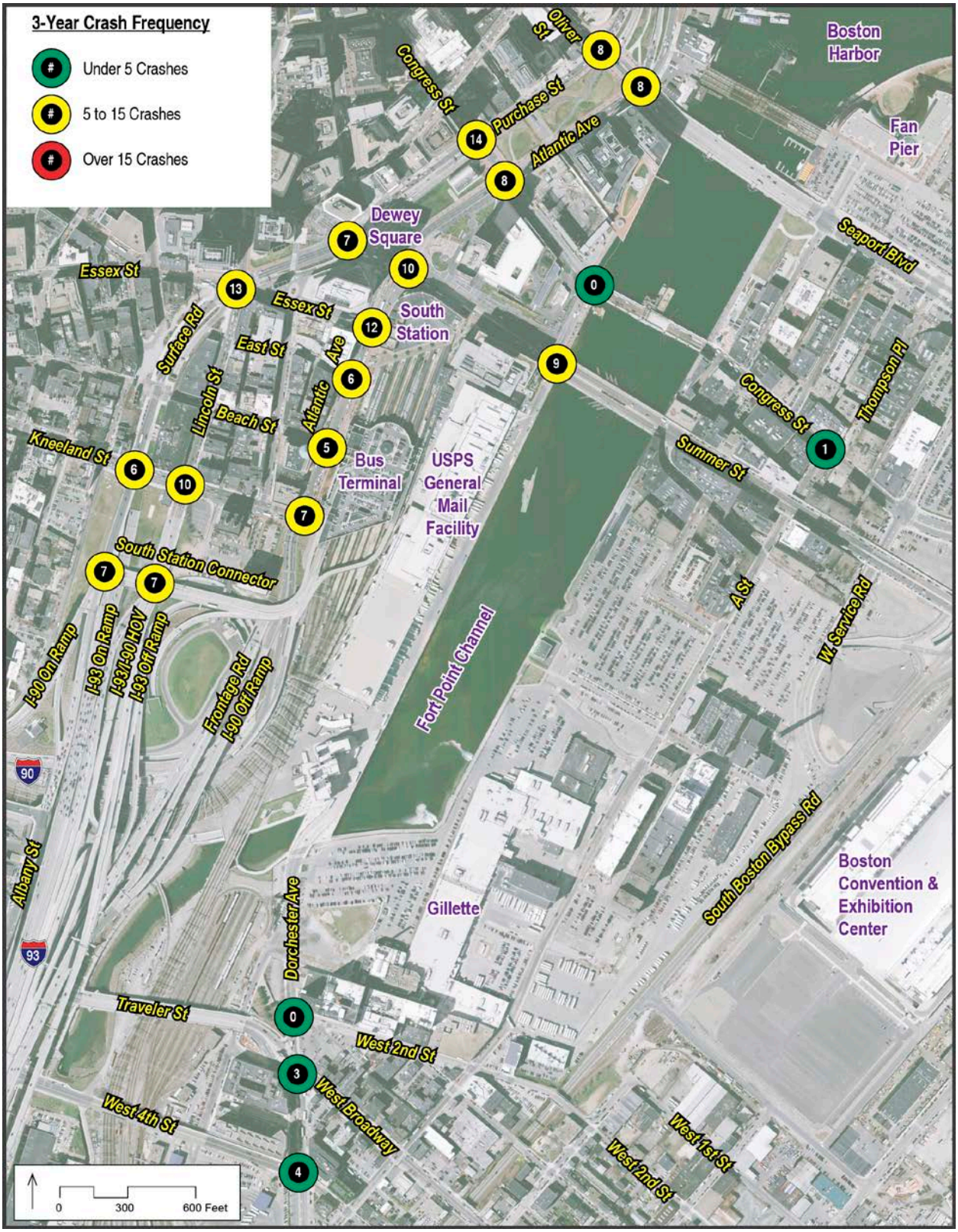

Figure 14—South Station Area Crash Frequency – 2010 to 2012

Figure 15—Amtrak Services from South Station

Source: MBTA. www.mbta.com

Figure 16—MBTA System Map

Figure 16 (continued)—MBTA System Map Detail

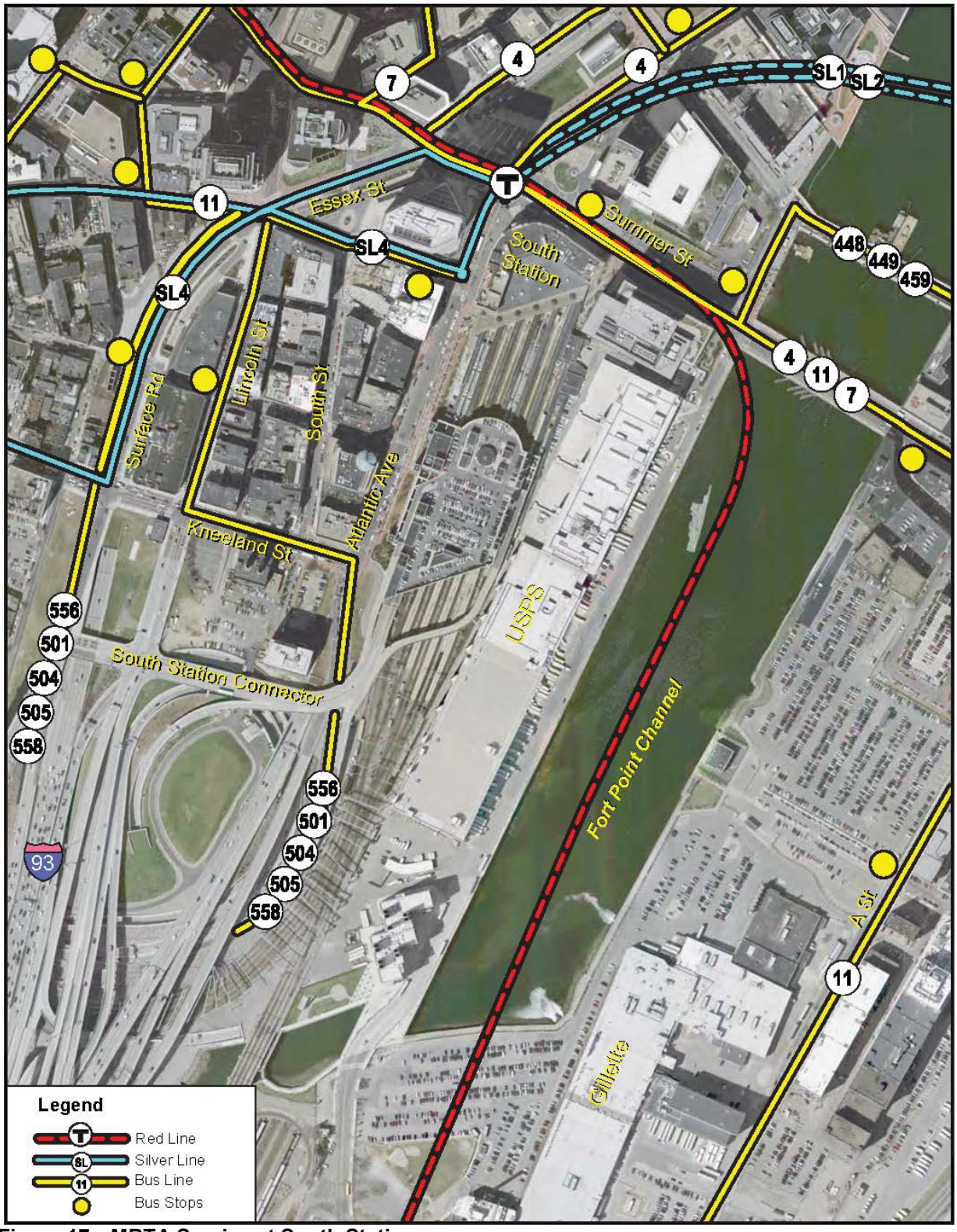

Figure 17—MBTA Service at South Station

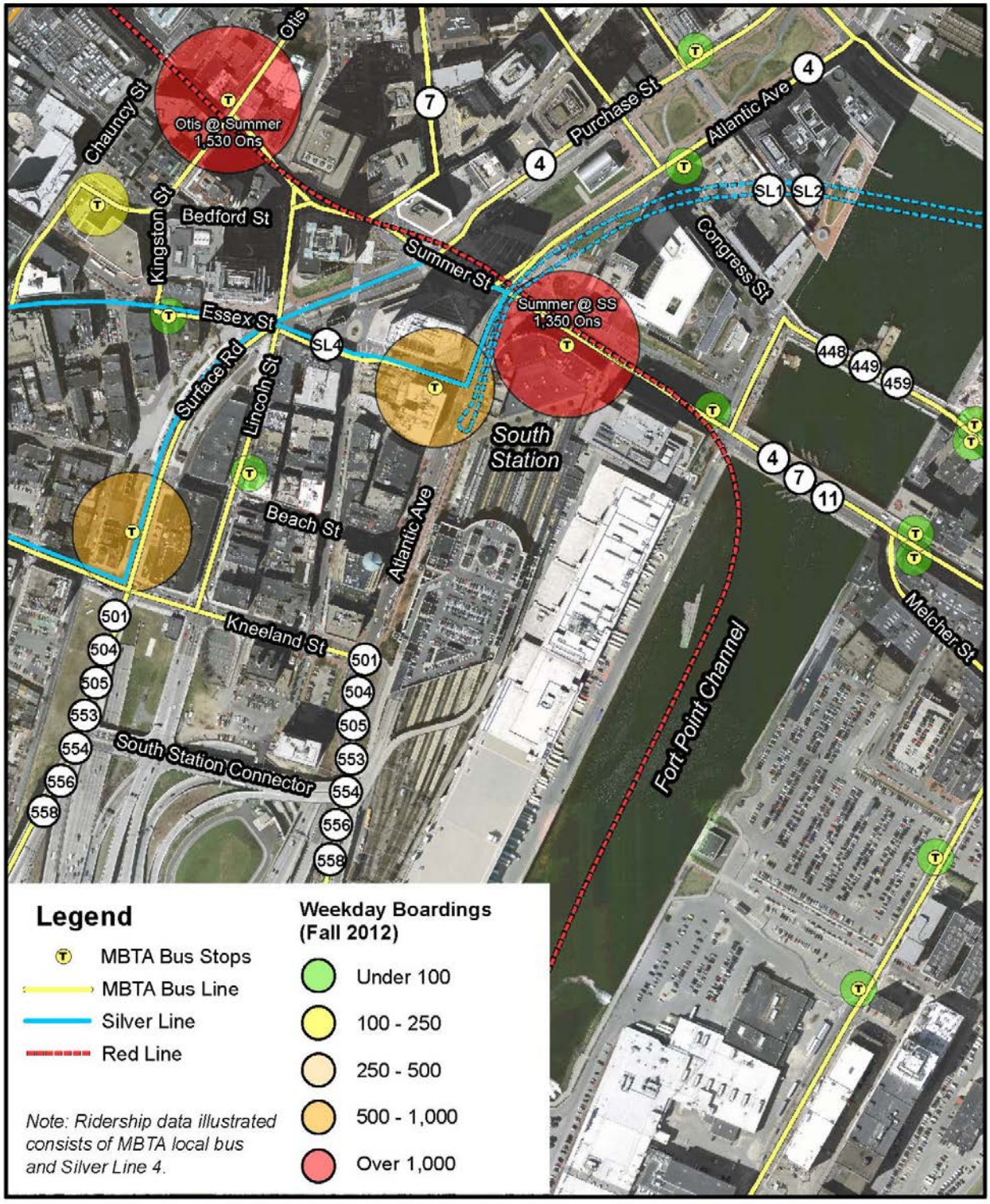

Figure 18—Existing MBTA Weekday Bus Boardings

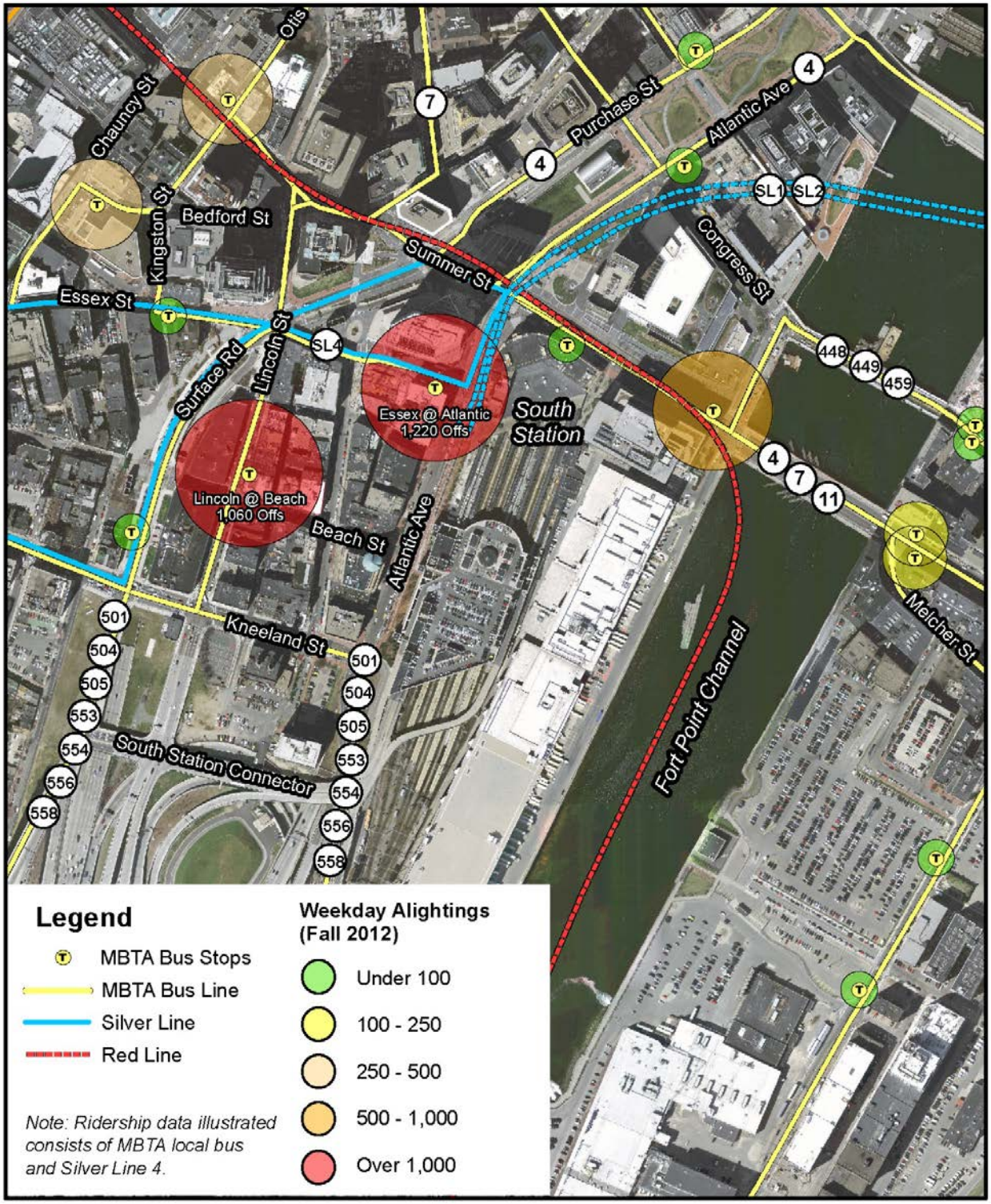

Figure 19—Existing MBTA Weekday Bus Alightings

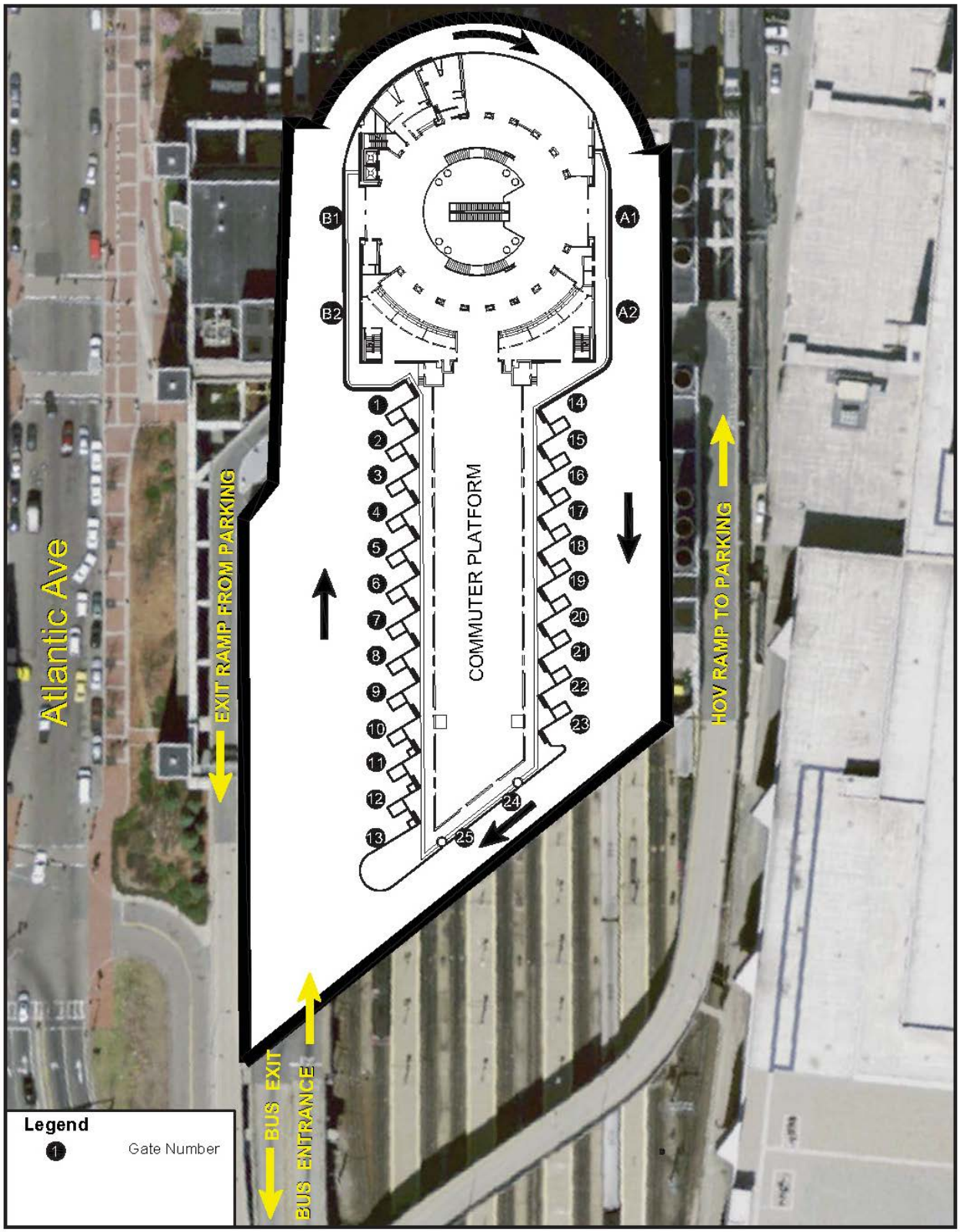

Figure 20—South Station Bus Terminal Circulation

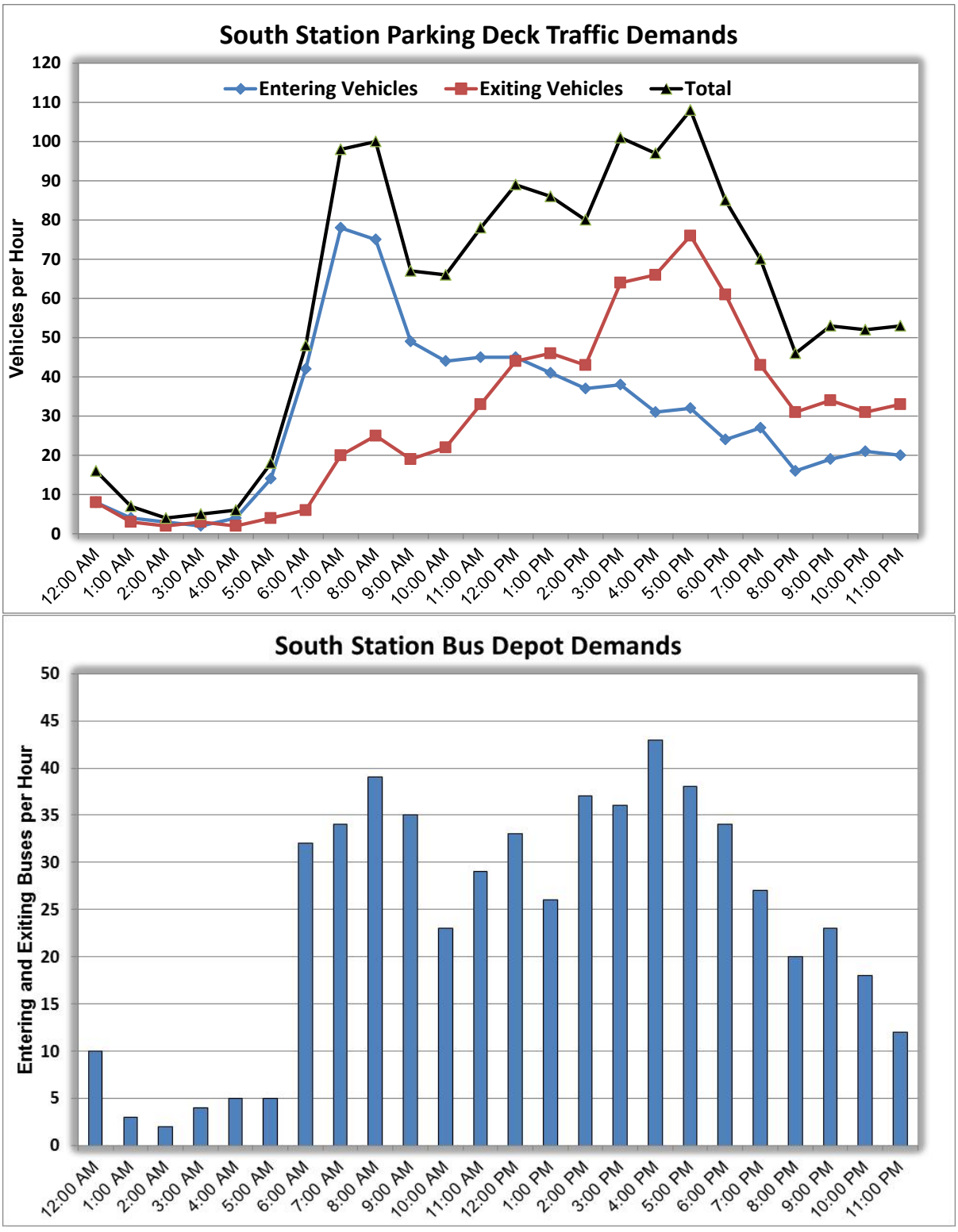

Figure 21—South Station Bus Traffic Demands

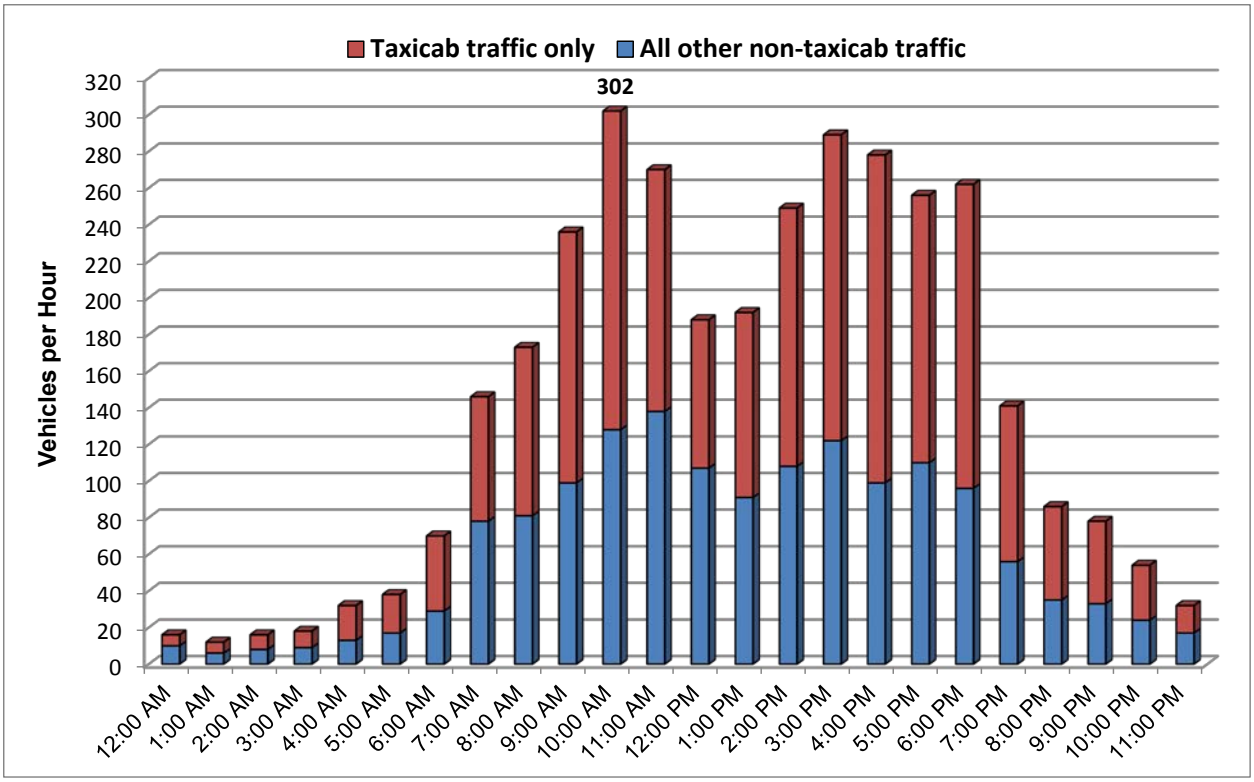

Figure 22—Atlantic Avenue Curbside Traffic Generation

Figure 23—South Station Curbside Issues

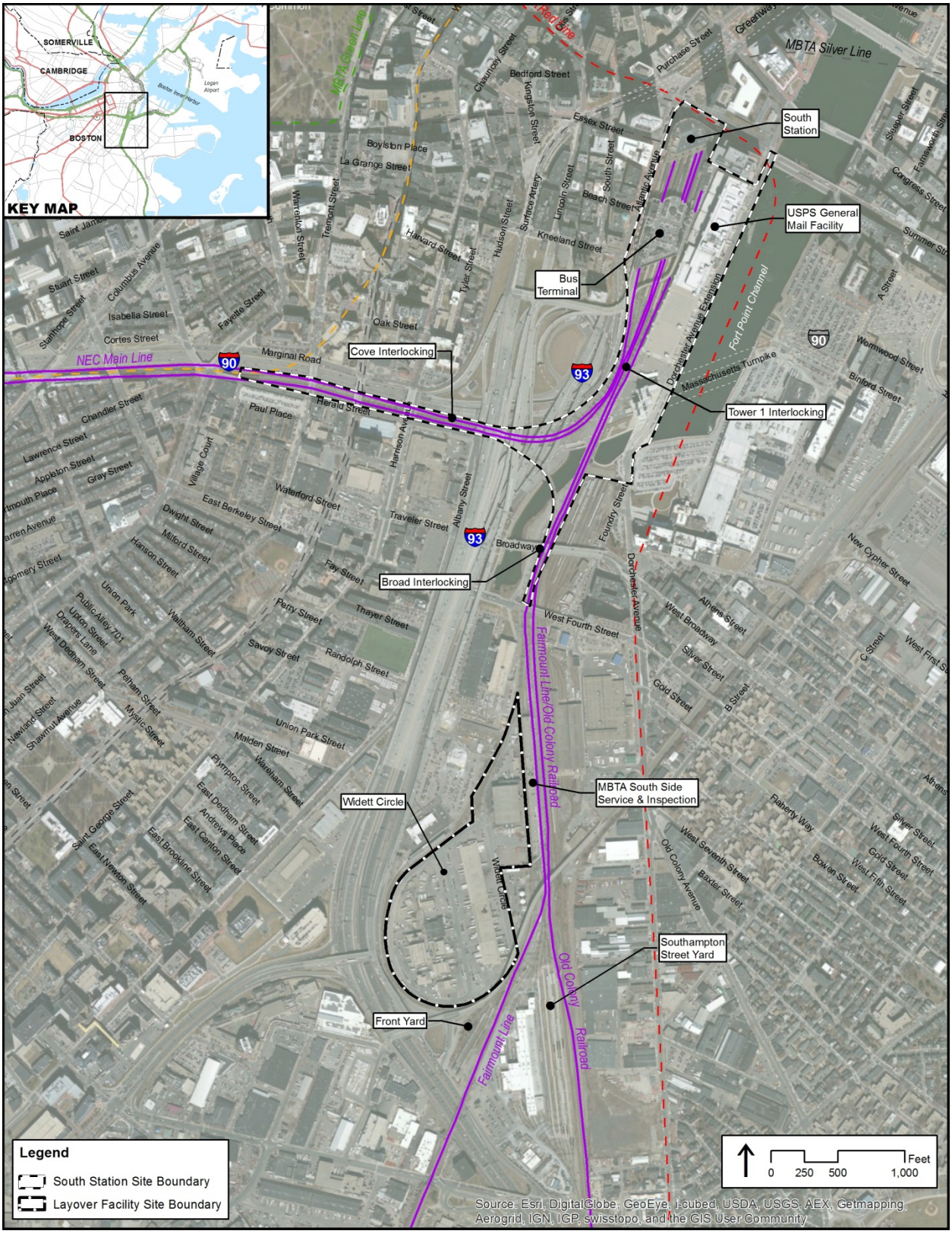

Figure 24—South Station and Widett Circle Layover Facility Site Boundaries

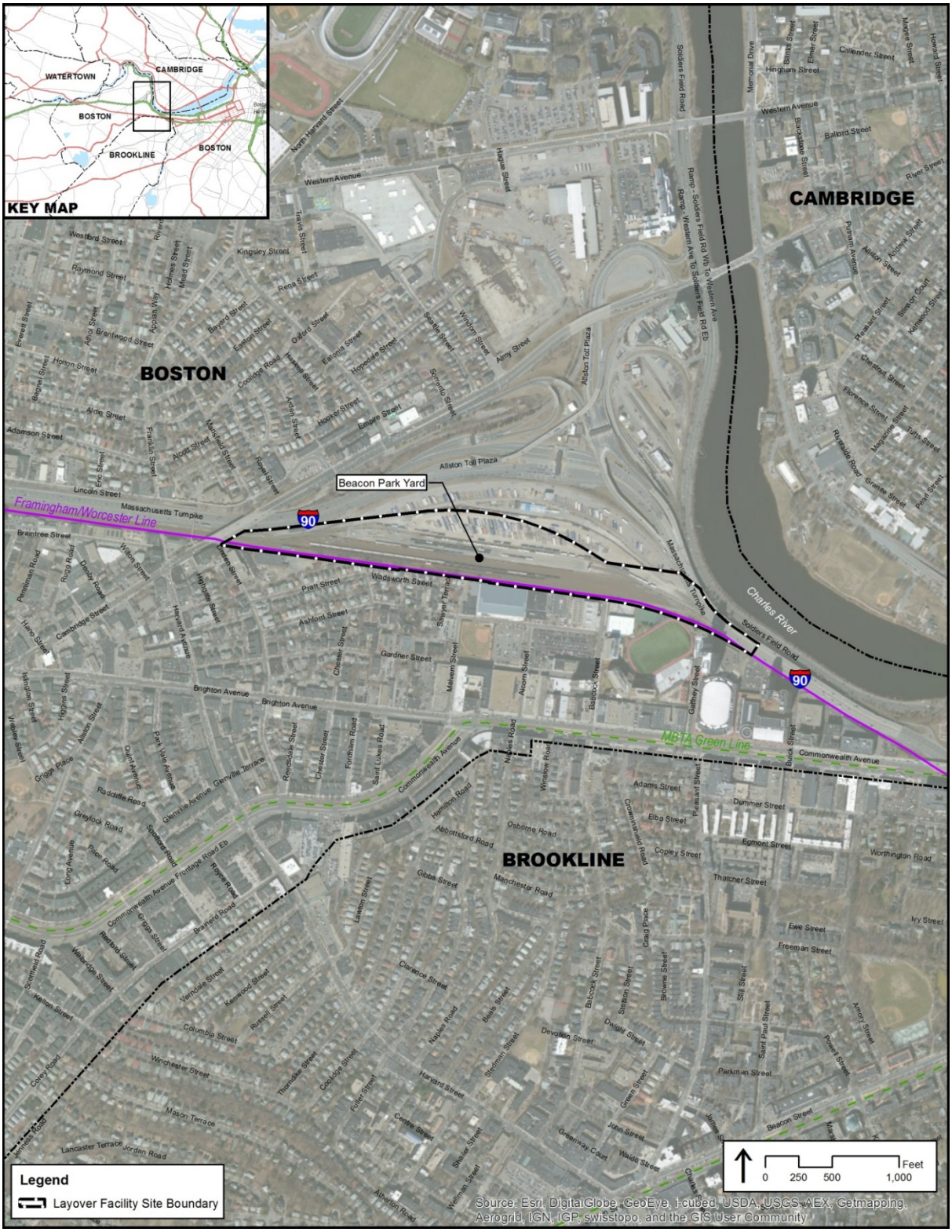

Figure 25—Beacon Park Yard Layover Facility Site Boundary

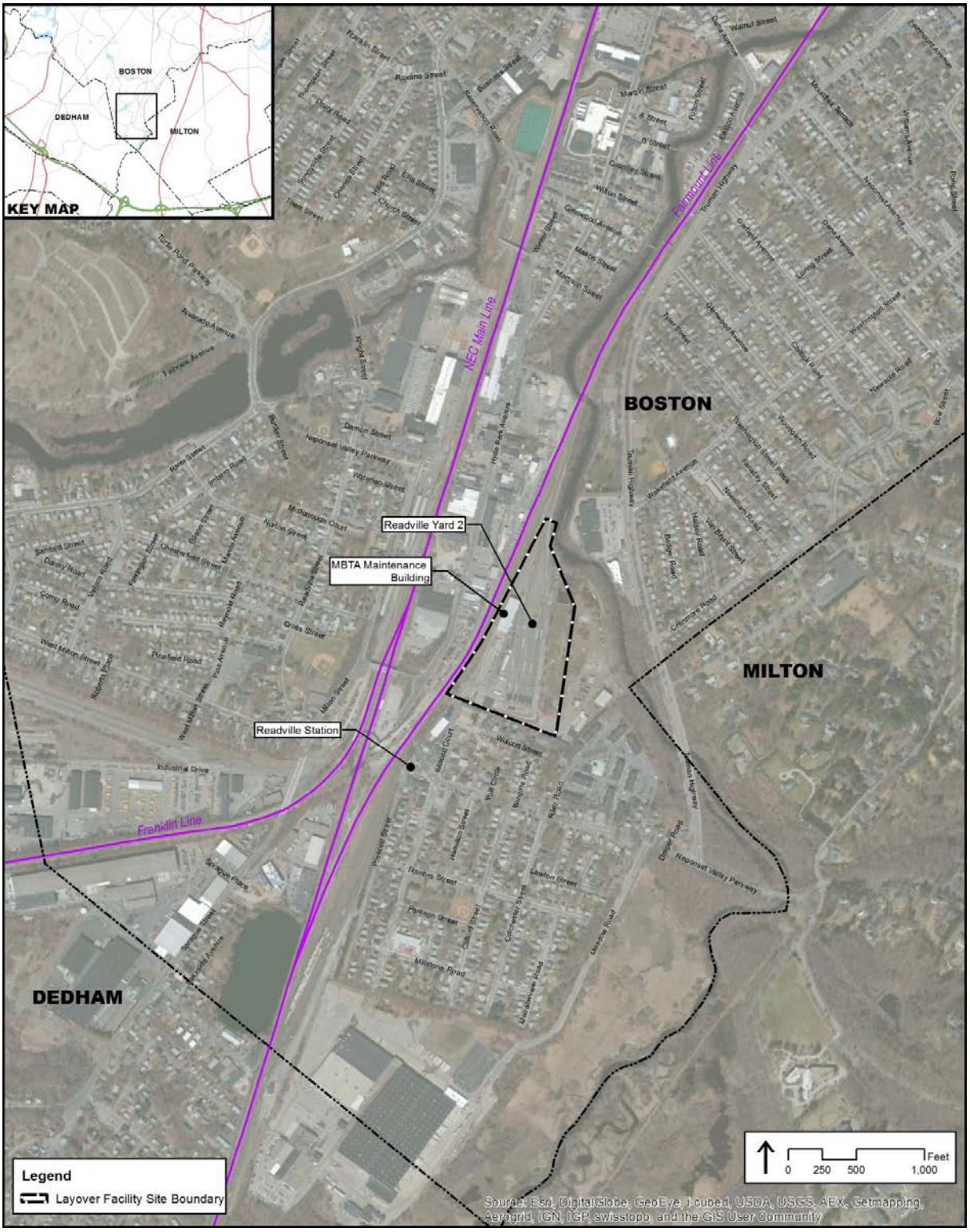

Figure 26—Readville-Yard 2 Layover Facility Site Boundary

Widett Circle

Beacon Park Yard

Readville Yard

Figure 27—Layover Facility Analysis Intersections

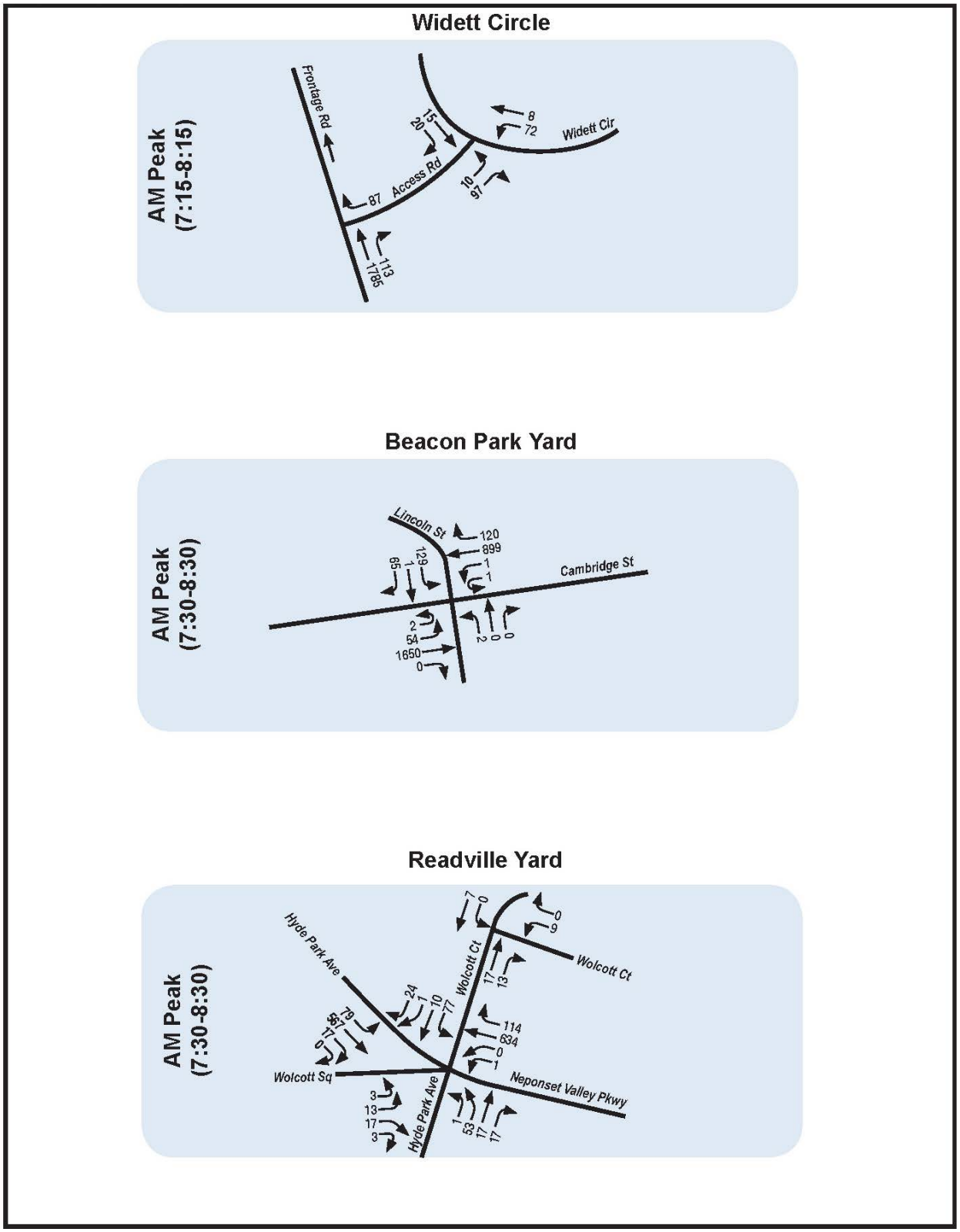

Figure 28—2012 Existing Condition - Layover Facility Morning Peak Hour Traffic Volumes

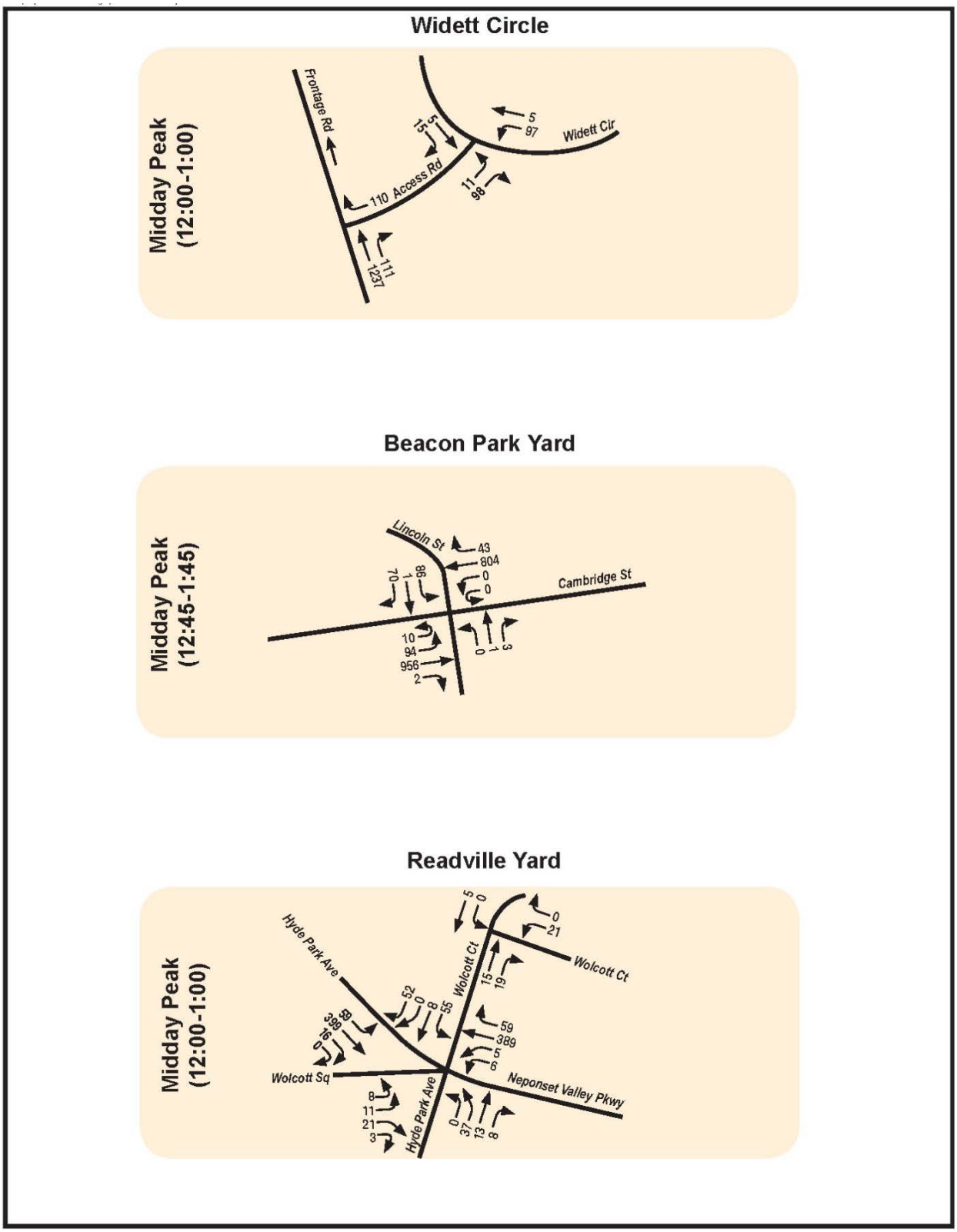

Figure 29—2012 Existing Condition - Layover Facility Midday Peak Hour Traffic Volumes

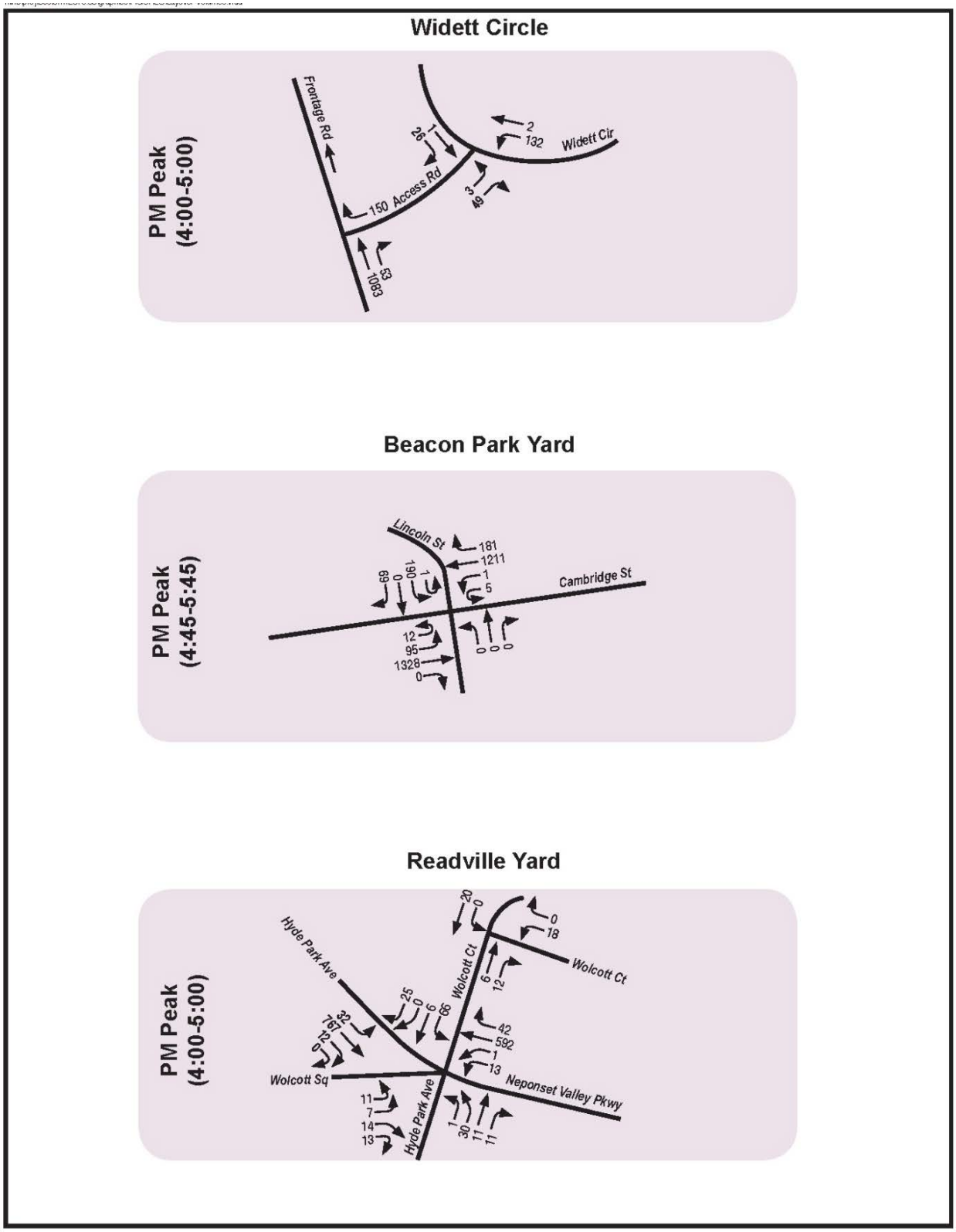

Figure 30—2012 Existing Condition - Layover Facility Evening Peak Hour Traffic Volumes

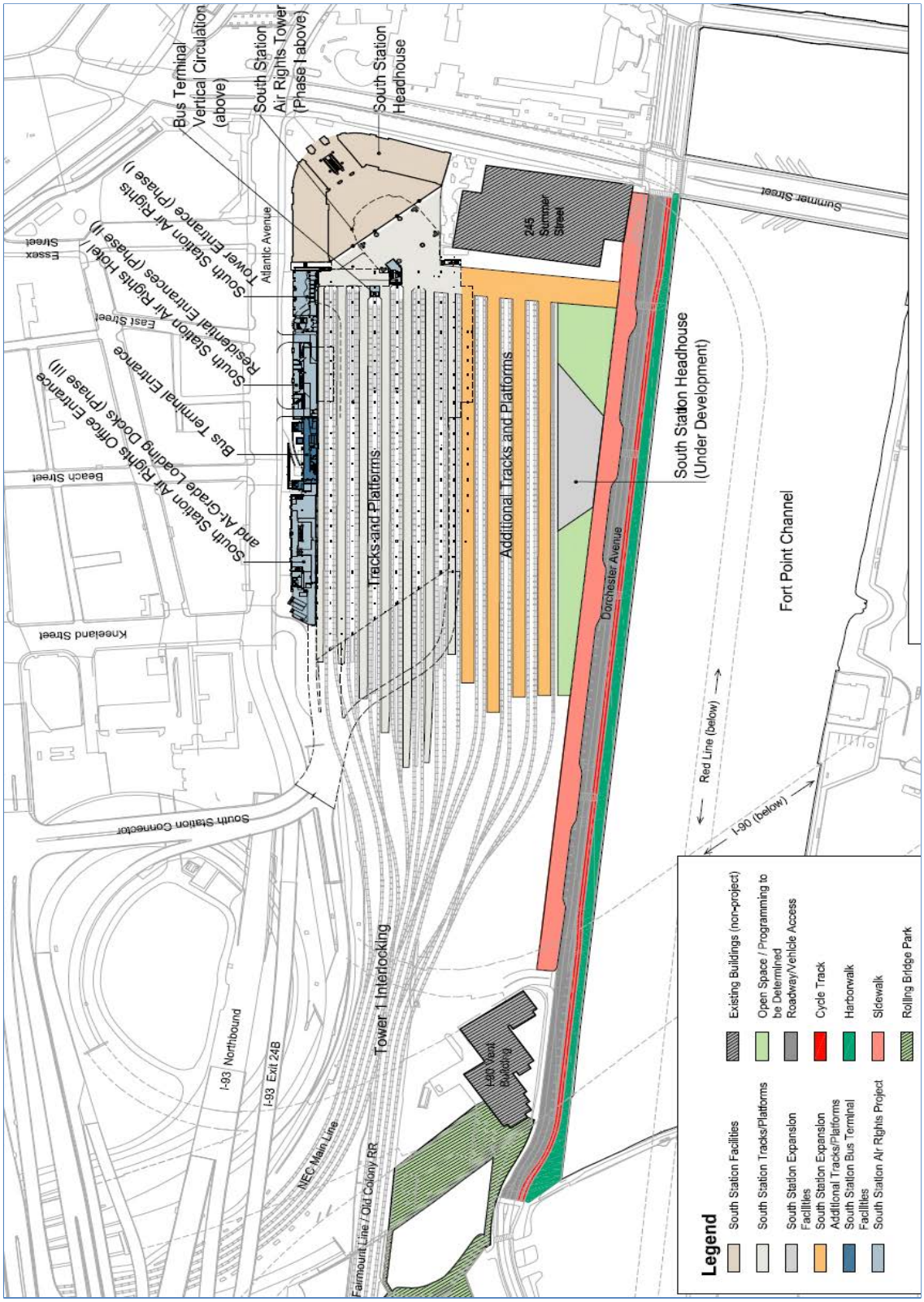

Figure 31—Alternative 1 Concept Plan

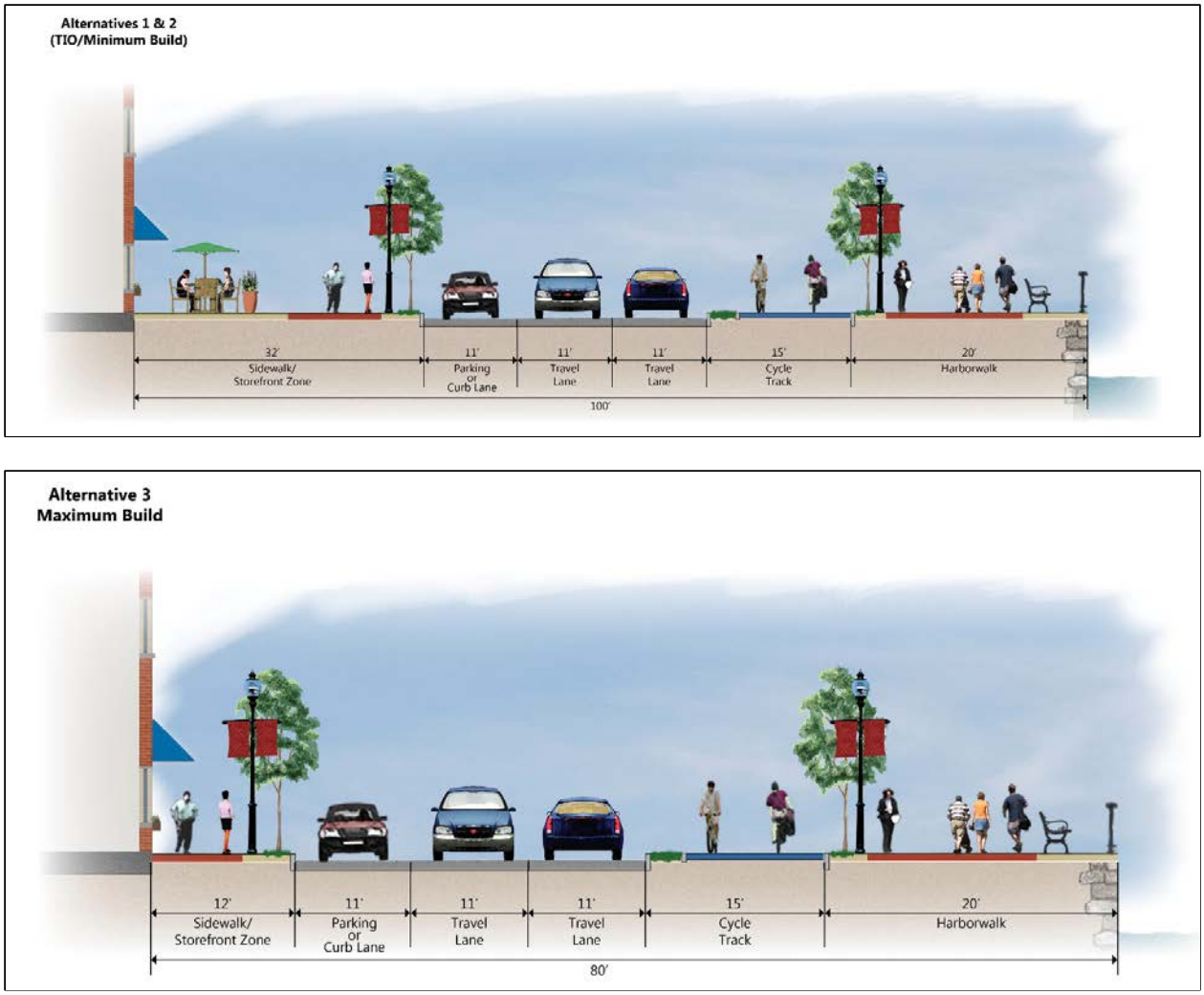

Figure 32—Dorchester Avenue Typical Cross-Section

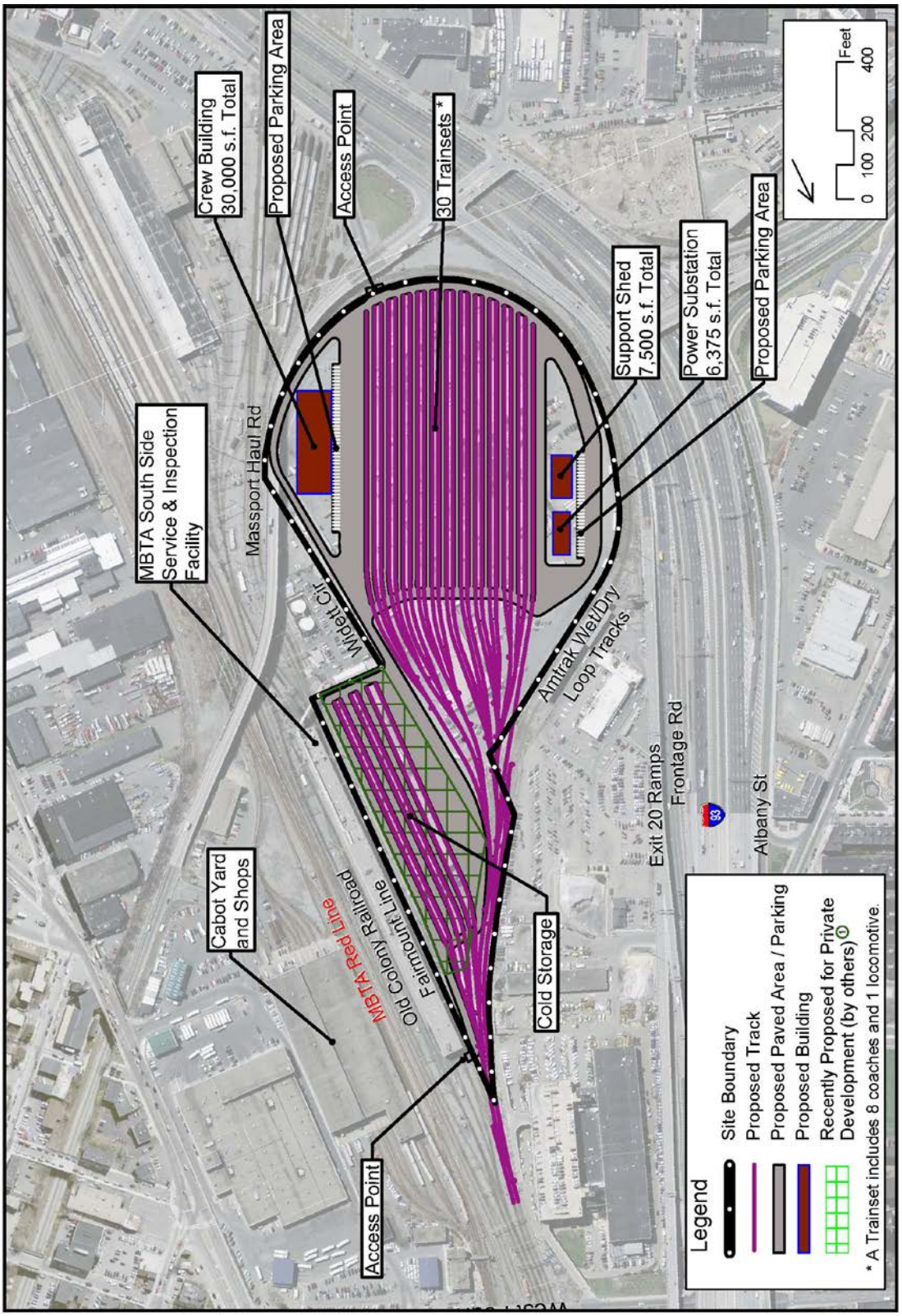

Figure 33—Widett Circle Layover Facility Site Plan

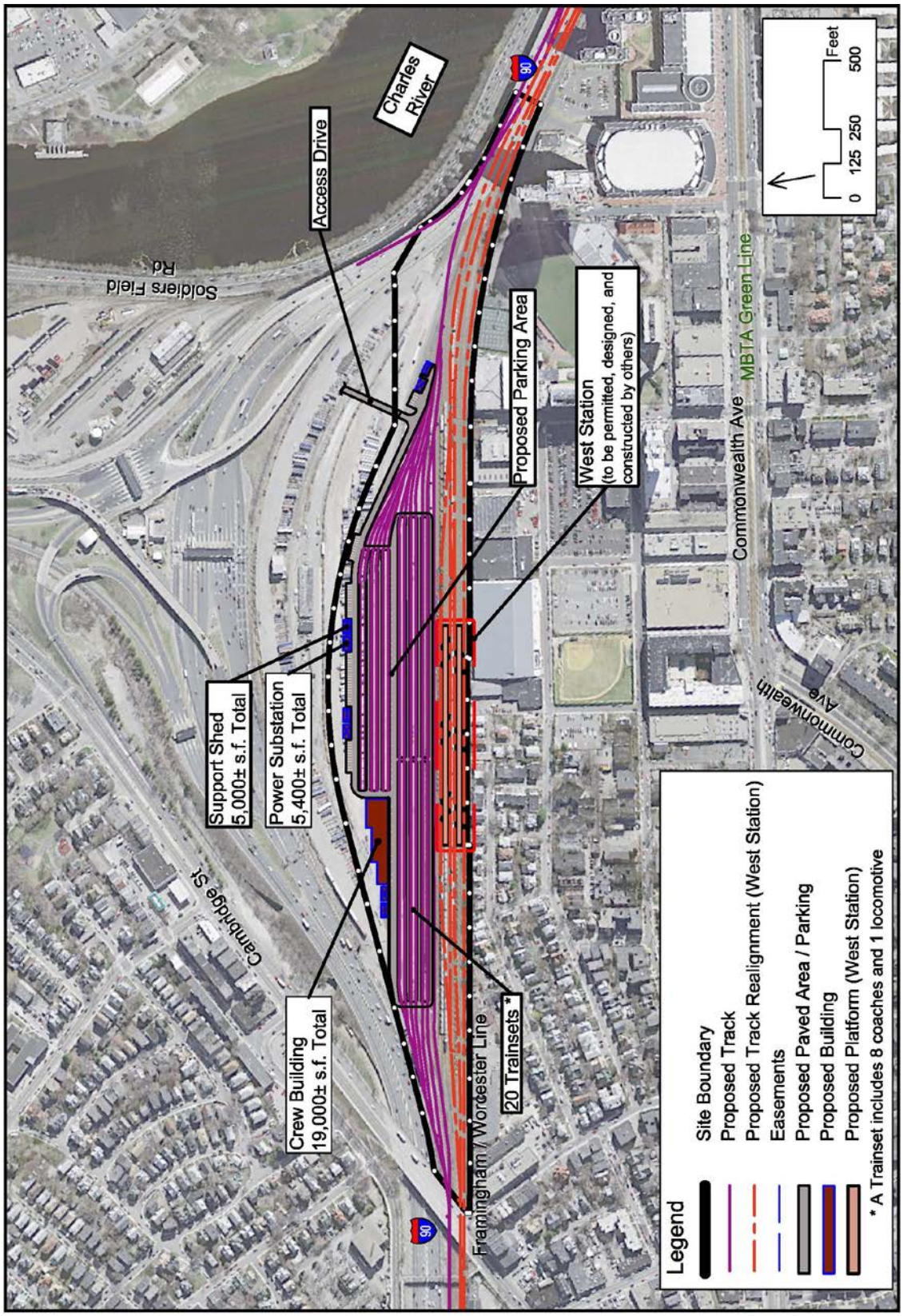

Figure 34—Beacon Park Yard Layover Facility Site Plan

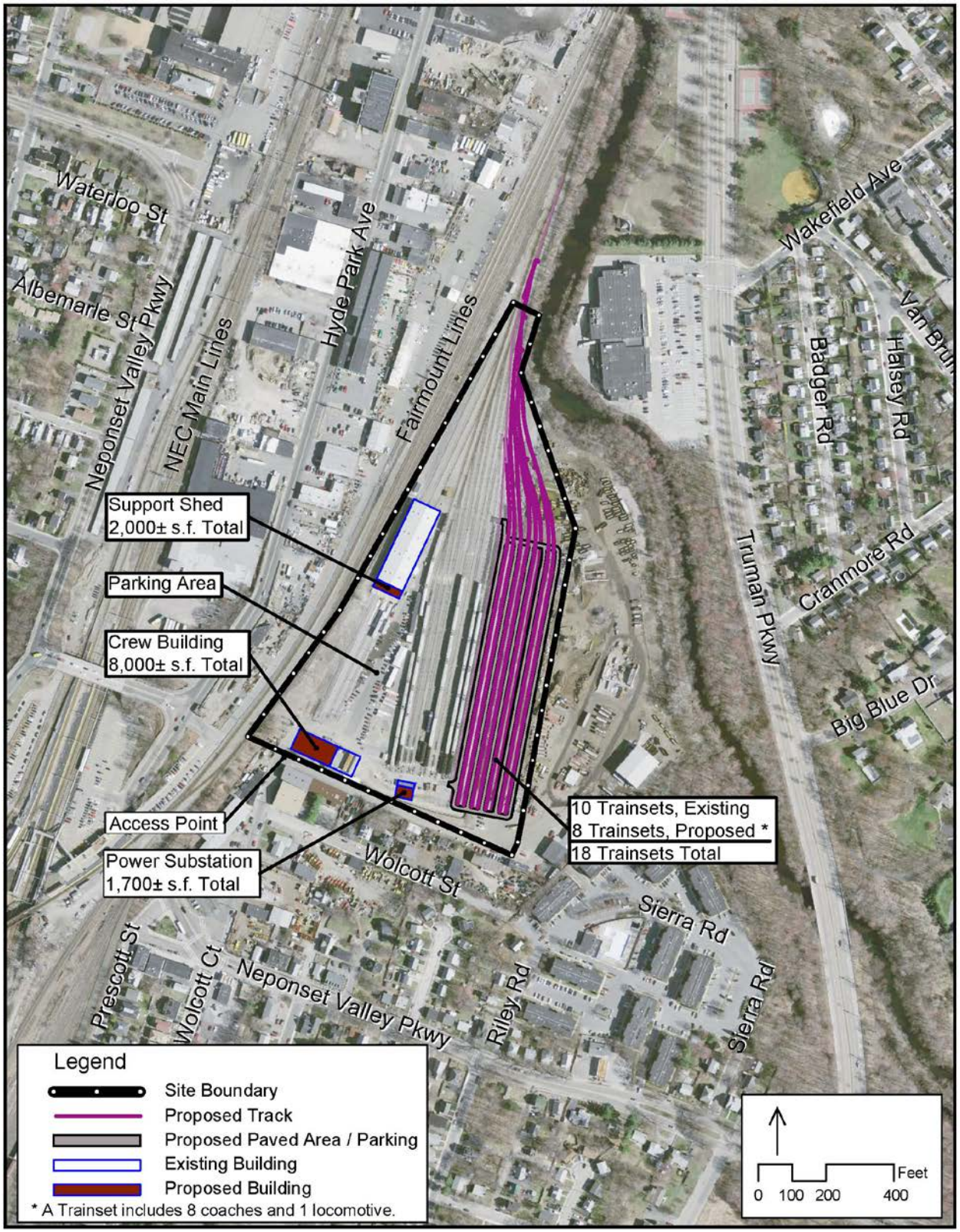

Figure 35—Readville-Yard 2 Layover Facility Site Plan

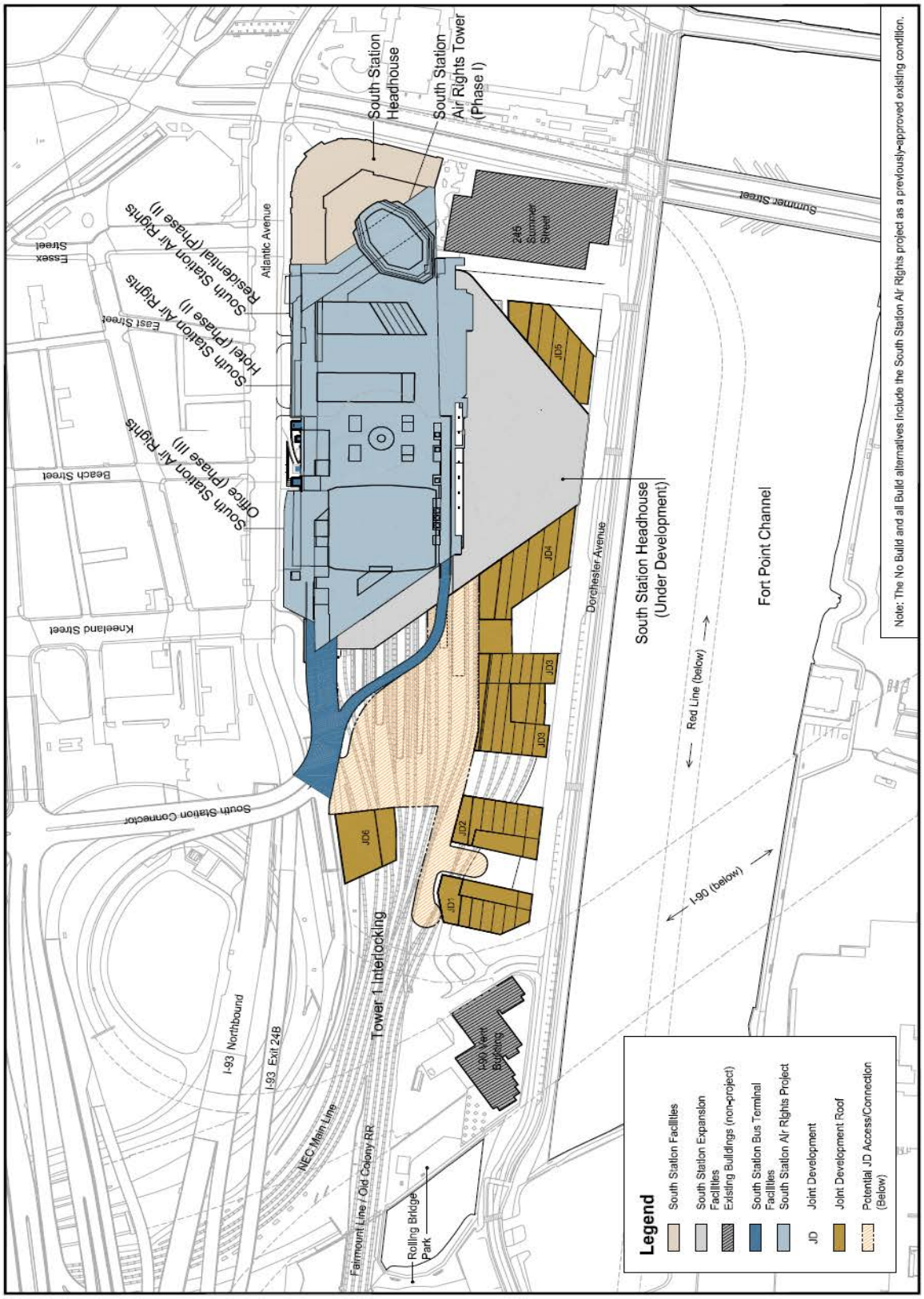

Figure 36—Alternative 2 Concept Plan

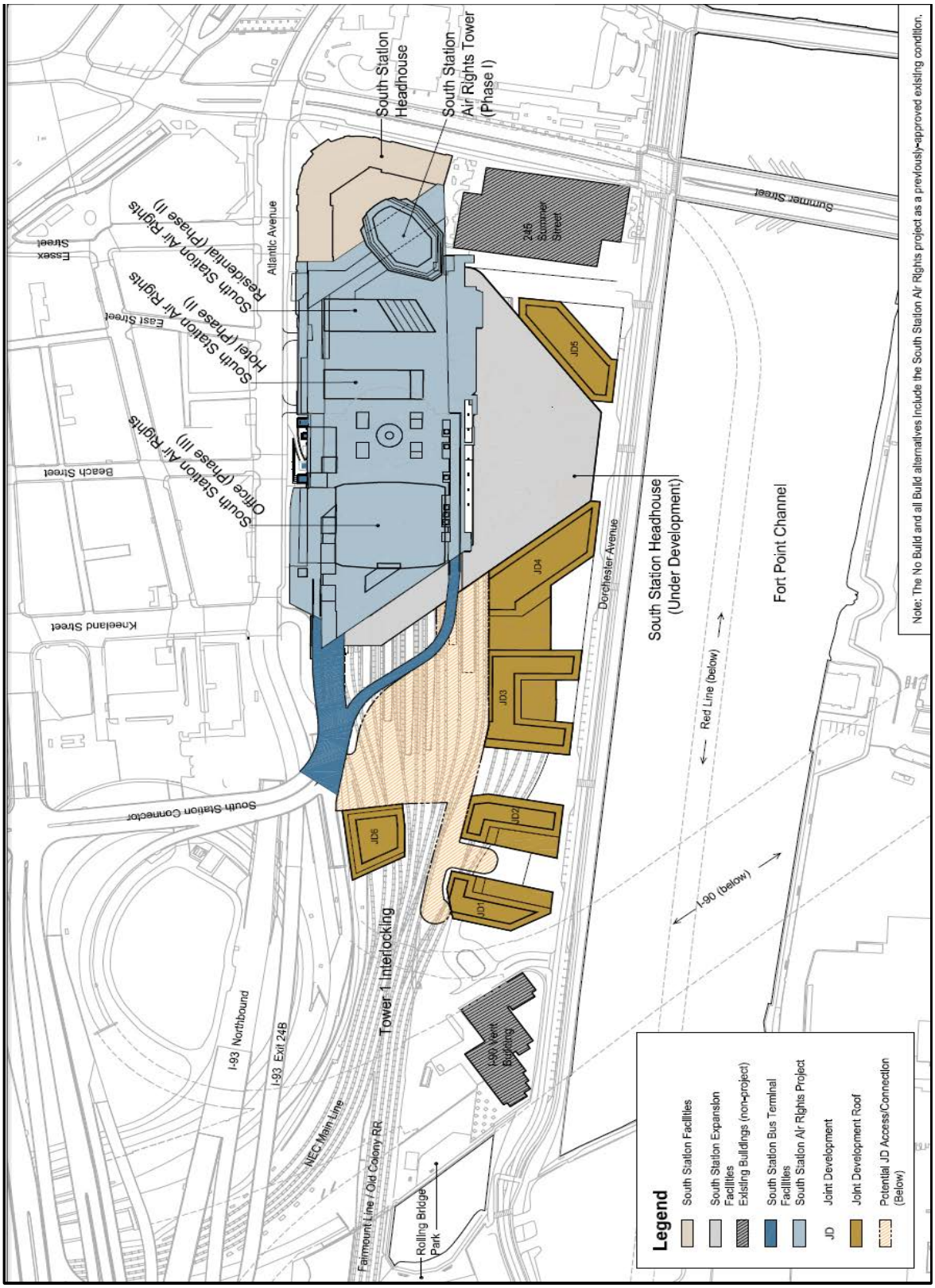

Figure 37—Alternative 3 Concept Plan

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