# Notice of Project Change

# STAVIS SEAFOODS DEVELOPMENT

## Boston, Massachusetts

Submitted to:

The Boston Planning & Development Agency

Submitted by:

MP MMT Development Co LLC

Prepared by:

Epsilon Associates, Inc.

November 15, 2016

Epsilon
ASSOCIATES INC.

November 15, 2016

Brian P. Golden, Director
Boston Planning & Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201-1007

**Subject:** **Notice of Project Change**
**Stavis Seafoods Development Project, Raymond L. Flynn Marine Park,**
**(formerly referred to as the "Boston Cargo Terminal Project")**
**Boston, Massachusetts**

Dear Director Golden:

This Notice of Project Change ("NPC") is being submitted in accordance with Article 80A-6, *Project Changes and Lapses of Time,* of the Boston Zoning Code (the "Code") on behalf of Millennium Partners and its affiliate, MP MMT Development Co LLC (together, the "Proponent"), for the Stavis Seafoods Development Project (the "Project," formerly referred to as the "Boston Cargo Terminal Project") proposed for a 7.2-acre portion of the larger 29.8-acre site most recently contemplated for the Project. Although projects on lands under the control of the Massachusetts Port Authority (Massport) are not subject to the Code or other local zoning regulations, the Proponent agreed to undergo voluntary development review of the Project consistent with the provisions of Article 80 of the Code. The updated Project is now anticipated to include the construction of a single, two-story, approximately 201,000 square-foot building housing the Stavis Seafoods fish processing facility, executive offices for Stavis Seafoods, and room for future intermodal marine industrial and/or marine industrial support facilities.

The 7.2-acre "Project Site" is located within the approximately 40-acre Massport Marine Terminal (MMT), which, in turn, is located entirely within the Raymond L. Flynn Marine Park (the "RLFMP" - formerly the Boston Marine Industrial Park) in South Boston. The relationship of the Project Site boundaries to those of the larger 29.8-acre site most recently contemplated for the Project, the MMT, and the RLFMP are shown on Figure 1, *Site Context Map* (all referenced figures are included in Attachment A, *Figures*). As shown on Figure 1, the Project Site is bounded by Fid Kennedy Avenue to the south, the Boston Inner Harbor to the north, and MMT lands to the east and west. The Project Site is owned by the Boston Planning and Development Agency / Economic Development and Industrial Corporation of

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Boston, and is under a long-term lease to the Massachusetts Port Authority ("Massport") through February 2070. Pursuant to a development agreement with Massport, the Proponent intends to enter into a long-term sublease with Massport to develop the Project Site. The Proponent no longer has rights to develop the balance of the larger 29.8-acre site, and understands that Massport is considering various RFP proposals for potential separate development of the remaining portion of the property. A "Conceptual Parcel Framework" map reproduced from the *Massport Marine Terminal Request for Proposals* issued by Massport on February1, 2016 is presented in Figure 2, *Massport Marine Terminal Conceptual Parcel Framework, 2016*. Any future development of the balance of the Project Site as proposed in the 2014 NPC is anticipated to be permitted by Massport or its tenants separately from the Project.

As noted above, the Project Site is located within the boundary of the area previously contemplated for the Project, but has been reduced in size. The earlier Project included three buildings totaling approximately 510,552 square feet of floor area and an approximately 4.3 acre area designated for a future bulk cargo handling facility, all located on approximately 29.8 acres of underutilized and generally paved land. A comparison to site plan contemplated Project in 2014 to that currently envisioned is presented in Figure 3, *2014 NPC Conceptual Site Plan*.

The revised Project described in this NPC calls for the development of an intermodal marine industrial facility, a significant portion of which will be devoted to fish processing and distribution. More specifically, the Project will be developed as a multi-tenant terminal integrating seafood processors, cold storage facilities, warehouse distribution facilities and associated offices.

## Project Background

On June 15, 2007, the Proponent submitted a Project Notification Form (the "PNF") to the Boston Redevelopment Authority (now known as the Boston Planning & Development Agency and referred to in this NPC as the "BPDA") requesting approval for the construction of a new multi-tenant terminal integrating seafood processors, cold storage facilities, warehouse distribution facilities and bulk cargo operations, including an import/export operation for cement, on 29.8 acres of the MMT property. At that time, the Project included three buildings totaling approximately 510,552 gross square feet and an approximately 4.3 acre area designated for a future bulk cargo handling facility. On September 11, 2007, the BPDA authorized the Director of the BPDA to issue a Scoping Determination waiving the requirement of further review for the Project pursuant to Article 80, Section 80B-5.3(d) of the Boston Zoning Code, and the Director of the BPDA issued such a determination on November 2, 2007 (the "Scoping Determination").

On March 1, 2012, the Proponent submitted a NPC to the BPDA for an approximately 3-acre reduction in the size of the Boston Cargo Terminal Project Site, a modest reduction in the total square footage of the three buildings (from 510,552 square feet to 459,917 square feet), a change in the type of bulk storage proposed for the approximately 4.3 acre future bulk cargo handling facility, and a lapse of time/revised building schedule. On August 9, 2012, the BPDA authorized the Director of the BPDA to issue a determination waiving further review of the 2012 NPC pursuant to Section 80A-6.2 of the Code, and on September 26, 2012, the Director issued such a determination.

On March 11, 2014, the Proponent submitted a new NPC in response to interest from potential tenants and further discussions with Massport (the "2014 NPC"). In the 2014 NPC, the site area and proposed total building square-footages were returned to their original 2007 dimensions (specifically, 29.8 acres and 510,522 square feet), while the changes in the type of bulk storage described in the 2012 NPC were retained. Per the 2007 PNF and the 2012 NPC, the envisioned site use remained as a multi-tenant terminal integrating seafood processors, cold storages facilities, warehouse distribution facilities and bulk cargo operations. On May 30, 2014, following BPDA approval, the Director of the BPDA issued a determination that the 2014 NPC was "consistent with the provisions of Article 80, Section 80A-6, in that the project changes do not significantly increase the impacts of the previously approved project and that further review is not warranted or required."

In addition to the above filings under Article 80 of the Code, an Environmental Notification Form (ENF) was filed for the Project with the Executive Office of Energy and Environmental Affairs (EOEEA) Massachusetts Environmental Policy Act (MEPA) office on August 15, 2016. On September 23, 2016, following agency and public review of the ENF, the Secretary of EOEA issued a Certificate on the ENF stating that the ENF properly complied with MEPA, and that no further MEPA review of the Project was required.

## The Proposed Stavis Seafoods Development Project

The Project is proposed as a state-of-the-art seafood processing and marine warehousing and industrial facility. The Project is designed to relocate the existing Stavis Seafoods processing facilities in the RLFMP, and the Stavis Seafoods executive offices located in the Boston Fish Pier, into a single location and to create seafood processing, marine warehousing and/or associated marine office space for additional tenants.

The Project includes a single, one- and two-story, approximately 201,000 gross-square-foot, seafood processing, marine warehousing and marine support office

building with an approximately 130,000 square-foot footprint. The new facility will offer Stavis Seafoods the opportunity to consolidate, improve and potentially expand its seafood processing operation, while continuing its contribution and support of the success of the seafood processing industry within the RLFMP and the Port of Boston at-large. Plans of the proposed building and site layout are presented in Figure 4, *Proposed Site Plan*. Renderings of the proposed building are presented in Figure 5, *Building Renderings*.

The Project Site is located within the MMT and the larger RLFMP, both areas of which have been designated for the preservation and development of marine industrial facilities. To that end, the Project building is being designed to include seafood processing, marine and industrial cargo distribution, and temperature controlled facilities. The temperature controlled facilities will serve and support the overall water-dependent uses of the Project Site, allowing for the processing, preservation and transportation of seafood and other perishables. The operation of the facility will offer direct economic support to other water-dependent uses in the MMT, surrounding portions of the RLFMP, and the larger Port of Boston, while maintaining the utility of the site. As currently proposed and shown in Figure 4, Stavis Seafoods will occupy the northern approximately 91,000 square feet of the building. The tenant, or tenants, for the southern approximately 110,000 square feet of the building have not been determined, but are currently projected to include approximately 55,000 square feet of seafood processing and/or marine industrial space, and approximately 55,000 square feet of supporting office space and/or upper floor light industrial uses consistent with allowable marine industrial uses.

The Proponent remains committed to the advancement of sustainable and environmentally conscious design and construction, and is designing the Project to meet the requirements of LEED certifiable. In addition, the Project building and the Project Site are being designed to address both currently designated floodplain issues and potential sea level rise. More specifically, the Project will utilize and comply with the Massport *Floodproofing Design Guide,* adopted by Massport in order to make infrastructure and operations more resilient to potential flooding threats. In doing so, the Project is also embracing the findings and recommendations outlined in the City of Boston Climate Action Plan and the recently issued *Climate Ready Boston* report.

Most of the Project Site lies above the currently designated Federal Emergency Management Agency (FEMA) floodplain, and none of the Project Site lies within a mapped velocity zone (FEMA Flood Insurance Rate Map, Suffolk County, Massachusetts, Map Number 25025C0082J, Revised March 16, 2016). Approximately 1.5 acres of the northernmost portion of the Project Site has been

mapped by FEMA as lying within an area subject to a potential 100-year flood elevation of 12.0 feet NAVD88 (North America Vertical Datum, 1988), which translates to 18.46 feet Boston City Base (BCB), while a narrow, approximately 0.3-acre strip of the Project Site parking lot along Fid Kennedy Avenue has been mapped at floodplain elevation 10.0 feet NAVD88 (16.46 feet BCB). The central 5.7 acres of the 7.2-acre site is located outside of the 100-year flood zone. Meanwhile, the recent (May 2016) *Climate Ready Boston* study led by the City of Boston has identified the potential for sea level increases in Boston Harbor of approximately 0.7 feet by 2030, and 1.5 feet by 2050.

In response to the current floodplain mapping and future sea level rise, the floor of the proposed building is being set at 20.5 feet BCB, or 2.0+ feet above the predicted 18.46 BCB high water mark during a 100-year flood event. More importantly, in consideration of both potential flooding and future sea level rise, and in compliance with the Massport *Floodproofing Design Guide* "Design Flood Elevations" for critical equipment in South Boston, all critical utilities and life-safety systems, including transformers, electric switchgears, electric service and distribution panels, and domestic and fire water pumps are being set at minimum elevations of 23.5 feet BCB, or 5.0+ feet above the currently predicted 100-year floodwater elevation on the Project Site.

## Project Changes

As noted above, the Project is located within a portion of the footprint of the Project Site as proposed in the 2014 NPC. The change in the Project from that of the Project as presented in 2014 is essentially a reduction in the size of the Project Site and an associated reduction in the total built square footage of the Project. Similarly, while there is a partial change in the range of materials to be handled, the proposed use of the Project Site is essentially unchanged from that of the Project as proposed in the 2014 NPC. The Proponent believes that, after consideration of these changes, the Director may properly determine that further review by the BPDA will not be required.

***Reduction in Building and Lot Area Square Footages.*** The Project presented in the 2014 NPC contemplated three buildings totaling approximately 510,522 square feet of floor area on approximately 25.5 acres of the then approximately 29.8-acre Project Site. The remaining approximately 4.3 acres were designated for a future bulk cargo handling facility. As shown on Figure 3, the three buildings included Building A at approximately 231,522 square feet, Building B at approximately 162,032 square feet, and Building C at approximately 66,264 square feet. In comparison, the currently proposed Project contemplates an approximately 201,000 square-foot building, similar in size to the previously proposed Buildings A and B,

on 7.2 acres of the approximately 25.5-acre area previously proposed for the three buildings. As such, the Stavis Seafoods Development Project represents a reduction in the overall building square footage, and an anticipated corresponding reduction in Project impacts. A comparison of the 2014 NPC and the revised Project building and lot areas is presented in Table 1.

Table 1 – Comparison of 2014 NPC and Revised Project

| Project Component | 2014 NPC | 2016 Revised |
|---|---|---|
| Project Site | 29.8 acres | 7.2 acres |
| Marine Industrial Buildings | 510,552 square feet | 201,000 square feet |

*Modification to Types of Bulk Cargo.* The 2007 PNF envisioned an approximately 4.3 acre portion of the Project Site would be utilized as a bulk cargo handling facility for the importation and trans-loading of cement by ship and barge. As detailed in the above-reference 2012 NPC, and reiterated in the 2014 NPC, the Proponent determined that there was no operator looking to expand cement operations in Boston, and that the 4.3-acre portion of the site would be most effectively utilized for the handling of a variety of aggregates and other bulk components. Accordingly, the Project anticipated that the bulk cargo handling facility would be constructed to adaptively handle various different types of aggregates and bulk components, instead of being limited to cement-related activities.

The Stavis Seafoods Development Project Site does not encompass the 4.3-acre bulk cargo portion of the 2014 Project Site and does not contemplate the handling of aggregates and similar bulk components. As shown on Figures 2 and 3, the general area of the MMT previously envisioned for bulk cargo handling is identified in the February 1, 2016 *Massport Marine Terminal Request for Proposals* as Parcel 8.

*Roadway Improvements*. Access to and from the Project Site will be established by an extension of Tide Street northward along the eastern side of the Site (see Figure 4 in Attachment B). Tide Street currently extends between Northern Avenue and Fid Kennedy Avenue, and consists of a single lane in both directions separated by a double yellow center line. As shown on Figure 4, both employee parking and building truck bays will face the new Tide Street extension, and will therefore access Fid Kennedy Avenue from a single point coincident to the current Tide Street intersection. Doing so eliminates the driveway in the 2014 NPC plan, which was located along Fid Kennedy Avenue in an offset position relative to the existing Tide Street alignment.

*District Energy*. The Proponent understands that the concept of a district energy system is being contemplated for the RLFMP. Such facilities typically involve the distribution of steam, hot water, or chilled water from a central plant. Generally, such resources are not suitable for a mostly refrigerated facility such as is being proposed for the Project, as the necessary refrigerant temperatures are much colder than those that would be generated by a central plant. Similarly, as currently envisioned, office space at the Project will be on the order of approximately 32,000 square feet, making the fitting of the building for a potential future district energy facility less practical. Nonetheless, during the design process the Proponent will explore the feasibility of incorporating design elements that would make the subsequent retrofitting of the facility more practical, should a district energy facility be proposed for the area.

## Delay in Developing the Project

Construction of the Stavis Seafoods Development Project is anticipated to commence in the first quarter of 2017 and to be completed in the third quarter of 2018. The Project is not currently proposed to be constructed in phases. However, the Proponent may elect to initially construct only the portion of the building designated for Stavis Seafoods and to delay construction of the second portion of the building until a tenant-certain arrangement can be confirmed. Should such a delay occur, all site improvements (i.e. stormwater, grading and landscaping) will be completed with the completion of the Stavis Seafoods portion of the building, other than those improvements that would be directly impacted by the subsequent construction activities.

## Impact of Proposed Changes

The Stavis Seafoods Development Project will not increase the potential impacts identified in the 2014 NPC. Applying the factors listed in Section 80A-6 of the Code, and, more specifically Section 80A-6.2 (a) through (g), *Directors Determination*, to the Stavis Seafoods Development Project indicates the following:

(a) *increase in the Proposed Project's size or intensity of use*. The Stavis Seafoods Development Project will not increase the size or intensity of use of the Project Site as compared to the Project as approved in 2014. As noted above, the Project presented in the 2014 NPC contemplated three buildings totaling approximately 510,522 square feet of floor area and approximately 4.3 acres of land devoted to bulk cargo handling on an approximately 29.8-acre site. In comparison, the currently proposed Project contemplates a single, approximately 201,000 square-foot building, similar in size to the previously proposed Buildings A and B, on an approximately 7.2 acre Project Site. As such, the Project is not of the scale of the

earlier Project, nor does it occupy an equal or greater footprint. The single building proposed for the Stavis Seafoods Development Project is of a comparable scale, both in square-footage and area footprint, to individual buildings "A" and "B" described in the 2014 NPC. Any future development of the parcels within the balance of the Project Site as proposed in the 2014 NPC is anticipated to be permitted by Massport or its tenants separately from the Project, per the above-referenced *Massport Marine Terminal Request for Proposals*.

As regards the future use of these other parcels, the Massport *Marine Terminal Request for Proposals* states, in part, that any development proposals should address the following objectives:

> "Expand, strengthen, and support the existing seafood cluster, including the construction and operation of new infrastructure at the MMT needed to modernize and advance the seafood industry at the Port," and
>
> "Encourage maritime industrial development at the MMT (e.g., cold storage, warehouse, logistics) that complements the seafood cluster and has synergies with Conley Terminal, which result in economic development and new industrial jobs."

(b) *generation of additional or greater impacts of the type that may be examined by the applicable review*. The Stavis Seafoods Development Project will not generate additional or greater impacts beyond those specified in the 2007 PNF, or the subsequent 2012 and 2014 NPCs. Subsequent to the completion of the PNF, a greater emphasis has been placed upon both sustainable building design and the adaptation to climate change and sea level rise. In response, the Project building is being designed so as to meet the requirements of LEED Certifiable. In addition, and as discussed below, the Project is being designed in accordance with the Massport *Floodproofing Design Guide*, which addresses both currently designated floodplain issues and potential sea level rise. Finally, as also discussed below, the Project will comply with the Massachusetts Stormwater Management Regulations to the maximum extent practicable, consistent with its status as a Redevelopment Project as defined in Standard 7 of the stormwater regulations.

As noted above, and as regards potential flooding, the more restrictive FEMA 100-year floodplain on the Project Site is elevation 12.0 feet NAVD88. This elevation translates to 18.46 feet BCB. In response, the proposed finished floor elevation for the building is proposed as 20.5 BCB, which is two (2+) feet above the current FEMA 100-year floodplain elevation.

Meanwhile, with regard to sea level rise, Massport has adopted the above-referenced *Floodproofing Design Guide* to make its infrastructure and operations more resilient to potential flooding hazards caused by extreme storms and rising sea levels. The Project will comply with these guidelines. For new Massport facilities, the Design Flood Elevation (DFE) is defined by the maximum water elevation with a 0.2% annual probability of exceedance in year 2070, plus three (3) feet of freeboard. This results in an elevation of 17.0 feet NAVD88, which Massport has set as the DFE for critical equipment for new facilities in South Boston. This elevation translates to 23.46 feet BCB. In response, the Project design will raise critical utilities and life-safety systems (transformers, electrical switchgears, electric service/distribution panels, and domestic/fire water pumps) to elevation 23.5 BCB, which is five (5+) feet above the current (March 16, 2016) FEMA 100-year floodplain elevation.

Finally, as noted above, the Project has been designed to fully comply with the standards of the Massachusetts Stormwater Management Regulations. Under existing conditions, the Project Site is relatively flat and almost entirely covered by impervious surfaces. Stormwater runoff from the Project Site currently flows overland and untreated to an existing 48-inch storm drain located north of and parallel to Fid Kennedy Avenue. This existing storm drain flows westward towards Seafood Way, and ultimately discharges to Boston Harbor.

The Project Site originally consisted of tidal flats which were filled with dredged materials from the adjacent Boston Harbor. Additionally, due to the Project Site's waterfront location, groundwater levels are anticipated to be subject to tidal influence. Due to these existing constraints – dredged fill material and tidally influenced groundwater – the Project Site is not suitable for low impact development techniques, such as infiltration and other non-structural BMPs.

In the proposed condition, previously untreated stormwater runoff from the Project Site will be directed to new control measures to provide the required water quality treatment. Stormwater runoff from the proposed paved areas will be collected in a series of deep-sump hooded catch basins and directed to proprietary particle separators designed to provide for the removal of oil and suspended solids prior to discharging to a proposed 42-inch storm drain in the proposed Tide Street Extension, and ultimately to the harbor.

The Project proposes a net decrease in impervious surfaces on-site of approximately 0.97 acres from the existing condition. The decrease in impervious surfaces will reduce the stormwater runoff volume and velocity from the Project Site. As proposed, the redevelopment Project will also result in an improvement of stormwater runoff quality and quantity.

(c) *increase in traffic impacts or increase in the number of proposed parking spaces.* The currently proposed Project proposes a single building, comparable in size to several of the individual buildings proposed for the Project in the 2014 NPC, on a 7.2-acre portion of the 29.8 acres contemplated in the 2014 NPC. Additionally, the uses of the proposed building are similar to, if not the same, as previously contemplated and analyzed. WSP|Parsons Brinckerhoff has reviewed existing traffic and transportation conditions in the vicinity of the Project Site, determined the number of trips anticipated to be generated by the Project, and analyzed the impact those trips would have on the infrastructure in the area. A copy of the findings of that review is presented in Attachment B, *Transportation Analysis*.

As discussed in the attached *Transportation Analysis*, the Project Site has frontage along the north side of Fid Kennedy Avenue and will be accessed via an extension of Tide Street on the eastern side of the Project Site. The Project will have regional access via Massport Haul Road and Northern Avenue connecting to Seafood Way, Tide Street and Fid Kennedy Avenue. As further outlined in Attachment B, approximately 1,124 vehicular trips are estimated to be generated by the proposed Project over the course of a weekday. During the weekday AM peak hour, 111 vehicle trips (78 in and 33 trips out) will be generated. During the weekday PM peak hour, 110 vehicle trips (95 trips in and 15 trips out) will be generated. Finally, an analysis of adjacent intersection of Tide Street and Fid Kennedy Street indicates that levels of service will remain at levels "A" and "B."

(d) *change in the expected commencement or completion date, or change in the schedule of work on the project.* As discussed above, the Stavis Seafoods Development Project is being proposed on a portion of the Project Site contemplated in the 2014 NPC and, as such, does not represent a delay in the Project. Construction of the Stavis Seafoods Development Project is anticipated to commence in the first quarter of 2017 and to be completed in the third quarter of 2018.

(e) *change of project site.* The Stavis Seafoods Development Project is proposed for an approximately 7.2 acre portion of the Project Site contemplated in the 2014 NPC. The relationship of the Project Site to the earlier Project is illustrated in Figures 1 and 3 in Attachment A.

(f) *the need for additional Zoning Relief.* The Stavis Seafoods Development Project will not require zoning relief.

(g) *changes in the surrounding area, when a lapse of time is the reason for the Director's review under this section of 80A-6.* As discussed below, the Project is being proposed for a portion of the Project Site last reviewed in 2014. Since that time there has not been any significant additional development in the immediate vicinity of the Project Site which would affect the Project as proposed.

## Summary

The foregoing information is intended to inform the BPDA of the Stavis Seafoods Development Project and its reduced potential impacts as compared to the Project contemplated in the 2014 NPC. The Proponent believes that, after consideration of these lesser impacts, the Director may properly determine that further review by the BPDA under Article 80 of the Code will not be required. Accordingly, the Proponent respectfully requests that the Director determine that no further review will be required for the Stavis Seafoods Development Project and issue a determination pursuant to Section 80A-6.2 of the Code which finds that this Notice of Project Change (i) adequately described the potential impacts arising from the Revised Project and (ii) provides sufficient mitigation measures to minimize these impacts, and which waives further review of the Project as now proposed.

Please do not hesitate to contact me if any additional information is required.

Very truly yours,

EPSILON ASSOCIATES, INC.

Andrew D. Magee
Principal

cc: Joseph Larkin, Millennium Partners
Jacob Citrin, Millennium Partners
Johnathan Rothstein, Millennium Partners
John E. Rattigan, Jr., DLA Piper LLP (US)
Brian Awe, Esq., DLA Piper LLP (US)
Andrew Hargens, Massport
Lauren Gabel, Massport
Stewart Dalzell, Massport

Attachments:
Attachment A: Figures
Attachment B: Transportation Analysis

# Attachment A

## Figures

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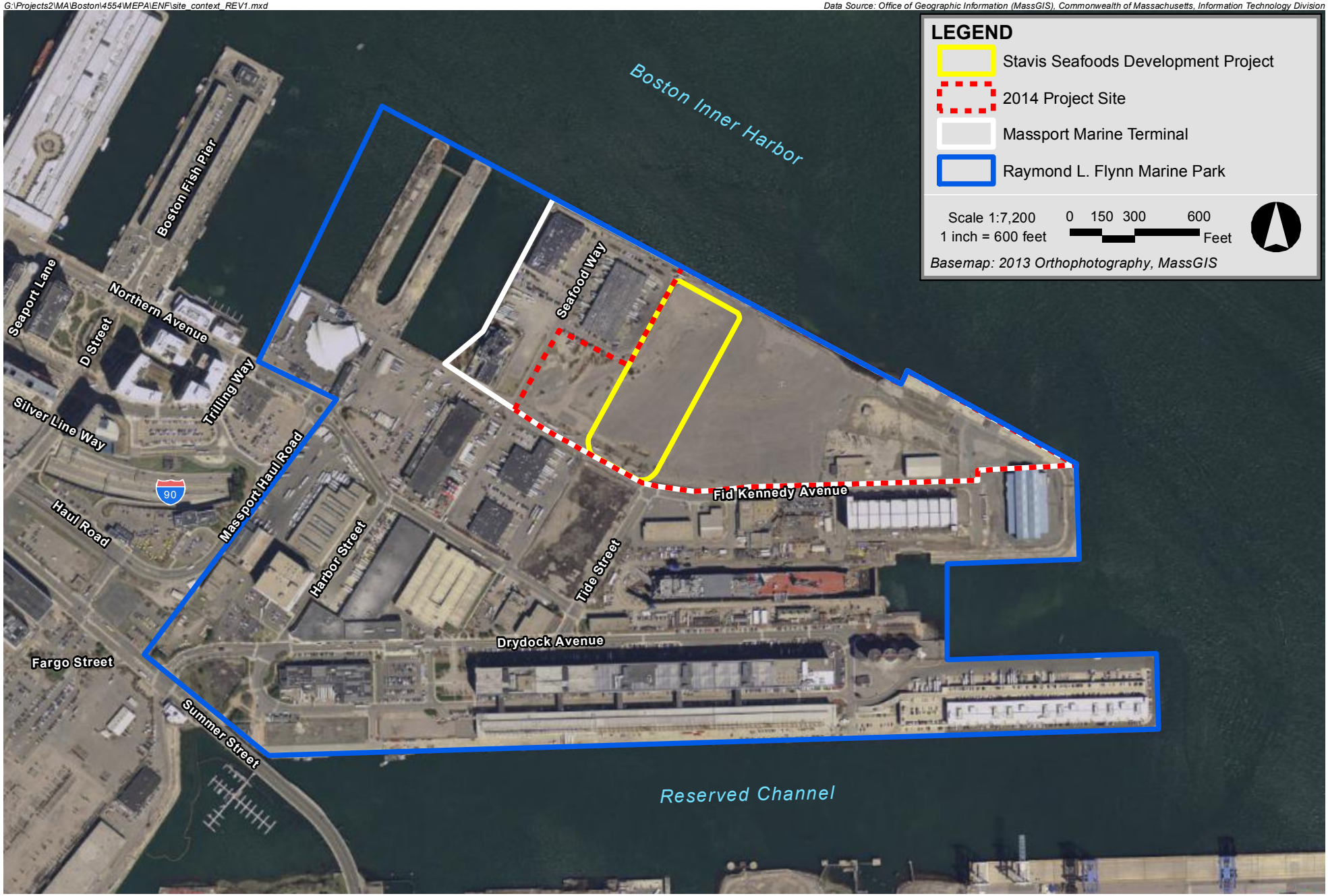
Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division

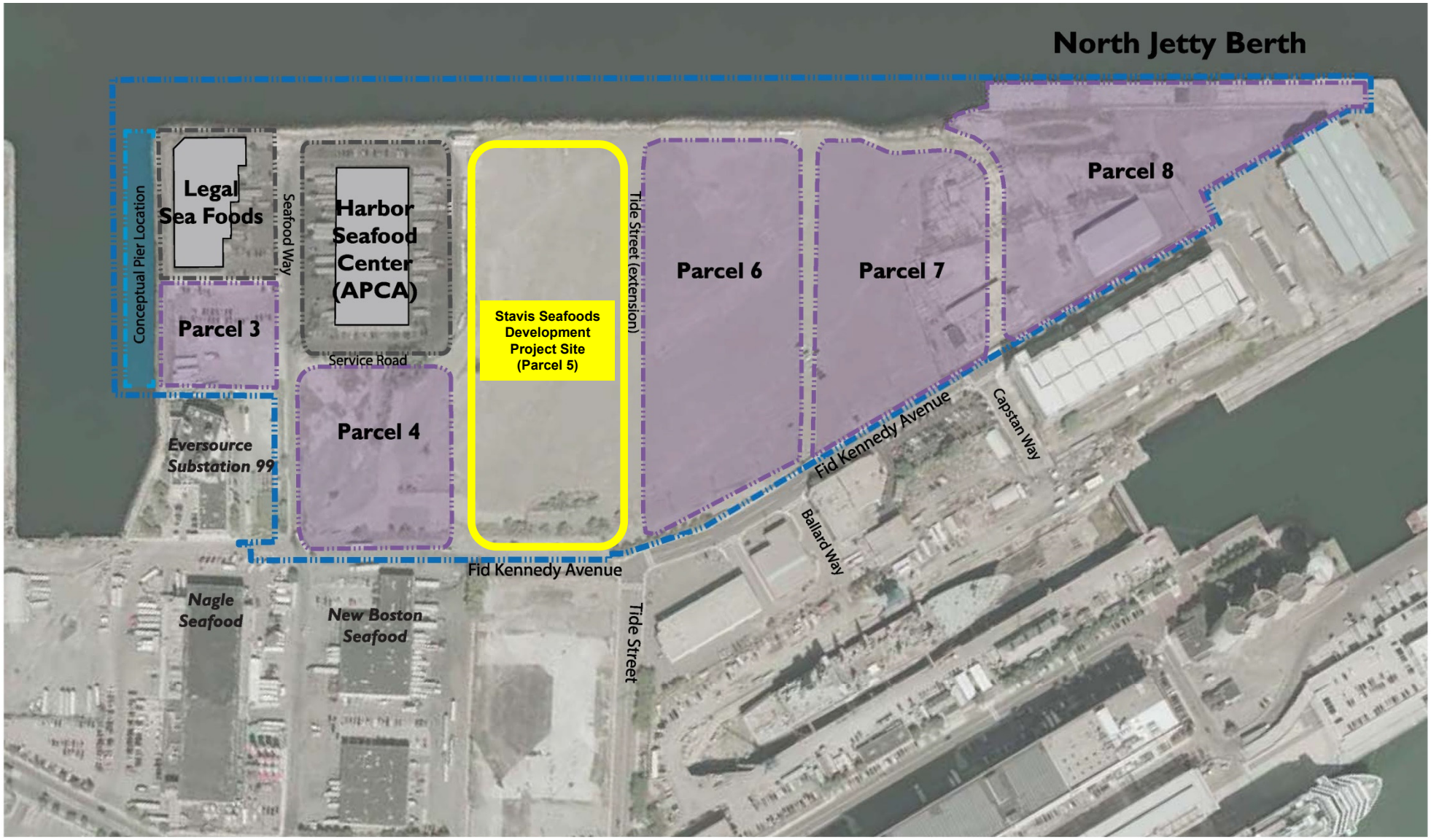



**Stavis Seafoods Development Project Boston, Massachusetts**

Epsilon ASSOCIATES INC.

**Figure 1**

*Site Context Map*




**Massachusetts Port Authority**
*Real Estate & Asset Management*
*January 2016*

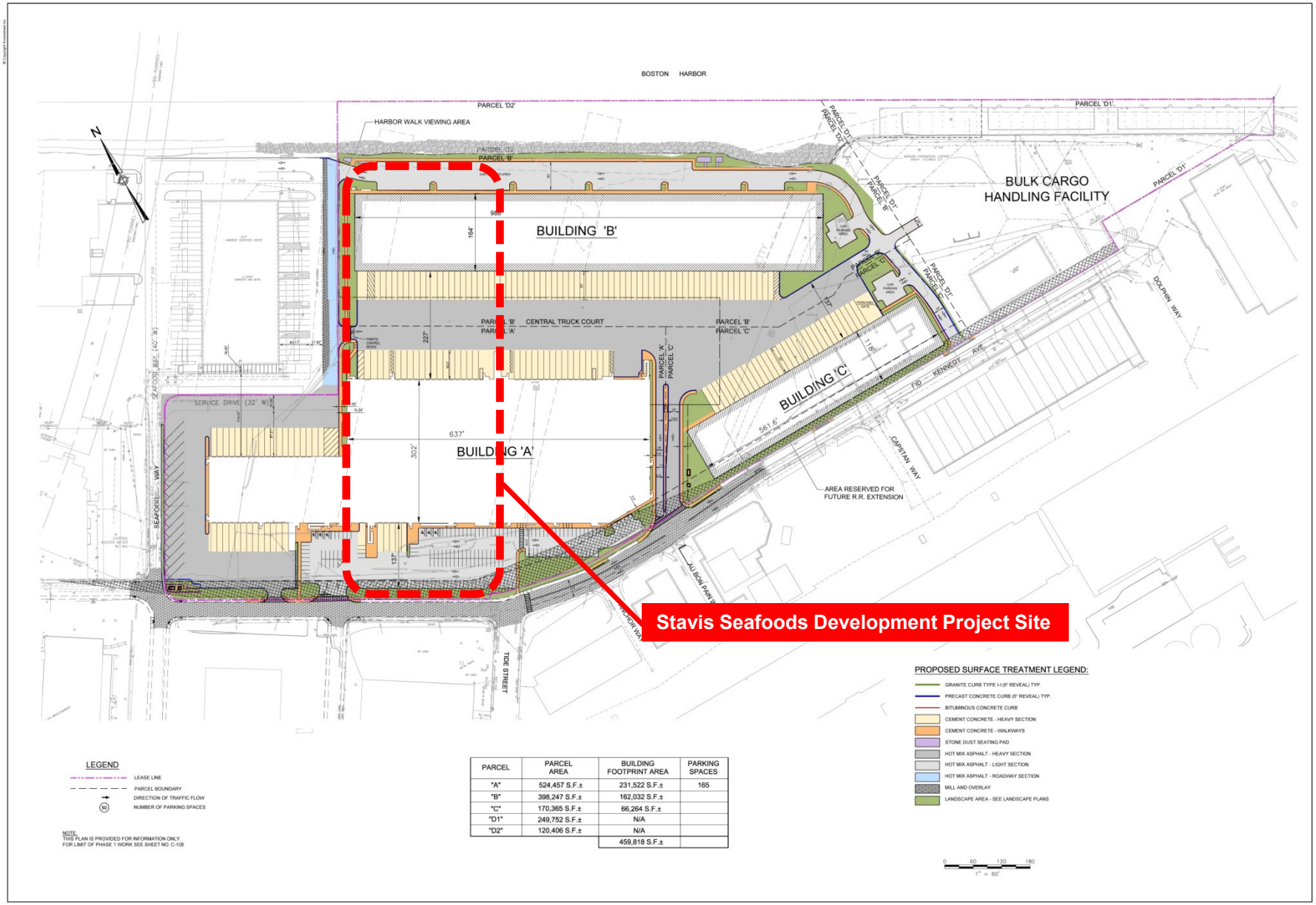
## A- Figure 4: Conceptual Parcel Framework

*Massport Marine Terminal, South Boston*

**Stavis Seafoods Development Project Boston, Massachusetts**

**Figure 2**

*Massport Marine Terminal Conceptual Parcel Framework, 2016*




| PARCEL | PARCEL AREA | BUILDING FOOTPRINT AREA | PARKING SPACES |
|---|---|---|---|
| "A" | 524,457 S.F.± | 231,522 S.F.± | 165 |
| "B" | 398,247 S.F.± | 162,032 S.F.± | |
| "C" | 170,365 S.F.± | 66,264 S.F.± | |
| "D1" | 249,752 S.F.± | N/A | |
| "D2" | 120,406 S.F.± | N/A | |
| | | 459,818 S.F.± | |

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Project Number 12044
Author
Checker
Issue date 26 FEBRUARY 2014

Revisions

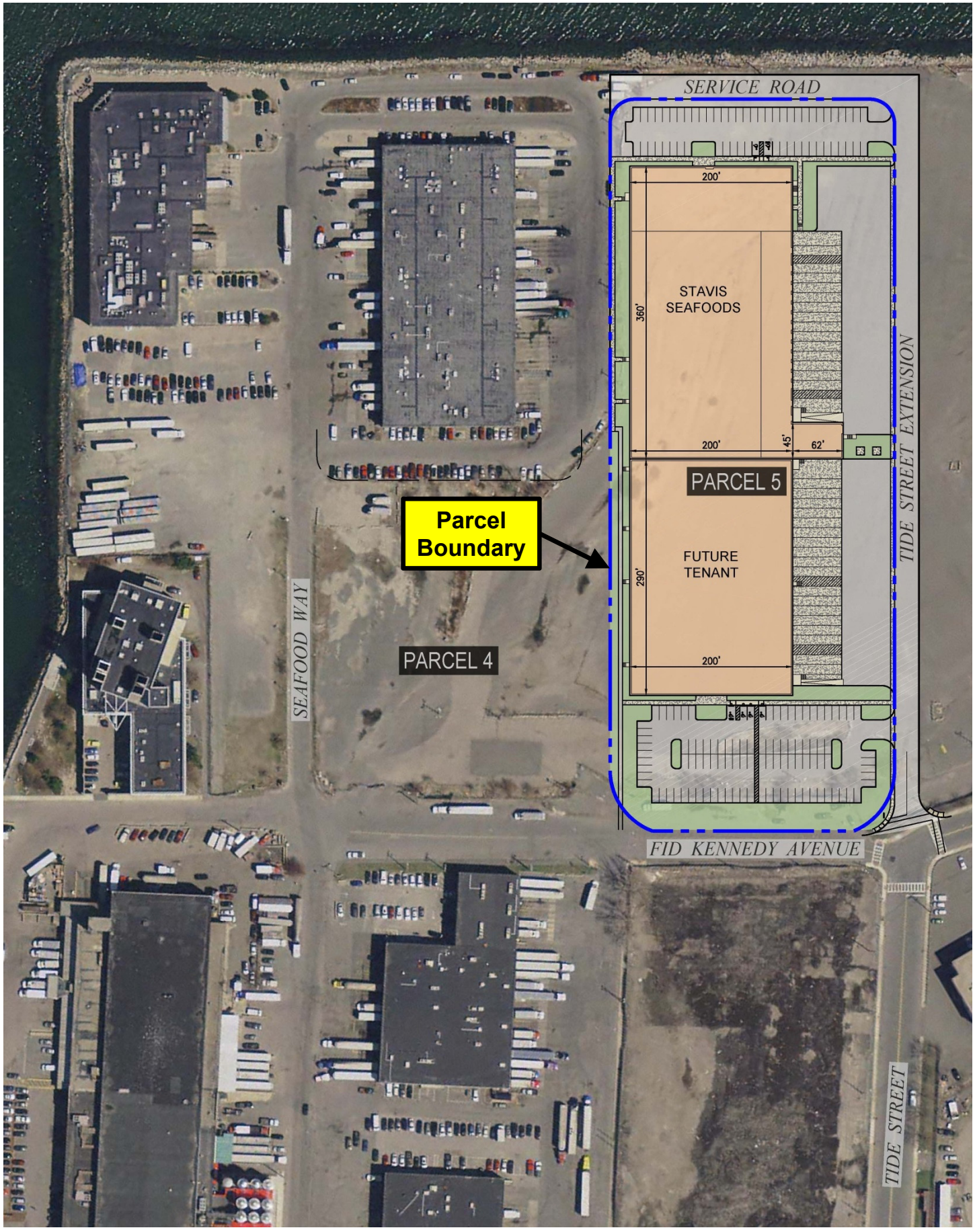
Drawing Title
SITE LOCATION PLAN
COMPLETE SITE
BUILDING A
SCALE As indicated
Drawing Number
C-100

**Stavis Seafoods Development Project Boston, Massachusetts**

Epsilon ASSOCIATES INC.

**Figure 3**

*2014 NPC Conceptual Site Plan*




**Stavis Seafoods Development Project Boston, Massachusetts**

Epsilon ASSOCIATES INC.

**Figure 4**
*Proposed Site Plan*

# PARCEL 5 - RENDER VIEW

PEDESTRIAN VIEW FROM SERVICE ROAD & TIDE STREET EXTENSION INTERSECTION

PEDESTRIAN VIEW FROM FID KENNEDY AVENUE & TIDE STREET EXTENSION INTERSECTION

**Stavis Seafoods Development Project** **Boston, Massachusetts**

Attachment B

# Transportation Analysis

# MEMORANDUM

75 Arlington Street, 9th Floor
Boston, MA 02116

Tel: +1 (617) 426-7330

**www.wspgroup.com**
**www.pbworld.com**

Date: September 12, 2016

To: Mr. Jonathan Rothstein,
Millennium Partners

From: Jennifer Conley, P.E., P.T.O.E.

**Subject: Transportation Analysis | Stavis Seafoods Development Project**

**WSP | Parsons Brinckerhoff** (PB) has determined the transportation impacts anticipated with the Stavis Seafoods Development Project in the South Boston Cargo Terminal Area. The site has frontage along the north side of Fid Kennedy Avenue and will be accessed via an extension of Tide Street. PB reviewed the existing conditions in the vicinity of the site, determined the number of trips that will be generated by the project, and analyzed the impact those trips would have on the infrastructure in the area.

## PROPOSED PROGRAM

The Stavis Seafoods Development Project site will be developed into a single building with two uses. The first use will be a seafood processing facility, which will occupy 91,000 square feet at the north end of the building. The tenant for the second use has not been determined, but for the purposes of this analysis is anticipated to include 55,000 square feet of warehouse and 55,000 square feet of office space. Figure 1 shows the site plan for the project.

**Figure 1 Proposed Development**

## EXISTING CONDITIONS

PB reviewed the existing transportation conditions in the vicinity of the site during June and July of 2016. The following traffic analysis reviews the traffic conditions on Fid Kennedy Avenue adjacent to the project site, as well as other local and regional roadways relevant to the project.

### Roadways

The Stavis Seafoods Development Project site will have regional access via Massport Haul Road and Northern Avenue connecting to Seafood Way, Tide Street and Fid Kennedy Avenue. The site has frontage along the northern side of Fid Kennedy Avenue. Fid Kennedy Avenue consists of a single lane in each direction separated by a double yellow center line. No bicycle accommodations are provided on Fid Kennedy Avenue, and concrete sidewalks are typically present along the length of the road.

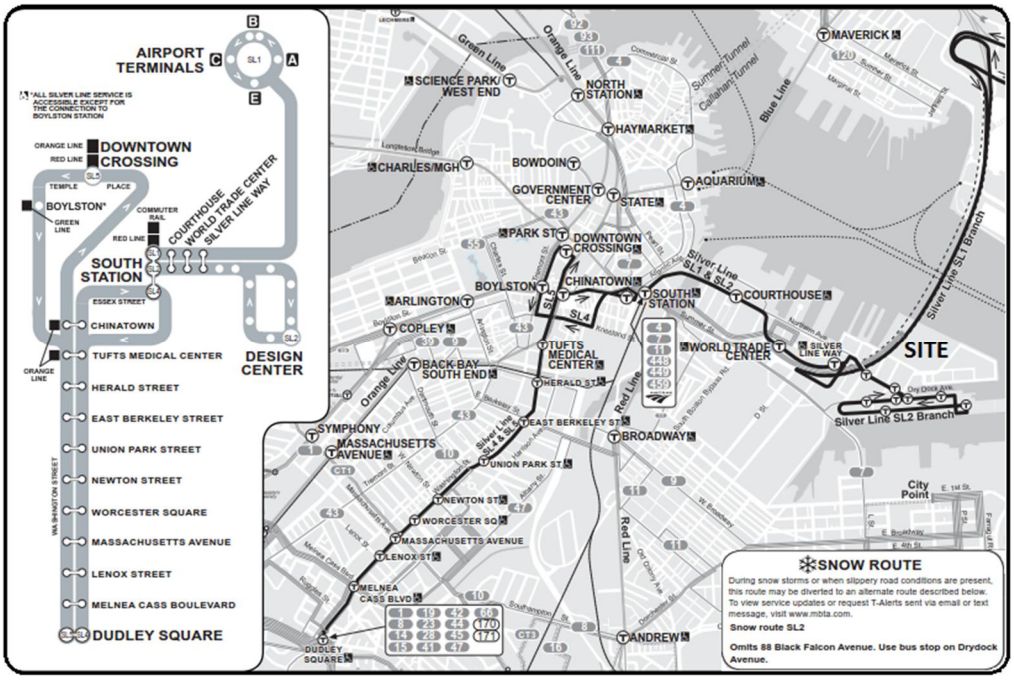
The project proposes the extension of Tide Street to provide access on the east side of the site. Tide Street currently extends between Northern Avenue and Fid Kennedy Avenue and consists of a single lane in both directions separated by a double yellow center line, with concrete sidewalks on both sides. Figure 2 shows the location of the site and the area surrounding it.

**Figure 2 Stavis Seafoods Development Project Site Vicinity**


### Transit

Transit service to the site is provided by the Massachusetts Bay Transportation Authority (MBTA's) Silver Line Routes SL1, SL2 and Bus numbers 4 and 7. Transit stops are located at Northern Avenue opposite Harbor Street and at Northern Ave at Tide Street. The Silver Line runs dual-mode buses, partly in a dedicated bus tunnel and partly on shared roadway, including surface streets, the Ted Williams Tunnel, and airport roads. At South Station, the service connects to the MBTA's regional subway, bus, and commuter rail system. The MBTA publishes route maps and the route map of the Silver Line in the study area is shown in Figure 3.

**Figure 3 Silver Line SL1 and SL2 MBTA Routes in the Study Area**




## Pedestrian and Bike Facilities

Concrete sidewalks are present on both sides of almost all roadway in the area including Fid Kennedy Avenue. Pedestrian traffic was noted in the vicinity of the proposed site during field visits. Dedicated bike lanes were not present, however, traffic volumes in the immediate site area were low and bike traffic was observed during site visits. A number of Hubway bicycle stations are provided in the South Boston Waterfront District, including a location less than ¼ mile from the proposed site. Figure 4 provides the location of all transit stops (circled in white) and Hubway bicycle stations.

**Figure 4 Transit Stops and Hubway Bicycle Stations near the Site**

### Traffic Volumes

PB collected traffic volume data in June 2016. An Automatic Traffic Recorder (ATR) collected traffic volumes for a 24-hour period on Tuesday, June 28, 2016 on Fid Kennedy Avenue near the proposed site location. According to the ATR, 505 vehicles passed by the proposed site (269 westbound and 236 eastbound) over the course of a weekday. Traffic in the area peaks at nontraditional times during the middle of the day likely due to high volumes of midday truck traffic. For the purpose of this analysis, the peak hours between the hours of 5:00 to 9:00 AM and 2:00 to 6:00 PM were determined. The weekday AM peak hour occurred from 7:00 to 8:00 AM when 30 vehicles passed by the proposed site (23 westbound and 7 eastbound). The weekday PM peak hour occurred from 2:30 to 3:30 PM when 67 vehicles passed by the proposed site (34 westbound and 33 eastbound).

The ATR data included vehicle classification data. Over the course of the 24-hour period, the traffic on Fid Kennedy Avenue included 10 percent of three, four, and five axle trucks. The traffic stream also consisted of 68 percent cars and other two axle vehicles and 21 percent buses. The bicycle percentage was one (1) percent. The composition of traffic during the peak hours was similar to that noted over the course of the day.

In addition to traffic volume data, the ATR collected speed information. The 85$^{th}$ percentile speed, or prevailing speed, on Fid Kennedy Avenue was 26 mph from the west and 28 mph from the east. The posted speed limit on Fid Kennedy Avenue is 25 mph.

## TRIP GENERATION

The trip generation expected at the Stavis Seafoods was determined. The industry standard source for trip generation data, the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 9$^{th}$ Edition, was researched and additional data was obtained from the proposed tenant that is known at this time. Although it is possible that the peak hours of the fish processing facility will not coincide with the other user on the site or the adjacent roadway, each of the peak hours of the users was superimposed on the roadway peak hour in order to provide the most conservative analysis of project impact.

### Trip Generation for the Fish Processing Facility

The ITE Trip Generation Manual includes trip rates for a wide variety of land use codes (LUC). PB investigated the appropriate LUCs for the proposed uses at the site. Because there is no LUC provided for a fish processing facility, PB developed trip generation rates based on employment, truck and customer information collected by Stavis Seafoods who is the expected user of the 91,000 square foot processing facility. Based on information provided by Stavis Seafoods:

- Approximately 75 trucks (150 one way truck trips) are expected on a typical weekday between the hours of 6:00 AM and 6:00 PM.
- 60 office employees and 90 processing employees will be employed on site. Employees work in three shifts. The first shift begins at 6AM and ends at 4 PM and consists of 60 office employees and 65 processing employees. The second shift spans from 4 PM to 12 AM and consists of 5 processing employees. The last shift starts at 10 PM and ends at 6 AM and employs 20 processing workers. Each employee counts as two one way trips commuting. In addition, some employee trips will occur in the middle of a shift (lunch, errands, exercise, etc.).
- Approximately 200 customers (400 one way trips) are expected on a typical weekday. Customer trips occur during the typical operating hours (6:00 AM to 3:00 PM).

Trips were distributed over a period of 24 hours including assumptions for the arrival and departure distribution of employees and the proportion that will leave the facility mid shift. In addition to these trips, PB estimated about 30 miscellaneous trips (1 in and 1 out per hour) were include to account for mail and package delivery, miscellaneous employee trips, etc.

PB calculated the trip generation of the fish processing facility using the closest ITE LUCs (150 – Warehousing and 140 – Manufacturing). The number of trips estimated by ITE is significantly lower than the trips calculated based on the actual user of the site.

**Trip Generation for the Warehouse Facility**

The trip generation associated with the warehouse facility were determined using ITE data. The trips associated with a 55,000 square feet of warehouse space were calculated using the ITE rates for LUC 150, Warehouse. About 200 daily trips are generated by such a facility with 17 trips in the AM peak and 18 trips in the PM peak. Estimating a proportion of trucks similar to filings for similar land uses in the site vicinity, it was estimated that approximately 35 percent of the peak hour trips to the site will be truck trips. Over the course of the day, approximately 55 percent of trips to the warehouse space will be truck trips.

The trips associated with the 55,000 square feet of office space proposed on the site were calculated using ITE's LUC 710. The office space is expected to generate approximately 600 trips over the course of a weekday with 86 trips generated during the weekday AM peak hour and 82 trip generated during the weekday PM peak hour.

## MODES OF TRAVEL

The daily, AM peak hour, and PM peak hour modes of travel were determined. According to the South Boston Waterfront Sustainable Transportation Plan, about half of the employees in this area drive to work and the remainder are evenly split between transit and other modes such as bike and pedestrian.

The mode splits observed in the South Boston Waterfront Sustainable Transportation Plan were applied to all employee trips to and from the site. Customer trips to the fish processing facility were estimated to be made 80 percent by vehicle and 20 percent by alternate modes of travel. The resulting modal split and trip generation is shown in Table 1.

**Table 1: Modal Split of the Intermodal Facility Trips**

| Mode | Daily | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| **Trucks** | 258 | 12 | 8 | 20 | 7 | 11 | 18 |
| **Auto** | 866 | 66 | 25 | 91 | 8 | 84 | 92 |
| **Transit/Ped/Bicycle** | 686 | 59 | 12 | 71 | 11 | 98 | 109 |
| **Total** | 1810 | 195 | 32 | 227 | 26 | 193 | 219 |

As shown in Table 1, the project will generate 866 auto trips over the course of the day. Of the 866 daily auto trips, 91 trips during the AM peak hour (66 in and 25 out) and 92 trips during the PM peak hour (8 in and 84 out). The project will generate 258 truck trips daily, of which 20 trips are anticipated to occur during the AM peak hour (12 in and 8 out) and 18 trips during the PM peak hour (7 in and 11 out). The project will generate an additional 686 trips alternate mode trips throughout the course of a day. 71 of those trips are expected during the AM peak hour (59 in and 12 out) and 109 trips (11 in and 98 out) during the PM peak hour, consisting of a combination of transit, pedestrian, and bicycle trips.

**Vehicular Trips**

As outlined above, a total of 1,124 vehicular trips will be generated by the project over the course of a weekday. During the weekday AM peak hour, 111 vehicle trips (78 in and 33 trips out) will be generated. During the weekday PM peak hour, 110 vehicle trips (95 trips in and 15 trips out) will be generated.

The South Boston Waterfront Sustainable Transportation Plan included information on the residential locations of South Boston Waterfront employees. Using that information, the traffic patterns of employees to the area were determined and applied to the automobile portion of the Stavis Seafoods Development Project trips. Almost all of the site trips will be oriented to and from points west on Northern Avenue with only a minor percentage to access Dry Dock Avenue and points in South Boston.

**Alternate Mode Trips**

Based on the information provided in the South Boston Waterfront Sustainable Transportation Plan, approximately half of the trips visiting the South Boston Waterfront District were attributed to alternate modes. As outlined above, these aggressive mode splits were not applied to truck trips or fish processing customer trips.

During the field visit, pedestrian amenities were noted in the site vicinity and pedestrians were noted taking advantage of those facilities. Just under half of the alternative mode trips were estimated to be made on foot based on the information provided in the South Boston Waterfront Sustainable Transportation Plan.

The closest Hubway station is approximately ¼ mile from the site on Drydock Avenue with additional Hubway stations slightly further from the site. With further development of the area, it is likely that additional Hubway stations will be installed. Based on the information provided in the South Boston Waterfront Sustainable Transportation Plan, three (3) percent of the 54 percent of trips made by alternative modes will be made via bicycle.

The South Boston Waterfront Sustainable Transportation Plan indicates that the Silver Line SL2, which provides the closest service to the site, is operating at maximum capacity during the critical AM peak hour. Because the employees anticipated at Stavis Seafoods will commute earlier than the typical weekday AM peak hour, capacity is likely available to accommodate these commuters. In addition, the SL1 line also provides service to Silver Line Way at the Manulife Building, which is in walking distance to the proposed Stavis Seafoods. This line has capacity available, even during the peak hours. The South Boston Waterfront Sustainable Transportation Plan estimates that approximately half of the trips made by alternative modes will be made by transit.

## VEHICULAR OPERATIONS

The vehicular trips associated with the Stavis Seafoods Development Project site were added to the traffic volumes on Fid Kennedy Avenue. An intersection analysis of Fid Kennedy at Tide Street was conducted because the most intense traffic impacts from the project will occur at that intersection. Other intersections were not analyzed as they will experience less significant impact as vehicles distribute to different routes.

The operations at the intersection of Fid Kennedy Avenue at Tide Street were evaluated and are shown in Table 2 below.

**Table 2: Unsignalized Intersection Operations Analysis Summary**

| Fid Kennedy Avenue at Tide Street | Build Condition | | | |
|---|---|---|---|---|
| | All Traffic Using Fid Kennedy Avenue | | All Traffic Using Tide Street | |
| | LOS | Delay | LOS | Delay |
| **Northbound Approach** | | | | |
| **AM Peak Hour** | B | 11.8 | B | 10.0 |
| **PM Peak Hour** | B | 10.2 | B | 10.1 |
| **Southbound Approach** | | | | |
| **AM Peak Hour** | A | 9.1 | A | 9.8 |
| **PM Peak Hour** | A | 9.2 | B | 10.4 |

With the proposed additional traffic visiting the site, vehicles at the intersection of Fid Kennedy Avenue at Tide Street will experience very good operations with an average of ten seconds of delay per vehicle.

## CONCLUSIONS

The traffic impacts associated with the development of Stavis Seafoods Development Project site were determined. As shown, the transportation infrastructure is in place to accommodate the vehicular, transit, pedestrian and bicycle trips expected to be generated by the proposed redevelopment.

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.9 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 74 | 7 | 0 | 0 | 23 | 0 | 0 | 4 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 58 | 58 | 58 | 58 | 58 | 58 | 80 | 80 | 80 |
| Heavy Vehicles, % | 31 | 31 | 31 | 31 | 31 | 31 | 15 | 15 | 15 |
| Mvmt Flow | 128 | 12 | 0 | 0 | 40 | 0 | 0 | 5 | 0 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | |
|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 40 | 0 | 0 | 12 | 0 | 0 | 327 | 307 | 12 |
| Stage 1 | - | - | - | - | - | - | 267 | 267 | - |
| Stage 2 | - | - | - | - | - | - | 60 | 40 | - |
| Critical Hdwy | 4.41 | - | - | 4.41 | - | - | 7.25 | 6.65 | 6.35 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.25 | 5.65 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.25 | 5.65 | - |
| Follow-up Hdwy | 2.479 | - | - | 2.479 | - | - | 3.635 | 4.135 | 3.435 |
| Pot Cap-1 Maneuver | 1402 | - | - | 1437 | - | - | 602 | 586 | 1032 |
| Stage 1 | - | - | - | - | - | - | 711 | 665 | - |
| Stage 2 | - | - | - | - | - | - | 920 | 837 | - |
| Platoon blocked, % | | - | - | | - | - | | | |
| Mov Cap-1 Maneuver | 1402 | - | - | 1437 | - | - | 535 | 532 | 1032 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 535 | 532 | - |
| Stage 1 | - | - | - | - | - | - | 646 | 604 | - |
| Stage 2 | - | - | - | - | - | - | 881 | 837 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | | | 11.8 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 532 | 1402 | - | - | 1437 | - | - | 923 |
| HCM Lane V/C Ratio | 0.009 | 0.091 | - | - | - | - | - | 0.045 |
| HCM Control Delay (s) | 11.8 | 7.8 | 0 | - | 0 | - | - | 9.1 |
| HCM Lane LOS | B | A | A | - | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | 0 | - | - | 0 | - | - | 0 |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 0 | 2 | 31 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 80 | 80 | 80 |
| Heavy Vehicles, % | 24 | 24 | 24 |
| Mvmt Flow | 0 | 2 | 39 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 310 | 307 | 40 |
| Stage 1 | 40 | 40 | - |
| Stage 2 | 270 | 267 | - |
| Critical Hdwy | 7.34 | 6.74 | 6.44 |
| Critical Hdwy Stg 1 | 6.34 | 5.74 | - |
| Critical Hdwy Stg 2 | 6.34 | 5.74 | - |
| Follow-up Hdwy | 3.716 | 4.216 | 3.516 |
| Pot Cap-1 Maneuver | 602 | 572 | 972 |
| Stage 1 | 922 | 820 | - |
| Stage 2 | 690 | 650 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 556 | 519 | 972 |
| Mov Cap-2 Maneuver | 556 | 519 | - |
| Stage 1 | 837 | 820 | - |
| Stage 2 | 621 | 590 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 9.1 |
| HCM LOS | A |

| Minor Lane/Major Mvmt |
|---|

| Intersection | |
|---|---|
| Int Delay, s/veh | 5.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 13 | 33 | 0 | 0 | 34 | 0 | 0 | 2 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Heavy Vehicles, % | 31 | 31 | 31 | 31 | 31 | 31 | 47 | 47 | 47 |
| Mvmt Flow | 16 | 41 | 0 | 0 | 42 | 0 | 0 | 2 | 0 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | |
|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 43 | 0 | 0 | 41 | 0 | 0 | 176 | 117 | 41 |
| Stage 1 | - | - | - | - | - | - | 74 | 74 | - |
| Stage 2 | - | - | - | - | - | - | 102 | 43 | - |
| Critical Hdwy | 4.41 | - | - | 4.41 | - | - | 7.57 | 6.97 | 6.67 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.57 | 5.97 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.57 | 5.97 | - |
| Follow-up Hdwy | 2.479 | - | - | 2.479 | - | - | 3.923 | 4.423 | 3.723 |
| Pot Cap-1 Maneuver | 1398 | - | - | 1401 | - | - | 697 | 697 | 915 |
| Stage 1 | - | - | - | - | - | - | 834 | 753 | - |
| Stage 2 | - | - | - | - | - | - | 805 | 778 | - |
| Platoon blocked, % | | - | - | | - | - | | | |
| Mov Cap-1 Maneuver | 1398 | - | - | 1401 | - | - | 609 | 689 | 915 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 609 | 689 | - |
| Stage 1 | - | - | - | - | - | - | 824 | 744 | - |
| Stage 2 | - | - | - | - | - | - | 709 | 778 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | | | 10.2 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 689 | 1398 | - | - | 1401 | - | - | 982 |
| HCM Lane V/C Ratio | 0.004 | 0.012 | - | - | - | - | - | 0.121 |
| HCM Control Delay (s) | 10.2 | 7.6 | 0 | - | 0 | - | - | 9.2 |
| HCM Lane LOS | B | A | A | - | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 0 | 5 | 90 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 80 | 80 | 80 |
| Heavy Vehicles, % | 12 | 12 | 12 |
| Mvmt Flow | 0 | 6 | 112 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 118 | 117 | 43 |
| Stage 1 | 43 | 43 | - |
| Stage 2 | 75 | 74 | - |
| Critical Hdwy | 7.22 | 6.62 | 6.32 |
| Critical Hdwy Stg 1 | 6.22 | 5.62 | - |
| Critical Hdwy Stg 2 | 6.22 | 5.62 | - |
| Follow-up Hdwy | 3.608 | 4.108 | 3.408 |
| Pot Cap-1 Maneuver | 835 | 755 | 1000 |
| Stage 1 | 946 | 840 | - |
| Stage 2 | 910 | 814 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 825 | 746 | 1000 |
| Mov Cap-2 Maneuver | 825 | 746 | - |
| Stage 1 | 935 | 840 | - |
| Stage 2 | 896 | 804 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 9.2 |
| HCM LOS | A |

| Minor Lane/Major Mvmt |
|---|

| Intersection | |
|---|---|
| Int Delay, s/veh | 7.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 7 | 0 | 0 | 23 | 0 | 0 | 78 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 58 | 58 | 58 | 58 | 58 | 58 | 80 | 80 | 80 |
| Heavy Vehicles, % | 31 | 31 | 31 | 31 | 31 | 31 | 15 | 15 | 15 |
| Mvmt Flow | 0 | 12 | 0 | 0 | 40 | 0 | 0 | 98 | 0 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | |
|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 40 | 0 | 0 | 12 | 0 | 0 | 72 | 52 | 12 |
| Stage 1 | - | - | - | - | - | - | 12 | 12 | - |
| Stage 2 | - | - | - | - | - | - | 60 | 40 | - |
| Critical Hdwy | 4.41 | - | - | 4.41 | - | - | 7.25 | 6.65 | 6.35 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.25 | 5.65 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.25 | 5.65 | - |
| Follow-up Hdwy | 2.479 | - | - | 2.479 | - | - | 3.635 | 4.135 | 3.435 |
| Pot Cap-1 Maneuver | 1402 | - | - | 1437 | - | - | 888 | 815 | 1032 |
| Stage 1 | - | - | - | - | - | - | 976 | 860 | - |
| Stage 2 | - | - | - | - | - | - | 920 | 837 | - |
| Platoon blocked, % | | - | - | | - | - | | | |
| Mov Cap-1 Maneuver | 1402 | - | - | 1437 | - | - | 853 | 815 | 1032 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 853 | 815 | - |
| Stage 1 | - | - | - | - | - | - | 976 | 860 | - |
| Stage 2 | - | - | - | - | - | - | 874 | 837 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | | | 10 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 815 | 1402 | - | - | 1437 | - | - | 799 |
| HCM Lane V/C Ratio | 0.12 | - | - | - | - | - | - | 0.052 |
| HCM Control Delay (s) | 10 | 0 | - | - | 0 | - | - | 9.8 |
| HCM Lane LOS | B | A | - | - | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 0 | 33 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 80 | 80 | 80 |
| Heavy Vehicles, % | 24 | 24 | 24 |
| Mvmt Flow | 0 | 41 | 0 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 101 | 52 | 40 |
| Stage 1 | 40 | 40 | - |
| Stage 2 | 61 | 12 | - |
| Critical Hdwy | 7.34 | 6.74 | 6.44 |
| Critical Hdwy Stg 1 | 6.34 | 5.74 | - |
| Critical Hdwy Stg 2 | 6.34 | 5.74 | - |
| Follow-up Hdwy | 3.716 | 4.216 | 3.516 |
| Pot Cap-1 Maneuver | 830 | 799 | 972 |
| Stage 1 | 922 | 820 | - |
| Stage 2 | 898 | 844 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 754 | 799 | 972 |
| Mov Cap-2 Maneuver | 754 | 799 | - |
| Stage 1 | 922 | 820 | - |
| Stage 2 | 796 | 844 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 9.8 |
| HCM LOS | A |

| Minor Lane/Major Mvmt |
|---|

| Intersection | |
|---|---|
| Int Delay, s/veh | 6.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 33 | 0 | 0 | 34 | 0 | 0 | 15 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Heavy Vehicles, % | 31 | 31 | 31 | 31 | 31 | 31 | 47 | 47 | 47 |
| Mvmt Flow | 0 | 41 | 0 | 0 | 42 | 0 | 0 | 19 | 0 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | |
|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 43 | 0 | 0 | 41 | 0 | 0 | 143 | 84 | 41 |
| Stage 1 | - | - | - | - | - | - | 41 | 41 | - |
| Stage 2 | - | - | - | - | - | - | 102 | 43 | - |
| Critical Hdwy | 4.41 | - | - | 4.41 | - | - | 7.57 | 6.97 | 6.67 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.57 | 5.97 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.57 | 5.97 | - |
| Follow-up Hdwy | 2.479 | - | - | 2.479 | - | - | 3.923 | 4.423 | 3.723 |
| Pot Cap-1 Maneuver | 1398 | - | - | 1401 | - | - | 734 | 728 | 915 |
| Stage 1 | - | - | - | - | - | - | 871 | 780 | - |
| Stage 2 | - | - | - | - | - | - | 805 | 778 | - |
| Platoon blocked, % | | - | - | | - | - | | | |
| Mov Cap-1 Maneuver | 1398 | - | - | 1401 | - | - | 649 | 728 | 915 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 649 | 728 | - |
| Stage 1 | - | - | - | - | - | - | 871 | 780 | - |
| Stage 2 | - | - | - | - | - | - | 691 | 778 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | | | 10.1 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 728 | 1398 | - | - | 1401 | - | - | 787 |
| HCM Lane V/C Ratio | 0.026 | - | - | - | - | - | - | 0.151 |
| HCM Control Delay (s) | 10.1 | 0 | - | - | 0 | - | - | 10.4 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0 | 0 | - | - | 0 | - | - | 1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 0 | 95 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 80 | 80 | 80 |
| Heavy Vehicles, % | 12 | 12 | 12 |
| Mvmt Flow | 0 | 119 | 0 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 94 | 84 | 43 |
| Stage 1 | 43 | 43 | - |
| Stage 2 | 51 | 41 | - |
| Critical Hdwy | 7.22 | 6.62 | 6.32 |
| Critical Hdwy Stg 1 | 6.22 | 5.62 | - |
| Critical Hdwy Stg 2 | 6.22 | 5.62 | - |
| Follow-up Hdwy | 3.608 | 4.108 | 3.408 |
| Pot Cap-1 Maneuver | 866 | 787 | 1000 |
| Stage 1 | 946 | 840 | - |
| Stage 2 | 937 | 841 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 849 | 787 | 1000 |
| Mov Cap-2 Maneuver | 849 | 787 | - |
| Stage 1 | 946 | 840 | - |
| Stage 2 | 914 | 841 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 10.4 |
| HCM LOS | B |

| Minor Lane/Major Mvmt |
|---|