Appendix D

Transportation Impact Study

EIR Alternatives Analysis Transportation Memo

Source: Google Earth

Prepared for

San Francisco
Planning
Department

Prepared by

FEHR & PEERS

332 Pine Street, Floor 4
San Francisco, CA 94104

India Basin Development

Transportation Impact Study

FINAL

August 2017

Final Transportation Impact Study

India Basin

Case Number: 2014.002541ENV

Prepared for:

San Francisco Planning Department

Prepared by:

FEHR PEERS

August 2017

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1 INTRODUCTION

This transportation impact study report describes the existing transportation setting and provides a transportation impact analysis for the proposed development at India Basin (herein referred to as the "Proposed Project") in San Francisco, California. The Proposed Project, co-sponsored by Build and the San Francisco Recreation and Parks Department (RPD), would redevelop both Project Sponsors' parcels along the India Basin shoreline of the San Francisco Bay; it would develop the privately owned 16.94 acres plus 5.77 acres of developed and undeveloped public rights of way for residential, commercial, office, institutional uses, and recreational uses and create a 14.2-acre network of new and/or modified parkland and open space. The Project also includes changes to the roadway network in the immediate area, including construction of new streets, new sidewalks and bicycle facilities, an on-street and off-street vehicle parking program, and a Transportation Demand Management (TDM) Program.

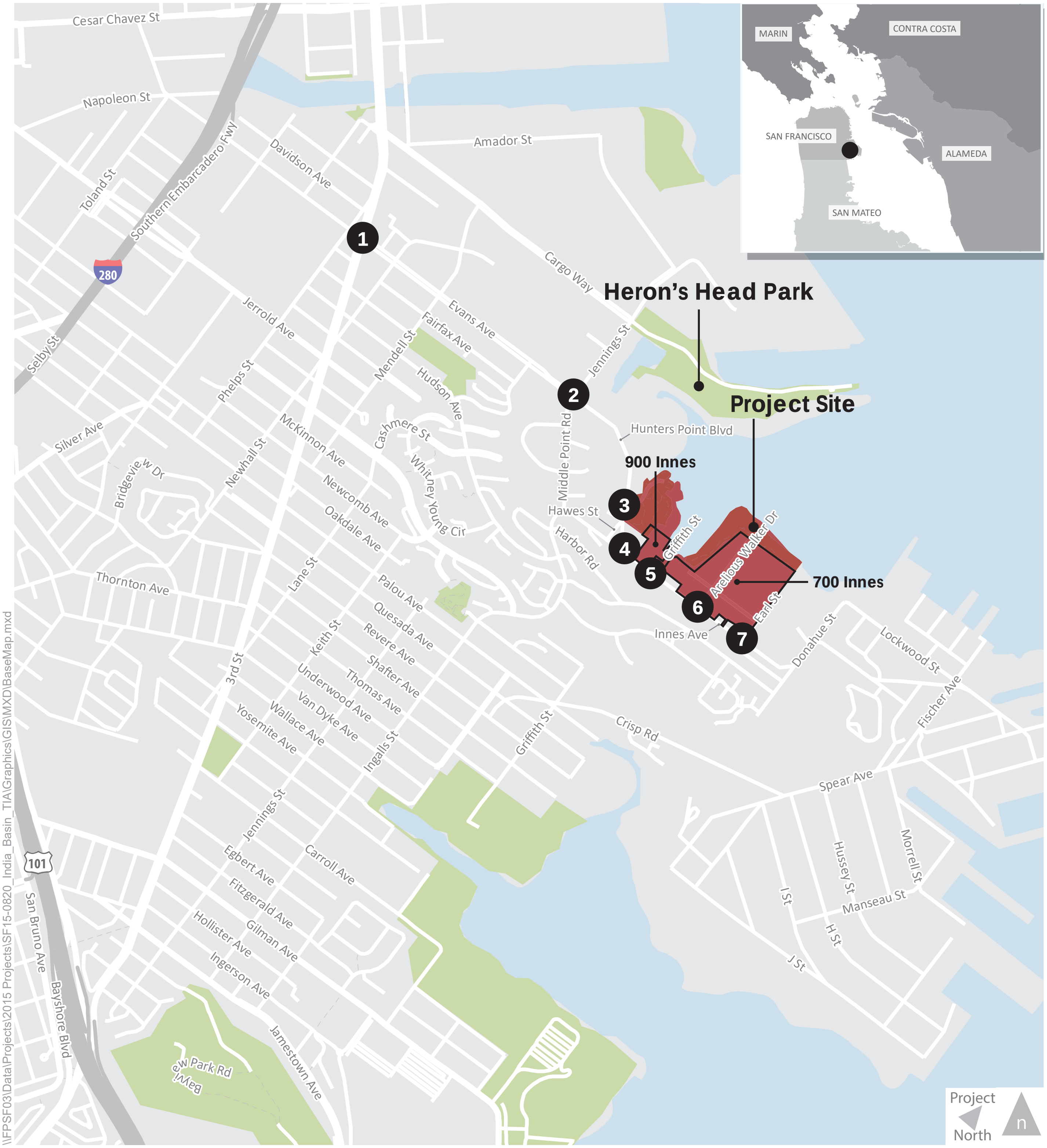
Consistent with the *San Francisco Transportation Impact Analysis Guidelines for Environmental Review* (October 2002) (herein "*SF Guidelines*") and the *Resolution Modifying Transportation Impact Analysis* (March 2016)[1], this transportation impact analysis evaluates the Proposed Project's potential impacts on vehicle miles traveled (VMT), traffic hazards, transit operations, bicycle conditions, pedestrian conditions, loading operations, emergency access, construction activities, and parking, and also features a discussion of traffic operations for informational purposes. This chapter summarizes the key attributes of the project relating to transportation conditions, outlines the report structure and describes the methodology used for analysis. A detailed description of the scope of work is provided in **Appendix A**.

1.1 PROJECT SETTING

The Project is located in the Bayview Hunters Point neighborhood in the southeast quadrant of the city. **Figure 1** shows the location of the Project Site and streets in the vicinity. The site perimeter has frontage on Innes Avenue, Hunters Point Boulevard, and Earl Street, and the site has frontage onto Hawes Street, Hudson Avenue, Griffith Street, and Arelious Walker Drive. Currently, the Project Site is generally undeveloped with the exception of a few low-rise structures. Approximately twelve acres of the site is open space and includes a portion of the Blue Greenway along the shoreline, which is a City project to modify the Blue Greenway/Bay Trail. Approximately 2.5 acres between the India Basin Shoreline Park and India Basin Shoreline Open Space contains several buildings in various stages of disrepair, including the historically-designated Shipwright's Cottage. More than seven acres are public right-of-way on Griffith Street, Hudson Avenue, Earl Street, and Arelious Walker Drive. The remainder of the site contains light brush, debris, dirt, and gravel mounts.

The neighborhood surrounding the Project Site is being developed with numerous development proposals in the planning and approval stages. The Project Site is bounded to the east by the Candlestick-Hunters Point Shipyard Phase II Development project area, which includes more than 10,000 residential units, 250,000 sf of neighborhood retail, 2.5 million square feet of research and development, artist studios, hotel rooms, open space, and community services.

[1] San Francisco Planning Department, *Resolution Modifying Transportation Impact Analysis* (March 2016). http://commissions.sfplanning.org/cpcpackets/Align-CPC%20exec%20summary_20160303_Final.pdf



Study Intersection

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Figure 1
Project Site Location and Study Intersections

The Proposed Project, co-sponsored by Build and the San Francisco Recreation and Park Department (RPD), would redevelop both Project Sponsors' parcels along the India Basin shoreline of the San Francisco Bay. Build and RPD are collectively referred to as "Project Sponsor" throughout this document. The parcels that are collectively referred to as 700 Innes Avenue property, comprise nearly 17.12 acres of the site and are owned or would be acquired by Build. The parcels that are collectively referred to as 900 Innes Avenue property, India Basin Open Space, and India Basin Shoreline Park, make up more than 14.2 acres and are owned by the RPD. The remaining 5.94 acres make up the developed and undeveloped public right-of-way on Griffith Street, Hudson Avenue, Earl Street, and Arelious Walker Drive. The Project Site ownership by parcel is detailed in **Figure 2A**.

1.2 PROJECT DESCRIPTION

1.2.1 Land Use Program

Two project land use variants are proposed: the Proposed Project and a Maximum Commercial Program Variant ("Project Variant"), which has fewer dwelling units and more commercial development than the Proposed Project. The land use plan for the Proposed Project is illustrated in **Figure 2B**, and the land use plan for the Project Variant is illustrated in **Figure 2C**. Land uses associated with the Proposed Project and the Project Variant are described below and detailed in **Table 1-1**. Off-street parking associated with the Proposed Project and the Project Variant are described below and detailed in **Table 1-2**. While the amount of off-street parking associated with the land use program is shown in this section, a detailed breakdown of the amount and location of both on-street and off-street parking is provided in Section 1.2.8. Detailed plans are included in **Appendix B**.

1.2.1.1 Build Property: 700 Innes Avenue

Proposed Project – The proposed development at 700 Innes Avenue would include 1,240 residential units, 35,000 square feet (35 thousand square feet [ksf]) of restaurant and café space, a 25 ksf supermarket, 40.4 ksf of general retail, and 174.93 ksf of general office in the Proposed Project. The Proposed Project would also include a preparatory school (50 ksf) and a 5.63-acre publicly accessible open space area, referred to as the "Big Green". The proposed pre-K-8 private school would be located along the eastern perimeter of the India Basin site, abutting the southwest corner of the intersection of New Hudson Avenue/Earl Street. The school would be a five-story, 50,000-sf building with 20 classrooms. A 10,000-sf yard would be provided on the roof of the building as well as a 1,700-sf auxiliary yard along the building's southern frontage. The school is expected to enroll 450 students and employ 95 teachers and staff members. The proposed school conceptual site plan is shown in **Figure 2D**.

At least one on-site childcare facility would be provided within the project; the specific location of this childcare facility has not been determined. With the exception of a barn structure at 702 Earl Street, which is a residential house structure that would be relocated within the Project Site, the existing structures on the 700 Innes Avenue property would be demolished.

The Proposed Project includes the provision of 1,800 off-street parking spaces; this includes 1,230 private parking spaces and 570 public parking spaces. These parking spaces would be located in garage structures built into the other land uses on both the ground level and up to two stories below ground. There are no separate structures that contain only parking. The Proposed Project would provide 1,506 bicycle parking spaces as follows: 1,343 Class I bicycle parking spaces (such as bike lockers, or secure bike rooms), and 163 Class II bicycle parking spaces (publicly accessible bicycle racks).

Project Variant – The Project Variant would include 500 residential units, 45 ksf of restaurant and café space, a 25 ksf supermarket, 70 ksf of general retail and 400 ksf of general office. In addition, the Project Variant would include 275 ksf of Research and Development (R&D) lab area, 85 ksf of clinical use, and 100 ksf of administrative use. The Project Variant would also include a preparatory school (50 ksf) and the "Big Green". At least one on-site childcare facility would be provided within the project; the specific location of this childcare facility has not been determined. With the exception of 702 Earl Street, a residential house that would be relocated within the Project Site, the existing structures on the 700 Innes Avenue property would be demolished.

The Project Variant includes the provision of 1,912 off-street parking spaces; this includes 1,412 private parking spaces and 500 public parking spaces. These parking spaces would be located in garage structures built into the other land uses on both the ground level and up to two stories below ground. The Project Variant will would provide 909 bicycle parking spaces as follows: 745 Class I bicycle parking spaces and 164 Class II bicycle parking spaces.

1.2.1.2 RPD Property - 900 Innes, India Basin Shoreline Park, and India Basin Open Space

The development of the RPD Property is the same for the Proposed Project and the Project Variant. The proposed development at 900 Innes Avenue, India Basin Shoreline Park, and India Basin Open Space would make changes to the park and open space use and would be combined to create a 14.2-acre network of new and/or modified parkland and open space. This new shoreline network would extend the Blue Greenway/Bay Trail and would provide pedestrian and bicycle connections to and along the shoreline. The 6.2-acre India Basin Open Space would remain in a natural state. The existing tidal salt marsh wetlands would be modified to include sand dunes, bird islands, a recreational beach area, a boat launch, a bioengineered breakwater, brackish lagoons, scrub upland planting, tree stands for wind buffering, and new wetlands and ponds. Pathways in the form of boardwalks, trails, and stairways would connect India Basin Open Space with the upland parkland and would provide continuous, publicly accessible shoreline access along the Bay. The 5.6-acre India Basin Shoreline Park would be redesigned. Potential uses that could be programmed for this property could include modified playground and recreational facilities, restrooms, additional trees, lawn areas, barbecue pits, drinking fountains, a boat launch ramp, in-water piers, art installations, lighting, and exercise or cross training course. The existing surface parking, vehicular access, and drop-off and loading zones also would be changed.

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TABLE 1-1: PROPOSED PROJECT FLOOR AREA USE				
Floor Area Use	**Proposed Project**	**Floor Area (gsf)**	**Project Variant**	**Floor Area (gsf)**
Build Property				
Residential	1,240 units[1]: 198 studios 236 one-bedroom 670 two-bedroom 136 three-bedroom	1,240,100	500 units[1]: 50 studios 125 one-bedroom 275 two-bedroom 50 three-bedroom	417,300
Commercial/ Retail	R&D Lab Area	-	R&D Lab Area	275,000
	Clinical Use	-	Clinical Use	85,000
	Administrative Use	-	Administrative Use	100,000
	General Office	174,930	General Office	400,000
	Restaurant	15,000	Restaurant	25,000
	Café	20,000	Café	20,000
	Supermarket	25,000	Supermarket	25,000
	General Retail	40,400	General Retail	70,000
	Total	*275,330*	*Total*	*1,000,000*
Institutional/ Educational	Private School	50,000	Private School	50,000
Open Space	Big Green Open Space	237,400	Big Green Open space	237,400
Subtotal	-	*1,802,830*	-	*1,654,700*
RPD Property				
Open Space (Public)	India Basin Open Space 900 Innes India Basin Shoreline Park *Total*	270,000 78,400 243,900 *592,300 (=13.6 ac)*	India Basin Open Space 900 Innes India Basin Shoreline Park *Total*	270,000 78,400 243,900 *592,300 (=13.6 ac)*
Total	-	*2,395,130*	-	*2,297,000*

Notes:

1. This unit count includes the barn structure at 702 Earl Street, a residential house on the Project Site that would be relocated elsewhere on the Project Site. However, because the relocated house would not increase trip generation it is omitted from travel demand calculations below.

Source: Draft India Basin Notice of Preparation of an Environmental Impact Report and Public Scoping Meeting, April 30, 2015, modified October 2015.

TABLE 1-2: PROPOSED PROJECT OFF-STREET PARKING AND BICYCLE PARKING		
Type	**Proposed Project**	**Project Variant**
Build Property		
Off-Street Parking	1,230 private off-street spaces 570 public off-street spaces	1,412 private off-street spaces 500 public off-street spaces
	Total: 1,800 off-street spaces	*Total: 1,912 off-street spaces*
Bike Parking[1]	1,343 Class 1 spaces 163 Class 2 spaces	745 Class 1 spaces 164 Class 2 spaces
	Total: 1,506 spaces	*Total: 909 spaces*

Notes:

1. One Class 1 space would be provided for each residential unit, i.e. 1,240 for the Proposed Project and 500 for the Project Variant. The remainder in each scenario would be for commercial users.

Source: Draft India Basin Notice of Preparation of an Environmental Impact Report and Public Scoping Meeting, April 30, 2015, modified October 2015.

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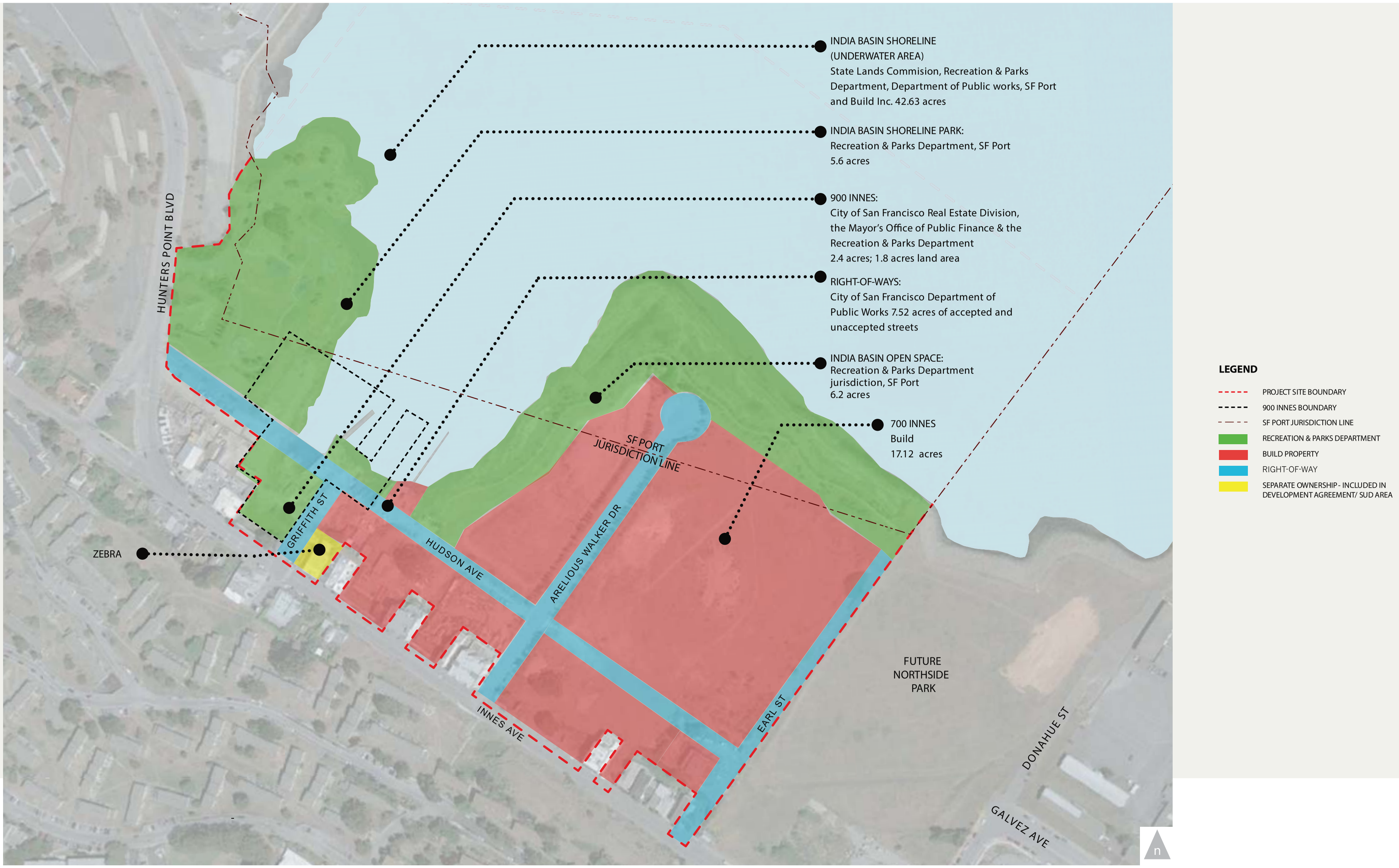

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Figure 2A

Proposed Project Site

LEGEND

- Project Site Boundary
- Potential School Location
- Residential
- Ground Floor Commercial
- Two-Level Commercial
- Two-Level Commercial w/ Residential
- Open Space
- Recreation and Parks Department

Figure 2B

Proposed Project Land Use Plan

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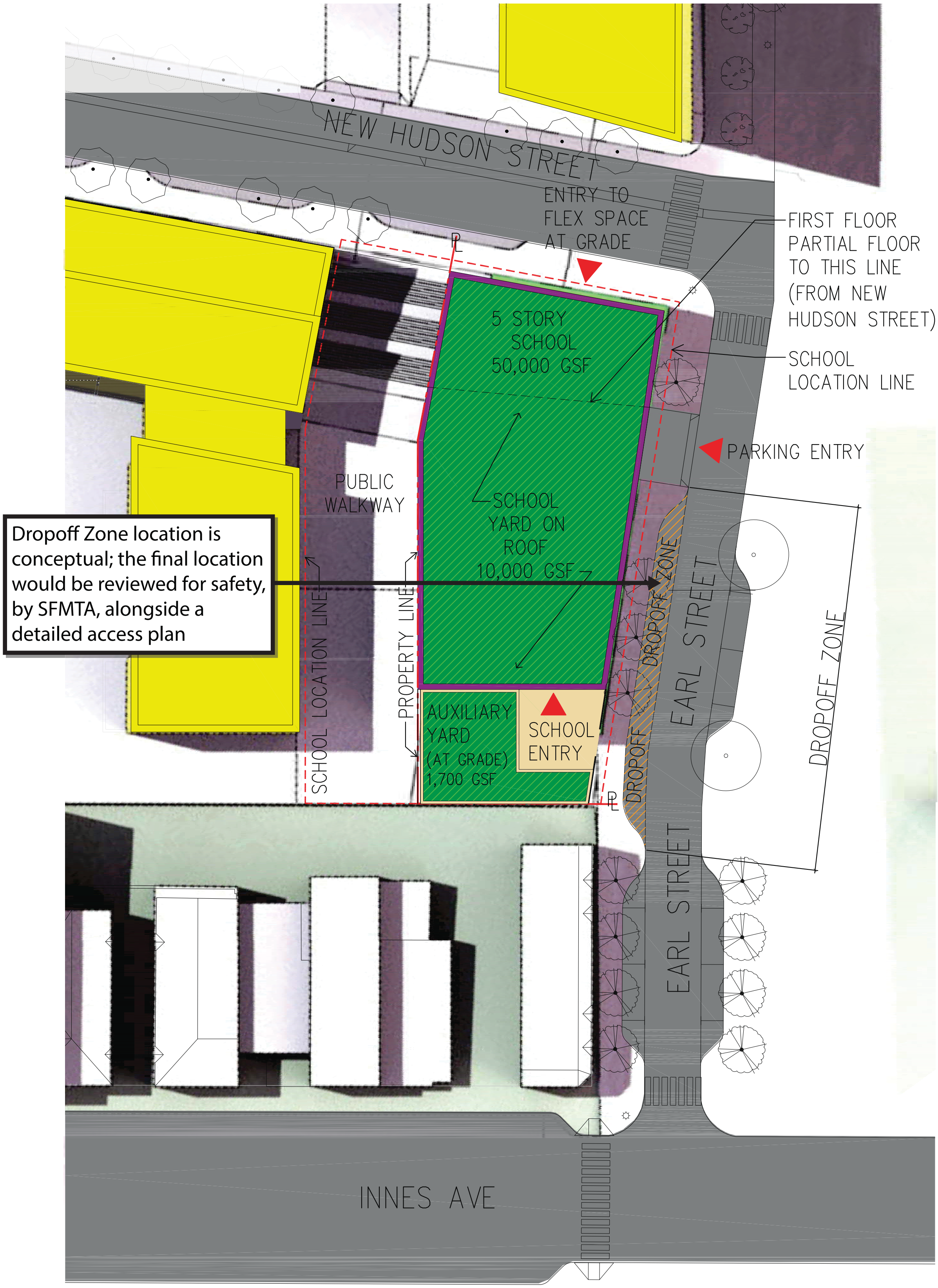
Figure 2C

Maximum Commercial Variant Land Use Plan



CONCEPTUAL DRAWING ONLY
DETAILED DESIGN MUST BE COMPLETED
PRIOR TO CONSTRUCTION

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Figure 2D

Conceptual Proposed School Site Plan

1.2.2 Construction Phasing

Buildout of the Proposed Project is anticipated to occur in three phases over an approximately eight year period, from 2018 through 2026. Project construction phasing is presented in **Table 1-3**.

TABLE 1-3: PROJECT CONSTRUCTION PHASING

Property	Phase	Start Date	Duration (months)	Residential (units)	Commercial (ksf)	School (ksf)	Parking (ksf)	Site/ Outdoor
Proposed Project								
Build	1	March 2018	40	709	233	50	655	973
	2	June 2020	30	531	43	0	25	713
RPD	RPD	January 2019	24	0	15	0	6*	592
Total	-	-	-	*1,240*	*290*	*50*	*686*	*2,278*
Project Variant								
Build	1	March 2018	40	10	869	50	692	955
	2	June 2020	30	490	132	0	25	721
RPD	RPD	January 2019	24	0	15	0	6*	597
Total	-	-	-	*500*	*1,015*	*50*	*723*	*2,272*

Notes:
* indicates parking would be outdoor surface parking

Construction phasing is presented in **Figure 2E** and **Figure 2F.**

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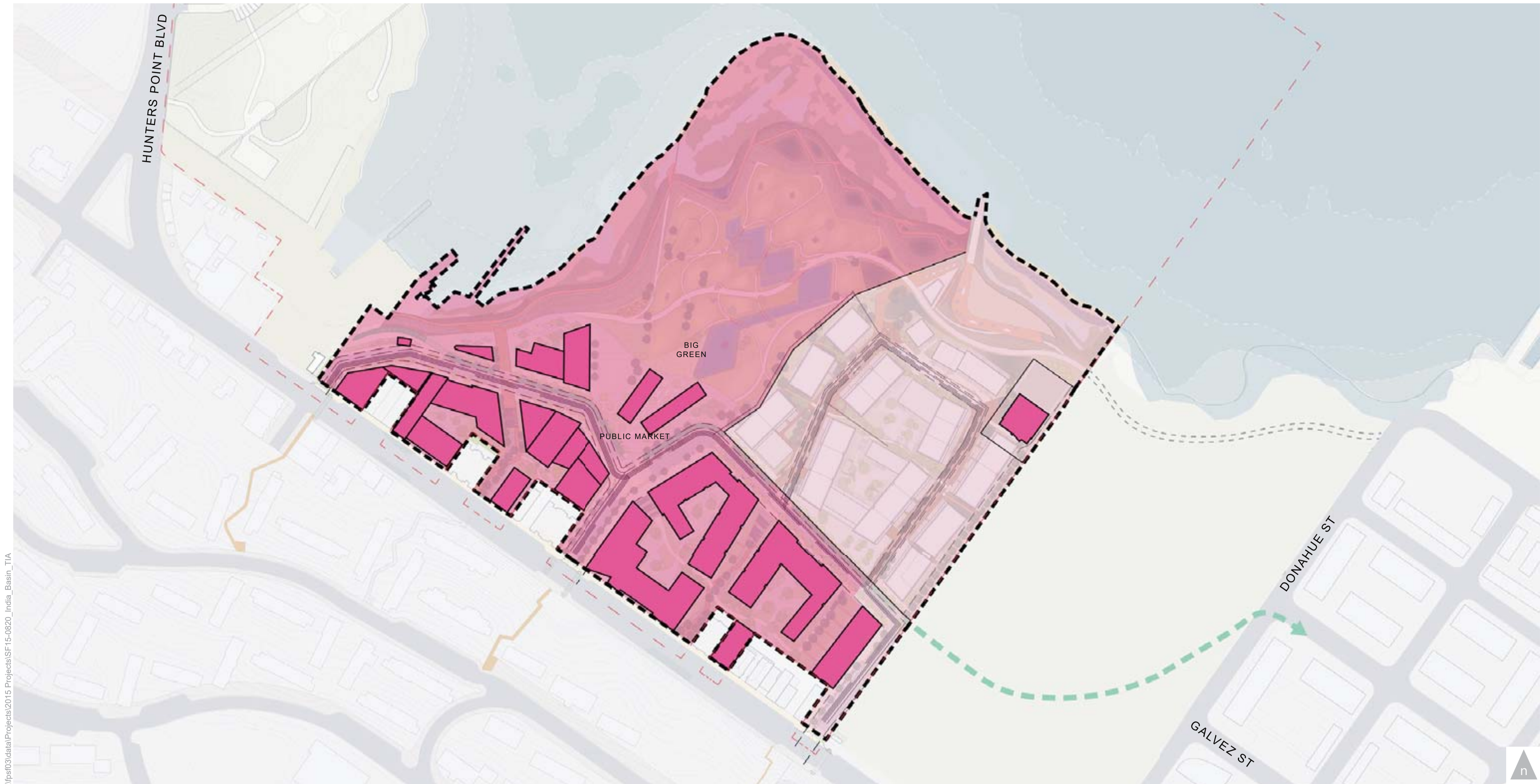

LEGEND

- PROJECT SITE BOUNDARY
- AREA BEING CONSTRUCTED
- **TEMPORARY ACCESS & AREA FOR CONSTRUCTION ACTIVITIES:** CLEAR & GRUB, EXCAVATION & ROUGH GRADING, SOIL MANAGEMENT, LAYDOWN, STAGING, ACCESS, TEMPORARY FACILITIES, TEMPORARY ROADS & VEHICULAR ACCESS
- BUILDINGS
- UTILITIES

Figure 2E

Construction - Phase 1

LEGEND

- PROJECT SITE BOUNDARY
- **TEMPORARY ACCESS & AREA UNDER CONSTRUCTION:** CLEAR & GRUB, EXCAVATION & ROUGH GRADING, SOIL MANAGEMENT, LAYDOWN, STAGING, ACCESS, TEMPORARY FACILITIES, TEMPORARY ROADS & VEHICULAR ACCESS, BUILD OUT
- BUILDINGS
- UTILITIES
- CONSTRUCTED BUILDINGS (MAJOR PHASE 1)

Figure 2F

Construction - Phase 2

1.2.3 Roadway Network Changes

Roadway network changes would be the same for both the Proposed Project and Project Variant, as explained below.

1.2.3.1 Internal to Project Site

Build Property: 700 Innes Avenue

Vehicular access to/from 700 Innes Avenue would be via Innes Avenue at either Griffith Street, Arelious Walker Drive, or Earl Street. Griffith Street would be a new residential street that would extend north of Innes Avenue into the Project Site. Arelious Walker Drive and Earl Street would be modified to become neighborhood commercial streets within the site.

The Project proposes two new streets in addition to Griffith Street: New Hudson Avenue would replace the existing unpaved Hudson Avenue[2] and would extend east-west connecting Griffith Street, Arelious Walker Drive, and Earl Street; and a new shared public way loop road would be constructed off of New Hudson Avenue. This loop would be named Beach Lane, Fairfax Lane, and Spring Lane. This street would consist of a single shared paved surface with no curbs or gutters[3] and it would have limited vehicular traffic and be designed to afford pedestrians priority over automobiles. Automobiles could access it from the adjoining streets by a curb cut similar to a typical driveway. All internal streets would be public streets.

Garage access would be provided on New Hudson Avenue, Arelious Walker Drive, Earl Street, Beach Lane, and Spring Lane. The garage access would be the same for the Proposed Project and Project Variant.

RPD Property - 900 Innes, India Basin Shoreline Park, and India Basin Open Space

Vehicular access to the India Basin Shoreline Park property would continue to be provided via Hunters Point Boulevard at Hawes Street. Hawes Street would be retained as the sole automobile access point to the park.

The existing vehicular right of way (ROW) on the western edge of the property, at Hudson Avenue, is proposed to be removed but would be maintained to provide vehicular access to the privately owned properties across Hudson Avenue, outside of the project site boundary, unless alternative access to these properties from Hunters Point Boulevard or Innes Avenue is feasible and would not create unacceptable conflicts between vehicles, cyclists and pedestrians. The Recreation and Parks Department will consider maintaining public access on Hudson Avenue to facilitate adjoining development that would activate and complement the park frontage. Emergency-vehicle access to the 900 Innes property would be permitted on the Class I bikeway, a separated right-of-way for the exclusive use of cyclists that would be constructed along the current alignment of Hudson Avenue adjacent to the 900 Innes property. This bikeway is explained in more detail in Section 1.2.6.

Table 1-4 summarizes characteristics of the streets within and adjacent to the Project.

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[2] The existing Hudson Avenue is a paper street, which is unpaved and operates as access to parking at the rear of the local buildings.

[3] Final designs would be subject to approval by the San Francisco Municipal Transportation Agency (SFMTA), San Francisco Fire Department, and the Department of Public Works to ensure that the streets are designed consistent with City policies and design standards.

TABLE 1-4: PROJECT SITE STREET TYPE AND RIGHT-OF-WAY (ROW) WIDTH					
Street	**Extent**	**Street Type**	**Travel Lanes**	**Travel Lane Width**	**Overall Right of Way**
Griffith Street	Innes Avenue to New Hudson Avenue	Neighborhood Commercial Street	2	13′	65′
Arelious Walker Drive	Innes Avenue to New Hudson Avenue	Neighborhood Commercial Street	2	13′	78′-2″
Earl Street	Innes Avenue to New Hudson Avenue	Neighborhood Commercial Street	2	11′-6″	46′-4″
New Hudson Avenue	Griffith Street to Earl Street	Neighborhood Commercial Street	2	10′	65′
Spring Lane	New Hudson Avenue to Fairfax Lane	Shared Public Way	2	10′	41′
Beach Lane	New Hudson Avenue to Fairfax Lane	Shared Public Way	2	10′	41′
Fairfax Lane	Spring Lane to Beach Lane	Shared Public Way	2	10′	41′
Hawes Street	Hunters Point Boulevard to San Francisco Bay	Parkway	2	~10′	25′

Source*:* India Basin Design Guidelines and Standards Draft, January 30, 2017.

1.2.3.2 External to Project Site

The following five intersections would be signalized as part of the Proposed Project:

- Hunters Point Boulevard/Hudson Avenue/Hawes Street
- Hunters Point Boulevard/Innes Avenue
- Innes Avenue/Griffith Street
- Innes Avenue/Arelious Walker Drive
- Innes Avenue/Earl Street

Design and construction of proposed signals would be subject to final review and approval of the city traffic engineer.

Eastbound left-turn lanes will be added along Innes Avenue at the three intersections adjacent to the Project Site to accommodate vehicle traffic entering the site:

- Innes Avenue/Griffith Street (170 feet long)
- Innes Avenue/Arelious Walker Drive (310 feet long)
- Innes Avenue/Earl Street (270 feet long)

In addition, the Project Sponsors would provide funding to the SFMTA for implementation of a transit only lane in each direction from the intersection of Hunters Point Boulevard/Evans Street/Jennings Street to the intersection of Donahue Street and Robinson Street should the SFMTA choose to implement the transit only lane at the time of the various improvements described above.

FivePoint (formerly, Lennar Urban) is obligated to reconstruct Evans Avenue, Hunters Point Boulevard, and Innes Avenue between Jennings Street and Donahue Way, as a condition of the Shipyard development. The City is currently undergoing a planning process to finalize the design of this street. The Proposed Project's external roadway improvements listed above are intended to be compatible with the ultimate configuration of Innes Avenue constructed by FivePoint as part of their obligations.

All internal and external streetscape improvements are subject to change per review by SFMTA, Department of Public Works, and the Fire Department. If changes occur, those changes will be subject to further review.

Vehicle access is illustrated in **Figure 2G**.

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LEGEND

- RESIDENTIAL/ COMMERCIAL/ OPEN SPACE STREET ACCESS (PUBLIC STREET)
- GARAGE ENTRANCE

Note: Innes Avenue is being studied under a separate Transportation Corridor Study. Bus stop, pedestrian crossings, and traffic light locations are preliminary.

Figure 2G

Proposed Project Roadway Network

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1.2.4 Transit Changes

The area surrounding the Proposed Project is slated for substantial additional transit service improvements not specifically tied to the Proposed Project. This section only discusses the specific transit elements included in the Proposed Project. Transit changes would be the same for both the Proposed Project and Project Variant, as explained below.

The Proposed Project would add physical elements to bus stops along Hunters Point Boulevard and Innes Avenue adjacent to the Project Site. The new elements may include amenities such as shelters and signs. However, the final locations of transit stops would be determined by SFMTA at a future date pursuant to their location guidance[4] and taking into account boarding/alighting demand and areas with higher activity and denser population. For the purposes of this study, eastbound and westbound bus stops were assumed at Hunters Point Boulevard/Hawes Street/Hudson Avenue, Hunters Point Boulevard/Innes Avenue, Innes Avenue/Griffith Street, Innes Avenue/Arelious Walker Street, and Innes Avenue/Earl Street. Proposed transit changes are shown in **Figure 2H**. Minor changes to the ultimate locations of these stops would not substantially alter the analysis or conclusions in this study.

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[4] SFMTA guidelines state that bus stops should be placed 800 to 1,360 feet apart on grades less than or equal to 10% and as close as 500 feet on grades over 10%. Rapid and Specialized stops are spaced on a case-by-case basis. Other metrics used include boarding/alighting demand, population density, and general intersection activity.

LEGEND

- PLANNED HPX
- EXISTING 19 POLK AND PLANNED 44 O'SHAUGHNESSY AND 48 QUINTARA-24TH ST
- POTENIAL* BUS STOP LOCATIONS
  Final locations of transit stops would be determined by SFMTA at a future date

Figure 2H

Proposed Transit Access

1.2.5 Pedestrian Circulation Changes

Pedestrian circulation changes would be the same for both the Proposed Project and Project Variant, as explained below.

1.2.5.1 Internal to Project Site

Build Property: 700 Innes Avenue

A new pedestrian network would be created throughout the Project Site. Sidewalks along Griffith Street, Arelious Walker Drive, Earl Street, and New Hudson Avenue would provide the primary pedestrian access to and through the Project Site. Mid-block pedestrian access from Innes Avenue would also be created via new pathways between Griffith Street and Arelious Walker Street and between Arelious Walker Street and Earl Street. All pathways and sidewalks would comply with Better Streets Plan.

The shared use bicycle and pedestrian path around the Spring Lane/Beach Lane/Fairfax Lane loop would provide pedestrian access to the residential uses along these streets. All internal site roadways would have continuous sidewalks.

An additional network of trails and shared use paths would be constructed to the Big Green open space within the Build property. The pedestrian paths would provide access to the Bay Trail, India Basin Shoreline Park, and Northside Park.

Curb extensions would be constructed at locations on corners and mid-block locations, where compatible with turning movement requirements and emergency vehicle access, as determined by SFMTA. New crosswalks are included at all internal intersections as part of the Proposed Project. Proposed pedestrian circulation within the Build property is illustrated in. **Figure 2J**.

RPD Property - 900 Innes, India Basin Shoreline Park, and India Basin Open Space

RPD proposes to make pedestrian circulation changes on RPD property which includes a network of off-street shared bicycle/pedestrian paths and pedestrian-only paths and trails through the India Basin Shoreline Park which would connect to the 700 Innes site and to existing facilities along Innes Avenue. Shared use paths would be constructed to the Big Green open space within the Project Site on the RPD Property. The pedestrian paths would provide access to the Bay Trail, India Basin Shoreline Park, and Northside Park. Proposed pedestrian circulation within the RPD property is illustrated in **Figure 2I**. A continuous sidewalk would not be provided along the full length of Hawes Street within the RPD Property, although the pedestrian pathway would run adjacent to the part of Hawes Street with on-street parking, providing access to/from parked vehicles.

Internal site roadways' proposed sidewalk widths are listed in **Table 1-5**.

TABLE 1-5: PROPOSED INTERNAL STREET SIDEWALK WIDTHS					
	Better Streets Plan			Proposed Project	
Street	Street Type	Minimum Sidewalk Width	Recommended Sidewalk Width	Sidewalk Width[1]	Sidewalk Throughway Width
Griffith Street	Neighborhood Commercial Street	12′	15′	13′-15′	5′-9′[2]
Arelious Walker Drive	Neighborhood Commercial Street	12′	15′	22-23′	9′-16′
Earl Street[2]	Neighborhood Commercial Street	12′	15′	15′	9′
New Hudson Avenue	Neighborhood Commercial Street	12′	15′	15′	9′
Spring Lane	Shared Public Way	N/A	N/A	6.5′-9′	6′-6.5′
Beach Lane	Shared Public Way	N/A	N/A	6.5′-9′	6′-6.5′
Fairfax Lane	Shared Public Way	N/A	N/A	6.5′-9′	6′-6.5′
Hawes Street	Parkway	12′	17′	N/A[3]	N/A[3]

Notes:
1. Sidewalk widths include buffer zones, pedestrian throughway, plantings, and furnishings.
2. Earl Street sidewalk widths presented are for the west side of the street. The east side of Earl Street is adjacent to Northside Park and the sidewalk widths are yet to be finalized in coordination with FivePoint who is redeveloping Northside Park. These sidewalks would be designed to comply with Better Streets Plan.
3. A continuous sidewalk would not be provided along the full length of Hawes Street within the RPD Property, although the pedestrian pathway would run adjacent to the part of Hawes Street with on-street parking, providing access to/from parked vehicles.

Source: India Basin Design Guidelines and Standards Draft, June 23, 2017.

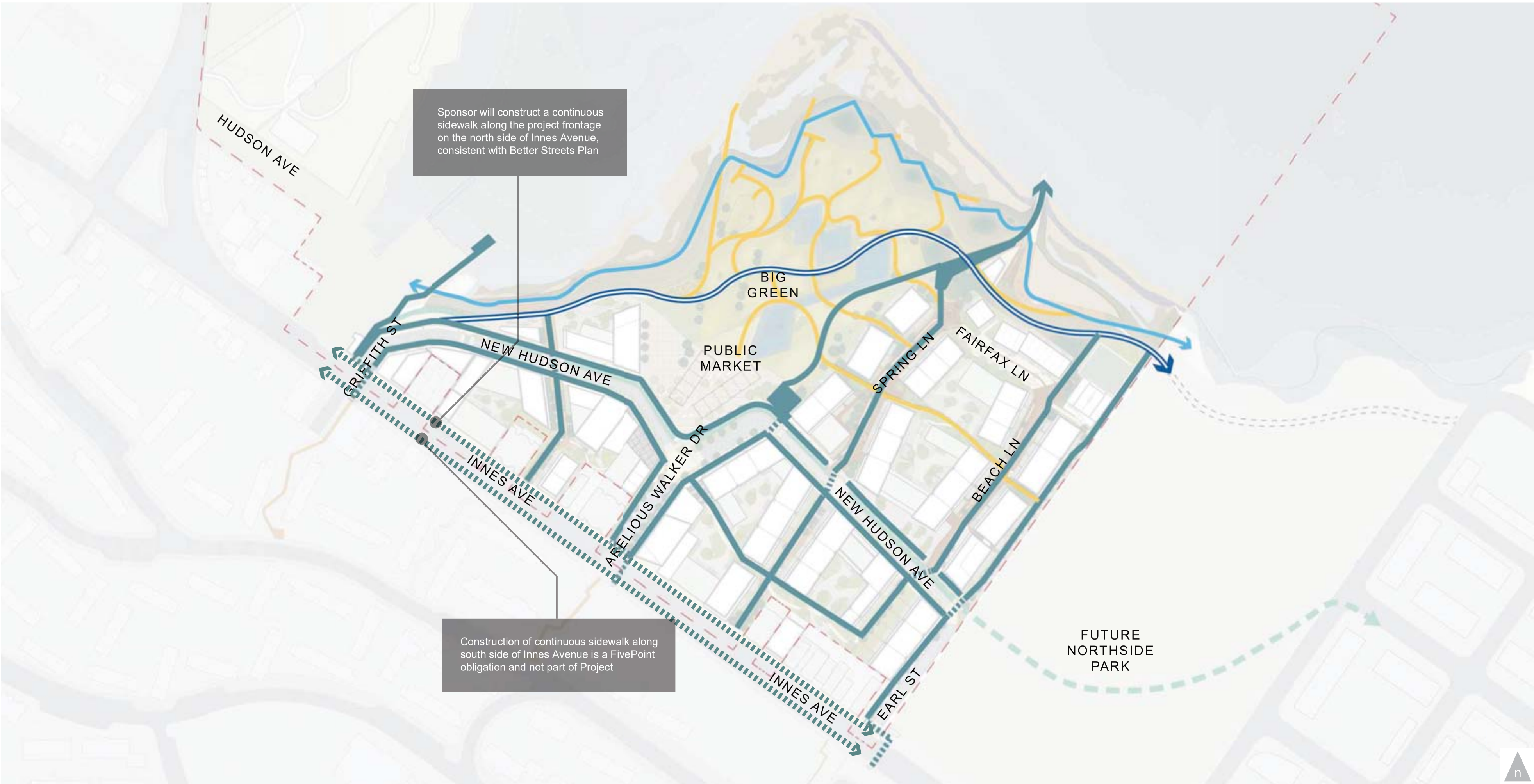
1.2.5.2 External to Project Site

The Project Sponsor would construct a continuous sidewalk on Hunters Point Boulevard and Innes Avenue along their project frontage (i.e. the north, or bay, side of the street only). While the sidewalk design would be finalized at a later date in coordination with SFMTA, Planning Department, FivePoint, DPW, and others, it would be constructed in a manner consistent with the Better Streets Plan.

As part of the signalization of Hunters Point Boulevard/Hudson Avenue/Hawes Street, crosswalks will be constructed on the west (i.e. across Hawes Street) and north and south (i.e. across Hunters Point Boulevard) approaches. As part of the signalization of Hunters Point Boulevard/Innes Avenue, crosswalks would be installed on the north (i.e. across Hunters Point Boulevard) and south (i.e. across Innes Avenue) approaches. As part of their signalization, crosswalks would be installed on all approaches except the west leg at the intersections of Innes Avenue with Griffith Street, Arelious Walker Street, and Earl Street. Some intersection approaches would not have crosswalks in order to reduce vehicular congestion into and out of the Project Site.

Figure 2I

Proposed RPD Property Pedestrian Network



LEGEND

- PEDESTRIAN SIDEWALK / PAVED PATH
- BAY TRAIL/SHARED PATH (12' WIDE)
- HIKING TRAILS (4' WIDE)
- SHORELINE BOARDWALK (4' WIDE)

Figure 2J

Proposed Build Property Pedestrian Network

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1.2.6 Bicycle Circulation Changes

Bicycle circulation changes would be the same for both the Proposed Project and Project Variant, as explained below.

As part of the Proposed Project, a new Class I bicycle corridor (i.e., cycle track) would be constructed parallel with, and to the north of, Innes Avenue, along Hudson Avenue and New Hudson Avenue connecting to Northside Park. Given that this Class I bicycle facility would be provided on Hudson Avenue and New Hudson Avenue, no bicycle facility is planned for Hunters Point Boulevard between Hawes Street and Innes Avenue nor for Innes Avenue between Hunters Point Boulevard and Earl Street. The existing Class II bicycle facility (i.e. standard bicycle lanes) on Hunters Point Boulevard between Hudson Avenue and Innes Avenue would be removed and the facility relocated to the new Class I facility. The Proposed Project would relocate any future bicycle facility along Innes Avenue between Hunters Point Boulevard and Earl Street to the new Class I facility. A Class I multi-use path would be constructed on Earl's Path, which is a north-south path that extends north from the intersection of New Hudson Avenue/Earl Street. This path would be for pedestrians and bicyclists only. Additionally, Class III shared lane markings (sharrows) would be painted along Earl Street between New Hudson Avenue and Innes Avenue.

The new Class I facility would connect India Basin with an extensive bicycle network approved within the Hunters Point Shipyard site to the east and the Blue Greenway (a planned 13-mile network of parks and trails around the waterfront of southeastern San Francisco) to the west, closing a gap link in the plans for a continuous bicycle facility from Candlestick Point and Hunters Point Shipyard along the waterfront to Downtown San Francisco. Recreational paths connecting the on-site bike route to the Bay Trail, Northside Park, and India Basin Shoreline Park would be constructed.

The Proposed Project would ensure a continuous bicycle connection from any future facility on Hunters Point Boulevard to the Class I bicycle corridor within the Project Site. The western terminus of the planned bicycle facility within the Project Site is at the intersection of Hudson Avenue/Hawes Street/Hunters Point Boulevard. Should a Class II bicycle lane be present on southbound Hunters Point Boulevard, a connection would be constructed for cyclists making left turns at the multi-lane intersection of Hunters Point Boulevard/Hudson Avenue (signalized as part of the Proposed Project) from the bike lane on southbound Hunters Point Boulevard to the Class I facility on Hudson Avenue. Design and construction of this facility would be subject to final review and approval of the City Traffic Engineer. This may include one of the following two designs:

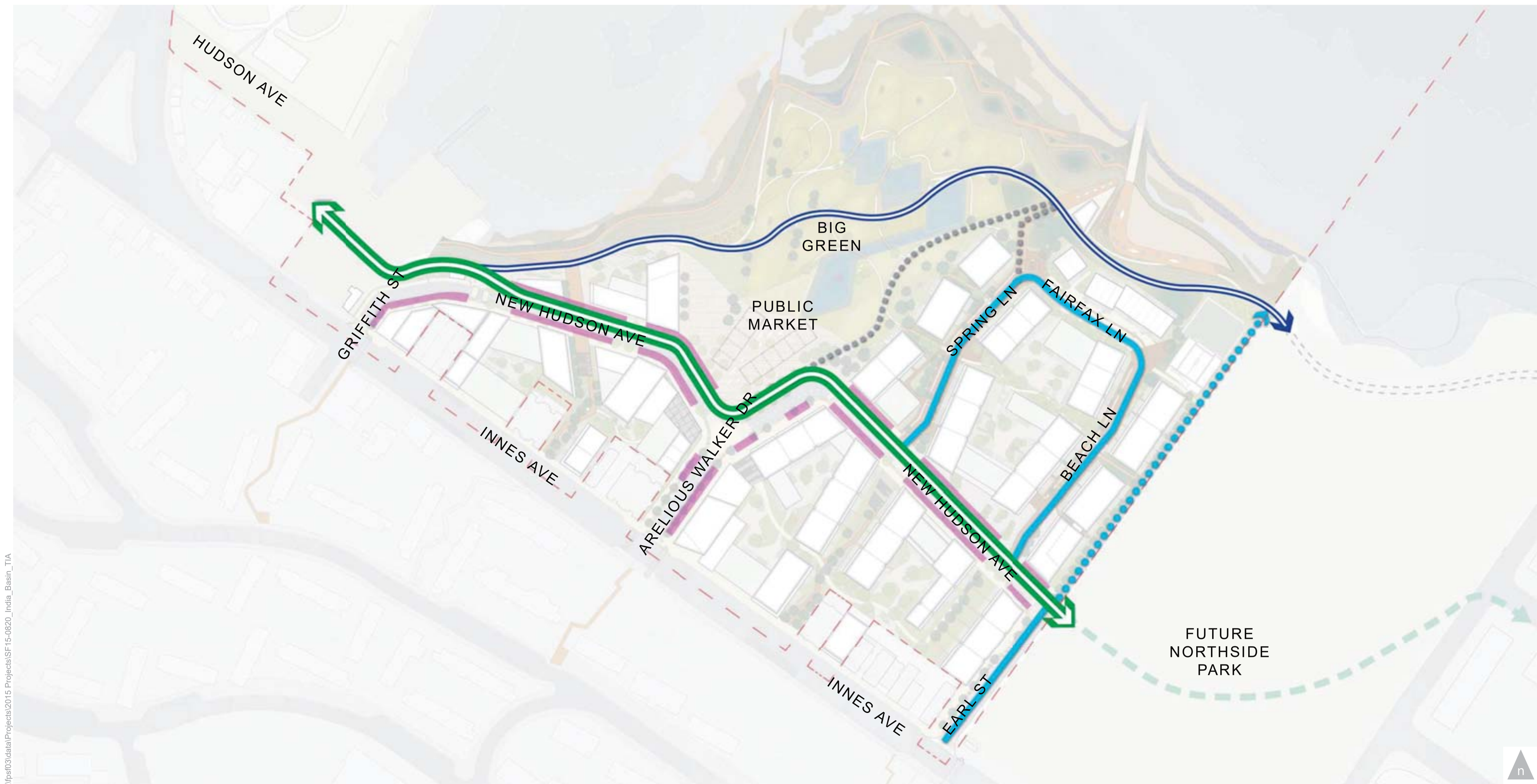
- installation of bicyclist signal heads, bicycle left-turn lane, and an accompanying dedicated signal phase for the maneuver; or,
- installation of a two-stage turn queue box at the far side of the intersection; which is a space where cyclists can wait more safely prior to completing the maneuver in a location visible to other road users.

On-street Class II bicycle parking would be installed along select locations on the north side of Innes Avenue where setbacks to the buildings would result in adequate space to accommodate the bicycle parking. These locations have not yet been determined. This bicycle parking would comply with SFMTA Rack Placement Guidelines.

The proposed bicycle circulation is illustrated in **Figure 2K** and **Figure 2L**.

Figure 2K

Proposed RPD Property Bicycle Network



LEGEND

- CLASS I BIKEWAY (2 WAY, 12' WIDE)
- BAY TRAIL (12' WIDE)
- MINOR SHARED PATH
- CLASS III BIKEWAY (SHARROW)
- SHARED USE PEDESTRIAN/ BICYCLE PATH
- BIKE PARKING- WITHIN FURNISHING ZONE

Figure 2L

Proposed Build Property Bicycle Network

1.2.7 Loading Supply

The Proposed Project would provide a total of 21 loading zones, while the Project Variant would provide a total of 30 loading zones, as described below.

1.2.7.1 Build Property: 700 Innes Avenue

Off-street Loading – The Proposed Project would include 14 off-street loading spaces, distributed across the four proposed off-street parking garages. Each space would be at least 35 feet long and 12 feet wide to meet the dimension requirements set by the Planning Code.

The Project Variant would include 23 off-street loading spaces, distributed across the four proposed off-street parking garages. Each space would be at least 35 feet long and 12 feet wide to meet the dimension requirements set by the Planning Code.

Individual loading spaces may not be assigned to particular uses; therefore, these spaces would be shared across uses. In general, retail uses should have one loading zone per every 25,000 square feet of gross leasable area except in locations with shared loading facilities where sufficient on-street loading facilities are available. Commercial uses would have one to three nearby off-street loading spaces. Where subterranean service delivery loading is provided, it would be provided in the first subterranean level of basement parking. To minimize conflicts with pedestrians and bicyclists, the number of loading access points per building would be minimized, which would minimize curb cuts. Pedestrian movement would be prioritized at curb cuts by including a continuous material treatment extending from the sidewalk or pedestrian path over the vehicular path that makes clear the pedestrian right-of-way at these locations. Exterior loading docks would be avoided, and commercial loading entries would be located at least 60 feet from the corner of an intersection. Waste collection would occur outside of the public right-of-way, minimizing conflicts with the Project Site walkways.

On-street Loading – Both the Proposed Project and the Project Variant would include four on-street loading zones: one space located on Earl Street, two spaces on Fairfax Lane, and one space on Arelious Walker Drive. The on-street loading zones would be used for both passenger pick-up and drop-off or temporary commercial loading (e.g., mail package delivery) and would be 20-30 feet in length. Most would be dual-use zones, although in the heavier retail areas there would be some dedicated loading zones for each use; this level of distinction would be decided at a later stage in the design process, although for the purposes of this study each is assumed to be a dual-use zone. The loading zones would be located close to building entrances in order to facilitate short loading times.

An additional passenger loading zone would be provided adjacent to the school to facilitate student pick-up and drop-off, as illustrated in **Figure 2D**. This conceptual plan includes a loading zone on the west side of Earl Street between Innes Avenue and New Hudson Avenue. Loading zone size, design, and location would be further developed and reviewed for safety by the SFMTA before being finalized.

1.2.7.2 RPD Property: 900 Innes, India Basin Shoreline Park, and India Basin Open Space

Two loading zones would be included for access to the RPD Property: one on-street on the east side of Hunters Point Boulevard, to the immediate north of the Hunters Point Boulevard/Hawes Street/Hudson Avenue intersection, and one on-street on the north side of Innes Street, to the west of the intersection with Griffith Street, and adjacent to the Overlook Building. These loading zones would be located near the main picnic and gathering areas.

Final design and placement of loading spaces would be determined by the Proposed Project's final development design proposals. Loading zone locations are shown in **Figure 2M** and **Figure 2N**.

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LEGEND

- PROJECT SITE BOUNDARY
- PARKING GARAGES BELOW
- 30 FT ON STREET LOADING ZONES
- GARAGE ENTRANCE

Figure 2M

Proposed Project Loading Plan

LEGEND

- PROJECT SITE BOUNDARY
- PARKING GARAGES BELOW
- 30 FT ON STREET LOADING ZONES
- GARAGE ENTRANCE

Figure 2N

Maximum Commercial Variant Loading Plan

1.2.8 Parking Supply

While on-street parking supply between the Proposed Project and Project Variant would be the same, off-street parking supply differs, as explained below.

1.2.8.1 Internal to Project Site

Build Property: 700 Innes Avenue

Off-street parking would be provided in three parking garages: Cove Parking Garage (two floors), Hillside Parking Garage (three floors), and Flats Parking Garage (two floors). Cove Parking Garage would have one driveway on New Hudson Avenue. Hillside Parking Garage would have a driveway on Arelious Walker Drive north of New Hudson Avenue and a driveway on Earl Street. Flats Parking Garage would have a driveway on Spring Lane and a driveway on Beach Lane. The school site parking would be provided within the Hillside Parking Garage.

The Proposed Project would provide a total of 1,800 off-street parking spaces, including 570 public parking spaces and 1,230 private parking spaces. The Project Variant would provide a total of 1,912 parking spaces, including 1,412 public parking spaces and 500 private parking spaces. The proposed off-street parking configuration for the Proposed Project is shown in **Figure 2Q**. The proposed off-street parking configuration for the Project Variant is shown in **Figure 2R**.

Both the Proposed Project and Project Variant would include a total of 20 on-street parking spaces within the Project Site, on the west side of Arelious Walker Drive and the west side of Earl Street. This is a decrease of 75 from the 95 existing on-street spaces within the Build property (all on Arelious Walker Drive). The proposed on-street parking configuration for the Proposed Project and Project Variant as the same and are shown in **Figure 2S**.

RPD Property - 900 Innes, India Basin Shoreline Park, and India Basin Open Space

Within the RPD open space property, the existing on-street parking on the India Basin Shoreline Park parcel would be modified to feature 12 parallel parking spaces along Hawes Street and 13 head-in parking spaces at the remodeled turnaround, for a total of 25 parking spaces (an increase of seven from the 18 existing spaces). The RPD open space parking plan is shown in **Figure 2P**.

No parking is proposed for the 900 Innes or India Basin Open Space parcels. However, members of the public who wish to drive to access these parcels could either use paid public parking available in the Build property off-street parking garages, or on-street parking. Adequate pedestrian thoroughfares are proposed to connect the pedestrian garage entries/exits to parks and open spaces throughout the Proposed Project.

Proposed parking supply is summarized in **Table 1-6**.

TABLE 1-6: PROPOSED PARKING SUPPLY						
Name	**Proposed Project**			**Project Variant**		
	Public Spaces	**Private Spaces**	**Total**	**Public Spaces**	**Private Spaces**	**Total**
Build Property						
Cove Parking Garage	142	239	381	356	46	403
Flats Parking Garage	10	290	300	10	318	328
Hillside Parking Garage	418	701	1,119	1,046	136	1,181
Subtotal Off-Street	*570*	*1,230*	*1,800*	*1,412*	*500*	*1,912*
Subtotal On-Street	*20*	-	*20*	*20*	-	*20*
Total	*590*	*1,230*	*1,820*	*1,432*	*500*	*1,932*
RPD Property						
Total (On-Street)	*25*	-	*25*	*25*	-	*25*
Overall						
Grand Total	*615*	*1,230*	*1,845*	*1,457*	*500*	*1,957*

1.2.8.2 External to Project Site

The construction of the three eastbound left-turn pockets would result in the elimination of a total of 36 parking spaces on the north side of Innes Avenue as follows: four between Hunters Point Boulevard and Griffith Street, 10 between Griffith Street and Arelious Walker Street, nine between Arelious Walker Street and Earl Street, and 13 between Earl Street and Donahue Street. The parking removal between Earl Street and Donahue Street would be necessary to enable the travel lanes to line up with the new lane alignments west of Earl Street.

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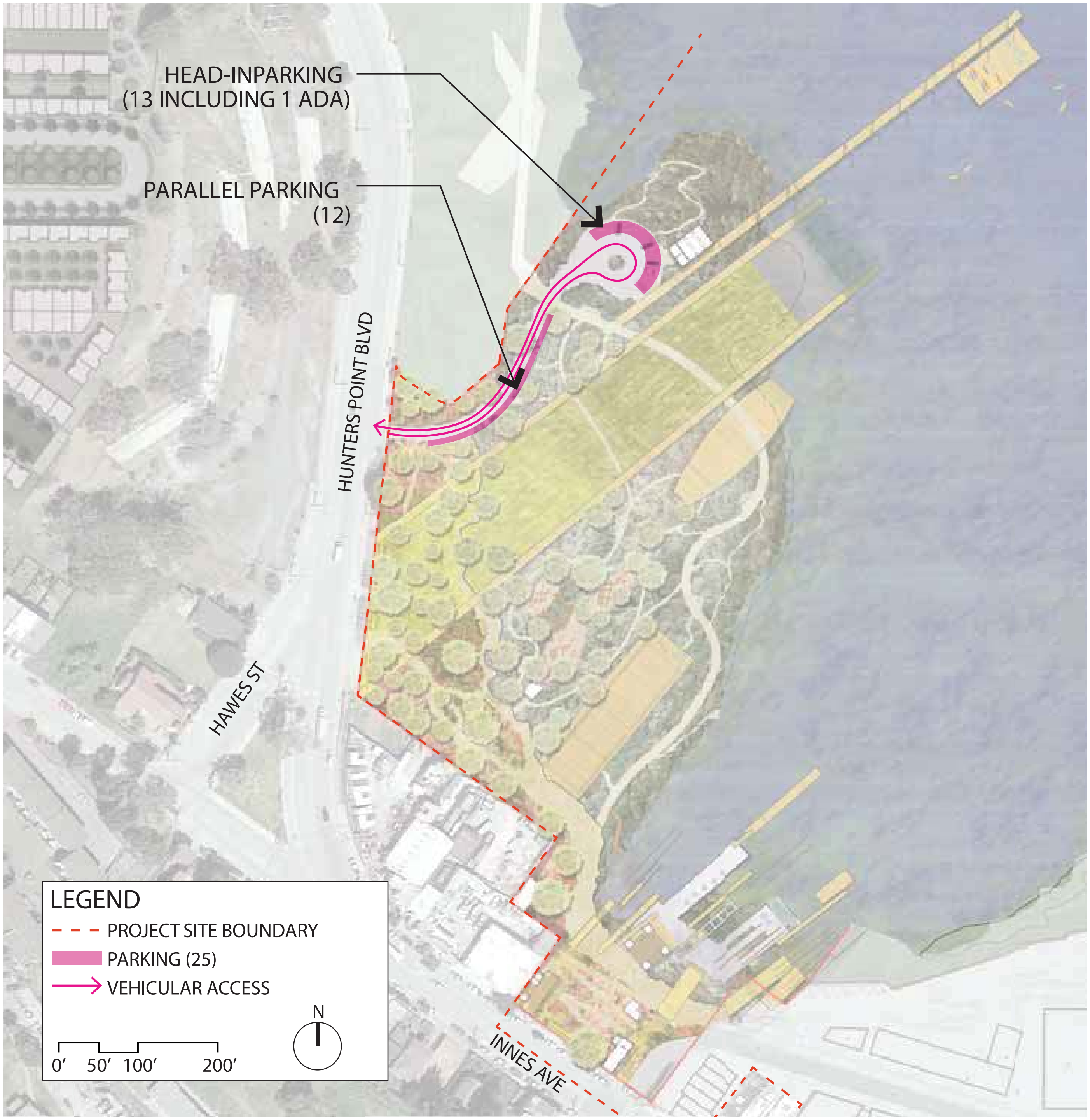
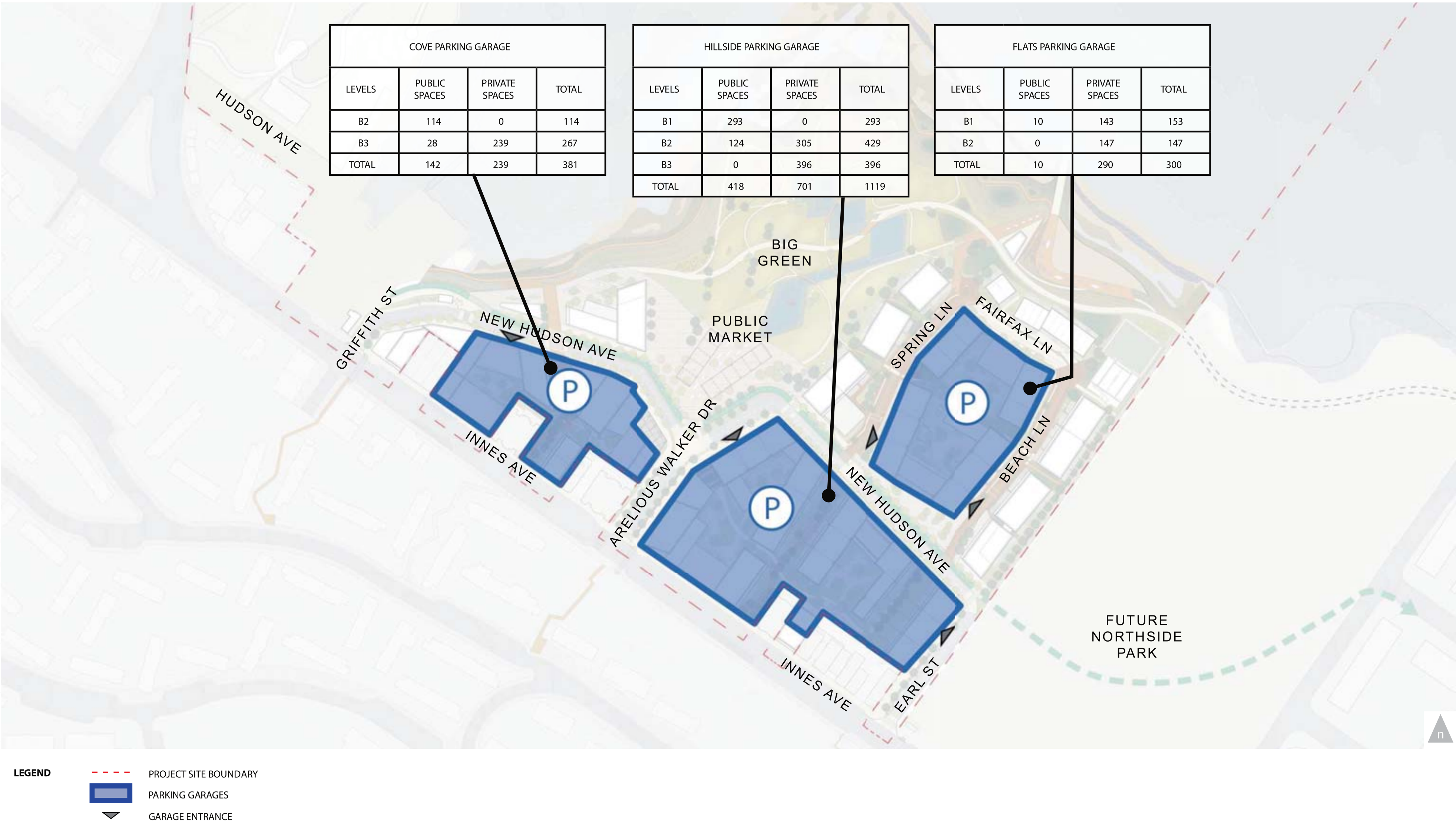


Figure 2P

Proposed RPD Property Parking Plan



COVE PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B2	114	0	114
B3	28	239	267
TOTAL	142	239	381

HILLSIDE PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B1	293	0	293
B2	124	305	429
B3	0	396	396
TOTAL	418	701	1119

FLATS PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B1	10	143	153
B2	0	147	147
TOTAL	10	290	300

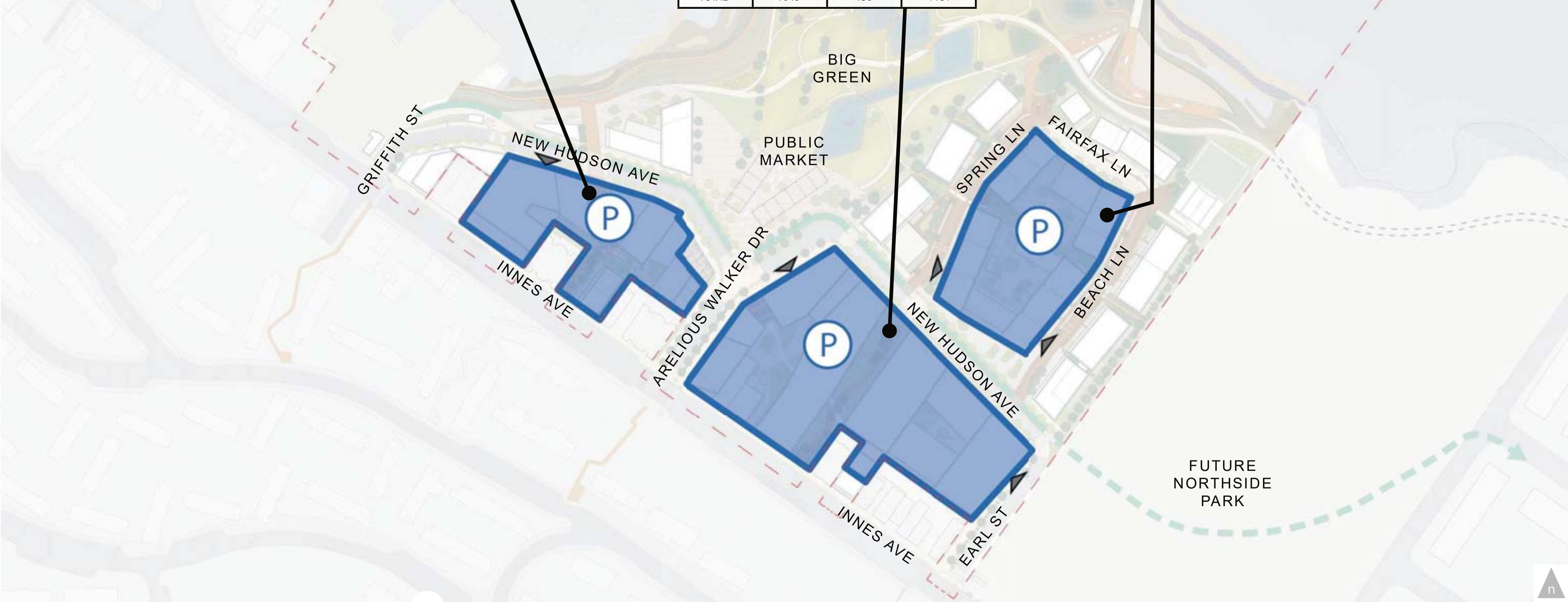
Figure 2Q

Proposed Project (Build Property) Parking Plan - Off-street

COVE PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B2	121	0	121
B3	236	46	282
TOTAL	356	46	403

HILLSIDE PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B1	310	0	310
B2	453	0	453
B3	282	136	418
TOTAL	1046	136	1181

FLATS PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B1	10	157	167
B2	0	161	161
TOTAL	10	318	328



LEGEND

PROJECT SITE BOUNDARY
PARKING GARAGES
GARAGE ENTRANCE

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Figure 2R

Maximum Commercial Variant (Build Property) Parking Plan - Off-street

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LEGEND

- PROJECT SITE BOUNDARY
- ON-STREET PARKING

TOTAL ON-STREET PARKING PROVIDED:
20 SPACES

Figure 2S

Project Parking Plan (Build Property) - On-street

1.2.9 Transportation Demand Management (TDM)

The Project would include a TDM Plan that provides a comprehensive strategy to manage the transportation demand created by the Project. The TDM Plan would be the same for both the Proposed Project and Project Variant, as explained below.

This section provides a prospective outline of the TDM Plan for the Project. The details of the TDM Plan would be finalized through discussions between Build, SFMTA, Planning, and Office of Economic and Workforce Development (OEWD) as part of the Development Agreement. While the TDM Plan would be finalized in a separate process, the differences are not expected to affect the conclusions in this TIS. As is the case for other elements of the project description that may affect travel patterns, such as parking supply the Class I bicycle facility, availability of bike parking, and the pedestrian network, the TDM measures listed below are not accounted for in the project vehicle trip generation, project mode split, or project VMT calculation. This is a conservative assumption because each of these elements would reduce automobile travel beyond the levels of travel estimated in this study. The levels of travel presented in this study are estimated using the SF Guidelines, which does not consistently factor elements such as these in its approach as it is based on a generalized data set.

Administration of the TDM Plan and funding of the below measures would be the responsibility of the Property Manager, who must also comply with all reporting and monitoring requirements.

The TDM Plan would include the following measures to reduce single occupancy vehicles and encourage transit and non-motorized modes of travel:

- **Active Transportation Measures**
    - Improve Walking Conditions: provide streetscape improvements, such as sidewalk furniture, curb ramps, or additional sidewalk space, to encourage walking. All facilities that are part of the Proposed Project and Project Variant would comply with Better Streets Plan standards for the pedestrian environment.
    - Bicycle Parking: provide secure bicycle parking in the form of bicycle lockers or racks located within the project in an indoor space. The Proposed Project would provide 1,343 Class I bicycle parking spaces (such as bike lockers, or secure bike rooms), and 163 Class II bicycle parking spaces (traditional, publicly accessible bicycle racks). The Project Variant would provide 745 Class I bicycle parking spaces and 164 Class II bicycle parking spaces.
    - Showers and Lockers: provide on-site showers and lockers. At least one shower facility, and at least one locker location would be provided per commercial building.
    - Bike Share Membership: provide bike share memberships for all residents and employees.
    - Bicycle Repair Stations: provide on-site tools and space for bicycle repair. Bicycle repair stations would be provided in convenient locations for cyclists using the cross-site cycle track.
    - Bicycle Maintenance: Provide maintenance services to residents either through an on-call mechanic or vouchers to a local shop.
    - Fleet of Bicycles: Provide an on-site fleet of bicycles for residents, employees, and/or guests to use if there is no bike share station on-site. These bicycles may be owned and managed by the property manager or by an individual employer, and made available on a temporary basis for short trips.
    - Temporary Bicycle Valet Parking: Provide monitored bicycle parking for 20 percent of total guests for larger events taking place at the Open Space.

- **Carshare Measure**
  - Carshare Parking: Provide carshare parking: parking spaces would be reserved for carshare vehicles in each off-street garage at a number that meets code requirements, in locations of high convenience for residents. Signage would be installed to direct individuals to carshare access locations.
- **Delivery Measures**
  - Delivery Supportive Amenities: facilitate deliveries with a staffed reception desk, lockers, or other accommodation in every building.
  - Provide Delivery Services: Provide delivery of products (e.g., groceries) or services (e.g., dry cleaning). This measure may be provided through contracting with individual service providers.
- **Family Measures**
  - Family TDM Amenities: provide storage for car seats near carshare parking, cargo bikes, and shopping carts.
  - On-Site Childcare: provide on-site childcare services. At least one on-site childcare facility would be provided within the project.
- **Information and Communication Measures**
  - Multi-modal Wayfinding Signage: provide directional signage for locating transportation services (including shuttle stops) and amenities (bicycle parking and carshare parking).
  - Real Time Transportation Information Displays: large screen or monitor that displays, at a minimum, transit arrival and departure information.
  - Tailored Transportation: provide residents and employees with information about travel options, generally as part of a welcome packet. This may include information on local transit services, carpool matching tools, benefits provided through the TDM plan, and facilities available to support transit or active transport use.
- **Land Use Measures**
  - Healthy Food Retail in Underserved Area: The project includes a supermarket, as well as restaurant and café space, all of which are available to residents of neighboring communities. There are currently no supermarkets or grocery stores in the vicinity of the Project Site; the nearest full-service grocery store is located on Third Street, approximately 1.5 miles to the west.[5]
  - On-Site Affordable Housing: Up to 12 percent of the dwelling units in the project are designated as affordable.
- **Parking Management Measures**
  - Unbundle Parking: separating the cost of parking from the cost of rent, lease, or ownership.

The TDM checklist is included in **Appendix C**.

[5] The USDA defines what's considered a food desert and which areas will be helped by this initiative: To qualify as a "low-access community," at least 500 people and/or at least 33 percent of the census tract's population must reside more than one mile from a supermarket or large grocery store (for rural census tracts, the distance is more than 10 miles). Source: American Nutrition Association, *Nutrition Digest Volume 38, No. 2*. Accessed from: http://americannutritionassociation.org/newsletter/usda-defines-food-deserts

1.3 REPORT ORGANIZATION

The remainder of this report is divided into the following chapters:

Chapter 2 – Existing Conditions describes the operating conditions of the existing transportation network in the project vicinity, including the surrounding roadway network, weekday AM and PM peak hour traffic volumes, and intersection operations. Additionally, this section describes the public transit network, bicycle facilities, pedestrian facilities, existing loading operations, and emergency service activity and access. A discussion of current off-street and on-street parking conditions is also included.

Chapter 3 – Baseline Conditions describes the land uses, streetscape changes, and transit service changes expected to be in place upon construction of the Proposed Project, and include the associated amount of automobile activity and transit demand that would be added to the existing conditions network as part of these changes.

Chapter 4 – Travel Demand Analysis includes the Proposed Project's trip generation, trip distribution, mode split, and trip assignment forecasts, as well as parking, loading, and construction travel demand.

Chapter 5 – Project Impact Analysis describes the anticipated operating conditions of the transportation network with the Proposed Project in place, and identifies the extent to which the Project would impact the transportation network. Chapter 5 discusses the transportation network under the Baseline Plus Proposed Project Conditions for both the Proposed Project and Project Variant. Operations of the transportation network after the addition of the travel demand from the project are described, including the project's impacts on vehicle-miles traveled (VMT), transit, bicycles, pedestrians, loading, emergency vehicles, school site access, parking, and the potential impacts of the project construction on the transportation network.

Chapter 6 – Cumulative Conditions describes the anticipated operating conditions of the transportation network in Cumulative Conditions with traffic associated with the Proposed Project and other reasonably foreseeable development projects. Future year 2040 traffic analysis utilizes the traffic forecasts from most recent version of the City's travel demand forecasting model, as developed for the Central SoMa Plan, with no additional model runs required for this study.

Chapter 7 – Intersection Operations Analysis describes traffic operations for existing, baseline, and Cumulative scenarios. Improvement measures are provided to increase motor vehicle mobility.

Chapter 8 – Mitigation and Improvement Measures summarizes all of the mitigation measures and improvement measures contained in the report.

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2 EXISTING CONDITIONS

This chapter provides a description of the existing transportation and circulation setting within the vicinity of the Proposed Project. This section includes descriptions of the existing roadway network, intersection operating conditions, transit network and service, pedestrian conditions, and bicycle conditions near the Project Site, on-street loading and emergency access, and existing on-street parking supply and occupancy.

2.1 ELEMENTS OF ANALYSIS

The study examines existing facilities and conditions related to the following transportation elements:

- **Vehicle Miles Traveled (VMT) Conditions** – Estimated vehicle-miles traveled by land use type for the Transportation Analysis Zone (TAZ) in which the Proposed Project is located as well as the nine-county San Francisco Bay Area regional average VMT by land use type;

- **Traffic Hazards Conditions** – traffic volumes including areas of congestion in the immediate vicinity of the Project Site;

- **Transit Conditions** – Muni operations within ¼ mile of the site, Muni screenlines into the Downtown business district, line-by-line analysis of nearby Muni service, regional transit providers, and linkages to BART, Caltrain, and Muni light rail service;

- **Pedestrian and Bicycle Conditions** – operations along facilities within and adjacent to the Project Site;

- **Loading and Emergency Service Conditions** – operations within and adjacent to the Project Site; and

- **Parking Conditions** – characterization of supply and demand near the Project Site.

2.2 ROADWAY FACILITIES

This section describes the local and regional roadway system in the vicinity of the Project Site. Roadway classification definitions, according to the Transportation Element of the San Francisco General Plan, are contained in **Appendix D** of this report. Local access roadway descriptions also indicate the corresponding roadway designation and direction, number of travel lanes, and number of parking or bicycle lanes, where present.

2.2.1 Regional Access

Regional access to the Project Site is provided by U.S. Highway 101 (US 101) and Interstate 280 (I-280). Both of these regional freeways are located to the west of the Project Site.

U.S. Highway 101 (US 101) provides access to the north and south of the Project Site. US 101 connects to Marin County and the North Bay via the Golden Gate Bridge and continues south to San Jose. US 101 connects with I-80 and the San Francisco–Oakland Bay Bridge to the north of the Project Site. Vehicles traveling along US 101 to or from north of the Proposed Project would enter or exit the highway at Exit 432 at Cesar Chavez Street, about 2.5 miles northwest of the Project Site. Vehicles traveling along US 101 to or from south of the Proposed Project would enter or exit the highway at Exit 429 at Jamestown Avenue, 2.2 miles southwest of the Project Site.

Interstate 280 (I-280) provides regional access to the Project Site from the South Bay and Peninsula. The interstate's northern terminus is northwest of the Project Site in the South of Market neighborhood of San Francisco. An interchange about 3.5 miles southwest of the Proposed Project connects I-280 and US 101. Nearby on- and off-ramps are accessed from the Project Site via Evans Avenue to Cesar Chavez Street or Third Street.

2.2.2 Local Access

Local access to the Project Site is provided by the urban street grid network. This section describes the key local roadways adjacent to the Project Site and the study intersections, which are described later in this Chapter. This section also describes the relevant roadway classifications identified in the San Francisco General Plan Transportation Element. **Table 2-1** summarizes the roadway network immediately adjacent to the Project Site.

TABLE 2-1: SUMMARY OF EXISTING TRANSPORTATION NETWORK

Street	From	To	Travel Lanes	Parking	Bicycle Facilities	Sidewalks
Jennings Street	Cargo Way	Evans Avenue	Two lanes, one in each direction, 12'	Both sides, 12'	None	Both sides, 8'
Evans Avenue	Jennings Street	Hunters Point Blvd	Four lanes, two in each direction, outer as 17', inner as 12'	None	None	Both sides, 8' south side, 10' north side
Hunters Point Boulevard	Evans Avenue	Hudson Avenue	Four lanes, two in each direction, outer as 12', inner as 11'	None	Bicycle lanes both sides, 4' south side, 6' north side	Both sides, 6' south side, 7' north side
Hunters Point Boulevard	Hudson Avenue	Innes Avenue	Four lanes, two in each direction, outer as 12', inner as 11'	None	Bicycle lanes both sides, 6' west side, 6' east side	Both sides, 9' west side, 6' east side
Innes Avenue	Hunters Point Boulevard	Griffith Street	Four lanes, two in each direction, outer eastbound as 11', others as 10'	Both sides, 8'	None	Both sides, 6' south side, 10' north side
Innes Avenue	Griffith Street	Arelious Walker Street	Four lanes, two in each direction, outer eastbound as 11', others as 10'	Both sides, 8'	None	Both sides, 5' south side, 8' north side
Innes Avenue	Arelious Walker Street	Earl Street	Four lanes, two in each direction, outer eastbound as 11', others as 10'	Both sides, 8'	None	North side only, 4'
Innes Avenue	Earl Street	Donahue Street	Four lanes, two in each direction, outer eastbound as 11', others as 10'	Both sides, 8'	None	North side only, 5'

Source: Build et al. Draft India Basin Transportation Action Plan (IBTAP). 2015.

A figure showing key details of the existing transportation network, such as existing off-site parking, curb cuts, crosswalks, stop bars, as well as existing building locations adjacent to the Project Site, including the barn structure at 702 Innes Avenue that would be relocated within the Project Site as part of the Proposed Project, is provided in **Figure 3**.

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Figure 3

Existing Pedestrian and Traffic Facilities

2.2.2.1 East–West Roadways

Cargo Way is a four-lane, divided two-direction roadway that runs east-west between Third Street and Jennings Street. On-street parking is not permitted along Cargo Way, and there are sidewalks present on both sides of the street. A two-way cycletrack runs along the south side of the street. Cargo Way is northwest of the Project Site, and can be accessed via Jennings Street and Hunters Point Boulevard. The San Francisco General Plan (General Plan) refers to Cargo Way as a *Secondary Arterial*.

Evans Avenue runs parallel to Cargo Way from Cesar Chavez Street to Hunters Point Boulevard, between Cesar Chavez Street and Third Street, Evans Avenue is a four-lane, two-direction roadway with a Class III bicycle facility. East of Third Street, Evans Avenue is four-lane roadway with a Class II bicycle facility and a center median. Along this segment of Evans Avenue, left turn pockets provide access to driveways and cross-streets. On-street parking is permitted along Evans Avenue, and there are sidewalks present on both sides of the street. The General Plan refers to Evans Avenue as a *Secondary Arterial*. Muni routes 19 Polk and 44 O'Shaughnessy run along Evans Avenue.

Innes Avenue runs east-west between Middle Point Road and Coleman Street. Innes Avenue runs along the perimeter of the Project Site, and it is a four-lane, two-direction roadway with on-street parking and a sidewalk on the north side of the street. Innes Avenue is a designated bicycle route. The General Plan refers to Innes Avenue as a *Secondary Arterial*. Muni route 19 Polk provides service along this roadway with an existing stop at the intersection of Innes Avenue and Arelious Walker Drive.

Oakdale Avenue runs east-west between Bayshore Boulevard and Griffith Street with a gap between Keith Street and Ingalls Street. It is situated a few blocks south of the Project Site. On-street parking is permitted on Oakdale Avenue, and there are sidewalks on both sides of the street. Oakdale Avenue has a Class II bicycle facility between Bayshore Boulevard and Mendell Street. The General Plan refers to Oakland Avenue as a *Secondary Arterial*. Muni route 23 Monterey provides service along this roadway between Bayshore Boulevard and Toland Street.

Palou Avenue runs east-west from Barneveld Avenue to a dead-end east of Griffith Street. It is situated a few blocks south of the Project Site. There are no direct routes between the Project Site and Palou Avenue, and thus, it is about one mile from the Project Site along the existing road network. On-street parking is permitted on Palou Avenue, and there are sidewalks on both sides of the street. There is a Class III bicycle facility on Palou Avenue between Phelps Street and Griffith Street. This roadway is undesignated within the General Plan. Muni route 23 Monterey provides service along Palou Avenue.

2.2.2.2 North–South Roadways

Third Street is a four-lane divided roadway that runs north-south from Market Street south through Dogpatch and Bayview neighborhoods, ending at Bayshore Boulevard near US 101. The T Third Muni route runs along this roadway's median. There is a Class III bicycle facility on the roadway, and Third Street can be accessed via Evans Avenue from the Project Site.

Middle Point Road/Jennings Street is a two-lane north-south roadway. The street is named Jennings Street between Amador Street and Evans Avenue, and becomes Middle Point Road between Evans Avenue and Innes Avenue. Middle Point Road ends at Innes Avenue and becomes Ingalls Street. The roadway is two-way north of Catalina Street, but only runs southbound south of Catalina Street. On-street parking is permitted on Middle Point Road/Jennings Street, and there are sidewalks on both sides of the street. There is no bicycle facility on this roadway. Muni Route 44 O'Shaughnessy runs along the road from Evans Avenue into Ingalls Street.

2.3 BACKGROUND VEHICLE MILES TRAVELED IN SAN FRANCISCO

Many factors affect travel behavior. These factors include density, diversity of land uses, design of the transportation network, access to regional destinations, distance to high-quality transit, development scale, demographics, and transportation demand management.[6] Typically, low-density development at great distance from other land uses, located in areas with poor access to non-private vehicular modes of travel, generates more automobile travel compared to development located in urban areas, where a higher density, mix of land uses, and travel options other than private vehicles are available.

Given the travel behavior factors described above, San Francisco (in the aggregate) has a lower average VMT ratio (i.e. VMT per person) than the nine-county San Francisco Bay Area region (hereinafter, the region). In addition, for the same reasons, different areas of the city have different VMT ratios and some areas of the City have lower VMT ratios than other areas of the city.

These geographic based differences in VMT that are associated with different parts of the city and region are identified in transportation analysis zones (TAZs). TAZs are used by planners as part of transportation planning models for transportation analysis and other planning purposes. The TAZs vary in size from single city blocks in the Downtown core, multiple blocks in outer neighborhoods, to even larger zones in historically industrial areas like the Hunters Point Shipyard.

The Project Site is located in the eastern part of TAZ 446, which is bounded by Middle Point Road to the west, Evans Avenue to the north, Innes Avenue to the south, and Earl Street to the east.. The location of the Project Site is adjacent to a Muni bus route, the citywide bicycle network, pedestrian networks and facilities, and a diversity and density of land uses. A project located in TAZ 446 would have substantially reduced vehicle trips and shorter vehicle distance, and thus, reduced VMT, when compared to other areas of the region.

This is demonstrated by comparing data on average VMT for residential, office, and retail uses in the region and the specific Project Site TAZ, TAZ 446. Thus, the following VMT rates are identified for each by category of use:

Regional VMT: For residential development, the regional average daily VMT per capita is 17.2.[7] For office and retail development, regional average daily work-related VMT per employee is 19.1 and 14.9, respectively.

TAZ 446 VMT: The average VMT estimates for each use category in TAZ 446 are projected to be substantially lower than the regional value. For residential development, the TAZ 446 average daily VMT per capita is 9.0. For office and retail development, the TAZ 446 average daily VMT per capita (measured in terms of employees) is 15.3 and 8.1, respectively. For retail uses, the San Francisco County Transportation Authority (SFCTA) uses trip-based analysis, which counts VMT from individual trips to and from the project (as opposed to entire chain of trips). A trip-based approach, as opposed to a tour-based approach, is necessary

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[6] California Smart-Growth Trip Generation Rates Study, Appendix A, University of California, Davis Institute of Transportation Studies, March 2013.

[7] Includes the VMT generated by the Proposed Project (www.sftransportationmap.org, accessed October 3, 2016).

for retail projects because a tour is likely to consist of trips stopping in multiple locations, and summarizing tour VMT to each location would over-estimate VMT.[8, 9]

Table 2-2 includes a summary of the daily VMT per capita for the region and for the transportation analysis zone in which the Project Site is located, TAZ 446.

TABLE 2-2: EXISTING DAILY VEHICLE MILES TRAVELED PER CAPITA

Land Use	Bay Area Regional Average	TAZ 446
Households (Residential)	17.2	9.0
Employment (Office)	19.1	15.3
Visitors (Retail)	14.9	8.1

Source: San Francisco Planning Department, Online at sftransportationmap.org, Accessed February 15, 2017.

2.4 TRANSIT NETWORK

Primary public transit access to the Project Site is provided by San Francisco Municipal Railway ("Muni") bus service. The North Bay, East Bay, Peninsula and South Bay are public transit accessible via connections via Muni to Golden Gate Transit (North Bay), AC Transit (East Bay), Bay Area Rapid Transit (BART), Caltrain (Peninsula and South Bay), and SamTrans (San Mateo County). Transit routes near the Project Site are shown on Figure 4. Muni bus stops adjacent to the Project Site are located in both westbound and eastbound directions on Innes Avenue at the following intersections: Innes Avenue/Hunters Point Boulevard, Innes Avenue/Griffith Street, Innes Avenue/Arelious Walker Street, and Innes Avenue/Earl Street.

This section discusses Muni, which provides primary transit access to the Project Site, followed by a discussion of regional transit providers that operate within San Francisco.

2.4.1 San Francisco Muni

Muni operates bus, cable cars and light rail lines within San Francisco. Some of Muni light rail service is underground, but the majority of light rail service operates on surface streets. This transportation analysis uses a quarter-mile radius as a generally reasonable walking distance for transit access. Muni routes that fall within a quarter-mile radius of the Project Site and their characteristics are summarized in **Table 2-3**.

[8] To state another way: a tour-based assessment of VMT at a retail site would consider the VMT for all trips in the tour, for any tour with a stop at the retail site. If a single tour stops at two retail locations, for example, a coffee shop on the way to work and a restaurant on the way back home, then both retail locations would be allotted the total tour VMT. A trip-based approach allows analysts to apportion all retail-related VMT to retail sites without double-counting.

[9] San Francisco Planning Department, *Executive Summary: Resolution Modifying Transportation Impact Analysis*, Appendix F, Attachment A, March 3, 2016.

TABLE 2-3: LOCAL MUNI OPERATIONS							
Route	**AM Peak Weekday Headways (7:00 AM – 9:00 AM)**	**Midday Peak Weekday Headways (12:00 PM – 2:00 PM)**	**PM Peak Weekday Headways (4:00 PM – 7:00 PM)**	**Hours of Operation**	**Nearest Stop Location**	**Distance to Project Site[1]**	**Neighborhoods Served by Route**
Within ¼ mile of the Project Site							
19 Polk	15 min	15 min	15 min	5:15 AM – 12:45 AM	Innes Ave & Griffith St	0.1 miles	Russian Hill, Nob Hill, Civic Center, SoMa, Potrero Hill, Bayview, Hunters Point
44 O'Shaughnessy	8 min	12 min	9 min	5:30 AM- 12:45 AM	Middle Point Rd & Innes Ave	0.2 miles	Inner Richmond, Inner Sunset, Forest Knolls, Bernal Heights, Bayview, Hunters Point
54 Felton	20 min	20 min	20 min	5:30 AM- 12:30 AM	Northridge Rd & Harbor Rd	0.2 miles	Ingleside Heights, Sunnyside, Bernal Heights, Bayview, Hunters Point
Within 1 mile of the Project Site							
23 Monterey	20 min	20 min	20 min	5:15 AM – 11:30 PM	Oakdale Ave & Ingalls St	0.6 miles	Lake Shore, Sunnyside, Glen Park, Bernal Heights, Bayview, Hunters Point
Over one mile from the Project Site							
24 Divisadero	10 min	10 min	10 min	5:45 AM – 12:30 AM	3rd St & Palou Ave	1.1 miles	Pacific Heights, Western Addition, Haves Valley, Noe Valley, Bernal Heights, Bayview, Hunters Point
T Third	9 min	10 min	9 min	4:30 AM – 1:30 AM	Third Street & Evans Ave	1.1 miles	West Portal, Market Street, Mission Bay, Dogpatch, Portola Place, Visitation Valley

Notes:

1. Distances are approximate and are measured from the center of the proposed Project Site along local streets to reach nearest stop.

Source: SF Muni, 2013; 511.org, 2015; Prepared by Fehr & Peers, 2016.

Figure 4

Existing Transit Network

2.4.1.1 Individual Routes

The Maximum Load Point (MLP) for a transit route is the location where the route has its highest number of passengers relative to its capacity. Capacity utilization relates the number of passengers per transit vehicle to the design capacity of the vehicle. The capacity per vehicle includes both seated and standing capacity, where standing capacity is between 30 to 80 percent of seated capacity (depending upon the specific transit vehicle configuration).

AM and PM peak hour capacity utilization was determined at the MLP for the two Muni routes that are within convenient walking distance of the Proposed Project. Because they are within walking distance of the Proposed Project, they are the routes that most people traveling by transit to/from the Project Site will use for access, even if they are not the only routes they use during the trip (i.e. some may transfer to/from these routes as part of the journey).

The two routes within convenient walking distance of the Proposed Project are the 19 Polk and the 44 O'Shaughnessy. The 19 Polk travels along Innes Avenue and provides a direct connection to the Project as well as connections to other Muni lines, notably the T Third. The 44 O'Shaughnessy travels along Middle Point Road, with the closest stop located at Innes Avenue/Middle Point Road. This stop is about 2,000 feet from the Project Site, which is approximately a 7-minute walk, i.e. within typical walking distance. While the nearest stop for the 54 Felton route at Northridge Road/Dormitory Road is 500 feet walking distance from the Project Site (specifically from the intersection of Arelious Walker Drive/Innes Avenue), this walk features an almost-continual elevation gain of 95 feet along a stairwell. Due to this prohibitive elevation gain, this route is not considered within convenient walking distance of the Project Site and is not considered.

Typically, for route-specific capacity impact analysis, only the peak demand on a given bus route over the course of the entire route (hereafter called the Global Maximum Load Point, or GMLP) is evaluated. However, since it is expected that a substantial number of riders on the 19 Polk would transfer to the T Third before reaching the GMLP, a Local Maximum Load Point (LMLP) was also evaluated for the 19 Polk. This LMLP is located on Evans Avenue east of Third Street, to capture the large proportion of transit riders that would be expected to use the 19 Polk to transfer to the T Third.

The capacity of the bus vehicle for each of these routes is 63 passengers. The SFMTA Board has adopted an 85 percent capacity utilization performance standard for transit vehicle loads.[10] The SFMTA Board has determined that this performance standard reflects actual operations and the likelihood of "pass-ups" (i.e., vehicles not stopping to pick up more passengers). It should be noted that the 85 percent utilization is of seated and standing loads, so at 85 percent all seats are taken, and there are many standees. The Planning Department has similarly utilized the 85 percent capacity utilization standard as threshold of significance for determining peak period transit demand impacts to the SFMTA lines.

Table 2-4 outlines the AM and PM peak ridership and capacities at maximum load points for transit lines in the study area. One Muni route (44 O'Shaughnessy) records passenger loads that exceed 85 percent capacity utilization, which is SFMTA's standard maximum acceptable utilization. Overall, passenger loads

[10] SFMTA. 2017. *Short Range Transit Plan Fiscal Year 2017 – Fiscal Year 2030*. p. 40 Available online at https://www.sfmta.com/sites/default/files/agendaitems/2017/6-6-17%20Item%2011%20%20Short%20Range%20Transit%20Plan.pdf. Accessed August 8, 2017.

range from 10 percent (19 Polk inbound[11] – AM Peak Hour) to 86 percent (44 O'Shaughnessy inbound[12] – PM Peak Hour) of capacity. Immediately adjacent to the study area, capacity utilization is generally lower than the utilization at the MLP.

TABLE 2-4: MUNI PEAK HOUR LOAD AND CAPACITY UTILIZATION BY LINE

Route	Peak Hour	Maximum Load Point	Passenger Load[1]	Peak Hour Capacity[2]	Capacity Utilization
Inbound (Project Designation) / Outbound (SFMTA Designation)					
19 Polk (LMLP[3])	AM	Evans Ave/Newhall St	24	252	10%
	PM	Evans Ave/Newhall St	44	252	17%
19 Polk (GMLP[3])	AM	8th St/Howard St	160	252	63%
	PM	8th St/Mission St	168	252	67%
44 O'Shaughnessy (GMLP[3])	AM	Silver Ave/Dartmouth Ave	300	473	63%
	PM	Silver Ave/Mission St	360	420	**86%**
Outbound (Project Designation) / Inbound (SFMTA Designation)					
19 Polk (LMLP[3])	AM	Evans Ave/Newhall St	84	252	33%
	PM	Evans Ave/Newhall St	52	252	21%
19 Polk (GMLP[3])	AM	Larkin St/O'Farrell St	188	252	75%
	PM	7th St/Howard St	180	252	71%
44 O'Shaughnessy (GMLP[3])	AM	O'Shaughnessy Blvd/Del Vale	368	473	78%
	PM	Silver Ave/San Bruno Ave	240	420	57%

Notes:
Bold indicates capacity utilization of 85 percent or greater.

1. Peak hour ridership. Existing Load at Local Maximum Load Point or Global Maximum Load Point from Transit Data for Transportation Impact Studies (SF Planning, May 2015) or Transit Effectiveness Project Route analysis (Fehr & Peers, October 2011).
2. Total peak period capacity in passengers per hour.
3. GMLP is the Global Maximum Load Point, which is the route-wide maximum load point. LMLP is the Local Maximum Load Point, which is the maximum load point on the route east of Third Street.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015. See **Appendix E** for transit line capacity calculations.

2.4.1.2 Downtown Screenlines

The existing transit system near the Project Site was analyzed using the screenline method. This directional analysis was used to determine if certain screenline approaches between the Project Site and Downtown San Francisco have adequate capacity to serve demand. These screenlines are defined in the *SF Guidelines* and are shown in **Appendix E**. Because the City's transit system is largely arranged to carry passengers into and out of Downtown, four screenlines that surround Downtown San Francisco were also analyzed. **Table**

[11] "Inbound" and "outbound" designations for individual routes in the text of this document are in reference to the Project. SFMTA designation for 19 Polk is opposite to the "Project" designation: i.e. SFMTA's designation of inbound is to Fisherman's Wharf, and outbound is to Hunters Point.

[12] "Inbound" and "outbound" designations for individual routes in the text of this document are in reference to the Project. SFMTA designation for 44 O'Shaughnessy is opposite to the "Project" designation: i.e. SFMTA's designation of inbound is to The Richmond, and outbound is to Hunters Point.

2-5 presents the existing ridership and capacity utilization at the maximum load point (MLP) for the routes crossing the four Downtown Screenlines during the weekday PM peak hour, using September/October 2013 ridership and hourly capacity data – the most recent data available at the time the analysis was conducted. Data is shown for the outbound direction only as that is the peak direction for PM peak period travel.

The Planning Department uses an 85 percent capacity utilization standard as the threshold of significance for identifying transit crowding impacts. While most directional screenlines and corridors within the screenlines operate under the 85 percent performance standard, some exceed 100 percent capacity utilization. Corridors exceeding this standard include the Fulton/Hayes (90 percent) and Third Street (99 percent) in the PM peak hour, Subway lines (102 percent) in the AM peak hour, and corridors composed of other lines in the Southwest screenline (94 percent).

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TABLE 2-5: MUNI DOWNTOWN SCREENLINES - EXISTING CONDITIONS

Screenline	AM Peak Hour[1]			PM Peak Hour[1]		
	Ridership	Capacity	Capacity Utilization	Ridership	Capacity	Capacity Utilization
Kearny/Stockton[2]	2,211	3,050	72%	2,245	3,327	67%
Other lines[3]	538	1,141	47%	683	1,078	63%
Northeast Screenline Total	*2,749*	*4,191*	*66%*	*2,928*	*4,405*	*66%*
Geary[4]	1,821	2,490	73%	1,964	2,623	75%
California[5]	1,610	2,010	80%	1,322	1,752	75%
Sutter/Clement[6]	480	630	76%	425	630	67%
Fulton/Hayes[7]	1,277	1,680	76%	1,184	1,323	**89%**
Balboa[8]	758	1,019	74%	625	974	64%
Northwest Screenline Total	*5,946*	*7,829*	*76%*	*5,520*	*7,302*	*76%*
Third Street[9]	350	793	44%	782	793	**99%**
Mission[10]	1,643	2,509	65%	1,407	2,601	54%
San Bruno/Bayshore[11]	1,689	2,134	79%	1,536	2,134	72%
Other lines[12]	1,466	1,756	83%	1,084	1,675	65%
Southeast Screenline Total	*5,148*	*7,192*	*72%*	*4,809*	*7,203*	*67%*
Subway lines[13]	6,330	6,205	**102%**	4,904	6,164	80%
Haight/Noriega[14]	1,121	1,554	72%	977	1,554	63%
Other lines[15]	465	700	66%	555	700	79%
Southwest Screenline Total	*7,916*	*8,459*	***94%***	*6,436*	*8,418*	*76%*
Total All Screenlines	*21,759*	*27,671*	*79%*	*19,693*	*27,328*	*72%*

Notes:

Bold indicates capacity utilization of 85 percent or greater.

1. AM Peak hour as inbound (i.e. toward Downtown) only; PM peak hour as outbound (i.e. away from Downtown) only
2. 8 Bayshore, 30 Stockton, 30X Marina Express, 41 Union, 45 Union-Stockton
3. F Market & Wharves, 10 Townsend, 12 Folsom-Pacific
4. 38 Geary, 38R Geary Rapid, 38AX Geary 'A' Express, 38BX Geary 'B' Express
5. 1 California, 1AX California 'A' Express, 1AX California 'B' Express
6. 2 Sutter, 3 Clement
7. 5 Fulton, 21 Hayes
8. 31 Balboa, 31AX Balboa 'A' Express, 31BX Balboa 'B' Express
9. T Third Street
10. 14 Mission, 14R Mission Rapid, 14X Mission Express, 49 Van Ness-Mission
11. 8AX Bayshore 'A' Express, 8BX Bayshore 'B' Express, 8 Bayshore, 9 San Bruno, 9R San Bruno Rapid
12. J Church, 10 Townsend, 12 Folsom-Pacific, 19 Polk, 27 Bryant
13. K Ingleside, L Taraval, M Ocean View, N Judah
14. 6 Haight-Parnassus, 7/7R Haight-Noriega/Limited, 7X Noriega Express, NX Judah Express
15. F Market & Wharves

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015; Fehr & Peers, 2016; see **Appendix E** for transit line capacity calculations.

2.4.2 Regional Transit Service

In addition to Muni operations, regional transit service was considered. The following regional transit services operate within San Francisco and are accessible from the Project Site via Muni.

2.4.2.1 Bay Area Rapid Transit (BART)

BART provides regional commuter rail service between the East Bay (from Pittsburg/Bay Point, Richmond, Dublin/Pleasanton and Fremont) and San Francisco, and between San Mateo County (from SFO Airport and Millbrae) and San Francisco, with operating hours between 4:00 AM and midnight. Within San Francisco, BART operates underground below Market Street and proceeds south through the Mission District towards Daly City after the Civic Center Station. During the weekday PM peak period, headways are generally 5 to 15 minutes for each line. The BART stations most easily accessible to the Project Site are the 24th Street Mission Station (approximately 3.5 miles northwest from the Project Site) and Glen Park Station, about 4 miles west of the Project Site. The 24th Street Mission Station can be accessed by taking the 19 Polk Muni route and transferring at 25th Street and Connecticut Street to outbound Muni route 48 Quintara. The Glen Park Station can be accessed by Muni route 44 O'Shaughnessy.

2.4.2.2 Caltrain

Caltrain provides passenger rail service on the Peninsula between San Francisco and Downtown San Jose with several stops in San Mateo County and Santa Clara County. Limited service is available south of San Jose. Within San Francisco, Caltrain terminates at the Fourth/King Station in the South of Market neighborhood. The Project Site is roughly equidistant between the 22nd Street Station to the north and the Bayshore Station to the south; each are about 2.5 miles away. The 22nd Street Station can be accessed by taking the 19 Polk Muni route and transferring at 25th Street and Connecticut Street to inbound Muni route 48 Quintara. Caltrain service headways during the AM and PM peak periods are between five and 60 minutes, depending highly on the type of train (i.e. local, limited, or express "Baby Bullet"). The 22nd Street Station is served by local, limited, and "Baby Bullet" trains. In the weekday AM and PM peak periods, the station is served around four times per hour by a mix of limited trains and "Baby Bullet" trains. The Bayshore Station can be accessed by taking the 19 Polk Muni route and transferring at Third Street/Evans Avenue to the T Third light rail line, which terminates a short walk from the Bayshore Station. The Bayshore Station is served by local and limited but not express "Baby Bullet" trains.

2.4.2.3 Alameda-Contra Costa County Transit District (AC Transit)

AC Transit operates bus service in western Alameda and Contra Costa Counties, as well as routes to the City of San Francisco and San Mateo County. AC Transit operates 27 "Transbay" bus routes between the East Bay and the Transbay Terminal, temporarily located at Howard Street and Beale Street, which is near many major San Francisco Muni routes. The Transbay Terminal about 5 miles north of the Project Site and is most easily accessible from the Project Site by taking Muni route 19 Polk to the T Third. Most Transbay service is provided only during commute periods, with headways between buses of approximately 15 to 20 minutes, although limited service is provided during off-peak hours.

2.4.2.4 San Mateo County Transit District (SamTrans)

SamTrans operates bus and rail service in San Mateo County, with select routes providing transit service outside of the County. SamTrans Routes 292, 391, and 397 serve Downtown San Francisco providing connections to San Mateo County destinations. In general, SamTrans service to Downtown San Francisco operates along Mission Street to the Transbay Terminal at First Street and Mission Street. SamTrans routes serving Downtown San Francisco do not make local stops at the Project Site, and SamTrans cannot pick up northbound passengers or drop off southbound passengers within San Francisco.

2.4.2.5 Golden Gate Transit

The Golden Gate Bridge, Highway, and Transportation District operates Golden Gate Transit (GGT) and provides bus and ferry service between the North Bay (Marin and Sonoma counties) and San Francisco. GGT operates 22 commuter bus routes, nine basic bus routes, and 16 ferry feeder bus routes into San Francisco. Basic bus routes operate at regular intervals of 15 to 90 minutes depending on time and day of week. Golden Gate Transit operates routes on Battery Street during the AM peak period and on Sansome Street during the PM peak period. The Golden Gate Transit bus service stops closest to the Project Site are located at the Temporary Transbay Terminal, on Howard Street and Beale Street. Golden Gate Transit also operates ferry service between the North Bay and San Francisco, connecting Larkspur and Sausalito with the Ferry Building during the morning and evening commute periods.

2.4.2.6 Water Emergency Transportation Authority (WETA)

The Water Emergency Transportation Authority (WETA) is a regional public transit agency that operates ferry service on the San Francisco Bay and coordinates the water transit response to regional emergencies. WETA service operates from eight terminals in Alameda, Oakland, San Francisco, South San Francisco, and Vallejo. The nearest terminal to the Project Site is the San Francisco Ferry Building. On days when the San Francisco Giants have home games, regional service is available to the ferry terminal adjacent to AT&T Park. Ferry routes typically operate at 30 to 60 minute headways depending on time and day of the week.

2.4.2.7 Regional Transit Screenlines

Similar to Muni, transit service into and out of San Francisco on regional service providers is examined on a screenline basis. The existing regional transit screenlines, as described in the *SF Guidelines*, were used to analyze regional transit capacity near the Project Site. A map of the regional screenlines is provided in **Appendix E**. **Table 2-6** presents the ridership and capacity utilization at the MLP for the regional screenlines during the weekday PM peak hour. For regional operators, the MLP is typically at the San Francisco city limit (i.e., the East Bay MLP would occur at the Transbay Tube and on the Bay Bridge; the North Bay MLP would occur at the Golden Gate Bridge; and the South Bay MLP would occur at the southern city border). Transit lines headed away from Downtown (outbound) are most congested during the weekday PM peak commute hour, therefore, the ridership presented in the table reflects only the outbound ridership and capacity.

For regional transit providers, the established capacity utilization threshold is equal to the number of available seats (and in the case of BART, standing area also), i.e. 100 percent of capacity. This standard is different from Muni because each operator decides their own threshold for capacity utilization. As shown in **Table 2-6**, the East Bay regional screenline currently exceeds its established capacity utilization standard in the AM peak hour and the South Bay regional screenline exceeds its established capacity utilization standard in the PM peak hour, primarily due to overcrowding on BART. All other regional screenlines operate within established utilization standards.

TABLE 2-6: REGIONAL TRANSIT SCREENLINES - EXISTING CONDITIONS						
Screenline	AM Peak Hour			PM Peak Hour		
	Ridership	Capacity	Capacity Utilization[1]	Ridership	Capacity	Capacity Utilization[1]
East Bay						
BART	25,399	23,256	**109%**	24,488	22,784	**107%**
AC Transit	1,568	2,829	55%	2,256	3,926	58%
Ferries	810	1,170	69%	805	1,615	50%
Screenline Subtotal	27,777	27,255	**102%**	27,549	28,325	97%
North Bay						
Golden Gate Transit Buses	1,330	2,543	52%	1,384	2,817	49%
Ferries	1,082	1,959	55%	968	1,959	49%
Screenline Subtotal	*2,412*	*4,502*	*54%*	*2,352*	*4,776*	*49%*
South Bay						
BART	14,150	19,367	73%	13,500	18,900	71%
Caltrain	2,171	3,100	70%	2,377	3,100	77%
SamTrans	255	520	49%	141	320	44%
Screenline Subtotal	16,576	22,987	72%	16,018	*22,320*	*72%*
Regional Total	46,765	54,744	85%	45,919	*55,421*	*83%*

Notes:

Bold indicates capacity utilization of 100 percent or greater.

1.Whereas Muni threshold for overcrowding is 85% of capacity, each agency listed in this table has an overcrowding threshold of 100%. Therefore, none of the transit providers operate over their established load standard except for BART in the PM peak hour.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015. San Francisco Planning Department, "Updated BART Regional Screenlines – Revised," October 17, 2016; Fehr & Peers, 2016.

2.5 PEDESTRIAN FACILITIES

A qualitative evaluation of existing pedestrian conditions was conducted along Jennings Street between Cargo Way and Evans Avenue, and along Hunters Point Boulevard and Innes Avenue between Evans Avenue and Donahue Street. This evaluation occurred during field visits in May 2015. Pedestrian facilities include sidewalks, crosswalks, and curb ramps. There are no signalized intersections in this area adjacent to the Project Site.

Due to the generally undeveloped nature of the Project Site area, the pedestrian facilities in the immediate vicinity range from adequate to non-existent, and the quality ranges from poor to acceptable. The presence and width of sidewalks in the vicinity of the Project Site varies greatly. There are currently crosswalks at several locations in the vicinity of the Project Site, but crosswalks are not painted/installed consistently at all intersections. The sidewalks are poorly maintained, and there is limited street furniture. Adjacent to the Project Site, most intersections include curb ramps, although they are one-directional and don't reflect the most recent best practices for installing curb ramps as defined by the City. This review summarizes pedestrian conditions from west to east on street segments between the intersection of Evans Avenue/Hunters Point Boulevard and the intersection of Earl Street/Innes Avenue. The presence of sidewalks, crosswalks, and stairwells in the Project Site vicinity are shown in **Figure 5**. Specific locations of curb cuts, curb ramps, and sidewalk widths adjacent to the Project Site are shown in **Figure 3**.

Between Cargo Way and Evans Avenue, Jennings Street includes eight-foot sidewalks on both sides of the street. Between Jennings Street and Hunters Point Boulevard, Evans Avenue includes a 10-foot sidewalk on both sides of the street. Between Evans Avenue and Hudson Avenue, Hunters Point Boulevard currently has sidewalks on both sides of the street (four feet wide on the south side and five feet wide on the north side). There are two existing flights of stairs to the Hunters View housing development up the hill on the west side of Hunters Point Boulevard across from the PG&E station, but they are separated from the sidewalk along this side of the street by a chain-link fence. Between Evans Avenue and Hudson Avenue, there is a 6.5-foot sidewalk along the east side of Hunters Point Boulevard on both sides of the trail entrance to India Basin Shoreline Park.

Pedestrians may access India Basin Shoreline Park from multiple locations: an off-street path into the park directly from the sidewalk on Hunters Point Boulevard just north of the intersection with Hudson Avenue, an 8-foot sidewalk on the south side of Hawes Street (i.e. the park driveway) that leads to multiple off-street paths within India Basin Shoreline Park, and from the Bay Trail. Hawes Street has no through access and accordingly is a low volume street, only used by vehicles visiting the park. There are no marked crossings across this segment of Hawes Street. Arelious Walker Drive provides access to India Basin Open Space and has sidewalks of approximately 6-foot-width on both sides.

There are painted stop bars and stop signs at numerous stop-controlled intersections in the vicinity of the Project Site. However, striped crosswalks are infrequent. Standard crosswalks are present across Hawes Street at Hunters Point Boulevard, across Hawes Street at Innes Avenue, and across Innes Avenue and Donahue Streets at the intersection of those two streets. Ladder crosswalks are present across Innes Avenue at Griffith Street and across Hunters Point Boulevard and Innes Avenue at the intersection of those two streets.

Between Hawes Street and Arelious Walker Drive, Innes Avenue currently has sidewalks on both sides of the street (approximately 5 feet wide on the south side and 8 feet wide on the north side). There are four flights of stairs on the south side of the street: at Hawes Street, Griffith Street, mid-block between Griffith Street and Arelious Walker Drive, and at Arelious Walker Drive. Most of these stairwells connect across a steep incline from Northridge Road at the top of the hillside to continuous sidewalks on the south side of

Innes Avenue at the bottom of the hillside; however, there is no sidewalk to the east of the base of the stairs across from Arelious Walker Drive. There are "Pedestrian Crossing" pavement markings in both the eastbound and westbound approach to Griffith Street along Innes Avenue. There are bus stops for both the inbound and outbound Muni route 19 Polk on both the north and south sides of the intersection of Arelious Walker Drive and Innes Avenue. These flag or pole bus stops consist solely of "coach stop" markings on the pavement or telephone pole; no length of curb space is reserved for buses. Pedestrian access from the Project Site to these bus stops would involve walking along internal streets to Innes Avenue, then along Innes Avenue to the intersection of Arelious Walker Drive and Innes Avenue. From the east, pedestrians would remain on the north side of Innes Avenue until reaching the intersection of Arelious Walker Drive and Innes Avenue, because the sidewalk on the south side of Innes Avenue does not continue east of that intersection.

Between Arelious Walker Drive and Earl Street, Innes Avenue currently has a 10-foot sidewalk on the north side of the street with a brief gap near Arelious Walker Drive. There is an existing staircase leading up the hillside to Jerrold Avenue south of Innes Avenue at Earl Street. The base of the stairs does not connect to a crosswalk on Innes Avenue. There are no marked crosswalks at the intersection of Innes Avenue and Earl Street.

Between Earl Street and Donahue Street, Innes Avenue currently has a nine-foot sidewalk on both sides of the street. There are brief sidewalk gaps on both sides of the street immediately east of Earl Street. At the intersection of Innes Avenue and Donahue Street there are marked crosswalks at all four crossings.

None of the sidewalks in the vicinity of the Project Site meet the *Better Streets Plan* minimum sidewalk width, which is 12 feet (15 feet recommended) for commercial and residential throughways. Innes Avenue is a commercial throughway between Hunters Point Boulevard and Arelious Walker Drive and residential throughway between Arelious Walker Drive and Earl Street.

General pedestrian impediments observed in the vicinity of the Project Site include:

- Long distances between intersections limiting crossing opportunities and intersections with no marked crosswalk;
    - In particular, people were observed to cross Innes Avenue at Arelious Walker to access the bus stop, and no crosswalk is marked at this location.
- Narrow effective sidewalk width and at times no sidewalk at all;
- Long crossing distances (across four lanes of traffic) along Innes at crosswalk locations where drivers are required to yield. Pedestrians are exposed to the "double-threat" scenario where if one vehicle stops for a pedestrian and another vehicle overtakes it on either side, the pedestrian may not be visible and be struck;
- Vehicles were regularly observed to travel above the 25 mph speed limit;
- Some missing ADA curb ramps at some intersection corners.

Pedestrian volumes adjacent to the Project Site were observed to be generally low along Innes Avenue towards Earl Street and Arelious Walker, but they were higher with people crossing Innes Avenue at Griffith Street to and from the bus stop on the north side of Innes Avenue.

\\fpsf03\data\Projects\2015 Projects\SF15-0820_India_Basin_TIA

Figure 5

Existing Pedestrian Network (Sidewalks and Crosswalks)

2.6 BICYCLE FACILITIES

Bicycle facilities consist of bicycle lanes, trails, and paths, as well as bike parking, bike lockers, and showers for cyclists. On-street bicycle facilities are grouped into four categories:

Class I:

Provides a completely separated right of way for the exclusive use of cyclists and pedestrians with cross-flow minimized.

Facilities consist of off-street bicycle paths and are generally shared with pedestrians. Class I facilities may be adjacent to an existing roadway, or may be entirely independent of existing vehicular facilities.

The San Francisco Bay Trail connects to the west and eastern edges of the Project Site. It is a partially-completed recreational corridor that, when complete, would encircle San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails. It would connect the shoreline of all nine Bay Area counties, link 47 cities, and cross the major toll bridges in the region. To date, approximately 338 miles of the alignment have been completed.

Class II:

Provides a striped lane for one-way travel on a street or highway.

Facilities consist of striped bicycle lanes on roadways. These facilities reserve a minimum of four to five feet of space for bicycle traffic.

The following Class II bike lane is in the vicinity of the Project Site:

- Class II bicycle lanes run along Hunters Point Boulevard between Evans Avenue and Innes Avenue.

Class III:

Provides for shared use with motor vehicle traffic.

Facilities consist of designated and signed bicycle routes where bicyclists share the roadway with vehicles, may or may not be marked with "sharrows," but are usually signed.

The following Class III bicycle facilities are in the vicinity of the Project Site:

- A signed Class III bicycle route runs along Third Street.
- A signed Class III bicycle route runs along Phelps Street and Palou Street.
- A Class III bicycle route without marked sharrows runs along Innes Avenue alongside the Project Site between Hunters Point Boulevard and Donahue Street.

Class IV:

Provides for exclusive use including a separation required between the bikeway and the through vehicular traffic.

The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

The following Class IV bicycle facilities are in the vicinity of the Project Site:

- Class IV separated bikeway along Cargo Way.

Current on-street bicycle facilities in the vicinity of the Project Site, as designated by the San Francisco Bike Plan (June 2009) ("Bike Plan"), are shown in **Figure 6**. The majority of the streets in the immediate vicinity of the Project Site are flat, with limited changes in grades, facilitating bicycling within and through the area. However, the terrain south and west of the Project Site is very steep, limiting bicycle connectivity.

Bike parking in the vicinity of the Project Site is limited to two racks on the north side of Innes Avenue between Hunters Point Boulevard and Griffith Street and a bike corral containing five racks on the north side of Innes Avenue between Arelious Walker Drive and Earl Street.

Very few bicyclists were observed in the vicinity of the Project Site. The absence of bicycle facilities, the presence of high-speed traffic, and the danger presented by the door zone adjacent to on-street parking contribute to an uncomfortable bicycling experience along Innes Avenue. Along Hunters Point Boulevard, the presence of a Class II bicycle lane and the absence of on-street parking create a moderately comfortable bicycling experience; high traffic speeds however make bicycling on Hunters Point Boulevard less comfortable.

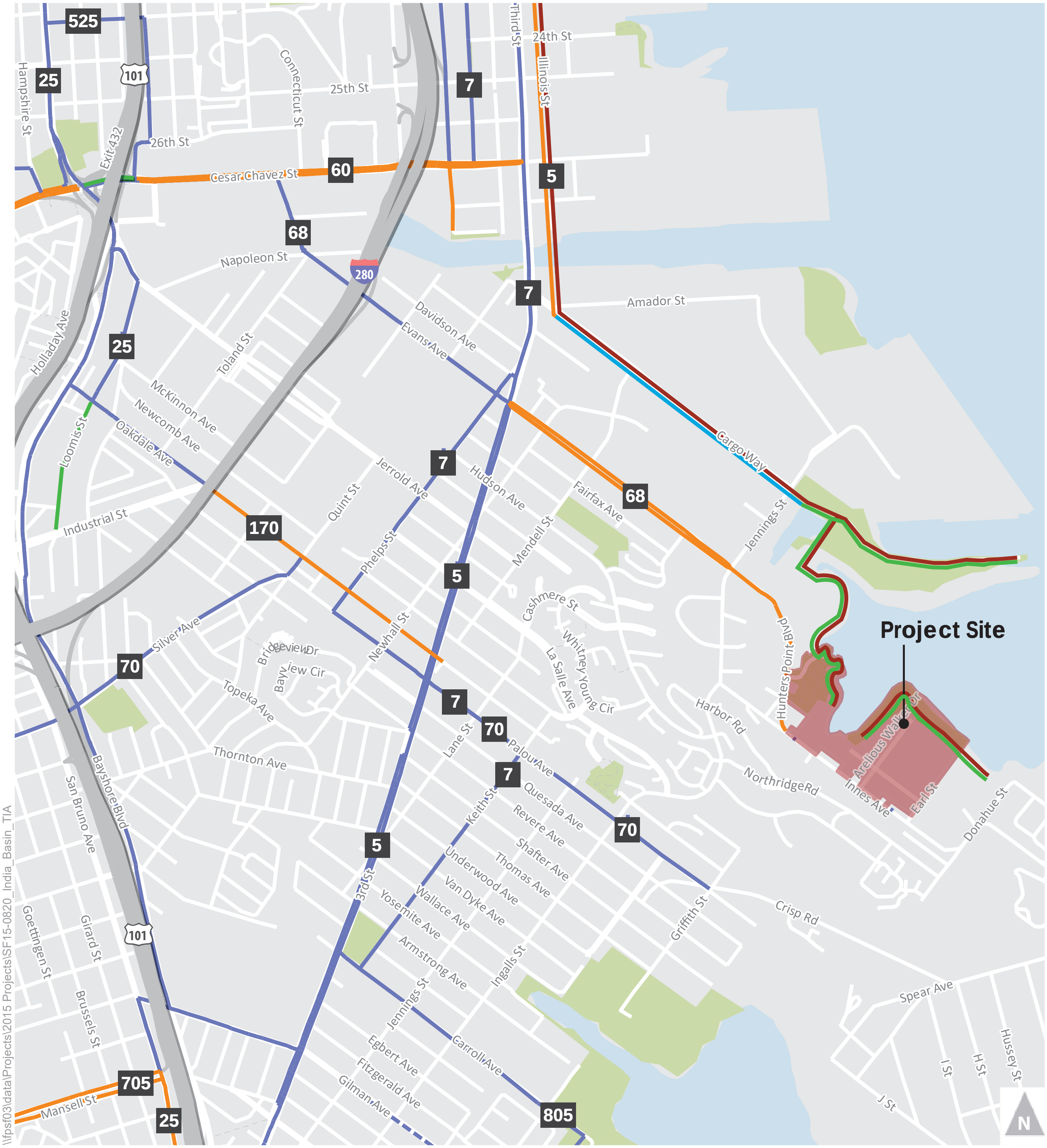
Grade changes along Innes Avenue are minor and do not present a major deterrent to bicycling. Shallow grade changes occur along Hunters Point Boulevard, presenting a minor challenge to bicyclists. The terrain to the south and immediate west of the Project Site is very steep and effectively impassable to bicyclists; however, access to Hunters Point Shipyard via Donahue Street is feasible with minimal grade changes.

A substantial proportion of bicycling activity in the vicinity of the Project Site occurs along the San Francisco Bay Trail. Conditions on the Bay Trail are mixed: the pathway is not currently continuous through the Project Site, and paving quality is adequate but not excellent.

2.6.1 Bay Area Bike Share

Bay Area Bike Share is a regional public bicycle sharing system that went into operation as a pilot project in August 2013. The bicycles are securely docked at stations throughout the City and region. After a user obtains a membership, they may take unlimited trips of up to 30 minutes between stations. There are no Bay Area Bicycle Share stations in the vicinity of the Project Site, but the system is going to expand to 7,000 bicycles through 2017 and 2018, including additional stations in San Francisco, San Jose, Oakland, Berkeley, and Emeryville, and a renaming to Ford GoBike. Upon this expansion of the Bay Area Bike Share network in San Francisco, the nearest bike share station would be located approximately 1.5 miles to the northwest of the Project Site.[13] More information on Bay Area Bike Share can be accessed at their website: https://bayareabikeshare.com/.

[13] Discussion of nearest future bike share station is based on preliminary Bay Area Bike Share Expansion station siting and may be subject to change.



Bicycle Class I
Bicycle Class II
Bicycle Class III
Bicycle Class IV
Bay Trail
Bicycle Route Number

Figure 6

Existing Bicycle Network

2.7 LOADING FACILITIES

There are currently no marked on-street loading spaces along Innes Avenue or Hunters Point Boulevard adjacent to the Project Site or along any of the streets internal to the Project Site. There are no marked loading spaces along Hawes Street within India Basin Shoreline Park, although there is a turnaround at the tip of the street (with a radius of around 35 feet) which can accommodate loading to/from larger vehicles. Because of the industrial nature of much of the India Basin area, loading was observed to typically occur off-street, or in the plentiful on-street general parking not specifically designated for loading.

Some existing commercial uses along Innes Avenue contain off-street loading zones, accessible via driveway entrances on Innes Avenue. Given the low on-street parking occupancy on Innes Avenue, existing land uses were observed to occasionally utilize available on-street parking to serve exiting loading demand. **Figure 7** depicts the existing off-street loading accommodations along this corridor.

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LEGEND

Residential Uses
Name (Address): Description

Commercial Uses
Name (Address): Description

Project Site Boundary

Garage, Roll-Up Door, or Barn Door

Figure 7

Existing Loading

2.8 EMERGENCY SERVICES & ACCESS

Emergency vehicles in the area typically use major streets when heading to and from an emergency and/or emergency facility. Arterial roadways allow the emergency vehicles to travel at higher speeds and permit other traffic to maneuver out of the path of the emergency vehicle. Non-emergency vehicles have to yield to emergency vehicles headed to the Project Site, as required by the California Vehicle Code.[14]

The San Francisco Fire Department stations closest to the Project Site are:

- Station 17 on Shafter Avenue at Ingalls Street (1.1 miles from the Project Site),
- Station 25 on Third Street at Cargo Way (1.3 miles from the Project Site),
- Station 9 on Jerrold Avenue at Upton Street (2.2 miles from the Project Site), and
- Station 42 on San Bruno Avenue at Silliman Street (2.5 miles from the Project Site).

Fire Department vehicles likely travel from these stations to the Project Site via Third Street, Evans Avenue, Hunters Point Boulevard, Innes Avenue, and Ingalls Street. Police and ambulance service vehicles also access the Project Site via Third Street, Evans Avenue, Hunters Point Boulevard, Innes Avenue, and Ingalls Street.

2.9 PARKING CONDITIONS

This section describes the results of a survey of existing supply and occupancy of on-street parking facilities conducted in March 2015. There are no public off-street parking facilities in the parking study area. **Figures 8A** and **8B** show the parking study area, which is bounded by Middle Point Road to the west, Innes Avenue to the south, Donahue Street to the east, and Hunters Point Road and the shoreline to the north.

2.9.1 On-Street Parking

Parking conditions within the parking study area were assessed for the weekday mid-afternoon period (1:30 to 3:30 PM) and the weekday evening period (6:30 to 8:00 PM). The parking study area includes a total of 533 public on-street parking spaces. **Figure 8A** shows the blocks contained within the parking study area and summarizes parking occupancy rates during the mid-afternoon period. **Figure 8B** summarizes parking occupancy rates during the PM peak period. Based on field observations, on-street parking in the Project study area is not utilized consistently throughout the study area. Parking occupancy during the mid-afternoon ranges from 0 percent to 100 percent full with most streets between 20 and 40 percent occupied. The highest occupancy mid-afternoon is along Donahue Street, likely due to parking by construction personnel working on nearby Shipyard construction. Peak hour parking during the mid-afternoon period on Arelious Walker Drive is less than 20 percent occupied. Parking occupancy is generally lower during the evening, with most streets less than 20 percent occupied, although some areas are fully occupied. Peak hour parking during the evening period on Arelious Walker Drive is less than 10 percent occupied. A detailed summary of the parking supply and occupancy in the Project area is provided in **Appendix F.**

Residential Permit Parking ("RPP") regulations generally restrict weekday on-street parking to a one-hour or two-hour period, except for residents with permits. However, the study area is not located within an RPP

[14] Per the California Vehicle Code, Section 21806, all vehicles must yield right of way to emergency vehicles, and should remain stopped until the emergency vehicle has passed.

zone; the nearest zones are in the Dogpatch and Potrero Hill neighborhoods, approximately two miles from the Project Site.

San Francisco implemented a more efficient way of managing its on-street and public garage parking supply through the SF*park* program administered by SFMTA. SF*park* uses new technologies and parking pricing policies to optimize the use of existing parking resources in order to make finding a parking space faster and easier and by extension reducing circling by vehicles looking for parking near their destination. Currently, SF*park* is managing 7,000 on-street metered parking spaces (25 percent of the City's supply) and 12,250 off-street parking spaces in city-owned garages.[15] There are no SF*park* meters in the vicinity of the Project; the nearest SF*park* blocks are in the Mission Bay neighborhood, approximately three miles from the Project Site.

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[15] SFMTA SFpark program, http://sfpark.org/about-the-project/, accessed on March 19, 2015.

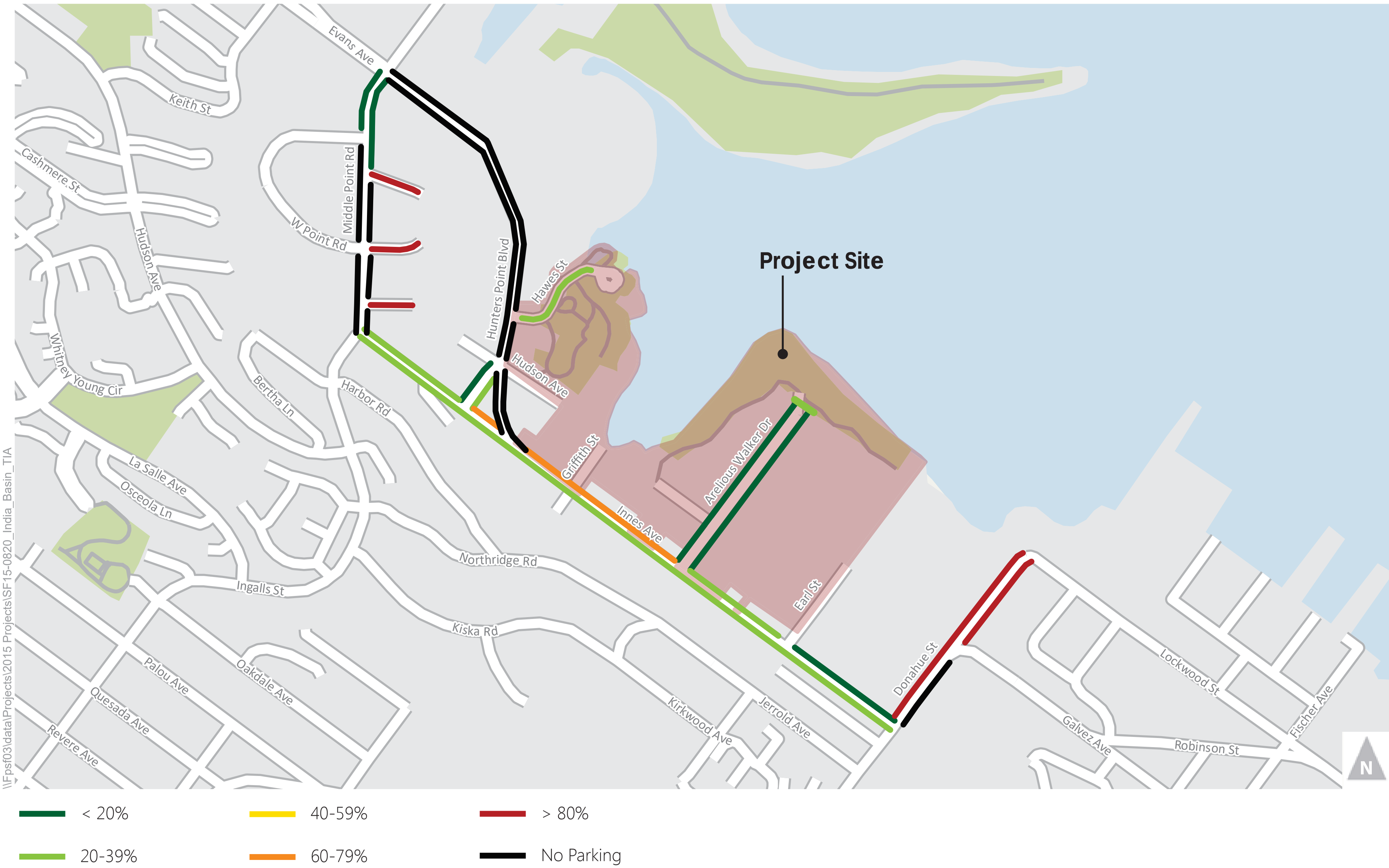

Figure 8A

On-Street Parking Occupancy - Midday

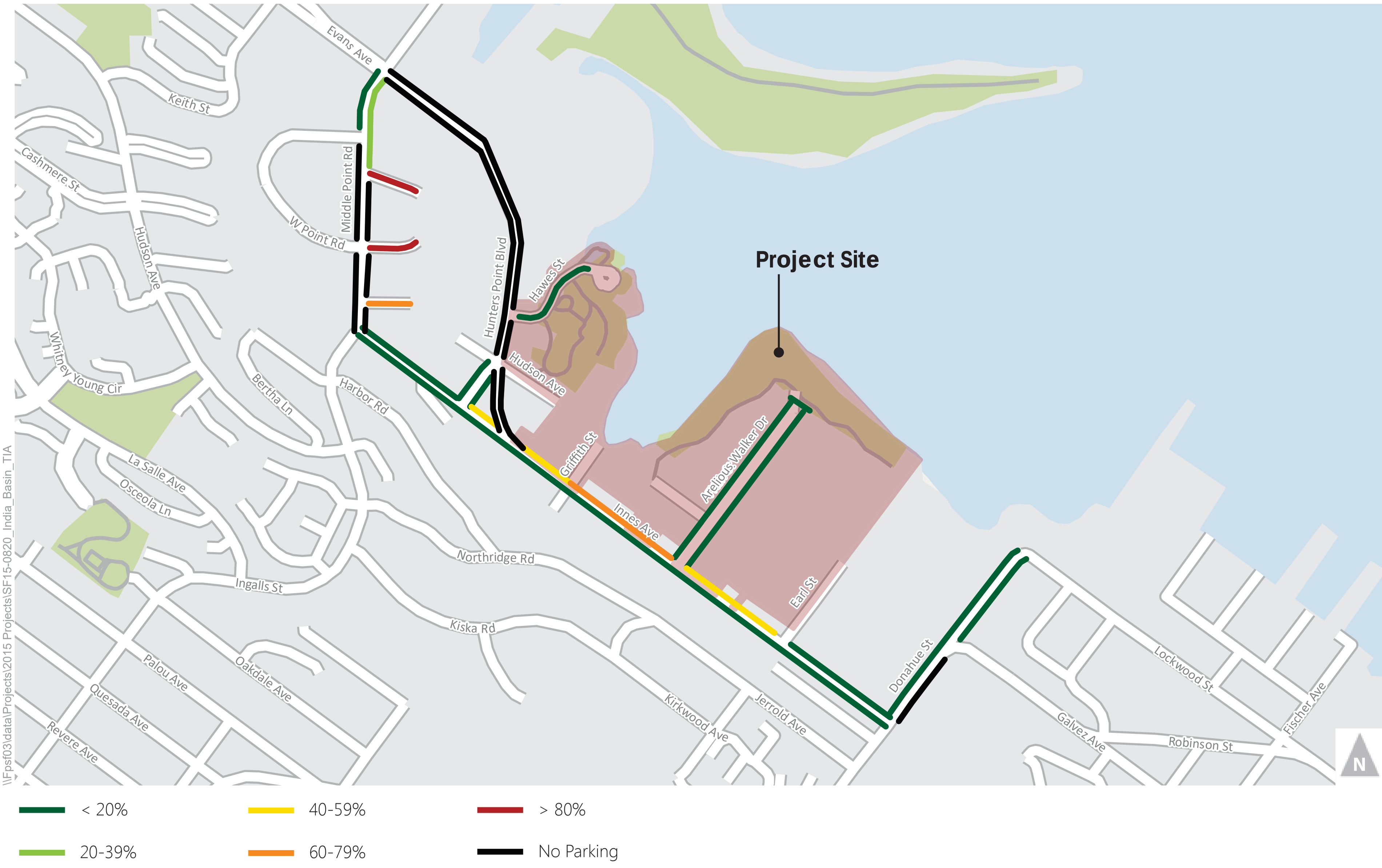

Figure 8B

On-Street Parking Occupancy - Evening

3 BASELINE CONDITIONS

Existing Conditions typically forms the baseline against which Project impacts are measured. However, conditions are in flux in this neighborhood because the Phase 1 of the nearby Hunters Point Shipyard (Shipyard) project has begun construction. Many units from the Shipyard project would be occupied prior to completion of the Proposed Project's Transportation Impact Analysis and opening of the initial phases of the Proposed Project. Additionally, Jennings Street, Evans Avenue, Hunters Point Boulevard, and Innes Avenue will be reconstructed as part of obligations for the Candlestick Point Hunters Point Shipyard (CPHPS) project. The reconstruction of these streets is planned to occur during Major Phase 1 Subphase 1 of Shipyard construction (2014-2021) and be completed in June 2020[16] prior to opening of Phase 1 of the Proposed Project, expected in July 2021. Therefore, an existing plus project transportation analysis does not accurately reflect the conditions that will exist at the time the project's impacts actually occur and an existing plus project conditions transportation analysis could be misleading to the public and decision makers. Therefore, a modified baseline scenario (Baseline Scenario) is presented and analyzed in this report.

The Baseline Scenario contains all development, changes to streetscape and circulation, and transit service improvements that are both approved and funded and near to the Project Site, as described in more detail below.

3.1 LAND USE CHANGES

This scenario includes 494 residential units approved as Phase 1 of the nearby Shipyard development that are currently under construction. The Project Sponsor for the Shipyard development is FivePoint. The 494 units included in the Baseline Scenario are part of Major Phase 1 Subphase 1 (i.e. Phase I) of the Shipyard project, which is an area adjacent to Donahue Street and extends for four blocks east towards Hunters Point.

3.1.1 Shipyard Phase 1

The Project Site is located to the immediate west of the Shipyard development. The first phase of the Shipyard development includes 519 residential units, of which 25 were occupied as of the time of traffic counts[17] collected in mid-May 2015 and are therefore accounted for in the counts. Since the remaining 494 units would be completed and occupied by 2018, the vehicle trips generated by the Shipyard Phase I project have been added to the existing conditions to form the modified Baseline Conditions scenario. **Figure 9** shows the location of the Shipyard Phase I development.

The trip generation, distribution, and mode share forecasts for the Shipyard Phase I residential units were developed based on the environmental analysis for the *CPHPS EIR*, specifically the *Proposed Trip Generation, Distribution, and Transit Mode Split Forecasts for the Bayview Waterfront Project Transportation Study*, a 2009 memo that is included as **Appendix G**. **Table 3-1** summarizes the vehicle trip generation forecasts for the Shipyard Phase I development that would be added to the Existing Conditions volumes to establish the modified Baseline Conditions scenario. Note that the automobile trip generation rates for the land uses within the CPHPS area assume implementation of the transit improvements proposed for the area, as no scenario was evaluated in the *CPHPS EIR* that did not assume substantial transit improvements proposed as part of that development. Without the transit improvements, the automobile trip generation rates may

[16] Candlestick Point Major Phase 1 Application, Lennar. Approved: March 15, 2016 OCII Commission Resolution 2016013. Updated August 24, 2016. Exhibit D-B, page 120.

[17] Email from Frankie Arias, Lennar, dated June 26, 2015.

be higher. These transit improvements would be implemented, as they are included in the approved CPHPS project description and mitigation measures, although the ones due for implementation after 2018 are not included as part of the Baseline Scenario. **Table 3-2** summarizes the vehicle trip distribution, and **Table 3-3** summarizes the mode share for the residential units both based on the *CPHPS EIR*.

The vehicle trips generated by these 494 units are part of the Baseline Scenario and are assigned to intersections in the vicinity of the Project Site using the trip distribution shown **Table 3-2**.

TABLE 3-1: SHIPYARD PHASE I RESIDENTIAL VEHICLE TRIP GENERATION

Time Period	Units[1]	Rate[2]	In[2]	Out[2]	Total Vehicle Trips	Trips In	Trips Out
AM Peak Hour	494	0.23	17%	83%	114	19	95
PM Peak Hour	494	0.28	67%	33%	139	93	46

Notes:

1. Number of units from email from Frankie Arias, Lennar, dated June 26, 2015
2. Trip generation rates are effective auto trip generation rates per dwelling unit from CPHPS EIR.

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Figure 9
Shipyard Phase I Location

TABLE 3-2: SHIPYARD PHASE I RESIDENTIAL TRIP DISTRIBUTION	
Zone[2]	**Trip Distribution[1]**
Superdistrict 1	13.5%
Superdistrict 2	8.5%
Superdistrict 3	36.5%
Superdistrict 4	3.5%
East Bay	9.0%
North Bay	1.5%
South Bay & Outside Region	27.5%
TOTAL	*100.0%*

Notes:

1. A 2030 PM SF-CHAMP model was used to develop trip distribution for work and non-work trips. This distribution was combined with the work/non-work trip split for residential land uses (from the SF Guidelines) to calculate an overall trip distribution.
2. A superdistrict map is included in Appendix H.

Source: Proposed Trip Generation, Distribution, and Transit Mode Split Forecasts for the Bayview Waterfront Project Transportation Study memo, May 2009; Fehr & Peers

TABLE 3-3: SHIPYARD PHASE I RESIDENTIAL MODE SHARE AND PERSON TRIPS			
Mode	**Percentage Share[1]**	**AM Peak Person Trips**	**PM Peak Person Trips**
Vehicle	54%	182	222
Transit	16%	53	65
Bicycle	2%	7	9
Internalized	29%	97	118
TOTAL	*100%*	*339*	*414*

Notes:

1. This mode share is based on Table 12 of the Proposed Trip Generation, Distribution, and Transit Mode Split Forecasts for the Bayview Waterfront Project Transportation Study which details the number of trips made by vehicle, transit, and bicycle. The vehicle trip generation rate summarized in Table 1 above incorporated the auto mode split percentage. Consistent with the Bayview Waterfront Project Transportation Study, an AVO of 1.60 was applied to vehicle trips to derive auto person trips. Then, the number of vehicle trips and the mode share percentages for the other modes were used to calculate the number of trips taken by the other modes.

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3.2 CIRCULATION AND STREETSCAPE CHANGES

The Baseline Scenario includes a range of network changes throughout the Jennings Street—Evans Avenue—Hunters Point Boulevard—Innes Avenue corridor. Excluding Jennings Street, this is the primary corridor along which a high number of Project-generated trips would occur. The changes are sourced from the 2010 CPHPS Transportation Plan[18] and the Shipyard Phase II Infrastructure Plan, both of which are approved and funded, except for the section between Earl Street and Donahue Street which is revised from the Infrastructure Plan recommendations based on a more detailed engineering feasibility study and an agreement between FivePoint (the Shipyard Project Sponsor) and the City. There have been no changes to the Hunters Point Shipyard Phase II Infrastructure Plan since 2010 that would affect circulation along Hunters Point Boulevard and Innes Avenue.

The intersection of Evans Avenue/Jennings Street is signalized in this scenario because signalization of this intersection is a mitigation measure that FivePoint is committed to implementing as part of the Shipyard project.

A table showing how Baseline cross-sections differ to Existing Conditions is shown in **Table 3-4** below.

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[18] A revised version of the CPHPS Transportation Plan was completed and approved by the Office of Community Investment and Infrastructure (OCII) in July 2014. However the changes that were made to the Plan were primarily to the Candlestick Point portion of the CPHPS development, and all cross-sectional references to streets within and adjacent to the Hunters Point Shipyard were removed from the Plan in anticipation of additional refinements to those streets. Therefore, the 2010 version of the Transportation Plan that was approved alongside the original CPHPS project contains the most recent set of approved cross-sections for the Hunters Point Shipyard.

TABLE 3-4: COMPARISON OF BASELINE SCENARIO CIRCULATION VERSUS EXISTING CONDITIONS CIRCULATION

Street	From	To	Scenario	Travel Lanes	Parking	Bicycle Facilities	Sidewalks
Jennings Street	Cargo Way	Evans Avenue	Existing Conditions	Two lanes, one in each direction, 12'	Both sides, 12'	None	Both sides, 8'
			Baseline Scenario	Two lanes, one in each direction, 12'	Both sides, 12'	None	Both sides, 8' west side, 16' east side
Evans Avenue	Jennings Street	Hunters Point Boulevard	Existing Conditions	Four lanes, two in each direction, outer as 18', inner as 12'	None	None	Both sides, 10' south side, 10' north side
			Baseline Scenario	Four lanes, two in each direction, outer as 11' shared bus/auto lane, inner as 10'	South side, 9'	Bicycle lanes both sides, 6' south side, 6' north side	Both sides, 8' south side, 10' north side
Hunters Point Boulevard	Evans Avenue	Hudson Avenue	Existing Conditions	Four lanes, two in each direction, outer as 12', inner as 11'	None	Bicycle lanes both sides, 6' south side, 6' north side	Both sides, 6' south side, 7' north side
			Baseline Scenario	Four lanes, two in each direction, outer as 11' shared bus/auto lane, inner as 10'	South side, 8'	Bicycle lanes both sides, 6' south side, 6' north side	Both sides, 8' south side, 10' north side
Hunters Point Boulevard	Hudson Avenue	Innes Avenue	Existing Conditions	Four lanes, two in each direction, outer as 12', inner as 11'	None	Bicycle lanes both sides, 6' south side, 6' north side	Both sides, 9' south side, 6' north side
			Baseline Scenario	Four lanes, two in each direction, outer as 11' shared bus/auto lane, inner as 10'	None	Bicycle lanes both sides, 5' south side, 5' north side[1]	Both sides, 8' south side, 10' north side
Innes Avenue	Hunters Point Boulevard	Griffith Street	Existing Conditions	Four 11' lanes, two in each direction	Both sides, 8'	None	Both sides, 7'
			Baseline Scenario	Four 10' lanes, two in each direction	Both sides, 8'	Bicycle lanes, both sides, 5'[1]	Both sides, 7'
Innes Avenue	Griffith Street	Arelious Walker Street	Existing Conditions	Four lanes, two in each direction, outer as 12' shared bus/auto lane, inner as 10'	Both sides, 8'	None	Both sides, 5' south side, 8' north side
			Baseline Scenario	Four lanes, two in each direction, outer eastbound as 11' shared bus/auto lane, others as 10'	Both sides, south side 7', north side 8'	5' bicycle lane on north side, sharrows on south side[1]	Both sides, 5' south side, 7' north side
Innes Avenue	Arelious Walker	Earl Street	Existing Conditions	Four lanes, two in each direction, outer as 12' shared bus/auto lane, inner as 10'	Both sides, 8'	None	North side, 4'
			Baseline Scenario	Four lanes, two in each direction, outer eastbound as 11' shared bus/auto lane, others as 10'	Both sides, south side 7', north side 8'	5' bicycle lane on north side, sharrows on south side[1]	Both sides, 5' south side, 7' north side

Street	From	To	Scenario	Travel Lanes	Parking	Bicycle Facilities	Sidewalks
Innes Avenue	Earl Street	Donahue Street	Existing Conditions	Four 10' lanes, two in each direction	Both sides, 8'	None	North side, 9'
			Baseline Scenario	Four lanes, two in each direction, outer as 11' shared bus/auto lane, inner as 10'	Both sides, 7'	None	Both sides, 5' south side, 7' north side

Notes:
1. These bicycle facilities would be removed by the Proposed Project and Project Variant, and the bicycle facility relocated to a parallel Class I facility on Hudson Avenue.

Source: Draft IBTAP, 2015.

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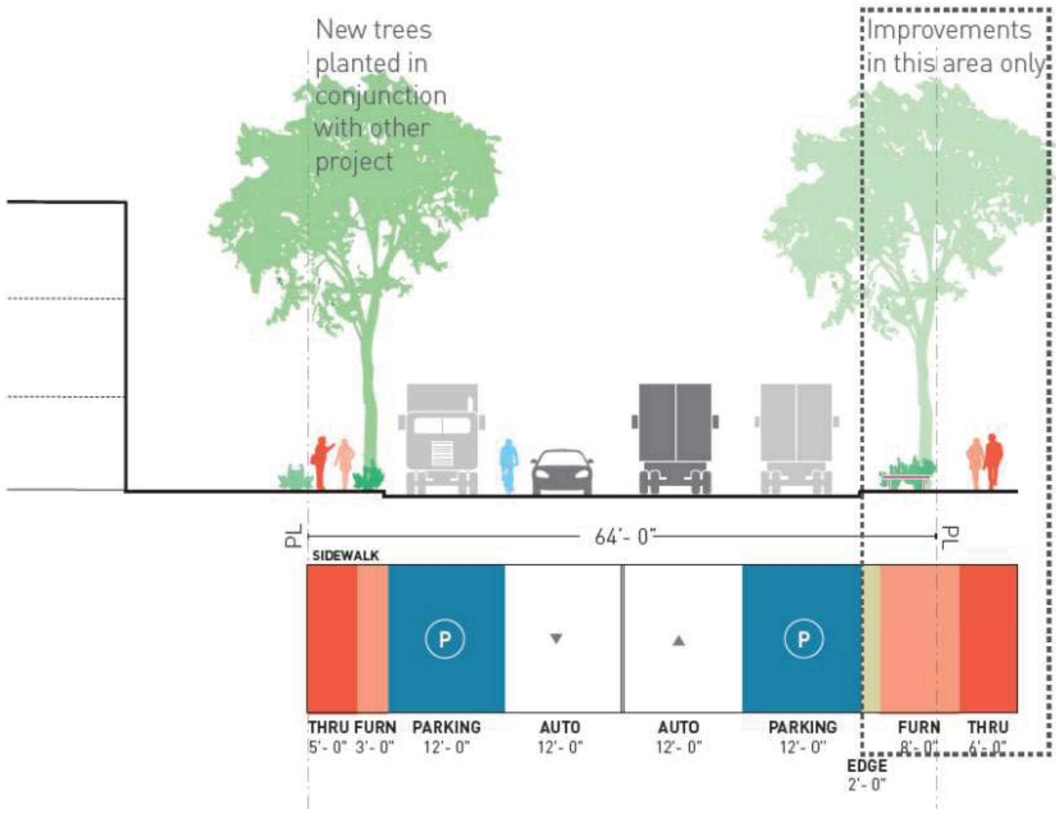
Individual road segment cross-sections for this scenario are described in detail below.

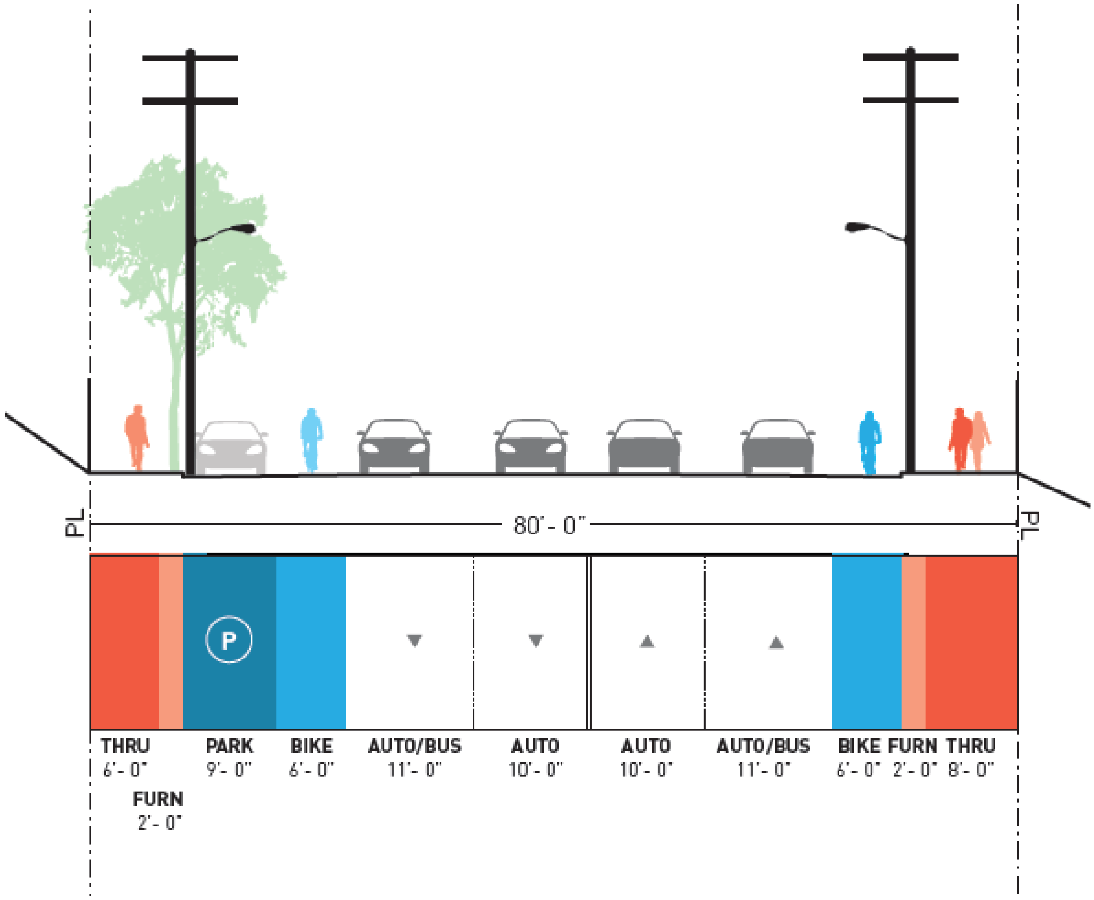
On Jennings Street, between Cargo Way and Evans Avenue, the street cross-section would include two travel lanes (one in each direction), on-street parking on both sides of the street, and sidewalks on both sides of the street (8-foot on the west side of the street and 16-foot on the east side of the street). **Inset 1** depicts the street section of Jennings Street in the Baseline scenario. All inset figures depict the street corridor looking north or west (i.e. the bay side is on the right).

Inset 1: Baseline – Jennings Street between Cargo Way and Evans Avenue



On Evans Avenue and Hunters Point Boulevard, between Jennings Street and Hudson Avenue, the street cross-section would include four travel lanes (two in each direction), on-street parking on the south side of the street, sidewalks on both sides of the street (8-foot on the south side of the street and 10-foot on the north side of the street), and 6-foot Class II bicycle lanes in both the eastbound and westbound directions. **Inset 2** depicts the street section of Evans Avenue and Hunters Point Boulevard in the Baseline scenario.

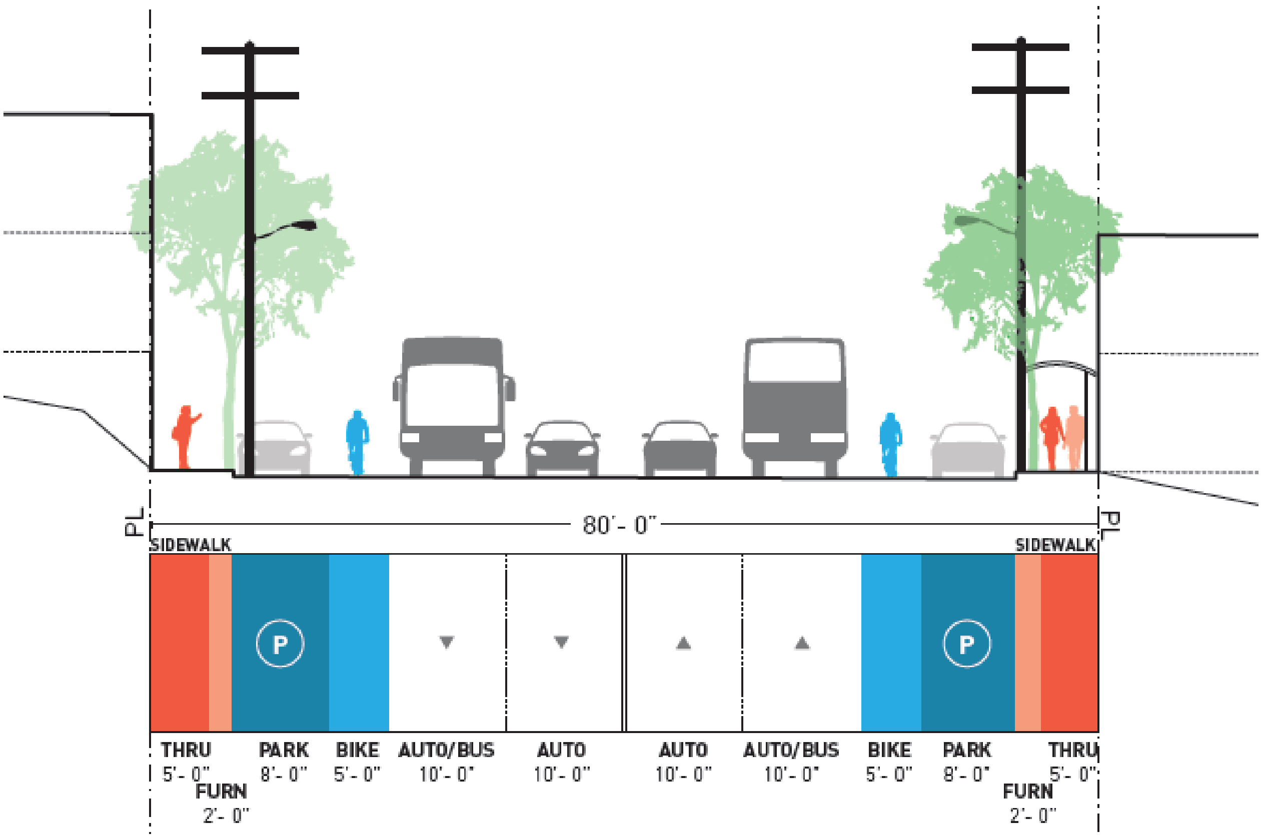
Inset 2: Baseline – Hunters Point Boulevard and Evans Avenue between Jennings Street and Hudson Avenue



Hunters Point Boulevard between Hudson Avenue and Innes Avenue and Innes Avenue between Hunters Point Boulevard and Griffith Street would provide four travel lanes (two in each direction), on-street parking on both sides of the street, 7-foot sidewalks on both sides of the street, and 5-foot Class II bicycle lanes in both directions.[19] **Inset 3** depicts the street section of Hunters Point Boulevard between Hudson Avenue and Innes Avenue and Innes Avenue between Hunters Point Boulevard and Griffith Street in the Baseline scenario.

[19] The CPHPS Transportation Plan was developed prior to plans for the proposed Class I facility on Hudson Avenue. These Class II bicycle lanes would be removed by the Proposed Project and Project Variant, and the bicycle facility relocated to a parallel Class I facility on Hudson Avenue.

Inset 3: Baseline – Hunters Point Boulevard and Innes Avenue between Hudson Avenue and Griffith Street



Between Griffith Street and Earl Street, Innes Avenue would provide four travel lanes (two in each direction), on-street parking on both sides of the street, sidewalks on both sides of the street (5-feet on the south side and 7-feet on the north side), and a Class II bicycle lane in the westbound direction only[20] (with 7-feet of unmodified hillside remaining within the right of way). **Inset 4** depicts the street section of Innes Avenue between Griffith Street and Earl Street in the Baseline scenario.

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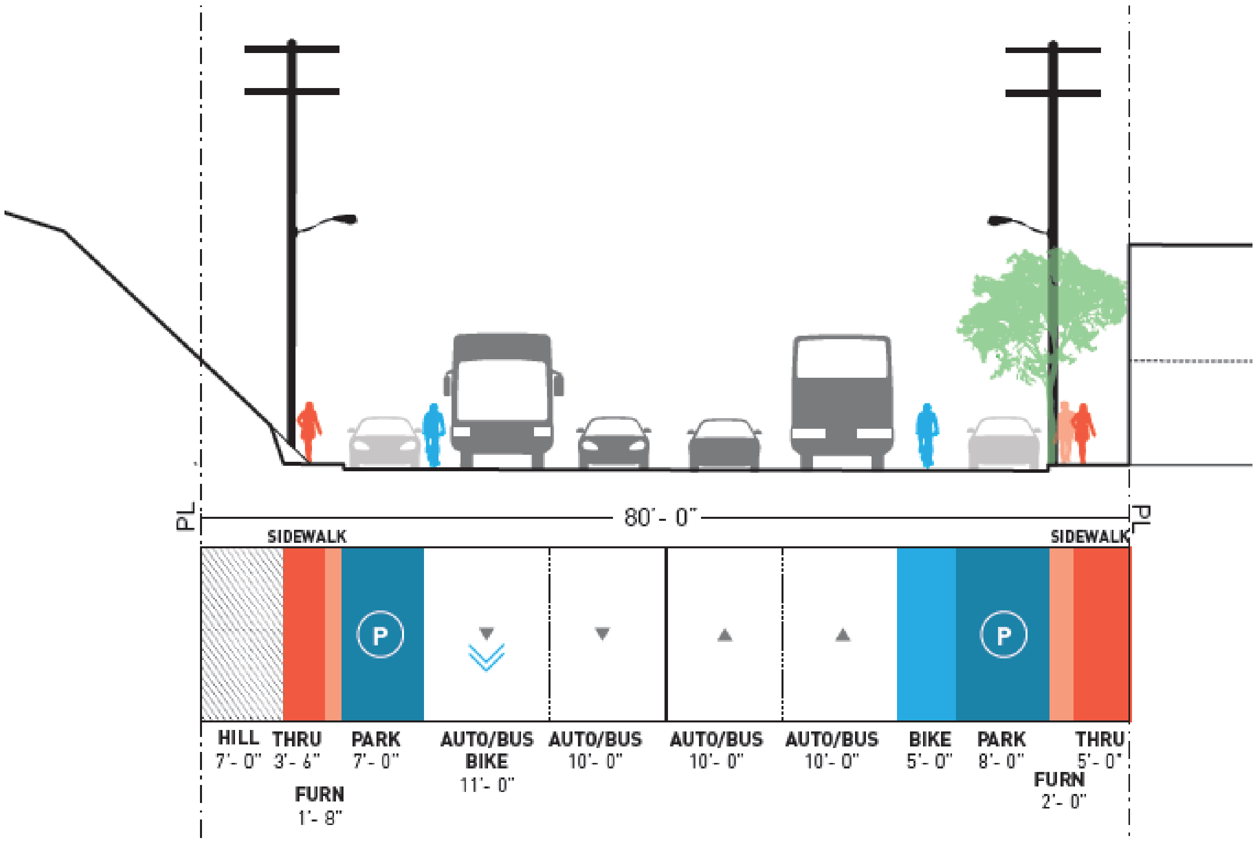
[20] This Class II bicycle lane would be removed by the Proposed Project and Project Variant, and the bicycle facility relocated to a parallel Class I facility on Hudson Avenue.

Inset 4: Baseline – Innes Avenue between Griffith Street and Earl Street



Between Earl Street and Donahue Street, the Innes Avenue cross-section is revised from the Infrastructure Plan recommendations based on a more detailed engineering feasibility study and an agreement between FivePoint (the Shipyard Project Sponsor) and the City. On this block, Innes Avenue would provide four travel lanes (two in each direction), on-street parking on both sides of the street, sidewalks on both sides of the street (12-feet on the south side and 13-feet on the north side), and no bicycle facilities. Ten-feet of unmodified hillside would remain within the right of way. **Inset 5** depicts the street section of Innes Avenue between Earl Street and Donahue Street in the Baseline scenario.

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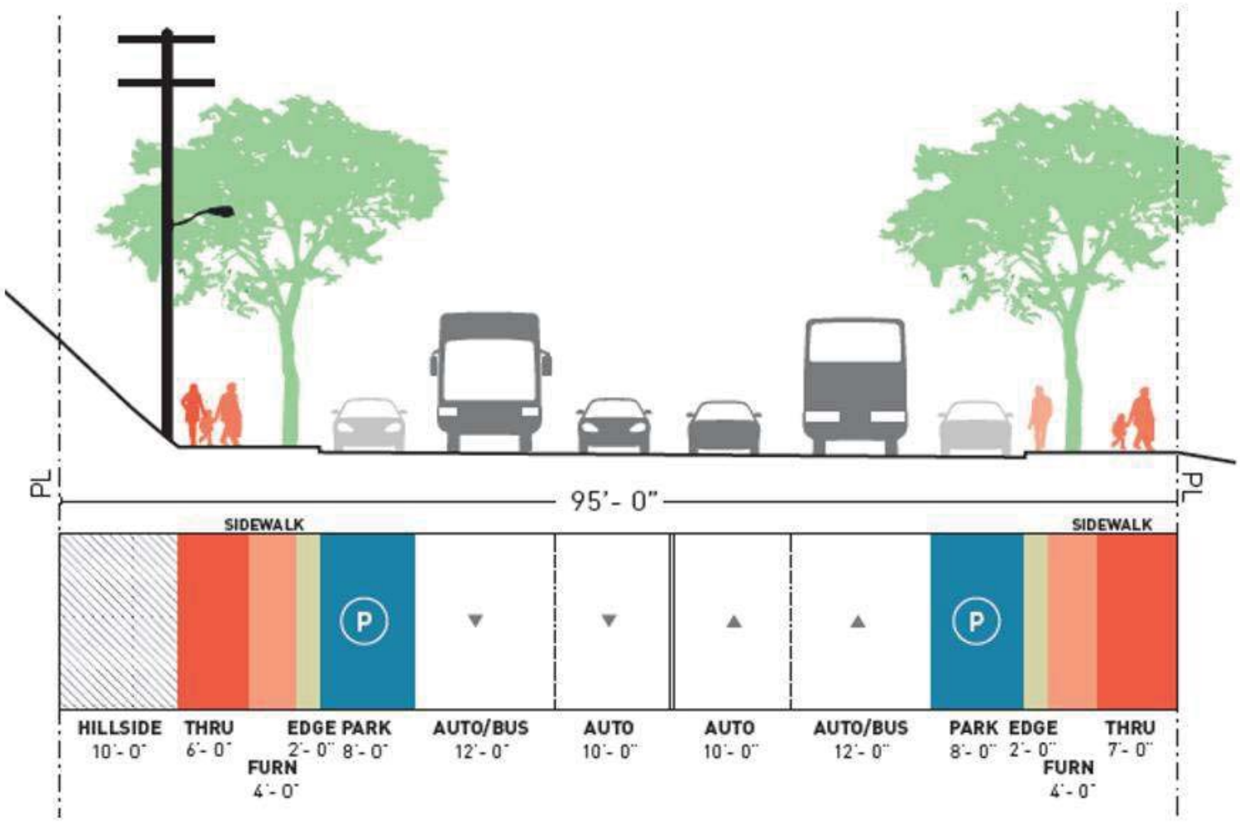
Inset 5: Baseline – Innes Avenue between Earl Street and Donahue Street



Northside Park is adjacent to the Project Site to the east. Northside Park is not part of India Basin; it is part of the Shipyard project. While a two-way Class I bicycle facility (cycletrack) has been proposed through the park, this scenario assumes this bicycle route has not been constructed. Instead, bicycle connections between the Class I facility on New Hudson and the intersection of Innes Avenue/Donahue Street include Class III sharrows along Earl Street between New Hudson Avenue and Innes Avenue, which are part of the Proposed Project, and a Class III facility on Innes Avenue between Earl Street and Donahue Street.

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3.3 TRANSIT SERVICE CHANGES

This scenario includes approved and funded transit service changes that would be implemented by the year 2018. These include two changes contained within Muni Forward and one change contained within the CPHPS Transportation Plan, as described below.

3.3.1 Muni Forward

The SFMTA and City of San Francisco Controller's Office are in the process of implementing Muni Forward, a review of the City's public transit system with recommendations designed to make Muni service more reliable, quicker, and more frequent.[21] Muni Forward includes new routes and route extensions, more service on busy routes, the elimination or consolidation of routes or route segments with low ridership, and corridor infrastructure projects to improve transit reliability by implementing transit preferential treatments such as transit only lanes or boarding islands. The SFMTA would implement Muni Forward projects based on funding and resource availability. However, no Muni Forward transit service changes are included in this scenario as there are none that are near the Project site and currently scheduled for implementation prior to 2018.

A number of recommendations that were considered as part of the Muni Forward process are not included in this scenario because those proposals are not currently scheduled for implementation prior to 2018:[22]

- **19 Polk:** The route alignment would be curtailed south of 24th Street to be replaced by the 48 Quintara-24th Street.
- **23 Monterey:** The 18 46th Ave would be combined with the 23 Monterey, providing direct service to the Outer Sunset and Outer Richmond.
- **48 Quintara-24th St:** This route would be extended to replace a portion of the 19 Polk along Evans Avenue and Innes Avenue.
- **54 Felton:** More direct routing would be provided to improve service to/from Balboa Park BART station.
- **T Third (light rail):** Increase frequency and capacity plus an extension into Chinatown via the Central Subway would be provided.

[21] The Muni Forward recommendations were unanimously endorsed by the SFMTA Board of Directors for environmental review in October 2008, and the EIR was completed in 2014. Muni Forward was previously called the Transit Effectiveness Project (TEP), and the TEP EIR uses this previous name.

[22] These recommendations are considered as part of the Cumulative scenario, discussed in section 6.1.2.

3.3.2 CPHPS Transportation Plan

In addition to and independent of the Muni Forward improvements described above are transit service changes conditioned as part of the construction of Shipyard Phase II. Upon construction of portions of that site, substantial additional transit service would be implemented. Because the Plan is approved and funded, any improvements anticipated to be implemented by the Year 2018 are included in this scenario. Only one of the transit service changes meets this criterion, which is:

- **29 Sunset:** Extension along Gilman Ave to Harney Way

3.3.2.1 Individual Routes

The 494 Shipyard residential units assumed under the Baseline Scenario would add approximately 53 AM and 65 PM new transit trips during the weekday peak hours. Because the 19 Polk and 44 O'Shaughnessy are the only routes within convenient walking distance it was assumed that the majority of transit travel to the Superdistricts that they serve would include a trip on one of these two routes. Thirty AM and 37 PM transit trips would be assigned on the 19 Polk across the LMLP. Two trips in the AM and three trips in the PM would also pass the GMLP for this line. Twenty-one AM and 25 PM transit trips would be assigned on the 44 O'Shaughnessy at its GMLP. The 44 O'Shaughnessy route in the inbound direction would be above the capacity threshold in the PM period. All other line/direction combinations would be under the capacity threshold at all times. **Table 3-5** shows the assignment of baseline transit trips across the two routes.

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TABLE 3-5: BASELINE MUNI PEAK HOUR LOAD AND CAPACITY UTILIZATION BY LINE							
Route	Peak Hour	Maximum Load Point	Passenger Load[1]	Back-ground Growth	Baseline No Project Load	Peak Hour Capacity[2]	Capacity Utilization
Inbound (Project Designation) / Outbound (SFMTA Designation)							
19 Polk (LMLP[3])	AM	Evans Ave/Newhall St	24	5	29	252	12%
	PM	Evans Ave/Newhall St	44	25	69	252	27%
19 Polk (GMLP[3])	AM	8th St/Howard St	160	0	160	252	64%
	PM	8th St/Mission St	168	2	170	252	67%
44 O'Shaughnessy (GMLP[3])	AM	Silver Ave/Dartmouth Ave	300	4	304	473	64%
	PM	Silver Ave/Mission St	360	17	377	420	**90%**
Outbound (Project Designation) / Inbound (SFMTA Designation)							
19 Polk (LMLP[3])	AM	Evans Ave/Newhall St	84	25	109	252	43%
	PM	Evans Ave/Newhall St	52	12	64	252	25%
19 Polk (GMLP[3])	AM	Larkin St/O'Farrell St	188	2	190	252	75%
	PM	7th St/Howard St	180	1	181	252	72%
44 O'Shaughnessy (GMLP[3])	AM	O'Shaughnessy Blvd/Del Vale	368	17	385	473	81%
	PM	Silver Ave/San Bruno Ave	240	8	248	420	59%

Notes:
Bold indicates capacity utilization of 85 percent or greater.

1. Peak hour ridership. Existing Load at Local Maximum Load Point or Global Maximum Load Point from Transit Data for Transportation Impact Studies (SF Planning, May 2015) or Transit Effectiveness Project Route analysis (Fehr & Peers, October 2011).
2. Total peak period capacity in passengers per hour.
3. GMLP is the Global Maximum Load Point, which is the route-wide maximum load point. LMLP is the Local Maximum Load Point, which is the maximum load point on the route east of Third Street.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015. See **Appendix E** for transit line capacity calculations.

3.3.2.2 Downtown Screenlines

The 494 Shipyard residential units assumed under the Baseline Scenarios would add approximately 53 AM and 65 PM new transit trips during the weekday peak hours. The geographic distribution of these trips is the same as the distribution of baseline vehicle trips. Twelve AM and seven PM transit trips would be distributed on San Francisco Muni routes that pass Downtown Screenlines, and four AM and four PM transit trips would be on regional routes, including one AM and two PM transit trips to the East Bay and three AM and six PM transit trips to the South Bay. No new transit trips would be taken to the North Bay. **Table 3-6** shows the distribution of baseline transit trips across the Downtown Screenlines..

TABLE 3-6: MUNI DOWNTOWN SCREENLINE CAPACITY UTILIZATION – BASELINE SCENARIO					
Screenline	**Existing Peak Hour[1] Ridership**	**Peak Hour Baseline Increment**	**Peak Hour[1] Baseline Ridership**	**Peak Hour[1] Capacity**	**Peak Hour[1] Capacity Utilization**
AM Peak Hour					
Kearny/Stockton[2]	2,211	0	2,211	3,050	72%
Other lines[3]	538	0	538	1,141	47%
Northeast Screenline Total	*2,749*	*0*	*2,749*	*4,191*	*66%*
Geary[4]	1,821	0	1,821	2,490	73%
California[5]	1,610	0	1,610	2,010	80%
Sutter/Clement[6]	480	0	480	630	76%
Fulton/Hayes[7]	1,277	0	1,277	1,680	76%
Balboa[8]	758	0	758	1,019	74%
Northwest Screenline Total	*5,946*	*0*	*5,946*	*7,829*	*76%*
Third Street[9]	350	9	359	793	45%
Mission[10]	1,643	0	1,643	2,509	65%
San Bruno/Bayshore[11]	1,689	1	1,690	2,134	79%
Other lines[12]	1,466	2	1,468	1,756	84%
Southeast Screenline Total	*5,148*	*12*	*5,160*	*7,192*	*72%*
Subway lines[13]	6,330	0	6,330	6,205	**102%**
Haight/Noriega[14]	1,121	0	1,121	1,554	72%
Other lines[15]	465	0	465	700	66%
Southwest Screenline Total	*7,916*	*0*	*7,916*	*8,459*	***94%***

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PM Peak Hour					
Kearny/Stockton[2]	2,245	0	2,245	3,327	67%
Other lines[3]	683	0	683	1,078	63%
Northeast Screenline Total	*2,928*	*0*	*2,928*	*4,405*	*66%*
Geary[4]	1,964	0	1,964	2,623	75%
California[5]	1,322	0	1,322	1,752	75%
Sutter/Clement[6]	425	0	425	630	67%
Fulton/Hayes[7]	1,184	0	1,184	1,323	**89%**
Balboa[8]	625	0	625	974	64%
Northwest Screenline Total	*5,520*	*0*	*5,520*	*7,302*	*76%*
Third Street[9]	782	6	788	793	**99%**
Mission[10]	1,407	0	1,407	2,601	54%
San Bruno/Bayshore[11]	1,536	0	1,536	2,134	72%
Other lines[12]	1,084	1	1,085	1,675	65%
Southeast Screenline Total	*4,809*	*7*	*4,816*	*7,203*	*67%*
Subway lines[13]	4,904	0	4,904	6,164	80%
Haight/Noriega[14]	977	0	977	1,554	63%
Other lines[15]	555	0	555	700	79%
Southwest Screenline Total	*6,436*	*0*	*6,436*	*8,418*	*76%*

Notes:
1. AM Peak hour as inbound (i.e. toward Downtown) only; PM peak hour as outbound (i.e. away from Downtown) only
2. 8 Bayshore, 30 Stockton, 30X Marina Express, 41 Union, 45 Union-Stockton
3. F Market & Wharves, 10 Townsend, 12 Folsom/Pacific
4. 38 Geary, 38R Geary Rapid, 38AX Geary 'A' Express, 38BX Geary 'B' Express
5. 1 California, 1AX California 'A' Express, 1AX California 'B' Express
6. 2 Sutter, 3 Clement
7. 5 Fulton, 21 Hayes
8. 31 Balboa, 31AX Balboa 'A' Express, 31BX Balboa 'B' Express
9. T Third Street
10. 14 Mission, 14R Mission Rapid, 14X Mission Express, 49 Van Ness-Mission
11. 8AX Bayshore 'A' Express, 8BX Bayshore 'B' Express, 8 Bayshore, 9 San Bruno, 9L San Bruno Limited
12. J Church, 10 Townsend, 12 Folsom/Pacific, 19 Polk, 27 Bryant
13. KT Ingleside/Third Street, L Taraval, M Ocean View, N Judah
14. 6 Haight-Parnassus, 7/7R Haight-Noriega/Rapid, 7X Noriega Express, NX Judah Express
15. F Market & Wharves

Source: San Francisco Planning Department, May 2015; Fehr & Peers, 2016, see **Appendix E** for transit line capacity calculations

3.3.2.3 Regional Transit

Table 3-7 shows the distribution of baseline transit trips across regional screenlines.

TABLE 3-7: REGIONAL TRANSIT SCREENLINE – BASELINE SCENARIO					
Screenline	**Existing Peak Hour Ridership**	**Baseline Increment**	**Baseline Ridership**	**Peak Hourly Capacity**	**Capacity Utilization**
AM Peak Hour					
East Bay					
BART	25,399	1	25,400	23,256	**109%**
AC Transit	1,568	0	1,568	2,829	55%
Ferries	810	0	810	1,170	69%
Screenline Subtotal	*27,777*	*1*	*27,778*	*27,255*	***102%***
North Bay					
Golden Gate Transit Buses	1,330	0	1,330	2,543	52%
Ferries	1,082	0	1,082	1,959	55%
Screenline Subtotal	*2,412*	*0*	*2,412*	*4,502*	*54%*
South Bay					
BART	14,150	1	14,151	19,367	73%
Caltrain	2,171	2	2,173	3,100	70%
SamTrans	255	0	255	520	49%
Screenline Subtotal	*16,576*	*3*	*16,579*	*22,987*	*72%*
Regional Total	*46,765*	*4*	*46,769*	*54,744*	*85%*
PM Peak Hour					
East Bay					
BART	24,488	2	24,490	22,784	**107%**
AC Transit	2,256	0	2,256	3,926	57%
Ferries	805	0	805	1,615	50%
Screenline Subtotal	*27,549*	*2*	*27,551*	*28,325*	*97%*
North Bay					
Golden Gate Transit Buses	1,384	0	1,384	2,817	49%
Ferries	968	0	968	1,959	49%
Screenline Subtotal	*2,352*	*0*	*2,352*	*4,776*	*49%*
South Bay					
BART	13,500	2	13,502	18,900	71%
Caltrain	2,377	4	2,381	3,100	77%
SamTrans	141	0	141	320	44%
Screenline Subtotal	*16,018*	*6*	*16,024*	*22,320*	*72%*
Regional Total	*45,919*	*8*	*45,927*	*55,421*	*83%*

Bold indicates capacity utilization of 100 percent or greater.
Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015. San Francisco Planning Department, "Updated BART Regional Screenlines – Revised," and October 17, 2016; Fehr & Peers, 2016.

4 TRAVEL DEMAND ANALYSIS

Travel demand refers to the new vehicle, transit, bicycle and pedestrian traffic that would be generated by the Proposed Project and Project Variant. This chapter provides a forecast of the trips that would be generated by the new residential, retail, office, open space, and school uses. Parking demand and delivery/service vehicle-trips for the new uses are also presented.

4.1 TRIP GENERATION

The methods commonly used for forecasting trip generation of projects in San Francisco are based on person-trip generation rates, trip distribution information, and mode split data described in the *SF Guidelines*, which are then used to assign trips to the surrounding roadway network. These data are based on a number of detailed travel behavior surveys conducted within San Francisco. The data in the *SF Guidelines* are generally accepted as more appropriate for use in the complex environs of San Francisco than more conventional methods because of the relatively unique mix of uses, density, availability of transit, and cost of parking commonly found in San Francisco. Therefore, the *SF Guidelines* were used for trip generation for all uses except schools and open space, for which guidance is not given. For the proposed R&D lab space, the general office trip rates from the *SF Guidelines* were applied. This assumption recognizes that R&D uses in San Francisco, due to their high employee densities, typically have trip rates more similar to typical office uses than to traditional R&D facilities.

For open space, this analysis uses rates and in/out splits from ITE Trip Generation, 9th Edition surveys.[23] The ITE rates are consistent with the type and extent of use expected from the proposed park(s).

For the school, trip generation rates were developed from data collected for a comparable school in San Francisco. The proposed school at the Project Site will be a private school for pre-K-through-8 students. The estimated number of daily person trips per student is 4.2, which considers the variety of modes that students would be expected to take and separately considers trips inbound and outbound from school, for both parents and students, in both the AM and PM periods. Those students dropped off by a parent/guardian or carpooling would generate at least four person trips per student per day, as parents/guardian trips are also considered. Those walking or taking transit or bicycle would result in two trips per student per day. When weighted over all modes, the average person trips per student per day is 4.2. The details of this calculation are provided in **Appendix I**.

Special events have not been considered as part of the travel demand assessment. While some planned events could occur on the Project Site, the size of the events are expected to create a small amount of traffic compared with the levels of traffic the Project would normally generate. They would also likely not occur at times of peak trip generation. Therefore, such events are not expected to complicate overall circulation and have not been considered.

4.1.1 Developing AM Rates from PM Rates

The *SF Guidelines* provide a method to calculate PM peak hour person-trips but do not provide rates to calculate AM peak hour person-trips. Therefore, for each land use included in the *SF Guidelines*, a conversion factor was developed to calculate AM peak hour person trips based on the number of PM peak hour person

[23] Land Use 411 - City Park.

trips. This conversion factor is based on the ratio of AM peak hour vehicle-trips to PM peak hour vehicle-trips as provided by ITE *Trip Generation*, 9th Edition, for comparable land uses. The conversion factors for the land uses included in the project are shown below in **Table 4-1**. The rates presented in the **Table 4-1** are vehicle trip generation rates. These rates were used for developing a person-trip PM to AM conversion factor only, by virtue of being the best data available, and were not used for the purposes of person-trip generation.

TABLE 4-1: DERIVING PM TO AM CONVERSION FACTORS FOR PERSON TRIP GENERATION

Land Use	ITE Code	Vehicle Trip Generation Rate (per ksf or Dwelling Unit)		Conversion Factor (PM to AM)
		AM Peak Hour	PM Peak Hour	
Residential	223	0.30	0.39	77%
Clinical Use	710	1.56	1.49	105%
Administrative Use	710	1.56	1.49	105%
General Office	710	1.56	1.49	105%
Restaurant	931	0.81	7.49	11%
Café	932	10.81	9.85	110%
Supermarket	850	3.40	9.48	36%
General Retail	820	0.96	3.71	26%

Source: ITE Trip Generation, 9th Edition, 2012

4.1.2 AM, PM, and Daily Trip Rates and Person Trips

The conversion factors were applied to the *SF Guidelines* PM peak hour person trip rates to give AM peak hour person trip rates. The trip rates for land uses included in the *SF Guidelines* and the person trips for all uses in the Proposed Project are shown in **Table 4-2**. The calculations of trip generation rates for uses not included in the *SF Guidelines* (R&D, open space, and educational) are also shown.

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TABLE 4-2: PROJECT PERSON TRIP GENERATION							
Land Use	**Size**	**Trip Generation Rates**			**Person Trips Generated**		
		Daily Trip Rate	**AM Peak Hour as % of Daily[1]**	**PM Peak Hour as % of Daily**	**Daily**	**AM Peak Hour**	**PM Peak Hour**
Proposed Project							
700 Innes							
Residential	198 studio units	7.5 per unit	13.3%	17.3%	1,485	198	257
	236 1-bedroom units	7.5 per unit	13.3%	17.3%	1,770	235	306
	805[4] 2+ bedroom units	10 per unit	13.3%	17.3%	8,050	1,072	1,393
	Subtotal	-	-	-	11,305	1,505	1,956
Commercial	174,930 sf General Office	18.1 per ksf	8.9%	8.5%	3,166	282	269
	Subtotal	-	-	-	3,166	282	269
Retail	15,000 sf Restaurant	200 per ksf	1.5%	13.5%	3,000	44	405
	20,000 sf Café	200 per ksf[2]	14.8%	13.5%	4,000	593	540
	25,000 sf Supermarket	297 per ksf	2.6%	7.3%	7,425	194	542
	40,400 sf General Retail	150 per ksf	2.3%	9.0%	6,060	141	545
	Subtotal	--	--	--	20,485	972	2,032
Educational[3]	450 students	4.2 per student	50.0%	15.7%	1,890	945	297
	95 staff	2.0 per staff	25.0%	25.0%	190	48	48
	Subtotal	--	--	--	2,080	993	345
Open space	5.4 acres	24.3 per acre	23.3%	25.9%	131	31	34
Parcel Total	--	--	--	--	*37,167*	*3,783*	*4,636*
RPD Property							
Open Space	5.6 acres of India Basin Shoreline Park	24.3 per acre	23.3%	25.9%	137	32	35
	1.8 acres of 900 Innes Avenue	24.3 per acre	23.3%	25.9%	44	10	11
	6.2 acres of India Basin Open Space	24.3 per acre	23.3%	25.9%	152	35	39
	Subtotal	--	--	--	333	77	85
Site Total	**--**	**--**	**--**	**--**	**37,500**	**3,860**	**4,722**

Project Variant							
700 Innes							
Residential	50 studio units	7.5 per unit	13.3%	17.3%	375	50	65
	125 1-bedroom units	7.5 per unit	13.3%	17.3%	938	125	162
	324[4] 2+ bedroom units	10 per unit	13.3%	17.3%	3,240	432	561
	Subtotal	--	--	--	4,553	607	788
Commercial	85,000 sf Clinical Use	43.3 per ksf	15.2%	14.5%	3,681	559	534
	100,000 sf Administrative	36.4 per ksf	17.0%	16.2%	3,640	618	590
	400,000 sf General Office & 275,000 sf R&D Lab Area	18.1 per ksf	8.9%	8.5%	12,218	1,087	1,038
	Subtotal	--	--	--	19,539	2,264	2,162
Retail	25,000 sf Restaurant	200 per ksf	1.5%	13.5%	5,000	73	675
	20,000 sf Café	200 per ksf[2]	14.8%	13.5%	4,000	593	540
	25,000 sf Supermarket	297 per ksf	2.6%	7.3%	7,425	194	542
	70,000 sf General Retail	150 per ksf	2.3%	9.0%	10,500	245	945
	Subtotal	--	--	--	26,925	1,105	2,702
Educational	450 students	4.2 per student	50.0%	15.7%	1,890	945	297
	95 staff	2.0 per staff	25.0%	25.0%	190	48	48
	Subtotal	--	--	--	2,080	993	345
Open space	5.4 acres	24.3 per acre	23.3%	25.9%	131	31	34
Parcel Subtotal	--	--	--	--	*53,228*	*5,000*	*6,031*
RPD Property							
Open Space	5.6 acres of India Basin Shoreline Park	24.3 per acre	23.3%	25.9%	137	32	35
	1.8 acres of 900 Innes Avenue	24.3 per acre	23.3%	25.9%	44	10	11
	6.2 acres of India Basin Open Space	24.3 per acre	23.3%	25.9%	152	35	39
Open Space	Subtotal	--	--	--	333	77	85
Total	--	**--**	**--**	**--**	**53,561**	**5,077**	**6,117**

Notes:

1. For uses whose trip generation is from SF Guidelines, the AM Peak Hr rate was calculated using conversion factors shown in **Table 4-1**.
2. Quality sit-down rate (200) is used for the Café Type Area. SF Guidelines does not provide a café trip generation, and the composite rate (600) is inappropriately high because it is skewed upward by the Fast Food rate (1,400). Based on the similarities in use between café and quality sit-down restaurant, the quality sit-down rate from SF Guidelines (200) is adopted to represent café use, noting that it is comparable to the ITE rate for this use (land use code 932), which is 195.
3. School trip rates developed from *Sacred Heart Campus Circulation Study* data, conducted by Fehr & Peers, April 24, 2015.
4. The unit count for 2+ bedrooms is one fewer than contained within the project description because it does not contain one private residence that currently exists and would be relocated from its current location with the Project Site, therefore not affecting travel demand.

Source: *SF Guidelines*, 2002

As is shown in the above table, the Proposed Project is expected to generate 3,860 person trips during the AM peak hour (3,783 person trips on the 700 Innes parcel and 77 person trips on the RPD Property) and 4,722 person trips in the PM peak hour (4,636 person trips on the 700 Innes parcel and 85 person trips on the RPD Property). The Project Variant is expected to generate 5,077 person trips in the AM peak hour (5,000 person trips on the 700 Innes parcel and 77 person trips on the RPD Property) and 6,117 person trips in the PM peak hour (6,031 person trips on the 700 Innes parcel and 85 person trips on the RPD Property).

4.2 TRIP DISTRIBUTION

The next component of the analysis is a forecast of the geographic trip distribution of project trips by trip purpose. The proposed project trip distribution for residential, office, and retail uses was primarily derived from San Francisco CHAMP travel demand forecasting model outputs, maintained by the San Francisco County Transportation Authority (SFCTA). As described below, this report proposes to use trip distribution forecasts consistent with the CPHPS EIR. Because the forecasts from the CPHPS EIR are from 2009, Fehr & Peers compared the trip distribution from the CPHPS EIR with forecasts from the most recent version of the SF-CHAMP model to verify the validity of the CPHPS forecasts. School trip distribution is based on student catchment area data.

4.2.1 Residential, Office, Retail, and Open Space Uses

The trip distribution for work and non-work trips from India Basin was developed previously as part of the CPHPS EIR, as described in the letter report *Proposed Trip Generation, Distribution, and Transit Mode Split Forecasts for the Bayview Waterfront Project Transportation Study* from May 2009 (*CPHPS Travel Demand Memo*), included in the Technical Appendix to the CPHPS EIR's Transportation Impact Study, and shown in **Appendix G**.

Because the forecasts from the *CPHPS EIR* are from 2009, Fehr & Peers compared the trip distribution from the *CPHPS EIR* with forecasts from the most recent version of the SF-CHAMP model[24] to verify the validity of the CPHPS forecasts. Specifically, the CPHPS EIR forecasts were compared with model runs recently developed for the Central SoMa EIR. The SF-CHAMP model assumptions from the Central SoMa EIR for the India Basin site were similar to the Proposed Project, in terms of growth in households (as shown in **Table 4-3**). In terms of employment, the SF-CHAMP model assumed approximately the average of the Proposed Project and Project Variant, and therefore represents a reasonable approximation of trip distribution for the project overall.

TABLE 4-3: LAND USE GROWTH COMPARISONS (USING CENTRAL SOMA SF-CHAMP MODEL)

Land Use Characteristic	2012 to 2040 Central SoMa SF-CHAMP Model Growth (TAZ #446)	Proposed Project Growth (India Basin)	Project Variant Growth (India Basin)
Households	1,140	1,190	781
Employees	1,220	244	2,108

Source: SF-CHAMP 2012 and 2040, Central SoMa EIR

24 SF-CHAMP model runs from the *Central SoMa Plan Draft Environmental Impact Report (*Case No. 2011.1356E) were used

Table 4-4 compares the trip distribution from the more recent SF-CHAMP model output (developed for Central SoMa) with the trip distribution as derived from the SF-CHAMP model used for the *CPHPS EIR*.

TABLE 4-4: TRIP DISTRIBUTION COMPARISON		
Location	**SF TAZ #446 - 2040 SF-CHAMP (Central SoMa)**	**Total Trip Distribution – 2030 SF-CHAMP (*CPHPS EIR*)**
Superdistrict 1	8%	12%
Superdistrict 2	6%	8%
Superdistrict 3	46%	36%
Superdistrict 4	5%	3%
East Bay	8%	9%
North Bay	3%	3%
South Bay & Out of Region	23%	29%
Total	***100%***	***100%***

Source: *Proposed Trip Generation, Distribution, and Transit Mode Split Forecasts for the Bayview Waterfront Project Transportation Study*, May 2009; Central SoMa CHAMP model runs, 2015

As shown in **Table 4-4**, although there are moderate differences between the two models, overall, the trip distribution percentages for the TAZ from the SF-CHAMP model for Central SoMa are similar to those presented from the *CPHPS Travel Demand Memo*. Therefore, since the trip distribution results are similar for the two models, this analysis uses the more detailed and refined trip distribution percentages for work and non-work trips from the *CPHPS Travel Demand Memo*.

4.2.2 School

Trip distribution for the school was developed using data provided by Mission Prep School[25], which is a school with a similar student profile to the proposed school (i.e. a preparatory school for grades K-8). Trip distribution data was collected for a second similar school, also located in Superdistrict 3 (La Scuola International School[26]). The trip distribution profiles of the two schools were similar, justifying using data from Mission Prep as an adequately generic representation of the proposed school. Home locations of students for Mission Prep school were provided by the head of school. Home location served as the basis for trip distribution for all student school trips. Staff/faculty trips are assumed to be the same as the composite for residential, office, and retail uses.

It was assumed that home locations of students at the proposed school would be similar to those elsewhere in Superdistrict 3. Home locations are as follows: 50 percent of students in zip code 94112 (which incorporates Excelsior, Balboa Park, Ingleside, and Outer Mission), 37 percent throughout other southeastern San Francisco neighborhoods, and 13 percent outside of San Francisco. Zip Code 94112 is entirely within Superdistrict 3. The 37 percent throughout other southeastern San Francisco neighborhoods was assigned to Superdistrict 3. As the school would be located approximately 3 miles from San Mateo

[25] Located at 75 Francis Street in the Excelsior neighborhood

[26] Located at 728 20th Street in the Dogpatch neighborhood

County, the 13 percent outside of San Francisco was assumed to be from the Peninsula/South Bay region. Trip distribution splits are shown in **Table 4-5**.

TABLE 4-5: SCHOOL STUDENT TRIP DISTRIBUTION

Data from School		Data for Analysis	
Location	**Percentage**	**Location**	**Percentage**
Zip code 94112	50%	Superdistrict 3	50%
Other southeastern SF neighborhoods	37%	Superdistrict 3	37%
Other SF neighborhoods	0%	Superdistrict 1	0%
		Superdistrict 2	0%
Outside of SF	13%	South Bay	13%
		East Bay, North Bay, Out of Region	0%
Total	*100%*	*Total*	*100%*

Source: Email from Jane Henzerling, Head of Mission Prep School, 2015

4.3 MODE SPLIT

The project-generated person-trips were assigned to travel modes in order to determine the number of auto, transit, walk, and "other" trips. "Other" includes bicycle, motorcycle, taxi and additional modes. Mode split information for the residential portion of the project was based on the most recent US Census American Community Survey data available (2009-2013). An average vehicle occupancy rate, obtained from US Census American Community Survey data, was applied to the number of auto person trips to determine the number of vehicle trips generated by the Proposed Project. The Proposed Project is located in Census Tract 231.03.

Mode split forecasts were developed for two different scenarios:

- **Baseline Plus Project:** This scenario contains transit service approved and funded and expected to be implemented by 2018, which is the same as existing levels of transit service, and
- **Cumulative Plus Project:** This scenario contains substantial changes to transit service expected to occur through 2029 as part of the implementation of the adjacent CPHPS project, shown in **Figure 10** below. Because these changes are part of the Cumulative scenario, they are explained in detail in Section 6.1.2.

This section first presents the approach to determining mode split for residential, office, and retail uses. The approach for open space and school uses is different and is presented at the end of the section.

Existing Light Rail	Downtown Express Bus
Potential Extension of T-Third	Bus Rapid Transit
New/Modified MUNI Bus Routes in Mixed Flow Lanes	Proposed Transit Stop
(A) Improvement	

Figure 10

Transit Network Improvements

4.3.1.1 Residential, Office, and Retail Uses

As per trip distribution, mode split forecasts for development within the India Basin project were previously developed in 2009 as part of the *CPHPS EIR*. In that study, the level of transit provided by the full implementation of the CPHPS Transportation Plan (shown in **Figure 10** and explained in Section 6.1.2) was assumed; therefore, this analysis will use those mode split percentages for the Cumulative Plus Project scenario. Using this as a starting point, the analysis then calculates the Project mode split percentages for the Baseline Plus Project scenario by comparing SF-CHAMP model runs for conditions with and without the increased transit service.

Large, mixed-use projects such as the Proposed Project and Project Variant would be expected to have a certain amount of internalization of trips, whereby trips between complementary land uses are captured internally. For a project of this size and composition, these internal trips are assumed to be walking trips, and all walking trips are assumed to be to and from destinations within the Project Site.

While the *SF Guidelines* methodology provides a walk mode split percentage for retail and commercial work and non-work trips separately in Superdistrict 3, it is not sensitive to the unique combination of retail, residential, and commercial development within the Project Site.

Instead, internalization was forecasted using a mixed-use development trip generation methodology (MXD+) based on two individual studies of mixed-used developments: one study sponsored by the US Environmental Protection Agency (EPA)[27] and another by the Transportation Research Board (TRB)[28]. The two studies examined over 260 mixed-use development sites throughout the U.S. and, using different approaches, developed new quantification methods for mixed-use development trip generation. The two methods, including the basis, capabilities, and appropriate uses of each, have been combined to produce the MXD+ method which combines the strengths of the two individual advances to best practice. The MXD+ tool has been validated by applying it at a set of 28 independent MXD sites across the country that were not included in the initial model development. The MXD+ model has been approved for use by the EPA[29]. It has also been peer-reviewed in the American Society of Civil Engineers (ASCE) Journal of Urban Planning and Development,[30] peer-reviewed in a 2012 TRB paper evaluating various smart growth trip generation methodologies,[31] recommended by the San Diego Association of Governments (SANDAG) for use on mixed-use smart growth developments,[32] and has been applied to forecasts for new development throughout California.

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[27] *Traffic Generated by Mixed-Use Developments—A Six-Region Study Using Consistent Built Environmental Measures* (Ewing et al, ASCE UP0146, Sept 2011)

[28] National Cooperative Highway Research Program (NCHRP) Report 684 *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments* (Bochner et al, March 2011)

[29] Trip Generation Tool for Mixed-Use Developments (2012). www.epa.gov/dced/mxd_tripgeneration.html

[30] "Traffic Generated by Mixed-Use Developments—Six-Region Study Using Consistent Built Environmental Measures." Journal of Urban Planning and Development, 137(3), 248–261.

[31] Shafizadeh, Kevan et al. "Evaluation of the Operation and Accuracy of Available Smart Growth Trip Generation Methodologies for Use in California". Presented at 91st Annual Meeting of the Transportation Research Board, Washington, D.C., 2012.

[32] SANDAG Smart Growth Trip Generation and Parking Study.
http://www.sandag.org/index.asp?projectid=378&fuseaction=projects.detail

As part of the trip generation process, the MXD+ tool calculates the estimated internalization rate of the site. The MXD+ model incorporates local area factors such as local and regional demographic data (average household size, employment within 1 mile of site, and employment within 30 minutes of transit), number of vehicles per household, and intersection density to estimate the rate of internalization. Using the proposed land uses for the Project, the MXD+ tool estimated that the Proposed Project Scenario would result in an internalization of 15 percent in the AM peak hour and 21 percent in the PM peak hour. The MXD+ tool estimated that the Project Variant Scenario would result in an internalization of 10 percent in the AM peak hour and 17 percent in the PM peak hour.

The Proposed Project internalization rate of 15 percent in the AM peak is slightly lower than the 2040 walk mode split for the TAZ as predicted by the SF-CHAMP model (Central SoMa Plan model run), which yielded a walk mode split of 19 percent, and lower than the internalization rate for the India Basin forecasted in the CPHPS EIR, which estimated an internalization of 38 percent for a somewhat different mix of uses. The PM peak internalization is slightly higher than the SF-CHAMP estimate, but still lower than the prior internalization rate for India Basin from the CPHPS EIR. The remaining trips (85 percent and 79 percent, respectively) are external trips. The mode split percentages from the *CPHPS EIR* were scaled accordingly to represent percentages of all person trips including the walking trips, as shown in **Table 4-6**, below. These calculations are detailed in **Appendix I**.

TABLE 4-6: MODE SPLIT FOR CUMULATIVE PLUS PROPOSED PROJECT SCENARIO

Mode	External Mode Split (by Trip Purpose)		Total Mode Split	
	Work Trips	Non-Work Trips	Work Trips	Non-Work Trips
AM Peak Hour				
Automobile	70%	83%	59%	70%
Transit	27%	15%	23%	12%
Bike	3%	3%	3%	3%
Walk	-	-	15%[1]	15%[1]
Total	***100%***	***100%***	***100%***	***100%***
PM Peak Hour				
Automobile	70%	83%	55%	65%
Transit	27%	15%	22%	12%
Bike	3%	3%	2%	2%
Walk	-	-	21%[1]	21%[1]
Total	***100%***	***100%***	***100%***	***100%***

Notes:

1. These generally represent trips that are internal to the neighborhood. These are trips that would travel external to the Project Site, but would walk to destinations in the surrounding neighborhood (e.g. Hunters Point). This mode split was calculated by applying the MXD+ methodology using the proposed land uses for the Proposed Project Scenario

Source: *Proposed Trip Generation, Distribution, and Transit Mode Split Forecasts for the Bayview Waterfront Project Transportation Study*, May 2009; Fehr & Peers, 2016

The Project Variant internalization rate of 10 percent in the AM peak and 17 percent in the PM peak is lower than both the SF-CHAMP model and the CPHPS EIR's forecasts for the India Basin site, which is likely due to the domination of a single land use, in this case office, when compared to the Proposed Project Scenario.

The remaining trips (90 percent and 83 percent, respectively) are external trips, and so the external mode split percentages from the *CPHPS EIR* were scaled accordingly to represent percentages of all person trips including the walking trips, as shown in **Table 4-7,** below.

TABLE 4-7: MODE SPLIT FOR CUMULATIVE PLUS PROJECT VARIANT SCENARIO

Mode	External Mode Split (by Trip Purpose)		Total Mode Split	
	Work Trips	Non-Work Trips	Work Trips	Non-Work Trips
AM Peak Hour				
Automobile	70%	83%	63%	74%
Transit	27%	15%	24%	13%
Bike	3%	3%	3%	3%
Walk	-	-	10%[1]	10%[1]
Total	***100%***	***100%***	***100%***	***100%***
PM Peak Hour				
Automobile	70%	83%	58%	68%
Transit	27%	15%	23%	13%
Bike	3%	3%	2%	2%
Walk	-	-	17%[1]	17%[1]
Total	***100%***	***100%***	***100%***	***100%***

Notes:

1. These generally represent trips that are internal to the neighborhood. These are trips that would travel external to the Project Site, but would walk to destinations in the surrounding neighborhood (e.g. Hunters Point). This mode split was calculated by applying the MXD+ methodology using the proposed land uses for the Project Variant Scenario.

Source: *Proposed Trip Generation, Distribution, and Transit Mode Split Forecasts for the Bayview Waterfront Project Transportation Study*, May 2009; Fehr & Peers, 2016.

The forecasted change in mode splits for the site from SF-CHAMP between 2012 and 2040 were used to estimate the project mode split without the effect of future transit changes (i.e. existing conditions), with the exception of the walk mode split. The 2012 SF-CHAMP model was used as a proxy for the Baseline scenario, while the 2040 model was used to represent the Cumulative scenario. The walk mode split essentially represents an internalization rate and was forecasted to be 15 percent and 10 percent in the AM peak hour and at 21 percent and 17 percent in the PM peak for the Proposed Project and Project Variant Scenarios, respectively. This was accomplished by calculating the shifts in transit mode split for the India Basin TAZ using recent SF-CHAMP model runs developed for the ongoing Central SoMa Plan project in San Francisco. From the 2040 to the 2012 SF-CHAMP model, the automobile mode split increases by eight percent, while transit would decrease by the same amount. The bicycle mode share decreases by one percent while walking increases by the same amount. The mode split outputs from the 2012 and 2040 SF-CHAMP models and the resulting mode splits for work and non-work trips that will be applied to the Baseline and Cumulative scenarios are shown in **Table 4-8** and **Table 4-9**, below.

TABLE 4-8: MODE SPLIT FOR PROPOSED PROJECT							
Mode	**Total Mode Split Shift Calculation[1] (SF TAZ #446)**			**Mode Split Cumulative Scenario**		**Mode Split Baseline Scenario**	
	2040 SF-CHAMP	**2012 SF-CHAMP**	***Shifts (2040 to 2012)[2]***	**Work Trips**	**Non-Work Trips**	**Work Trips**	**Non-Work Trips**
AM Peak Hour							
Automobile	55%	63%	*+8%*	59%	70%	67%	78%
Transit	20%	12%	*-8%*	23%	12%	15%	4%
Bike	4%	3%	*-1%*	3%	3%	3%	3%
Walk & Other[4]	21%	22%	*+1%*	15%[3]	15%[3]	15%[3]	15%[3]
Total	*100%*	*100%*		*100%*	*100%*	*100%*	*100%*
PM Peak Hour							
Automobile	55%	63%	*+8%*	55%	65%	63%	73%
Transit	20%	12%	*-8%*	22%	12%	14%	4%
Bike	4%	3%	*-1%*	2%	2%	2%	2%
Walk & Other[4]	21%	22%	*+1%*	21%[3]	21%[3]	21%[3]	21%[3]
Total	*100%*	*100%*		*100%*	*100%*	*100%*	*100%*

Notes:

1. "Total" mode split means work and non-work trips combined
2. Positive entry indicates that 2012 percentage is larger than 2040 percentage, i.e. a decrease from 2012 to 2040. Negative entry indicates that 2012 percentage is smaller than 2040 percentage, i.e. an increase from 2012 to 2040.
3. The walk mode split was calculated using the MXD+ methodology. While the 2040 SF-CHAMP walk mode split for the TAZ of 19 percent is slightly higher in the AM peak and lower in the PM peak than the estimated internalization rates, the project walk mode split was assumed to remain at 15 percent in the AM and 21 percent in the PM in the future scenario. Therefore, the shift between 2040 and 2012 was applied to the bike mode split.
4. Other includes truck and taxi trips. This mode was not included as part of the project mode split.

Source: SF-CHAMP runs from Central SoMa project (2015)

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TABLE 4-9: MODE SPLIT FOR PROJECT VARIANT

Mode	Total Mode Split Shift Calculation[1] (SF TAZ #446)			Mode Split Cumulative Scenario		Mode Split Baseline Scenario	
	2040 SF-CHAMP	2012 SF-CHAMP	*Shifts (2040 to 2012)*[2]	Work Trips	Non-Work Trips	Work Trips	Non-Work Trips
AM Peak Hour							
Automobile	55%	63%	*+8%*	63%	74%	71%	82%
Transit	20%	12%	*-8%*	24%	13%	16%	5%
Bike	4%	3%	*-1%*	3%	3%	3%	3%
Walk & Other[4]	21%	22%	*+1%*	10%[3]	10%[3]	10%[3]	10%[3]
Total	*100%*	*100%*		*100%*	*100%*	*100%*	*100%*
PM Peak Hour							
Automobile	55%	63%	*+8%*	58%	68%	66%	76%
Transit	20%	12%	*-8%*	23%	13%	15%	5%
Bike	4%	3%	*-1%*	2%	2%	2%	2%
Walk & Other[4]	21%	22%	*+1%*	17%[3]	17%[3]	17%[3]	17%[3]
Total	*100%*	*100%*		*100%*	*100%*	*100%*	*100%*

Notes:

1. "Total Mode Split" means work and non-work trips combined
2. Positive entry indicates that 2012 percentage is larger than 2040 percentage, i.e. a decrease from 2012 to 2040. Negative entry indicates that 2012 percentage is smaller than 2040 percentage, i.e. an increase from 2012 to 2040.
3. The walk mode split as calculated using MXD+ methodology. While the 2040 SF-CHAMP walk mode split for the TAZ of 19 percent is slightly higher in the and PM peak than the estimated internalization rates, the project walk mode split was assumed to remain at 10 percent in the AM and 17 percent in the PM in the future scenario. Therefore, the shift between 2040 and 2012 was applied to the bike mode split.
4. Other includes truck and taxi trips. This mode was not included as part of the project mode split.

Source: SF-CHAMP runs from Central SoMa project (2015)

4.3.1.2 Pass-by Trips

When retail developments (supermarkets, restaurants, etc.) are located adjacent to arterial roadways, a portion of the trips attracted to the site would come from existing traffic passing by the site on the way from an origin to an ultimate destination. These types of trips attracted by the site are referred to as "pass-by trips" but are not new trips added to the traffic network, since they are trips that would already occur without the development in place. In the case of India Basin, most of the pass-by traffic would be those traveling to/from the Hunters Point Shipyard and other parts of the neighborhood who stop off at the India Basin retail on their way to/from their destination. Applying a pass-by percentage is justified because the retail mix planned for this location is not "destination" retail but neighborhood-serving in nature.

The ITE *Trip Generation Handbook (9th Edition)* provides guidance on the application of pass-by trips for retail development. The Handbook includes empirical retail pass-by trip percentages based on site surveys for several types of land uses, similar to the *Trip Generation Manual's* extensive trip generation surveys.

Based on the proposed size of retail for the Project, its location adjacent to an arterial street, and using the 820 Shopping Center land use code (which has many data points), the Handbook shows that a 40 percent average pass-by trip percentage would be applied. However, based on the geographic remoteness of the location, the neighborhood-serving nature of the retail uses (instead of being "destination" retail like a shopping center), and the fact that the Shipyard will contain many similar uses and therefore would compete for pass-by trips with India Basin, a dampened average pass-by trip percentage of only 10 percent was conservatively assumed for usage for Project retail uses.

Using the methodology outlined in the ITE *Trip Generation Handbook (9th Edition)*, retail trips entering and exiting the Project Site and eastbound and westbound base volumes along Innes were adjusted to incorporate the chosen pass-by rate.

4.3.2 Open Space Land Use

This analysis assumes the same mode split for the Project open spaces for the Baseline scenario as what was observed at Heron's Head Park. Heron's Head Park is located approximately 0.5 miles from the Project Site and consists primarily of open space and Bay shoreline access with minimal parking facilities and a few short trails, which is similar to what the Proposed Project would provide. This analysis also assumes that the relationship between the mode splits in the Baseline scenario and the Cumulative scenario detailed in **Table 4-6** and **Table 4-7** would apply to open space land uses. Therefore these shifts (eight percent decrease for automobile, eight percent increase for transit, and no change for bicycle) are applied to the Baseline scenario mode split to calculate the Cumulative scenario mode split. The mode split for open spaces in the Existing Conditions and the Cumulative scenarios are detailed in **Table 4-10**.

TABLE 4-10: OPEN SPACE MODE SPLIT

Mode	Mode Split Baseline Scenario		Mode Split Cumulative scenario	
	AM	PM	AM	PM
Automobile	83%	58%	75%	50%
Transit	0%	0%	8%	8%
Bike	13%	14%	13%	14%
Pedestrian	4%	28%	4%	28%
Total	*100%*	*100%*	*100%*	*100%*

Source: Count conducted on June 25, 2015 at Heron's Head Park; Adjustments from SF-CHAMP runs from Central SoMa Plan project (2015) – see Table 4-12.

4.3.3 School

As part of a previous study, Fehr & Peers collected travel data from Sacred Heart School, which is a private K-12 school located in the Pacific Heights neighborhood. This travel data contained mode split information, based on a 2015 survey.

The mode split survey from Sacred Heart was used to develop the mode split and trip generation because it has similar characteristics to the proposed school (private, elementary- and middle-level education) and the data was readily available. The trip distribution data from the Sacred Heart study would not have been appropriate to use for the proposed school in India Basin, since the Sacred Heart School is located in the

Pacific Heights neighborhood. Instead, as discussed in Section 4.2.2, the school trip distribution was prepared using available data from schools in the same Superdistrict as the proposed school (Mission Preparatory and La Scuola).

At Sacred Heart, the majority of student trips are by car (92 percent)[33] with a smaller share traveling by walking (six percent) and transit (one percent). An average vehicle occupancy (AVO) of 1.54 was recorded. The Cumulative scenario would result in increased transit accessibility to the school over the Baseline scenario. As a result, mode splits were modified based on the shifts presented in **Table 4-6** and **Table 4-7**.

Forecasted mode splits for the school for the Baseline and Cumulative scenarios are shown below in **Table 4-11**.

TABLE 4-11: SCHOOL MODE SPLIT

Mode	Students		Staff	
	Baseline Scenario	Cumulative scenario	Baseline Scenario	Cumulative scenario
Automobile	92%	83%	100%	92%
Transit	1%	9%	0%	8%
Bike	0%	1%	0%	0%
Walk/Other	7%	7%	0%	0%
Total	*100%*	*100%*	*100%*	*100%*

Source: Observed student mode split from Table 7 of *Sacred Heart Campus Circulation Study*, by Fehr & Peers, dated April 24, 2015; Plus Cumulative scenario adjustments from SF-CHAMP runs from Central SoMa project (2015)

4.3.4 Person and Vehicle Trip Summary

The four tables below (**Table 4-12** through **Table 4-15**) summarize the number of person and vehicle trips generated by each land use for both scenarios, for daily, AM, and PM peak hours for the Proposed Project and Project Variant for both the Baseline scenario and Cumulative scenario. Travel demand calculations are presented in **Appendix I**.

[33] Student trips also include accompanying parent/guardian trips.

TABLE 4-12: BASELINE SCENARIO - PROPOSED PROJECT PERSON TRIP GENERATION (BY MODE AND LAND USE)

Land Use	Net New Uses	Person Trips by Mode					Vehicle Trips		Transit Trips	
		Vehicle	Transit	Bike	Walk	*Total*	In	Out	In	Out
AM Peak Hour										
Build Property										
School	50 ksf	915	14	5	59	*993*	427	167	14	0
Retail	100.4 ksf	754	43	29	146	*972*	253[1]	145[1]	27	16
Office	174.93 ksf	194	37	8	42	*281*	122	17	33	4
Residential	1,239 du	1,091	143	45	226	*1,505*	201	447	44	99
Open Space	5.4 acres	26	0	4	1	31	14	11	0	0
Subtotal		*2,980*	*237*	*91*	*474*	*3,782*	*1,017*	*787*	*118*	*119*
RPD Property										
India Basin Shoreline Park	5.6 acres	26	0	4	1	*32*	14	11	0	0
900 Innes Avenue	1.8 acres	9	0	1	0	*10*	5	4	0	0
India Basin Open Space	6.2 acres	29	0	5	3	*36*	15	12	0	0
Subtotal		*64*	*0*	*10*	*4*	*78*	*34*	*27*	*0*	*0*
Total		*3,044*	*237*	*101*	*478*	*3,860*	*1,051*[1]	*814*[1]	*118*	*119*
		79%	*6%*	*3%*	*12%*	*100%*	*56%*	*44%*	*50%*	*50%*

TABLE 4-12: BASELINE SCENARIO - PROPOSED PROJECT PERSON TRIP GENERATION (BY MODE AND LAND USE)

Land Use	Net New Uses	Person Trips by Mode					Vehicle Trips		Transit Trips	
		Vehicle	Transit	Bike	Walk	*Total*	In	Out	In	Out
PM Peak Hour										
Build Property										
School	50 ksf	321	4	1	19	*345*	62	146	0	4
Retail	100.4 ksf	1,476	89	41	427	*2,033*	376[1]	403[1]	39	50
Office	174.93 ksf	175	33	5	57	*270*	12	113	1	32
Residential	1,239 du	1,330	176	39	411	*1,956*	506	284	160	16
Open Space	5.4 acres	20	0	5	9	34	11	8	0	0
Subtotal		*3,322*	*302*	*91*	*923*	*4,638*	*967*	*954*	*200*	*98*
RPD Property										
India Basin Shoreline Park	5.6 acres	21	0	5	10	35	11	9	0	0
900 Innes Avenue	1.8 acres	7	0	2	3	11	4	3	0	0
India Basin Open Space	6.2 acres	22	0	5	11	38	12	9	0	0
Subtotal		*50*	*0*	*12*	*24*	*84*	*27*	*21*	*0*	*0*
Total		*3,372*	*302*	*103*	*947*	*4,724*	*994*[1]	*975*[1]	*200*	*102*
		71%	*6%*	*2%*	*20%*	*100%*	*50%*	*50%*	*66%*	*34%*

Source: *SF Guidelines*, 2002, Fehr & Peers, 2016.

1. Numbers shown do not include retail pass-by trip reductions, which would be made to Innes E-W volumes as follows - AM: 25 trips in, 15 trips out; PM: 38 trips in, 40 trips out

TABLE 4-13: BASELINE SCENARIO - PROJECT VARIANT PERSON TRIP GENERATION (BY MODE AND LAND USE)

Land Use	Net New Uses	Person Trips by Mode					Vehicle Trips		Transit Trips	
		Vehicle	Transit	Bike	Walk	*Total*	In	Out	In	Out
AM Peak Hour										
Build Property										
School	50 ksf	915	14	5	59	*993*	427	167	14	0
Retail	140 ksf	901	60	33	110	*1,104*	307[1]	169[1]	39	21
Office/R&D	860 ksf	1,649	320	68	226	*2,263*	1,039	142	282	38
Residential	499 du	463	64	18	61	*606*	85	190	20	44
Open Space	5.4 acres	26	0	4	1	*31*	14	11	0	0
Subtotal		*3,954*	*458*	*128*	*457*	*4,997*	*1,872*	*679*	*355*	*103*
RPD Property										
India Basin Shoreline Park	5.6 acres	26	0	4	1	*32*	14	11	0	0
900 Innes Avenue	1.8 acres	9	0	1	0	*10*	5	4	0	0
India Basin Open Space	6.2 acres	29	0	5	3	*36*	15	12	0	0
Subtotal		64	0	10	4	*78*	34	27	0	0
Total		*4,018*	*458*	*138*	*461*	*5,075*	*1,906[1]*	*706[1]*	*355*	*103*
		79%	*9%*	*3%*	*9%*	*100%*	*73%*	*27%*	*78%*	*22%*

TABLE 4-13: BASELINE SCENARIO - PROJECT VARIANT PERSON TRIP GENERATION (BY MODE AND LAND USE)

Land Use	Net New Uses	Person Trips by Mode					Vehicle Trips		Transit Trips	
		Vehicle	Transit	Bike	Walk	***Total***	In	Out	In	Out
PM Peak Hour										
Build Property										
School	50 ksf	321	4	1	19	*345*	62	146	0	4
Retail	140 ksf	2,043	146	54	459	*2,702*	534[1]	545[1]	52	94
Office/R&D	860 ksf	1,464	288	43	368	*2,163*	100	948	7	281
Residential	499 du	559	79	16	134	*788*	213	119	64	15
Open Space	5.4 acres	20	0	5	9	*34*	11	8	0	0
Subtotal		*4,407*	*517*	*119*	*989*	*6,032*	*920*	*1,766*	*123*	*394*
RPD Property										
India Basin Shoreline Park	5.6 acres	21	0	5	10	*35*	11	9	0	0
900 Innes Avenue	1.8 acres	7	0	2	3	*11*	4	3	0	0
India Basin Open Space	6.2 acres	22	0	5	11	*38*	12	9	0	0
Subtotal		*50*	*0*	*12*	*24*	*84*	*27*	*21*	*0*	*0*
Total		*4,457*	*517*	*131*	*1,013*	*6,118236*	*947*[1]	*1,787*[1]	*123*	*394*
		73%	*8%*	*2%*	*17%*	*100%*	*35%*	*65%*	*24%*	*76%*

Source: *SF Guidelines*, 2002, Fehr & Peers, 2016.

1. Numbers shown do not include retail pass-by trip reductions, which would be made to Innes E-W volumes as follows - AM: 31 trips in, 17 trips out; PM: 53 trips in, 55 trips out

TABLE 4-14: CUMULATIVE SCENARIO – PROPOSED PROJECT PERSON TRIP GENERATION (BY MODE AND LAND USE)

Land Use	Net New Uses	Person Trips by Mode					Vehicle Trips		Transit Trips	
		Vehicle	Transit	Bike	Walk	*Total*	In	Out	In	Out
AM Peak Hour										
Build Property										
School	50 ksf	836	93	5	59	*993*	390	153	93	0
Retail	100.4 ksf	676	121	29	146	*972*	227[1]	130[1]	77	44
Office	174.93 ksf	172	60	8	42	*282*	108	15	53	7
Residential	1,239 du	970	263	45	226	*1,504*	178	397	82	181
Open Space	5.4 acres	23	3	4	1	*31*	12	10	1	1
Subtotal		2,677	540	91	474	*3,782*	915	705	306	233
RPD Property										
India Basin Shoreline Park	5.6 acres	24	3	4	1	*32*	13	10	1	1
900 Innes Avenue	1.8 acres	8	1	1	0	*10*	4	3	0	0
India Basin Open Space	6.2 acres	26	3	4	3	*36*	14	11	3	3
Subtotal		*58*	*7*	*9*	*4*	*78*	*31*	*24*	*4*	*4*
Total		*2,735*	*546*	*101*	*478*	*3,860*	*946*[1]	*729*[1]	*310*	*237*
		71%	*14%*	*3%*	*12%*	*100%*	*56%*	*44%*	*57%*	*43%*

Note: The cumulative scenario reflects a higher mode share for transit and walking compared to baseline conditions. Under cumulative conditions, there is expected to be more transit service near the project as well as additional nearby development (i.e. Hunters Point) that would make non-auto modes more attractive to use.

TABLE 4-14: CUMULATIVE SCENARIO – PROPOSED PROJECT PERSON TRIP GENERATION (BY MODE AND LAND USE)

Land Use	Net New Uses	Person Trips by Mode					Vehicle Trips		Transit Trips	
		Vehicle	Transit	Bike	Walk	*Total*	In	Out	In	Out
PM Peak Hour										
Build Property										
School	50 ksf	293	32	1	19	*345*	57	133	0	32
Retail	100.4 ksf	1,313	252	41	427	*2,033*	361[1]	333[1]	117	135
Office	174.93 ksf	153	55	5	57	*270*	11	98	3	52
Residential	1,239 du	1,173	332	39	411	*1,955*	476	219	264	68
Open Space	5.4 acres	17	3	5	9	*34*	9	7	1	1
Subtotal		*2,949*	*674*	*91*	*923*	*4,637*	*914*	*790*	*385*	*288*
RPD Property										
India Basin Shoreline Park	5.6 acres	18	3	5	10	*35*	10	7	1	1
900 Innes Avenue	1.8 acres	6	1	2	3	*11*	3	2	0	0
India Basin Open Space	6.2 acres	19	3	5	11	*40*	11	8	3	3
Subtotal		*43*	*7*	*12*	*24*	*86*	*24*	*17*	*4*	*4*
Total		*2,992*	*681*	*103*	*947*	*4,723*	*938[1]*	*808[1]*	*389*	*292*
		63%	*14%*	*2%*	*20%*	*100%*	*54%*	*46%*	*57%*	*43%*

Source: *SF Guidelines*, 2002, Fehr & Peers, 2016.

1. Numbers shown do not include retail pass-by trip reductions, which would be made to Innes E-W volumes as follows - AM: 23 trips in, 13 trips out; PM: 36 trips in, 33 trips out

TABLE 4-15: CUMULATIVE SCENARIO – PROJECT VARIANT PERSON TRIP GENERATION (BY MODE AND LAND USE)

Land Use	Net New Uses	Person Trips by Mode					Vehicle Trips		Transit Trips	
		Vehicle	Transit	Bike	Walk	*Total*	In	Out	In	Out
AM Peak Hour										
Build Property										
School	50 ksf	836	93	5	59	*993*	390	153	93	0
Retail	140 ksf	813	148	33	110	*1,104*	278[1]	152[1]	96	52
Office/R&D	860 ksf	1,468	501	68	226	*2,263*	924	126	441	60
Residential	499 du	415	112	18	61	*606*	76	170	35	77
Open Space	5.4 acres	23	3	4	1	*31*	12	10	1	1
Subtotal		3,555	857	131	457	*4,997*	1,680	2,011	666	190
RPD Property										
India Basin Shoreline Park	5.6 acres	24	3	4	1	*32*	13	10	1	1
900 Innes Avenue	1.8 acres	8	1	1	0	*10*	4	3	0	0
India Basin Open Space	6.2 acres	26	3	4	3	*36*	14	11	3	3
Subtotal		58	7	9	4	*78*	31	24	4	4
Total		*3,613*	*863*	*138*	*461*	*5,075*	*1,711*[1]	*635*[1]	*670*	*194*
		71%	*17%*	*3%*	*9%*	*100%*	*73%*	*27%*	*78%*	*22%*

Note: The cumulative scenario reflects a higher mode share for transit and walking compared to baseline conditions. Under cumulative conditions, there is expected to be more transit service near the project as well as additional nearby development (i.e. Hunters Point) that would result in increased congestion and make non-auto modes more attractive to use.

TABLE 4 15: CUMULATIVE SCENARIO – PROJECT VARIANT PERSON TRIP GENERATION (BY MODE AND LAND USE)

Land Use	Net New Uses	Person Trips by Mode					Vehicle Trips		Transit Trips	
		Vehicle	Transit	Bike	Walk	*Total*	In	Out	In	Out
PM Peak Hour										
Build Property										
School	50 ksf	293	32	1	19	*345*	57	133	0	32
Retail	140 ksf	1,827	362	54	459	*2,702*	480[1]	485[1]	156	206
Office/R&D	860 ksf	1,291	460	43	368	*2,162*	92	831	22	438
Residential	499 du	496	142	16	134	*788*	191	103	106	36
Open Space	5.4 acres	17	3	5	9	*34*	9	7	1	1
Subtotal		*3,924*	*999*	*119*	*989*	*6,031*	*829*	*1,559*	*285*	*713*
RPD Property										
India Basin Shoreline Park	5.6 acres	18	3	5	9	*35*	9	7	1	1
900 Innes Avenue	1.8 acres	5	1	1	4	*11*	4	3	0	0
India Basin Open Space	6.2 acres	20	3	6	11	*40*	11	8	3	3
Subtotal		43	7	12	24	*86*	24	18	4	4
Total		*3,967*	*1,006*	*131*	*1,013*	*6,117*	*853*[1]	*1,577*[1]	*289*	*717*
		65%	*16%*	*2%*	*17%*	*100%*	*35%*	*65%*	*29%*	*71%*

Source: *SF Guidelines*, 2002, Fehr & Peers, 2016.

1. Numbers shown do not include retail pass-by trip reductions, which would be made to Innes E-W volumes as follows - AM: 28 trips in, 15 trips out; PM: 48 trips in, 49 trips out

4.4 TRIP ASSIGNMENT

The trips were distributed across the transportation network based on the percentages for the respective land uses as shown on **Figure 11.** Project-generated vehicle trips were assigned to specific turning movements, presented in **Figure 12A** for the Baseline Plus Proposed Project Scenario. **Figure 13A** shows project-generated trip assignment for the Baseline Plus Project Variant Scenario. **Figure 12B** shows project-generated trip assignment for the Cumulative Plus Proposed Project Scenario. **Figure 13B** shows project-generated trip assignment for the Cumulative Plus Project Variant Scenario. The difference between baseline and cumulative trip assignments is a manifestation of the different mode splits assumed for each scenario. All trips were assumed to begin/end at the Project Site. Using the trip distribution percentages in **Table 4-4**, transit trips were assigned to specific routes based on the most direct transit route to and from the trip end.

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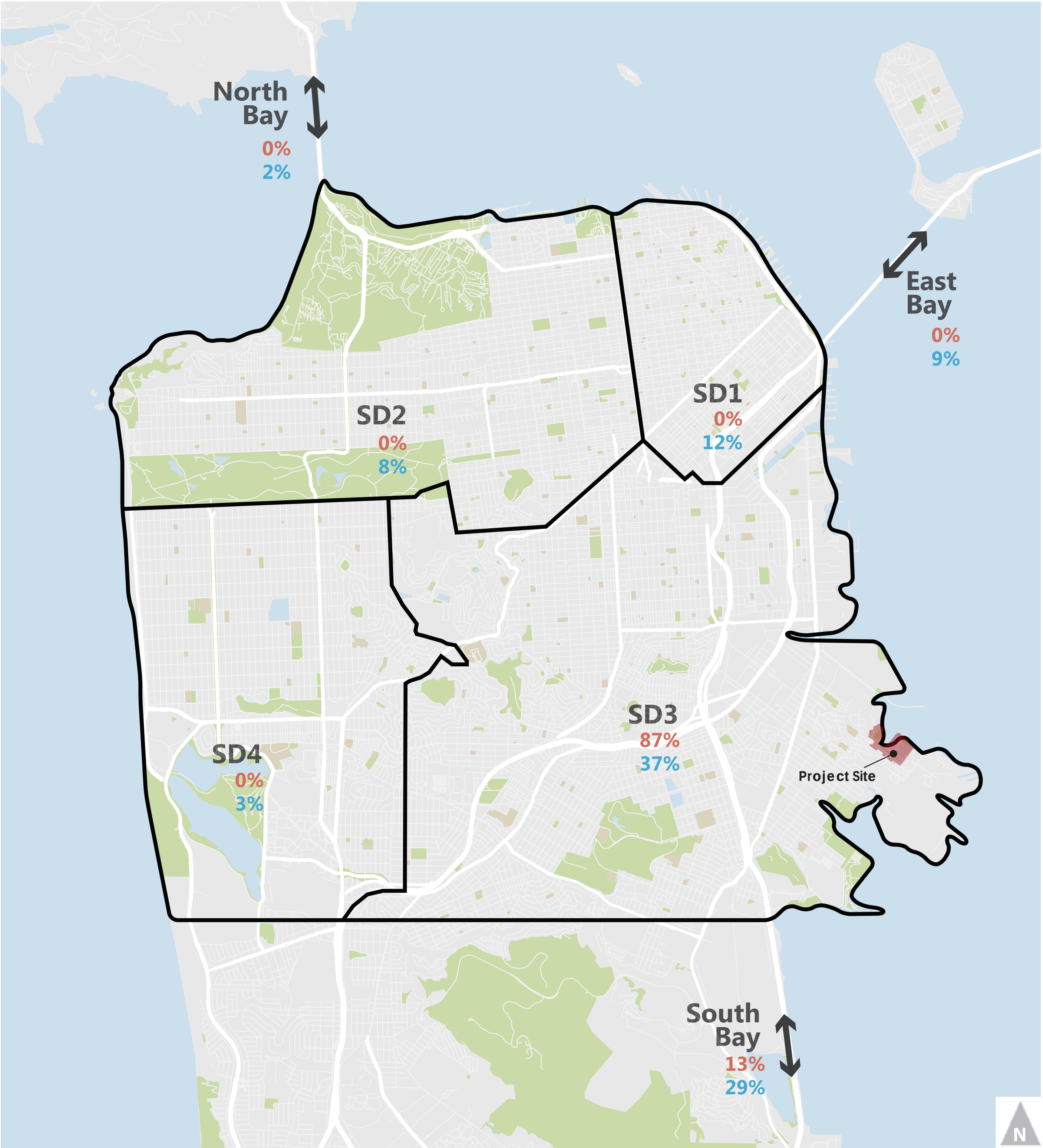


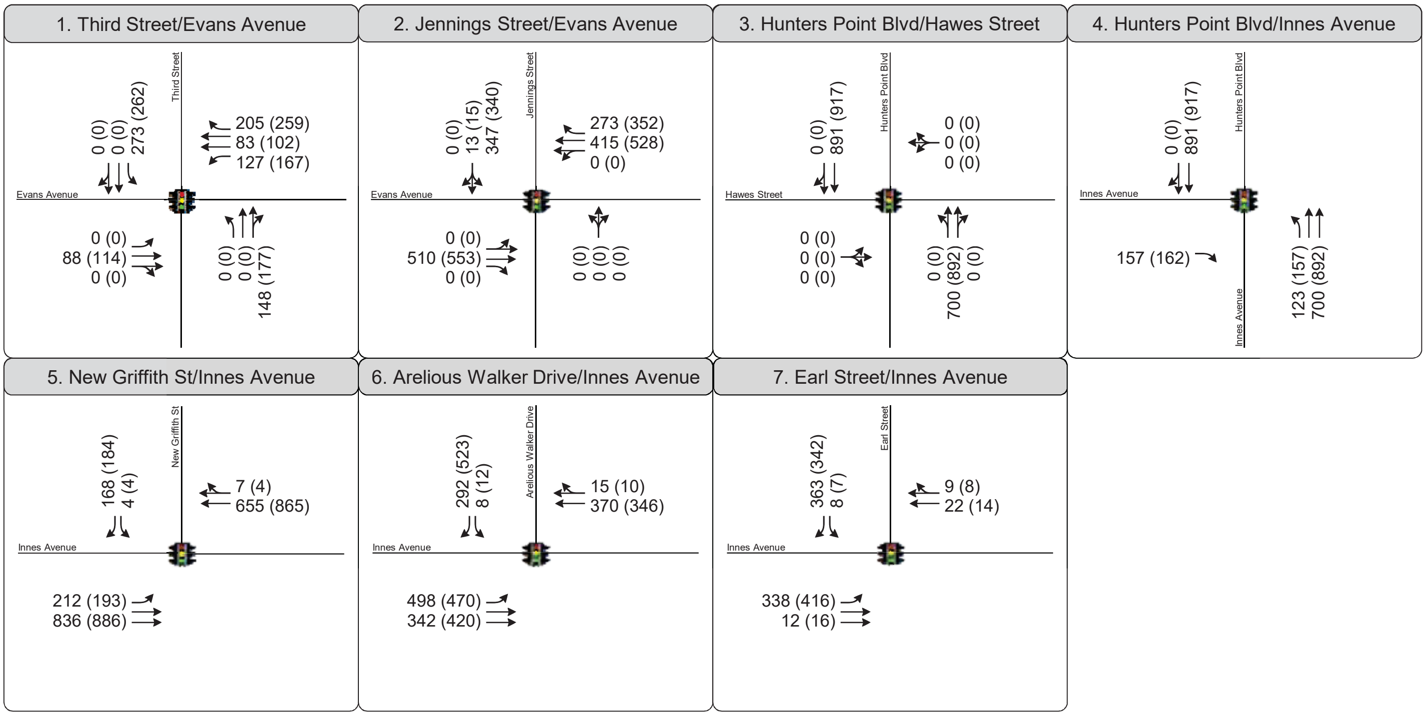
XX% School

XX% Residential, Office, Retail and Open Space

\\fpsf03\data\Projects\2015 Projects\SF15-0824_2675_Folsom_Street_TIA

Figure 11

Trip Distribution



Turn Lane

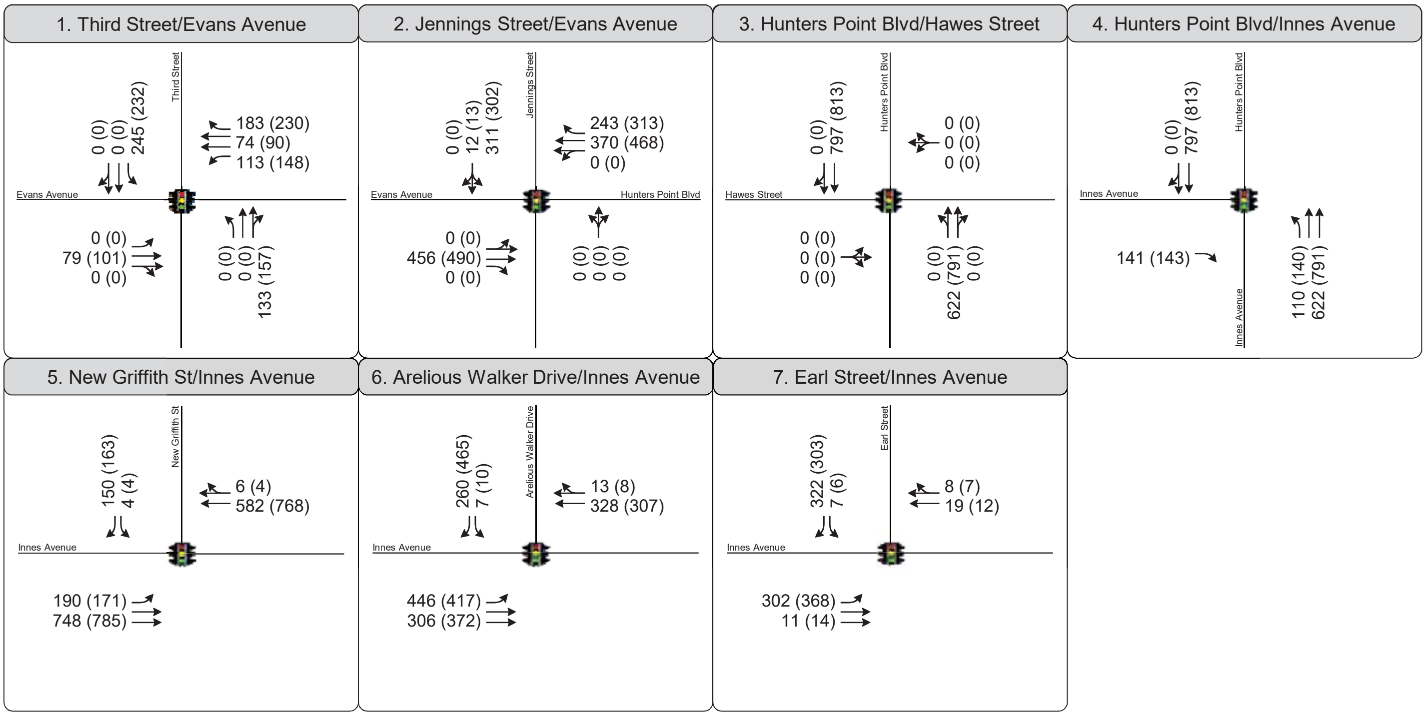
AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Figure 12A

Trip Assignment - Proposed Project



Turn Lane

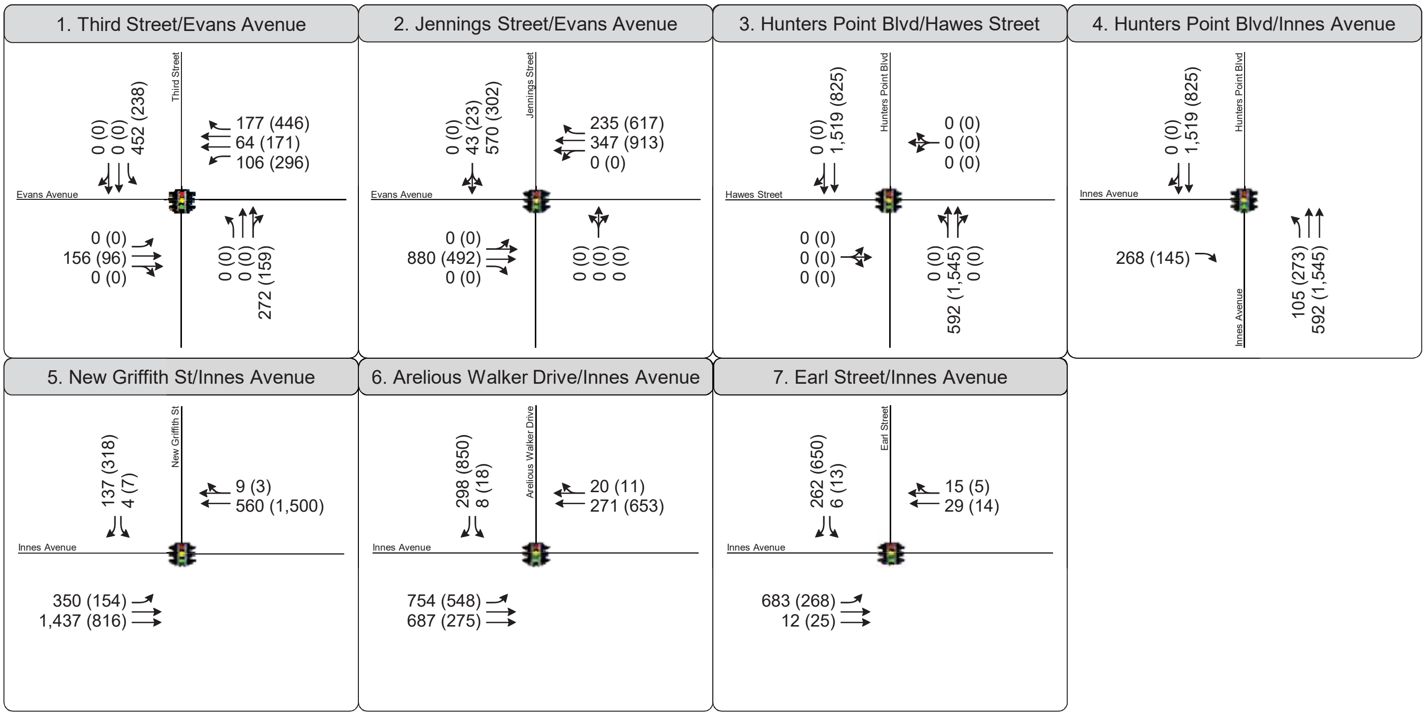
AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Figure 12B

Trip Assignment - Proposed Project (Cumulative Scenario)



Turn Lane

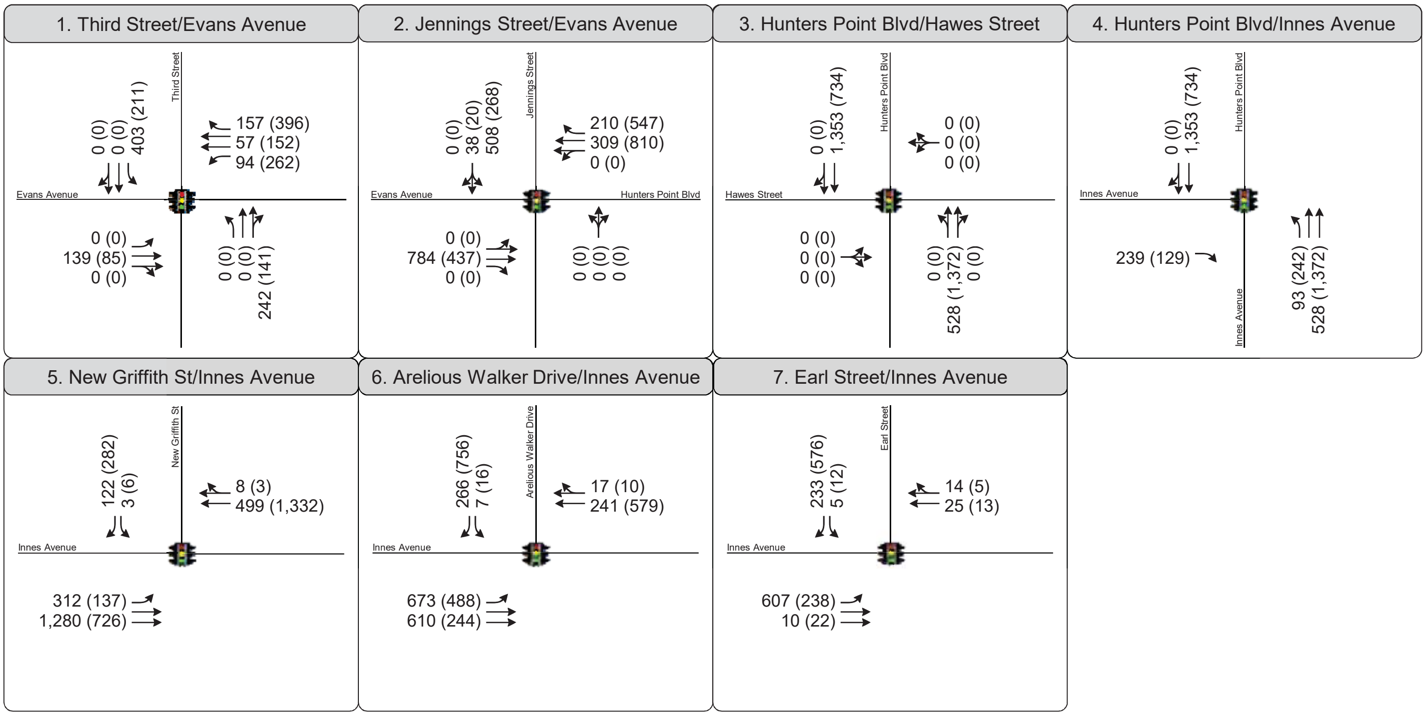
AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Figure 13A

Trip Assignment - Project Variant



Turn Lane

AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Figure 13B

Trip Assignment - Project Variant (Cumulative Scenario)

4.5 FREIGHT DELIVERY AND SERVICE DEMAND

The delivery/service vehicle demand was forecast based on the methodology and truck trip generation rates presented in the *SF Guidelines*. Delivery/service vehicle demand is based on the types and amount of land uses. The *SF Guidelines* do not include rates for loading demand for supermarkets. While the supermarket tenant would likely plan for and provide the loading spaces required, this analysis provides an estimate based on a recent study for a similar use. The Whole Foods grocery store at 2001 Market Street is 31,000 square feet would have a daily truck trip generation of 39 trips, peak hour demand for 3.6 loading spaces, and average hour demand for 2.4 loading spaces.[34] A supermarket loading demand rate was derived from this example and applied to the proposed supermarket on the Project Site.

The *SF Guidelines* also do not provide a loading demand rate for open spaces. This analysis assumes that the regular loading demand for the open space use would be negligible. There are no buildings that require resupply or deliveries. Recreational use may have occasional loading needs such as boat launch, but this demand would be accommodated by the two proposed on-street loading zones and the turnaround at the end of the proposed Hawes Street loop.

As shown in **Table 4-16**, the Proposed Project would generate a demand for 246 daily delivery/service vehicle-trips for the Proposed Project and 408 daily delivery/service vehicle trips for the Project Variant. This corresponds to a demand for 16 loading spaces for the Proposed Project and 25 loading spaces for the Project Variant during the peak hour of loading activities.

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[34] 2001 Market Street Mixed-Use Development (Case No. 2008.0550E) *Certificate of Determination for Exemption from Environmental Review*, November 10, 2010.

TABLE 4-16: DELIVERY/SERVICE VEHICLE TRIPS AND LOADING DEMAND					
Land Use	**Size (ksf)**	**Daily Truck Generation Rate (per ksf)**	**Daily Truck Generation**	**Average Hour Loading Space Demand**	**Peak Hour Loading Space Demand**
Proposed Project					
700 Innes					
Office	174.9	0.21	37	1.7	2.1
General Retail[1]	40.4	0.22	9	0.4	0.5
Restaurant	35.0	3.60	126	5.8	7.3
Supermarket	25.0	1.26[2]	32	1.9	2.9
Residential	1,240.1	0.03	37	1.7	2.2
School[3]	50.0	0.10	5	0.2	0.3
Open Space	237.4	n/a[4]	-	-	-
Subtotal	1802.8	-	246	11.8	15.3
RPD Property					
Open Space	592.3	n/a[3]	-	-	-
TOTAL	*2,395.1*		*246*	*11.8*	*15.3*
Project Variant					
700 Innes					
Office	860.0	0.21	181	8.4	10.5
General Retail[1]	70.0	0.22	15	0.7	0.9
Restaurant	45.0	3.60	162	7.5	9.4
Supermarket	25.0	1.26[2]	32	1.9	2.9
Residential	417.3	0.03	13	0.6	0.7
School[3]	50.0	0.10	5	0.2	0.3
Open Space	237.4	n/a[4]	-	-	-
Subtotal	1,704.7	-	408	19.3	24.6
RPD Property					
Open Space	592.3	n/a[3]	-	-	-
TOTAL	*2,297.0*		*408*	*19.3*	*24.6*

Notes:

1. The *SF Guidelines* do not provide a daily loading rate for a supermarket. This rate is calculated based on the assumption that the proposed supermarket would have a peak hour demand of less than one.
2. Includes café use.
3. The school loading demand is based on the "Institution" loading trip generation rate provided in the *SF Guidelines.*
4. The *SF Guidelines* do not provide a daily loading rate for open space.

Source: *SF Guidelines*, 2002

4.6 PARKING DEMAND

The daily parking demand generated by the proposed residential and retail uses was forecast using the methodology described in the *SF Guidelines*. The parking demand estimated for a development reflects a free, unconstrained supply of parking at the development; the approach conservatively estimates the parking demand from the development to inform decision-makers of the potential adverse effects from the development.[35]

Table 4-17 shows that the Proposed Project would create a demand for 2,553 parking spaces midday and for 2,439 parking spaces in the evening/overnight. **Table 4-18** shows that the Project Variant would create a demand for 3,624 parking spaces midday and 1,800 parking spaces in the evening/overnight. Because the existing site contributes relatively little to existing on-street demand, the analysis does not account for any existing parking demand that would be removed by the Proposed Project.

The calculated residential parking demand is based on the following rates as given in the *SF Guidelines:*[36]

- 1.1 vehicles per market-rate studio/1 bedroom unit (382 in the Proposed Project and 154 in the Project Variant)
- 1.5 vehicles per market-rate 2+ bedroom unit (709 in the Proposed Project and 286 in the Project Variant)
- 0.45 vehicles per affordable studio/1 bedroom unit (52 in the Proposed Project and 21 in the Project Variant)
- 0.92 vehicles per affordable 2 + bedroom unit (97 in the Proposed Project and 39 in the Project Variant)

Parking demand for retail, office, school, and open space is broken into long-term and short-term demand. The calculated long-term parking demand for retail, office, and the school[37] is based on the number of employees (calculated based on an average rate of square feet per employee from the *SF Guidelines*, Table C-1, or provided by the Project Sponsor), an auto mode split for workers traveling to Superdistrict 3 of 71.1 percent (*SF Guidelines*, Table E-5), and an average vehicle occupancy (*SF Guidelines*, Table E-5).

Short-term retail, office, and open space[38] demand is calculated based on non-work auto trips (based on the mode split analysis), non-work average vehicle occupancy (based on the mode split analysis), and an assumed daily parking turnover rate of 5.5 vehicles per space per day (*SF Guidelines*, Appendix G).

Table 4-17 presents the project-generated parking demand during the midday and evening. For the Proposed Project, the estimated midday peak of 2,553 and the evening demand of 2,439 spaces.

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[35] San Francisco Planning Commission, "*California Environmental Quality Act: Vehicle Miles Traveled, Parking, For-Hire Vehicles, and Alternatives*", February 2017

[36] This analysis assumes that 12 percent of studio/1 bedroom and 12 percent of 2+ bedroom units are affordable units.

[37] This analysis assumes that there are no employees associated with the open space land uses.

[38] This analysis assumes that there are no short-term parking uses associated with the school.

TABLE 4-17: PROPOSED PROJECT PARKING DEMAND						
Land Use	**Midday**			**Evening**		
	Long Term Parking Demand	**Short Term Parking Demand**	**Total Parking Demand**	**Long Term Parking Demand**	**Short Term Parking Demand**	**Total Parking Demand**
Build Property						
Residential	1,276	-	1,276	1,595	-	1,595
Retail	166	678	844	166	678	844
Office	366	15	381	-	-	0
School	29	-	29	-[1]	-[1]	0
Open Space	-	7	7	-[2]	-[2]	0
Subtotal	*1,837*	*700*	*2,537*	*1,761*	*678*	*2,439*
RPD Property						
India Basin Shoreline Park	-	7	7	-[2]	-[2]	0
900 Innes Avenue	-	2	2	-[2]	-[2]	0
India Basin Open Space	-	7	7	-[2]	-[2]	0
Subtotal	-	*16*	*16*	*-[2]*	*-[2]*	*0*
Total	*1,837*	*716*	*2,553*	*1,761*	*678*	*2,439*

Notes:
1. This analysis assumes negligible activities generating parking demand at the school after 6:00 PM.
2. This analysis assumes negligible activities generating parking demand at the open space after 6:00 PM.

Source: *SF Guidelines* Appendix G

Table 4-18 presents the parking demand for the Project Variant during the midday and evening. For the Project Variant, the estimated midday peak of 3,624 spaces, and the evening demand of 1,800 spaces.

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TABLE 4-18: PROJECT VARIANT PARKING DEMAND						
Land Use	**Midday**			**Evening**		
	Long Term Parking Demand	**Short Term Parking Demand**	**Total Parking Demand**	**Long Term Parking Demand**	**Short Term Parking Demand**	**Total Parking Demand**
Build Property						
Residential	514	-	514	642	-	642
Retail	231	927	1,158	231	927	1,158
Office	1,801	99	1,900	-	-	0
School	29	-	29	-[1]	-[1]	0
Open Space	-	7	7	-[2]	-[2]	0
Subtotal	*2,575*	*1,033*	*3,608*	*873*	*927*	*1,800*
RPD Property						
India Basin Shoreline Park	-	7	7	-[2]	-[2]	0
900 Innes Avenue	-	2	2	-[2]	-[2]	0
India Basin Open Space	-	7	7	-[2]	-[2]	0
Subtotal	-	16	16	-[2]	-[2]	0
Total	*2,575*	*1,049*	*3,624*	*873*	*927*	*1,800*

Notes:

1. This analysis assumes negligible activities generating parking demand at the school after 6:00 PM.
2. This analysis assumes negligible activities generating parking demand at the open space after 6:00 PM.

Source: *SF Guidelines* Appendix G.

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5 PROJECT IMPACT ANALYSIS

This chapter presents the assessment of transportation impacts resulting from the travel demand generated by the Proposed Project. The impacts are grouped into nine potential impact areas: (1) VMT, (2) traffic hazards, (3) transit, (4) bicycles, (5) pedestrian, (6) loading, (7) emergency access, (8) construction, and (9) parking impacts. Impact areas were analyzed for the Baseline Plus Project Conditions by adding net project travel demand associated with the Project to Baseline Conditions.

5.1 SIGNIFICANCE CRITERIA

The significance criteria listed below are organized by mode to facilitate the transportation impact analysis; however, the transportation significance thresholds are essentially the same as the ones in the environmental checklist (Appendix G of the State *CEQA Guidelines*) and within the SF Planning Commission Resolution 19579 (and supporting materials). For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the proposed project would result in a significant impact on transportation and circulation:

Vehicle Miles Traveled (VMT) – The project would have a significant effect on the environment if it would cause substantial additional VMT. Also, the project would have a significant effect on the environment if it would substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network.

Traffic Hazards – A project would have a significant adverse impact if it would cause major traffic hazards.

Transit – A project would have a significant effect on the environment if it would result in an increase in delay of at least half a headway in the round-trip travel time for a particular transit route adjacent to the Project Site. This significance threshold is based on the need to retain a comparable transit headway to what is planned. The half-headway threshold represents the tipping point at which point investment in an additional vehicle would be required to counterbalance degradation in transit travel times to maintain the same headway.

A project would also have a significant effect on the environment if it would cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service; or cause a substantial increase in operating costs such that significant adverse impacts in transit service levels could result. With the Muni and regional transit screenlines analyses, the project would have a significant effect on the transit provider if project-related transit trips would cause the capacity utilization standard to be exceeded during the peak hour. For screenlines that already operate above the utilization standard during the peak hour, a project would have a significant effect on the transit provider if project-related transit trips were more than five percent of total transit trips during the peak hour.

Pedestrians – A project would have a significant effect on the environment if it would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

Bicycles – A project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

Loading – A project would have a significant effect on the environment if it would result in a loading demand during the peak hour of loading activities that could not be accommodated within proposed on-site loading facilities or within convenient on-street loading zones, and if it would create potentially hazardous conditions affecting traffic, transit, bicycles, or pedestrians or significant delays affecting transit.

Emergency Vehicle Access – A project would have a significant effect on the environment if it would result in inadequate emergency access.

Construction – Construction of the project would have a significant effect on the environment if, in consideration of the Project Site location and other relevant project characteristics, the temporary construction activities' duration and magnitude would result in substantial interference with pedestrian, bicycle, or vehicle circulation and accessibility to adjoining areas thereby resulting in potentially hazardous conditions.

Parking – The project would have a significant effect on the environment if it would result in a substantial parking deficit that could create hazardous conditions affecting traffic, transit, bicycles, or pedestrians or significant delays affecting transit and where particular characteristics of the project or its site demonstrably render use of other modes infeasible.

5.2 VEHICLE-MILES TRAVELED (VMT) IMPACTS

5.2.1 VMT Analysis

Transportation is a major contributor to greenhouse gas emissions and a direct result of population and employment growth, which generates vehicle trips to move goods, provides public services, and connects people with work, school, shopping, and other activities. Growth in travel (especially vehicle travel) is due in large part to urban development patterns (i.e., the built environment).

A performance measure used to quantify the amount of travel is vehicle-miles traveled (VMT). VMT is also an important input to GHG analysis since the amount of travel and conditions under which the travel occurs directly relate to how much fuel vehicles burn. One combusted gallon of gas from a vehicle produces approximately 19 pounds of carbon dioxide.[39] Given today's average vehicle fuel mileage (approximately 22 miles per gallon for light duty vehicles),[40] one mile of travel equates to about 14 ounces of carbon dioxide. As a result, increases in VMT directly cause increases in greenhouse gas emissions and air pollution.

In January 2016, the State of California Office of Planning and Research (OPR) published for public review and comment a *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA* recommending that transportation impacts for projects be measured using a vehicle miles traveled (VMT) metric. On March 3, 2016, in anticipation of the future certification of the revised CEQA Guidelines, the San Francisco Planning Commission adopted OPR's recommendation to use the VMT metric instead of automobile delay to evaluate the transportation impacts of projects (Resolution 19579).

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[39] U.S. Energy Information Administration, "How much carbon dioxide is produced from burning gasoline and diesel fuel?" 2017. Available online at https://www.eia.gov/tools/faqs/faq.php?id=307&t=11.

[40] USDOT, Bureau of Transportation Statistics, "Average Fuel Efficiency of U.S. Light Duty Vehicles," 2017. Available online at https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_04_23.html

Prior to the Planning Commission's action on March 3, 2016, some projects, including the Proposed project, were in the process of environmental review, and had substantively completed draft Transportation Impact Studies using the methodology and the level of service (LOS) CEQA significance criteria formerly used by the San Francisco Planning Department (*2002 San Francisco Transportation Impact Analysis Guidelines for Environmental Review [SF Guidelines]*). Therefore, Section 7 of this study includes a discussion of LOS conditions under existing, baseline, baseline plus project, and cumulative conditions for informational purposes. In addition, improvement measures that would address intersection operations are identified. Localized traffic volumes are described in the TIS to inform transportation improvement projects proposed/agreed to by the Project Sponsor, and to help inform related topics such as air quality and noise. In addition, traffic volumes are used in CEQA transportation impact determinations, as they may affect traffic hazards and transit delay.

As noted above, the Planning Commission's Resolution No. 19579 is consistent with the direction of CEQA Section 21099(b)(2), and OPR's proposed transportation impact guidelines. Moreover, it is based upon, and consistent with, the authority and deference CEQA provides to local agencies to identify the methodology to analyze and environmental impact.[41] Residential and office projects located in areas with low VMT, and that incorporate similar features (i.e., sufficient density, mix of uses, transit accessibility) tend to exhibit similarly low VMT. OPR's Technical Advisory recognizes that there are various methods for assessing VMT, and specifically acknowledged the efficacy of a map-based screening approach. The City uses this approach.

San Francisco, and other lead agencies, such as Oakland and Pasadena, use maps illustrating areas that exhibit below threshold VMT to screen out projects that may not require a detailed VMT analysis. Under this approach, travel demand models or survey data provide the existing residential or office VMT, which can be modified for mixed use projects by using each use-based map as a screen for the respective use-portion of the project, to then develop maps illustrating VMT for different areas in the city. Thus, the maps demonstrate whether a proposed project is in a transportation-efficient location, (e.g., transit-oriented infill), with safe and adequate access to a multi-modal transportation system and key destinations, and that will help the city, region, and state reach their GHG reduction targets under AB 32.

This mapping approach for VMT screening has also been recently acknowledged in the Caltrans Local Development Intergovernmental Review Program, Interim Guidance, revised November 9, 2016. This Caltrans Guidance provides further support for use of a map-based screening approach. (The Interim Caltrans Guidelines replaces Caltrans' 2002 Guidelines, and is part of Caltrans' effort to support smart growth and efficient development. It is intended to help ensure that greenhouse gas emissions reduction, good community design, improved proximity to key destinations, and a safe multimodal transportation system are all integral parts of the land use decision-making process.)

The San Francisco County Transportation Authority (Transportation Authority) uses SF-CHAMP to estimate VMT by private automobiles and taxis for different land use types within individual TAZs. Travel behavior in SF-CHAMP is calibrated by Transportation Authority staff based on observed behavior from the California Household Travel Survey 2010-2012, Census data regarding automobile ownership rates and county-to-county worker flows, and observed vehicle counts and transit boardings. SF-CHAMP uses a synthetic population, which is a set of individual actors that represents the Bay Area's actual population, who make simulated travel decisions for a complete day. The Transportation Authority uses tour-based analysis for office and residential uses, which examines the entire chain of trips over the course of a day, not just trips to and from the project. For retail uses, the Transportation Authority uses trip-based analysis, which counts

[41] California Public Resources Code Section 21099(b)(1); 14 Cal. Code Regs., Section 15064(b).

VMT from individual trips to and from the project (as opposed to entire chain of trips). A trip-based approach, as opposed to a tour-based approach, is necessary for retail projects because a tour is likely to consist of trips stopping in multiple locations, and the summarizing of tour VMT to each location would over-estimate VMT.[42, 43] The VMT metric does not apply to the analysis of impacts on non-automobile modes of travel such as riding transit, walking and bicycling.

The following identifies thresholds of significance and screening criteria used to determine if a land use project or plan would result in significant impacts under the VMT metric.

For residential projects, a project would generate substantial additional VMT if it exceeds the regional household VMT per capita minus 15 percent. . In San Francisco, the City's average VMT per capita (8.4) is lower than the regional average (17.2). Therefore, the City average is irrelevant for the purposes of the analysis.

For office projects, a project would generate substantial additional VMT if it exceeds the regional VMT per employee minus 15 percent.

For retail projects, the Planning Department uses a VMT efficiency metric approach for retail projects: a project would generate substantial additional VMT if it exceeds the regional VMT per retail employee minus 15 percent.

For mixed-use projects, each proposed land use is evaluated independently, per the significance criteria described above.

The Planning Department's transportation impact guidelines do not provide screening criteria or thresholds of significance for other types of land uses, other than those projects that meet the definition of a small project, which does not apply to the Proposed Project. Therefore, the Planning Department provides additional screening criteria and thresholds of significance to determine if land uses similar in function to residential, office, and retail would generate a substantial increase in VMT.[44] The Planning Department applies the Map-Based Screening and Proximity to Transit Station screening criteria to the following land use types:

- Research and Development (R&D) Lab Area, Restaurants, Childcare, K-12 Schools – Trips associated with these land uses typically function similarly to office. While some of these uses may have some visitor/customer trips associated with them (e.g., childcare and school drop-off, etc.), those trips are often a side trip within a larger tour. For example, the visitor/customer trips are influenced by the

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[42] Retail travel is not explicitly captured in SF-CHAMP, rather, there is a generic "Other" purpose which includes retail shopping, medical appointments, visiting friends or family, and all other non-work, non-school tours. The retail efficiency metric captures all of the "Other" purpose travel generated by Bay Area households. The denominator of employment (including retail; cultural, institutional, and educational; and medical employment; school enrollment, and number of households) represents the size, or attraction, of the zone for this type of "Other" purpose travel.

[43] San Francisco Planning Department, Executive Summary: Resolution Modifying Transportation Impact Analysis, Appendix F, Attachment A, March 3, 2016.

[44] San Francisco Planning Department, Executive Summary: Resolution Modifying Transportation Impact Analysis, Appendix F, Attachment A, March 3, 2016.

origin (e.g., home) and/or ultimate destination (e.g., work) of those tours. Therefore, these land uses are treated as office for screening and analysis.

- Grocery Stores and Parks – Trips associated with grocery stores and parks typically function similar to retail. Therefore, these types of land uses are treated as retail for screening and analysis.

This approach is consistent with CEQA Section 21099 and the thresholds of significance for other land uses recommended in OPR's Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA[45] ("proposed transportation impact guidelines"). OPR described a 15 percent threshold below existing development as being "both reasonably ambitious and generally achievable" for the following reasons.

First, Section 21099/SB 743 states that the criteria for determining significance must "promote the reduction in greenhouse gas emissions." SB 743 also states the Legislature's intent that the analysis of transportation in CEQA better promote the State's goals of reducing greenhouse gas emissions. It cites in particular the reduction goals in the Global Warming Solutions Act and the Sustainable Communities and Climate Protection Act, both of which call for substantial reductions. The California Air Resources Board established long-term reduction targets for the largest regions in the state that ranged from 13 to 16 percent.

Second, Caltrans has developed a statewide VMT reduction target in its Strategic Management Plan. Specifically, it calls for a 15 percent reduction in per capita VMT, compared to 2010 levels, by 2020.

Third, according to the California Air Pollution Control Officers Association (CAPCOA), 15 percent reductions in VMT are typically achievable at the project level in a variety of place types.[46]

Fourth, the First Update to the AB 32 Scoping Plan states, "[r]ecognizing the important role local governments play in the successful implementation of AB 32, the initial Scoping Plan called for local governments to set municipal and communitywide GHG reduction targets of 15 percent below then-current levels by 2020, to coincide with the statewide limit."[47]

In addition to the map-based screening criterion the City has adopted a Proximity to Transit Stations screening criterion. The Planning Department recommends that residential, retail, and office projects, as well projects that are a mix of these uses, proposed within 0.5 mile of an existing major transit stop (as defined by CEQA Section 21064.3) or an existing stop along a high quality transit corridor (as defined by CEQA Section 21155) would not result in a substantial increase in VMT. However, this presumption would not apply if the project would: have a floor area ratio of less than 0.75; (2) include more parking for use by residents, customers, or employees of the project than required or allowed, without a conditional use; or (3) is inconsistent with the applicable Sustainable Communities Strategy.[48]

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[45] This document is available online at: https://www.opr.ca.gov/s_sb743.php, Page III:20.

[46] CAPCOA, *Quantifying Greenhouse Gas Measures*, 2010, p. 55. Available online at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

[47] *First Update to the AB 32 Scoping Plan,* p. 113. Available online at https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm.

[48] A project is considered to be inconsistent with the Sustainable Communities Strategy if development is located outside of areas contemplated for development in the Sustainable Communities Strategy.

Although the Proposed Project does not require a detailed VMT analysis per the Eligibility Checklist: CEQA Section 21099 (February 15, 2017, included in **Appendix J**), an overview of the expected VMT impact of the Project is included below.

City policies recognize that improvements to transit service would make transit more attractive in comparison to vehicular travel and would therefore reduce VMT. As a result, projects which are solely transit improvements are typically screened out of a VMT assessment as they can be reasonably anticipated that no significant impacts to VMT would result.

For residential development, the regional average daily household VMT per capita is 17.2. For office and retail development, regional average daily work-related VMT per employee are 19.1 and 14.9, respectively. As detailed in Section 5.1, a project is considered to have the potential for a significant VMT impact if it exceeds the regional average minus 15 percent. **Table 5-1** shows the regional average VMT values for these land uses, the values for the region minus 15 percent, and the value for the transportation analysis zone in which the Project Site is located, TAZ 446. TAZ 446 is bounded by Middle Point Road to the west, Evans Avenue to the north, Innes Avenue to the south, and Earl Street to the east. As the VMT impact analysis focuses on per capita VMT generated by the project instead of the aggregate VMT generated, the two land use scenarios – the Proposed Project and the Project Variant – are not analyzed separately. It is assumed that the VMT per capita for residents, office employees, and retail employees would be the same in both land use scenarios.

TABLE 5-1: DAILY VEHICLE-MILES TRAVELED (BASELINE)

	Regional VMT Average Per Capita	Regional Average Minus 15%	TAZ 446 (Project)
Residential (per resident)	17.2	14.6	9.0
Office[1] (per office employee)	19.1	16.2	15.3
Retail (per retail employee)	14.9	12.6	8.1

Notes:

1. School VMT falls within the office category. While some school-related trips are visitor trips (e.g. pick-up/drop-off), those trips are most heavily influenced by the origin (e.g. home) and/or the ultimate destination (e.g. work) and are therefore typically a component of a larger tour. It is therefore appropriate to assign school trips to the use which is the dominant influence within that tour, which is office work trips.

Source: SF-CHAMP 2015, Fehr & Peers 2015, San Francisco Planning Department 2016.

5.2.1.1 Role of TDM in Achieving VMT Reductions

As stated above, many factors affect travel behavior. These factors include density, diversity of land uses, design of the transportation network, access to regional destinations, distance to high-quality transit, development scale, demographics, and transportation demand management.[49] The Transportation Authority's SF-CHAMP accounts for a variety of these factors to estimate VMT throughout San Francisco. SF-CHAMP is not sensitive to site-level characteristics like Transportation Demand management (TDM) measures. The amount of parking provided on a site is considered a TDM measure.

As part of the "Shift" component of the Transportation Sustainability Program, the City has recently adopted the San Francisco TDM Program. The purpose of the TDM Program is to reduce the VMT that otherwise

[49] California Smart-Growth Trip Generation Rates Study, Appendix A, University of California, Davis Institute of Transportation Studies, March 2013.

would be forecast to occur from new development (in SF-CHAMP or other transportation modeling software) based upon the new development's TAZ location. In order to achieve this VMT reduction, the San Francisco TDM Program requires that property owners select from a menu of TDM measures, defined as measures that reduce VMT by residents, tenants, employees, and visitors and are under the control of the property owner. A reduction in VMT may result from shifting vehicle trips to sustainable travel modes or reducing vehicle trips, increasing vehicle occupancy, or reducing the average vehicle trip length.

The TDM Technical Justification document[50] provides the technical basis for the creation of the applicability, targets, and assignment of points to individual measures on the TDM menu used for the San Francisco TDM Program. Each of the TDM measures on the menu is assigned a number of points, reflecting its relative effectiveness in reducing VMT. This relative effectiveness determination is grounded in literature review, local data collection, best practices research, and professional transportation expert opinion. One of the individual measures in the TDM menu that was researched was parking supply, as described below.

In 2010, the California Air Pollution Control Officers Association (CAPCOA) published a report that quantifies project-level land use, transportation, energy use, and other measures effects on GHG emissions based upon a literature review of research conducted to date.[51] The CAPCOA report identifies a maximum of 12.5 percent reduction in VMT related to parking supply (PDT-1). Recent research, described further below, indicates that an area with more parking influences a higher demand for more automobile use.

A New York City study of three boroughs showed a clear relationship between guaranteed vehicular parking at home and a greater tendency to use the automobile for trips made to and from work, even when both work and home are well served by transit. The study also infers that driving to other non-work activities is also likely to be higher for households with guaranteed vehicular parking.[52] Related literature focused on the relationship between the availability of free on-street parking supply and the number of cars per household supports the findings that the availability of parking increases private car ownership by approximately nine percent.[53] A study of households within a two-mile radius of ten rail stations in New Jersey concluded that if development near transit stations provides a high parking supply (on- and off-street), then those developments wouldn't reduce automobile use compared to developments located further away from transit stations. In addition, parking supply can undermine the incentive to use transit that proximity to transit provides.[54] A study of nine cities across the United States looked at the question of whether citywide changes in vehicular parking cause automobile use to increase, or whether minimum parking requirements an appropriate response the already rising automobile use. The study concluded that:

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[50] San Francisco Planning Department, *Transportation Demand Management Technical Justification*, June 2016.

[51] California Air Pollution Control Officers Association (CAPCOA), *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures,* August 2010.

[52] Rachel Weinberger, "Death by a thousand curb-cuts: Evidence on the effect of minimum parking requirements on the choice to drive," *Transport Policy, 20,* March 2012.

[53] Zhan Guo, "Residential Street Parking and Car Ownership," *Journal of the American Planning Association, 79:1*, 32-48, May 9, 2013.

[54] Daniel Chatman, "Does Transit-Oriented Development Need the Transit?", Access, Fall 2015.

"parking provision in cities is a likely cause of increased driving among residents and employees in those places".[55]

Research conducted in San Francisco focused on whether or not a relationship exists between the provision of off-street parking and the choice to drive among individuals traveling to or from the site (similar to the focus of one of the questions in the nine-city United States study). Following data collection and an empirical review of the data, this research found that reductions in off-street vehicular parking for office, residential, and retail developments reduce the overall automobile mode share associated with those developments, relative to projects with the same land uses in similar contexts that provide more off-street vehicular parking.[56] In other words, more off-street vehicular parking is linked to more driving and people without dedicated parking spaces are less likely to drive.

Based upon the recent research, a reduced parking supply is one the most effective TDM measures available in the menu for the San Francisco TDM Program. Eleven options (with points associated with them) are provided for this TDM measure in the TDM Program, depending upon the development project's parking supply[57] compared to the neighborhood parking rate. The neighborhood parking rate is number of existing parking spaces provided per dwelling unit or per 1,000 square feet of non-residential uses for each TAZ within San Francisco.

Using the neighborhood parking rate as a basis for assigning points accounts for the variability in geography throughout San Francisco and the effect this can have on travel behavior. Although parking supply is not an input into SF-CHAMP, based upon the recent research, the existing parking supply within a TAZ has a relationship with the VMT for that TAZ. Therefore, a new development would most likely not reduce VMT as it relates to parking supply if the new development is not parked at least at or below the neighborhood parking rate.

The existing neighborhood parking rate for the Project Site (TAZ 446) is 0.92 spaces per residential unit and 0.02 per 1,000 square feet of non-residential space. The parking rate takes into account the amount of parking and residential units and non-residential square footage in the TAZ itself and other nearby accessible TAZs within a 0.75 mile network-based walking distance, with more distant parking and residential units and non-residential square footage within that walking distance given decreasing weight. The rate for non-residential space is substantially lower than many areas in the City, likely due to the prevalence of large industrial warehousing spaces in the neighborhood that tend to have large square footages with relatively low travel activity, and thus require low amounts of off-street parking, particularly when on-street parking exists.

In addition, even though parking is not specifically an input into SF-CHAMP, the existing parking is reflected in the estimates of VMT outputs from SF-CHAMP because it is an existing condition on the ground. As mentioned above, existing average daily VMT per capita, per employee, and per retail employee in TAZ 446 is below the existing regional average daily VMT per capita, per employee, and per retail employee, respectively. Therefore, in order to exceed the threshold of 15 percent below regional averages, the project would have to substantially increase VMT per capita, per employee, and per retail employee.

[55] Chris McCahill, et al., "Effects of Parking Provision on Automobile Use in Cities: Inferring Causality," Transportation Research Board, November 13, 2015.

[56] Fehr and Peers, *Parking Analysis and Methodology Memo – Final*, April 2015.

[57] This refers to accessory (or off-street) parking supply, which is defined in the TDM Program Standards.

In typical conditions, a proposed project would be relatively similar in land use mix to the surrounding neighborhood's land uses. Under these circumstances, in order to account for an increase or decrease in VMT per capita from the project's parking supply, the project's parking rate is compared to the neighborhood parking rate.

The Proposed Project includes 1,845 parking spaces on the Project Site (1,800 off-street plus 45 on-street) and the Project Variant includes 1,957 parking spaces (1,912 off-street plus 45 on-street) on the Project Site. Maximum parking supply rates per land use are 1.0 spaces per residential unit and 2.03 spaces per 1,000 square feet for non-residential uses for the Proposed Project and 1.0 spaces per residential unit and 1.41 spaces per 1,000 square feet for non-residential uses for the Project Variant. The residential parking rate (1.0 spaces per residential unit) is slightly higher than the neighborhood average rate (0.92 spaces per residential unit); however, it is very close to the neighborhood average, and to the extent such a small difference (a 9 percent increase) may affect VMT, it is not likely to increase VMT to the point where it would exceed the threshold since the residential VMT per capita in TAZ 446 is expected to be 9.0 VMT per capita, 48 percent below the regional average of 17.2 VMT per capita and 5.6 VMT per capita below the threshold of 15 percent below regional averages.

The Proposed Project's parking supply rates for non-residential uses, in terms of spaces per 1,000 square feet of development, are much higher than the neighborhood average. In the case of the Proposed Project, the existing neighborhood non-residential parking supply, expressed as a rate per 1,000 square feet of development, is highly influenced by the prevalence of warehouses and other industrial uses which have large square footages and relatively little transportation activity per square foot. In contrast, the Proposed Project would consist primarily of residential, retail, and office, which would result in a higher population (employees and visitors) per square foot than industrial uses. Thus, the fact that the Proposed Project's non-residential parking supply rates, which are based on retail and office are higher than the existing neighborhood's non-residential parking ratio, which consists of industrial uses, does not necessarily suggest that the Proposed Project's land uses would generate VMT per capita for office and retail uses at a higher rate than forecasted by SF-CHAMP. Because the uses and densities are dramatically different, comparing parking supply rates in terms of spaces per 1,000 square feet of development does not allow for a comparison in terms of VMT per capita, because the comparative density of persons per 1,000 square feet is greater in office and retail uses..

Further, as noted in Section 5.11.3, the Proposed Project's parking supply is forecast to be less than the forecast parking demand, meaning that parking is constrained and likely contributing to decreases in VMT compared to conditions with an unconstrained parking supply. Thus, the parking at the Proposed Project may not be readily available and travelers may experience parking shortfalls during peak times. As a result, even though the proposed project parking ratios would be higher than the neighborhood average, the VMT per capita levels forecast by SF-CHAMP should not be adjusted to account for the fact that parking rates are higher for proposed office and retail uses than parking rates for existing warehouse and industrial uses.

This analysis indicates that office trips to and from India Basin would be longer on average than residential trips, which are slightly longer than retail trips. As a result, the Proposed Project can be expected to have lower VMT per capita than the Project Variant; while the Project Variant has slightly more retail uses (including restaurants) than the Proposed Project, it also has significantly more office uses and fewer residential units, which would result in a higher average VMT across all uses on the site. Nevertheless, because projected VMT per capita for office, residential, and retail uses in the Project Site's TAZ are below 85% of the regional average, the Project Variant would not cause a significant VMT impact.

As listed in **Table 5-1**, existing average daily VMT per capita is more than 15 percent below the existing regional average daily VMT per capita for residential, office, and retail uses in TAZ 446 where the Proposed Project is located. Given that the Project Site is located in an area where existing VMT is more than 15 percent below the existing regional average and that the Proposed Project incorporates similar features to other development within the TAZ that influence the lower-than-average VMT, such as density, mix of uses, and transit accessibility, the Proposed Project's residential, office, and retail (and thus, restaurant, open space, and school) uses would not result in substantial additional VMT and impacts would be **less-than-significant**. Furthermore, the Project Site meets the Proximity to Transit Stations screening criterion, which also indicates that the Proposed Project's uses would not cause substantial additional VMT. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**. Additionally, the above assessment does not fully account for the reduction in VMT likely to occur due to the Proposed Project's TDM Plan, which includes robust measures (such as participation in the regional bikeshare program and unbundled parking supply) to reduce VMT. Therefore, with full accounting of the TDM Plan, the VMT impacts of the Proposed Project would be **less-than-significant**.

Residential and commercial development projects that locate in areas with low VMT per capita and incorporate similar features, such as density, mix of uses, transit accessibility, tend to exhibit similarly low VMT per capita. While the Proposed Project would generate a large number of trips to and from the Project Site, the significant metric for measuring VMT is measured per capita and is not an aggregate of VMT. The aim of this metric is to direct growth to areas of low VMT per capita, not to prevent any growth in VMT from new development.

5.3 TRAFFIC IMPACTS

5.3.1 Induced Travel

The Proposed Project is not a transportation project. However, the Project would include features that would alter the transportation network. These features include sidewalk widening, installation of on-street loading zones, curb cuts, on-street safety strategies, intersection signalization, and left-turn lanes. These features fit within the general types of projects identified that would not substantially induce automobile travel as they do not create substantial increases in roadway capacity.[58] Instead, they are modifications to facilitate non-automobile modes to make them more attractive when compared to automobile travel. While intersection signalization may induce automobile travel in some situations, in this location, it is being installed to provide a safe pedestrian crossing and would not increase vehicle speeds or reduce automobile delay. While a lane addition such as a turn-pocket may induce automobile travel in some situations, in this location, the left-turn pockets are minor changes to the transportation network and are being installed to provide access to the site and would not increase vehicle speeds or reduce automobile delay; therefore it is assumed that they would not induce automobile travel. Therefore, impacts would be **less-than-significant**. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

5.3.2 Traffic Hazard Impacts

The Proposed Project would have a significant impact to traffic if it caused major traffic hazards. In this section, the impacts for the Project Variant would be the same as for the Proposed Project because the

[58] San Francisco Planning Department, *Executive Summary: Resolution Modifying Transportation Impact Analysis*, Appendix F, Attachment A, March 3, 2016.

street design is the same. The effect on traffic hazards of the difference in traffic generated between the Proposed Project and Project Variant are explained in this section.

The layouts for the internal street network have not been finalized, but would conform to the specifications in the draft India Basin Design Standards and Guidelines as well as the Better Streets Plan. Layouts for the internal street network are subject to review and approval by the City. The draft design has been analyzed in this document and features small corner radii, curb extensions at intersections, and speed tables at midblock and intersection crossing locations, which all serve to calm traffic as is appropriate for neighborhood streets. Griffith Street, New Hudson Avenue, Arelious Walker Drive, and Earl Street have the design vehicle of a passenger car and are also designed to accommodate larger vehicles, including SU-30 single unit, fire, and WB-40 semi-trailer trucks. The garages with access off of these streets are also designed to accommodate the WB-40 truck. Spring Lane, Beach Lane, and Fairfax Lane have a design vehicle of a passenger car and are also designed to accommodate SU-30 and fire trucks, but not WB-40 trucks. As such, WB-40 trucks will not be permitted access to these streets.

While the small turn radii will slow speeds for all vehicles, they would cause some larger vehicles (such as SU-30 and WB-40) to cross the centerline, which requires appropriate design elements to avoid introducing hazards. For this reason, Griffith Street, Arelious Walker Drive, and Earl Street have been designed with mountable buffer zones when needed, and roadway design along these streets complies with the seven-foot-wide refuge zone for vehicles. The SU-30 vehicle is the same as a smaller move-in truck and a larger delivery vehicle. Based on the land uses (residential and commercial) these vehicles are expected to frequently use the internal roads for residential move-in/move-out and deliveries. The small turn radii would also cause WB-40 trucks to cross the centerline in places. This is permitted in the Better Streets Plan, is typical when these vehicles traverse neighborhood streets, is addressed with appropriate design elements that minimize truck speed and ensure truck visibility, and therefore does not constitute a major traffic hazard.

In general, the Proposed Project would add vehicle trips to the surrounding roadways; however, a general increase in traffic would not be considered a traffic hazard. Existing vehicle, pedestrian, and bicycle volumes on Innes Avenue and other streets near the Project are low. The additional Project vehicle trips would substantially contribute to traffic and occasional congestion at nearby intersections. The Proposed Project would generate around 2,000 vehicle trips in both the AM and PM peak hours and the Project Variant would generate around 2,600 vehicle trips in both the AM and PM peak hours. A large majority of the Project vehicle traffic would travel along Evans Avenue, Hunters Point Boulevard, and Innes Avenue to the west of the Project Site to access other destinations in the city and region. Therefore the Project would cause increases to traffic volumes primarily at nearby intersections along these streets to the west of the Project Site. While the project would increase the total number of trips within the vicinity of the project site, increased trips alone do not cause traffic hazards. The inclusion of signalization at the project intersections along Innes Avenue removes conflicts that would otherwise exist between the substantial number of project vehicles and the substantial number of people driving along Innes Avenue in a way that does not cause any new traffic hazards. Therefore the project impact would be **less-than-significant**.

5.3.3 Intersection Improvement Measures Identified

A detailed traffic analysis utilizing the level of service metric (LOS) was conducted for informational and site planning purposes. Although private passenger vehicle delay as measured by LOS in that analysis is not relevant to the Proposed Project's environmental review and no significant impacts are identified associated with that analysis, the traffic analysis did result in a recommendation for an improvement to an intersection that is summarized here. Note that the numbering does not begin at I-TR-1, as this improvement measure is described in more detail later in this document and the numbering reflects its position later in this report. Also, note that there is no I-TR-4A. In this document, improvement and mitigation measures with the suffix "A" apply only to the Proposed Project and those with suffix "B" apply only to the Project Variant.

Improvement Measure I-TR-4B: Reconfigure Southbound Approach of Jennings Street/Evans Avenue (Project Variant only)

To improve vehicular mobility at the intersection of Jennings Street/Evans Avenue in the Baseline Plus Project Variant Scenario, Improvement Measure I-TR-4B reconfigures the southbound approach to the intersection of Jennings Street/Evans Avenue include a 100-foot left turn pocket. Adding this turn pocket to this intersection would require restricting parking on the west side of Jennings Street, removing approximately five parking spaces.

For the Project Variant, responsibility for implementing the improvement measure would be based on the relative contribution of traffic to the intersection from the four parcels. At this location, 98 percent of vehicle trips would be generated by the 700 Innes Avenue parcel, one percent of vehicle trips would be generated by the India Basin Shoreline Park parcel, zero percent of vehicle trips would be generated by the 900 Innes Avenue parcel, and one percent of trips would be generated by the India Basin Open Space parcel.

Improvement Feasibility

This improvement is feasible. FivePoint is committed to signalizing the intersection as part of the Hunters Point Shipyard project, and construction of this improvement would occur at the same time as signalization. Trips generated from the Build Property comprise 98 percent of the Project Variant Scenario vehicle trips through this intersection during both the AM and PM peak hours. Trips generated from the RPD Property comprise two percent of the Project Variant Scenario vehicle trips through this intersection during both the AM and PM peak hours. Therefore Build would be responsible for 98 percent of the costs, and RPD would be responsible for 2 percent of the costs.

Operations After Improvement

Restriping the southbound approach to include a southbound left turn pocket improves intersection operations to LOS E in the AM peak period and LOS C in the PM peak period.

More detail on the traffic analysis is presented in Chapter 7.

5.4 TRANSIT CAPACITY IMPACTS

Transit capacity impacts were evaluated based on the ability of the transit system to accommodate existing and projected future ridership demands. Most transit users would be expected to travel between the Project Site and transit stops/stations by foot. A discussion on pedestrian access to transit can be found in Section 5.7 on Pedestrian Impacts.

The geographic trip distribution presented earlier in this report also applies to transit trips generated by both the Proposed Project and Project Variant. The Project would have a significant impact if the addition of project trips to an individual route would cause the capacity utilization to exceed SFMTA's 85 percent operating threshold. The Project would also have a significant impact if the addition of project trips to the Downtown Screenlines would cause the capacity utilization to exceed SFMTA's 85 percent operating threshold. The Project would also have a significant impact if the generated trips exceed the thresholds for regional operators, which is 100 percent.

5.4.1 Baseline Plus Proposed Project

Transit capacity impacts for the Proposed Project were assessed at the individual route level, the Downtown Screenline level, and at the regional screenline level. Analysis is presented in turn, below.

5.4.1.1 Individual Muni Routes

The Project's impact to transit capacity on transit routes adjacent to the Project was evaluated. Two Muni bus lines would continue to serve the Project Site in the Baseline scenario: the 19 Polk and the 44 O'Shaughnessy. The 19 Polk travels along Innes Avenue and would provide a direct connection to the Project as well as connections to other Muni lines, notably the T Third. The 44 O'Shaughnessy travels along Middle Point Road, with the closest stop located at Innes Avenue/Middle Point Road. This stop is about 2,000 feet from the Project Site, which is approximately a 7-minute walk (i.e. considered within walking distance for the purpose of this analysis).

Using the previously-calculated transit trip distributions to each Superdistrict and an understanding of which neighborhoods each line serves, the proportion of Project trips to each of these two lines was estimated. The current frequency of each line was used to estimate the number of Project trips that would be added to each bus vehicle in the inbound and outbound directions during the AM and PM peak periods.

Typically, for route-specific capacity impact analysis, only the peak demand on a given bus route over the course of the entire route (hereafter called the Global Maximum Load Point, or GMLP) is evaluated. However, since it is expected that a substantial number of riders on the 19 Polk would transfer to the T Third before reaching the GMLP, a Local Maximum Load Point (LMLP) was also evaluated for the 19 Polk. This LMLP is located on Evans Avenue east of Third Street, to capture the large proportion of transit riders that would be expected to use the 19 Polk to transfer to the T Third.

Table 5-2 below summarizes the results of the transit line capacity analysis for the 19 Polk and 44 O'Shaughnessy. In the AM period, the Proposed Project would add up to 67 trips per bus on the 19 Polk and up to 52 trips per bus on the 44 O'Shaughnessy. In the PM period, the Proposed Project would add up to 106 trips per bus on the 19 Polk and up to 88 trips per bus on the 44 O'Shaughnessy.

As a result of the added transit trips, the Proposed Project's impact on transit capacity would be considered **significant** on the 44 O'Shaughnessy in the inbound direction during the AM peak period and in the outbound direction during the PM peak period. The significant impact to the 44 O'Shaughnessy would be triggered by the development contained within Phase 1 of the construction plan for the Proposed Project.

TABLE 5-2: LOCAL TRANSIT CAPACITY - PROPOSED PROJECT								
Route	**Peak Hour**	**Existing Load (pax)[1]**	**Background Growth[2]**	**Baseline No Project Load**	**Project-Added Trips**	**Baseline Plus Project Load**	**Threshold (pax)[3]**	**Significant Impact?**
Inbound (Project Designation) / Outbound (SFMTA Designation)								
19 Polk (LMLP[4])	AM	24	5	29	63	92	216	No
	PM	44	25	69	106	175		No
19 Polk (GMLP[4])	AM	160	0	160	4	164		No
	PM	168	2	170	6	176		No
44 O'Shaughnessy (GMLP[4])	AM	300	4	304	52	355	405	No
	PM	362	17	379	88	467	362	**Yes**
Outbound (Project Designation) / Inbound (SFMTA Designation)								
19 Polk (LMLP[4])	AM	84	25	109	67	176	216	No
	PM	52	12	64	57	121		No
19 Polk (GMLP[4])	AM	188	2	190	5	195		No
	PM	180	1	181	4	185		No
44 O'Shaughnessy (GMLP[4])	AM	368	17	385	49	433	405	**Yes**
	PM	241	8	249	42	291	362	No

Notes:

Bold and shaded indicates significant transit capacity impact.

1. Existing Load at Local Maximum Load Point or Global Maximum Load Point from *Transit Data for Transportation Impact Studies* (SF Planning, May 2015) or Transit Effectiveness Project Route analysis (Fehr & Peers, October 2011). Pax = passengers.
2. Background Growth reflects 494 residential units approved as Phase 1 of the nearby Hunters Point Shipyard development that are currently under construction.
3. Threshold is based on a total capacity of 63 persons (seated plus standing) per bus for both 19 Polk and 44 O'Shaughnessy (as identified in *Transit Data for Transportation Impact Studies*) and 85 percent capacity utilization significance threshold per SF TIA Guidelines. Pax = passengers.
4. GMLP is the Global Maximum Load Point, which is the route-wide maximum load point. LMLP is the Local Maximum Load Point, which is the maximum load point on the route east of Third Street.

Source: Fehr & Peers, 2017

Mitigation Measure M-TR-1A (Proposed Project): Implement Transit Capacity Improvements

To mitigate significant transit capacity impacts that could occur as a result of Proposed Project transit trips before the transit service improvements that are part of the Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) are in operation, the Project Sponsor of the 700 Innes Avenue property shall fund and/or implement a transit capacity improvement measure as described below. Implementation of one of the two options described would mitigate the transit capacity impact of the Project to less than significant.

Option 1 – Fund Temporary Transit Service Improvements until applicable portion of Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) is in Operation

To mitigate significant transit capacity impacts, the Project Sponsors shall fund, and the SFMTA shall provide, temporary increased frequencies on the 44 O'Shaughnessy from for the period of time until similar improvements required as part of the Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) are in operation. Specifically, the frequency of the transit service shall be increased from 8 minutes to 6.5 minutes in the AM peak period and from 9 minutes to 7.5 minutes in the PM peak period. This increased frequency is set at the level where the project-generated transit trips would no longer result in a significant transit capacity impact. The Project Sponsor's funding contributions would be based on the cost to serve the relative proportion of transit trips generated by each of the four parcels that make up the Proposed Project, and it would include the cost to requisition and operate any additional buses needed to increase the frequencies as specified.

Under Option 1, the increased frequency on the 44 O'Shaughnessy would result in increased passenger capacity along the route (because more buses would be provided per hour), thereby lowering the average passenger load per bus below the 85 percent capacity utilization threshold.

Mitigation Measure M-TR-1A, Option 1 would be implemented prior to the issuance of the building permits for the incremental amount of development at the Project Site (20 transit trips outbound to the Project on the 44 O'Shaughnessy in the AM peak hour or 18 transit trips inbound to the Project on the 44 O'Shaughnessy in the PM peak hour) that would cause the significant impact. This incremental amount of development would be a subset of the first phase of construction.

Option 2 – Implement Temporary Shuttle Service until Applicable Portion of Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) is in Operation

If for any reason the SFMTA determines that the provision of increased transit frequency is not feasible at the time its implementation would be required, the Project Sponsor for the 700 Innes Avenue property shall implement a temporary shuttle service that would supplement existing nearby transit service by providing connections to local and regional rail service. A shuttle service operating at 20 minute headways in the AM and PM peak periods could accommodate the estimated demand, although a minimum frequency of 15 minutes is recommended in order to provide an adequate level of service to urban commuters. The AM peak period is defined as from 7:00 AM to 9:00 AM, and the PM peak period is defined as from 4:00 PM to 6:00 PM. Shuttle operations should extend on either side of these defined periods if necessary to adequately serve the peak period of project travel demand. The shuttle would connect the Project Site with T-Third, Caltrain, and BART stations. The shuttle stop location would either be located on Innes Avenue at

Arelious Walker Drive or on New Hudson Street at Innes Avenue. The shuttle would be required to operate during the period of time until improvements required as part of the Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) are in operation. The shuttle would be required to operate within all applicable SFMTA and City of San Francisco regulations and programs. The Project Sponsors shall be required to monitor ridership on the shuttle annually and produce a report to the SFMTA describing the level of service provided and associated ridership. If ridership on the overcrowded Muni route is above 85 percent of overall service capacity as routinely monitored by the SFMTA, additional shuttle frequency shall be provided by the Project Sponsors to reduce occupancy to below 85 percent utilization.

Mitigation Measure M-TR-1A Option 2 would be implemented prior to the issuance of the Temporary Certificates of Occupancy (TCO) for the incremental amount of development at the Project Site (20 transit trips outbound to the Project on the 44 O'Shaughnessy in the AM peak hour or 18 transit trips inbound to the Project on the 44 O'Shaughnessy in the PM peak hour) that would cause the significant impact. This incremental amount of development would be a subset of the first phase of construction.

Effects of Mitigation Measure M-TR-1A

Under Option 1, the increased frequency of the 44 O'Shaughnessy would result in increased passenger capacity along the route (due to the provision of more buses per hour), thereby lowering the average passenger load per pus below the 85 percent capacity utilization threshold.

Under Option 2, the shuttle service would supplement existing transit routes by providing sufficient capacity to accommodate the demand generated by the Project above the 85 percent utilization threshold with a 20 percent factor of safety.

Riders travelling to/from destinations in Downtown San Francisco and the northern neighborhoods of San Francisco could use the shuttle to connect with Muni, Caltrain, or BART. Absent the shuttle, many of these transit trips would be taken using the 19 Polk to get to Downtown or to transfer to the T Third to travel to Mission Bay or Downtown. The shuttle service would provide additional transit capacity along Evans Avenue to access the T Third as well as provide an alternative route to Downtown San Francisco via the connection to BART.

Riders travelling to/from destinations in the southern and western neighborhoods of San Francisco could transfer to the 48 Quintara at the 24th Street Mission BART station or use the shuttle to transfer to BART at 24th Street Mission station to travel to destinations close to other BART stations in the southwest of the City. Absent the shuttle, many of these transit trips would be taken using the 44 O'Shaughnessy. The shuttle would provide an alternate option to the 44 O'Shaughnessy to access the BART network and would provide a quicker connection to BART than the 44 O'Shaughnessy as it would have fewer intermediate stops. It would therefore be an attractive option for these travelers and may attract trips from the 44 O'Shaughnessy, which would alleviate overcrowding on that route. Transit service would be monitored, and the shuttle service would be adjusted, if needed, to reach the capacity utilization threshold.

The shuttle service would be provided only during peak hours, and only until the CPHPS TP Transit Service Improvements are in place.

Mitigation Measure Implementation

If selected, Option 1 of Mitigation Measure M-TR-1A would be implemented prior to the issuance of building permits for the incremental amount of development at the Project Site (20 transit trips outbound to the Project on the 44 O'Shaughnessy in the AM peak hour or 18 transit trips inbound to the Project on the 44 O'Shaughnessy in the PM peak hour) that would cause the significant impact. This incremental amount of development would be a subset of the first phase of construction. If selected, Option 2 of Mitigation Measure M-TR-1A would be implemented prior to occupancy of the incremental amount of development at the Project Site that would cause the significant impact. The funding contribution from the Project Sponsors is detailed in Section 5.4.1.

With the implementation of one of the options under Mitigation Measure M-TR-1A, the Proposed Project's impacts to transit capacity would become **less-than-significant with mitigation**. Because the proposed changes are restricted to providing additional capacity for transit riders, they would not result to changes to pedestrian facilities or bicycle facilities, nor create potentially hazardous conditions or elsewhere interfere with pedestrian or bicycle accessibility. The shuttle service may need to be compliant with the City's Commuter Shuttle Program Policy, which includes measures to minimize effect on pedestrians and bicyclists. The proposed changes would not have an effect on parking provision. Therefore, the mitigation measure would result in **less-than-significant** pedestrian, bicycle, and parking impacts. The mitigation measure would not require any construction, so therefore it would result in a **less-than-significant** impact due to construction. There would also be a **less-than-significant** impact to emergency access since the mitigation measure does not propose to change existing access to the Project Site.

Table 5-3 below summarizes the incremental number of Project transit trips above which there would be a significant transit capacity impact to either the 19 Polk or 44 O'Shaughnessy.

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TABLE 5-3: TRANSIT TRIP THRESHOLDS (MM M-TR-1A AND M-TR-1B)			
Transit Route	**Peak Hour**	**Added Transit Trips[1] (passengers)**	
		Proposed Project	**Project Variant**
Outbound (SFMTA Designation) / Inbound (Project Designation)			
19 Polk (LMLP[2])	AM	-	187
	PM	-	-
44 O'Shaughnessy (GLMP[3])	AM	-	101
	PM	18	18
Inbound (SFMTA Designation) / Outbound (Project Designation)			
19 Polk (LMLP[2])	AM	-	-
	PM	-	152
44 O'Shaughnessy (GLMP[3])	AM	20	20
	PM	-	112

Notes:

1. The added transit trips are the incremental number of Project transit trips above which there would be a significant transit capacity impact to the respective route. Added trips are identified only for the route/direction/time period where the Proposed Project (or Project Variant) would cause a significant impact.
2. LMLP = Local Maximum Load Point
3. GMLP = Global Maximum Load Point

Source: Fehr & Peers, 2017.

The following section specifies the total number of project transit trips that would result in a significant transit capacity impact, allocated to the different land uses. By identifying the number of Project trips that would need to be generated to cause a significant impact, this implementation plan enables the City and the Project Sponsor to determine, in a straightforward manner, when each mitigation measure should be implemented according to the level of development completed. This approach provides the desired development flexibility and also ensures that mitigation measures are implemented at the appropriate time. Providing these trip rates also allows for recalculation of impact significance in the event of changes to the development profile in response to changing market demands over time.

This plan presents distinct trip generation levels when the appropriate mitigation measure would be recommended. **Table 5-4** which details the vehicle trip generation rates for each land use in both the Proposed Project and the Project Variant, can then be used to simply calculate whether any particular development would generate a significant transit impact.

TABLE 5-4: TRANSIT TRIPS GENERATED BY PROJECT DEVELOPMENT UNDER BASELINE CONDITIONS						
Land Use	**Project Transit Trips (Under Baseline Conditions)**					
	AM Peak Hour			**PM Peak Hour**		
	Rate	**Inbound**	**Outbound**	**Rate**	**Inbound**	**Outbound**
Open Space	-	-	-	-	-	-
School	0.03 per student, plus 0.01 per staff	100%	0%	0.01 per student, plus 0.01 per staff	0%	100%
Retail						
Restaurant	0.16 per 1000 square feet (KSF)	65%	35%	1.44 per KSF	36%	64%
Café	1.60 per KSF			1.45 per KSF		
Supermarket	0.44 per KSF			1.20 per KSF		
General Retail	0.19 per KSF			0.73 per KSF		
Office						
R&D Lab Area	0.19 per KSF	88%	12%	0.16 per KSF	2%	98%
Clinical Use	0.98 per KSF			0.88 per KSF		
Administrative	0.91 per KSF			0.83 per KSF		
General Office	0.24 per KSF			0.22 per KSF		
Residential						
Studio	0.10 per dwelling unit (DU)	31%	69%	0.14 per DU	81%	19%
1 Bedroom	0.10 per DU			0.13 per DU		
2+ Bedrooms	0.14 per DU			0.17 per DU		

Source: Fehr & Peers, 2017.

With the implementation of one of the options under Mitigation Measure M-TR-1A, the Proposed Project's impacts to transit capacity would become **less-than-significant with mitigation**. The mitigation measure would result in **less-than-significant** pedestrian, bicycle, and parking impacts because the proposed changes are restricted to providing additional capacity for transit riders, and therefore would not result in changes to those facilities. The mitigation measure would not require any construction, so therefore it would result in a **less-than-significant** impact due to construction. There would also be a **less-than-significant** impact to emergency access since the mitigation measure does not propose to change existing access to the Project Site.

5.4.1.2 Downtown Screenlines

Under the Baseline Scenario, the Proposed Project would generate 237 transit trips during the weekday AM peak hour and 302 transit trips during the PM peak hour. Transit trips to and from the Project Site would use nearby Muni lines (such as 19 Polk, 44 O'Shaughnessy, and the T Third), BART, Caltrain, or regional bus service, and would transfer to and from other Muni bus and light rail lines as needed. Of these transit trips, 39 would cross the screenlines inbound to Downtown in the AM peak hour, and 58 would cross the screenlines outbound from Downtown in the PM peak hour; the remainder of the transit trips do not cross the Downtown Screenlines. As shown in **Table 5-5** the addition of 39 AM and 58 PM Proposed Project-generated local transit trips crossing screenlines inbound in the AM peak hour and outbound in the PM peak hour would not increase screenline capacity utilization to greater than the 85 percent threshold an any screenline, except for the Southwest Screenline in the AM peak hour. The Southwest screenline would operate at 94 percent utilization in the PM peak hour; however, the Proposed Project would add only one trip to this screenline which is less than the threshold of five percent of ridership for screenlines exceeding the capacity utilization threshold under conditions without the Proposed Project.

Three subcorridors operate above the capacity utilization threshold of 85 percent in the Baseline Plus Proposed Project condition: Subway lines—AM only, Fulton/Hayes—PM only, and Third Street—PM only. For each of these subcorridors, the Proposed Project contribution to the screenline would be less than five percent.

TABLE 5-5: MUNI DOWNTOWN SCREENLINES - PROPOSED PROJECT

Screenline	Baseline[1]			Baseline Plus Proposed Project		
	Peak Hour[2] Baseline Ridership	Peak Hour[2] Capacity	Peak Hour[2] Capacity Utilization	Peak Hour Proposed Project Trips	Peak Hour[1] Ridership	Peak Hour[1] Capacity Utilization
AM Peak Hour						
Kearny/Stockton[3]	2,211	3,050	72%	3	2,214	73%
Other lines[4]	538	1,141	47%	1	539	47%
Northeast Screenline Total	*2,749*	*4,191*	*66%*	*4*	*2,753*	*66%*
Geary[5]	1,821	2,490	73%	2	1,823	73%
California[6]	1,610	2,010	80%	1	1,611	80%
Sutter/Clement[7]	480	630	76%	1	481	76%
Fulton/Hayes[8]	1,277	1,680	76%	1	1,278	76%
Balboa[9]	758	1,019	74%	1	759	74%
Northwest Screenline Total	*5,946*	*7,829*	*76%*	*6*	*5,951*	*76%*
Third Street[10]	359	793	45%	22	381	48%
Mission[11]	1,643	2,509	65%	0	1,643	65%
San Bruno/Bayshore[12]	1,690	2,134	79%	2	1,692	79%
Other lines[13]	1,468	1,756	84%	5	1,473	84%
Southeast Screenline Total	*5,160*	*7,192*	*72%*	*29*	*5,189*	*72%*
Subway lines[14]	6,330	6,205	**102%**	0	6,330	**102%**
Haight/Noriega[15]	1,121	1,554	72%	1	1,122	72%
Other lines[16]	465	700	66%	0	465	66%
Southwest Screenline Total	*7,916*	*8,459*	***94%***	*1*	*7,917*	***94%***

PM Peak Hour						
Kearny/Stockton[3]	2,245	3,327	67%	3	2,248	68%
Other lines[4]	683	1,078	63%	1	684	63%
Northeast Screenline Total	*2,928*	*4,405*	*66%*	*4*	*2,932*	*67%*
Geary[5]	1,964	2,623	75%	2	1,966	75%
California[6]	1,322	1,752	75%	1	1,323	76%
Sutter/Clement[7]	425	630	67%	1	426	68%
Fulton/Hayes[8]	1,184	1,323	**89%**	1	1,185	**90%**
Balboa[9]	625	974	64%	1	626	64%
Northwest Screenline Total	*5,520*	*7,302*	*76%*	*6*	*5,526*	*76%*
Third Street[10]	788	793	**99%**	37	825	**104%**
Mission[11]	1,407	2,601	54%	0	1,407	54%
San Bruno/Bayshore[12]	1,536	2,134	72%	4	1,541	72%
Other lines[13]	1,085	1,675	65%	9	1,094	65%
Southeast Screenline Total	*4,816*	*7,203*	*67%*	*50*	*4,866*	*68%*
Subway lines[14]	4,904	6,164	80%	0	4,904	80%
Haight/Noriega[15]	977	1,554	63%	1	978	63%
Other lines[16]	555	700	79%	0	555	79%
Southwest Screenline Total	*6,436*	*8,418*	*76%*	*1*	*6,437*	*76%*

Notes:

Bold indicates capacity utilization of 85 percent or greater.

1. Baseline condition is a modified existing condition.
2. AM Peak hour as inbound (i.e. toward Downtown) only; PM peak hour as outbound (i.e. away from Downtown) only
3. 8 Bayshore, 30 Stockton, 30X Marina Express, 41 Union, 45 Union-Stockton
4. F Market & Wharves, 10 Townsend, 12 Folsom/Pacific
5. 38 Geary, 38R Geary Rapid, 38AX Geary 'A' Express, 38BX Geary 'B' Express
6. 1 California, 1AX California 'A' Express, 1AX California 'B' Express
7. 2 Sutter, 3 Clement
8. 5 Fulton, 21 Hayes
9. 31 Balboa, 31AX Balboa 'A' Express, 31BX Balboa 'B' Express
10. T Third Street
11. 14 Mission, 14R Mission Rapid, 14X Mission Express, 49 Van Ness-Mission
12. 8AX Bayshore 'A' Express, 8BX Bayshore 'B' Express, 8 Bayshore, 9 San Bruno, 9L San Bruno Limited
13. J Church, 10 Townsend, 12 Folsom/Pacific, 19 Polk, 27 Bryant
14. KT Ingleside/Third Street, L Taraval, M Ocean View, N Judah
15. 6 Haight-Parnassus, 7/7R Haight-Noriega/Rapid, 7X Noriega Express, NX Judah Express
16. F Market & Wharves

Source: San Francisco Planning Department, May 2015; Fehr & Peers, 2016, see **Appendix E** for transit line capacity calculations

Therefore, the Proposed Project's impact to Muni transit capacity at the Downtown Screenlines and subcorridors would be **less-than-significant.** As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

5.4.1.3 Regional Transit

The Proposed Project would add approximately 44 AM peak hour and 40 PM peak hour transit trips to regional transit providers. These include 10 AM and 9 PM transit trips to the East Bay, 33 AM and 30 PM transit trips to the South Bay[59], and two AM and one PM transit trips to the North Bay. The thresholds for regional operators is 100 percent, compared to 85 percent for Muni. As shown in **Table 5-6** the East Bay screenline would operate at 102 percent in the AM peak hour. However, the Proposed Project would add only 10 trips to this screenline, which is less than the threshold of five percent of ridership for screenlines exceeding the capacity utilization threshold under conditions without the Proposed Project. Therefore, the Proposed Project would have a **less-than-significant** impact to regional transit capacity. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

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[59] Because there are no proposed direct transit links to nearby Caltrain stations, transit passengers traveling to and from the South Bay are expected to utilize first/last mile services such as taxi, Transportation Network Companies (TNCs), or bicycling to access Caltrain.

TABLE 5-6: REGIONAL TRANSIT SCREENLINES - PROPOSED PROJECT						
Screenline	Baseline[1]			Baseline Plus Proposed Project		
	Baseline Ridership	Peak Hourly Capacity	Capacity Utilization	Project Trips	Ridership	Capacity Utilization
AM Peak Hour						
East Bay						
BART	25,400	23,256	**109%**	10	25,410	**109%**
AC Transit	1,568	2,829	55%	0	1,568	55%
Ferries	810	1,170	69%	0	810	69%
Screenline Subtotal	*27,778*	*27,255*	***102%***	*10*	*27,788*	***102%***
North Bay						
Golden Gate Transit	1,330	2,543	52%	1	1,331	52%
Ferries	1082	1,959	55%	0	1082	55%
Screenline Subtotal	*2,412*	*4,502*	*54%*	*1*	*2,413*	*54%*
South Bay						
BART	14,151	19,367	73%	10	14,161	73%
Caltrain	2,173	3,100	70%	23	2,196	71%
SamTrans	255	520	49%	0	255	49%
Screenline Subtotal	*16,579*	*22,987*	*72%*	*33*	*16,612*	*72%*
Regional Total	*46,769*	*54,744*	*85%*	*44*	*46,813*	*86%*
PM Peak Hour						
East Bay						
BART	24,490	22,784	**107%**	9	24,499	**108%**
AC Transit	2,256	3,926	57%	0	2,256	57%
Ferries	805	1,615	50%	0	805	50%
Screenline Subtotal	*27,551*	*28,325*	*97%*	*9*	*27,560*	*97%*
North Bay						
Golden Gate Transit	1,384	2,817	49%	1	1,385	49%
Ferries	968	1,959	49%	0	968	49%
Screenline Subtotal	*2,352*	*4,776*	*49%*	*1*	*2,353*	*49%*
South Bay						
BART	13,502	18,900	71%	9	13,511	71%
Caltrain	2,381	3,100	77%	21	2,404	78%
SamTrans	141	320	44%	0	141	44%
Screenline Subtotal	*16,024*	*22,320*	*72%*	*30*	*16,054*	*72%*
Regional Total	*45,927*	*55,421*	*83%*	*40*	*45,967*	*83%*

Notes:

Bold indicates capacity utilization of 100 percent or greater.

1. Baseline condition is a modified existing condition.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015. San Francisco Planning Department, "Updated BART Regional Screenlines – Revised," October 17, 2016; Fehr & Peers, 2016.

5.4.2 Baseline Plus Project Variant

Transit capacity impacts for the Project Variant were assessed at the individual route level, the Downtown Screenline level, and at the regional screenline level. Analysis is presented in turn, below.

5.4.2.1 Individual Muni Routes

Table 5-7 below summarizes the results of the transit line capacity analysis for the 19 Polk and 44 O'Shaughnessy under the Project Variant. In the AM peak hour, the Project Variant would add up to 195 trips on the 19 Polk and up to 149 trips on the 44 O'Shaughnessy. In the PM peak hour, the Project Variant would add up to 221 trips on the 19 Polk and up to 162 trips on the 44 O'Shaughnessy.

As a result of the added transit trips, the Project Variant's impact on transit capacity would be considered **significant** on the 19 Polk at the Local Maximum Load Point in the inbound direction in the AM peak period and in the outbound direction in the PM peak period. In addition, the Project Variant's impact on transit capacity would be considered **significant** on the 44 O'Shaughnessy in both the inbound and outbound direction during both the AM and PM peak periods. The significant impact to the 44 O'Shaughnessy would be triggered by the development contained within Phase 1 of the construction plan for the Project Variant. The significant impact to the 19 Polk would be triggered by the development contained within Phase 2 of the construction plan for the Project Variant.

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TABLE 5-7: LOCAL TRANSIT CAPACITY - PROPOSED PROJECT VARIANT								
Route	**Peak Hour**	**Existing Load (pax)[1]**	**Background Growth[2]**	**Baseline No Project Load**	**Project Variant - Added Trips**	**Baseline Plus Variant Load**	**Threshold (pax)[3]**	**Significant Impact?**
Inbound (Project Designation) / Outbound (SFMTA Designation)								
19 Polk (LMLP[4])	AM	24	5	29	195	224	216	**Yes**
	PM	44	25	69	68	137		No
19 Polk (GMLP[4])	AM	160	0	160	14	175		No
	PM	168	2	170	5	175		No
44 O'Shaughnessy (GMLP[4])	AM	300	4	304	149	453	405	**Yes**
	PM	362	17	379	52	431	362	**Yes**
Outbound (Project Designation) / Inbound (SFMTA Designation)								
19 Polk (LMLP[4])	AM	84	25	109	58	167	216	No
	PM	52	12	64	221	285		**Yes**
19 Polk (GMLP[4])	AM	188	2	190	4	194		No
	PM	180	1	181	16	197		No
44 O'Shaughnessy (GMLP[4])	AM	368	17	385	42	427	405	**Yes**
	PM	241	8	249	162	412	362	**Yes**

Notes:

Bold and shaded indicates significant transit capacity impact.

1. Existing Load at Local Maximum Load Point or Global Maximum Load Point from *Transit Data for Transportation Impact Studies* (SF Planning, May 2015) or Transit Effectiveness Project Route analysis (Fehr & Peers, October 2011). Pax = passengers.
2. Background Growth reflects 494 residential units approved as Phase 1 of the nearby Hunters Point Shipyard development that are currently under construction.
3. Threshold is based on a total capacity of 63 persons (seated plus standing) per bus for both 19 Polk and 44 O'Shaughnessy (as identified in *Transit Data for Transportation Impact Studies*) and 85 percent capacity utilization significance threshold per SF TIA Guidelines.
4. GMLP is the Global Maximum Load Point, which is the route-wide maximum load point. LMLP is the Local Maximum Load Point, which is the maximum load point on the route east of Third Street.

Source: Fehr & Peers, 2017

Mitigation Measure M-TR-1B (Project Variant): Implement Transit Capacity Improvements

To mitigate significant transit capacity impacts that could occur as a result of Project or Variant transit trips before the transit service improvements that are part of the Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) are in operation, the Project Sponsors shall fund and/or implement a transit capacity improvement measure as described below.

Option 1 – Fund Temporary Transit Service Improvements until applicable portion of Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) is in Operation

To mitigate significant transit capacity impacts, the Project Sponsors shall fund, and the SFMTA shall provide, temporary increased frequencies on the 44 O'Shaughnessy for the period of time until similar improvements required as part of the Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) are in operation. SFMTA shall also increase frequencies to the 48 Quintara for the same time period. The 48 Quintara would replace the 19 Polk that currently travels along Innes Avenue—Hunters Point Boulevard—Evans Avenue. Specifically, frequency for the 44 O'Shaughnessy shall be increased from 8 minutes to 6.5 minutes in the AM and from 9 minutes to 7.5 minutes in the PM peak period, and for the 48 Quintara the frequency shall increase from 15 minutes to 10 minutes in both the AM and PM peak period. These increases frequency are set at the level where the project would no longer have a significant impact. The Project Sponsors' funding contributions would be based on the cost to serve the relative proportion of transit trips generated by each of the four parcels that make up the Proposed Variant, and it would include the cost to requisition and operate any additional buses needed to increase the frequencies as specified.

Option 2 – Implement Temporary Shuttle Service until applicable portion of Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) is in Operation

If for any reason the SFMTA determines that the provision of increased transit frequency is not feasible at the time its implementation would be required, the Project Sponsors shall implement a temporary shuttle service that would supplement existing nearby transit service by providing connections to local and regional rail service. A shuttle service operating at 20-minute headways in the AM and PM peak periods could accommodate the estimated demand, although a minimum frequency of 15 minutes is recommended in order to provide an adequate level of service to urban commuters. The AM peak period is defined as from 7:00 AM to 9:00 AM, and the PM peak period is defined as from 4:00 PM to 6:00 PM. Shuttle operations would extend on either side of these defined periods if necessary to adequately serve the peak period of project travel demand. The shuttle would connect the Project Site with T-Third, Caltrain, and BART stations. The shuttle stop location would either be located on Innes Avenue at Arelious Walker Drive or on New Hudson Street at Innes Avenue. The shuttle would be required to operate within all applicable SFMTA and City of San Francisco regulations and programs. The Project Sponsors shall be required to monitor ridership on the shuttle annually and produce a report to the SFMTA describing the level of service provided and associated ridership. If ridership on the overcrowded Muni route is above 85 percent of overall service capacity, additional shuttle frequency shall be provided by the Project Sponsors to reduce capacity on the affected transit routes to below 85 percent utilization.

Impacts of Mitigation Measure M-TR-1B

Under Option 1, the increased frequency of the 44 O'Shaughnessy would result in increased passenger capacity along the route (due to the provision of more buses per hour), thereby lowering the average passenger load per pus below the 85 percent capacity utilization threshold.

Under Option 2, the shuttle service would supplement existing transit routes by providing sufficient capacity to accommodate the demand generated by the Project above the 85 percent utilization threshold with a 20 percent factor of safety. Riders travelling to/from destinations in Downtown San Francisco and the northern neighborhoods of San Francisco could use the shuttle to connect with Muni, Caltrain, or BART. Absent the shuttle, many of these transit trips would be taken using the 19 Polk to get to Downtown or to transfer to the T Third to travel to Mission Bay or Downtown. The shuttle service would provide additional transit capacity along Evans Avenue to access the T Third as well as provide an alternative route to Downtown San Francisco via the connection to BART.

Riders travelling to/from destinations in the southern and western neighborhoods of San Francisco could transfer to the 48 Quintara at the 24th Street Mission BART station or use the shuttle to transfer to BART at 24th Street Mission to travel to destinations close to other BART stations in the southwest of the City. Absent the shuttle, many of these transit trips would be taken using the 44 O'Shaughnessy. The shuttle provides an alternate option to the 44 O'Shaughnessy to access the BART network and would provide a quicker connection to BART than the 44 O'Shaughnessy as it would have fewer intermediate stops. It would therefore be an attractive option for these travelers and may attract trips from the 44 O'Shaughnessy, which would alleviate overcrowding on that route.

The shuttle service would be provided only during peak hours, and only until the CPHPS TP Transit Service Improvements are in place.

Mitigation Measure Implementation

If selected, Option 1 of Mitigation Measure M-TR-1B would be implemented prior to the issuance of building permits for the incremental amount of development at the Project Site (187 transit trips inbound to the Project on the 19 Polk in the AM peak hour, 152 transit trips outbound to the Project on the 19 Polk in the PM peak hour, 20 transit trips outbound to the Project on the 44 O'Shaughnessy in the AM peak hour, or 18 transit trips inbound to the Project on the 44 O'Shaughnessy in the PM peak hour. that would cause the significant impact. This incremental amount of development would be a subset of the first phase of construction. If selected, Option 2 of Mitigation Measure M-TR-1B would be implemented prior to the issuance of the Temporary Certificate of Occupancy (TCO) of the incremental amount of development at the Project Site that would cause a significant impact. The funding contribution from the Project Sponsors is detailed in Section 5.4.1.

With the implementation of one of the options under Mitigation Measure M-TR-1B, the Project Variant's impacts to transit capacity would become **less-than-significant with mitigation**. Because the proposed changes are restricted to providing additional capacity for transit riders, they would not result to changes to pedestrian facilities or bicycle facilities, nor create potentially hazardous conditions or elsewhere interfere with pedestrian or bicycle accessibility. The shuttle service may need to be compliant with the City's Commuter Shuttle Program Policy, which includes measures to minimize effect on pedestrians and bicyclists. The proposed changes would not have an effect on parking provision. Therefore, the mitigation measure would result in **less-than-significant** pedestrian, bicycle, and parking impacts. The mitigation measure would not require any construction, so therefore it would result in a **less-than-significant** impact due to construction. There would also be a **less-than-significant** impact to emergency access since the mitigation measure does not propose to change existing access to the Project Site.

5.4.2.2 Downtown Screenlines

The Project Variant would generate 458 transit trips during the weekday AM peak hour and 517 transit trips during the weekday PM peak hour. Transit trips to and from the Project Site would use nearby Muni lines, BART, Caltrain, or regional bus service, and would transfer to and from other Muni bus and light rail lines as needed. Of these transit trips, 60 would cross the Downtown Screenlines inbound to Downtown in the AM peak hour, and 67 would cross the screenlines outbound away from Downtown in the PM peak hour; the remainder of the transit trips do not cross the Downtown Screenlines. As shown in **Table 5-8**, the addition of the 60 AM and 67 PM Project-generated transit trips crossing screenlines inbound in the AM peak hour and outbound in the PM peak hour would not increase screenline capacity utilization to greater than the 85 percent threshold. The Southwest screenline would operate at 94 percent utilization in the AM peak hour; however, the Project Variant would add only three trips to this screenline which is less than the threshold of five percent of ridership for screenlines exceeding the capacity utilization threshold under conditions without the Proposed Project.

Three subcorridors operate above the capacity utilization threshold of 85 percent in the Baseline Plus Project Variant condition: Subway lines—AM only, Fulton/Hayes—PM only, and Third Street—PM only. For each of these subcorridors, the Proposed Project contribution to the screenline would be less than five percent.

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TABLE 5-8: MUNI DOWNTOWN SCREENLINE CAPACITY UTILIZATION – PROJECT VARIANT						
Screenline	**Baseline[1]**			**Baseline Plus Project Variant**		
	Peak Hour[2] Baseline Ridership	**Peak Hour[2] Capacity**	**Peak Hour[2] Capacity Utilization**	**Peak Hour Proposed Project Trips**	**Peak Hour[2] Ridership**	**Peak Hour[2] Capacity Utilization**
AM Peak Hour						
Kearny/Stockton[3]	2,211	3,050	72%	8	2,219	73%
Other lines[4]	538	1,141	47%	3	541	47%
Northeast Screenline Total	*2,749*	*4,191*	*66%*	*11*	*2,760*	*66%*
Geary[5]	1,821	2,490	73%	6	1,827	73%
California[6]	1,610	2,010	80%	4	1,614	80%
Sutter/Clement[7]	480	630	76%	4	484	77%
Fulton/Hayes[8]	1,277	1,680	76%	3	1,280	76%
Balboa[9]	758	1,019	74%	3	761	75%
Northwest Screenline Total	*5,946*	*7,829*	*76%*	*20*	*5,966*	*76%*
Third Street[10]	359	793	45%	20	379	48%
Mission[11]	1,643	2,509	65%	0	1,643	65%
San Bruno/Bayshore[12]	1,690	2,134	79%	2	1,692	79%
Other lines[13]	1,468	1,756	84%	5	1,473	84%
Southeast Screenline Total	*5,160*	*7,192*	*72%*	*27*	*5,187*	*72%*
Subway lines[14]	6,330	6,205	**102%**	1	6,331	**102%**
Haight/Noriega[15]	1,121	1,554	72%	2	1,123	72%
Other lines[16]	465	700	66%	0	465	66%
Southwest Screenline Total	*7,916*	*8,459*	***94%***	*3*	*7,919*	***94%***

PM Peak Hour						
Kearny/Stockton[3]	2,245	3,327	67%	8	2,253	68%
Other lines[4]	683	1,078	63%	3	686	64%
Northeast Screenline Total	*2,928*	*4,405*	*66%*	*11*	*2,93*	*67%*
Geary[5]	1,964	2,623	75%	6	1,970	75%
California[6]	1,322	1,752	75%	5	1,327	76%
Sutter/Clement[7]	425	630	67%	5	430	68%
Fulton/Hayes[8]	1,184	1,323	**89%**	3	1,187	**90%**
Balboa[9]	625	974	64%	3	628	64%
Northwest Screenline Total	*5,520*	*7,302*	*76%*	*22*	*5,542*	*76%*
Third Street[10]	788	793	**99%**	23	811	**102%**
Mission[11]	1,407	2,601	54%	0	1,407	54%
San Bruno/Bayshore[12]	1,536	2,134	72%	2	1,538	72%
Other lines[13]	1,085	1,675	65%	5	1,090	65%
Southeast Screenline Total	*4,816*	*7,203*	*67%*	*30*	*4,846*	*67%*
Subway lines[14]	4,904	6,164	80%	1	4,905	80%
Haight/Noriega[15]	977	1,554	63%	3	980	63%
Other lines[16]	555	700	79%	0	555	79%
Southwest Screenline Total	*6,436*	*8,418*	*76%*	*4*	*6,440*	*77%*

Notes:
Bold indicates capacity utilization of 85 percent or greater.
1. Baseline condition is a modified existing condition.
2. AM Peak hour as inbound (i.e. toward Downtown) only; PM peak hour as outbound (i.e. away from Downtown) only
3. 8 Bayshore, 30 Stockton, 30X Marina Express, 41 Union, 45 Union-Stockton
4. F Market & Wharves, 10 Townsend, 12 Folsom/Pacific
5. 38 Geary, 38R Geary Rapid, 38AX Geary 'A' Express, 38BX Geary 'B' Express
6. 1 California, 1AX California 'A' Express, 1AX California 'B' Express
7. 2 Sutter, 3 Clement
8. 5 Fulton, 21 Hayes
9. 31 Balboa, 31AX Balboa 'A' Express, 31BX Balboa 'B' Express
10. T Third Street
11. 14 Mission, 14R Mission Rapid, 14X Mission Express, 49 Van Ness-Mission
12. 8AX Bayshore 'A' Express, 8BX Bayshore 'B' Express, 8 Bayshore, 9 San Bruno, 9L San Bruno Limited
13. J Church, 10 Townsend, 12 Folsom/Pacific, 19 Polk, 27 Bryant
14. KT Ingleside/Third Street, L Taraval, M Ocean View, N Judah
15. 6 Haight-Parnassus, 7/7R Haight-Noriega/Rapid, 7X Noriega Express, NX Judah Express
16. F Market & Wharves

Source: San Francisco Planning Department, May 2015; Fehr & Peers, 2016, see **Appendix E** for transit line capacity calculations

Therefore, the Proposed Project's impact to Muni transit capacity would be **less-than-significant.** As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

5.4.2.3 Regional Transit

The Project Variant would add approximately 140 weekday AM peak hour and 158 weekday PM peak hour transit trips to regional transit providers. During the AM peak hour, this includes 32 transit trips to the East

Bay, 103 transit trips to the South Bay,[60] and five transit trips to the North Bay. During the PM peak hour, this includes 37 transit trips to the East Bay, 115 transit trips to the South Bay, and six transit trips to the North Bay. The thresholds for regional operators is 100 percent, compared to 85 percent for Muni. As shown in **Table 5-9**, the East Bay screenline would operate at 102 percent in the AM peak hour. However, the Project Variant would add only 32 trips to this screenline, which is less than the threshold of five percent of ridership for screenlines exceeding the capacity utilization threshold under conditions without the Proposed Project. Therefore, the Project Variant would have a **less-than-significant** impact to regional transit capacity. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

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[60] Because there are no proposed direct transit links to nearby Caltrain stations, transit passengers traveling to and from the South Bay are expected to utilize first/last mile services such as taxi, employer shuttles, TNCs, or bicycling to access Caltrain.

TABLE 5-9: REGIONAL TRANSIT SCREENLINE - PROJECT VARIANT						
Screenline	Baseline[1]			Baseline Plus Project Variant		
	Baseline Ridership	Peak Hourly Capacity	Capacity Utilization	Project Trips	Ridership	Capacity Utilization
AM Peak Hour						
East Bay						
BART	25,400	23,256	**109%**	32	25,432	**109%**
AC Transit	1,568	2,829	55%	0	1,568	55%
Ferries	810	1,170	69%	0	810	69%
Screenline Subtotal	*27,778*	*27,255*	***102%***	*32*	*27,810*	***102%***
North Bay						
Golden Gate Transit	1,330	2,543	52%	4	1,334	52%
Ferries	1082	1,959	55%	1	1083	55%
Screenline Subtotal	*2,412*	*4,502*	*54%*	*5*	*2,417*	*54%*
South Bay						
BART	14,151	19,367	73%	31	14,182	73%
Caltrain	2,173	3,100	70%	72	2,245	72%
SamTrans	255	520	49%	0	255	49%
Screenline Subtotal	*16,579*	*22,987*	*72%*	*103*	*16,682*	*73%*
Regional Total	*46,769*	*54,744*	*85%*	*140*	*46,909*	*86%*
PM Peak Hour						
East Bay						
BART	24,490	22,784	**107%**	37	24,527	**108%**
AC Transit	2,256	3,926	57%	0	2,256	57%
Ferries	805	1,615	50%	0	805	50%
Screenline Subtotal	*27,551*	*28,325*	*97%*	*37*	*27,588*	*97%*
North Bay						
Golden Gate Transit	1,384	2,817	49%	4	1,388	49%
Ferries	968	1,959	49%	1	969	49%
Screenline Subtotal	*2,352*	*4,776*	*49%*	*5*	*2,357*	*49%*
South Bay						
BART	13,502	18,900	71%	35	13,537	72%
Caltrain	2,381	3,100	77%	81	2,462	79%
SamTrans	141	320	44%	0	141	44%
Screenline Subtotal	*16,024*	*22,320*	*72%*	*116*	*16,140*	*72%*
Regional Total	*45,927*	*55,421*	*83%*	*158*	*46,085*	*83%*

Notes:

Bold indicates capacity utilization of 100 percent or greater.

1. Baseline condition is a modified existing condition.

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015. San Francisco Planning Department, "Updated BART Regional Screenlines – Revised," October 17, 2016; Fehr & Peers, 2016.

5.5 TRANSIT DELAY IMPACTS

Transit delay impacts were evaluated based on the Project's impacts to nearby transit operations and transit delay.

A quantitative transit delay analysis is prompted by a number of distinctive factors of the Project: the large size of the Project and associated trips generated by it (over 2,000 vehicle trips in a typical peak hour for the Project and over 2,600 vehicle trips in a typical peak hour for the Variant), the constrained site circulation and access (i.e. a singular access route to the west), and the presence of transit service along the Innes Avenue corridor. The transit delay analysis consists of an evaluation of how the addition of Proposed Project or Project Variant vehicle trips to the roadway network would affect the travel time of transit that operates in the Project vicinity. As stated in Section 5.1, the Proposed Project (or Project Variant) would have a transit impact if project-generated trips cause an increase in transit travel time of at least half a headway in the round-trip travel time for a particular transit route as a result of the Project. The half-headway threshold represents the tipping point at which investment in an additional transit vehicle would be required to counterbalance degradation in transit travel times to maintain the same headway. Transit delay consists of congestion delay caused by Project vehicle trips plus delay caused by Project boardings and alightings while the bus is dwelling at a stop.

The study area for this corridor analysis is the Evans Avenue–Hunters Point Boulevard–Innes Avenue corridor between Third Street and Donahue Street, which is approximately 1.4 miles long. While no one unique route travels the extent of this corridor in this scenario, different routes would overlap to serve the entire corridor at different levels of completion of the CPHPS Transportation Plan. Therefore, this is a non-route-specific presentation of transit delay impacts along the entire corridor. As part of the CPHPS project's approvals, a mitigation measure to provide transit-only lanes along Evans Avenue between Third Street and Jennings Street was identified; that measure is not assumed to be in place in any of the Baseline scenarios because it is not expected to be triggered until beyond 2022.

Transit service would be unchanged from what currently exists, and thus the highest frequency route along the Evans Avenue—Hunters Point Boulevard—Innes Avenue corridor would be the 44 O'Shaughnessy (although it does not serve the Project Site directly) with a frequency of 8 and 9 minutes in the AM and PM period, respectively. The 19 Polk, which does serve the Project directly, has frequency of 15 minutes in both periods. Therefore, the significance threshold for this scenario would vary depending on which bus route was under consideration. Namely, the significance threshold for the 19 Polk route would be equal to 4 minutes in the AM period and 4½ minutes in the PM period, while the significance threshold for the 44 O'Shaughnessy route would be equal to 7½ minutes in both the AM and PM periods.

The Proposed Project would generate around 2,000 vehicle trips in both the AM and PM peak hours and the Project Variant would generate around 2,600 vehicle trips in both the AM and PM peak hours. A large majority of the Project vehicle traffic would travel along Evans Avenue, Hunters Point Boulevard, and Innes Avenue to the west of the Project Site to access other destinations in the city and region. Therefore the Project would cause increases to traffic congestion primarily at nearby intersections along these streets to the west of the Project Site.

Baseline project-caused transit delay was analyzed using Synchro intersection delay calculations (i.e. a macroscopic traffic analysis) for the Baseline Scenario, and Project ridership forecasts for each route were incorporated to account for increased dwell time caused by boarding and alighting of Project transit trips. Intersection delays with and without the Proposed Project or Project Variant were compared, and the difference in intersection delay was attributed to the presence of the Proposed Project or Project Variant.

For each bus route, the Project's forecasted peak hour bus ridership was divided by the number of buses per hour, yielding the expected number of project-generated passengers per bus trip. Added boarding delay was estimated as equal to two seconds per added passenger. The sum of project-added intersection delay at all intersections traversed by each bus route and project-added boarding delay, in both directions, constituted total added transit delay associated with the Proposed Project or Project Variant along the corridor. The results of the baseline transit delay analysis are presented in **Table 5-10**. Details of this analysis are presented in **Appendix L**.

The combination of the congestion delay plus the boarding/alighting delay due to the Proposed Project or Project Variant trips in the AM or PM peak hours would not lead to an increase in round-trip travel time to buses of greater than half of each bus route's peak-hour headway. Therefore, the Proposed Project and Project Variant's transit delay impact for the Baseline scenario would be **less-than-significant**.

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TABLE 5-10: BASELINE TRANSIT DELAY IMPACTS

Project	Time Period	Measure	Muni Route	
			19 Polk	44 O'Shaughnessy
Proposed Project	AM Peak Hour	Added Intersection Delay (s)	22	15
		Added Boarding Delay (s)	65	27
		Total Added Delay (s)	*86*	*42*
		Significance Threshold (s)	450	240
		Significant Impact?	No	No
	PM Peak Hour	Added Intersection Delay (s)	31	14
		Added Boarding Delay (s)	82	40
		Total Added Delay (s)	*113*	*54*
		Significance Threshold (s)	450	270
		Significant Impact?	No	No
Project Variant	AM Peak Hour	Added Intersection Delay (s)	45	18
		Added Boarding Delay (s)	123	54
		Total Added Delay (s)	*168*	*72*
		Significance Threshold (s)	450	240
		Significant Impact?	No	No
	PM Peak Hour	Added Intersection Delay (s)	49	27
		Added Boarding Delay (s)	143	66
		Total Added Delay (s)	*192*	*93*
		Significance Threshold (s)	450	270
		Significant Impact?	No	No

Notes:
1. "Added Delay" is the total delay caused by the Project above and beyond No Project baseline conditions. Added delay is presented as the sum of inbound and outbound project-caused delay.

Source: Fehr & Peers, 2016

5.6 BICYCLE IMPACTS

The first part of this section describes the City of San Francisco bicycle parking requirements per the Planning Code, as they relate to the project. The second part describes the bicycle circulation impacts in the area around the Project Site.

5.6.1 Bicycle Parking

The City of San Francisco Planning Code Section 155.2 specifies the following Class 1 and Class 2 bicycle space minimum requirements as outlined in **Table 5-11**, below.

- **Class 1 bicycle parking** can include bicycle lockers, check-in facilities, monitored parking, or other types of restricted-access parking areas. Required bicycle parking spaces shall not be provided within dwelling units, balconies, or required open space. Bicycle parking must otherwise meet the standards set out for Class 1 parking as described in Section 155.1 of the Planning Code.

- **Class 2 bicycle parking** should constitute racks located in a publicly-accessible, highly visible location intended for transient or short-term use by visitors, guests, and patrons to the building or use. They shall be located, as feasible, near all main pedestrian entries to the uses to which they are accessory, and should not be located in or immediately adjacent to service, trash or loading zones.

TABLE 5-11: BICYCLE PARKING CODE REQUIREMENTS

Land Use	Class 1 Minimum Requirement	Class 2 Minimum Requirement
Dwelling units (including SRO units and student housing that are dwelling units)	One Class 1 space for every dwelling Unit. For buildings containing more than 100 dwelling units, 100 Class 1 spaces plus one Class 1 space for every four dwelling units over 100. Dwelling units that are also considered Student Housing per Section 102.36 shall provide 50 percent more spaces than would otherwise be required.	One per 20 units. Dwelling units that are also considered Student Housing per Section 102.36 shall provide 50 percent more spaces than would otherwise be required.
Personal Services, Financial Services, Restaurants, Limited Restaurants and Bars	One Class 1 space for every 7,500 square feet of occupied floor area.	Minimum two spaces. One Class 2 space for every 750 square feet of occupied floor area.
Offices	One Class 1 space for every 5,000 occupied square feet	Minimum two spaces for any office use greater than 5,000 gross square feet, once Class 2 space for each additional 50,000 occupied square feet.
Retail Sales, including grocery stores	One Class 1 space for every 7,500 square feet of occupied floor area.	Minimum two spaces. One Class 2 space for every 2,500 sq. ft. of occupied floor area. For uses larger than 50,000 gross square feet, 10 Class 2 spaces plus one Class 2 space for every additional 10,000 occupied square feet.
Personal Services, Financial Services, Restaurants, Limited Restaurants and Bars	One Class 1 space for every 7,500 square feet of occupied floor area.	Minimum two spaces. One Class 2 space for every 750 square feet of occupied floor area.
School	Four Class 1 spaces for every classroom.	One Class 2 space for every classroom.
Open Space	None required.	None required.

Source: City of San Francisco Planning Code Section 155.2

The amount of bicycle parking required is shown in **Table 5-12**, below. For the Proposed Project, 1,369 Class 1 and 162 Class 2 bicycle parking spaces are required. For the Project Variant, 771 Class 1 and 185 Class 2 bicycle parking spaces are required.

TABLE 5-12: BICYCLE PARKING REQUIRED						
Land Use	Proposed Project			Project Variant		
	Size	Class 1 Required Spaces	Class 2 Required Spaces	Size	Class 1 Required Spaces	Class 2 Required Spaces
Dwelling Units	1,240 du	1,240[1]	62	500 du	500[1]	25
Office	174,930 sf	35	6	860,000 sf	172	20
Retail (including supermarket)	65,400 sf	9	27[2]	95,000 sf	13	60[2]
Restaurants	35,000 sf	5	47	45,000 sf	6	60
School[3]	20 classrooms	80	20	20 classrooms	80	20
Open Space	829,700 sf	-	-	829,700 sf	-	-
Total		*1,369*	*162*		*771*	*185*

Notes:
1. The Class 1 bicycle parking requirement rate for dwelling units decreases in buildings with more than 100 units. This calculation assumes that no single building in the development has more than 100 units; the number of required Class 1 bicycle parking spaces would be slightly lower in any buildings with more than 100 units, and therefore this calculation is conservative.
2. The Class 2 bicycle parking requirement rate for retail decreases in buildings with more than 50,000 square feet. This calculation assumes that no single building in the development has more than 50,000 square feet of retail use; the number of required Class 2 bicycle parking spaces would be slightly lower in any buildings with more than 50,000 square feet of retail space, and therefore this calculation is conservative.
3. The San Francisco Planning Code specifies different bicycle parking requirements for schools (see **Table 5-11**).

Source: City of San Francisco Planning Code Section 155.2

The Proposed Project and Project Variant propose to provide bicycle parking spaces in compliance with the Planning Code requirements.

Bicycle parking would be provided for school employees and students, and would be provided in the school grounds and in the parking garage nearest to the school.

5.6.2 Bicycle Circulation

The Proposed Project is expected to increase bicycle demand in the area, by 101 new AM peak hour trips and 103 new PM peak hour trips. The Project Variant would produce 138 new AM peak hour trips and 131 new PM peak hour trips by bicycling.

As discussed in Section 3.2, the Baseline Scenario includes several bicycle facilities (primarily Class II Bicycle Lanes and Class III Bicycle Routes) in the area around the Proposed Project. As part of the Proposed Project and Project Variant, additional bicycle facilities would be implemented and bicycle access would be improved from the Baseline Scenario. The Class II Bicycle Lanes included along Hunters Point Boulevard and Innes Avenue in the Baseline Scenario would be removed by the Proposed Project and Project Variant, and the bicycle facility would be relocated to a parallel Class I facility on Hudson Avenue. A map of the bicycle network for Baseline Plus Proposed Project is shown in Figure 14. The network would be identical for Baseline Plus Project Variant.

5.6.2.1 Internal Circulation

Within the Project Site, the Proposed Project would include a Class IV cycle-track along New Hudson Avenue through the Project Site. This facility would provide a higher level of protection for east-west cyclists than exists under Baseline Scenario. The Proposed Project would also complete the segment of the Bay Trail/Blue Greenway running along the shoreline through the Project Site. Within the Project Site, Spring Lane, Fairfax Lane, and Beach Lane, which form a loop to access the buildings north of New Hudson Avenue, would have a Class III bicycle route. Recreational paths would provide bicycle access from these bicycle lanes to the Bay Trail in two locations: at the corner of Spring Lane/Fairfax Lane and at the corner of Fairfax Lane/Beach Lane. Two additional recreational paths would provide a connection from New Hudson Avenue and Hudson Avenue to the Bay Trail on either side of Earl Street. Earl Street would also have a Class III bicycle route. The Proposed Project's bicycle facilities would provide a robust bicycle network within the site to connect to nearby facilities, improving bicycle accessibility in the area. These additional bicycle facilities would also reduce hazards for bicyclists; by providing designated or protected bicycle facilities, the Proposed Project would reduce bicycle-vehicle conflicts.

The eastern terminus of the project-funded Class IV bicycle facility along New Hudson Avenue within the Project Site would be at the intersection with Earl Street. FivePoint, the developer of the adjacent Hunters Point Shipyard project, which includes the Northside Park opposite Earl Street from the Proposed Project, has tentatively agreed to fund the continuation of the facility through Northside Park, although no formal commitments have been made and the park's design is still in progress.

5.6.2.2 Access to the Project Site

The Project Site is within convenient bicycling distance (approximately three miles or less) of office and retail buildings in the Hunters Point, Dogpatch, Potrero Hill, and Bayview neighborhoods. As such, it is anticipated that a substantial portion of the non-motorized trips generated by the Proposed Project would be bicycle trips. As noted on **Figure 6**, there are bicycle routes nearby to the Project Site, including bicycle lanes on Evans Avenue and the Bay Trail. Bicyclists heading to or from the north, south, or west would connect to one of the several existing bicycle facilities in the area, including the Class III bicycle routes on Third Street/Phelps Street (Route 7), Third Street (Route 5), Silver Avenue/Palou Avenue (Route 70), and the Class II bicycle lanes on Cesar Chavez Street (Route 60) and Oakdale Avenue (Route 170). Bicyclists heading east towards Hunters Point would use the Bay Trail. Nearly all bicycle travel near the Project Site is east-west; the steep hillside results in limited north-south connectivity and bicycle travel.

With construction of the Proposed Project, bicycle facilities would be present on the streets adjacent to the Project Site. On Hunters Point Boulevard and Evans Avenue, the street section would include a Class II bicycle facility (bike lanes in each direction). No bicycle facilities would be present along Hunters Point Boulevard or Innes Avenue between Hawes Street and Earl Street as a Class IV cycle-track provided within the Project Site on New Hudson Avenue would parallel Innes Avenue, forming a continuous two-way cycle-track from Jennings Street to the Northside Park adjacent to the Hunters Point Shipyard project. While the Project would move the bicycle facility east of Hawes Street away from the Class II facility on Hunters Point Boulevard and Innes Avenue, leading to some bicycle lane removal, the proposed Class IV facility would be a general improvement over the current facility for cyclists traveling east-west along the corridor.

The conditions surrounding the Project Site present limited hazards to bicyclists. No corridors adjacent to the Project Site have been designated as Vision Zero High Injury Corridors for the City of San Francisco, as there were zero bicyclist injuries and fatalities in this area between 2007 and 2011. Locations where vehicles cross a bicyclist's path of travel are potential conflict areas. These locations could include vehicles turning into and out of driveways, as well as intersection turning movements that cross a high volume of cyclists. There are few driveways along corridors connecting to the Project Site, so there would be minimal opportunities for this type of conflict. In sum, the Proposed Project would not create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility within the Project Site and in the surrounding area.

As discussed above, the Project would comply with the Planning Code requirements for bicycle parking; the Project would not increase bicycle traffic to a level that adversely affects bicycle facilities in the area; nor would the Proposed Project create a new hazard or substantial conflict to bicycling. The Project would not negatively affect bicycle accessibility to the Project Site or adjoining areas. Thus, the Project's impact to bicycle facilities and circulation would be considered **less-than-significant** for both the Proposed Project and Project Variant. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

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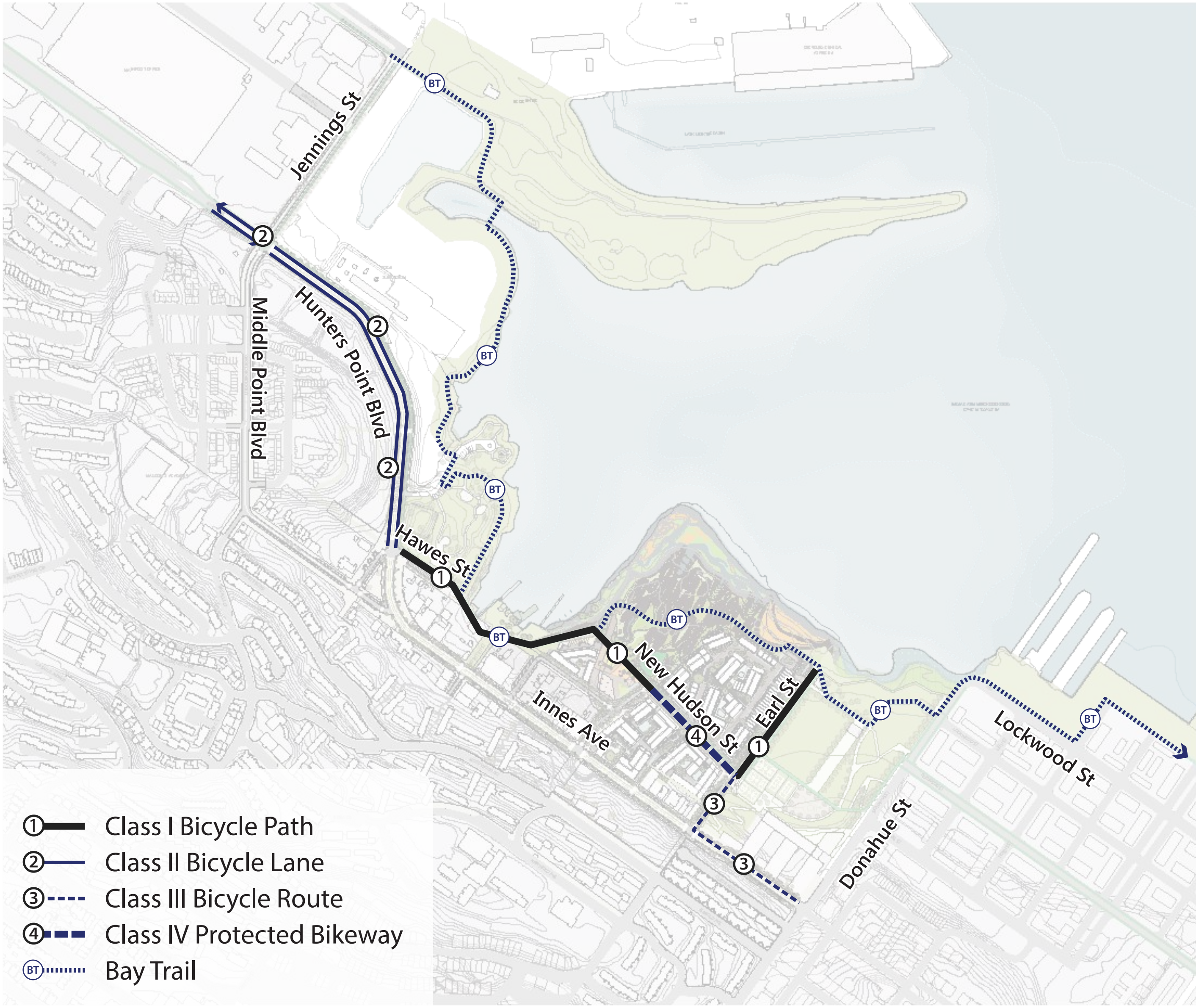

Figure 10

Baseline Plus Project Bicycle Network

5.7 PEDESTRIAN IMPACTS

Pedestrian trips generated by the Proposed Project would include walk trips to and from the local and regional transit stops, as well as some walk trips to and from nearby complementary land uses. The Proposed Project would generate 478 walk trips in the AM peak hour and 947 during the weekday PM peak hour. The Project Variant would generate 461 walk trips in the AM peak hour and 1,013 during the weekday PM peak hour.

In addition to walk trips between the Project Site and other uses, project-generated transit trips would begin as pedestrian trips traveling to the appropriate transit stop. Residents and employees traveling to and from the site to access transit would typically access the 19 Polk on Innes Avenue. They may also walk to access the 44 O'Shaughnessy on Hunters Point Boulevard. Some may walk to access the 54 Felton on Northridge Road although this includes an elevation climb of 950 feet along a stairwell which may be inconvenient for many pedestrians. Pedestrian changes included as part of the Project would provide adequate pedestrian access along Innes Avenue to the 19 Polk and the 44 O'Shaughnessy on Hunters Point Boulevard, as they will fill the existing gaps in the sidewalk network on the north side of the street along the Project frontage, and improve pedestrian crossings across Innes Avenue by restriping crosswalks and signalizing the intersections so that vehicles must stop while pedestrians have right-of-way to cross (except turning vehicles which would have to yield). Proposed crosswalks and sidewalk infill that are part of the Baseline scenarios would provide adequate pedestrian access to existing staircases that provide access to the nearest 54 Felton bus stops on Northridge Road.

The Project's access points would be on Hudson Avenue from Hunters Point Boulevard to the west, from Earl Street and Northside Park to the east, and from four pedestrian pathways into the site from Innes Avenue to the south, as shown in **Figure 2J**. Pedestrians would access the Project Site from Innes Avenue at Griffith Street, Arelious Walker Drive, and Earl Street, and from pedestrian paths between Griffith Street and Arelious Walker Drive and between Arelious Walker Drive and Earl Street.

The Proposed Project would include the construction of pedestrian facilities along each of the new internal project streets, in addition to changes to the pedestrian realm along the north side of Innes Avenue and Hunters Point Boulevard in the vicinity of the Project as explained in Section 2.5. Internal to the Project Site, all streets would have sidewalks that meet ADA requirements and Better Streets Plan requirements. External to the Project Site, the sidewalks along Hunters Point Boulevard and the south side of Innes Avenue would meet ADA requirements.

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TABLE 5-13: SIDEWALK WIDTH GUIDELINES					
Street	Better Streets Plan			Existing Width	Baseline Plus Project Width
	Street Type[1]	Minimum Width	Recommended Width		
External to Project Site					
Hunters Point Boulevard	Commercial Throughway	12′	15′	6′-9′	**8′-10′**
Innes Avenue (Hunters Point Blvd to Griffith)	Commercial Throughway	12′	15′	7′	**7′**
Innes Avenue (Griffith to Earl)	Commercial/ Residential Throughway[2]	12′	15′	0′-8′	**5′-7′**
Innes Avenue (Earl to Donahue)	Residential Throughway	12′	15′	0′-9′	**5′-7′**
Internal to Project Site					
New Hudson Avenue	Neighborhood Commercial	12′	15′	n/a	15′
Arelious Walker Drive	Neighborhood Commercial	12′	15′	6′	22′-23′
Earl Street	Neighborhood Commercial	12′	15′	0′-11′	15′
Griffith Street	Neighborhood Commercial	12′	15′	n/a	13′-15′
New Hudson Avenue	Neighborhood Commercial	12′	15′	n/a	15′
Spring Lane	Shared Public Way	n/a	n/a	n/a	6.5′-9′[3]
Fairfax Lane	Shared Public Way	n/a	n/a	n/a	6.5′-9′[3]
Beach Lane	Shared Public Way	n/a	n/a	n/a	6.5′-9′[3]

Notes:
Bold indicates that Baseline Plus Proposed Project width is less than the Better Streets Plan minimum width.

1. Street type designations are taken from San Francisco Planning Department, Online at sftransportationmap.org, Accessed February 15, 2017.
2. Commercial Throughway west of Arelious Walker Drive and Residential Throughway east of Arelious Walker Drive.
3. Spring Lane, Fairfax Lane, and Beach Lane are designated as shared use between vehicles, bicyclists, and pedestrians. The Project proposes a 6.5-9′ sidewalk throughway plus a 20′ foot right-of-way to be shared by all users.

Source: Source: Draft IBTAP, 2015; India Basin Design Guidelines and Standards Draft, January 30, 2017.

All internal roadways would be two lane roads, some with on-street parking which is likely to result in lower travel speeds (i.e. at most 25 miles per hour). The Proposed Project would also include a shared street treatment on Spring Lane, Fairfax Lane, and Beach Lane, with curbless streets designed to prioritize pedestrian travel by implicitly slowing traffic speeds to approximately 5-15 miles per hour using pedestrian volumes, design, and other cues to slow or divert vehicle traffic. The intent of shared streets is to increase driver awareness of other road users to result in more careful driving and lower travel speeds. The India

Basin Design Guidelines & Standards includes a section related to "Public Realm", focused on the interior of the Project Site. This report, currently being developed by Build (draft released in January 2017), explains the application of varying City regulations to the Project design, such as parking requirements. All streets and sidewalk designs have undergone preliminary review by DPW's Disabled Access Coordinator, and the plans will be submitted for final approval when submitted to the City with the Subdivision Map application. Final designs would be subject to approval by the SFMTA, San Francisco Fire Department, and the Department of Public Works to ensure that the streets are designed consistent with ADA and City policies and design standards.

Additionally, the project would make modifications to the Bay Trail which runs along the San Francisco Bay to the north side of the Project Site. As part of the Proposed Project, the portion of the Bay Trail passing through the Project Site would be completed, providing connections to each side for this planned multi-use path along the eastern waterfront of San Francisco. The access points along Innes Avenue would be signalized as part of the Proposed Project, and would include pedestrian phases for pedestrian travel across the proposed crosswalks at each of these intersections. These pedestrian phases would provide for a safer environment for pedestrians to cross at these location where there would be higher speeds, higher automobile volumes, and wider right-of-way than internal to the project site.

Intersections would be designed to meet ADA requirements with curb ramps with truncated domes. Additionally, each intersection would be designed to incorporate pedestrian safety elements such as marked crosswalks and pedestrian countdown timers. All new intersections would be designed to City standards, generally as compact as possible (given design vehicle requirements for turning) for a pedestrian-friendly design. All new crosswalks on public streets would be compliant with the Better Streets Plan, which recommends that crosswalks be marked with the continental striping pattern for high visibility.

External to the Project Site, the Baseline scenario includes reconstruction of the existing sidewalks along Hunters Point Boulevard and Innes Avenue and the construction of new sidewalks along the south side of Innes Avenue where no sidewalks are currently present. The proposed sidewalk networks in the Baseline would be consistent with ADA requirements.

Pedestrian travel to nearby land uses would occur along the Blue Greenway, a dedicated bike/pedestrian path that goes through the Project Site, or along Innes Avenue. Pedestrians would likely use the sidewalk on the north side of Innes Avenue, adjacent to the Project Site, due to its proximity to the Project Site, the livelier land use mix on the north side of Innes Avenue, and the generally greater sidewalk width. Pedestrian travel to transit stops along Innes Avenue would similarly involve exiting the Project Site via internal streets, then traveling along Innes Avenue and crossing Innes Avenue, when necessary, at a marked crosswalk. All Project crosswalks would be striped as continental crosswalks to be compliant with the Better Streets Plan.

The school's primary pedestrian entry would be located on its southern frontage, next to the auxiliary yard, just off of Earl Street. This entry would be immediately adjacent to a proposed passenger loading zone on Earl Street. A public walkway would run along the school's western frontage, and sidewalks would be installed along the proposed school's northern and eastern frontages (along New Hudson Avenue and Earl Street, respectively). Within close proximity to the school, crosswalks are planned across Earl Street at New Hudson Avenue and at Innes Avenue, as well as across Innes Avenue at Earl Street and across New Hudson Avenue at Earl Street. Students and staff accessing the school by transit would likely alight along Innes Avenue at either Arelious Walker Drive or Earl Street depending on the route. From either location, the students and staff would have continuous sidewalk access to the main school entrance.

While some of the pedestrian facilities included in the Baseline scenarios would not meet the minimum desired width in the Better Streets Plan, those changes would meet ADA requirements and would generally result in a net improvement from current conditions (where sidewalks are very narrow or non-existent) and thus represent a net benefit for users. Compared to most other areas within San Francisco, existing pedestrian volumes in the vicinity of the Project Site are very low, due to its comparatively remote location. Combining the existing activity with additional activity associated with projects that would be operating under the Baseline scenario, the amount of pedestrian activity added by the Proposed Project or Project Variant would not exceed the capacity of the proposed sidewalk widths within and adjacent to the Project Site.

The proposed pedestrian facilities would not create potentially hazardous conditions for pedestrians or interfere with pedestrian accessibility to the site. The Proposed Project would include three parking garages. Cove Parking Garage would have one driveway on New Hudson Avenue, Flats Parking Garage would have a driveway on Arelious Walker Drive and a driveway on Earl Street, and the Hillside Parking Garage would have a driveway on Spring Lane and a driveway on Beach Lane. Each driveway would present an opportunity for vehicle/pedestrian conflicts, however, the driveways would not create hazardous conditions for pedestrians. The internal streets and driveways would be designed to keep vehicle speeds low. In addition, audio and visual alerts installed at project driveways would notify pedestrians of oncoming vehicles exiting the driveways.

Generally, the Proposed Project and Project Variant's pedestrian network would be adequate to accommodate expected pedestrian demand, would not create potentially hazardous conditions for pedestrians, nor otherwise interfere with pedestrian accessibility to the site and adjoining areas, and therefore would result in a **less-than-significant** impact. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

The Proposed Project's parking structures would be dispersed throughout the site, with driveways that could create conflicts with pedestrians as vehicles queue to enter or exit the parking structures. These conflicts would be minimized by the internal street and driveway design, which would reduce vehicle speeds and alert vehicles to pedestrians. In addition, the effect of vehicle queuing across sidewalks should be minimized with implementation of **Improvement Measure I-TR-1**, to ensure that pedestrian travel is unimpeded:

Improvement Measure I-TR-1: Queue Abatement

As an improvement measure to minimize the vehicle queues at the Proposed Project garage entrances into the public right-of-way, the Proposed Project would be subject to the Planning Department's vehicle queue abatement Conditions of Approval[61] (see **Appendix K**).

Although each of the four components of the Proposed Project would be subject to the Queue Abatement Conditions of Approval, only the 700 Innes parcel would have parking garages and therefore the measure is applicable to that parcel only.

It shall be the responsibility of the owner/operator of any off-street parking facility located at the 700 Innes property with more than 20 parking spaces (excluding loading and car-share spaces) to ensure that recurring vehicle queues do not occur on the public right-of-way. A vehicle queue is defined as one or more vehicles (destined to the parking facility) blocking any portion of any

[61] The queue abatement conditions of approval were established in a Memo to the Planning Commission, *Condition of Approval to address vehicle queues*, dated November 23, 2010

public street, alley or sidewalk for a consecutive period of three minutes or longer on a daily or weekly basis.

If a recurring queue occurs, the owner/operator of the parking facility shall employ abatement methods as needed to abate the queue. Appropriate abatement methods will vary depending on the characteristics and causes of the recurring queue, as well as the characteristics of the parking facility, the street(s) to which the facility connects, and the associated land uses (if applicable). Suggested abatement methods include but are not limited to the following: redesign of facility to improve vehicle circulation and/or on-site queue capacity; employment of parking attendants; installation of LOT FULL signs with active management by parking attendants; use of valet parking or other space-efficient parking techniques; use of off-site parking facilities or shared parking with nearby uses; use of parking occupancy sensors and signage directing drivers to available spaces; travel demand management strategies such as additional bicycle parking, customer shuttles, delivery services; and/or parking demand management strategies such as parking time limits, paid parking, time-of-day parking surcharge, or validated parking.

If the Planning Director, or his or her designee, suspects that a recurring queue is present, the Department shall notify the property owner in writing. The Property Owner shall have no less than 45 days to take reasonable measures to abate the queues. If after 45 days, the Planning Director, or his or her designee, reasonably believes, upon further examination that the abatement measures have not been effective, then the Planning Director may suggest additional measures or may request, the owner/operator shall hire a qualified transportation consultant to evaluate the conditions at the site for no less than seven days. The consultant shall prepare a monitoring report to be submitted to the Department for review. If the Department determines that a recurring queue does exist, the facility owner/operator shall have 90 days from the date of the written determination to abate the queue.

5.8 LOADING IMPACTS

This section describes the Proposed Project's freight and delivery (i.e. goods) loading impacts. A project would have a significant effect on the environment if it would result in a loading demand during the peak hour of loading activities that could not be accommodated within proposed on-site loading facilities or within convenient on-street loading zones and it would create potentially hazardous conditions or significant delays affecting traffic, transit, bicycles or pedestrians.

In this analysis it is assumed that loading demand for the RPD site would not use loading zones provided on or adjacent to the Build property, and vice versa. This is because the loading zones would be sufficiently far enough from each other that loading demand for one property would be very unlikely to use supply provided on or adjacent to the other property.

5.8.1 Existing Uses

On-street loading demand for the existing commercial and residential land uses along Innes Avenue that would remain with construction of the Proposed Project is not expected to change. For existing residential uses nearby, on-street loading amounts to move-in/move-out events, which would occur on an infrequent basis and for which a special permit can be obtained from SFMTA to reserve nearby on-street parking spaces for this purpose. All commercial uses nearby currently use off-street loading into their garages and warehouse spaces as there are currently no designated on-street loading spaces. To the extent that some commercial uses may currently use nearby on-street parking spaces for occasional goods loading, this could continue after construction of the Proposed Project or Project Variant as parking would still be available on each side of Innes Avenue on each block that businesses are located on.

5.8.2 Build Property: 700 Innes Avenue

5.8.2.1 Residential, Commercial, Retail, and School Goods Loading

The proposed off-street loading spaces discussed below are each at least 35 feet long and 12 feet wide to meet the dimension requirements set by the Planning Code. There would be a built-in vertical height buffer in the overall building design for the proposed parking garages that would allow for 14-foot vertical clearance for all loading spaces within the parking garages.

Residential loading demand would typically be generated when tenants move in and out of the building and would require a parking permit if they park large moving trucks on-street. Due to the high number of units, move in and move out would be a frequent occurrence, occurring multiple times per week. Parcel delivery vehicles (e.g., UPS) would also arrive at the residential buildings; however, these deliveries are usually short and would not substantially affect conditions around the site. The four dual-use on-street loading spaces could be used for short delivery and residential move in and move out, for which parking permits may be required. The off-street loading zones could also be used. The preliminary locations for the four on-street dual-use loading zones on the Build property that could accommodate residential loading have been identified, but final locations are yet to be determined. Preliminary locations are one loading zone on Earl Street, one on Arelious Walker Drive, and two on Fairfax Lane. The Project Sponsor would apply to the SFMTA for final authorization for the on-street loading spaces.

Commercial loading demand would typically be generated by trucks delivering goods to businesses, such as the restaurants and retail tenants. These deliveries would primarily occur in the off-street loading zones located in the underground parking garages (Proposed Project would have 14 and Project Variant would have 23), which would be used for commercial loading only. Some commercial loading, typically the parcel deliveries and other deliveries featuring smaller vehicles, would occur at the four on-street dual-use loading zones on the Build property.

The Project's school would have a loading demand for one delivery/freight loading spaces during the average and peak hour. School loading would typically be generated by food delivery trucks, parcel delivery vehicles, and other short-term services. These deliveries would occur at an off-street loading dock contained within a nearby parcel.

The four on-street loading zones on the Build property are assumed to be dual use for the purposes of this analysis and it is assumed that during the peak demand hour, half (two) of the spaces are available for goods/delivery loading and the remaining for passenger loading. The school passenger loading zone is not considered part of available supply for goods loading.

Proposed Project and Proposed Variant loading demand is reported as the sum of individual land use loading demand, rounded up to the next integer. The Proposed Project would have a demand for 12 delivery/freight loading spaces during the average hour and 16 during the peak hour. The supply of 14 off-street loading zones plus two on-street goods/delivery loading zones (total of 16 spaces) on the Build property would meet loading demand for the Proposed Project. Therefore, the Proposed Project would have a **less-than-significant** impact on goods loading at the Build Property.

The Project Variant would have a demand for 20 delivery/freight loading spaces during the average hour and 25 during the peak hour. The supply of 23 off-street loading zones plus two on-street goods/delivery loading zones (total of 25 spaces) on the 700 Innes site would meet commercial loading demand during the peak hour for the Proposed Project Variant. The school loading zone is not considered part of available supply for these uses. Therefore, the Project Variant would have a **less-than-significant** impact on goods loading at the Build Property.

A summary of goods loading supply and demand is shown in **Table 5-14**.

TABLE 5-14: BUILD PROPERTY GOODS LOADING SUPPLY AND DEMAND SUMMARY

			Proposed Project	Project Variant
Demand	Residential	Average hour	1.7	0.6
		Peak hour	2.2	0.7
	Commercial/Retail/School	Average hour	10.1	18.7
		Peak hour	13.1	23.9
	Total	*Average hour*	*11.8*	*19.3*
		Peak hour	*15.3*	*24.6*
Supply		On-Street[1, 2]	2	2
		Off-Street	14	23
		Total	*16*	*25*

Notes:
1. Four dual use zones available; assumes two spaces available for goods loading at any one time (considered here) with the other two available for passenger loading at any one time (not considered here).
2. On-street supply does not include school loading zone.

While loading supply would be sufficient to meet the anticipated loading demand, the following improvement measure should be implemented to manage loading activity throughout the Project Site:

Improvement Measure I-TR-2: Active Loading Management Plan

If the Project Sponsor for the 700 Innes Property proposes to provide fewer loading spaces than required under the Special Use District (SUD) for the Project or Variant, the Project Sponsors would develop an Active Loading Management Plan for approval by Planning Department to address operational loading actions for City review and approval. The Active Loading Management Plan would facilitate efficient use of loading spaces and may incorporate the following ongoing actions to address potential ongoing loading issues:

- Direct residents and commercial tenants to schedule all move-in and move-out activities and deliveries of large items (e.g., furniture) with management of the respective building.
- Direct commercial and retail tenants to schedule deliveries, to the extent feasible.

- Reduce illegal stopping of delivery vehicles by directing the lobby attendants of each building and retail tenants to notify any illegally-stopped delivery personnel (i.e., in the red zones) that delivery vehicles should be parked within the on-street commercial loading spaces.

- Design the loading areas to include sufficient storage space for deliveries to be consolidated for coordinated deliveries internal to project facilities (i.e., retail and residential); and

- Design the loading areas to allow for unassisted delivery systems (i.e., a range of delivery systems that eliminate the need for human intervention at the receiving end), particularly for use when the receiver site (e.g., retail space) is not in operation. Examples could include the receiver site providing a key or electronic fob to loading vehicle operators, which enables the loading vehicle operator to deposit the goods inside the business or in a secured area that is separated from the business, but is accessible from a public right-of-way.

A Draft Active Loading Management Plan would be included as part of the Design Guidelines and Standards document for the entire Project site. A Final Active Loading Management Plan and all subsequent revisions, if implemented, would be reviewed and approved by the Planning Department. The Final Active Loading Management Plan would be approved prior to receipt of the first certificate of occupancy for the first parking/loading garage.

The Draft and Final Active Loading Management Plan would be evaluated by a qualified transportation professional, retained by the Project Sponsors and approved by the Planning Department, after the combined occupancy of the commercial and residential uses reaches 50 percent occupancy and once a year going forward until such time that the Planning Department determines that the evaluation is no longer necessary or could be done at less frequent intervals. The content of the evaluation report would be determined by Planning Department staff, in consultation with SFMTA, and generally shall include an assessment of on-site and on-street loading conditions, including actual loading demand, loading operation observations, and an assessment of how the project meets this improvement measure.

The Final Active Loading Management Plan evaluation report would be reviewed by Planning Department staff, which shall make the final determination whether there are conflicts associated with loading activities. In the event that the conflicts are occurring, Project Sponsor may propose modifications to the above Final Active Loading Management Plan requirements to reduce conflicts and improve performance under the Plan such as the hour and day restrictions to be included in the Active Loading Management Plan, number of loading vehicle operations permitted during certain hours, etc. to address the circumstances for review and approval by the Planning Department.

5.8.2.2 School and Childcare Facility Passenger Loading

The school would experience passenger loading demand relating to student drop-off/pick-up. To provide context for the expected passenger loading demand, **Table 5-15** shows the loading space provision per student at other San Francisco schools. With an enrollment of 450 students, the amount of loading space that would be appropriate to provide, consistent with these examples, is approximately 185 feet. While a preliminary location for an on-street drop-off/pick-up zone is shown in **Figure 2D**, the length and location of this zone are conceptual. The location will be further developed and reviewed for safety by the SFMTA before being finalized. SFMTA must approve the final designs prior to construction of the school.

TABLE 5-15: SCHOOL LOADING ZONE COMPARISON

School Name	Address	Enrollment	Loading Zone(s) Total Length (ft)	Loading (ft/student)
Schools of the Sacred Heart: Stuart Hall High School Campus	1715 Octavia Street	210 (K-12)	165	0.79
Schools of the Sacred Heart: Broadway Campus	2222 Broadway Street	850 (K-12)	300	0.35
San Francisco Friends School	250 Valencia Street	435 (K-8)	150	0.34
			Average Rate	*0.41*

Due to the comparably short periods of heavy drop-off and pick-up at the school, it will have a much higher level of passenger loading activity during its peak than any other of the proposed uses. Because of this, and because the design of the school passenger loading zone is not finalized, the school site passenger loading impacts are **significant**. To ensure adequate operations of the proposed school loading zone, the following mitigation measure is proposed:

Mitigation Measure M-TR-2: School Site Loading Plan

Once school enrollment reaches 22 students, the school will provide and enforce a pick-up/drop-off plan subject to review and approval by the SFMTA to minimize disruptions to traffic, bicycle, and pedestrian circulation associated with school pick-up/drop-off activities and ensure safety of all modes. This plan may include elements such as size and location of loading zone, parking monitors, staggered drop-offs, a number system for cars, one-way circulation, encouragement of car pools/ride-sharing, and a safety education program. The safety education program would be targeted at students, parents, school staff, and residents and businesses near the school site. Informational materials targeted to parents, nearby residents, and nearby employees shall focus on the importance of vehicular safety, locations of school crossings, and school zone speed limits and hours. The school is located on the 700 Innes parcel, and therefore, responsibility for implementing this Mitigation Measure would be on the 700 Innes component of the Proposed Project.

School site passenger loading impacts would be **less-than-significant with mitigation.**

Passenger loading for the childcare facility would be similar in nature to the school, but with a much lesser intensity given that daily enrollment is expected to be much lower than the school. While the specific location has not been identified, it would meet City requirements, such as be adjacent to code required open space, and be accompanied by a passenger loading zone whose proximity to the site and whose length would meet City standards. The length of the loading zone would be a function of projected number of children. Also, the details of design would have to be approved by City as part of Phase Application. The impact of passenger loading at the childcare facility would therefore be **less-than-significant**.

5.8.3 RPD Property: 900 Innes, India Basin Shoreline Park, and India Basin Open Space

The Proposed Project's open space does not specifically require loading spaces. While loading demand for the open spaces is expected to be low, particularly during weekdays, designing curb space adjacent to the open space would allow for loading activities. The Proposed Project proposes two loading zones adjacent to India Basin Shoreline Park, one on Hunters Point Boulevard at Hudson Avenue, and the other on Innes Avenue west of Griffith Street. The Project Sponsor would apply to the SFMTA for final authorization for the on-street loading spaces. Because no loading spaces are required at the open space, the Proposed Project and Project Variant would have a **less-than-significant** impact on loading at the RPD Property.

5.9 EMERGENCY ACCESS IMPACTS

The Project Sponsor will provide emergency vehicle access to the site off of Innes Avenue along Arelious Walker Drive, Hudson Avenue, New Hudson Avenue, Earl Street, Spring Lane, Fairfax Lane, and Beach Lane. The Project Sponsor has worked with San Francisco Fire Department (SFFD) to develop preliminary street designs for all internal streets that meet emergency access requirements. The action of SFFD reviewing and signing off on the subdivision map and final street design is part of the project approval process.

Emergency vehicles would approach the Project Site from nearby fire stations located on Shafter Avenue at Ingalls Street, Third Street at Cargo Way, Jerrold Avenue at Upton Street, and San Bruno Avenue at Silliman Street. Emergency vehicles would likely access the Project Site and other nearby parcels via Third Street, Evans Avenue, Hunters Point Boulevard, Innes Avenue, and Ingalls Street. The Proposed Project's streetscape changes would maintain a sufficient right of way for emergency vehicles and therefore would not result in a significant impact to emergency vehicle access.

The proposed widths of internal streets are presented in **Table 1-4**, and range from 25 to 78 feet. The shared way along Spring Lane, Fairfax Lane, and Beach Lane would include 20-foot-wide clear emergency vehicle access around the loop with most areas having a 26-foot-wide staging area for emergency vehicles. These proposed widths are greater than or equal to the acceptable minimum widths for emergency vehicle access. While final roadway designs would need to be approved by the Fire Department prior to construction, all roadways have been designed to accommodate a standard fire truck. Thus, the Proposed Project or Variant would have a **less-than-significant** impact to emergency access. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

5.10 CONSTRUCTION IMPACTS

The discussion of construction impacts is based on currently available information from the Project Sponsor and professional knowledge of typical construction practices in San Francisco. Prior to construction, as part of the construction application phase, the Project Sponsor and construction contractor(s) would be required to meet with the Department of Public Works and SFMTA to develop and review truck routing plans for demolition, disposal of excavated materials, materials delivery and storage, as well as staging for construction vehicles. In general, lane and sidewalk closures or diversions are subject to review and approval by the City's Transportation Advisory Staff Committee ("TASC"), which consists of representatives from the Fire Department, Police Department, SFMTA Traffic Engineering Division, and the Department of Public Works (DPW). The construction contractor would be required to meet the City of San Francisco's Regulations for Working in San Francisco Streets (the Blue Book), and would meet with SFMTA staff to determine if any special traffic permits would be required.[62] In addition to the regulations in the Blue Book, the contractor would be responsible for complying with all city, state, and federal codes, rules, and regulations. Although conflicts with transit operations are not anticipated, the Project contractor is required to coordinate with Muni's Street Operations and Special Events Office to coordinate construction activities and reduce any impacts to transit operations.

Construction impacts would be the same for the Proposed Project and Project Variant. Buildout of the Project is anticipated to occur in three phases over an approximately five to eight year period, from 2018 through 2026. **Figure 15** depicts the planned construction traffic routes. Infrastructure would be constructed in tandem with new buildings and open space. Construction-related activities would generally occur Monday through Saturday, between 7:00 AM and 8:00 PM, and the typical work shift for most construction workers would be from 7:00 AM to approximately 3:30 PM on weekdays.[63] Construction is not anticipated to occur on Sundays or major legal holidays, but it may occur on an as-needed basis if approved by the Department of Building Inspection (DBI). The hours of construction would be stipulated by the DBI, and the contractor would be required to comply with the San Francisco Noise Ordinance.

Throughout the construction period, there would be construction-related trucks entering and exiting the site. There would be an average of between 50 and 100 construction trucks traveling to the site on a daily basis during the demolition, site preparation and grading/excavation phases. The greatest number of construction trips would occur during the grading and excavation phase with an average of 85 and up to 250 per day. There would be between 30 and 60 construction workers per day at the site during demo, site prep, grading/excavation, drainage/utilities/subgrade phases of construction and increase up to 200-250 during the building construction and architectural coating phases. The impact of construction truck traffic would be a temporary lessening of the capacities of local streets due to the size, slower acceleration, and larger turning radii of trucks, which may temporarily affect traffic and transit operations and increase traffic, pedestrian, and bicycle conflicts near the Project Site. Truck traffic to and from the site would be routed along major arterials and freight routes, as identified by SFMTA.

The trip distribution and mode split of construction workers are speculative to estimate. However, it is anticipated that the addition of the worker-related vehicle- or transit-trips would not substantially affect transportation conditions, as impacts on local intersections or the transit network would be substantially less than those associated with the Proposed Project and temporary in nature. Construction workers who drive to the site and potential temporary parking restrictions along the building frontage would cause a temporary increase in parking demand and a decrease in supply. Construction workers would need to park either on-street or in parking facilities that currently have availability during the day. However, parking shortfalls would be temporary and are not considered a significant environmental impact.

The construction impacts of the Proposed Project and Project Variant would be **less-than-significant**. Although no significant construction impacts have been identified, the following Improvement Measure has been identified:

[62] The Blue Book is available at http://www.sfmta.com/cms/vcons/bluebook.htm.

[63] Per the San Francisco Department of Public Health, construction noise is generally permitted in San Francisco between the hours of 7:00 AM to 8:00 PM, seven days per week.

Improvement Measure I-TR-3: Construction Management

Each of the four parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would be responsible for developing their own construction management plan.

Traffic Control Plan for Construction – In order to reduce potential conflicts between construction activities and pedestrians, transit and autos during construction activities, the Project applicant shall require construction contractor(s) to prepare a traffic control plan for major phases of Project construction (e.g. demolition, construction, or renovation of individual buildings). The Project applicant and their construction contractor(s) will meet with relevant City agencies to coordinate feasible measures to reduce traffic congestion, including temporary transit stop relocations and other measures to reduce potential traffic and transit disruption and pedestrian circulation effects during major phases of construction. For any work within the public right-of-way, the contractor would be required to comply with the City of San Francisco's Regulations for Working in San Francisco Streets, which establish rules and permit requirements so that construction activities can be done safely and with the least possible interference with pedestrians, bicyclists, transit, and vehicular traffic. Additionally, truck movements and deliveries will be limited during peak hours to the extend feasible and commercially reasonable in light of noise regulations, labor and contract requirements, available daylight hours, and critical path construction schedule (generally 4:00 to 6:00 PM, or other times, as determined by SFMTA and its Transportation Advisory Staff Committee [TASC]).

In the event that the construction timeframes of the major phases and other development projects adjacent to the Project Site overlap, the Project applicant should coordinate with City Agencies through the TASC and the adjacent developers to minimize the severity of any disruption to adjacent land uses and transportation facilities from overlapping construction transportation impacts. The Project applicant, in conjunction with the adjacent developer(s), shall propose a construction traffic control plan that includes measures to reduce potential construction traffic conflicts to the extent feasible and commercially reasonable in light of noise regulations, labor and contract requirements, available daylight hours, and critical path construction schedule, such as coordinated material drop offs, collective worker parking and transit to job site and other measures.

Reduce SOV Mode Share for Construction Workers – In order to minimize parking demand and vehicle trips associated with construction workers, the Project Sponsor will require the construction contractor to include in the Traffic Control Plan for Construction methods to encourage walking, bicycling, carpooling, and transit access to the project sites by construction workers.

Project Construction Updates for Adjacent Residents and Businesses – In order to minimize construction impacts on access for nearby residences, institutions, and businesses, the Project applicant will provide nearby residences and adjacent businesses with regularly-updated information regarding Project construction, including construction activities, peak construction vehicle activities (e.g., concrete pours), travel lane closures, and lane closures via a newsletter and/or website.

Contruction Traffic Route

\\FPSF03\Data\Projects\2015 Projects\SF15-0820_India_Basin_TIA\Graphics\GIS\MXD\BaseMap.mxd

Figure 15

Construction Traffic Routes

5.11 PARKING IMPACTS

Parking conditions are not static, as parking supply and demand varies from day to day, from day to night, from month to month, etc. Hence, the availability of parking spaces (or lack thereof) is not a permanent physical condition, but changes over time as people change their modes and patterns of travel. While parking conditions change over time, a substantial deficit in parking caused by a project that creates hazardous conditions or significant delays to traffic, transit, bicycles or pedestrians could adversely affect the physical environment. Whether a deficit in parking creates such conditions would depend on the magnitude of the shortfall and the ability of drivers to change travel patterns or switch to other travel modes. If a substantial deficit in parking caused by a project creates hazardous conditions or significant delays in travel, such a condition could also result in secondary physical environmental impacts (e.g., air quality or noise impacts cause by congestion), depending on the project and its setting.

The absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxis, bicycles or travel by foot) and a relatively dense pattern of urban development induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to transit service or other modes (walking and biking), would be in keeping with the City's "Transit First" policy and numerous San Francisco General Plan Polices, including those in the Transportation Element. The City's Transit First Policy, established in the City's Charter Article 8A, Section 8A.115, provides that "parking policies for areas well served by public transit shall be designed to encourage travel by public transportation and alternative transportation."

The transportation analysis accounts for potential secondary effects, such as cars circling and looking for a parking space in areas of limited parking supply, by assuming that all drivers would attempt to find parking at or near the Project Site and then seek parking farther away if convenient parking is unavailable. The secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to others who are aware of constrained parking conditions in a given area, and thus choose to reach their destination by other modes (i.e. walking, biking, transit, taxi). If this occurs, any secondary environmental impacts that may result from a shortfall in parking in the vicinity of the proposed project would be minor, and the traffic assignments used in the transportation analysis, as well as in the associated air quality, noise and pedestrian safety analyses, would reasonably address potential secondary effects.

5.11.1 Planning Code Parking Requirements

The Proposed Project currently falls within the Light Industrial (M-1), Heavy Industrial (M-2), Public (P), and Small Scale Neighborhood Commercial (NC-2) designations for zoning use districts, though the Proposed Project would re-zone the site to add a new India Basin Special Use District (SUD). The India Basin Special Use District would establish parking requirements for the Proposed Project.

Per Table 166 of the San Francisco Planning Code, newly constructed residential buildings with more than 201 residential units require two carshare spaces plus one additional carshare space for every 200 dwelling units over 200. As a result, the Proposed Project would require seven carshare spaces and the Project Variant would require three carshare spaces.

5.11.2 On-Street Parking Supply

In this section, reference to Proposed Project also applies to Project Variant.

The area under consideration for parking impacts is the portion of the street network within a 5 to 10 minute walk from the Project Site (approximately 1,300 to 2,600 feet). This is also the area used for data collection for existing parking conditions. The Innes Avenue corridor, between Hunters Point Boulevard and Donahue Street, has 209 on-street parking spaces under existing conditions (there are no on-street parking spaces on Hunters Point Boulevard, either existing or proposed). There are 113 additional on-street spaces along Arelious Walker Drive within the Build Property and Hawes Street within the RPD Property, for a total of 322 spaces. The Proposed Project would include left-turn pockets at three intersections along Innes Avenue, which would reduce the number of on-street parking spaces by an estimated 36 spaces. The Proposed Project would also reduce on-street parking on the Build property by 75 and increase on-street parking on the RPD Property by seven, resulting in a net decrease of 104 on-street spaces. **Table 5-16** summarizes the on-street parking supply adjacent to and internal to the Project Site under each scenario.

<table>
<tr><th colspan="8">TABLE 5-16: ON-STREET PARKING SUPPLY</th></tr>
<tr><th></th><th colspan="4">Innes Avenue</th><th colspan="2">Internal</th><th rowspan="3">Total</th></tr>
<tr><th>From:</th><th>Hunters Point Boulevard[1]</th><th>Griffith Street</th><th>Arelious Walker Drive</th><th>Earl Street</th><th rowspan="2">Build Property</th><th rowspan="2">RPD Property</th></tr>
<tr><th>To:</th><th>Griffith Street</th><th>Arelious Walker Drive</th><th>Earl Street</th><th>Donahue Street</th></tr>
<tr><td>Existing Conditions</td><td>37</td><td>56</td><td>57</td><td>59</td><td>95</td><td>18</td><td>322</td></tr>
<tr><td>Baseline</td><td>37</td><td>56</td><td>57</td><td>59</td><td>95</td><td>18</td><td>322</td></tr>
<tr><td>Baseline Plus Project</td><td>33</td><td>46</td><td>48</td><td>46</td><td>20</td><td>25</td><td>218</td></tr>
</table>

Notes:
1. Hunters Point Boulevard does not contain any on-street parking spaces in any scenario.

5.11.3 Parking Demand & Occupancy

As discussed earlier (see Section 4.6), the parking demand forecast was developed using a methodology identified in the *SF Guidelines*. The Proposed Project would have a peak demand for 2,553 parking spaces midday and 2,439 spaces in the evening. The Project Variant would have a peak demand for 3,624 parking spaces midday and 1,800 spaces in the evening.

The Proposed Project includes the provision of 1,800 off-street parking spaces; this includes 1,230 private parking spaces and 570 public parking spaces. The Project Variant includes the provision of 1,912 off-street parking spaces; this includes 1,412 private parking spaces and 500 public parking spaces.

Figures 8A and **8B** show the parking study area, which is bounded by Middle Point Road to the west, Innes Avenue to the south, Donahue Street to the east, and Hunters Point Road and the shoreline to the north. Midday occupancy of on-street parking in the parking study area was found to be 188 of 533 spaces (35 percent). There is therefore an available supply of 345 on-street spaces. Evening occupancy of on-street parking in the parking study area was found to be 164 of the 533 spaces (31 percent). There is therefore an available supply of 369 on-street spaces in the evening. It is assumed that the Project residents would first use the available off-street parking spaces in the Project's parking garage and the remaining demand would park on-street.

The school would provide reserved parking for staff and teachers within the proposed Hillside parking garage, located adjacent to the school.

The Project-generated and existing midday parking supply and demand for the Baseline scenarios is presented in **Table 5-17**, below. The Proposed Project is primarily residential and therefore demand is highest during the evening/overnight. The Project Variant has more retail and office uses and therefore demand is highest during the midday.

Parking demand would exceed the combined on-street and off-street parking supply for both the Proposed Project and Project Variant during the midday peak period. During the evening peak period, parking demand would exceed the combined on-street and off-street parking supply in the Proposed Project, but the supplied parking for the Project Variant would satisfy the demand during the evening peak period.

TABLE 5-17: PARKING SUPPLY, DEMAND, AND CODE REQUIREMENTS

Scenario	Proposed Off-Street Supply	Proposed Change in On-Street Supply	Existing Off-Street Parking Surplus	Existing On-Street Parking Surplus[1]	Calculated Peak Demand	Project Parking Surplus Compared with Demand[2]
Midday						
Proposed Project	1,800	-104	0	345	2,553	-512
Project Variant	1,912	-104			3,624	-1,471
Evening						
Proposed Project	1,800	-104	0	369	2,439	-374
Project Variant	1,912	-104			1,800	377

Notes:

1. Existing on-street parking surplus refers to the number of existing on-street spaces that are vacant spaces during that time period.
2. Refers to the proposed change in supply plus the existing surplus minus project peak demand, i.e. the anticipated parking surplus. Negative surpluses refer to anticipated parking demand higher than proposed supply, i.e. shortfalls.

Source: *SF Guidelines*, 2002; CPHPS Transportation Plan, 2010; *IBTAP*, 2015; Fehr & Peers, 2016.

While the above analysis forecasts a parking deficit for both scenarios, the Project would implement TDM measures (presented in Section 1.2.9) to encourage the use of transit, walking, bicycling, and other modes and discourage the use of single occupancy automobiles or automobiles in general. These measures were not specifically accounted for in the travel demand forecast process and would likely result in a substantial shift in mode share away from automobiles and decrease the demand for parking. As a result, the parking demand estimate is conservative; it overestimates vehicle trips by excluding vehicle trip reductions resulting from TDM. Additionally, the Project Site is well served by public transit and bicycle facilities, which would be further expanded by changes contained within the Baseline. These would serve to further provide transportation choices to the automobile. Because of this anticipated mode shift, any unmet parking demand associated with the project would not be substantial.

In summary, neither the Proposed Project nor the Project Variant would result in a substantial parking deficit with the on-street and off-street parking currently proposed. Therefore, impacts related to parking would be **less-than-significant**. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

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6 CUMULATIVE CONDITIONS

As noted earlier, the Proposed Project's impacts were evaluated for Baseline Plus Project conditions and for longer-term Cumulative conditions, projected for the year 2040. This chapter discusses the project's contribution to cumulative transportation-related impacts. Cumulative Conditions typically forms the future condition against which Project impacts are measured. However, future conditions are in flux in this neighborhood. While the below project list and transit improvements are assumed to be implemented in all Cumulative scenarios, there are multiple alternative circulation and streetscape conditions for 2040.

In 2015, Build led a planning study focused on a number of streets adjacent to and near the Project Site, and the resulting plan is called the India Basin Transportation Action Plan (IBTAP). FivePoint as well as City agencies such as SFMTA, DPW, RPD, OCII, and the Planning Department were also involved. The 2015 draft of this plan is a vision for streetscape and mobility improvements along the India Basin transportation corridor along Jennings Street, Evans Avenue, Hunters Point Boulevard, and Innes Avenue. It integrates work documented in the India Basin Neighborhood Association Vision Plan; The Bayview Transportation and Infrastructure Plan; The Candlestick Point Hunters Point Shipyard Transportation and Infrastructure Plans; PG&E's power plant site streetscape improvements; Build's ongoing development plans; and the Recreation and Parks Department plans for 900 Innes, India Basin Shoreline Park, and India Basin Open Space. While not yet approved, the IBTAP design is an evolution of design intentions for the corridor, building off the CPHPS Transportation Plan, and is therefore included as a separate Cumulative scenario in this study.

Some IBTAP improvements are included in the Proposed Project. These elements include:

- Sidewalk improvements along the project frontage, constructed in a manner consistent with Better Streets Plan. Detailed designs would be developed with SFMTA, Planning, Fivepoint, DPW, and other key stakeholders.
- Relocation of the Innes Avenue bicycle facility to New Hudson Avenue
- Construction of five signals at Hunters Point Boulevard/Hudson Avenue/Hawes Street, Hunters Point Boulevard/Innes Avenue, Innes Avenue/Griffith Street, Innes Avenue/Arelious Walker Drive, and Innes Avenue/Earl Street. Signal construction includes removal of some parking and installation of new pedestrian crosswalks at these locations, as well as the addition of eastbound-left turn pockets at Innes Avenue/Griffith Street, Innes Avenue/Arelious Walker Drive, and Innes Avenue/Earl Street (note that these turn pockets are not included in the IBTAP).

6.1 SCENARIO ASSUMPTIONS

To fully analyze project impacts and provide information for decision makers, three Cumulative scenarios are presented and analyzed in this report:

- Cumulative Scenario
    - CPHPS Transportation Plan streetscape is assumed
- Cumulative – IBTAP Subvariant A

- IBTAP streetscape is assumed between Jennings Street and Donahue Street[64]
- CPHPS Transportation Plan streetscape is assumed between Cargo Way and Jennings Street[65]

- Cumulative – IBTAP Subvariant B
  - IBTAP streetscape is assumed between Cargo Way and Donahue Street

FivePoint is obligated to reconstruct the entire IBTAP corridor except Jennings Street between Evans Avenue and Cargo Way. There are two IBTAP scenarios to separately environmentally analyze: the full extent of the IBTAP versus only the extent of the corridor that FivePoint is obligated to obstruct. B

Project impacts for all modes are analyzed for the Cumulative scenario. The two IBTAP scenarios are assessed for traffic hazards, bicycle, pedestrian, and parking impacts, as these are the elements which IBTAP would affect.

6.1.1 Project List

Forecasts of transportation activity in the Cumulative Scenario take into account a combination of specific development projects and general background population growth. Reasonably foreseeable development projects and transportation network changes were considered in the Cumulative Scenario. Projects include (but are not limited to) the following:

- San Francisco Bicycle Plan
- Muni Forward
- Eastern Neighborhoods Plan
- CPHPS
- San Francisco Public Utilities Commission (PUC) Southeast Treatment Plant construction projects, including new Biosolids Digester Facilities and replacement of the Headworks facility
- Blue Greenway/Bay Trail
- Hunters View
- Executive Park
- Visitacion Valley/Schlage Lock Redevelopment

San Francisco Bicycle Plan – No long-term Bicycle Plan transportation network changes (other than those proposed by the Proposed Project) were included for the streets adjacent to the project as none are included in the 2009 Bicycle Plan.

Muni Forward – As indicated in Section 3.3.1, Muni Forward (formerly the Transit Effectiveness Project) anticipates changes to Muni routes in the vicinity of the Proposed Project. Year 2040 Cumulative analysis

[64] This is the extent that FivePoint is obligated to construct.

[65] FivePoint is not obligated to reconstruct Jennings Street between Evans Avenue and Cargo Way.

assumes changes to the capacity of the lines as identified by route changes and headway changes indicated within Muni Forward.

Eastern Neighborhoods Plan – The Eastern Neighborhoods Plan included changes in zoning controls and General Plan amendments for an approximately 2,200-acre area on the eastern side of the City. It is intended to encourage new housing while maintaining or creating cohesive neighborhoods.

CPHPS Development – City-approved CPHPS Development includes 10,500 housing units, 134.5 ksf office, 3 million square feet (MSF) Research & Development, 1,200 seat film arts center, 4,400 seat performance venue, 220 hotel rooms, 256 ksf neighborhood retail, 635 ksf regional retail, 255 ksf artist's studio/art center, and 100 ksf community facilities.

PUC Southeast Treatment Plant construction projects – PUC plans to update its large wastewater treatment plant, located along Phelps Street between Jerrold Avenue and Evans Avenue, with new biosolids digesters and headworks. These projects are not included in the cumulative SF-CHAMP forecast as they are not substantial trip generators, but are discussed in Section 6.10, Cumulative Construction Impacts.

Blue Greenway/Bay Trail – a 13-mile network of connected parks, trails, and green open space along San Francisco's southeastern waterfront.

Hunters View – approximately 800 new residential units on the former site of 267 public housing units along West Point Road. 350 units will be for rental, all of which will be affordable (and 267 of which will provide a direct replacement for the 267 existing units); up to 450 units will be for sale, approximately 10 to 15 percent of which will be affordable.

Executive Park – construction of 964 housing units north of Executive Park Boulevard North and Crescent Way. Existing office park buildings within Executive Park will be redeveloped as a predominantly residential area to include 1,600 housing units and 73,000 square feet of retail.

Visitacion Valley/Schlage Lock Redevelopment – a large development in the Visitacion Valley neighborhood planned to include 2,014 housing units, 72,700 square feet of neighborhood-serving commercial establishments, and 25,000 square feet of cultural use.

6.1.2 Transit Service

The Cumulative Scenario includes full implementation of the transit improvements contained within Muni Forward and the CPHPS Transportation Plan, which are as follows:

- **19 Polk:** Discontinuation of the route south of 24th Street (i.e. in the vicinity of the Project Site); in this extent, service would be replaced by the 48 Quintara-24th Street. Approximate implementation 2019.

- **24 Divisadero:** Extension along Palou, Crisp and Spear avenues to the Hunters Point Shipyard Transit Center. Approximate implementation 2019.

- **23 Montgomery:** Extension to Hunters Point Shipyard Transit Center to provide interim service prior to the extension of the 24 Divisadero. Once 24 Divisadero service is extended, 23 Montgomery would resume providing service along its original route.

- **28R 19th Ave/Geneva Limited (BRT):** Extension along Geneva Ave through Candlestick Point to Hunters Point Shipyard. Conversion to BRT, with streetscape modifications along Geneva Ave. Approximate implementation 2023.
- **29 Sunset:** Extension along Gilman Ave to Harney Way. Approximate implementation 2017.
- **44 O'Shaughnessy:** Extension along Innes Avenue to Hunters Point Shipyard Transit Center. Approximate implementation 2023.
- **48 Quintara-24th St:** Extension to Hunters Point Shipyard Transit Center. Approximate implementation 2019.
- **Candlestick Point Express (CPX):** Provide new express bus service between Candlestick Point and Downtown San Francisco. Approximate implementation 2020.
- **Hunters Point Express (HPX):** Provide new express bus service between Hunters Point Shipyard and Downtown San Francisco. Approximate implementation 2023.
- **T Third (light rail):** Increase frequency and capacity plus an extension into Chinatown via the Central Subway would be provided.

6.1.3 Circulation and Streetscape

All improvements described in the Baseline Scenario would be implemented at this time, and there are other streetscape improvements in the area that may be implemented by 2040 as well. This section summarizes the proposed circulation and streetscape improvements associated with each of the three Cumulative scenarios: Cumulative Scenario, IBTAP Subvariant A, and IBTAP Subvariant B. The only difference between the two IBTAP scenarios is the configuration of Jennings Street between Evans Avenue and Cargo Way.

6.1.3.1 Cumulative Scenario

The Cumulative Scenario includes the same network changes throughout the Jennings Street—Evans Avenue—Hunters Point Boulevard—Innes Avenue corridor that are included in the Baseline Conditions. The changes are sourced from the 2010 CPHPS Transportation Plan and the Hunters Point Shipyard Phase II Infrastructure Plan, both of which are approved and funded, except for the section between Earl Street and Donahue Street which is revised from the Infrastructure Plan recommendations based on a more detailed engineering feasibility study and an agreement between FivePoint (the Shipyard Project Sponsor) and the City. This exception is included in the Baseline Scenario as well. There have been no changes to the Hunters Point Shipyard Phase II Infrastructure Plan since 2010 that would affect circulation along Hunters Point Boulevard and Innes Avenue. All Cumulative scenarios would include the addition of the Class I bicycle path through Northside Park, connecting India Basin to Shipyard.

6.1.3.2 IBTAP Subvariant A

The IBTAP Subvariant A varies from the Cumulative Scenario by including all proposed IBTAP improvements (denoted as "Recommended" in IBTAP) between Jennings Street and Donahue Street, which would replace streetscape proposals contained within CPHPS Transportation Plan on these streets. The streetscape on Jennings Street between Cargo Way and Evans Avenue would remain as that contained within the CPHPS

Transportation Plan. FivePoint is obligated to implement the improvements along Evans Avenue, Hunters Point Boulevard, and Innes Avenue. Funding has not yet been identified for proposed improvements along Jennings Street.

A table showing how IBTAP cross-sections differ to the Cumulative Scenario is shown in **Table 6-1** below.

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TABLE 6-1: SUMMARY OF IBTAP TRANSPORTATION NETWORK CHANGES

Street	From	To	Scenario	Travel Lanes	Parking	Bicycle Facilities	Sidewalks
Jennings Street	Cargo Way	Evans Avenue	Cumulative Scenario[1] and IBTAP Subvariant A	Two lanes, one in each direction, 12′	Both sides, 12′	None	Both sides, 8′ west side, 16′ east side
Jennings Street	Cargo Way	Evans Avenue	IBTAP Subvariant B Only	Two lanes, one in each direction, 12′	West side, 8'	11' two-way cycle track on east side	Both sides, 8' west side, 16' east side
Evans Avenue	Jennings Street	Hunters Point Boulevard	Cumulative Scenario	Four lanes, two in each direction, outer as 11' shared bus/auto lane, inner as 10'	South side, 9'	Bicycle lanes both sides, 6′ south side, 6′ north side	Both sides, 8' south side, 10' north side
Evans Avenue	Jennings Street	Hunters Point Boulevard	IBTAP scenarios	Four lanes, two in each direction, outer as 12' shared bus/auto lane, inner as 10'	None	11' two-way cycle track on north side	Both sides, 10'
Hunters Point Boulevard	Evans Avenue	Hudson Avenue	Cumulative Scenario	Four lanes, two in each direction, outer as 11' shared bus/auto lane, inner as 10'	South side, 8'	Bicycle lanes both sides, 6′ south side, 6′ north side	Both sides, 8' south side, 10' north side
Hunters Point Boulevard	Evans Avenue	Hudson Avenue	IBTAP scenarios	Four lanes, two in each direction, outer as 12' shared bus/auto lane, inner as 10'	None	11' two-way cycle track on north side	Both sides, 10'
Hunters Point Boulevard	Hudson Avenue	Innes Avenue	Cumulative Scenario	Four lanes, two in each direction, outer as 11' shared bus/auto lane, inner as 10'	None	Bicycle lanes both sides, 5′ south side, 5′ north side[2]	Both sides, 8' south side, 10' north side
Hunters Point Boulevard	Hudson Avenue	Innes Avenue	IBTAP scenarios	Four lanes, two in each direction, outer as 12' shared bus/auto lane, inner as 10'	None	11' two-way cycle track on north side	Both sides, 8' south side, 10' north side
Innes Avenue	Hunters Point Boulevard	Griffith Street	Cumulative Scenario	Four 10' lanes, two in each direction	Both sides, 8'	Bicycle lanes, both sides, 5'[2]	Both sides, 7'
Innes Avenue	Hunters Point Boulevard	Griffith Street	IBTAP scenarios	Four lanes, two in each direction, outer as 12' shared bus/auto lane, inner as 10'	Intermittent bays on north and south side, 8′ width	None	Both sides, 10′
Innes Avenue	Griffith Street	Arelious Walker Street	Cumulative Scenario	Four lanes, two in each direction, outer eastbound as 11' shared bus/auto lane, others as 10'	Both sides, south side 7', north side 8′	5' bicycle lane on north side, sharrows on south side[2]	Both sides, 5' south side, 7' north side
Innes Avenue	Griffith Street	Arelious Walker Street	IBTAP scenarios	Four lanes, two in each direction, outer as 12' shared bus/auto lane, inner as 10'	Intermittent bays on north side, 8′ width	None	both sides, 8' south side, 10' north side

Street	From	To	Scenario	Travel Lanes	Parking	Bicycle Facilities	Sidewalks
Innes Avenue	Arelious Walker Street	Earl Street	Cumulative Scenario	Four lanes, two in each direction, outer eastbound as 11' shared bus/auto lane, others as 10'	Both sides, south side 7', north side 8′	5' bicycle lane on north side, sharrows on south side[2]	Both sides, 5' south side, 7' north side
			IBTAP scenarios	Four lanes, two in each direction, outer as 12' shared bus/auto lane, inner as 10'	Intermittent bays on north side, 8′ width	None	both sides, 8' south side, 10' north side
Innes Avenue	Earl Street	Donahue Street	Cumulative Scenario	Four lanes, two in each direction, outer as 12' shared bus/auto lane, inner as 10'	Both sides, 8'	None	Both sides, 12' south side, 13' north side
			IBTAP scenarios	Same as Cumulative scenario			

Notes:

1. The Cumulative Scenario, which for streetscape purposes along the Evans Avenue—Hunters Point Boulevard—Innes Avenue corridor is the same as the Baseline Scenario, features streetscape designs from the CPHPS Transportation Plan.
2. These bicycle facilities would be removed by the Proposed Project and Project Variant, and the bicycle facility relocated to a parallel Class I facility on Hudson Avenue.

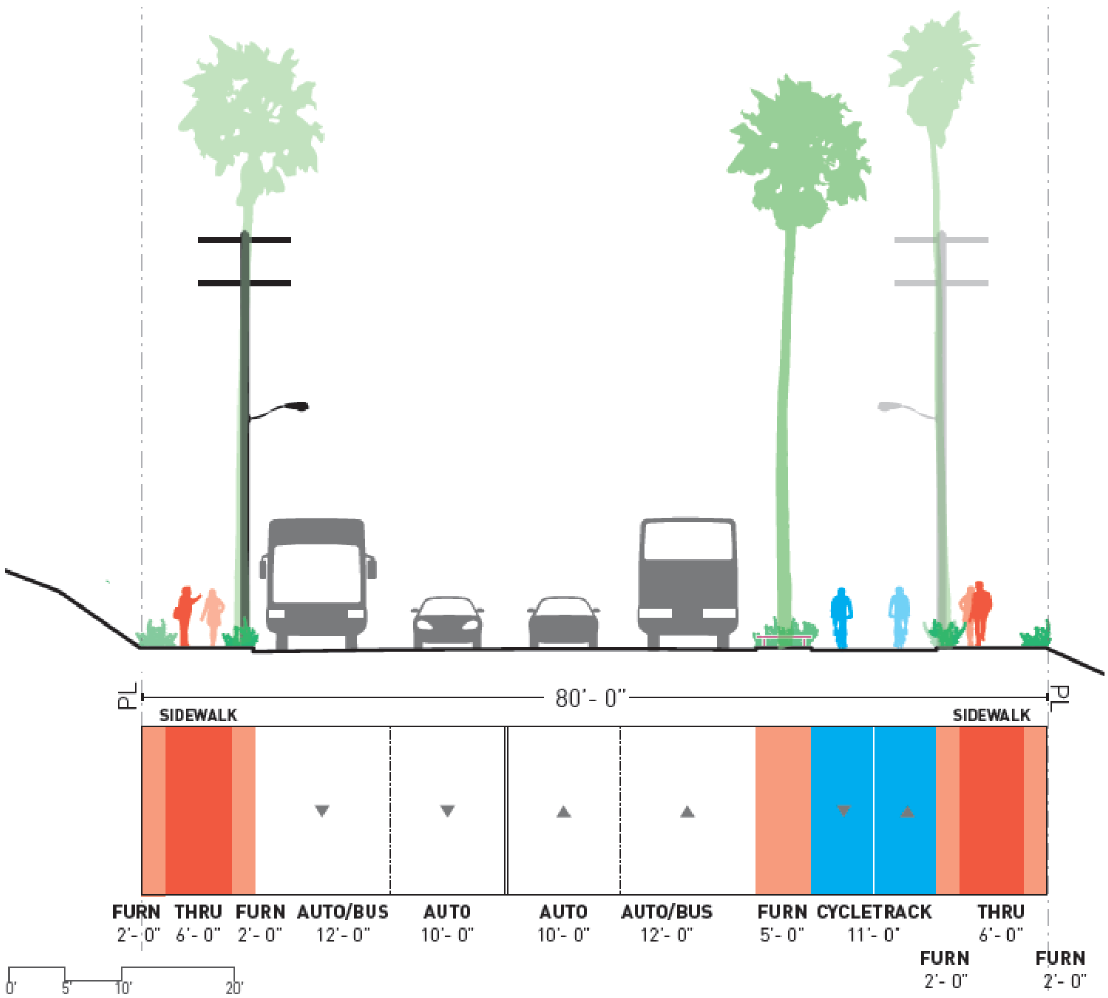
Source: Draft IBTAP, 2015

Individual road segment cross-sections for IBTAP Subvariant A are described in detail below.

On Jennings Street between Cargo Way and Evans Avenue, the cross-section would be the same as for the Cumulative Scenario.

On Evans Avenue and Hunters Point Boulevard, between Jennings Street and Hudson Avenue, the street cross-section would include four travel lanes (two in each direction), 10-foot sidewalks on both sides of the street, and an 11-foot two-way Class I cycle-track on the bay side of the street. The cycle-track would be separated from vehicle traffic by a 5-foot furnishing zone. No on-street parking would be provided along this street segment. **Inset 6** depicts the street section of Evans Avenue and Hunters Point Boulevard in the IBTAP scenarios. This segment would have the same streetscape in both IBTAP Subvariant A and IBTAP Subvariant B.

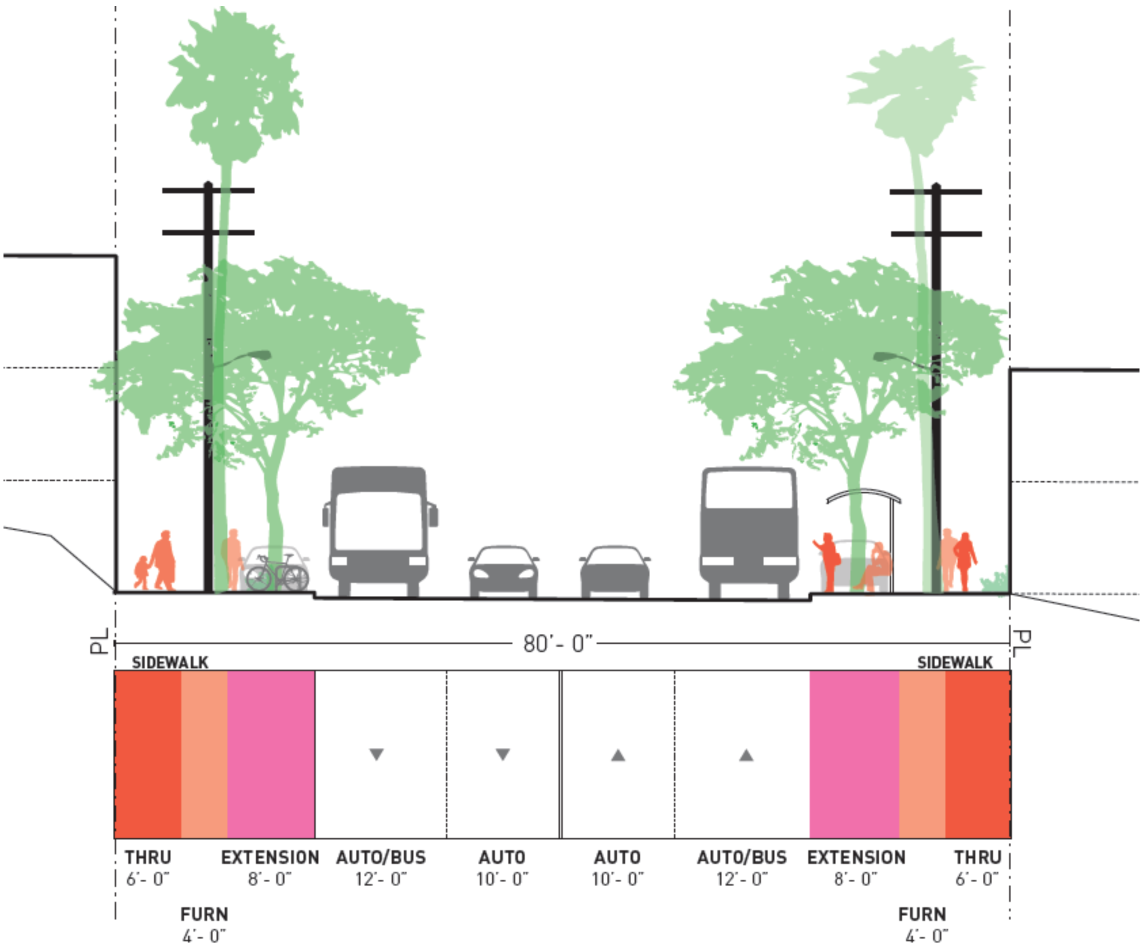
Inset 6: IBTAP Scenarios – Evans Avenue and Hunters Point Boulevard between Jennings Street and Hudson Avenue



Hunters Point Boulevard between Hudson Avenue and Innes Avenue and Innes Avenue between Hunters Point Boulevard and Griffith Street would provide four travel lanes (two in each direction), 10-foot sidewalks on both sides of the street, and 8-foot intermittent sidewalk extension zones on both sides of the street.

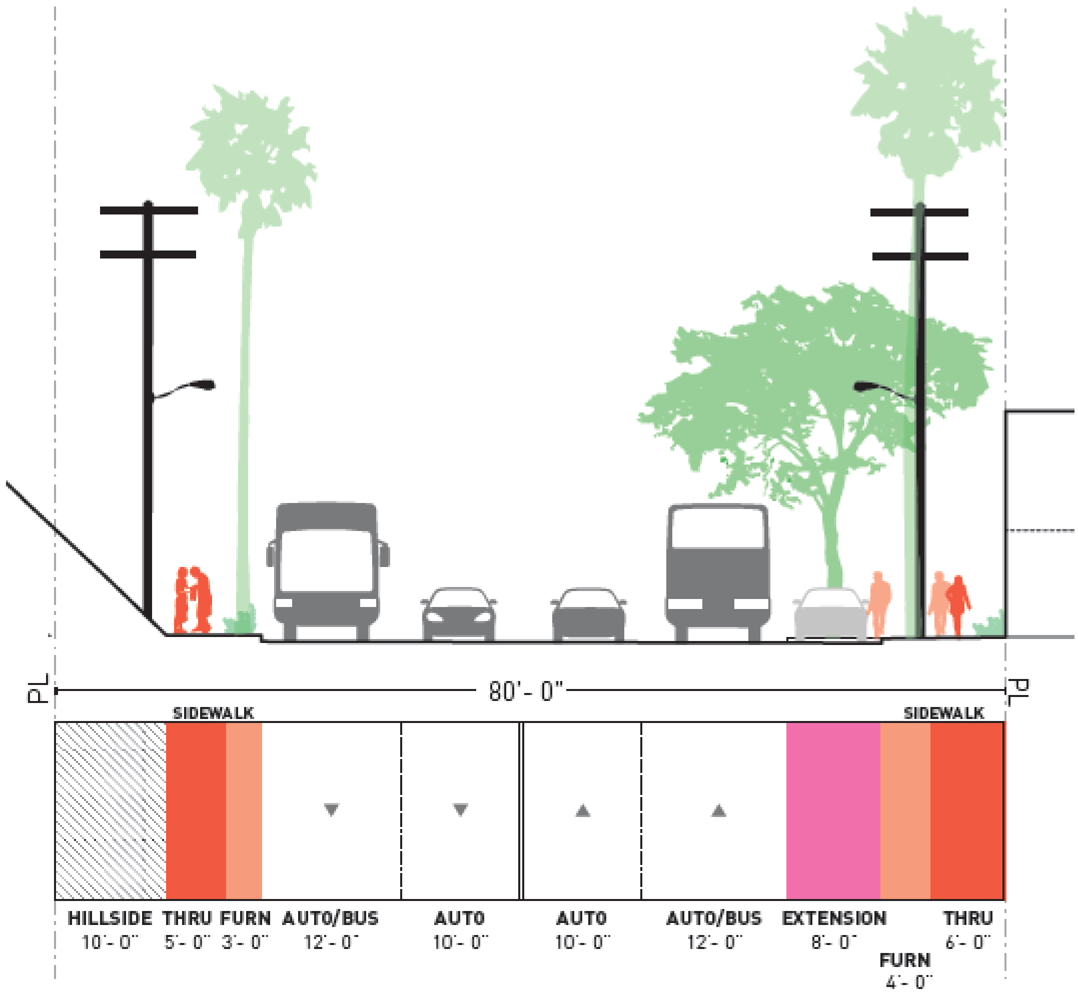
The extension zone is similar to a bulb out of the sidewalk, in that it is intermittent across the length of the block. Where there is no extension zone, the sidewalk is ten feet wide. Where the extension zone is present, the sidewalk is 18 feet wide. The extension zone would include special paving for pedestrian zones and planting, as well as distinctive paving in the parking lane to differentiate it from the travel lanes. Parking would be provided in locations where the sidewalk extensions are not provided. **Inset 7** depicts the street section of Hunters Point Boulevard between Hudson Avenue and Innes Avenue and Innes Avenue between Hawes Street and Griffith Street in the IBTAP scenarios.

Inset 7: IBTAP Scenarios – Hunters Point Boulevard and Innes Avenue between Hudson Avenue and Griffith Street



Between Griffith Street and Earl Street, Innes Avenue would provide four travel lanes (two in each direction), sidewalks on both sides of the street (8-feet on the south side and 10-feet on the north side), and at a few locations there would be 8-foot-wide sidewalk extension zones (i.e. bulbouts) on the north side of the street. Parking would be provided in locations where the sidewalk extension is not provided. Ten-feet of unmodified hillside would remain within the right of way. **Inset 8** depicts the street section of Innes Avenue between Hawes Street and Griffith Street in the IBTAP scenarios.

Inset 8: IBTAP Scenarios – Innes Avenue between Griffith Street and Earl Street



As shown, no bicycle facilities would be included along these segments of Hunters Point Boulevard and Innes Avenue (from Hudson Avenue to Earl Street), as a Class I cycle-track provided within the Project Site on Hudson Avenue and New Hudson Avenue would parallel this street.

Between Earl Street and Donahue Street, the Innes Avenue street section would match the Cumulative Scenario, which is "Recommended" IBTAP design. Northside Park is adjacent to the Project Site to the east. Northside Park is not part of India Basin; it is a different project, namely Shipyard. Under the Cumulative Scenario and the IBTAP scenarios, Northside Park would include a two-way cycle-track through the park, providing an off-street bicycle connection between the Project Site, Donahue Street, and bicycle facilities in the Hunters Point Shipyard site.

A map of the Cumulative (IBTAP scenarios) Plus Proposed Project bicycle network is shown below in **Figure 16**.

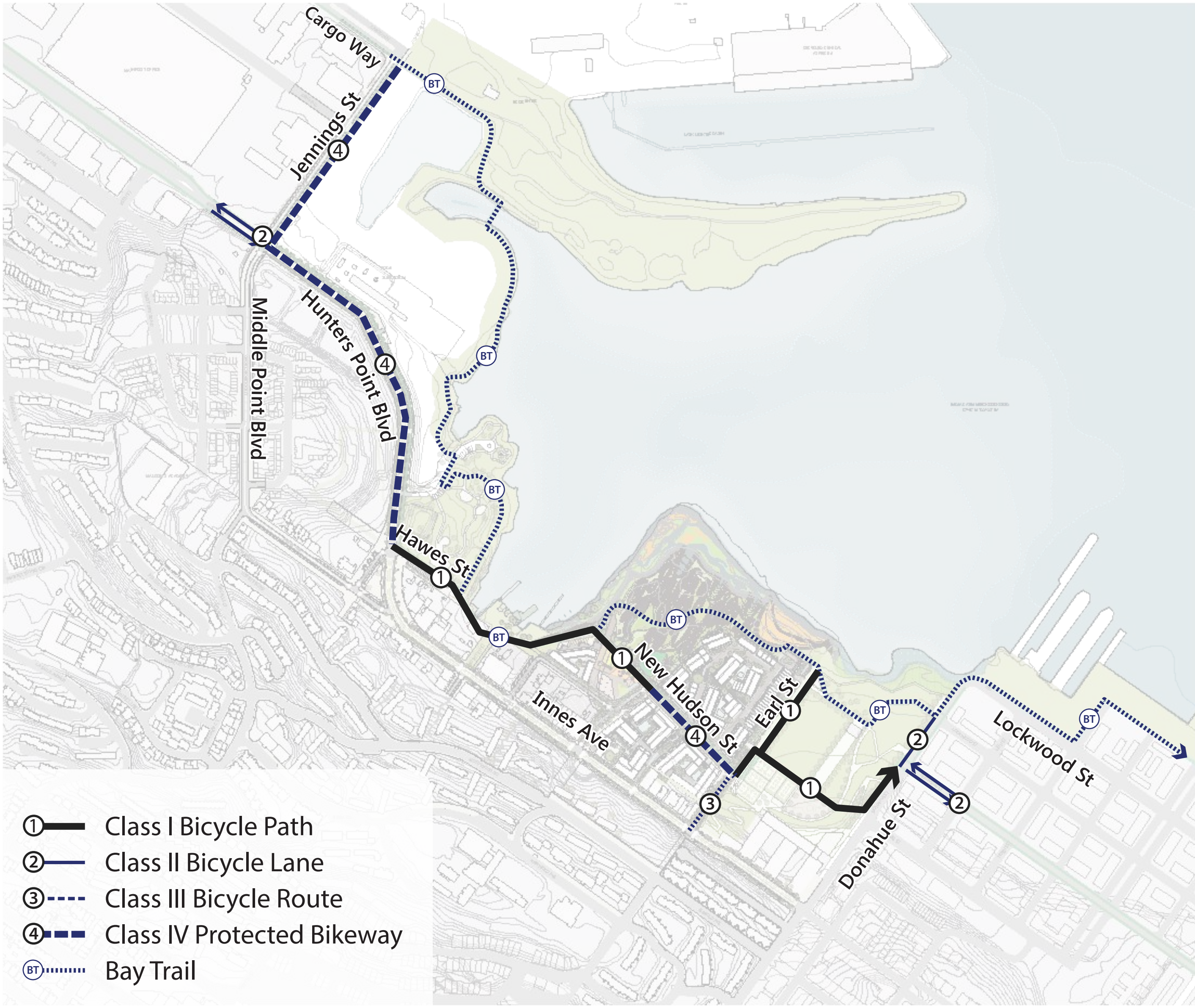


Figure 16

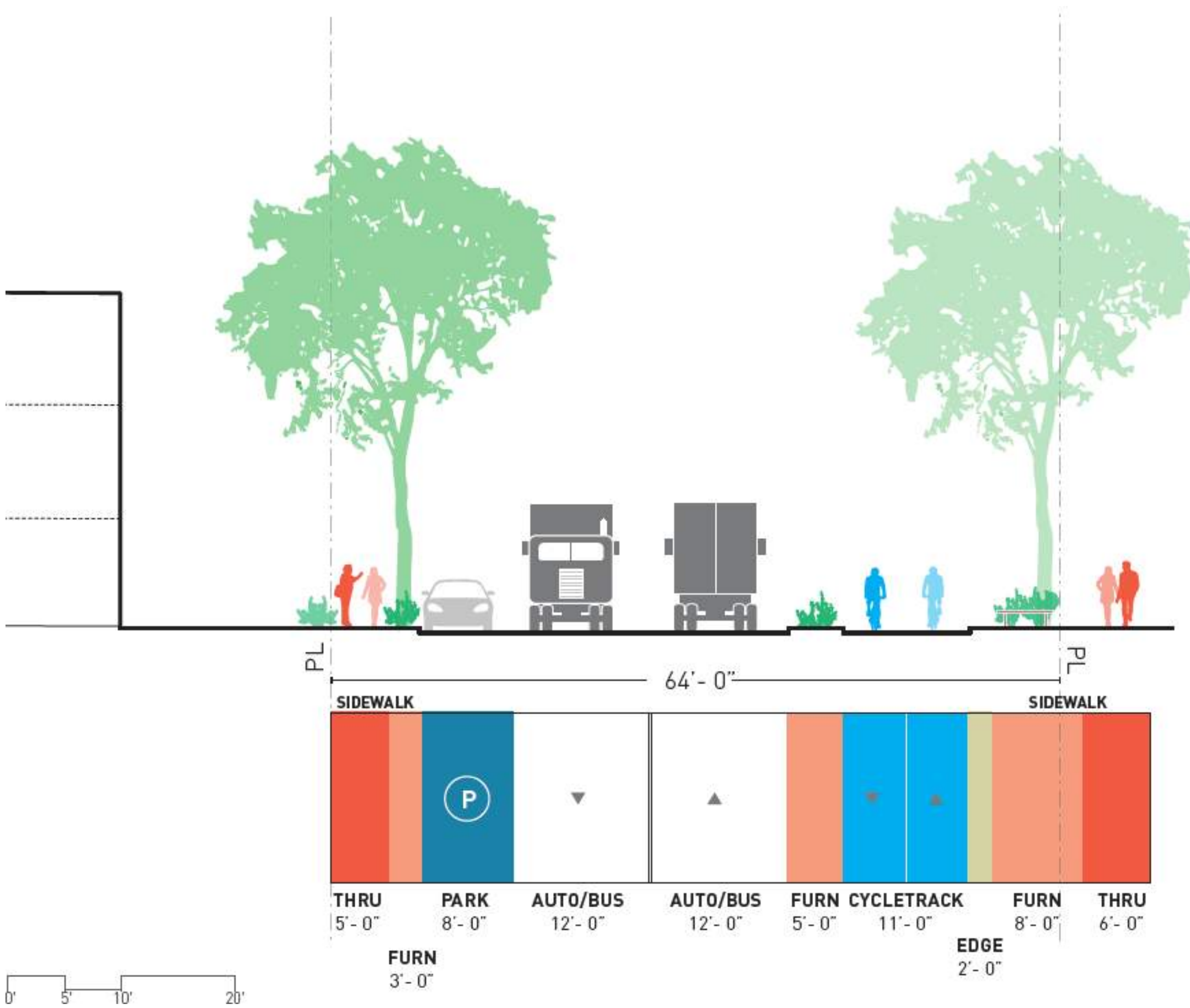
Cumulative (IBTAP Subvariant) Plus Project Bicycle Network

6.1.3.3 IBTAP Subvariant B

The IBTAP Subvariant B varies from the Cumulative Scenario by including all proposed IBTAP improvements between Cargo Way and Donahue Street (described in IBTAP Subvariant A, above), which would replace streetscape proposals contained within CPHPS Transportation Plan on these streets. FivePoint would be conditioned to implement the improvements along Evans Avenue, Hunters Point Boulevard, and Innes Avenue. Funding has not yet been identified for proposed improvements along Jennings Street.

On Jennings Street, the street cross-section would be that described as "Recommended" in IBTAP. It would include two travel lanes (one in each direction), an 11-foot two way cycle track on the bay side of the street, and sidewalks on both sides of the street. The sidewalk on the south side of the street would be five feet wide with a three-foot-wide furnishing zone. The sidewalk on the north side of the street would be six feet wide with an eight-foot-wide furnishing zone and two-foot-wide edge zone. On-street parking would be provided on the south side of the street. **Inset 9** depicts the street section of Jennings Street in IBTAP Subvariant B.

Inset 9: IBTAP Subvariant B – Jennings Street



6.2 CUMULATIVE VMT IMPACTS

Because the transportation network and forecasted land uses are different in 2040 Cumulative conditions from in the Baseline conditions, it is likely that the VMT per capita and VMT per employee for the Project and Project Variant TAZ would change.

An SF-CHAMP model run for the 2040 Cumulative conditions was conducted to estimate VMT by private automobiles and taxis for different land use types. Under Cumulative conditions, for residential development, the regional average daily household VMT per capita is 15.8, a decrease of approximately eight percent from baseline conditions. For office and retail development, regional average daily work-related VMT per employee is 16.7 and 14.3, respectively. This represents a decrease of twelve and four percent, respectively, from baseline conditions. As detailed in Section 5.1, a project is considered to have a significant impact if it exceeds the regional average minus 15 percent. **Table 6-2** shows the regional VMT values for these land uses, the values for the region minus 15 percent, and the value for the transportation analysis zone in which the Project Site is located, TAZ 446, which is bounded by Middle Point Road to the west, Evans Avenue to the north, Innes Avenue to the south, and Earl Street to the east. As the VMT impact analysis focuses on per capita VMT generated by the project instead of the aggregate VMT generated, the two land use scenarios – the Proposed Project and the Project Variant – are not analyzed separately. It is assumed that the VMT per capita for residents, office employees, and retail employees will be the same in both land use scenarios.

TABLE 6-2: AVERAGE DAILY VEHICLE-MILES TRAVELED (YEAR 2040)

Land Use	Regional Average VMT Per Capita	Regional Average Minus 15%	TAZ 446 (Project)[1]
Residential (per resident)	15.8	13.7	8.9
Office[2] (per office employee)	16.7	14.5	13.4
Retail (per retail employee)	14.3	12.4	8.8

As listed in **Table 6-2** Cumulative average daily VMT per capita is more than 15 percent below the Cumulative regional average daily VMT per capita for residential, office, and retail uses in TAZ 446 where the Proposed Project is located. Given that the Project Site is located in an area where Cumulative VMT is more than 15 percent below the Cumulative regional average, the Proposed Project's residential, office, and retail (and thus, restaurant, opens space, and school) uses would not result in substantial additional VMT and impacts on cumulative conditions would be **less-than-significant**. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, on cumulative conditions would also be **less-than-significant**.

Research conducted in California and New York indicates a relationship between built environment factors, such as density, mix of uses, transit accessibility, transportation network design, development scale, and transportation demand management, and travel patterns including VMT. In particular, the supply of guaranteed vehicular parking was associated with a higher rate of driving. The recently adopted San Francisco TDM Program includes a menu of TDM measures, including parking supply reduction, available to Project Sponsors. In San Francisco, using the neighborhood parking supply rate accounts for variability in geography, so projects' parking rates are evaluated in comparison with the prevailing parking supply rate in the project's TAZ. The Proposed Project's parking rate slightly exceeds the surrounding TAZ's (TAZ 446) residential and commercial parking rates, but still falls short of projected parking demand, meaning that parking would be constrained at the Proposed Project and parking would thus contribute to TDM at the Project Site. A full discussion of these themes is presented in Section 5.2.1.1 above.

6.3 CUMULATIVE TRAFFIC HAZARDS IMPACTS

In this section, the impacts for the Project Variant would be the same as for the Proposed Project.

6.3.1 Induced Travel

As mentioned in Chapter 5, the Proposed Project is not a transportation project. However, the Proposed Project would include features that would alter the transportation network. These features would be sidewalk reconstruction and widening, on-street loading zones, curb cuts, on-street safety strategies, and intersection signalization. These features fit within the general types of projects identified that would not substantially induce automobile travel as they do not create substantial increases in roadway capacity.[66] Therefore, impacts on cumulative conditions would be **less-than-significant**.

6.3.2 Traffic Hazard Impacts

The Proposed Project would have a significant impact to traffic if it caused major traffic hazards. In this section, the impacts for the Project Variant would be the same as for the Proposed Project because the street design is the same.

The Proposed Project would add vehicle trips to the surrounding roadways; however, a general increase in area traffic would not be considered a traffic hazard. Cumulative vehicle, pedestrian, and bicycle volumes on Innes Avenue and other streets near the Project Site are substantial (in the range of 600 to 900 vehicles per peak hour in each direction). The additional Project vehicle trips would substantially contribute to traffic and occasional congestion at nearby intersections. The Proposed Project would generate around 2,000 vehicle trips in both the AM and PM peak hours and the Project Variant would generate around 2,600 vehicle trips in both the AM and PM peak hours. A large majority of the Project vehicle traffic would travel along Evans Avenue, Hunters Point Boulevard, and Innes Avenue to the west of the Project Site to access other destinations in the city and region. Therefore, the Project would cause increases to traffic congestion primarily at nearby intersections along these streets to the west of the Project Site. This substantial increase in vehicle volumes, added to already substantial Cumulative volumes, would worsen vehicular delay, but vehicular delay alone does not create traffic hazards. The inclusion of signalization at the project intersections along Innes Avenue removes conflicts that would otherwise exist between the substantial number of project vehicles and the substantial number of people driving along Innes Avenue. Therefore, no traffic hazard would be caused. Therefore the project impact would be **less-than-significant**.

Vehicle queues at the Proposed Project garage entrance driveways into the public right-of-way would be subject to the Planning Department's vehicle queue abatement Conditions of Approval as described in Improvement Measure I-TR-1. The Proposed Project's new internal street system is currently under development; however, the final designs would be subject to approval by the SFMTA, San Francisco Fire Department, and the Department of Public Works to ensure that the streets are designed consistent with

[66] San Francisco Planning Department, *Executive Summary: Resolution Modifying Transportation Impact Analysis*, Appendix F, Attachment A, March 3, 2016.

City policies and design standards which contain minimum widths required for emergency (i.e. fire truck) access and streetscape elements consistent with the proposed neighborhood type.

6.3.3 Intersection Improvement Measures Identified

A detailed traffic analysis was conducted for informational and site planning purposes. Although the results of that analysis are not relevant to the Proposed Project's environmental review and no significant impacts are identified associated with that analysis, the traffic analysis did result in a recommendation for an improvement to an intersection in the Cumulative Scenario that is summarized here (note that the numbering does not follow on from the previous measure, as this measure is described in more detail later in this document and the numbering reflects its position later in this report):

Cumulative Improvement Measure C-I-TR-5: Reconfigure Eastbound Approach of Jennings Street/Evans Avenue

To improve vehicular mobility at the intersection in the Cumulative Plus Project and Project Variant Scenario, Cumulative Improvement Measure C-I-TR-5 proposes that the Project Sponsors fund the reconfiguration of the eastbound approach of the intersection of Jennings Street/Evans Avenue by the SFMTA from one shared through/left lane, one through lane, and one 100-foot left turn pocket to have one 100-foot left turn pocket, one through lane, and one shared through/right turn lane. No additional right-of-way would be required to implement this measure. The Project Sponsors will fund their fair share cost of the design and implementation of the new eastbound approach configuration for the intersection of Jennings Street/Evans Avenue.

Responsibility for paying a fair share fee would be based on the relative contribution of traffic to the intersection from the four parcels. At this location, 98 percent of vehicle trips would be generated by the 700 Innes Avenue parcel, one percent of vehicle trips would be generated by the India Basin Shoreline Park parcel, zero percent of vehicle trips would be generated by the 900 Innes Avenue parcel, and one percent of trips would be generated by the India Basin Open Space parcel.

Improvement Measure Feasibility

This improvement is feasible pending endorsement and subsequent funding commitment from the SFMTA. The funding contribution from the Project Sponsors is detailed in Section 7.5.3.

Operations After Improvement Measure

Implementing Cumulative Improvement Measure C-I-TR-5 would improve the intersection operation to LOS C in AM peak hour under Cumulative Plus Proposed Project and would result in LOS E intersection operation under Cumulative Plus Project Variant in AM peak hour. Cumulative Improvement Measure C-I-TR-5 would result in LOS D intersection operation in the PM peak hour for both Cumulative Scenarios (Project or Variant). Therefore, Improvement Measure C-I-TR-5 would improve operations under the Cumulative Plus Proposed Project Scenario; no feasible improvement measure has been identified that would improve further the operations at this intersection in the Cumulative Plus Project Variant Scenario. This improvement measure is a minor capacity increase at a single location. While it would reduce automobile delay at this location in the short run, because the capacity of the corridor as a whole is not being changed, it would result in a negligible change in the level of congestion on the roadway network.

6.4 CUMULATIVE TRANSIT CAPACITY IMPACTS

Future year 2040 Cumulative ridership projections were developed based on transit growth projections provided by the Planning Department.[67] Estimated future hourly ridership demand was then compared to expected hourly capacity, as determined by the likely route and headway changes identified in Muni Forward to estimate capacity utilization under 2040 Cumulative conditions. The year 2040 Cumulative analysis assumes changes to the capacity of the lines as identified by route changes and headway changes indicated within the recommended Muni Forward.

6.4.1 Cumulative Plus Proposed Project

The transit person-trips estimated to be generated by the Proposed Project were compared to the Cumulative Conditions projections on a screenline basis. Both transit capacity and utilization increase in the future, captured by this Cumulative Scenario. This section summarizes capacity utilization for the individual route HPX Hunters Point Express, a project-specific cordon, and the Downtown Screenlines.

6.4.1.1 Individual Muni Routes

It is assumed that in both directions of travel in the Cumulative Scenario, two-thirds of the project-generated transit trips through the Third Street subcorridor (within the Southeast Screenline) would use the Hunters Point Express (HPX) route (as it serves the Project Site directly), while one-third of trips would use the T-Third route. It is then conservatively assumed that of all project transit trips that utilize the T-Third route, all use either the 44 O'Shaughnessy or the 48 Quintara routes to transfer to/from the T Third, as it is not possible to transfer from the HPX route to the T-Third, as the HPX route would run express to Downtown after stopping at the Project Site.

As shown in **Table 6-3**, the HPX would operate below the established capacity utilization threshold of 85 percent. Therefore, the Proposed Project's cumulative transit impacts to the HPX would be **less-than-significant**. As a result, the cumulative transit impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, to the HPX would also be **less-than-significant**.

[67] San Francisco Planning Department, *Transit Data for Transportation Impact Studies*, May 15, 2015.

TABLE 6-3: CUMULATIVE HPX CAPACITY UTILIZATION - PROPOSED PROJECT					
Route	Cumulative			Project Contribution to /Route	
	Peak Hour[1] Ridership	Peak Hour[1] Capacity	Peak Hour[1] Capacity Utilization	Project Trips	Project Contribution to Ridership
AM Peak Hour					
HPX Inbound[1]	128	270	49%	25	19.5%
PM Peak Hour					
HPX Outbound[1]	181	270	67%	41	22.6%

Notes:
Bold indicates capacity utilization of 85 percent or greater

1. Inbound is towards Downtown; Outbound is away from Downtown. Data source: CPHPS Variant 2A (PPV2A)

Source: San Francisco Planning Department, May 2015; Fehr & Peers, 2015, see **Appendix E** for transit line capacity calculations

6.4.1.2 Project-Specific Cordon (Muni)

Because the 48 Quintara has been extended to directly serve the Project Site, people would now have the option of using either the 48 Quintara or the 44 O'Shaughnessy as a first- or last-mile connector from the T Third to the Project Site, which was not available in the Baseline Plus Project scenario where the 44 O'Shaughnessy stopped around a half-mile short of serving the Project Site. Because both routes can serve this function, travelers may choose either route to do so, and therefore treating them as a bundle for the purposes of a transit capacity analysis is appropriate. Crowding on these local routes is a concern, particularly as they would be used as feeder services to the T Third by both India Basin and Shipyard residents and employees. A cordon has been established between the T Third stop at Third Street/Evans Avenue and the Project Site. Peak hour ridership at the cordon is estimated at the local maximum load point between Third Street and the Project Site from SF-CHAMP 2040 model runs, located at Third Street/Palou Avenue.

As described in detail in Section 7.3, the SF-CHAMP model does account for some growth in the Project TAZ. However, the amount of traffic growth forecasted by the model for the roadways surrounding the Project Site is considerably less than the traffic growth projected to be generated by either the Proposed Project or Project Variant because the original land use proposed for India Basin and assumed in the model was of a smaller scale than the land use currently proposed by the Proposed Project or Project Variant. It can thus be inferred that the amount of transit trips generated by the Project as a part of the Cumulative Scenario is similarly underestimated.[68] However, the effect of this disparity lessens with distance because transit trips disperse onto different routes and streets. Because transit impacts are assessed at the Downtown Screenline level, the effect of the disparity in the India Basin TAZ would be reduced to a negligible level this far from the Project Site. Therefore no adjustments have been made to the Downtown Screenlines. Because the relative effect of the disparity is much higher adjacent to the project, the project

[68] The SF-CHAMP model forecasts are based on the Planning Department's (and ABAG's) estimation of how much development in San Francisco is economically feasible by 2040. So, if the Proposed Project were to build out more fully by 2040 than projected in the model, other development included in the model may occur at a slightly slower pace than projected, such that the overall total (and thus, the ridership demands across the Downtown Screenlines) would be the same.

trip contribution has been added to the project-specific cordon peak hour ridership to provide a conservative estimate.

As shown in **Table 6-4**, in each direction, the cordon would operate below the established capacity utilization threshold of 85 percent. Therefore, the Proposed Project's cumulative transit impacts at the cordon would be **less-than-significant**. As a result, the cumulative transit impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, on the cordon would also be **less-than-significant**.

TABLE 6-4: CUMULATIVE PROJECT-SPECIFIC CORDON CAPACITY UTILIZATION - PROPOSED PROJECT

Cordon	Cumulative			Project Contribution to Cordon	
	Peak Hour[1] Ridership	Peak Hour[1] Capacity	Peak Hour[1] Capacity Utilization	Project Trips	Project Contribution to Ridership
AM Peak Hour					
Project-Specific Cordon					
Westbound	646	1,016	64%	52	8.1%
Eastbound	515	1,016	51%	96	18.6%
PM Peak Hour					
Project-Specific Cordon					
Westbound	611	1,016	60%	76	12.4%
Eastbound	684	1,016	67%	86	12.6%

Bold indicates capacity utilization of 85 percent or greater
Source: San Francisco Planning Department, May 2015; Fehr & Peers, 2015, see **Appendix E** for transit line capacity calculations

6.4.1.3 Downtown Screenlines

All four Downtown Screenlines and constituent subcorridors were analyzed under cumulative conditions. As shown in **Table 6-5**, the following seven subcorridors and one screenline would operate above the 85 percent threshold in the AM peak hour without the Proposed Project, resulting in a **significant cumulative impact**: California, Fulton/Hayes, Mission, San Bruno/Bayshore, Southeast Other Lines, Subway lines, Haight/Noriega, and the Southwest Screenline. The following five subcorridors and one screenline would operate above the 85 percent threshold in the PM peak hour without the Proposed Project, resulting in a **significant cumulative impact**: California, Sutter/Clement, Fulton/Hayes, Mission, San Bruno/Bayshore, and the Northwest Screenline. Because the Proposed Project is estimated to contribute a negligible amount of riders to these subcorridors and screenlines (less than one percent in each case), the Proposed Project's contribution to this significant impact would **not be considerable**. No mitigation is required.

The remaining subcorridors and screenlines operate below the 85 percent threshold in the AM peak hour without the Proposed Project, resulting in a **less-than-significant** cumulative impact. As a result, the cumulative transit capacity impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, at these subcorridors and screenlines would also be **less-than-significant**.

TABLE 6-5: CUMULATIVE MUNI DOWNTOWN SCREENLINE CAPACITY UTILIZATION - PROPOSED PROJECT					
Screenline	**Cumulative**			**Project Contribution to Screenline**	
	Peak Hour[1] Ridership	**Peak Hour[1] Capacity**	**Peak Hour[1] Capacity Utilization**	**Project Trips**	**Project Contribution to Ridership**
AM Peak Hour					
Kearny/Stockton[2]	7,394	9,473	78%	4	0.1%
Other lines[3]	758	1,785	42%	2	0.3%
Northeast Screenline Total	*8,152*	*11,258*	*72%*	*6*	*0.1%*
Geary[4]	2,673	3,763	71%	3	0.1%
California[5]	1,989	2,306	**86%**	3	0.2%
Sutter/Clement[6]	581	756	77%	3	0.5%
Fulton/Hayes[7]	1,962	1,977	**99%**	2	0.1%
Balboa[8]	690	1,008	68%	2	0.3%
Northwest Screenline Total	*7,895*	*9,810*	*80%*	*13*	*0.2%*
Third Street[9]	2,442	5,712	43%	17	0.7%
Mission[10]	3,117	3,008	**104%**	0	0.0%
San Bruno/Bayshore[11]	1,952	2,197	**89%**	5	0.3%
Other lines[12]	1,795	2,027	**89%**	10	0.6%
Southeast Screenline Total	*9,286*	*12,944*	*72%*	*32*	*0.4%*
Subway lines[13]	6,314	7,020	**90%**	1	0.0%
Haight/Noriega[14]	1,415	1,596	**89%**	1	0.1%
Other lines[15]	175	560	31%	0	0.0%
Southwest Screenline Total	*7,904*	*9,176*	***86%***	*2*	*0.0%*
PM Peak Hour					
Kearny/Stockton[2]	6,295	8,329	76%	6	0.1%
Other lines[3]	1,229	2,065	60%	2	0.2%
Northeast Screenline Total	*7,524*	*10,394*	*72%*	*8*	*0.1%*
Geary[4]	2,996	3,621	83%	4	0.1%
California[5]	2,766	2,021	**137%**	3	0.1%
Sutter/Clement[6]	749	756	**99%**	3	0.4%
Fulton/Hayes[7]	2,762	1,878	**147%**	2	0.1%
Balboa[8]	776	974	80%	2	0.3%
Northwest Screenline Total	*8,049*	*9,250*	***87%***	*14*	*0.2%*
Third Street[9]	2,300	5,712	40%	29	1.3%
Mission[10]	2,673	3,008	**89%**	0	0.0%
San Bruno/Bayshore[11]	1,817	2,134	**85%**	8	0.4%
Other lines[12]	1,582	1,927	82%	17	1.1%
Southeast Screenline Total	*8,372*	*12,781*	*66%*	*54*	*0.6%*
Subway lines[13]	5,692	6,804	84%	1	0.0%
Haight/Noriega[14]	1,265	1,596	79%	2	0.2%
Other lines[15]	380	840	45%	0	0.0%
Southwest Screenline Total	*7,337*	*9,240*	*79%*	*3*	*0.0%*

Notes:
Bold indicates capacity utilization of 85 percent or greater
1. AM Peak hour as inbound (i.e. toward Downtown) only; PM peak hour as outbound (i.e. away from Downtown) only
2. 8 Bayshore, 30 Stockton, 30X Marina Express, 41 Union, 45 Union-Stockton
3. F Market & Wharves, 10 Townsend, 12 Folsom/Pacific
4. 38 Geary, 38R Geary Rapid, 38AX Geary 'A' Express, 38BX Geary 'B' Express

5. 1 California, 1AX California 'A' Express, 1AX California 'B' Express
6. 2 Sutter, 3 Clement
7. 5 Fulton, 21 Hayes
8. 31 Balboa, 31AX Balboa 'A' Express, 31BX Balboa 'B' Express
9. T Third Street
10. 14 Mission, 14R Mission Rapid, 14X Mission Express, 49 Van Ness-Mission
11. 8AX Bayshore 'A' Express, 8BX Bayshore 'B' Express, 8 Bayshore, 9 San Bruno, 9L San Bruno Limited
12. J Church, 10 Townsend, 12 Folsom/Pacific, 19 Polk, 27 Bryant
13. KT Ingleside/Third Street, L Taraval, M Ocean View, N Judah
14. 6 Haight-Parnassus, 7/7R Haight-Noriega/Rapid, 7X Noriega Express, NX Judah Express
15. F Market & Wharves

Source: San Francisco Planning Department, May 2015; Fehr & Peers, 2015, see **Appendix E** for transit line capacity calculations

6.4.1.4 Regional Transit

As noted previously, the Proposed Project would add approximately 99 AM transit trips and 109 PM transit trips to regional transit providers. In the AM, these trips include 20 transit trips to the East Bay, 76 transit trips to the South Bay,[69] and three transit trips to the North Bay. In the PM, these trips include 24 transit trips to the East Bay, 81 transit trips to the South Bay, and four transit trips to the North Bay (see **Table 6-6**). Under the Cumulative Scenario, BART would operate at higher occupancies than the established capacity utilization threshold (100 percent) resulting in a **significant cumulative impact**. Because the Proposed Project is estimated to contribute a negligible amount of riders to these screenlines (around 0.1 percent in each case), the Proposed Project's contribution to this significant impact would **not be considerable**. No mitigation is required. As a result, the contribution to the **significant cumulative impact** from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would be **not considerable**.

[69] Because there are no proposed direct transit links to nearby Caltrain stations, transit passengers traveling to and from the South Bay are expected to utilize first/last mile services such as taxi, TNCs, or bicycling to access Caltrain.

TABLE 6-6: REGIONAL TRANSIT SCREENLINES – CUMULATIVE PLUS PROPOSED PROJECT					
Screenline	**Cumulative 2040**			**Cumulative Plus Proposed Project**	
	Peak Hour Ridership	**Peak Hourly Capacity**	**Capacity Utilization**	**Project Trips**	**Project Contribution to Ridership**
AM Peak Hour					
East Bay					
BART	38,000	32,100	**118.4%**	20	0.1%
AC Transit	7,000	12,000	58.3%	0	0.0%
Ferries	4,682	5,940	78.8%	0	0.0%
Screenline Subtotal	*49,682*	*50,040*	*99.3%*	*20*	*0.0%*
North Bay					
Golden Gate Transit Bus	1,990	2,543	78.3%	2	0.1%
Ferries	1,619	1,959	82.6%	1	0.1%
Screenline Subtotal	*3,609*	*4,502*	*80.2%*	*3*	*0.1%*
South Bay					
BART	21,000	28,808	72.9%	23	0.2%
Caltrain	2,310	3,600	64.2%	53	2.3%
SamTrans	271	520	52.1%	0	0.0%
Ferries	59	200	29.5%	0	0.0%
Screenline Subtotal	*23,640*	*33,128*	*71.4%*	*76*	*0.3%*
Regional Subtotal	*76,931*	*87,670*	*87.8%*	*99*	*0.1%*
PM Peak Hour					
East Bay					
BART	36,000	32,100	**112.1%**	24	0.1%
AC Transit	7,000	12,000	58.3%	0	0.0%
Ferries	5,319	5,940	89.5%	0	0.0%
Screenline Subtotal	*48,319*	*50,040*	*96.6%*	*24*	*0.1%*
North Bay					
Golden Gate Transit Bus	2,070	2,817	73.5%	3	0.1%
Ferries	1,619	1,959	82.6%	1	0.1%
Screenline Subtotal	*3,689*	*4,776*	*77.2%*	*4*	*0.1%*
South Bay					
BART	20,000	28,808	69.4%	24	0.2%
Caltrain	2,529	3,600	70.3%	56	2.2%
SamTrans	150	320	46.9%	0	0.0%
Ferries	59	200	29.5%	0	0.0%
Screenline Subtotal	*22,738*	*32,928*	*69.1%*	*80*	*0.5%*
Regional Subtotal	*74,746*	*87,744*	*85.2%*	*108*	*0.2%*

Source: San Francisco Planning Department, “Transit Data for Transportation Impact Studies,” May 2015. San Francisco Planning Department, “Updated BART Regional Screenlines – Revised,” October 17, 2016; Fehr & Peers 2016.

6.4.2 Cumulative Plus Project Variant

The transit person-trips estimated to be generated by the Project Variant were compared to the Cumulative Conditions projections on a screenline basis. Both transit capacity and utilization increase in the future, captured by this Cumulative Scenario. This section summarizes capacity utilization for the individual route HPX Hunters Point Express, a project-specific cordon, and the Downtown Screenlines. The same assumptions were used as for the Proposed Project analysis presented above.

6.4.2.1 Individual Muni Routes

As shown in **Table 6-7**, the HPX would operate below the established capacity utilization threshold of 85 percent. Therefore, the Project Variant's cumulative transit impacts to the HPX would be **less-than-significant**. As a result, the cumulative transit impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, to the HPX would also be **less-than-significant**.

TABLE 6-7: CUMULATIVE HPX CAPACITY UTILIZATION - PROPOSED VARIANT

Route	Cumulative			Project Contribution to /Route	
	Peak Hour[1] Ridership	Peak Hour[1] Capacity	Peak Hour[1] Capacity Utilization	Project Trips	Project Contribution to Ridership
AM Peak Hour					
HPX Inbound[1]	128	270	47%	20	15.6%
PM Peak Hour					
HPX Outbound[1]	181	270	67%	30	16.6%

Notes:
Bold indicates capacity utilization of 85 percent or greater
1. Inbound is towards Downtown; Outbound is away from Downtown. Data source: CPHPS Variant 2A (PPV2A)

Source: San Francisco Planning Department, May 2015; Fehr & Peers, 2015, see **Appendix E** for transit line capacity calculations

6.4.2.2 Project-Specific Cordon (Muni)

As shown in **Table 6-8**, in each direction, the cordon would operate below the established capacity utilization threshold of 85 percent. Therefore, the Project Variant's cumulative transit impacts at the cordon would be **less-than-significant**. As a result, the cumulative transit impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, on the cordon would also be **less-than-significant**.

TABLE 6-8: CUMULATIVE PROJECT-SPECIFIC CORDON CAPACITY UTILIZATION - PROJECT VARIANT					
Cordon	Cumulative			Project Contribution to Cordon	
	Peak Hour[1] Ridership	Peak Hour[1] Capacity	Peak Hour[1] Capacity Utilization	Project Trips	Project Contribution to Ridership
AM Peak Hour					
Project-Specific Cordon					
Westbound	636	1,016	63%	42	6.6%
Eastbound	599	1,016	59%	180	30.0%
PM Peak Hour					
Project-Specific Cordon					
Westbound	711	1,016	70%	176	24.7%
Eastbound	662	1,016	65%	64	9.7%

Notes:
Bold indicates capacity utilization of 85 percent or greater
Source: San Francisco Planning Department, May 2015; Fehr & Peers, 2015, see **Appendix E** for transit line capacity calculations

6.4.2.3 Downtown Screenlines

All four Downtown Screenlines and constituent subcorridors were analyzed under cumulative conditions. As shown in **Table 6-5**, the following seven subcorridors and one screenline would operate above the 85 percent threshold in the AM peak hour without the Project Variant, resulting in a **significant cumulative impact**: California, Fulton/Hayes, Mission, San Bruno/Bayshore, Southeast Other Lines, Subway lines, Haight/Noriega, and the Southwest Screenline. The following five subcorridors and one screenline would operate above the 85 percent threshold in the PM peak hour without the Project Variant, resulting in a **significant cumulative impact**: California, Sutter/Clement, Fulton/Hayes, Mission, San Bruno/Bayshore, and the Northwest Screenline. Because the Project Variant is estimated to contribute a negligible amount of riders to these subcorridors and screenlines (less than one percent in each case), the Project Variant's contribution to this significant impact would **not be considerable**. No mitigation is required.

The remaining subcorridors and screenlines operate below the 85 percent threshold in the AM peak hour without the Project Variant, resulting in a **less-than-significant** cumulative impact. As a result, the cumulative transit capacity impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, at these subcorridors and screenlines would also be **less-than-significant**.

TABLE 6-9: CUMULATIVE MUNI DOWNTOWN SCREENLINE CAPACITY UTILIZATION - PROJECT VARIANT					
Screenline	Cumulative			Project Contribution to Screenline	
	Peak Hour[1] Ridership	Peak Hour[1] Capacity	Peak Hour[1] Capacity Utilization	Project Trips	Project Contribution to Ridership
AM Peak Hour					
Kearny/Stockton[2]	7,394	9,473	78%	12	0.2%
Other lines[3]	758	1,785	42%	5	0.7%
Northeast Screenline Total	*8,152*	*11,258*	*72%*	*17*	*0.2%*
Geary[4]	2,673	3,763	71%	9	0.3%
California[5]	1,989	2,306	**86%**	7	0.4%
Sutter/Clement[6]	581	756	77%	7	1.2%
Fulton/Hayes[7]	1,962	1,977	**99%**	5	0.3%
Balboa[8]	690	1,008	68%	5	0.7%
Northwest Screenline Total	*7,895*	*9,810*	*80%*	*33*	*0.4%*
Third Street[9]	2,442	5,712	43%	15	0.6%
Mission[10]	3,117	3,008	**104%**	0	0.0%
San Bruno/Bayshore[11]	1,952	2,197	**89%**	4	0.2%
Other lines[12]	1,795	2,027	**89%**	9	0.5%
Southeast Screenline Total	*9,286*	*12,944*	*72%*	*28*	*0.3%*
Subway lines[13]	6,314	7,020	**90%**	2	0.0%
Haight/Noriega[14]	1,415	1,596	**89%**	4	0.3%
Other lines[15]	175	560	31%	0	0.0%
Southwest Screenline Total	*7,904*	*9,176*	***86%***	*6*	*0.1%*
PM Peak Hour					
Kearny/Stockton[2]	6,295	8,329	76%	15	0.2%
Other lines[3]	1,229	2,065	60%	6	0.5%
Northeast Screenline Total	*7,524*	*10,394*	*72%*	*21*	*0.3%*
Geary[4]	2,996	3,621	83%	11	0.4%
California[5]	2,766	2,021	**137%**	8	0.3%
Sutter/Clement[6]	749	756	**99%**	8	1.1%
Fulton/Hayes[7]	2,762	1,878	**147%**	6	0.2%
Balboa[8]	776	974	80%	6	0.8%
Northwest Screenline Total	*8,049*	*9,250*	***87%***	*39*	*0.5%*
Third Street[9]	2,300	5,712	40%	21	0.9%
Mission[10]	2,673	3,008	**89%**	0	0.0%
San Bruno/Bayshore[11]	1,817	2,134	**85%**	5	0.3%
Other lines[12]	1,582	1,927	82%	11	0.7%
Southeast Screenline Total	*8,372*	*12,781*	*66%*	*37*	*0.5%*
Subway lines[13]	5,692	6,804	84%	2	0.0%
Haight/Noriega[14]	1,265	1,596	79%	5	0.4%
Other lines[15]	380	840	45%	0	0.0%
Southwest Screenline Total	*7,337*	*9,240*	*79%*	*7*	*0.1%*

Notes:
Bold indicates capacity utilization of 85 percent or greater
1. AM Peak hour as inbound (i.e. toward Downtown) only; PM peak hour as outbound (i.e. away from Downtown) only
2. 8 Bayshore, 30 Stockton, 30X Marina Express, 41 Union, 45 Union-Stockton
3. F Market & Wharves, 10 Townsend, 12 Folsom/Pacific

4. 38 Geary, 38R Geary Rapid, 38AX Geary 'A' Express, 38BX Geary 'B' Express
5. 1 California, 1AX California 'A' Express, 1AX California 'B' Express
6. 2 Sutter, 3 Clement
7. 5 Fulton, 21 Hayes
8. 31 Balboa, 31AX Balboa 'A' Express, 31BX Balboa 'B' Express
9. T Third Street
10. 14 Mission, 14R Mission Rapid, 14X Mission Express, 49 Van Ness-Mission
11. 8AX Bayshore 'A' Express, 8BX Bayshore 'B' Express, 8 Bayshore, 9 San Bruno, 9L San Bruno Limited
12. J Church, 10 Townsend, 12 Folsom/Pacific, 19 Polk, 27 Bryant
13. KT Ingleside/Third Street, L Taraval, M Ocean View, N Judah
14. 6 Haight-Parnassus, 7/7R Haight-Noriega/Rapid, 7X Noriega Express, NX Judah Express
15. F Market & Wharves

Source: San Francisco Planning Department, May 2015; Fehr & Peers, 2015, see **Appendix E** for transit line capacity calculations

6.4.2.4 Regional Transit

As noted previously, the Project Variant would add approximately 245 new AM transit trips and 281 new PM transit trips to regional transit providers. In the AM, this includes 54 transit trips to the East Bay, 182 transit trips to the South Bay[70], and nine transit trips to the North Bay. In the PM, this includes 64 transit trips to the East Bay, 206 transit trips to the South Bay, and 10 transit trips to the North Bay (see **Table 6-10**). Under the Cumulative Scenario, BART would operate at higher occupancies than the established capacity utilization threshold (100 percent) resulting in a **significant cumulative impact**. Because the Project Variant is estimated to contribute a negligible amount of riders to these screenlines (around 0.1 percent in each case), the Project Variant's contribution to this significant impact would **not be considerable**. No mitigation is required. As a result, the contribution to the **significant cumulative impact** from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would be **not considerable**.

[70] Because there are no proposed direct transit links to nearby Caltrain stations, transit passengers traveling to and from the South Bay are expected to utilize first/last mile services such as taxi, TNCs, or bicycling to access Caltrain.

TABLE 6-10: REGIONAL TRANSIT SCREENLINES – CUMULATIVE PLUS PROJECT VARIANT					
Screenline	**Cumulative 2040**			**Cumulative Plus Project Variant**	
	Peak Hour Ridership	**Peak Hourly Capacity**	**Capacity Utilization**	**Project Trips**	**Project Contribution to Ridership**
AM Peak Hour					
East Bay					
BART	38,000	32,100	**118.4%**	54	0.1%
AC Transit	7,000	12,000	58.3%	0	0.0%
Ferries	4,682	5,940	78.8%	0	0.0%
Screenline Subtotal	*49,682*	*50,040*	*99.3%*	*54*	*0.1%*
North Bay					
Golden Gate Transit Bus	1,990	2,543	78.3%	7	0.4%
Ferries	1,619	1,959	82.6%	2	0.1%
Screenline Subtotal	*3,609*	*4,502*	*80.2%*	*9*	*0.2%*
South Bay					
BART	21,000	28,808	72.9%	55	0.4%
Caltrain	2,310	3,600	64.2%	127	5.5%
SamTrans	271	520	52.1%	0	0.0%
Ferries	59	200	29.5%	0	0.0%
Screenline Subtotal	*23,640*	*33,128*	*71.4%*	*182*	*0.8%*
Regional Subtotal	*76,931*	*87,670*	*87.8%*	*245*	*0.3%*
PM Peak Hour					
East Bay					
BART	36,000	32,100	**112.1%**	64	0.2%
AC Transit	7,000	12,000	58.3%	0	0.0%
Ferries	5,319	5,940	89.5%	0	0.0%
Screenline Subtotal	*48,319*	*50,040*	*96.6%*	*64*	*0.1%*
North Bay					
Golden Gate Transit Bus	2,070	2,817	73.5%	8	0.4%
Ferries	1,619	1,959	82.6%	3	0.2%
Screenline Subtotal	*3,689*	*4,776*	*77.2%*	*11*	*0.3%*
South Bay					
BART	20,000	28,808	69.4%	62	0.3%
Caltrain	2,529	3,600	70.3%	144	5.7%
SamTrans	150	320	46.9%	0	0.0%
Ferries	59	200	29.5%	0	0.0%
Screenline Subtotal	*22,738*	*32,928*	*69.1%*	*206*	*0.9%*
Regional Subtotal	*74,746*	*87,744*	*85.2%*	*281*	*0.4%*

Source: San Francisco Planning Department, "Transit Data for Transportation Impact Studies," May 2015. San Francisco Planning Department, "Updated BART Regional Screenlines – Revised," October 17, 2016; Fehr & Peers 2016.

6.5 CUMULATIVE TRANSIT DELAY IMPACTS

The transit service changes planned for the area were developed as part of the CPHPS Transportation Plan and are assumed as part of the Cumulative Scenario for India Basin. The planned transit network changes include the 48 Quintara operating along Evans Avenue, Middle Point Road, and Innes Avenue, to be joined by the 44 O'Shaughnessy and the HPX Hunters Point Express along Innes Avenue adjacent to the Project Site (see **Figure 10**).

6.5.1 Traffic Performance

The Proposed Project and Project Variant would have an effect on cumulative condition traffic operations by adding at least 1,800 vehicle trips to the surrounding roadway network during the peak commute periods. Traffic conditions along the Hunters Point Boulevard—Innes Avenue corridor (approximately 4,500 feet long) are analyzed by the following metrics: the percentage of demand volume served, average traffic travel time, and queue length as a percentage of available capacity. **Table 6-11** below summarizes these metrics for each Cumulative Scenario. The metrics were developed using the SimTraffic microsimulation modeling platform and results are presented in **Appendix M**.

TABLE 6-11: CUMULATIVE YEAR TRAFFIC PERFORMANCE MEASURES

Scenario	Metric	AM	PM
Eastbound Direction			
C + PP[1]	Demand Served (%)[2]	80%	82%
	Travel Time (min:sec)[3]	2:53	3:12
	Queue Length (%)[4]	17%	22%
C + PV	Demand Served (%)	65%	86%
	Travel Time (min:sec)	3:02	4:05
	Queue Length (%)	22%	34%
Westbound Direction			
C + PP	Demand Served (%)	84%	63%
	Travel Time (min:sec)	10:28	15:46
	Queue Length (%)	78%	100%
C + PV	Demand Served (%)	83%	53%
	Travel Time (min:sec)	11:42	15:34
	Queue Length (%)	81%	100%

Notes:

1. C = Cumulative, PP = Proposed Project, PV = Project Variant.
2. Demand served as percentage of input volume served.
3. Travel time is between Jennings Street and Donahue Avenue for non-transit vehicles.
4. Queue length is percentage of capacity as measured by the distance between each intersection. The sum of average queue length in the eastbound through and westbound through direction at each intersection was used.

Source: Fehr & Peers, 2017.

In general, the Cumulative Plus Proposed Project tends to operate better than the Cumulative Plus Project Variant during both the AM and PM peak hour. Compared to the Project Variant, the Proposed Project Scenario tends to have a higher percentage of demand served, a lower travel time, and a lower percentage of queue capacity utilized, which indicates better corridor performance due to lower project volumes overall and more balanced project volumes in each direction.

Eastbound: In the eastbound direction, the percentage of demand served was generally high, in the range of 80 to 85 percent, with the exception of the Project Variant AM. The traffic demand is not fully served in the eastbound direction because eastbound traffic is constrained due to the assumed implementation of CPHPS transit-only lanes along Evans Avenue, which reduces lane capacity from two lanes in each direction (as exists today) to one lane. Travel times are low, in the range of three to four minutes, because between Jennings Street and Donahue Avenue there are two travel lanes in each direction. Queue length as a percentage of capacity would be in the range of 20 to 30 percent (about 800 to 1,200 feet long for the 4,000 foot-long corridor).

Westbound: In the westbound direction, the percentage of demand served is generally high in the AM peak hour, nearly 85 percent in both the Proposed Project and Project Variant Scenario, but generally low in the PM peak hour at approximately 55 to 60 percent. The PM peak period performs more poorly since there is generally a higher level of traffic demand westbound along Innes Avenue (and outbound from the Project driveways) in the PM peak period than in the AM peak period. Demand served is not closer to 100 percent because westbound traffic reaches a bottleneck at the intersection of Jennings Street and Evans Avenue due to the assumed implementation of transit-only lanes between Third Street and Jennings Street, which reduces lane capacity from two lanes (as exists today) to one lane at this intersection. This bottleneck causes a queue to form that reduces demand served and increases travel times. Travel times are generally high: 10 to 12 minutes in the AM peak hour and approximately 16 minutes in the PM peak hour. Queue length as a percentage of capacity is also high, ranging between 80 and 100 percent of capacity (about 3,200 to 4,000 feet long).

6.5.2 Transit Delay Analysis

As stated in Section 5.1, the Project would have a transit impact if it would cause an increase in delay of at least half a headway in the round-trip travel time for a particular transit route adjacent to the Project Site. This significance threshold is based on the need to retain a comparable transit headway to what is planned and approved. The half-headway threshold represents the tipping point at which point investment in an additional vehicle would be required to counterbalance degradation in transit travel times to maintain the same headway. Under Cumulative conditions, the 44 O'Shaughnessy would have the most frequent peak period service (6.5 minutes), so the threshold for significance under this scenario is 3.25 minutes (195 seconds) in both directions. The study area for this corridor analysis is the Evans Avenue–Hunters Point Boulevard–Innes Avenue corridor between Third Street and Donahue Street, which is approximately 1.4 miles long.

The transit operations plan developed as part of the CPHPS Transportation Plan identified the number of net new vehicles required to operate the planned transit service increases. As part of the CPHPS project's approvals, a mitigation measure to provide transit-only lanes along Evans Avenue between Napoleon Street (which is west of Third Street) and Jennings Street was identified; that measure is assumed to be in place in all Cumulative scenarios for this evaluation. Within the transit-only lanes, the travel speed for a transit vehicle is estimated to be 16 miles per hour, which is double the system-wide average Muni bus speed of eight miles per hour.[71, 72] Between Jennings Street and Donahue Street, the average motor vehicle travel speed from the microsimulation analysis was used as buses would travel in mixed flow. In aggregate, these assumptions would result in a bus travel time of about five and a half minutes in each direction (total of approximately 10.75 minutes) between Third Street and Donahue Street under Cumulative No Project conditions, with the transit-only lanes on Evans Avenue in place.

Table 6-12 details the round-trip travel time (and resulting average speed) along the study corridor between Third Street and Donahue Street for the Cumulative Plus Proposed Project and Cumulative Plus Project Variant Scenarios for the AM and PM peak hours, as compared to the Cumulative No Project scenario. Travel times are the sum of both directions because the basis of the impact criteria is the need for an additional bus in order to maintain scheduled headways, and this requirement is based on the round-trip travel time.

The travel times are obtained from the microsimulation results for these scenarios contained within Section 7.5. Compared against the Cumulative No Project scenario, in the AM peak hour, the travel time under the Cumulative Plus Proposed Project Scenario increases by about eight minutes, while under the Cumulative Plus Project Variant Scenario the travel time increases by about 11 minutes. In the PM peak hour, the travel time under the Cumulative Plus Proposed Project Scenario increases by about 15.5 minutes, while under the Cumulative Plus Project Variant Scenario the travel time increases by about 16 minutes. The increase in travel time is higher for the Cumulative Plus Project Variant Scenario due to the additional traffic this scenario generates compares to the Proposed Project Scenario.

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[71] Eight mile per hour average speed as presented in *San Francisco Muni Unique Cost/Operating Environment* presentation given to the SFMTA Board of Directors, September 2007.

[72] The doubling of transit speed in a transit-only lane compared to mixed flow traffic is based off of data from: Kittelson & Associates (2013), Transit Capacity and Quality of Service Manual – Third Edition, TCRP Document 165, Transit Cooperative Research Program, TRB (www.trb.org); at www.trb.org/Main/Blurbs/169437.aspx.

TABLE 6-12: CUMULATIVE TRANSIT TRAVEL TIME ALONG STUDY CORRIDOR						
Scenario	**Travel Time (minutes: seconds)**[1]	**Average Speed (mph)**	**Change from Cumulative No Project (minutes: seconds)**	**Change from Cumulative No Project (mph)**	**Threshold (minutes: seconds)**	**Significant Impact?**
AM Peak Hour						
Cumulative	10:44	16.0	-	-		-
C + PP[2]	18:52	9.1	+8:08	-6.9	+7:30	**Yes**
C + PV	21:42	7.9	+10:58	-8.1		**Yes**
PM Peak Hour						
Cumulative	11:09	15.4	-	-		-
C + PP	26:30	6.5	+15:21	-8.9	+7:30	**Yes**
C + PV	27:23	6.3	+16:14	-9.1		**Yes**

Notes:

1. Travel times are the sum of the eastbound and westbound direction along the Evans Avenue–Hunters Point Boulevard–Innes Avenue corridor between Third Street and Donahue Street. See **Appendix L** for detailed calculation sheets.
2. C = Cumulative, P = Proposed Project, V = Project Variant.

Source: Fehr & Peers, 2017.

In summary, there is a **significant cumulative impact** for both the Proposed Project and Project Variant to transit delay during the AM and PM peak hours due to increased traffic congestion along the corridor. Both the Proposed Project's and the Project Variant's contributions to their respective significant impacts would **be considerable**.

The following mitigation measure is proposed:

Mitigation Measure C-M-TR-3: Implement Transit-Only Lanes

To mitigate a cumulative transit delay impact caused by the Project and the Variant, in combination with other cumulative projects, the SFMTA shall convert one of the two travel lanes in each direction from mixed-flow to transit-only between the intersection of Evans Avenue/Jennings Street/Middle Point Road, along Hunters Point Boulevard, Innes Avenue, Donahue Street, to the intersection of Donahue Street/Robinson Street. The transit-only lanes shall be located in the lane nearest to the curb for each direction, similar to those identified as part of the CPHPS Phase II Redevelopment Plan EIR for Evans Avenue between Third Street and Jennings Street.

For the proposed project, the threshold of significance for transit delay would be exceeded sometime after full buildout of the proposed project, even when assuming background construction of the Shipyard development per the latest construction schedule. For the variant, however, the threshold of significance for transit delay would be exceeded before buildout of the project, assuming background construction of the Shipyard development per the latest construction schedule. Based on the vehicle-trip estimates for the variant, the significance threshold would be exceeded with occupancy of aggregate land uses generating 1,193 inbound vehicle-trips during the weekday a.m. peak hour or 1,606 outbound vehicle-trips during the weekday p.m. peak hour, whichever comes first. Therefore, the Project Sponsors shall fund, and the SFMTA shall implement, this measure prior to the time the Project or Variant that would result in an increase in transit travel time to 18 minutes, 14 seconds in the AM peak hour or 18 minutes, 39 seconds in the PM peak hour, whichever comes first. The SFMTA shall monitor transit service and travel time along the corridor to assess when this threshold is met and the Project sponsors shall pay their respective fair share amounts after invoicing by SFMTA.

A conceptual drawing of the mitigation measure is shown in **Figure 17**.

The Project Sponsors would be responsible for making a fair share contribution to funding the implementation of the transit-only lanes based on the relative proportion of vehicle trips that the Project or the Variant contribute to the cumulative traffic conditions that result in the need for mitigation. The fair share was determined by the ratio of the sum of project-added trips across the three 700 Innes-adjacent study intersections to the sum of eastbound and westbound through trips without the Project. Since the impact would occur both in the AM and PM peak period, the higher ratio of the peak periods was conservatively selected as the fair share ratio. For the Proposed Project, the fair share contribution would be 38 percent, while for the Project Variant the fair share contribution would be 50 percent. In addition, between the Project Sponsors of the Project, each of the four parcels that make up the Proposed Project or Project Variant would be responsible for their proportionate share of the Project contribution. In this case, 98 percent of vehicle trips would be generated by the 700 Innes Avenue parcel, one percent of vehicle trips would be generated by the India Basin Shoreline Park parcel, zero percent of vehicle trips would be generated by the 900 Innes Avenue parcel, and one percent of trips would be generated by the India Basin Open Space parcel.

Mitigation Measure C-M-TR-3 would reduce the Proposed Project and Project Variant's contribution to cumulative impacts to transit travel time (transit delay) to acceptable levels and result in a less than significant cumulative impact; however, because SFMTA cannot commit to implementing these improvements, the cumulative transit delay impact is considered **significant and unavoidable with mitigation**. If implemented, the mitigation measure would result in **less-than-significant** pedestrian, bicycle, and parking impacts because the proposed changes are restricted to restriping the mixed-flow travel lanes, and therefore would not result in changes to facilities for other modes. Any temporary sidewalk, parking, or traffic lane closures due to construction of the mitigation measure would be coordinated with City agencies, which would result in a **less-than-significant** impact due to construction. There would also be a **less-than-significant** impact to emergency access. The transit-only lane would be available to emergency vehicles and would therefore provide more rapid emergency access along the corridor.

With respect to VMT, the Planning Department has identified screening criteria to identify types, characteristics, or locations of projects and a list of transportation project types that would not result in significant transportation impacts under the VMT metric. These screening criteria are consistent with CEQA Section 21099 and the screening criteria recommended by OPR. If a project falls within certain types of transportation projects, then a detailed VMT analysis is not required for a project. Since the implementation of a transit-only lane would fall within the definition of an "active transportation, rightsizing (aka road diet), and transit project" or "other minor transportation project", a detailed VMT analysis is not required. Therefore, the impact to VMT would be **less-than-significant**.

Mitigation Measure Timing

Between 2018 and 2040, the following changes will affect transit delay in the corridor: phased construction of CPHPS land uses, phased implementation of CPHPS transportation improvements, and phased construction of the India Basin project. A quantitative assessment of transit delay over time has been undertaken for the period between 2018 and 2040 to determine the approximate year or level of development at which a significant transit delay would be triggered. The Mitigation Measure should be implemented no later than the year in which the threshold is triggered.

As part of this analysis the transit delay from an interim year of 2022 was assessed, which assumes full buildout of India Basin plus completion and occupancy of Hunters Point Shipyard Phase I and Major Phase 1 of the remaining Hunters Point Shipyard Phase 2 development including approximately 1,000 housing units and approximately two million square feet of research and development, retail, and other nonresidential uses.

For the Proposed Project, the threshold of significance for transit delay would be exceeded sometime after full buildout of the Proposed Project, even when assuming background construction of Shipyard per the latest construction schedule. However, for the Project Variant, the threshold of significance for transit delay would be exceeded prior to buildout of the Project, assuming background construction of Shipyard per the latest construction schedule.

The construction of the Proposed Project (plus the background construction of CPHPS Major Phase 1) would not create a significant transit delay impact in Year 2022. Project-added transit delay along the Innes Avenue corridor would be just slightly more than three minutes and forty-five seconds in both the AM and PM peak hours, and the expected threshold (based on transit service frequencies) would be 7.5 minutes. However, in the subsequent year 2023, the Proposed Project's transit delay would constitute a significant impact, with peak-hour bus headways along the corridor expected to decrease to 7.5 minutes, moving the threshold to 3 minutes and 45 seconds.

The construction of the Project Variant (plus the background construction of CPHPS Major Phase 1) would create a significant transit delay impact in both the AM and PM peak hours. This is because the Project Variant's land use program would generate more vehicle trips overall, and especially in the "peak direction", which is inbound in the AM and outbound in the PM, in each peak hour. Assuming a linear relationship between the number of "peak direction" project vehicle trips and the amount of project added transit delay, the AM peak hour transit delay impact would occur when land uses generating 1,193 inbound vehicle trips in the AM peak hour would be occupied. The PM peak hour transit delay impact would occur when land uses generating 1,606 outbound vehicle trips in the PM peak hour would be occupied. **Table 7-8** details the vehicle trip generation rates for each land use in both the Proposed Project and the Project Variant, which can be used to calculate whether any particular development would trigger this threshold.

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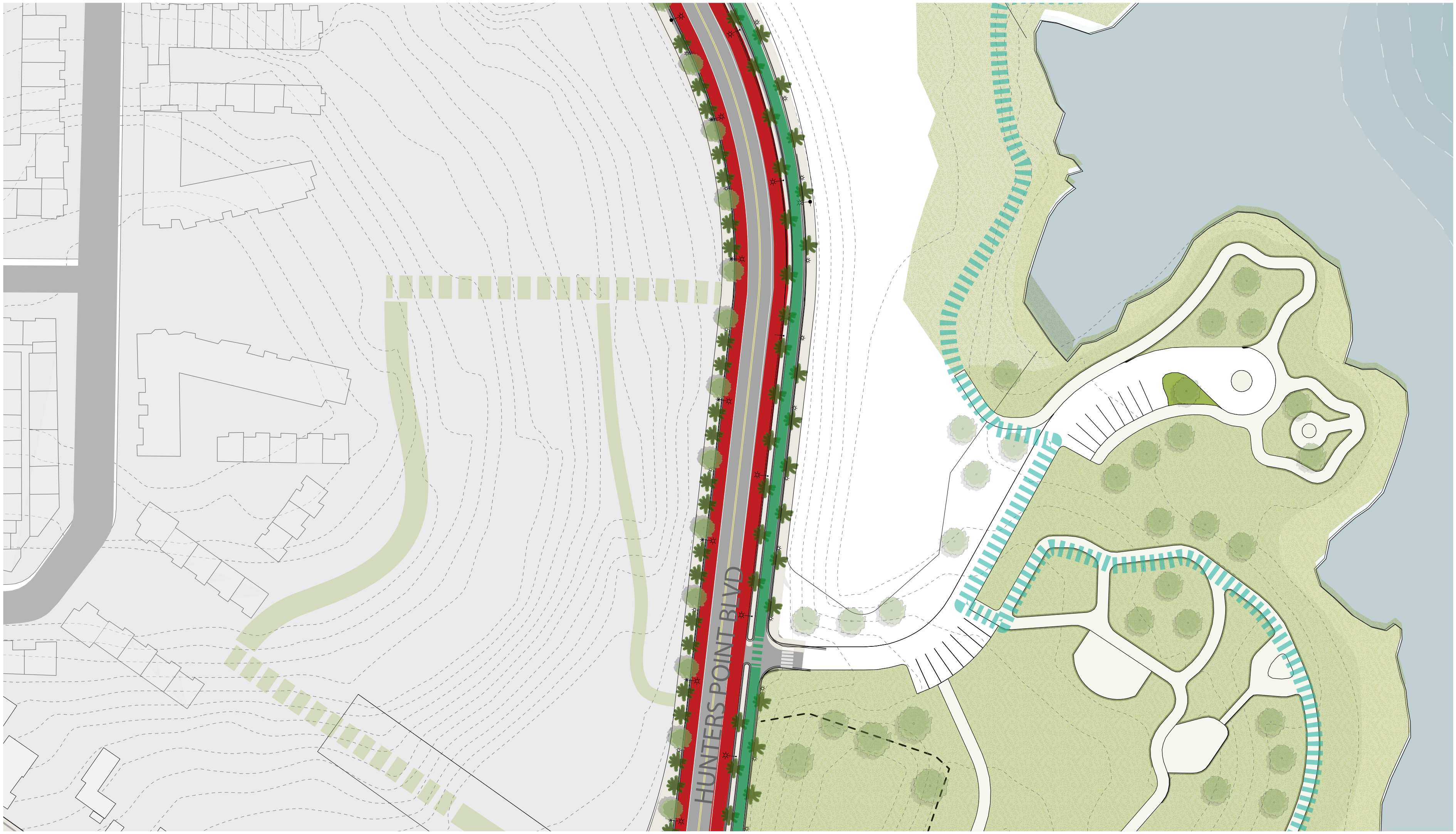
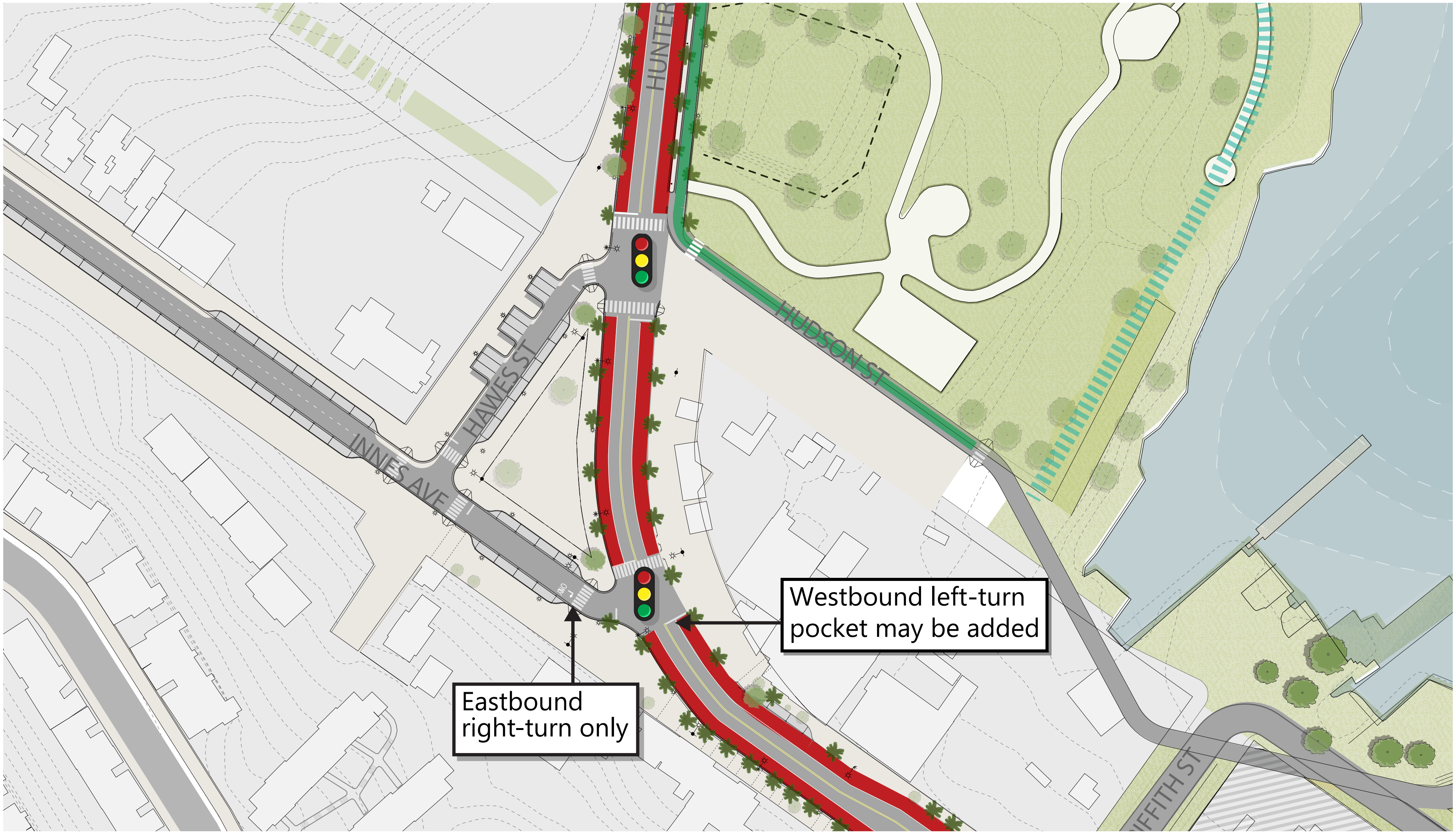


NOT TO SCALE
CONCEPTUAL DRAWING ONLY
DETAILED DESIGN MUST BE COMPLETED
PRIOR TO CONSTRUCTION

Figure 17A

Streetscape Concept
Bus Lane Mitigation Measure - A



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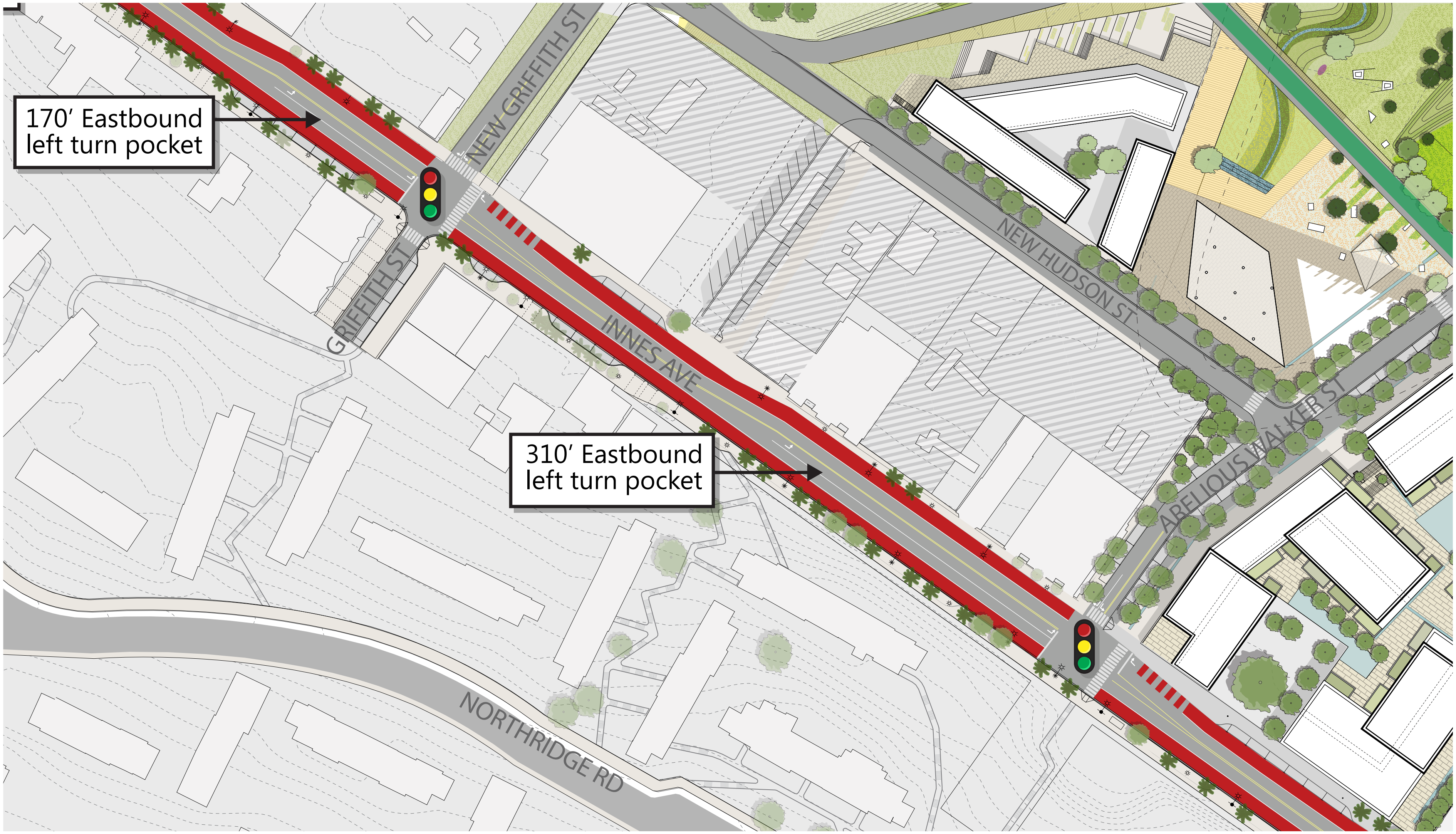
CONCEPTUAL DRAWING ONLY
DETAILED DESIGN MUST BE COMPLETED PRIOR TO CONSTRUCTION

Figure 17B

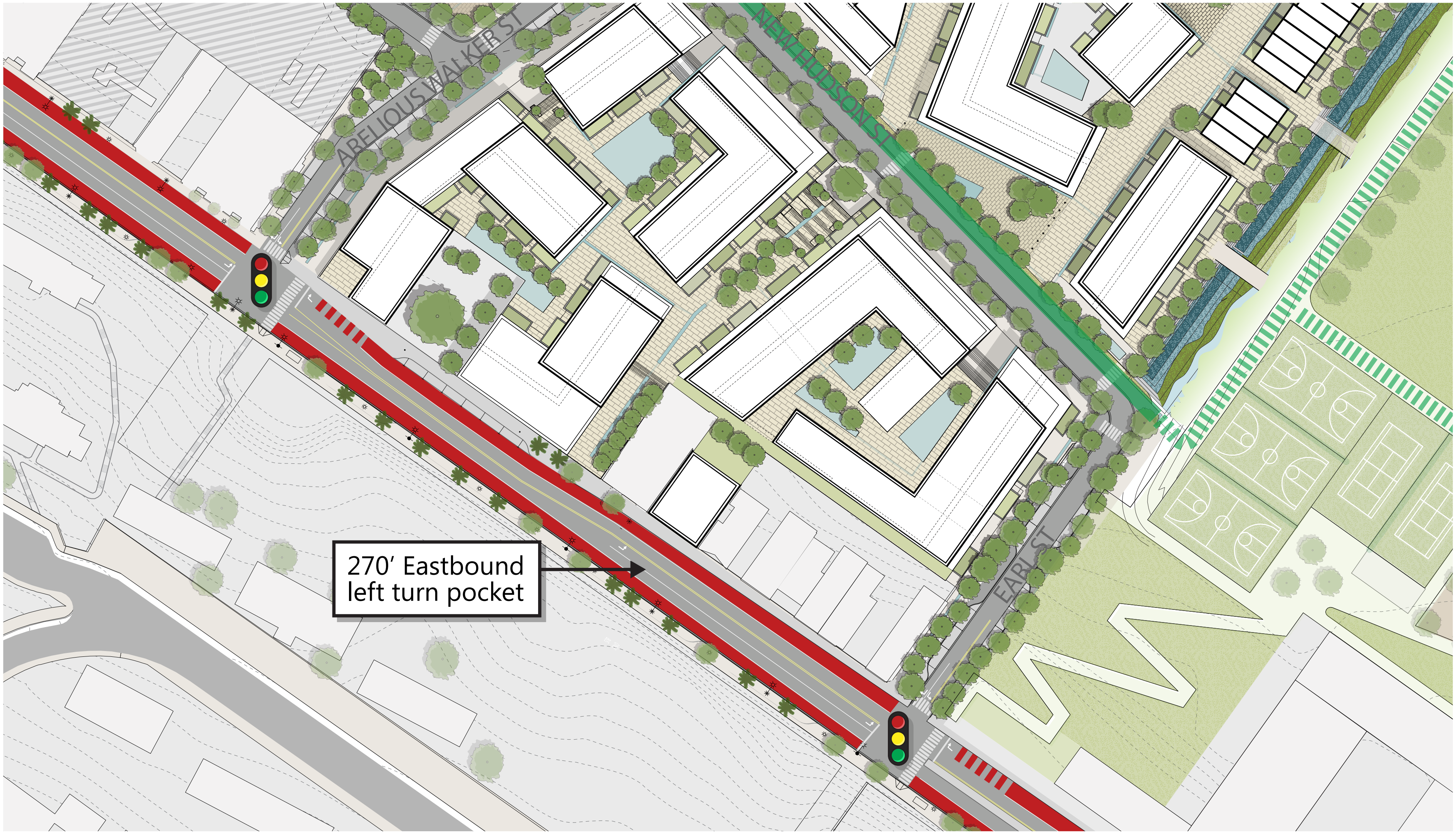
Streetscape Concept
Bus Lane Mitigation Measure - B



NOT TO SCALE
CONCEPTUAL DRAWING ONLY
DETAILED DESIGN MUST BE COMPLETED
PRIOR TO CONSTRUCTION

Figure 17C

Streetscape Concept
Bus Lane Mitigation Measure - C



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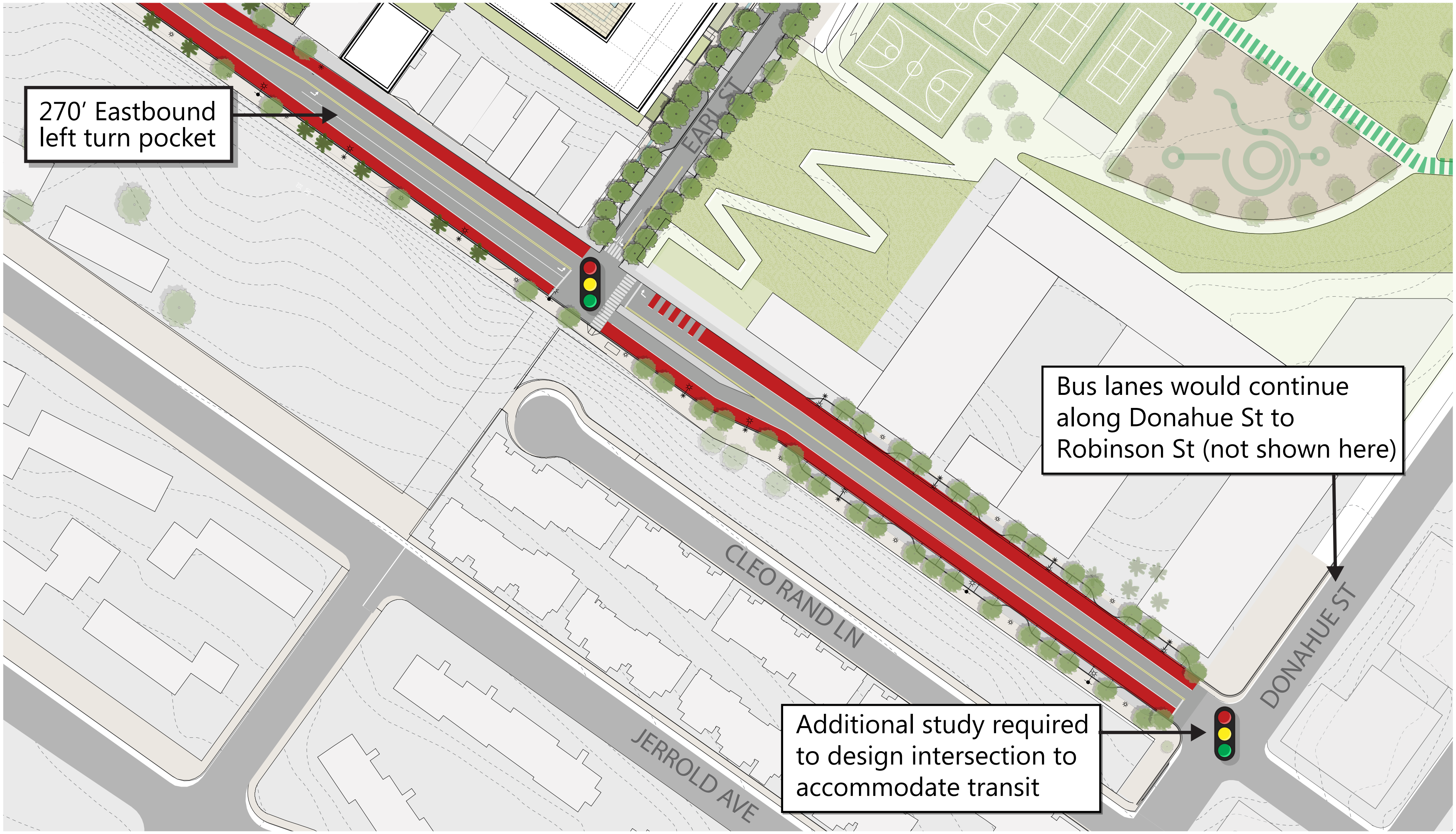
CONCEPTUAL DRAWING ONLY
DETAILED DESIGN MUST BE COMPLETED PRIOR TO CONSTRUCTION

Figure 17D

Streetscape Concept
Bus Lane Mitigation Measure - D



NOT TO SCALE
CONCEPTUAL DRAWING ONLY
DETAILED DESIGN MUST BE COMPLETED PRIOR TO CONSTRUCTION

Figure 17E

Streetscape Concept
Bus Lane Mitigation Measure - E

TABLE 6-13: MITIGATED CUMULATIVE TRANSIT TRAVEL TIME ALONG STUDY CORRIDOR						
Scenario	**Travel time (minutes: seconds)[1]**	**Average Speed (mph)**	**Change from Cumulative No Project (minutes: seconds)**	**Change from Cumulative No Project (mph)**	**Threshold (minutes: seconds)**	**Exceeds Threshold?**
AM Peak Hour						
Cumulative	10:44	16.0	-	-	+7:30	-
C + P	18:52	9.1	+8:08	-6.9		**Yes**
C + P (mitigated)	10:44	16.0	-	-		No
C + V	21:42	7.9	+10:58	-8.1		**Yes**
C + V (mitigated)	10:44	16.0	-	-		No
PM Peak Hour						
Cumulative	11:09	15.4	-	-	+7:30	-
C + P	26:30	6.5	+15:21	-8.9		**Yes**
C + P (mitigated)	10:44[2]	16.0[2]	-0:25	+0.6		No
C + V	27:23	6.3	+16:14	-9.1		**Yes**
C + V (mitigated)	10:44[2]	16.0[2]	-0:25	+0.6		No

Notes:

1. Travel times are the sum of the eastbound and westbound direction along the Evans Avenue–Hunters Point Boulevard–Innes Avenue corridor between Third Street and Donahue Street. See **Appendix L** for detailed calculation sheets.
2. With the addition of the transit-only lane along the Evans Avenue-Hunters Point Boulevard-Innes Avenue corridor, the average bus speed would increase to 16 mph, which is slightly higher than Cumulative No Project conditions (when it would operate in mixed-flow traffic). This higher speed results is a slightly lower travel time.

Source: Fehr & Peers, 2017.

6.5.3 Traffic Performance With Mitigation Measure

The implementation of Mitigation Measure C-M-TR-3 (transit-only lanes along Innes Avenue) to address the significant transit impact under both scenarios is expected to affect traffic operations since a mixed-flow travel lane in each direction would be converted to a transit-only lane, thereby reducing the vehicular capacity of the Innes Avenue corridor. In this section, the changes to traffic conditions along the Evans Avenue—Hunters Point Boulevard—Innes Avenue corridor with the implementation of the transit-only lanes is presented.

TABLE 6-14: CUMULATIVE YEAR TRAFFIC PERFORMANCE MEASURES					
Scenario	**Metric**	**AM**	**AM with C-M-TR-3**	**PM**	**PM with C-M-TR-3**
Eastbound Direction					
C + PP[1]	Demand Served (%)[2]	80%	59%	82%	65%
	Travel Time (min:sec)[3]	2:53	5:47	3:12	6:11
	Queue Length (%)[4]	17%	61%	22%	64%
C + PV	Demand Served (%)	65%	49%	86%	66%
	Travel Time (min:sec)	3:02	5:36	4:05	5:49
	Queue Length (%)	22%	62%	34%	65%
Westbound Direction					
C + PP	Demand Served (%)	84%	69%	63%	54%
	Travel Time (min:sec)	10:28	8:13	15:46	12:12
	Queue Length (%)	78%	63%	100%	62%
C + PV	Demand Served (%)	83%	68%	53%	41%
	Travel Time (min:sec)	11:42	10:16	15:34	11:25
	Queue Length (%)	81%	58%	100%	60%

Notes:

1. C = Cumulative, PP = Proposed Project, PV = Project Variant.
2. Demand served as percentage of input volume served.
3. Travel time is between Jennings Street and Donahue Avenue for non-transit vehicles.
4. Queue length is percentage of capacity as measured by the distance between each intersection. The sum of average queue length in the eastbound through and westbound through direction at each intersection was used.

Source: Fehr & Peers, 2017.

In general, the implementation of Mitigation Measure C-M-TR-3 would result in more traffic congestion (less demand served) which would increase travel times and queue lengths for non-transit vehicles along the corridor.

Eastbound: With the implementation of Mitigation Measure C-M-TR-3, the traffic operations of the corridor deteriorate for non-transit vehicles. The percentage of demand served drops to 50-70 percent (a decrease of 10 to 35 percent) under the Proposed Project and Project Variant Scenarios in the eastbound direction. This is because capacity is constrained along Innes Avenue between Jennings Street and Donahue Avenue since one of the two travel lanes is designated transit-only. As a result, travel times increase to around six minutes for all scenarios, an increase of two to three minutes from previous conditions. Queue lengths also increase to approximately 60 to 65 percent of capacity (about 2,400 to 2,600 feet), an increase of 30 to 45 percent.

Westbound: With the implementation of Mitigation Measure C-M-TR-3, the traffic operations of the corridor deteriorate for non-transit vehicles. The percentage of demand served drops to approximately 70 percent in the AM peak hour (a decrease of 15 percent) and to between 40 to 55 percent in the PM peak hour (a decrease of about 10 to 20 percent). This is because capacity is constrained along Innes Avenue between Jennings Street and Donahue Avenue since one of the two travel lanes is designated transit-only. Travel times decrease to between eight and ten minutes during the AM peak period (a decrease of two to four minutes). While this initially appears to be a counter-intuitive outcome, it is an artifact of the modeling process. Because capacity is constrained upstream at the intersection of Donahue Street and Innes Avenue, the traffic that does get served travels slightly faster within the corridor, because less traffic is served. Prior to entering the study corridor, travel times are very high as queuing occurs upstream of the bottleneck, but as it is outside of the study segment, it is not considered in the travel time statistics presented. A similar effect occurs in the PM peak hour, with travel times decreasing to between 11 to 12 minutes, a decrease of four to five minutes. As another result of the lower proportion of traffic served, queue lengths decrease to approximately 60 percent (about 2,400 feet) in both the AM and PM peak hours, a decrease of approximately 20 to 40 percent.

6.5.4 Model Limitations

The above transit delay impact analysis is based primarily on microsimulation of traffic flow conducted using SimTraffic software. A limitation of this modeling approach is that vehicle travel demand is not responsive to changing levels of congestion along the corridor. The addition of a transit lane along the entire Evans Avenue–Hunters Point Boulevard–Innes Avenue corridor could result in an increase in transit mode share for work trips. An estimation of this mode shift is presented in **Appendix N**.

6.6 CUMULATIVE BICYCLE IMPACTS

A cumulative bicycle impact would occur if the Proposed Project or Project Variant, in combination with other cumulative changes to land use and transportation infrastructure, would create potentially hazardous conditions for bicyclists, or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

The addition of the Proposed Project or Project Variant would contribute to bicycle volumes (101 new AM peak trips and 103 new PM peak trips for the Proposed Project; 138 new AM peak trips and 131 new PM peak trips for the Project Variant). Additional bicycle trips would occur due to the completion of CPHPS and background population and job growth. Vehicle volumes in the Project area would also increase in the Cumulative Scenario, due both to background growth, the full completion of CPHPS, and the addition of the Proposed Project or Project Variant.

In the Cumulative Scenario, CPHPS would be completed and either the CPHPS Transportation Plan streetscape improvements or IBTAP streetscape would be constructed. Thus, there would be high-quality bicycle facilities throughout the Project area. The Proposed Project includes new bicycle facilities including a new Class IV bicycle corridor parallel to and north of Innes Avenue, connected with other bicycle facilities in the Project area including the regional Blue Greenway/Bay Trail bicycle/pedestrian network.

Due to the provision of new Class IV bicycle infrastructure, the installation of bicycle infrastructure on roadways including Innes Avenue, and the less-than-significant cumulative traffic hazard impacts, the Proposed Project or Project Variant, in combination with past, present, and reasonably foreseeable development in San Francisco, would not create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility. Therefore, the Proposed Project or Project Variant, in combination with past, present, and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative impacts on bicyclists for the Cumulative Scenario. Given that the IBTAP would retain or improve bicycle circulation compared to the CPHPS Streetscape Cumulative scenario, the Proposed Project or Project Variant, in combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative impacts on bicyclists for the IBTAP scenarios.

As a result, the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, each in combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative impacts on bicyclists for the Cumulative scenario and IBTAP scenarios.

6.7 CUMULATIVE PEDESTRIAN IMPACTS

As indicated in Section 5.7, the Proposed Project and Project Variant would generate between 461 and 1,013 pedestrian trips during the AM and PM peak hours. The Proposed Project would improve pedestrian circulation adjacent to the Project Site by creating new sidewalks and adding to the Blue Greenway. All internal site roadways would have continuous sidewalks. Curb extensions are planned at key locations on corners and mid-block locations wherever feasible in order to increase pedestrian visibility, shorten crossing distance, and decrease vehicle speeds. New crosswalks are included as part of the Proposed Project, aiding pedestrian circulation. Although the CPHPS project to the east could contribute to demand for the surrounding pedestrian network, it would provide new facilities in the vicinity which would improve the overall pedestrian network. Additionally, CPHPS is not located close enough to the Proposed Project such that generated walking trips would frequently overlap and overcrowd the adjacent facilities.

For the above reasons, the Proposed Project, in combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative impacts on pedestrians for the Cumulative Scenario. Given that the IBTAP would retain or improve pedestrian circulation compared to the CPHPS Streetscape Cumulative Scenario, the Proposed Project, in combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative impacts on bicyclists for the IBTAP scenarios.

6.8 CUMULATIVE LOADING IMPACTS

Loading impacts are by their nature localized and site-specific, and they would not contribute to impacts from other development projects near the Project Site. While this is not true every time a proposed project aims to meet loading demand in the public right-of-way in a densely developed area, it applies to the Proposed Project and Project Variant given the site conditions and conditions across the street (steep hillside without development). The Proposed Project and the Project Variant are both expected to provide adequate loading facilities for the anticipated demand. In addition, there are some existing businesses along Innes Avenue that will be retained with construction of the Proposed Project. These businesses currently load off-street or in on-street parking spaces, and this arrangement is expected to continue upon construction of the Proposed Project. Therefore, the Proposed Project and Project Variant, in combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative loading impacts. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

6.9 CUMULATIVE EMERGENCY ACCESS IMPACTS

In this section, the impacts for the Project Variant would be the same as for the Proposed Project.

While there would be a general increase in vehicle traffic that is expected through the future scenario, the Proposed Project would not create potentially hazardous conditions for emergency vehicles, or otherwise interfere with emergency vehicle accessibility to the site and adjoining areas. For the above reasons, either the Proposed Project, in combination with past, present and reasonably foreseeable development in San

Francisco, would have **less-than-significant** cumulative emergency access impacts. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

6.10 CUMULATIVE CONSTRUCTION IMPACTS

In this section, the impacts for the Project Variant would be the same as for the Proposed Project.

The construction of the Proposed Project may overlap with the construction of other projects listed in Section 6.1.1. Since the Shipyard development project will be under construction for the next several years and it would also take several years for the Proposed Project to be constructed, it is likely that construction activities for these two projects would occur simultaneously and over a long period of time. Localized cumulative construction-related transportation effects could occur as a result of cumulative projects that generate increased traffic at the same time and on the same roads as the Proposed Project in close proximity to one another.

Improvement Measure I-TR-3, Construction Management (discussed in Section 5.10), would apply to the Proposed Project. The construction manager for each project will work with the various departments of the City and develop a coordinated plan to address construction vehicle routing, traffic control, and pedestrian movement adjacent to the construction area for the duration of any overlap in construction activity. As mentioned, because of the size of the Project Site, much of the construction activity can be completed on-site. In addition to any formal transportation construction management plan, the Proposed Project's construction would comply with the SFMTA *Regulations For Working In San Francisco Streets*, also known as the "Blue Book," and all other applicable City regulations.

Construction activities for the SFPUC Southeast Treatment Plant Biosolids and Headworks replacement projects would likely overlap with construction of the Proposed Project. These two projects may result in construction staging activity at Piers 94 and 96 near the Project Site. Trips between this staging site and the PUC Project Site would occur along Evans Avenue, as the PUC Project Site is located east of the Caltrain right-of-way between Evans Avenue and Jerrold Avenue. Construction for the SFPUC Southeast Treatment Plan Biosolids project would occur from August 2018 through May 2024. There would be 60 daily delivery truck trips and 142 construction truck trips daily during the peak month of construction. The SFPUC would prepare and implement a Traffic Control Plan to minimize impacts on local streets.[73] Construction for the Headworks replacement project will occur between August 2017 and December 2023. The number of daily truck trips will vary based on the phase of construction, and the maximum number of daily trips will be 24 daily truck trips during the improvements to the Bruce Flynn Pump Station, occurring between January 2018 and January 2019.[74] The PUC construction site is 0.7 miles northwest of the India Basin Project Site.

The Proposed Project's contribution to cumulative construction impact would not be cumulatively considerable as the construction would be of temporary duration, and the Project Sponsor would coordinate with various City departments such as SFMTA and DPW through the Transportation Advisory Staff Committee (TASC) to develop coordinated plans that would address construction-related vehicle routing and pedestrian movements adjacent to the construction area for the duration of construction

[73] *Biosolids Digester Facilities Project: Draft Environmental Impact Report – Volume 1*. May 2017. San Francisco Planning Department Case No. 2015-000644ENV.

[74] *Southeast Plan Headworks Replacement Project: Preliminary Mitigated Negative Declaration*. November 2016. San Francisco Planning Department Case No. 2015-006224ENV

overlap. Therefore, for the above reasons, the Proposed Project, in combination with past, present and reasonably foreseeable development in San Francisco, would result in **less-than-significant** cumulative construction-related transportation impacts. As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant**.

6.11 CUMULATIVE PARKING IMPACTS

In this section, the impacts for the Project Variant would be the same as for the Proposed Project.

The area under consideration for cumulative parking impacts is the portion of the street network within a 5 to 10 minute walk from the Project Site (approximately 1,300 to 2,600 feet). This is also the area used for data collection for existing parking conditions.

The parking conditions for Cumulative Plus Project are the same as the Baseline Plus Project scenario, with 218 on-street spaces in the area under consideration. The IBTAP Scenarios Plus Project and would reduce parking by 127 on-street spaces in the portion of the street network under consideration, compared with Cumulative Plus Project conditions. While IBTAP Subvariant B would also remove a parking lane on Jennings Street between Cargo Way and Evans Avenue resulting in the loss of approximately 45 spaces, this is outside of the parking area under consideration. Both of these IBTAP scenarios would reduce the total parking spaces to 91 in the Cumulative Plus Project condition. **Table 6-15** summarizes the on-street parking supply adjacent to and internal to the Project Site under each scenario.

Because the Proposed Project represents the only substantial new development in this area and its TDM measures would reduce parking demand associated with new project residents and employees, and because existing parking demand was not in excess of supply, the Proposed Project would not result in a substantial parking deficit for on-street and off-street parking . Therefore, cumulative impacts related to parking would be **less-than-significant** under the Cumulative Scenario. Even with the comparatively fewer on-street parking spaces, cumulative impacts related to parking would be **less-than-significant** under the IBTAP scenarios.

As a result, the impacts from the individual parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would also be **less-than-significant** under the Cumulative, IBTAP scenarios.

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TABLE 6-15: ON-STREET PARKING SUPPLY							
	Innes Avenue				**Internal**		***Total***
From:	**Hunters Point Boulevard[1]**	**Griffith Street**	**Arelious Walker Drive**	**Earl Street**	**Build Property**	**RPD Property**	
To:	**Griffith Street**	**Arelious Walker Drive**	**Earl Street**	**Donahue Street**			
Existing Conditions	37	56	57	59	95	18	*322*
Baseline	37	56	57	59	95	18	*322*
Baseline Plus Project	33	46	48	46	20	25	*218*
Cumulative Scenario Plus Project	33	46	48	46	20	25	*218*
IBTAP Scenarios	8	7	6	25	20	25	*91*

Notes:
1. Hunters Point Boulevard does not contain any on-street parking spaces in any scenario.

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7 INTERSECTION OPERATIONS

In this chapter, the operating characteristics of seven study intersections are evaluated, for informational purposes, using the concept of Level of Service ("LOS"). LOS is a quantitative description of an intersection's performance based on the average delay per vehicle. Intersection levels of service range from LOS A, which indicates free flow or excellent vehicle flow conditions with short delays, to LOS F, which indicates congested or overloaded vehicle flow conditions with extremely long delays. LOS is a generally-accepted metric to classify vehicle delay. In San Francisco, LOS is sometimes used to communicate levels of congestion. The intersections were evaluated using the 2000 Highway Capacity Manual (HCM) methodology. For signalized intersections, this methodology determines the capacity for each lane group approaching the intersection. The LOS is based on average delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average delay and LOS is presented for the intersection. **Appendix O** presents more detailed level of service descriptions for the study intersections.

Traffic operations at signalized intersections are evaluated using the LOS method described in Chapter 16 of the HCM. A signalized intersection's LOS is based on the weighted average control delay measured in seconds per vehicle and includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration. **Table 7-1** summarizes the relationship between the control delay and LOS for signalized intersections.

TABLE 7-1: SIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA

Level of Service	Description	Average Control Delay (seconds per vehicle)
A	Operations with very low delay occurring with favorable traffic signal progression and/or short cycle lengths.	< 10
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10 to 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20 to 35
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35 to 55
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55 to 80
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80

Source: *Highway Capacity Manual, Transportation Research Board,* 2000.

Traffic conditions at unsignalized intersections are evaluated using the method in Chapter 17 of the HCM. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. For all-way stop-controlled intersections, the average control delay is calculated for the intersection as a whole. At two-way or side street-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left turn movement from the major street, and the entire intersection, though only the delay for the worst movement is reported. **Table 7-2** summarizes the relationship between delay and LOS for unsignalized intersections.

TABLE 7-2: UNSIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA

Level of Service	Description	Average Control Delay (seconds per vehicle)
A	Little or no delays	< 10
B	Short traffic delays	> 10 to 15
C	Average traffic delays	> 15 to 25
D	Long traffic delays	> 25 to 35
E	Very long traffic delays	> 35 to 50
F	Extreme traffic delays with intersection capacity exceeded	> 50

Source: *Highway Capacity Manual, Transportation Research Board*, 2000.

7.1 EXISTING CONDITIONS

The traffic analysis evaluates the existing operational characteristics during the weekday AM and PM peak hours without the introduction of project-generated vehicle trips. The AM and PM peak hours occur within the peak periods of 7:00 AM to 9:00 AM and 4:00 to 6:00 PM, respectively. The selection of the seven intersections was made primarily to assess the effect of Project traffic on intersections near the Project Site through which Muni operates bus and light rail service. These intersections were selected based on consultation with City staff.

1. Evans Avenue/Third Street
2. Evans Avenue/Jennings Street
3. Hunters Point Boulevard/Hudson Avenue/Hawes Street
4. Innes Avenue/Hunters Point Boulevard
5. Innes Avenue/Griffith Street
6. Innes Avenue/Arelious Walker Drive
7. Innes Avenue/Earl Street

Figure 18 displays the existing AM and PM peak hour traffic volumes for the seven study intersections, obtained from peak period traffic counts collected in May 2015 and August 2016. Counts were not taken at Intersection #3 or Intersection #5 because side-streets are currently very minor streets with negligible traffic volumes. Instead, the analysis assumes through volumes balance with traffic at adjacent intersections and that side-streets have five vehicles entering and exiting to/from each direction, estimated based on observations. This figure also displays the lane configurations and traffic controls (signals, stop signs, etc.) at each intersection. Traffic volume and intersection turning movement count summary sheets are provided in **Appendix P**.

LOS was calculated at each study intersection for the weekday AM and PM peak hours. Table **7-3Table 7-3** presents the resulting LOS and corresponding delay at each study intersection. As shown in the table, all seven study intersections currently operate at LOS D or better during the AM and PM peak hours. The highest delay occurs at Evans Avenue/Third Street with LOS D during the PM peak hour.

Signal warrant analysis for unsignalized study intersections shows that none of the four unsignalized intersections currently meets peak hour warrants for signalization under existing conditions.[75]

TABLE 7-3: PEAK HOUR INTERSECTION LEVELS OF SERVICE – EXISTING CONDITIONS

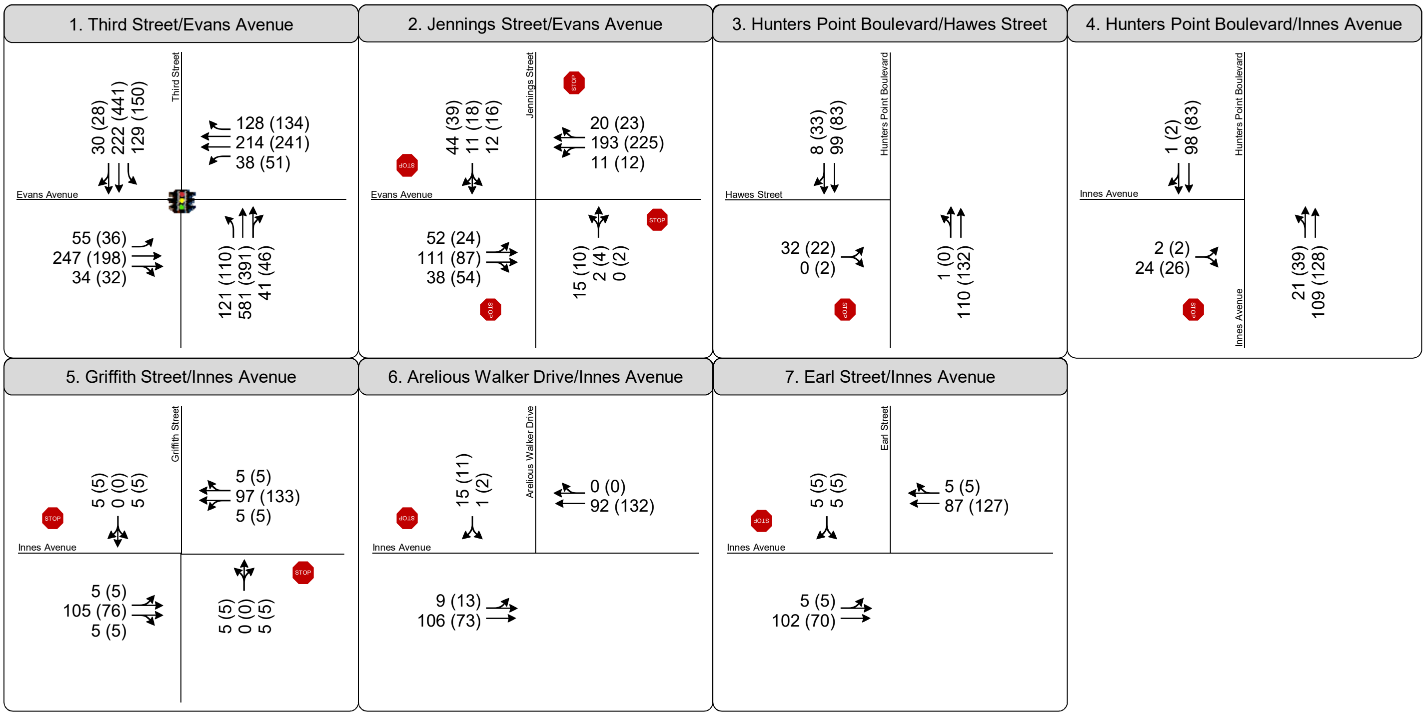
Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1. Evans Ave /Third St	Signal	38	D	36	D
2. Evans Ave/Jennings St	AWSC	<10	A	<10	A
3. Hudson Avenue/Hunters Point Boulevard/Hawes Street	SSSC	<10 (EB)	A	<10 (EB)	A
4. Innes Avenue/Hunters Point Boulevard	SSSC	<10 (EB)	A	<10 (EB)	A
5. Innes Ave/Griffith St	SSSC	12 (SB[3])	A	12 (SB)	B
6. Innes Ave/Arelious Walker Drive	SSSC	<10 (SB)	A	10 (SB)	A
7. Innes Ave/Earl St	SSSC	10 (SB)	B	11 (SB)	B

Notes:

1. Delay reported as seconds per vehicle.
2. For signalized intersections, LOS based on average intersection delay, based on the methodology in the Highway Capacity Manual, 2000. For unsignalized intersection, LOS is based on the worst approach which is indicated in parentheses. For signalized intersections operating at LOS F, volume-to-capacity (v/c) ratio is also presented.
3. Southbound approach represents private driveway which was observed during site visit to have some trips entering and exiting.

Source: Fehr & Peers, 2016.

[75] Note that meeting the peak hour signal warrant criteria is not necessarily indicative of the need for a traffic signal. A number of additional factors such as hourly traffic variation, traffic safety, and pedestrian volumes should be considered and the ultimate decision made by the City Traffic Engineer (and Caltrans where the intersection is ramp junction to a Caltrans facility). However, it is a reasonable indication of whether a signal may be worth investigating further and is presented here for informational purposes only.



Turn Lane

AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Figure 18

Peak Hour Traffic Volumes and Lane Configuration - Existing

7.2 BASELINE CONDITIONS

Figure 19 displays the Baseline No Project peak hour traffic volumes for the peak periods studied, lane configurations and traffic controls (signal or stop) at each study intersection. These volumes reflect the only nearby project that has either been approved, is under construction, or has been built since the counts were collected: Hunters Point Shipyard Phase I.

Table 7-4 presents the results of the Baseline Conditions intersection LOS analysis and corresponding delay at each study intersection for the study weekday peak periods. The intersection of Evans Avenue/Jennings Street is assumed to be signalized in the Baseline Scenario as this is a measure approved and funded as part of the Shipyard project.

As shown in the table, all of the study intersections would operate at LOS D or better during the AM and PM peak hours. Intersection level of service calculation sheets are provided in **Appendix O**.

None of the three unsignalized intersections meet peak hour warrants for signalization under baseline conditions.[76]

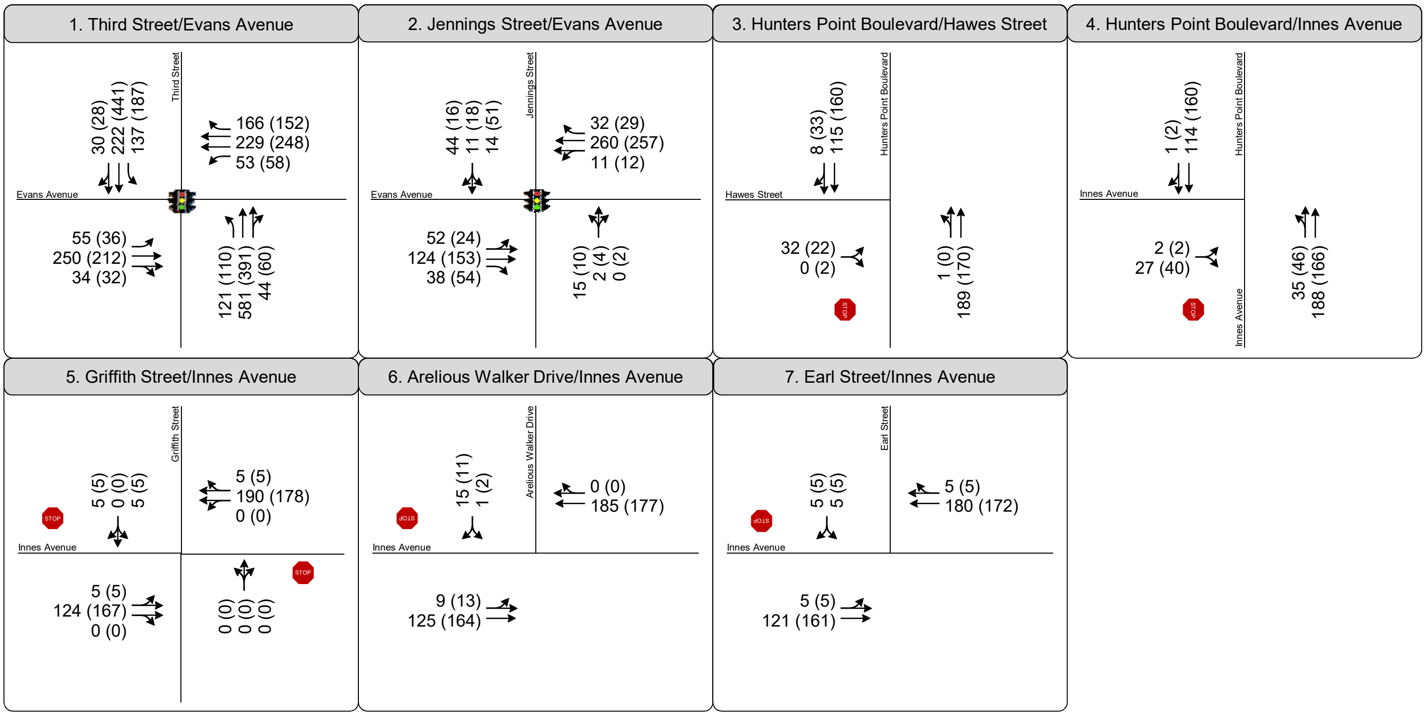
TABLE 7-4: PEAK HOUR INTERSECTION LEVELS OF SERVICE – BASELINE CONDITIONS

Intersection	Traffic Control	Existing				Baseline			
		AM		PM		AM		PM	
		Avg. Delay[1]	LOS[2]	Avg. Delay[1]	LOS[2]	Avg. Delay[1]	LOS[2]	Avg. Delay[1]	LOS[2]
1. Evans Ave/Third St	Signal	38	D	36	D	39	D	39	D
2. Evans Ave/Jennings St	***Signal***[3]	<10	A	<10	A	10	B	11	B
3. Hudson Avenue/ Hunters Point Boulevard/ Hawes Street	SSSC	<10 (EB)	A	<10 (EB)	A	10 (EB)	B	11 (EB)	B
4. Innes Avenue/ Hunters Point Boulevard	SSSC	<10 (EB)	A	<10 (EB)	A	<10 (EB)	A	<10 (EB)	A
5. Innes Ave/Griffith St	SSSC	12 (SB[3])	B	12 (SB)	B	13 (SB)	B	13 (SB)	B
6. Innes Ave/Arelious Walker Dr	SSSC	<10 (SB)	A	10 (SB)	A	10 (SB)	B	10 (SB)	B
7. Innes Ave/Earl St	SSSC	10 (SB)	B	11 (SB)	B	11 (SB)	B	11 (SB)	B

Notes:
Bold and italics indicates traffic control type change for Baseline compared to Existing.

1. Delay reported as seconds per vehicle. For unsignalized intersections, delay at worst case approach is shown.
2. LOS = Level of Service. For signalized intersections, LOS based on average intersection delay, based on the methodology in the *Highway Capacity Manual*, 2000.
3. Signalization of this intersection is a mitigation measure that FivePoint is committed to implementing as part of the Shipyard project.

[76] *ibid*.



Turn Lane

AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Figure 19

Peak Hour Traffic Volumes and Lane Configuration - Baseline

7.3 INNES AVENUE INTERSECTION DESIGN

The Project Site is located next to Innes Avenue adjacent to the existing unsignalized intersections at Griffith Street, Arelious Walker Drive, and Earl Street. The Proposed Project would add a fourth leg to the existing intersection at Griffith Street; the new leg to the north of Innes Avenue would also be named Griffith Street. These three intersections (#5 Griffith Street, #6 Arelious Walker Drive, and #7 Earl Street) would provide access to the site. Although the Innes Avenue corridor has been studied for several years, and plans have generally anticipated development at India Basin, no specific details regarding the India Basin project's travel demand or roadway configurations had been developed. Thus, prior studies were not able to account for the specifics of the Proposed Project. In this study, designs for the three intersections (#5 Griffith Street, #6 Arelious Walker Drive, and #7 Earl Street) have been developed using a microsimulation analysis and volume forecasts from the Cumulative Scenario, which includes full buildout of the Proposed Project and the Shipyard. The cumulative project scenarios were chosen because they reflect the ultimate volumes that the intersections would be required to handle beyond the Proposed Project buildout. The chosen designs are consistent with what is feasible within the existing right-of-way along Innes Avenue.

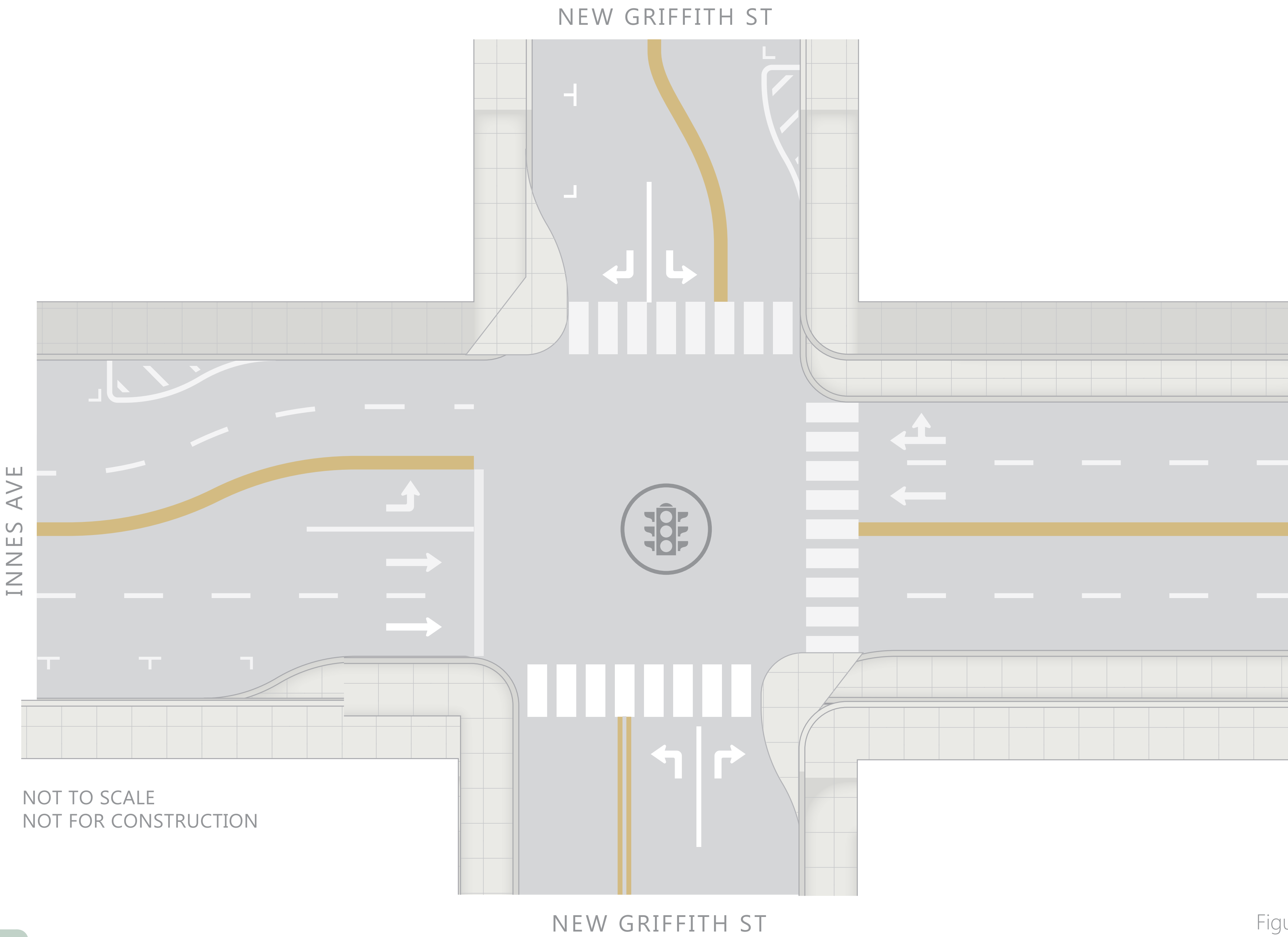
The microsimulation software used, SimTraffic, captures the effects of nearby intersections since the movement of individual vehicles is modeled through the network. Because the three intersections are spaced closely together and there is a high volume of traffic expected in the future, the microsimulation approach provides the ability to tailor a design that works optimally with future traffic conditions accounting for the ways in which closely-spaced intersections affect each other and operate as a single system.

Thus, the Plus Project information presented later in this chapter include the proposed intersection designs, whose features are as follows, and whose conceptual designs are shown in **Figure 20A**, **20B**, and **20C**, below:

  - All three intersections are signalized with a cycle length capped at 100 seconds. Signals are coordinated for traffic along Innes Avenue (eastbound and westbound).[77]
  - Eastbound left turn pocket at all three intersections. Pocket length varies.
  - Southbound left turn pocket at all three intersections. Pocket length varies.
  - At the intersection of Innes Avenue/Arelious Walker Drive, the southbound right turn movement would have an overlap phase with the eastbound left turn phase.
  - Crosswalks on the north and east legs of the intersections, but not on the west leg.

- Project Variant Only:
  - In addition to the above, at the intersections of Innes Avenue/Griffith Street and Innes Avenue/Earl Street, the southbound right turn movement would have an overlap phase with the eastbound left turn phase.

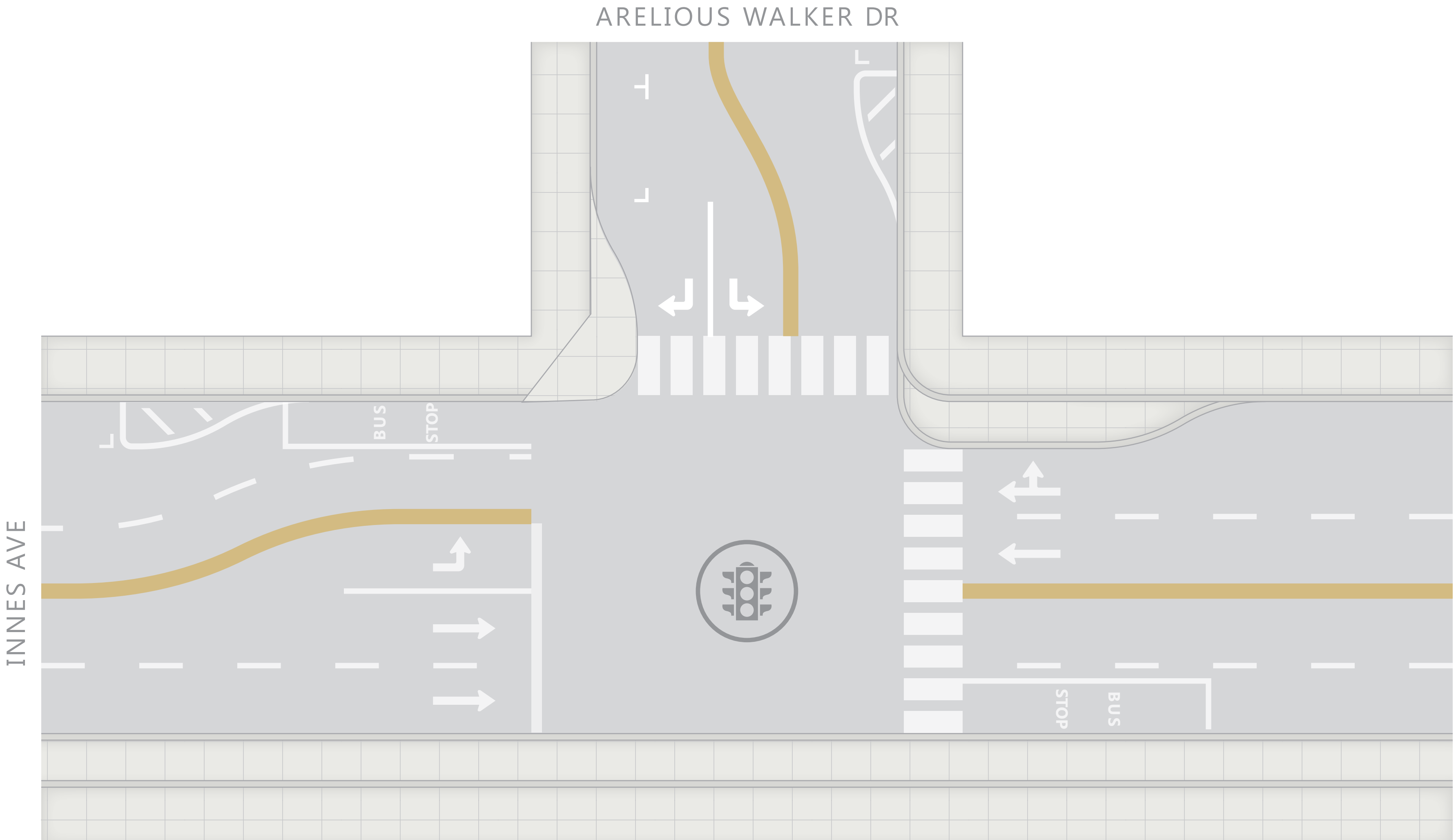
[77] It is noted that SFMTA would need to coordinate these three traffic signals on Innes Avenue with the two proposed signals at Hunters Point Blvd/Hawes Street/Hudson Avenue and Innes Avenue/Hunters Point Boulevard.



NOT TO SCALE
NOT FOR CONSTRUCTION

Figure 20A

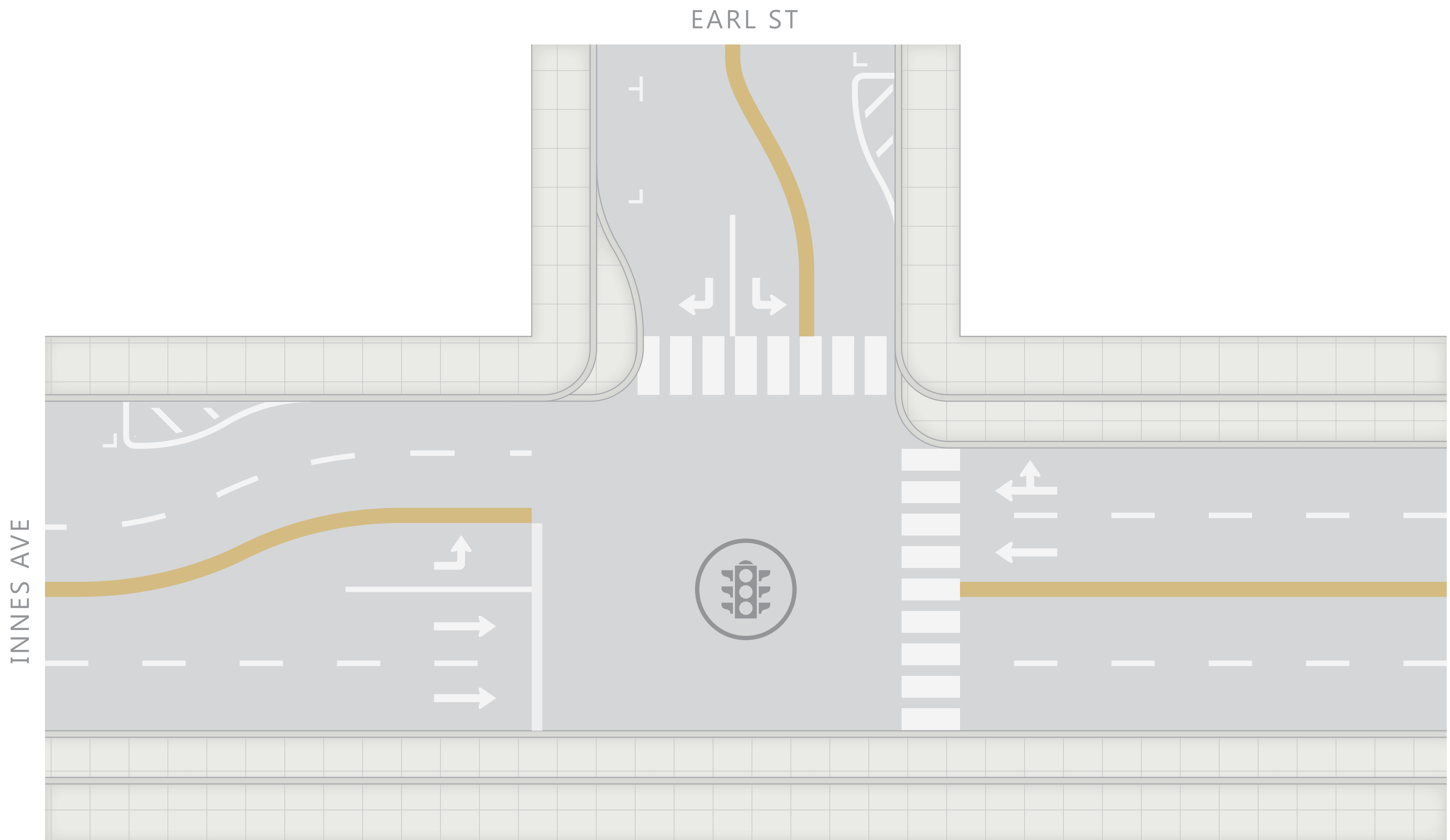
Innes Avenue Intersection Designs:
Innes Avenue/New Griffith Street



NOT TO SCALE
NOT FOR CONSTRUCTION

Figure 20B

Innes Avenue Intersection Designs:
Innes Avenue/Arelious Walker Drive



NOT TO SCALE
NOT FOR CONSTRUCTION

Figure 20C

Innes Avenue Intersection Designs: Innes Avenue/Earl Street

The design process was iterative, with the delay and queuing results used to guide configuration decisions. The Project will include eastbound-left turn pockets and signalization at all three intersections to facilitate site access. The Project will also include southbound left turn pockets at each intersection, to provide the flexibility to implement a southbound right turn overlap phase with the eastbound left turn movement in order to better serve traffic outbound from the site while maintaining efficient operations for Innes Avenue. Since the Cumulative condition contains traffic conditions which are more congested than under Baseline, the project vehicles entering and exiting the site were slightly redistributed compared to project volumes presented in the Baseline plus Proposed Project and Baseline plus Project Variant sections in order to approximate long run equilibrium approach delays across the three streets.

The delay and LOS results for the proposed design scenarios are shown in **Table 7-5** below. These results are intended for informational purposes with the intent of comparing the overall traffic operations of the two scenarios.

As shown in the table, traffic operations under the Proposed Project Scenario are generally better than under the Project Variant Scenario, with lower delays along Innes Avenue and at the side-street movements. This is primarily because the Proposed Project Scenario has a mix of land uses that provides for a more balanced flow of traffic into and out of the Project Site during both peak hours. In contrast, the Project Variant Scenario has significantly more office and R&D space which results in an unbalanced flow of traffic into the site in the morning and leaving the site in the afternoon (as well as a higher overall amount of vehicle trip generation).

In general, both scenarios operate at LOS D or better during the AM peak period, while the PM peak period experiences more congested conditions. During the PM peak, the westbound through and southbound movements (i.e. traffic exiting the Project Site) typically operate at LOS E or F at the intersections of Innes Avenue/Arelious Walker Drive and Innes Avenue/Earl Street. This is due to the high volume of demand to exit the site and travel westbound combined with the traffic from other developments already forecasted to travel westbound along Innes Avenue from Hunters Point. While the signals would be coordinated for traffic traveling along Innes Avenue, there is an additional tradeoff made in the decision of how to allocate green time between conflicting movements. This analysis assumes signal timing decisions would be made primarily to favor traffic and transit flows along Innes Avenue at the expense of additional side street delay. Despite this, the splits could be modified to further prioritize Innes Avenue, which would come at the expense of additional, severe delay on the project-internal side streets.

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TABLE 7-5: SIMTRAFFIC DELAY RESULTS FOR INTERSECTIONS ADJACENT TO THE PROJECT						
Movement	**Griffith Street/Innes Avenue**		**Arelious Walker/Innes Avenue**		**Earl Street/Innes Avenue**	
	AM	**PM**	**AM**	**PM**	**AM**	**PM**
Cumulative No Project						
EBT	<10 / A	<10 / A	<10 / A	12 / B	<10 / A	12 / B
EBL	12 / B	22 / C	13 / B	26 / C	13 / B	25 / C
WBT	<10 / A	<10 / A	<10 / A	<10 / A	<10 / A	<10 / A
SBR	<10 / A	<10 / A	<10 / A	12 / B	<10 / A	<10 / A
SBL	12 / B	13 / B	13 / B	16 / B	15 / B	16 / B
Intersection Average	*<10 / A*	*<10 / A*	*<10 / A*	*<10 / A*	*<10 / A*	*11 / B*
Cumulative Plus Proposed Project						
EBT	<10 / A	<10 / A	<10 / A	<10 / A	<10 / A	<10 / A
EBL	46 / D	42 / D	47 / D	48 / D	40 / D	23 / C
WBT	13 / B	29 / C	21 / C	73 / E	19 / B	86 / F
SBR	27 / C	240 / F	19 / B	49 / D	19 / B	160 / F
SBL	32 / C	186 / F	35 / D	57 / E	28 / C	146 / F
Intersection Average	*13 / B*	*40 / D*	*19 / B*	*48 / D*	*19 / B*	*70 / E*
Cumulative Plus Project Variant						
EBT	<10 / A	<10 / A	<10 / A	<10 / A	<10 / A	<10 / A
EBL	32 / C	67 / E	34 / C	44 / D	34 / C	19 / B
WBT	15 / B	28 / C	17 / B	87 / F	23 / C	229 / F
SBR	18 / B	300 / F	19 / B	295 / F	12 / B	198 / F
SBL	34 / C	275 / F	34 / C	301 / F	33 / C	206 / F
Intersection Average	*14 / B*	*56 / E*	*16 / B*	*100 / F*	*19 / B*	*138 / F*

Source: Fehr & Peers, 2016

7.3.1.1 Figure Intersection Queuing

In developing the proposed design, the turn pocket storage lengths were generally designed to accommodate the average and 95th-percentile queues, where possible. However, in some cases, such as at the intersections of Innes Avenue/Griffith Street and Innes Avenue/Arelious Walker Drive, the storage length was curtailed because the turn pocket could only be extended as far as the adjacent upstream intersection. Due to the constrained right-of-way available along Innes Avenue and the side streets, the inclusion of turn pockets would require the removal of some on-street parking spaces as shown in Section 5.11.2. **Table 7-6** below presents the design storage length, estimated number of parking spaces removed along Innes Avenue to accommodate the turn pocket (for informational purposes), and average and 95th-percentile queuing results for the Plus Proposed Project and Plus Project Variant Scenarios. Figures showing the 95th-percentile queue lengths at each intersection for the Plus Proposed Project and Plus Project Variant Scenarios are provided in **Appendix Q**.

In almost all cases, the average queue lengths along Innes Avenue are accommodated by the storage length provided. The exception is the westbound approach at Innes Avenue/Earl Street in the PM for the Cumulative Plus Project Variant Scenario. In all cases, the average southbound side-street queues exceed storage length. Eastbound-left 95th percentile queues along Innes Avenue are generally accommodated by the turn pockets, with three exceptions where they exceed slightly (Griffith Street for both scenarios).

TABLE 7-6: PEAK HOUR INTERSECTION QUEUE RESULTS (CUMULATIVE PLUS PROPOSED PROJECT)

Intersection	Movement	Storage Length (feet)	Parking Spaces Removed Along Innes	Queue Length (feet)	
				Average[1]	95th Percentile[1]
Cumulative No Project					
(#5) Innes Avenue / Griffith Street	EBT/L	190	N/A	100	180
	WBT/R	375		100	190
	SBL/R	200[2]		10	40
(#6) Innes Avenue / Arelious Walker Drive	EBT/L	375	N/A	130	210
	WBT/R	630		90	180
	SBL/R	190[2]		20	50
(#7) Innes Avenue / Earl Street	EBT/L	630	N/A	140	220
	WBT/R	600		160	300
	SBL/R	160		20	40
Cumulative Plus Proposed Project					
(#5) Innes Avenue / Griffith Street	EBL	160[2]	4	110	**170**
	EBT	190	-	140	**220**
	WBT/R	375	-	310	**420**
	SBL	200[2]		70	**230**
	SBR	200[2]		**580**	**1,020**
(#6) Innes Avenue / Arelious Walker Drive	EBL	350	9	220	310
	EBT	375	-	80	180
	WBT/R	630	-	570	**720**
	SBL	180		60	180
	SBR	190[2]		**250**	**440**
(#7) Innes Avenue / Earl Street	EBL	390	7	170	270
	EBT	630	-	100	170
	WBT/R	600	-	480	**780**
	SBL	160		60	**190**
	SBR	290[2]		**490**	**1,030**

Cumulative Plus Project Variant					
(#5) Innes Avenue / Griffith Street	EBL	160[2]	4	150	**210**
	EBT	190	-	170	**280**
	WBT/R	375	-	320	**410**
	SBL	200[2]		60	**210**
	SBR	200[2]		**960**	**1,410**
(#6) Innes Avenue / Arelious Walker Drive	EBL	280	7	170	260
	EBT	375	-	80	170
	WBT/R	630	-	610	**650**
	SBL	190		100	**250**
	SBR	190[2]		**1,320**	**1,360**
(#7) Innes Avenue / Earl Street	EBL	330	6	200	310
	EBT	630	-	90	190
	WBT/R	600	-	**630**	**650**
	SBL	210		70	**230**
	SBR	290[2]		**1,180**	**1,760**

Notes:

1. **Bold** indicates queue lengths that extend beyond the available storage. Queues reported are the worst case across AM and PM peak hours.
2. The storage length for this movement indicates the maximum possible storage before queues spillback into the adjacent upstream intersection.

Source: Fehr & Peers, 2016

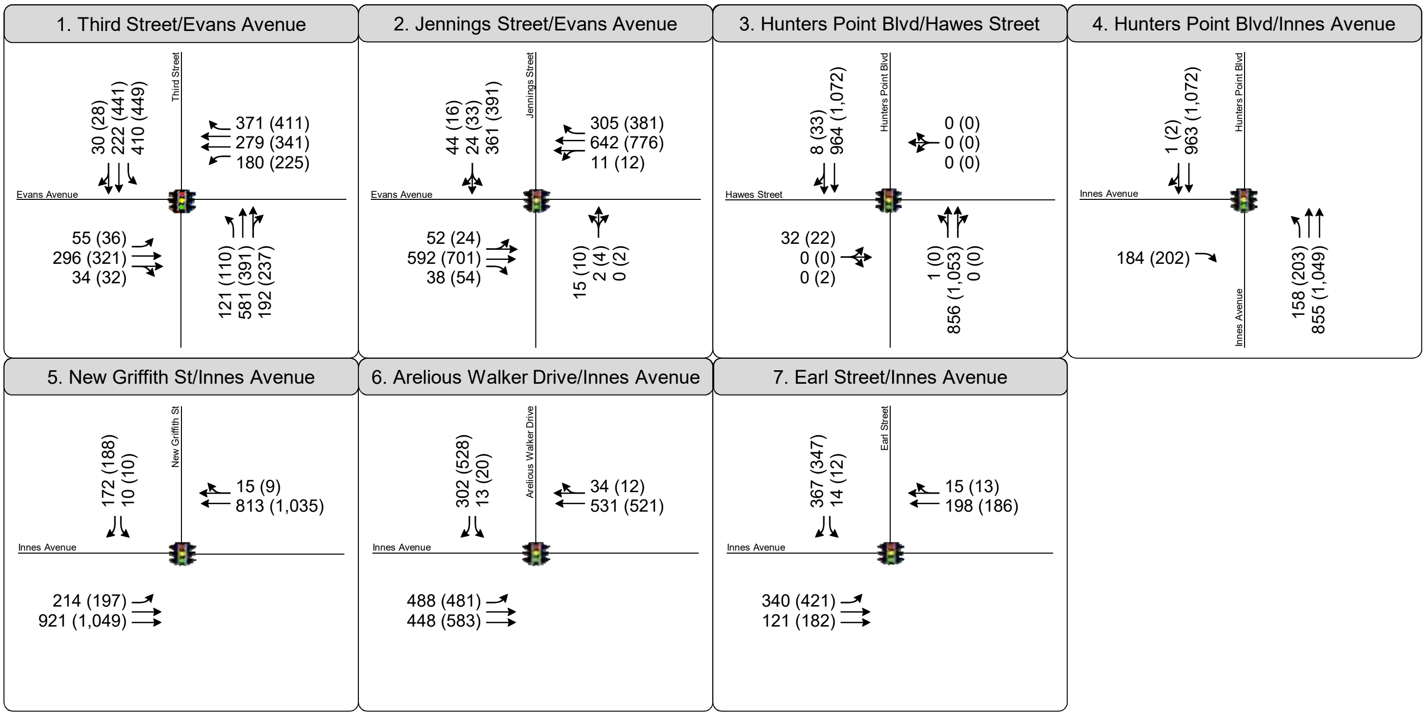
7.4 BASELINE PLUS PROJECT TRAFFIC OPERATIONS

In this section, Baseline Scenario traffic operations for the two project scenarios are presented. Each of the study intersections was chosen partly based on its overall importance to transit operations in the vicinity of the Project. An assessment of the Project's impacts on transit delays at each intersection is presented after the level of service assessment.

7.4.1 Intersection Effects

The trip generation for the Proposed Project is detailed in **Table 4-12**, and the trip generation for the Project Variant is detailed in **Table 4-13**. All Project-generated vehicle trips were assigned to and from the streets entering the Project Site (see **Figure 11** for directional distribution of vehicle trips). The resulting Baseline Plus Proposed Project and Plus Project Variant traffic volumes for the study intersections are presented in **Figure 21** and **Figure 22** respectively.

Table 7-7 presents the Baseline Plus Project intersection levels of service for the weekday AM and PM peak hour. It shows a summary of the intersection operations results for both Project and Variant scenarios. The Proposed Project causes the intersection operation at one intersection (Evans Avenue/Third Street) to deteriorate from LOS D to LOS F in both peak periods. The Project Variant causes the operation at two intersections to deteriorate to LOS F in both peak periods (Evans Avenue/Third Street and Evans Avenue/Jennings Street in the AM and Evans Avenue/Third Street and Innes Avenue/Arelious Walker Drive in the PM). At one intersection (Evans Avenue/Jennings Street), an improvement measure, described below, is proposed improve operations and reduce vehicle delay. For informational purposes, the following sections detail each intersection where intersection operations deteriorate to LOS F under any scenario.



Turn Lane

AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Figure 21

Peak Hour Traffic Volumes and Lane Configurations - Baseline Plus Project

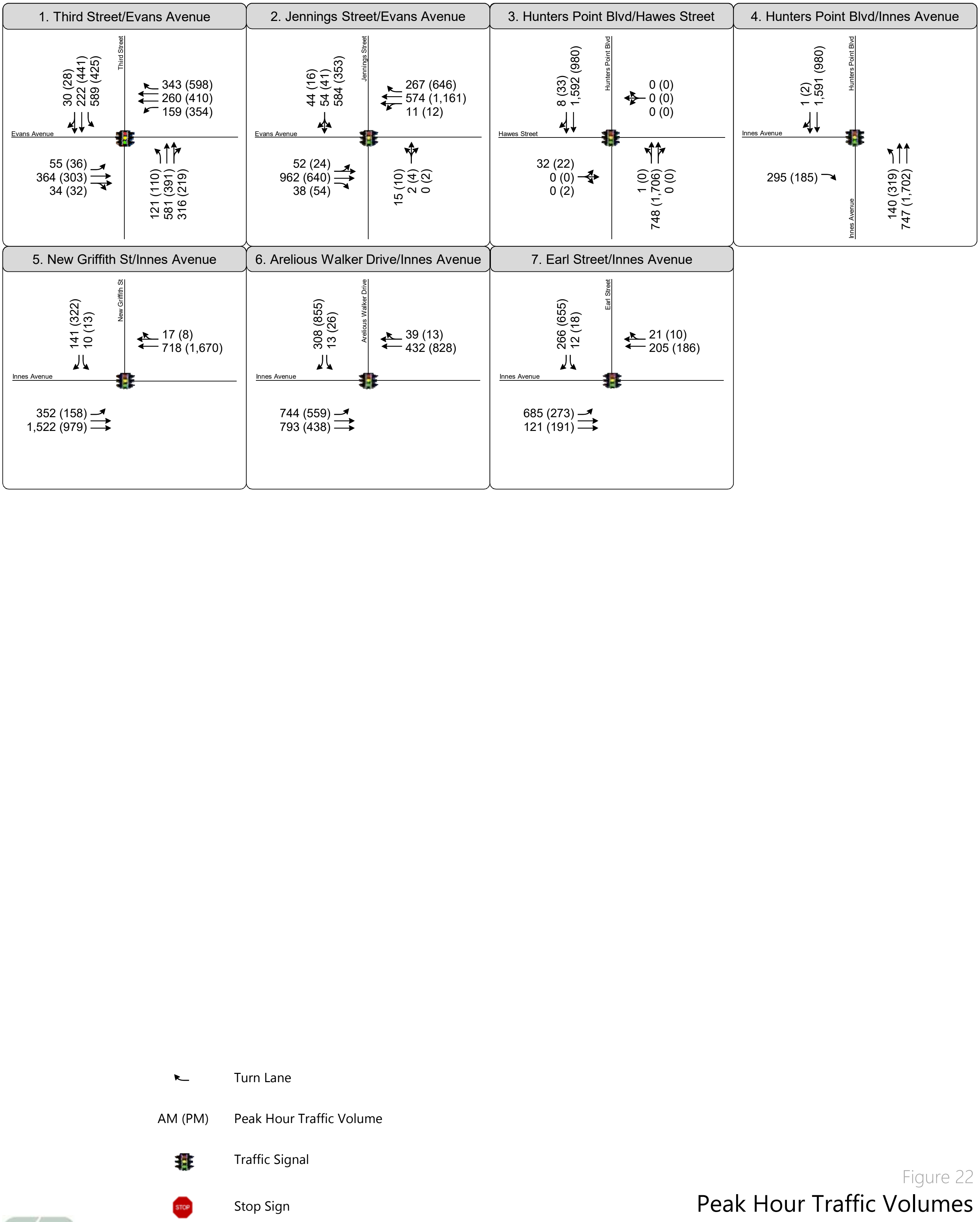


Figure 22

Peak Hour Traffic Volumes and Lane Configurations - Baseline Plus Project Variant

TABLE 7-7: PEAK HOUR INTERSECTION LEVELS OF SERVICE - BASELINE PLUS PROPOSED PROJECT AND PROJECT VARIANT					
Intersection	**Traffic Control**	**Delay[1], Automobile LOS[2]**			
		Existing	**Baseline**	**Baseline Plus Proposed Project**	**Baseline Plus Project Variant**
AM Peak Hour					
1. Evans Ave/Third St	Signal	38, D	36, D	>80, F (v/c =0.94)	>80, F (v/c =1.15)
2. Evans Ave/Jennings St	Signal[3]	<10, A	10, B	21, C	>80, F (v/c =1.28)
3. Hudson Avenue/ Hunters Point Boulevard/ Hawes St	***Signal***	<10 (EB), A	10 (EB), B	11, B	40, D
4. Innes Avenue/ Hunters Point Boulevard	***Signal***	<10 (EB), A	<10 (EB), A	<10, A	25, C
5. Innes Ave/Griffith St	***Signal***	12 (SB), B	13 (SB), B	<10, A	<10, A
6. Innes Ave/Arelious Walker Dr	***Signal***	<10 (SB), A	10 (SB), B	13, B	23, C
7. Innes Ave/Earl St	***Signal***	10 (SB), B	11 (SB), B	19, B	15, B
PM Peak Hour					
1. Evans Ave/Third St	Signal	36, D	39, D	>80, F (v/c =1.03)	>80, F (v/c =1.27)
2. Evans Ave/Jennings St	Signal[3]	<10, A	11, B	24, C	28, C
3. Hudson Avenue/ Hunters Point Boulevard/ Hawes St	***Signal***	<10 (EB), A	11 (EB), B	14, B	79, E
4. Innes Avenue/ Hunters Point Boulevard	***Signal***	<10 (EB), A	<10 (EB), A	10, B	31, C
5. Innes Ave/Griffith St	***Signal***	12 (SB), B	13 (SB), B	<10, A	26, C
6. Innes Ave/Arelious Walker Dr	***Signal***	<10 (SB), A	10 (SB), B	27, C	>80, F (v/c =1.41)
7. Innes Ave/Earl St	***Signal***	10 (SB), B	11 (SB), B	18, B	56, E

Notes:

Bold and italics indicates traffic control type change. AWSC = all-way stop control. SSSC = side-street stop control.

1. Delay reported as seconds per vehicle.
2. LOS = Level of Service. For signalized intersections, LOS based on average intersection delay, based on the methodology in the *Highway Capacity Manual*, 2000.
3. Signalization of this intersection is a mitigation measure that FivePoint is committed to implementing as part of the Shipyard project.

Source: Fehr & Peers, 2017.

1. Evans Ave/Third Street

Under Baseline conditions, the signalized intersection of Evans Avenue/Third Street operates at LOS D in both the AM and PM peak hour. The addition of Project trips causes the LOS at the intersection to worsen to LOS F in both the AM and PM peak hours under both the Proposed Project and the Project Variant. As a result, this intersection was examined for potential measures to improve operations in both the AM and PM peak hours.

Generally, to improve poor operating conditions of study intersections, additional travel lane capacity would be needed on one or more approaches to the intersection. The provision of additional travel lane capacity would typically require the narrowing of sidewalks, removal of on-street parking, removal of bicycle lanes, and/or the conversion of existing transit-only lanes to mixed-flow lanes. These would generally be inconsistent with the transit, bicycle, and pedestrian environment encouraged by the City's Transit First Policy by removing space dedicated to pedestrians, bicycles, and/or transit and increasing the distances required for pedestrians to cross streets. Furthermore, altering signal timing to better accommodate traffic volumes is not feasible at this intersection due to the signal priority for the T-Third Muni line on Third Street.

Therefore operations at this intersection would remain at LOS F under the Proposed Project or the Project Variant.

2. Evans Avenue/Jennings Street

Under Baseline conditions, the intersection of Jennings Street/Evans Avenue is assumed to be signalized, and it operates at LOS B in both the AM and PM peak hour. The addition of Project Variant trips would cause the LOS at the intersection to worsen to LOS F in the AM peak period. As a result, this intersection was examined for potential measures to improve operations.

Improvement Measure I-TR-4B: Reconfigure Southbound Approach of Jennings Street/Evans Avenue (Project Variant only)

To improve vehicular mobility at the intersection of Jennings Street/Evans Avenue in the Baseline Plus Project Variant Scenario, Improvement Measure I-TR-4B proposes that the intersection of Jennings Street/Evans Avenue be reconfigured. The Project Sponsors should fund this improvement measure under which the SFMTA reconfigures the southbound approach of this intersection to include a 100-foot left turn pocket. Adding this turn pocket would require that the SFMTA restrict parking on the west side of Jennings Street, removing approximately five parking spaces.

For the Project Variant, the Sponsors' responsibility for funding the implementation of the improvement measure would be based on the relative contribution of traffic to the intersection from the four parcels. At this location, 98 percent of vehicle trips would be generated by the 700 Innes Avenue parcel, one percent of vehicle trips would be generated by the India Basin Shoreline Park parcel, zero percent of vehicle trips would be generated by the 900 Innes Avenue parcel, and one percent of trips would be generated by the India Basin Open Space parcel.

Improvement Feasibility

This improvement is feasible. FivePoint has committed to signalizing the intersection as part of the Hunters Point Shipyard project, and implementation of this improvement measure would occur at the same time as signalization. Trips generated from the Build Property comprise 98 percent of the Project Variant Scenario vehicle trips through this intersection during both the AM and PM peak hours. Trips generated from the RPD Property comprise two percent of the Project Variant Scenario vehicle trips through this intersection during both the AM and PM peak hours. Therefore Build would be responsible for 98 percent of the costs, and RPD would be responsible for 2 percent of the costs.

Operations After Improvement Measure

Restriping the southbound approach to include a southbound left turn pocket improves intersection operations to LOS E in the AM peak period and LOS C in the PM peak period.

6. Innes Avenue/Arelious Walker Drive

Under Baseline conditions, the unsignalized intersection of Innes Avenue/Arelious Walker Drive operates at LOS B in the AM and PM peak hour. As part of the Proposed Project, this intersection would be signalized. The addition of Project Variant trips would cause the LOS at the intersection to degrade to LOS F in the PM peak hour. As a result, this intersection was examined for potential measures to improve operations.

Feasible improvements to this intersection have already been incorporated into its design as part of the Proposed Project. Similar to the intersection of Jennings Street/Evans Avenue, additional measures to improve operating conditions at Innes Avenue/Arelious Walker Drive would generally be inconsistent with the City's Transit First policy. Therefore, operations at this intersection would remain at LOS F.

7.4.2 Improvement Measure Implementation

The India Basin development would be constructed in phases, and each improvement measure detailed in the previous sections would become appropriate at a certain level of development. The following section specifies the total number of vehicle trips that would result in LOS E or F intersection operations and the appropriateness of the above improvement. By identifying the number of Project trips that would need to be generated to cause LOS E or LOS F intersection operations, this implementation plan enables the City and the Project Sponsor to determine, in a straightforward manner, when each improvement measure should be implemented according to the level of development completed. This approach provides the desired development flexibility and also ensures that improvement measures are implemented at the appropriate time.

Specifically, this plan is intended to define the improvements required for customized development configurations, within certain bounds, that are not studied in this report. This allows for development flexibility in response to changing market demands over time. The bounds are the maximum amount of residential uses that could be constructed (Proposed Project) on one side, and the maximum amount of commercial uses that could be constructed (Project Variant) on the other.

This plan presents distinct trip generation levels when the appropriate improvement measure would be recommended. In cases where no additional improvement measures are available, a development level at which the Project would contribute a high enough volume of vehicle traffic to an intersection to reduce operations to LOS E or LOS F is identified. **Table 7-8**, which details the vehicle trip generation rates by land use type for both the Proposed Project and the Project Variant, can be used to calculate whether any particular development would reduce operations to LOS E or LOS F.

TABLE 7-8: AUTOMOBILE TRIPS GENERATED BY PROJECT DEVELOPMENT UNDER BASELINE CONDITIONS						
Land Use	**Project Automobile Trips (Under Baseline Conditions)**					
	AM Peak Hour			**PM Peak Hour**		
	Rate	**Inbound**	**Outbound**	**Rate**	**Inbound**	**Outbound**
Open Space	4.51 per acre	56%	44%	3.52 per acre	57%	43%
School	1.26 per student, plus 0.31 per staff	72%	28%	0.40 per student, plus 0.31 per staff	30%	70%
Retail						
Restaurant	1.24 per 1000 square feet (KSF)	64%	36%	10.80 per KSF	48%	52%
Café	12.75 per KSF			10.80 per KSF		
Supermarket	3.36 per KSF			8.64 per KSF		
General Retail	1.51 per KSF			5.39 per KSF		
Office						
R&D Lab Area	0.68 per KSF	88%	12%	0.57 per KSF	10%	90%
Clinical Use	3.59 per KSF			3.22 per KSF		
Administrative	3.37 per KSF			3.03 per KSF		
General Office	0.88 per KSF			0.79 per KSF		
Residential						
Studio	0.44 per dwelling unit (DU)	31%	69%	0.56 per DU	64%	36%
1 Bedroom	0.46 per DU			0.54 per DU		
2+ Bedrooms	0.60 per DU			0.73 per DU		

Source: Fehr & Peers, 2017.

Improvement Measure

Table 7-9 details the minimum number of trips generated by the Project that would trigger implementation of the improvement measures identified in the previous section.

TABLE 7-9: IMPROVEMENT MEASURE RECOMMENDED IMPLEMENTATION POINT		
Improvement Measure	**Description**	**AM Peak Hour Project Trips**
Improvement Measure I-TR-4B	Reconfigure Southbound Approach of Jennings Street/Evans Avenue to include a 100-foot left turn pocket.	2,100

Source: Fehr & Peers, 2017.

Intersection Operations

Table 7-10 details the minimum number of trips generated by the Project that would cause the intersections identified below operate at LOS F.

TABLE 7-10: INTERSECTION OPERATIONS LOS F CONDITION		
Intersection	**AM Peak Hour Project Trips**	**PM Peak Hour Project Trips**
1. Evans Avenue/Third Street	650	850
6. Innes Avenue/Arelious Walker Drive	n/a[1]	1,900

Notes:

1. This intersection is expected to operate at LOS D or better in the AM period with full build-out of either the Proposed Project or the Project Variant.

Source: Fehr & Peers, 2017.

7.5 CUMULATIVE PLUS PROJECT TRAFFIC OPERATIONS

7.5.1 Traffic Volumes

Future year 2040 Cumulative traffic volumes were developed in order to assess the long-term cumulative effects of the Proposed Project in combination with projected development within San Francisco and the rest of the Bay Area, as well as implementation of planned transportation infrastructure projects. For the future year, Cumulative intersection traffic volumes were derived from outputs from the San Francisco County Transportation Authority's travel demand forecasting model (SF-CHAMP Model).

The SF-CHAMP model is an activity based travel demand model that has been validated to represent existing and future transportation conditions in San Francisco. The model predicts all person travels for a full day based on total and locations of population, housing units and employment, which are then allocated to different periods throughout the day, using time of day sub-models. The SF-CHAMP model predicts person travel by mode for auto, transit, walk and bicycle trips. The SF-CHAMP model also provides forecasts of vehicular traffic on regional freeways, major arterials and on the local roadway network considering the available roadway capacity, origin-destination demand and travel speeds when assigning the future travel demand to the roadway network.

SF-CHAMP divides San Francisco into 981 geographic areas, known as Traffic Analysis Zones (TAZs). It also includes zones outside of San Francisco, for which it uses the same geography as the current Metropolitan Transportation Commission (MTC) Model: "Travel Model One". For each TAZ, the model estimates the travel demand based on TAZ population and employment assumptions developed by the Association of Bay Area Governments (ABAG). Within San Francisco, the San Francisco Planning Department is responsible for allocating ABAG's countywide growth forecast to each TAZ for the future cumulative year model, based upon existing zoning and approved plans, using an area's potential zoning capacity, and the anticipated extent of redevelopment of existing uses. The current cumulative future year has been used consistently for recent large transportation studies in San Francisco.

Regional travel demand models such as SF-CHAMP are designed to be able to represent city-wide and regional trends and do not represent an intersection level of analysis commensurate with projecting specific turning movements. Instead, the SF-CHAMP model provides traffic volume outputs that can then be adjusted using professional judgment and methodology and then modeled in other traffic modeling software (such as Synchro), to represent intersection and turning movement operations. In addition to the application of a standard methodology, creating forecasts from model output involves engineering judgment, past experience, and knowledge of the transportation characteristics of the surrounding area.

The model run accounts for some growth in the Project TAZ. However, as shown in **Table 7-11**, the amount of traffic growth forecasted by the model for the roadways surrounding the Project Site is considerably less than the traffic growth projected to be generated by either the Proposed Project or Project Variant. The original land use proposed for India Basin was of a smaller scale than the land use currently proposed. Based on the travel demand estimates provided in Chapter 4, the SF-CHAMP model includes just 33 to 46 percent of the Proposed Project or Project Variant growth in the AM peak hour and 48 to 66 percent of the Proposed Project or Project Variant growth in the PM peak hour.

TABLE 7-11: CUMULATIVE VEHICLE TRIP GENERATION COMPARISON

TAZ[1]	Location	2040 CHAMP Output		Project Trips – Proposed Project Scenario		Variant Trips – Project Variant	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
446	India Basin	862	1,300	1,865	1,969	2,612	2,734

Notes:

1. Traffic analysis zone within SF-CHAMP model.

Source: SFCTA; Fehr & Peers, 2016.

Therefore, the modeled trips were manually removed from the TAZ to attain the Cumulative 2040 No Project volume forecasts. Proposed Project trips shown in **Figure 12** and **Figure 13** were then added to the Cumulative 2040 No Project forecasts to create Cumulative 2040 Plus Project intersection turning movement volumes, as shown in **Figure 23** (Proposed Project) and **Figure 24** (Project Variant).

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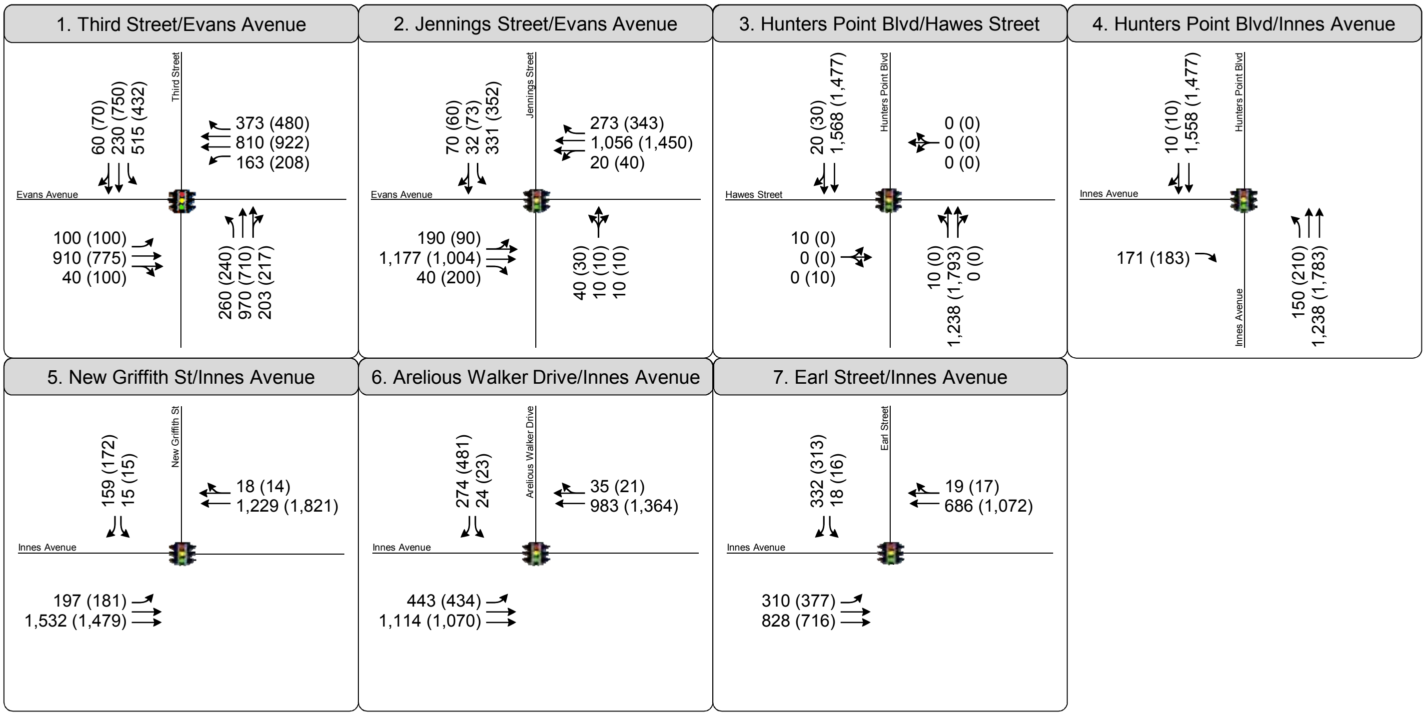


Turn Lane

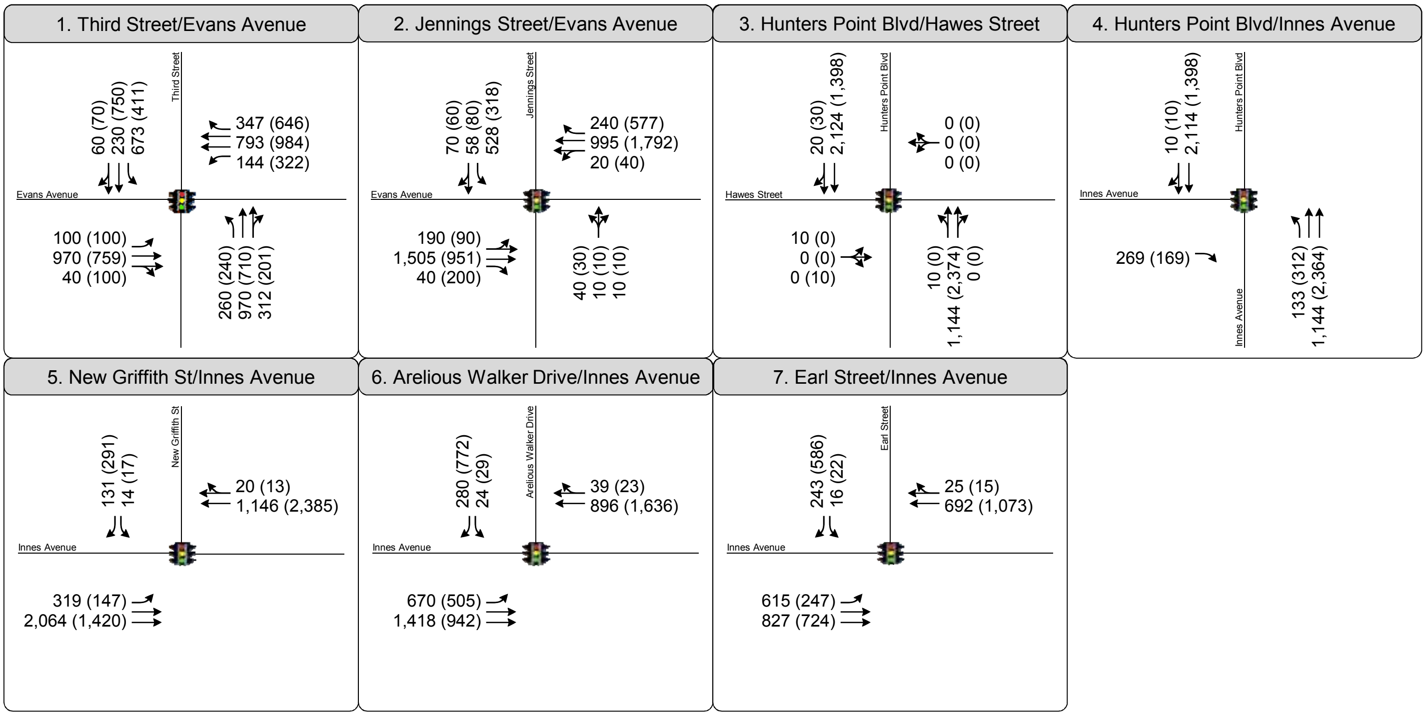
AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Figure 23

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Plus Project



Turn Lane

AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Figure 24

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Plus Variant

7.5.2 Intersection Effects

Table 7-12 presents the Cumulative intersection levels of service for weekday conditions for the Proposed Project and Project Variant compared to the No Project condition. The design for the three intersections adjacent to the Build property is as discussed in Section 7.3 and microsimulation results are provided for these intersections, which are consistent with the results shown in **Table 7-5**. For Intersections #1 through #4, Synchro results are presented.

TABLE 7-12: PEAK HOUR INTERSECTION LEVELS OF SERVICE – CUMULATIVE CONDITIONS

Intersection	Traffic Control	Delay[1], Automobile LOS[2]					
		Cumulative No Project		Cumulative Plus Proposed Project		Cumulative Plus Project Variant	
		AM	PM	AM	PM	AM	PM
1. Evans Ave /Third St	Signal	80, E	64, E	>80, F (v/c =1.44)	>80, F (v/c =1.34)	>80, F (v/c =1.63)	>80, F (v/c =1.51)
2. Evans Ave/Jennings St	Signal	16, B	14, B	>80, F (v/c =1.28)	49, D	>80, F (v/c =1.68)	57, E
3. Hudson Avenue/ Hunters Point Boulevard/Hawes St	Signal	<10, A	11, B	32, C	61, E	77, E	>80, F (v/c =0.98)
4. Innes Avenue/Hunters Point Boulevard	Signal	<10, A	<10, A	14, B	28, C	46, D	>80, F (v/c =1.22)
5. Innes Ave/Griffith St[2]	Signal	<10, A	<10, A	13, B	40, D	14, B	56, E
6. Innes Ave/Arelious Walker Dr[2]	Signal	<10, A	<10, A	19, B	48, D	16, B	>80, F (v/c =1.38)
7. Innes Ave/Earl St[2]	Signal	<10, A	11, B	19, B	70, E	19, B	>80, F (v/c =1.12)

Notes: Delay reported as seconds per vehicle.

1. LOS = Level of Service. For signalized intersections, LOS based on average intersection delay, based on the methodology in the *Highway Capacity Manual*, 2000.
2. The LOS results from the project driveways are calculated from the SimTraffic files used for the driveway design process detailed in the previous section.

Source: Fehr & Peers, 2016.

The Project causes intersections to operate at LOS E or LOS F during one or both peak periods at four intersections (Evans Avenue/Third Street, Evans Avenue/Jennings Street, Hudson Avenue/Hunters Point Boulevard/Hawes Street, and Innes Avenue/Earl Street), and the Project Variant causes the intersections to operate at LOS E or LOS F in one or both peak periods at all seven intersections. At one intersection (Evans Avenue/Jennings Street), a proposed improvement measure improves operations to improve intersection operations to LOS D or better in both scenarios and both peak periods. The following section details the intersections that operate at LOS E or LOS F under Cumulative Plus Proposed Project and/or Cumulative Plus Project Variant conditions. Intersections #1, #2, #3, and #7 operate at LOS E or LOS F in one or more peak hours and Project/Variant trips account for more than five percent of volume growth at critical movements operating at LOS E or F under Cumulative Plus Proposed Project and Cumulative Plus Project

Variant conditions. Intersections #4, #5, and #6 operate at LOS E or F and Project Variant trips account for more than five percent of volume growth at critical movements operating at LOS E or F in the PM peak hour under Cumulative Plus Project Variant conditions. Measures to improve operating conditions at these intersections would generally be inconsistent with the City's Transit First policy.

2. Jennings Street/Evans Avenue

Under Cumulative Plus Proposed Project and Cumulative Plus Project Variant, the signalized intersection of Jennings Street/Evans Avenue operates at LOS F in the AM peak hour. Under Cumulative Plus Project Variant, it operates at LOS E in the PM peak hour. Therefore, the operations at the intersection of Jennings Street/Evans Avenue merits examination for potential measures to improve operations, as shown below.

Cumulative Improvement Measure C-I-TR-5: Reconfigure Eastbound Approach of Jennings Street/Evans Avenue

To improve vehicular mobility at the intersection in the Cumulative Plus Project and Project Variant Scenario, Cumulative Improvement Measure C-I-TR-5 proposes that the Project Sponsors fund the reconfiguration of the eastbound approach of the intersection of Jennings Street/Evans Avenue by the SFMTA from one shared through/left lane, one through lane, and one 100-foot left turn pocket to have one 100-foot left turn pocket, one through lane, and one shared through/right turn lane. No additional right-of-way would be required to implement this measure. The Project Sponsors will fund their fair share cost of the design and implementation of the new eastbound approach configuration for the intersection of Jennings Street/Evans Avenue.

Responsibility for paying a fair share fee would be based on the relative contribution of traffic to the intersection from the four parcels. At this location, 98 percent of vehicle trips would be generated by the 700 Innes Avenue parcel, one percent of vehicle trips would be generated by the India Basin Shoreline Park parcel, zero percent of vehicle trips would be generated by the 900 Innes Avenue parcel, and one percent of trips would be generated by the India Basin Open Space parcel.

Improvement Measure Feasibility

This improvement is feasible pending endorsement and subsequent funding commitment from the SFMTA. The funding contribution from the Project Sponsors is detailed in Section 0.

Operations After Improvement Measure

Implementing Cumulative Improvement Measure C-I-TR-5 would improve the intersection operation to LOS C in AM peak hour under Cumulative Plus Proposed Project and would result in LOS E intersection operation under Cumulative Plus Project Variant in AM peak hour. Cumulative Improvement Measure C-I-TR-5 would result in LOS D intersection operation in the PM peak hour for both Cumulative Scenarios (Project or Variant). Therefore, Improvement Measure C-I-TR-5 would improve operations under the Cumulative Plus Proposed Project Scenario; no feasible improvement measure has been identified that would improve further the operations at this intersection in the Cumulative

Plus Project Variant Scenario. This improvement measure is a minor capacity increase at a single location. While it would reduce automobile delay at this location in the short run, because the capacity of the corridor as a whole is not being changed, it would result in a negligible change in the level of congestion on the roadway network.

7.5.3 Improvement Measures Implementation

The India Basin development would be constructed in phases, and the fair share cost of implementing the improvement measures detailed in the previous sections would depend on the final land use configuration. To provide the desired development flexibility, this section details a per trip contribution for each measure up to a maximum total project contribution. By establishing a fair share calculation linked to trip generation for each improvement measure, the City and the Project Sponsor would be able to establish the Project Sponsor's contribution for customized development configurations not specifically studied in this report, but generally within the bounds of the Proposed Project and Project Variant.

The following section analyzes each intersection with the proposed improvement measure. It presents the *project contribution*, or the percent of total intersection growth that is due to the Project, for both the Proposed Project and the Project Variant. It then presents a *per trip rate*, or the percent of total intersection growth that each single project trip contributes, for both the Project and the Project Variant. Regardless of the final land configuration, the fair share is equal to the *per trip* rate of the Proposed Project or the Project Variant, whichever is higher, up to the percent of *project contribution to growth* of the Proposed Project or the Project Variant, whichever is higher. The higher of the two variables is selected to estimate the conservative fair share contribution.

Vehicle trip generation rates (presented in **Table 4-1**) for each land use in both the Proposed Project and the Project Variant can then be used to calculate the fair share contribution required from the Project Sponsor for any land use configuration that falls within the "bookends" established by the Proposed Project and the Project Variant.

Cumulative Improvement Measure C-I-TR-5: Reconfigure Eastbound Approach of Jennings Street/Evans Avenue

Under the Cumulative Plus Proposed Project Scenario, the project contribution is 1,329 trips, i.e. 50 percent of the total intersection growth during the AM peak hour, which amounts to a per trip rate of 0.04 percent of the total intersection growth per trip. Under the Cumulative Plus Project Variant Scenario, the variant contribution is 1,786 trips, i.e. 58 percent of the total intersection growth during the AM peak hour, which amounts to a per trip rate of 0.03 percent of the total intersection volume per trip. Therefore, the Project's fair share contribution, regardless of final land use configuration, is 0.04 percent of the total cost per trip up to a maximum of 58 percent of the total cost.

Trips generated from the Build Property comprise 98 percent of the Project Variant Scenario vehicle trips through this intersection during both the AM and PM peak hours. Trips generated from the RPD Property comprise two percent of the Project Variant Scenario vehicle trips through this intersection during both the AM and PM peak hours. Therefore, Build would be responsible for 98 percent of the Project Applicant's share of costs, and RPD would be responsible for 2 percent of the Project Applicant's share of costs.

8 MITIGATION AND IMPROVEMENT MEASURES

This chapter presents the transportation mitigation measures that would be required to reduce the significant impacts of the Proposed Project or Project Variant, and conclusions about the level of impacts after implementation of recommended mitigation measures. In some cases, no significant impact was identified; however, improvement measures were noted that would improve conditions.

A summary table of the applicability of each mitigation measure to the Proposed Project and Project Variant is shown below in **Table 8-1**. A summary table of the applicability of each improvement measure to the Proposed Project and Project Variant is shown below in **Table 8-2**. In this document, mitigation and improvement measures with the suffix "A" apply only to the Proposed Project and those with suffix "B" apply only to the Project Variant. Those without either suffix apply to both.

TABLE 8-1: APPLICABILITY OF EACH MITIGATION MEASURE

Measure	Description	Proposed Project	Project Variant
Mitigation Measure M-TR-1A	Implement Transit Capacity Improvements	X	
Mitigation Measure M-TR-1B	Implement Transit Capacity Improvements		X
Mitigation Measure M-TR-2	School Site Loading	X	X
Cumulative Mitigation Measure C-M-TR-3	Implement Transit-Only Lanes	X	X

TABLE 8-2: APPLICABILITY OF EACH IMPROVEMENT MEASURE

Measure	Description	Proposed Project	Project Variant
Improvement Measure I-TR-1	Queue Abatement	X	X
Improvement Measure I-TR-2	Active Loading Management Plan	X	X
Improvement Measure I-TR-3	Construction Management	X	X
Improvement Measure I-TR-4B	Reconfigure Southbound Approach of Jennings Street/Evans Avenue		X
Cumulative Improvement Measure C-I-TR-5	Reconfigure Eastbound Approach of Jennings Street/Evans Avenue	X	X

8.1 TRAFFIC

No significant environmental impacts have been identified. No mitigation required.

8.2 TRANSIT

There would be a **significant** transit capacity impact for both the Proposed Project and the Project Variant. To mitigate these impacts, separate mitigation measures have been developed for the Proposed Project and Project Variant, as described below:

Mitigation Measure M-TR-1A (Proposed Project): Implement Transit Capacity Improvements

To mitigate significant transit capacity impacts that could occur as a result of Proposed Project transit trips before the transit service improvements that are part of the Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) are in operation, the Project Sponsor of the 700 Innes Avenue property shall fund and/or implement a transit capacity improvement measure as described below. Implementation of one of the two options described would mitigate the transit capacity impact of the Project to less than significant.

Option 1 – Fund Temporary Transit Service Improvements until applicable portion of Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) is in Operation

To mitigate significant transit capacity impacts, the Project Sponsors shall fund, and the SFMTA shall provide, temporary increased frequencies on the 44 O'Shaughnessy from for the period of time until similar improvements required as part of the Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) are in operation. Specifically, the frequency of the transit service shall be increased from 8 minutes to 6.5 minutes in the AM peak period and from 9 minutes to 7.5 minutes in the PM peak period. This increased frequency is set at the level where the project-generated transit trips would no longer result in a significant transit capacity impact. The Project Sponsors' funding contributions would be based on the cost to serve the relative proportion of transit trips generated by each of the four parcels that make up the Proposed Project, and it would include the cost to requisition and operate any additional buses needed to increase the frequencies as specified.

Under Option 1, the increased frequency on the 44 O'Shaughnessy would result in increased passenger capacity along the route (because more buses would be provided per hour), thereby lowering the average passenger load per bus below the 85 percent capacity utilization threshold.

Mitigation Measure M-TR-1A, Option 1 would be implemented prior to the issuance of the building permits for the incremental amount of development at the Project Site (20 transit trips outbound to the Project on the 44 O'Shaughnessy in the AM peak hour or 18 transit trips inbound to the Project on the 44 O'Shaughnessy in the PM peak hour) that would cause the significant impact. This incremental amount of development would be a subset of the first phase of construction.

Option 2 – Implement Temporary Shuttle Service until Applicable Portion of Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) is in Operation

If for any reason the SFMTA determines that the provision of increased transit frequency is not feasible at the time its implementation would be required, the Project Sponsor for the 700 Innes Avenue property shall implement a temporary shuttle service that would supplement existing nearby transit service by providing connections to local and regional rail service. A shuttle service operating at 20-minute headways in the AM and PM peak periods could accommodate the estimated demand, although a minimum frequency of 15 minutes is recommended in order to provide an adequate level of service to urban commuters. The AM peak period is defined as from 7:00 AM to 9:00 AM, and the PM peak period is defined as from 4:00 PM to 6:00 PM. Shuttle operations should extend on either side of these defined periods if necessary to adequately serve the peak period of project travel demand. The shuttle would connect the Project Site with T-Third, Caltrain, and BART stations. The shuttle stop location would either be located on Innes Avenue at Arelious Walker Drive or on New Hudson Street at Innes Avenue. The shuttle would be required to operate during the period of time until improvements required as part of the Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) are in operation. The shuttle would be required to operate within all applicable SFMTA and City of San Francisco regulations and programs. The Project Sponsors shall be required to monitor ridership on the shuttle annually and produce a report to the SFMTA describing the level of service provided and associated ridership. If ridership on the overcrowded Muni route is above 85 percent of overall service capacity as routinely monitored by the SFMTA, additional shuttle frequency shall be provided by the Project Sponsors to reduce occupancy to below 85 percent utilization.

Mitigation Measure M-TR-1A Option 2 would be implemented prior to the issuance of the Temporary Certificates of Occupancy (TCO) for the incremental amount of development at the Project Site (20 transit trips outbound to the Project on the 44 O'Shaughnessy in the AM peak hour or 18 transit trips inbound to the Project on the 44 O'Shaughnessy in the PM peak hour) that would cause the significant impact. This incremental amount of development would be a subset of the first phase of construction.

Effects of Mitigation Measure M-TR-1A

Under Option 1, the increased frequency of the 44 O'Shaughnessy would result in increased passenger capacity along the route (due to the provision of more buses per hour), thereby lowering the average passenger load per bus below the 85 percent capacity utilization threshold.

Under Option 2, the shuttle service would supplement existing transit routes by providing sufficient capacity to accommodate the demand generated by the Project above the 85 percent utilization threshold with a 20 percent factor of safety.

Riders travelling to/from destinations in Downtown San Francisco and the northern neighborhoods of San Francisco could use the shuttle to connect with Muni, Caltrain, or BART. Absent the shuttle, many of these transit trips would be taken using the 19 Polk to get to Downtown or to transfer to the T Third to travel to Mission Bay or Downtown. The shuttle service would provide additional transit capacity along Evans Avenue to access the T Third as well as provide an alternative route to Downtown San Francisco via the connection to BART.

Riders travelling to/from destinations in the southern and western neighborhoods of San Francisco could transfer to the 48 Quintara at the 24th Street Mission BART station or use the shuttle to transfer to BART at 24th Street Mission station to travel to destinations close to other BART stations in the southwest of the City. Absent the shuttle, many of these transit trips would be taken using the 44 O'Shaughnessy. The shuttle would provide an alternate option to the 44 O'Shaughnessy to access the BART network and would provide a quicker connection to BART than the 44 O'Shaughnessy as it would have fewer intermediate stops. It would therefore be an attractive option for these travelers and may attract trips from the 44 O'Shaughnessy, which would alleviate overcrowding on that route. Transit service would be monitored, and the shuttle service would be adjusted, if needed, to reach the capacity utilization threshold.

The shuttle service would be provided only during peak hours, and only until the CPHPS TP Transit Service Improvements are in place.

Mitigation Measure Implementation

If selected, Option 1 of Mitigation Measure M-TR-1A would be implemented prior to the issuance of building permits for the incremental amount of development at the Project Site (20 transit trips outbound to the Project on the 44 O'Shaughnessy in the AM peak hour or 18 transit trips inbound to the Project on the 44 O'Shaughnessy in the PM peak hour) that would cause the significant impact. This incremental amount of development would be a subset of the first phase of construction. If selected, Option 2 of Mitigation Measure M-TR-1A would be implemented prior to occupancy of the incremental amount of development at the Project Site that would cause the significant impact. The funding contribution from the Project Sponsors is detailed in Section 5.4.1.

With the implementation of one of the options under Mitigation Measure M-TR-1A, the Proposed Project's impacts to transit capacity would become **less-than-significant with mitigation**. Because the proposed changes are restricted to providing additional capacity for transit riders, they would not result to changes to pedestrian facilities or bicycle facilities, nor create potentially hazardous conditions or elsewhere interfere with pedestrian or bicycle accessibility. The shuttle service may need to be compliant with the City's Commuter Shuttle Program Policy, which includes measures to minimize effect on pedestrians and bicyclists. The proposed changes would not have an effect on parking provision. Therefore, the mitigation measure would result in **less-than-significant** pedestrian, bicycle, and parking impacts. The mitigation measure would not require any construction, so therefore it would result in a **less-than-significant** impact due to construction. There would also be a **less-than-significant** impact to emergency access since the mitigation measure does not propose to change existing access to the Project Site.

Mitigation Measure M-TR-1B (Project Variant): Implement Transit Capacity Improvements

To mitigate significant transit capacity impacts that could occur as a result of the Project Variant transit trips before the transit service improvements that are part of the Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) are in operation, the Project Sponsors shall fund and/or implement a transit capacity improvement measure as described below.

Option 1 – Fund Temporary Transit Service Improvements until applicable portion of Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) is in Operation

To mitigate significant transit capacity impacts, the Project Sponsors shall fund, and the SFMTA shall provide, temporary increased frequencies on the 44 O'Shaughnessy for the period of time until similar improvements required as part of the Candlestick Point Hunters Point Shipyard

Transportation Plan (CPHPS TP) are in operation. SFMTA shall also increase frequencies to the 48 Quintara for the same time period. The 48 Quintara would replace the 19 Polk that currently travels along Innes Avenue—Hunters Point Boulevard—Evans Avenue. Specifically, frequency for the 44 O'Shaughnessy shall be increased from 8 minutes to 6.5 minutes in the AM and from 9 minutes to 7.5 minutes in the PM peak period, and for the 48 Quintara the frequency shall increase from 15 minutes to 10 minutes in both the AM and PM peak period. These increases frequency are set at the level where the project would no longer have a significant impact. The Project Sponsors' funding contributions would be based on the cost to serve the relative proportion of transit trips generated by each of the four parcels that make up the Proposed Variant, and it would include the cost to requisition and operate any additional buses needed to increase the frequencies as specified.

Option 2 – Implement Temporary Shuttle Service until applicable portion of Candlestick Point Hunters Point Shipyard Transportation Plan (CPHPS TP) is in Operation

If for any reason the SFMTA determines that the provision of increased transit frequency is not feasible at the time its implementation would be required, the Project Sponsors shall implement a temporary shuttle service that would supplement existing nearby transit service by providing connections to local and regional rail service. A shuttle service operating at 20-minute headways in the AM and PM peak periods could accommodate the estimated demand, although a minimum frequency of 15 minutes is recommended in order to provide an adequate level of service to urban commuters. The AM peak period is defined as from 7:00 AM to 9:00 AM, and the PM peak period is defined as from 4:00 PM to 6:00 PM. Shuttle operations should extend on either side of these defined periods if necessary to adequately serve the peak period of project travel demand. The shuttle would connect the Project Site with T-Third, Caltrain, and BART stations. The shuttle stop location would either be located on Innes Avenue at Arelious Walker Drive or on New Hudson Street at Innes Avenue. The shuttle would be required to operate within all applicable SFMTA and City of San Francisco regulations and programs. The Project Sponsors shall be required to monitor ridership on the shuttle annually and produce a report to the SFMTA describing the level of service provided and associated ridership. If ridership on the overcrowded Muni route is above 85 percent of overall service capacity, additional shuttle frequency shall be provided by the Project Sponsors to reduce capacity on the affected transit routes to below 85 percent utilization.

Impacts of Mitigation Measure M-TR-1B

Under Option 1, the increased frequency of the 44 O'Shaughnessy would result in increased passenger capacity along the route (due to the provision of more buses per hour), thereby lowering the average passenger load per bus below the 85 percent capacity utilization threshold.

Under Option 2, the shuttle service would supplement existing transit routes by providing sufficient capacity to accommodate the demand generated by the Project above the 85 percent utilization threshold with a 20 percent factor of safety. Riders travelling to/from destinations in Downtown San Francisco and the northern neighborhoods of San Francisco could use the shuttle to connect with Muni, Caltrain, or BART. Absent the shuttle, many of these transit trips would be taken using the 19 Polk to get to Downtown or to transfer to the T Third to travel to Mission Bay or Downtown. The shuttle service would provide additional transit capacity along Evans Avenue to access the T Third as well as provide an alternative route to Downtown San Francisco via the connection to BART.

Riders travelling to/from destinations in the southern and western neighborhoods of San Francisco could transfer to the 48 Quintara at the 24th Street Mission BART station or use the shuttle to transfer to BART at 24th Street Mission to travel to destinations close to other BART stations in the southwest of the City. Absent the shuttle, many of these transit trips would be taken using the 44 O'Shaughnessy. The shuttle provides an alternate option to the 44 O'Shaughnessy to access the BART network and would provide a quicker connection to BART than the 44 O'Shaughnessy as it would have fewer intermediate stops. It would therefore be an attractive option for these travelers and may attract trips from the 44 O'Shaughnessy, which would alleviate overcrowding on that route.

The shuttle service would be provided only during peak hours, and only until the CPHPS TP Transit Service Improvements are in place.

Mitigation Measure Implementation

If selected, Option 1 of Mitigation Measure M-TR-1B would be implemented prior to the issuance of building permits for the incremental amount of development at the Project Site (187 transit trips inbound to the Project on the 19 Polk in the AM peak hour, 152 transit trips outbound to the Project on the 19 Polk in the PM peak hour, 20 transit trips outbound to the Project on the 44 O'Shaughnessy in the AM peak hour, or 18 transit trips inbound to the Project on the 44 O'Shaughnessy in the PM peak hour) that would cause the significant impact. This incremental amount of development would be a subset of the first phase of construction. If selected, Option 2 of Mitigation Measure M-TR-1B would be implemented prior to the issuance of the Temporary Certificate of Occupancy (TCO) of the incremental amount of development at the Project Site that would cause the significant impact. The funding contribution from the Project Sponsors is detailed in Section 5.4.1.

With the implementation of one of the options under Mitigation Measure M-TR-1B, the Project Variant's impacts to transit capacity would become **less-than-significant with mitigation**. Because the proposed changes are restricted to providing additional capacity for transit riders, they would not result to changes to pedestrian facilities or bicycle facilities, nor create potentially hazardous conditions or elsewhere interfere with pedestrian or bicycle accessibility. The shuttle service may need to be compliant with the City's Commuter Shuttle Program Policy, which includes measures to minimize effect on pedestrians and bicyclists. The proposed changes would not have an effect on parking provision. Therefore, the mitigation measure would result in **less-than-significant** pedestrian, bicycle, and parking impacts. The mitigation measure would not require any construction, so therefore it would result in a **less-than-significant** impact due to construction. There would also be a **less-than-significant** impact to emergency access since the mitigation measure does not propose to change existing access to the Project Site.

8.3 BICYCLE

No significant impacts have been identified in the Baseline Scenario; therefore, no mitigation is required.

8.4 PEDESTRIAN

No significant environmental impacts have been identified; however, an improvement measure has been identified. All of the project's or variant's parking garages would be located on the 700 Innes property; therefore, the Project Sponsor for the 700 Innes property would be solely responsible for implementing this improvement measure:

As an improvement measure to minimize the vehicle queues at the Proposed Project or Variant garage entrances into the public right-of-way, the Proposed Project or Variant would be subject to the Planning Department's vehicle queue abatement Conditions of Approval .

Although each of the four components of the Proposed Project would be subject to the Queue Abatement Conditions of Approval, only the 700 Innes parcel would have parking garages and therefore the measure is applicable to that parcel only.

Improvement Measure I-TR-1: Queue Abatement

It shall be the responsibility of the owner/operator of any off-street parking facility located at the 700 Innes property with more than 20 parking spaces (excluding loading and car-share spaces) to ensure that recurring vehicle queues do not occur on the public right-of-way. A vehicle queue is defined as one or more vehicles (destined to the parking facility) blocking any portion of any public street, alley or sidewalk for a consecutive period of three minutes or longer on a daily or weekly basis.

If a recurring queue occurs, the owner/operator of the parking facility shall employ abatement methods as needed to abate the queue. Appropriate abatement methods will vary depending on the characteristics and causes of the recurring queue, as well as the characteristics of the parking facility, the street(s) to which the facility connects, and the associated land uses (if applicable). Suggested abatement methods include but are not limited to the following: redesign of facility to improve vehicle circulation and/or on-site queue capacity; employment of parking attendants; installation of LOT FULL signs with active management by parking attendants; use of valet parking or other space-efficient parking techniques; use of off-site parking facilities or shared parking with nearby uses; use of parking occupancy sensors and signage directing drivers to available spaces; travel demand management strategies such as additional bicycle parking, customer shuttles, delivery services; and/or parking demand management strategies such as parking time limits, paid parking, time-of-day parking surcharge, or validated parking.

If the Planning Director, or his or her designee, suspects that a recurring queue is present, the Department shall notify the property owner in writing. The Property Owner shall have no less than 45 days to take reasonable measures to abate the queues. If after 45 days, the Planning Director, or his or her designee, reasonably believes, upon further examination that the abatement measures have not been effective, then the Planning Director may suggest additional measures or may request, the owner/operator shall hire a qualified transportation consultant to evaluate the conditions at the site for no less than seven days. The consultant shall prepare a monitoring report to be submitted to the Department for review. If the Department determines that a recurring queue does exist, the facility owner/operator shall have 90 days from the date of the written determination to abate the queue.

8.5 LOADING

While loading supply would be sufficient to meet the anticipated loading demand, the following improvement measure should be implemented to manage loading activity throughout the Project Site:

Improvement Measure I-TR-2: Active Loading Management Plan

If the Project Sponsor for the 700 Innes Avenue Property proposes to provide fewer loading spaces than required under the Special Use District (SUD) for the Project or Variant the Project Sponsors would develop an Active Loading Management Plan for approval by Planning Department to address operational loading actions for City review and approval. The Active Loading Management Plan would facilitate efficient use of loading spaces and may incorporate the following ongoing actions to address potential ongoing loading issues:

- Direct residents and commercial tenants to schedule all move-in and move-out activities and deliveries of large items (e.g., furniture) with management of the respective building(s).
- Direct commercial and retail tenants to schedule deliveries, to the extent feasible.
- Reduce illegal stopping of delivery vehicles by directing the lobby attendants of each building and retail tenants to notify any illegally-stopped delivery personnel (i.e., in the red zones) that delivery vehicles should be parked within the on-street commercial loading spaces.
- Design the loading areas to include sufficient storage space for deliveries to be consolidated for coordinated deliveries internal to project facilities (i.e., retail and residential); and
- Design the loading areas to allow for unassisted delivery systems (i.e., a range of delivery systems that eliminate the need for human intervention at the receiving end), particularly for use when the receiver site (e.g., retail space) is not in operation. Examples could include the receiver site providing a key or electronic fob to loading vehicle operators, which enables the loading vehicle operator to deposit the goods inside the business, or in a secured area that is separated from the business, but is accessible from a public right-of-way.

A Draft Active Loading Management Plan would be included as part of the Design Guidelines and Standards document for the entire Project site. A Final Active Loading Management Plan and all subsequent revisions, if implemented, would be reviewed and approved by the Planning Department. The Final Active Loading Management Plan would be approved prior to receipt of the first certificate of occupancy for the first parking/loading garage.

The Draft and Final Active Loading Management Plan would be evaluated by a qualified transportation professional, retained by the Project Sponsors and approved by the Planning Department, after the combined occupancy of the commercial and residential uses reaches 50 percent occupancy and once a year going forward until such time that the Planning Department determines that the evaluation is no longer necessary or could be done at less frequent intervals. The content of the evaluation report would be determined by Planning Department staff, in consultation with SFMTA, and generally shall include an assessment of on-site and on-street loading conditions, including actual loading demand, loading operation observations, and an assessment of how the project meets this improvement measure.

The Final Active Loading Management Plan evaluation report would be reviewed by Planning Department staff, which shall make the final determination whether there are conflicts associated with loading activities. In the event that the conflicts are occurring, Project Sponsor may propose modifications to the above Final Active Loading Management Plan requirements to reduce conflicts and improve performance under the Plan such as the hour and day restrictions to be included in the Active Loading Management Plan, number of loading vehicle operations permitted during certain hours, etc. to address the circumstances for review and approval by the by Planning Department.

The school site passenger loading impacts are considered **significant**. To ensure adequate operations of the proposed school loading zone, the following mitigation measure is proposed:

Mitigation Measure M-TR-2: School Site Loading Plan

Once school enrollment reaches 22 students, the school will provide and enforce a pick-up/drop-off plan subject to review and approval by the SFMTA to minimize disruptions to traffic, bicycle, and pedestrian circulation associated with school pick-up/drop-off activities and ensure safety of all modes. This plan may include elements such as size and location of loading zone, parking monitors, staggered drop-offs, a number system for cars, one-way circulation, encouragement of car pools/ride-sharing, and a safety education program. The safety education program would be targeted at students, parents, school staff, and residents and businesses near the school site. Informational materials targeted to parents, nearby residents, and nearby employees shall focus on the importance of vehicular safety, locations of school crossings, and school zone speed limits and hours. The school is located on the 700 Innes parcel, and therefore, responsibility for implementing this Mitigation Measure would be on the 700 Innes component of the Proposed Project.

School site passenger loading impacts would be **less-than-significant with mitigation.**

8.6 EMERGENCY ACCESS

No significant environmental impacts have been identified. No mitigation is required.

8.7 CONSTRUCTION

No significant environmental impacts have been identified. No mitigation is required; however, an improvement measure was identified:

Improvement Measure I-TR-3: Construction Management

Each of the four parcels, including 700 Innes, 900 Innes, India Basin Shoreline Park, and India Basin Open Space, would be responsible for developing their own construction management plan.

Traffic Control Plan for Construction – In order to reduce potential conflicts between construction activities and pedestrians, transit and autos during construction activities, the Project applicant will require construction contractor(s) to prepare a traffic control plan for major phases of Project construction (e.g. demolition, construction, or renovation of individual buildings). The Project applicant and their construction contractor(s) will meet with relevant City agencies to coordinate feasible measures to reduce traffic congestion, including temporary transit stop relocations and other measures to reduce potential traffic and transit disruption and pedestrian circulation effects during major phases of construction. For any work within the public right-of-way, the contractor would be required to comply with the City of San Francisco's Regulations for Working in San Francisco Streets, which establish rules and permit requirements so that construction activities can be done safely and with the least possible interference with pedestrians, bicyclists, transit, and vehicular traffic. Additionally, truck movements and deliveries will be limited during peak hours to the extent feasible and commercially reasonable in light of noise regulations, labor and contract requirements, available daylight hours and critical path construction schedule (generally 4:00 to 6:00 PM, or other times, as determined by SFMTA and its Transportation Advisory Staff Committee [TASC]).

In the event that the construction timeframes of the major phases and other development projects adjacent to the Project Site overlap, the Project applicant should coordinate with City Agencies through the TASC and the adjacent developers to minimize the severity of any disruption to adjacent land uses and transportation facilities from overlapping construction transportation impacts. The Project applicant, in conjunction with the adjacent developer(s), shall propose a construction traffic control plan that includes measures to reduce potential construction traffic conflicts to the extent feasible and commercially reasonable in light of noise regulations, labor and contract requirements, available daylight hours and critical path construction schedule, such as coordinated material drop offs, collective worker parking and transit to job site and other measures.

Reduce SOV Mode Share for Construction Workers – In order to minimize parking demand and vehicle trips associated with construction workers, the Project Sponsor will require the construction contractor to include in the Traffic Control Plan for Construction methods to encourage walking, bicycling, carpooling, and transit access to the project sites by construction workers.

Project Construction Updates for Adjacent Residents and Businesses – In order to minimize construction impacts on access for nearby residences, institutions, and businesses, the Project applicant will provide nearby residences and adjacent businesses with regularly-updated information regarding Project construction, including construction activities, peak construction vehicle activities (e.g., concrete pours), travel lane closures, and lane closures via a newsletter and/or website.

8.8 PARKING

No significant environmental impacts have been identified. No mitigation is required.

8.9 CUMULATIVE CONDITIONS

In summary, there is a **significant cumulative impact** for both the Proposed Project and Project Variant to transit delay during the AM and PM peak hours due to increased traffic congestion along the corridor. Both the Proposed Project's and the Project Variant's contributions to their respective significant impacts would **be considerable**.

The following mitigation measure is proposed:

Mitigation Measure C-M-TR-3: Implement Transit-Only Lanes

To mitigate a cumulative transit delay impact caused by the Project and the Variant, in combination with other cumulative projects, the SFMTA shall convert one of the two travel lanes in each direction from mixed-flow to transit-only between the intersection of Evans Avenue/Jennings Street/Middle Point Road, along Hunters Point Boulevard, Innes Avenue, Donahue Street, to the intersection of Donahue Street/Robinson Street. The transit-only lanes shall be located in the lane nearest to the curb for each direction, similar to those identified as part of the CPHPS Phase II Redevelopment Plan EIR for Evans Avenue between Third Street and Jennings Street.

For the proposed project, the threshold of significance for transit delay would be exceeded sometime after full buildout of the proposed project, even when assuming background construction of the Shipyard development per the latest construction schedule. For the variant, however, the threshold of significance for transit delay would be exceeded before buildout of the project, assuming background construction of the Shipyard development per the latest construction schedule. Based on the vehicle-trip estimates for the variant, the significance threshold would be exceeded with occupancy of aggregate land uses generating 1,193 inbound vehicle-trips during the weekday a.m. peak hour or 1,606 outbound vehicle-trips during the weekday p.m. peak hour, whichever comes first. Therefore, the Project Sponsors shall fund, and the SFMTA shall implement, this measure prior to the time the Project or Variant that would result in an increase in transit travel time to 18 minutes, 14 seconds in the AM peak hour or 18 minutes, 39 seconds in the PM peak hour, whichever comes first. The SFMTA shall monitor transit service and travel time along the corridor to assess when this threshold is met and the Project sponsors shall pay their respective fair share amounts after invoicing by SFMTA.

A conceptual drawing of the mitigation measure is shown in **Figure 17**.

The Project Sponsors would be responsible for making a fair share contribution to funding the implementation of the transit-only lanes based on the relative proportion of vehicle trips that the Project or the Variant contribute to the cumulative traffic conditions that result in the need for mitigation. The fair share was determined by the ratio of the sum of project-added trips across the three 700 Innes-adjacent study intersections to the sum of eastbound and westbound through trips without the Project. Since the impact would occur both in the AM and PM peak period, the higher ratio of the peak periods was conservatively selected as the fair share ratio. For the Proposed Project, the fair share contribution would be 38 percent, while for the Project Variant the fair share contribution would be 50 percent. In addition, between the Project Sponsors of the Project, each of the four parcels that make up the Proposed Project or Project Variant would be responsible for their proportionate share of the Project contribution. In this case, 98 percent of vehicle trips would be generated by the 700 Innes Avenue parcel, one percent of vehicle trips would be generated by the India Basin Shoreline Park parcel, zero percent of vehicle trips would be generated by the 900 Innes Avenue parcel, and one percent of trips would be generated by the India Basin Open Space parcel.

Mitigation Measure C-M-TR-3 would reduce the Proposed Project and Project Variant's contribution to cumulative impacts to transit travel time (transit delay) to acceptable levels and result in a less than significant cumulative impact; however, because SFMTA cannot commit to implementing these improvements, the cumulative transit delay impact is considered **significant and unavoidable with mitigation**. If implemented, the mitigation measure would result in **less-than-significant** pedestrian, bicycle, and parking impacts because the proposed changes are restricted to restriping the mixed-flow travel lanes, and therefore would not result in changes to facilities for other modes. Any temporary sidewalk, parking, or traffic lane closures due to construction of the mitigation measure would be coordinated with City agencies, which would result in a **less-than-significant** impact due to construction. There would also be a **less-than-significant** impact to emergency access. The transit-only lane would be available to emergency vehicles and would therefore provide more rapid emergency access along the corridor.

With respect to VMT, the Planning Department has identified screening criteria to identify types, characteristics, or locations of projects and a list of transportation project types that would not result in significant transportation impacts under the VMT metric. These screening criteria are consistent with CEQA Section 21099 and the screening criteria recommended by OPR. If a project falls within certain types of transportation projects, then a detailed VMT analysis is not required for a project. Since the implementation of a transit-only lane would fall within the definition of an "active transportation, rightsizing (aka road diet), and transit project" or "other minor transportation project", a detailed VMT analysis is not required. Therefore, the impact to VMT would be **less-than-significant**.

8.10 TRAFFIC IMPROVEMENT MEASURES

No significant environmental impacts have been identified; however, two improvement measures have been identified:

Improvement Measure I-TR-4B: Reconfigure Southbound Approach of Jennings Street/Evans Avenue (Project Variant only)

To improve vehicular mobility at the intersection of Jennings Street/Evans Avenue in the Baseline Plus Project Variant Scenario, Improvement Measure I-TR-4B proposes that the intersection of Jennings Street/Evans Avenue be reconfigured. The Project Sponsors should fund this improvement measure under which the SFMTA would reconfigure the southbound approach of this intersection to include a 100-foot left turn pocket. Adding this turn pocket would require that the SFMTA restrict parking on the west side of Jennings Street, removing approximately five parking spaces.

For the Project Variant, the Sponsors' responsibility for funding the implementation of the improvement measure would be based on the relative contribution of traffic to the intersection from the four parcels. At this location, 98 percent of vehicle trips would be generated by the 700 Innes Avenue parcel, one percent of vehicle trips would be generated by the India Basin Shoreline Park parcel, zero percent of vehicle trips would be generated by the 900 Innes Avenue parcel, and one percent of trips would be generated by the India Basin Open Space parcel.

Improvement Feasibility

This improvement is feasible. FivePoint has committed to signalizing the intersection as part of the Hunters Point Shipyard project, and implementation of this improvement measure would occur at the same time as signalization. Trips generated from the Build Property comprise 98 percent of the Project Variant Scenario vehicle trips through this intersection during both the AM and PM peak hours. Trips generated from the RPD Property comprise two percent of the Project Variant Scenario vehicle trips through this intersection during both the AM and PM peak hours. Therefore, Build would be responsible for 98 percent of the costs, and RPD would be responsible for 2 percent of the costs.

Operations After Improvement Measure

Restriping the southbound approach to include a southbound left turn pocket improves intersection operations to LOS E in the AM peak period and LOS C in the PM peak period.

Cumulative Improvement Measure C-I-TR-5: Reconfigure Eastbound Approach of Jennings Street/Evans Avenue

To improve vehicular mobility at the intersection in the Cumulative Plus Project and Project Variant Scenario, Cumulative Improvement Measure C-I-TR-5 proposes that the Project Sponsors fund the reconfiguration of the eastbound approach of the intersection of Jennings Street/Evans Avenue by the SFMTA from one shared through/left lane, one through lane, and one 100-foot left turn pocket to have one 100-foot left turn pocket, one through lane, and one shared through/right turn lane. No additional right-of-way would be required to implement this measure. The Project Sponsors will fund their fair share cost of the design and implementation of the new eastbound approach configuration for the intersection of Jennings Street/Evans Avenue.

Responsibility for paying a fair share fee would be based on the relative contribution of traffic to the intersection from the four parcels. At this location, 98 percent of vehicle trips would be generated by the 700 Innes Avenue parcel, one percent of vehicle trips would be generated by the India Basin Shoreline Park parcel, zero percent of vehicle trips would be generated by the 900 Innes Avenue parcel, and one percent of trips would be generated by the India Basin Open Space parcel.

Improvement Measure Feasibility

This improvement is feasible pending endorsement and subsequent funding commitment from the SFMTA. The funding contribution from the Project Sponsors is detailed in Section 0.

Operations After Improvement Measure

Implementing Cumulative Improvement Measure C-I-TR-5 would improve the intersection operation to LOS C in AM peak hour under Cumulative Plus Proposed Project and would result in LOS E intersection operation under Cumulative Plus Project Variant in AM peak hour. Cumulative Improvement Measure C-I-TR-5 would result in LOS D intersection operation in the PM peak hour for both Cumulative Scenarios (Project or Variant). Therefore, Improvement Measure C-I-TR-5 would improve operations under the Cumulative Plus Proposed Project Scenario; no feasible improvement measure has been identified that would improve further the operations at this intersection in the Cumulative Plus Project Variant Scenario. This improvement measure is a minor capacity increase at a single location. While it would reduce automobile delay at this location in the short run, because the capacity of the corridor as a whole is not being changed, it would result in a negligible change in the level of congestion on the roadway network.

APPENDIX A: APPROVED SCOPE OF WORK

SAN FRANCISCO
PLANNING DEPARTMENT

TRANSPORTATION STUDY
SCOPE OF WORK
ACKNOWLEDGEMENT AND APPROVAL

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Date: June 2, 2015

Transmittal To: Fehr & Peers, Transportation Consultants

The proposed scope of work for the 700-900 Innes Avenue (India Basin), Case No. 2014-002541ENV, dated May 2015 is hereby

☒ Approved as submitted

☐ Approved as revised and resubmitted

☐ Approved subject to comments below

☐ Not approved, pending modifications specified below and resubmitted

Signed: ______________________ ______________________
Transportation Planner Environmental Review Planner

Note: A copy of this approval and the final scope of work are to be appended to the transportation study. The Department advises consultants and project sponsors that review of the draft transportation report may identify issues or concerns of other City agencies not addressed in the scope of work hereby approved, and that the scope of work may need to be modified to accommodate such additional issues.

SCOPE OF WORK

Fehr & Peers has prepared this scope of work to perform a transportation impact study for the proposed mixed-use development at India Basin (Proposed Project). The Proposed Project, located in the Bayview Hunters Point neighborhood, is bounded by the San Francisco Bay on the north/northeast, Earl Street to the east, Innes Avenue to the south, and Hunters Point Boulevard and Hawes Street on the west/northwest. The 38.66-acre Project Site includes 16.94 acres of privately-owned land at 700 Innes, 14.2 acres of publicly-owned land at 900 Innes, India Basin Shoreline Park, and India Basin Open Space, and 7.52 acres of public right-of-way. The Proposed Project would construct a mixed-use, multi-phased master planned development on 22.71 acres of the total site while the San Francisco Recreation and Parks Department develops a 14.2-acre network of new and/or improved parkland and open space.

Specifically, the mixed-use, master planned portion of the proposed Project Site would add the following land uses (Proposed Project):

- 1,108 residential units with building heights of up to six stories (68')
- 116,070 sf of retail/commercial/R&D Lab/Clinical Care space
- 9.7 acres of open space and parks
- 1,447 vehicle and 1,108 bicycle parking spaces
- Mission Prep School – The K-8 school would start with 250 students in July 2017 and grow to 450 students adding 50 students per year over 4 years. In 5-7 years, the permanent school will be approximately 40,000 square feet and house 450 students.

The mixed-use, master planned portion of the Project Site has a project variant: the "Maximum Commercial Program Variant". Under this program, the 22.71 acres would have the following land uses:

- 706 residential units with building heights of up to six stories (68')
- 553,750 sf of retail/commercial/R&D Lab/Clinical Care space
- 9.74 acres of open space and parks
- 1,282 vehicle and 706 bicycle parking spaces
- Mission Prep School (unchanged from above)

Both the Proposed Project and the Maximum Commercial Variant will be described in Task 1: Project Description.

Fehr & Peers has tailored this scope of work based on the San Francisco Planning Department's *Transportation Impact Analysis Guidelines for Environmental Review*, published in October 2002 (*SF*

Guidelines). However, one of our first tasks will be to meet with the Planning Department's Environmental Planning (EP) section staff to confirm this scope and make revisions if needed. We have divided our scope into the following tasks:

TASK 0 – PROJECT SCOPING

Fehr & Peers will provide a draft scope of work to Planning Department staff for review. Fehr & Peers will attend one scoping meeting with Planning Department staff to review the scope and discuss modifications, if needed. At the scoping meeting, we will confirm the project description, transportation study area, analysis methodologies, analysis scenarios, and background assumptions (e.g., the level of future transit and roadway system improvements to be assumed).

Following the scoping meeting, Fehr & Peers will revise the scope of work based on Planning Department comments and submit a revised scope for review. We can begin work on subsequent tasks once the scope of work is approved by the Planning Department and a fully executed contract is in place.

TASK 1 – PROJECT DESCRIPTION

Fehr & Peers will describe the Proposed Project and the Maximum Commercial Project Variant in the Project Description section of the transportation impact study report. This section will include a brief description of the Proposed Project and variant, including the location, type of land uses proposed, the size of the project by land use, vehicular, transit, pedestrian, bicycle, loading and parking access and circulation, transportation improvements proposed as part of the project (e.g., new streets, sidewalks, and bicycle facilities), other programmed transportation improvements proposed in the area, and proposed on-site parking and loading facilities. We will provide a figure showing the existing site layout as well as a plan of the proposed project site that clearly describes on-site circulation, road classifications, and proposed land uses by type and size for the Proposed Project. We do not anticipate that the circulation network of the variant will be different enough to require separate review.

TASK 2 – DATA COLLECTION

Following approval of the scope of work, Fehr & Peers will collect the following data.

Traffic: Fehr & Peers will evaluate 17 study intersections for this study, as listed below. All of the intersections listed below except for five were studied in the Transportation Impact Analysis for the adjacent Candlestick Point / Hunters Point Shipyard EIR. These additional intersections were selected to better capture freeway access locations based on recent direction from the Planning Department on other projects and to capture access to the site from the south.

1. 25th St/Pennsylvania Ave
2. 25th St/Indiana St
3. Cesar Chavez St/Pennsylvania St/I 280
4. Cesar Chavez St/Indiana St
5. Cesar Chavez St/Third St
6. Third St/Cargo Way
7. Cargo Way/Illinois St/Amador St
8. Evans Ave/Third St
9. Evans Ave/Jennings St
10. Third St/Jerrold Ave
11. Innes Ave/Griffith St
12. Innes Ave/Arelious Walker Drive
13. Innes Ave/Earl St
14. Bayshore Blvd/Oakdale Ave
15. Third St/Oakdale Ave
16. Palou Ave/Ingalls St
17. Third St/Paul St

Third St/Paul Ave Because the traffic counts from the Shipyard are somewhat outdated (i.e., from 2008 and 2009), we will collect new weekday AM (7:00am to 9:00am) and PM (4:00pm to 6:00pm) peak period intersection turning movement counts for all study intersections except for #1, #2, #3, #5, #11, and #13. For intersections #1, #2, #4, and #5, 2013 or 2014 counts are available from the Pier 70 Transportation Impact Analysis.. (New traffic counts will be taken at two of these four locations to ensure that the 2013/2014 counts from Pier 70 adequately represent current conditions.) Intersections #11 Innes Avenue/Griffith Street and #13 Innes Avenue/Earl Street will also not be counted because the cross-streets are currently very minor with nearly negligible amounts of traffic; instead, Fehr & Peers will make assumptions for existng conditions volumes on the cross streets based on spot check field observations.

This scope assumes that no freeway segments will be analyzed.

Transit: Fehr & Peers will compile data on all Muni bus routes and rail lines (including motor coach, trolley coach, and light rail and historic streetcar service) within approximately a half-mile of the proposed project site. This will include a description of each route's transit route service hours, peak and off-peak period headways and nearest stop to the proposed project site. Fehr & Peers will prepare a map that presents nearby transit stops and routes graphically. The Muni transit lines which will be described are:

- 19-Polk (Assumed to be replaced by the 48-Quintara in the future)
- 23-Monterey
- 24-Divisadero
- 44-O-Shaughnessey
- 54-Felton
- T-Third

We will describe peak hour ridership and capacity utilization at the maximum load points (MLP) for the standard Downtown and regional transit screenlines. Fehr & Peers will use Muni weekday AM and PM peak hour ridership and capacity utilization at the MLP developed for the Transit Effectiveness Project (TEP) EIR, unless more recent data is provided by SFMTA. For the cumulative scenario, the proposed service planning changes outlined in the TEP will be assumed.

Fehr & Peers will also compile data on regional transit operators (BART, AC Transit, Golden Gate Transit bus and ferry service, SamTrans and Caltrain) including the nearest transit stop location within the study area boundary and the latest scheduled operations on weekdays. Weekday peak hour ridership and capacity utilization for the regional screenlines for the analysis periods identified will be obtained from the regional operators.

Pedestrian/Bicycle: Fehr & Peers will conduct a qualitative assessment of pedestrian and bicycle conditions in the vicinity of the project site. Bicycle conditions will be described as they relate to the proposed project site, including bicycle routes, bicycle connections to the SF Bay Trail, new park trails and adjacent open space, existing bicycle parking, safety and right-of-way issues, conflicts with traffic, and grade changes. Fehr & Peers will summarize proposed changes in the study area identified in the 2009 San Francisco *Bike Plan*. Pedestrian conditions will be described as they relate to safety and conflict issues at key crossing locations near the Project site, pedestrian routes between the Proposed Project and adjacent transit stops, pedestrian connections to the SF Bay Trail, other park trails, and open space, right-of-way conflicts, sidewalk widths, and compliance with ADA requirements. Much of this information can be summarized from recent planning work we have performed in the area.

Additionally, Fehr & Peers will collect weekday AM (7:00am to 9:00am) and PM (4:00pm to 6:00pm) peak period intersection bicycle turning movement and pedestrian crossing counts at the following four intersections:

1. Cargo Way/Illinois St/Amador St (traffic intersection #7)

2. Evans Ave/Jennings St (traffic intersection #9)
3. Third St/Oakdale Ave (traffic intersection #15)
4. Oakdale Ave/Quint St (not included in traffic intersection data collection)

Parking: Fehr & Peers will conduct counts of existing on-street and public off-street parking occupancy in a parking study area generally within a two- to three-block radius of the Proposed Project, bounded by Middle Point Road to the west, Innes Avenue to the south, Donahue Street to the east, and the waterfront to the north during the weekday midday period (1:30 to 3:00 PM) and evening period (6:30 to 8:00 PM). Current on-street parking regulations in the immediate vicinity of the Proposed Project will be noted. Fehr & Peers will include a brief qualitative discussion of proposed parking changes in the vicinity of the Project, if any.

Loading: Fehr & Peers will describe the size and location of off-street and on-street loading in the immediate vicinity of the Project site with regard to both commercial and passenger loading. Fehr & Peers will conduct a qualitative assessment of loading activities during AM and PM peak periods.

Emergency Vehicle Access: Fehr & Peers will qualitatively discuss emergency vehicle access to the Project Site.

TASK 3 – DOCUMENT EXISTING CONDITIONS

Using the data collected in Task 2, Fehr & Peers will document existing street traffic, circulation, parking, pedestrian, bicycle, loading, emergency vehicle access, and transit conditions in the vicinity of the project site, including:

- A base map for the study area describing the street designations, street names, number of lanes, and traffic flow directions;
- A description of existing uses and vehicular access to the project site;
- An assessment of existing parking activities, including hours of operation, supply and hourly utilization for the midday and evening peak hours;
- Graphics indicating the existing peak hour traffic volumes and lane configuration at the study intersections identified in Task 2;
- A map and discussion of Muni and regional transit services within the transportation study area, including bus routes and nearby bus stop locations for each route within a one-half mile radius of

the proposed project. The transit analysis will include weekday AM and PM peak hour capacity utilization analysis for the standard Downtown screenlines and the regional transit screenlines. Changes to Muni service in the area being proposed by the Transit Effectiveness Program (TEP) will also be described. We will also identify operational conflicts between buses or light rail vehicles and other vehicles, including bicycles;

- A qualitative assessment of existing bicycle and pedestrian conditions (conflicts, safety and operational issues) will be conducted;
- A description of changes to the bicycle network in the vicinity of the project site being considered by the San Francisco Bicycle Plan and other City proposals;
- A qualitative assessment of existing weekday commercial and passenger loading conditions within the transportation study area;
- A description of the existing emergency vehicle access routes to the project site, and
- A quantitative assessment of existing on- and off-street parking supply and utilization within the parking study area, and qualitative discussion of on-street parking regulations.

TASK 4 – DETERMINE TRAVEL DEMAND

TASK 4.1 BASELINE TRAVEL DEMAND

Trip Generation: Fehr & Peers will use the total number of new person- and vehicle-trips generated by anticipated near-term development projects on a typical weekday and during the AM and PM peak hours to develop a baseline conditions scenario with a horizon year of 2018. Anticipated near-term development projects in the vicinity of the Proposed Project are Hunters Point Shipyard Phase 1 and Hunter's View. Trip generation rates will be provided by the EIR documents of the respective development projects.

Trip Distribution/Mode Split: The vehicle trips generated by the baseline projects will be assigned to the study intersections based on the trip distributions provided, while transit trips will be assigned to transit routes in the area. The trip distribution and mode split percentages for the anticipated near-term development projects will be provided by the EIRs from the respective projects.

TASK 4.2 PROJECT TRAVEL DEMAND

Trip Generation: Fehr & Peers will estimate the total number of new person- and vehicle-trips generated by the Proposed Project on a typical weekday and during the AM and PM peak hours. The trip generation rates will be taken from the *SF Guidelines*. Fehr & Peers will prepare trip generation forecasts for the Proposed Project and the Project Variant.

Trip Distribution/Mode Split: Fehr & Peers will estimate the mode split percentages and trip distribution for person trips generated by the Proposed Project and Project Variant for two different conditions – near-term conditions with the existing levels of transit service and for long-term with substantial improvements to transit service expected to occur as part of the implementation of the adjacent Candlestick Point/Hunters Point Shipyard project. The increases in transit service expected to occur in the long-term are substantial enough to expect a meaningful change in mode split associated with the Proposed Project and Project Variant.

For the near term conditions, mode split forecasts will be based on the latest available Census mode split and place of employment information for the Census Tract surrounding the Proposed Project. We will use 2008-2012 American Community Survey data for mode split and trip distribution assumptions for the Proposed Project and Project Variant. A graphic showing vehicle-trip distribution and assignment for the Proposed Project and Project Variant will be included.

For the longer term conditions, Fehr & Peers will use previously-developed mode share forecasts for work and non-work trips based on the previously-proposed uses at the India Basin site. The methodology is identical to that developed for the Candlestick Point/Hunters Point Shipyard analysis, including uses at the India Basin site, and reflects the planned long-term level of transit service expected in the area.

Parking/Loading Demand: Fehr & Peers will forecast the parking and loading demand for the proposed uses based on the SF Guidelines methodology and describe the quantity and location of the changes to supply associated with the Proposed Project and Project Variant.

TASK 4.3 TRAVEL DEMAND DOCUMENTATION

Fehr & Peers will submit a Travel Demand Memo that includes project trip generation, trip distribution, and mode split for the Proposed Project and the Maximum Commercial Program Variant under both near-term conditions (with existing transit service) and long-term conditions (with substantial improvements to transit service). The memo will also include the trip generation, trip distribution, and mode split for the Hunters Point Shipyard Phase 1 and Hunter's View development projects that will be used to develop the baseline conditions scenario. This memo will be submitted to the Planning Department for review and comment. Fehr & Peers will revise and resubmit the travel demand memorandum. Upon approval by the Planning Department, Fehr & Peers will incorporate this work into the analysis.

TASK 5 – IMPACT ANALYSIS

Although the remainder of the scope refers to the "Proposed Project," tThe impact analysis will be conducted for either both the Proposed Project or and the Project Variant, whichever has greater trip generation, in consultation with the Planning Department.

Fehr & Peers will identify transportation-related impacts associated with the Proposed Project and the Project Variant. The effort will include impacts on the study intersections, transit operations, pedestrian and bicycle circulation, loading conditions, emergency vehicle access, construction activities, and parking. The methodology for assessing project impacts is described below.

Task 5.1 – Traffic: Fehr & Peers will calculate intersection LOS for the weekday AM and PM peak hours for all study intersections. The intersection LOS will be calculated for the following scenarios:

- Baseline (2018)
- Baseline plus Proposed Project
- Baseline plus Project Variant
- Baseline plus Proposed Project plus Transit Improvements
- Baseline plus Project Variant plus Transit Improvements
- Future Year 2040 Cumulative Plus Proposed Project
- Future Year 2040 Cumulative Plus Project Variant.

Baseline plus Project plus Transit Improvements

Should the Baseline plus Project scenarios identify significant transportation-related impacts, it is possible that some of them may be reduced with the planned transit improvements that the City has committed to in the area. Thus, those transit improvements may represent all or a portion of required mitigation measures for project-related impacts.

To calculate the degree to which the transit improvements may reduce significant project-related impacts, the long-term travel demand forecasts for the project described in Task 4 (which represent full implementation of the transit improvements) -will be applied to the baseline conditions. This analysis will isolate significant project impacts that cannot be addressed by the proposed transit improvements and will assist in developing additional project-related mitigation measures, if necessary.

Additionally Fehr & Peers will work with the Planning Department and the SFMTA to describe the feasibility of these transit improvements, including the status of funding, approval, and implementation timing relative to buildout of the Proposed Project.

Future Year 2040 Cumulative

For the Future Year 2040 Cumulative Conditions traffic analysis, future growth at the study intersections will be forecasted based on cumulative development and growth identified by the San Francisco County Transportation Authority (SFCTA) travel demand forecasting model, SF-CHAMP, using model output that represents existing conditions and model output that represent 2040 cumulative conditions. In order to estimate 2040 Cumulative plus Project conditions, the projected traffic volume growth between existing and 2040 cumulative conditions at the study intersections will be added to the traffic volumes for the 2040 cumulative conditions. 2040 cumulative conditions will include planned transportation infrastructure projects in the study area including the Hunters Point Shipyard Phases I and II.

Task 5.2 – Transit: Fehr & Peers will estimate the increase in weekday PM peak hour transit ridership for Muni and for regional transit providers as a result of the Proposed Project and Project Variant. Fehr & Peers will conduct a quantitative assessment of the project-related impacts in terms of ridership and capacity utilization to existing and future transit service on the Downtown screenlines, based on the distribution of project-generated transit trips (determined in Task 4). Potential impacts to Muni operations will be described using transit screenlines and maximum load points, as described in the *SF Guidelines*.

Task 5.3 – Site Access: Fehr & Peers will review site access and identify issues related to site ingress and egress, and provide design recommendations where necessary.

Fehr & Peers will review the proposed site plan for the Mission Prep School to qualitatively assess the circulation of passenger vehicles, emergency vehicles, and delivery trucks into and within the site. We will provide an estimate of vehicular trip generation in the AM and PM peak hours. We will qualitatively assess the adequacy of the pick-up, drop-off capacity through a comparison with up to two similar existing schools in San Francisco. We will quantitatively assess anticipated pick-up and drop-off operations, pedestrian and bicycle circulation, and pedestrian access to the pick-up and drop-off location. We will assess the parking provided by the proposed project to the extent that it serves expected demand from faculty and staff. Additionally, Fehr & Peers will review the proposed pedestrian and ADA circulation on site, and identify potential conflict areas and improvement opportunities. Bus loading operations will not be studied, and inclusion of such an analysis would require an additional study.

Task 5.4 – Loading: Fehr & Peers will conduct a loading supply/code/demand analysis for the Proposed Project and Project Variant. The proposed loading supply will be compared to the *Planning Code* requirements, and to the estimated demand generated by the Proposed Project. In addition, Fehr & Peers will assess the proposed loading facilities in terms of location and operational characteristics, including truck movement, internal loading circulation and clearance, location of trash storage/compactor, move-in/move-out procedures, and removal of garbage.

Task 5.5 – Pedestrian/Bicycles: Fehr & Peers will qualitatively assess pedestrian and bicycle conditions in the vicinity of the project site under existing and cumulative conditions, including changes that are anticipated as a result of the ongoing India Basin Corridor Transportation Study. Fehr & Peers will also qualitatively assess potential conflicts between project-generated vehicle traffic and pedestrian and bicycle circulation. *Planning Code* requirements for bicycle parking and related facilities will be identified and compared to the proposed supply. We will summarize proposed changes to the bicycling network near the project site as described in the San Francisco *Bike Plan*. Fehr & Peers will qualitatively discuss the adequacy of pedestrian routes from the Project site to the closest bus stops for routes described in Task 3. Fehr & Peers will qualitatively describe potential conflicts between vehicles entering and exiting Project driveways and other parking facilities and bicycle traffic along the adjacent streets.

Task 5.6 – Emergency Service Access: Fehr & Peers will qualitatively discuss impacts due to the Proposed Project with respect to emergency vehicle access to the Project Site.

Task 5.7 – Construction: Fehr & Peers will evaluate potential short-term construction impacts that would be generated by the Proposed Project. Construction impact evaluation will address the staging and duration of construction activity, differences in intensity between various stages of construction, truck routings, estimated daily truck volumes, street and/or sidewalk closures, impacts on Muni operations, and construction worker parking. Construction will likely overlap with several high-profile projects immediately adjacent to the Proposed Project, including the Hunters Point Shipyard, and therefore will require coordination with a variety of agencies and organizations including SFMTA and DPW. We will evaluate the temporary impacts that would result from concurrent construction of the Proposed Project and other projects identified by the Planning Department.

Task 5.8 – Parking: Fehr & Peers will conduct a parking supply/code/demand analysis for the Proposed Project and Project Variant. The proposed parking supply will be compared to the *Planning Code* requirement for the project. Exceptions to the *Planning Code* will be noted. The proposed parking supply will also be compared to the estimated demand generated by the Proposed Project. ADA-Accessible and bicycle parking supply and requirements will be described. Deficiencies will be quantified and discussed in relation to the effect on the parking supply in the area surrounding the project to identify parking-related impacts under existing and cumulative conditions. Fehr & Peers will discuss the proposed entry/exit locations for the parking garage and the effects of this placement on circulation in the vicinity of the site.

Task 5.9 – Develop Mitigation/Improvement Measures: Fehr & Peers will work cooperatively with Planning Department staff to develop mitigation measures, if necessary for both the Proposed Project and Project Variant. Mitigation measures to reduce the effect of potentially significant impacts will be proposed, as well as improvement measures aimed at reducing the effects of less than significant impacts. Where significant project-related impacts are identified, documentation of mitigation measures considered at each intersection or street segment will be included in the appendix of the transportation report. Furthermore, potential secondary effects, including potential LOS analysis, of any recommended mitigation measures or improvement measures will be analyzed and included in the transportation report.

We will work with the Planning Department, and others as the Planning Department deems appropriate, to develop an appropriate mitigation implementation plan that incorporates the desired development flexibility and also ensures that mitigation measures are implemented at the appropriate time. One potential approach is as follows:

- For the measures that are held in common between the Proposed Project and Project Variant, we will identify the trip generation threshold at which the measure would be required under each bookend; the ultimate trigger for implementation could be the lower of the two thresholds.
- For mitigation measures that are dependent on one of the two bookend scenarios, we will identify the critical amount of development that “triggers” the need for the measure. The methodology for determining this will depend on the impact.

We will attend a meeting with Planning Department and SFMTA staff prior to submittal of Administrative Draft 1 of the report to discuss potential mitigation measures for significant impacts.

TASK 6 – PREPARE TRANSPORTATION REPORT

Prepare Draft Report: Fehr & Peers will prepare an Administrative First Draft Transportation Impact Study, incorporating data, analysis, and conclusions from the above tasks. The draft report will be submitted to the Planning Department for review by the Planning Department and other City agencies. Technical appendices including background information used in the analysis (e.g., traffic counts) will be submitted to the Planning Department with the Administrative Draft Report.

Revisions to Draft Report: Fehr & Peers will incorporate comments from the City agencies, and prepare up to two additional draft reports (a Second Draft and a Screencheck Draft). We have budgeted for up to 40 hours of staff time to make these revisions. Comments from the City requiring additional technical analysis will be completed under an additional scope and fee.

Prepare Final Report: A Final Report will be prepared following the Planning Department EP staff's approval. We have budgeted for up to 16 hours of staff time to make these revisions. Comments from the City requiring additional technical analysis will be completed under an additional scope and fee.

Our scope of work and fee does not include preparation of or assistance with preparation of an EIR section or response to public comments on an EIR section.

TASK 7 – MEETINGS

Fehr & Peers will attend one scoping meeting with Planning Department staff to review the scope and discuss modifications, which is shown in Task 0. At the scoping meeting, Fehr & Peers will confirm the project description, transportation study area, analysis methodologies, analysis scenarios, and background assumptions (e.g., the level of future transit and roadway system improvements to be assumed). We have assumed up to ~~two~~ five additional meetings (including the meeting in Task 5.9), for a total of ~~three~~six. We have not assumed attendance at any public hearings, although we are available to attend additional meetings (staff-level of public hearings) on a time and materials basis.

TASK 8 – UPLOAD INTERSECTION RESULTS TO FTP SITE

Fehr & Peers will upload vehicle delay and LOS data into the excel template and to the Planning Department FTP site upon completion of the TIS. We will follow the process described in the December 9, 2013 letter from the Planning Department to the transportation consultant list.

APPENDIX B: PROPOSED PROJECT PLANS

LOCATION MAP

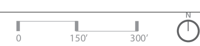
AERIAL VIEW

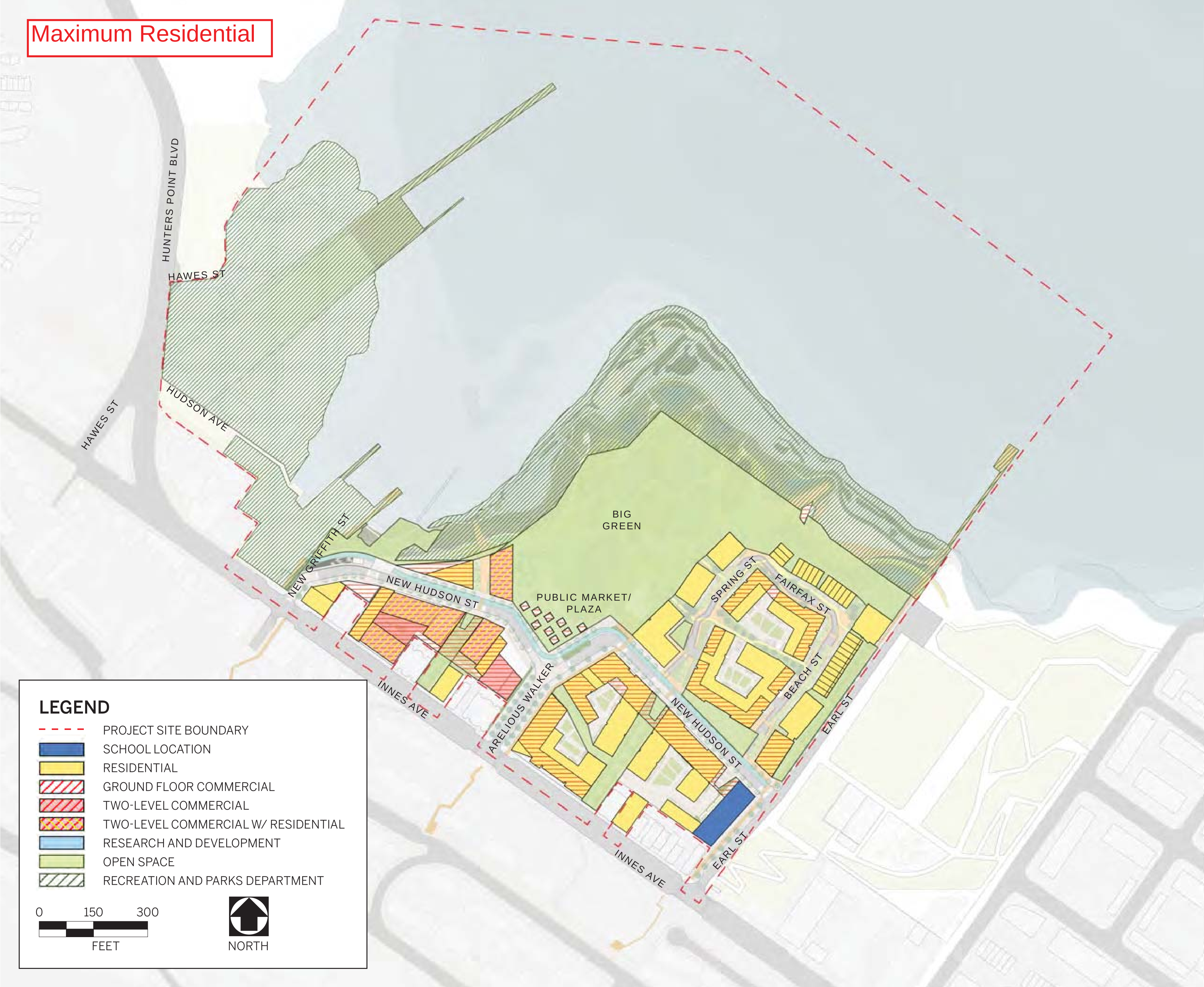
PROJECT SITE BOUNDARY
900 INNES BOUNDARY
RECREATION & PARKS DEPARTMENT
BUILD INC PROPERTY
RIGHT-OF-WAY
SEPARATE OWNERSHIP - INCLUDED IN 700 INNES

MAXIMUM RESIDENTIAL SCHEME

PROPOSED SITE PLAN

PROJECT SITE BOUNDARY




Maximum Residential
HUNTERS POINT BLVD
HAWES ST
HUDSON AVE
HAWES ST
NEW GRIFFITH ST
NEW HUDSON ST
BIG GREEN
PUBLIC MARKET/ PLAZA
SPRING ST
FAIRFAX ST
BEACH ST
EARL ST
ARELIOUS WALKER
NEW HUDSON ST
INNES AVE
INNES AVE
EARL ST
LEGEND
PROJECT SITE BOUNDARY
SCHOOL LOCATION
RESIDENTIAL
GROUND FLOOR COMMERCIAL
TWO-LEVEL COMMERCIAL
TWO-LEVEL COMMERCIAL W/ RESIDENTIAL
RESEARCH AND DEVELOPMENT
OPEN SPACE
RECREATION AND PARKS DEPARTMENT
0 150 300
FEET
NORTH

MAXIMUM RESIDENTIAL SCHEME

PROPOSED BUILDING HEIGHT

- PROJECT SITE BOUNDARY
- 2 STORIES (20' - 25')
- 3 STORIES (38' - 40')
- 4 STORIES (40' - 50')
- 5 STORIES (50' - 65')
- 6 STORIES (65' - 68')
- 7 STORIES (75' - 78')

0 150' 300' N

PEDESTRIAN ACCESS

BICYCLE CIRCULATION

TRANSIT & PEDESTRIAN CROSSING

Note: Innes Avenue is being studied under a separate Transportation Corridor Study. Bus stop, pedestrian crossings, and traffic light locations are preliminary.

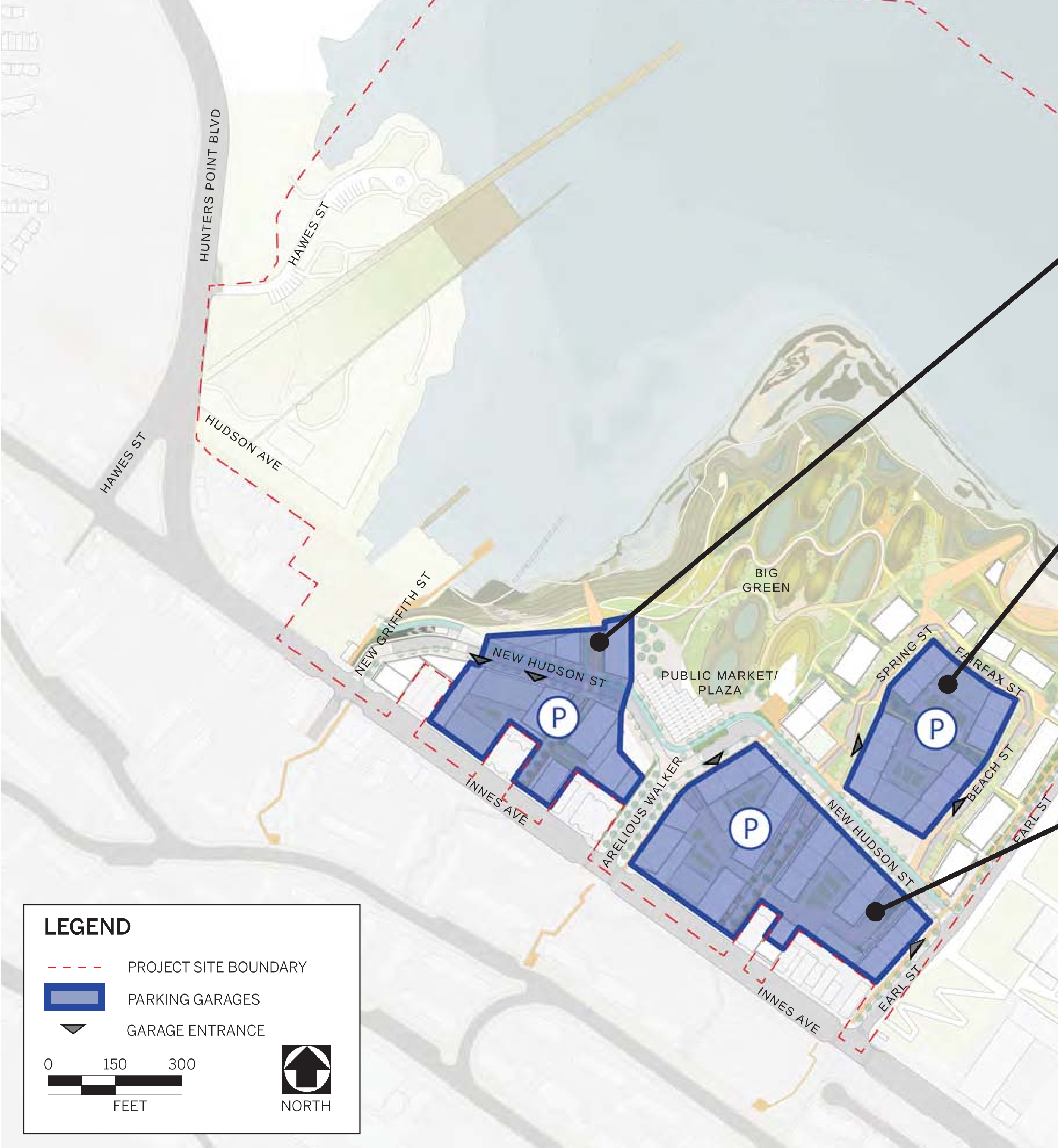
VEHICULAR CIRCULATION & GARAGE ENTRIES

Note: Innes Avenue is being studied under a separate Transportation Corridor Study. Bus stop, pedestrian crossings, and traffic light locations are preliminary.

ON-STREET PARKING

TOTAL ON-STREET PARKING PROVIDED:
30 SPACES

OFF-STREET PARKING



COVE PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B2	76	169	245
B3	76	169	245
TOTAL	152	338	490

FLATS PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B1	24	51	75
B2	59	130	189
TOTAL	83	181	264

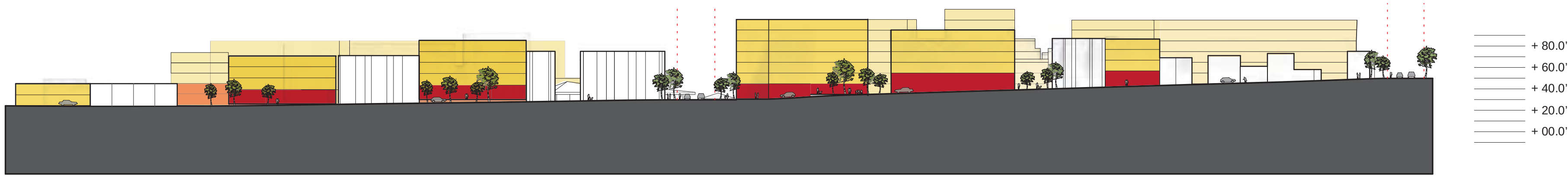
HILLSIDE PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B1	73	163	236
B2	132	292	424
B3	120	266	386
TOTAL	325	721	1046

MAXIMUM RESIDENTIAL SCHEME

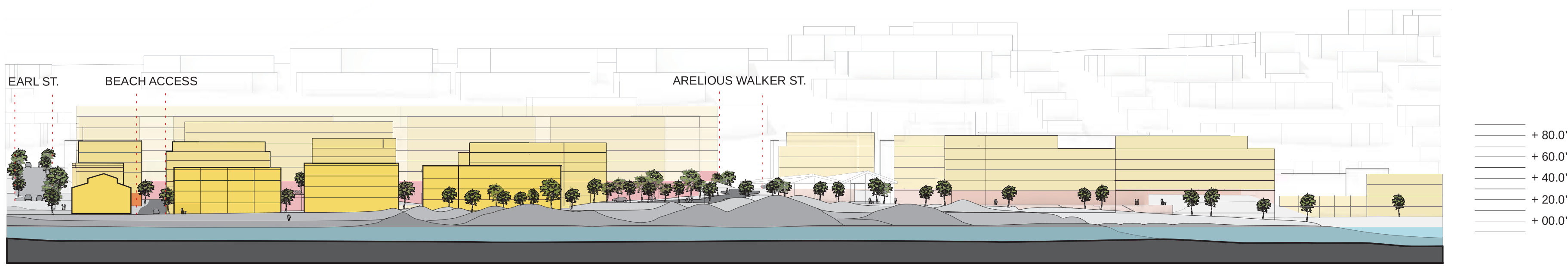
PROPOSED ELEVATIONS

RESIDENTIAL

RETAIL/COMMERCIAL



SOUTHWEST ELEVATION

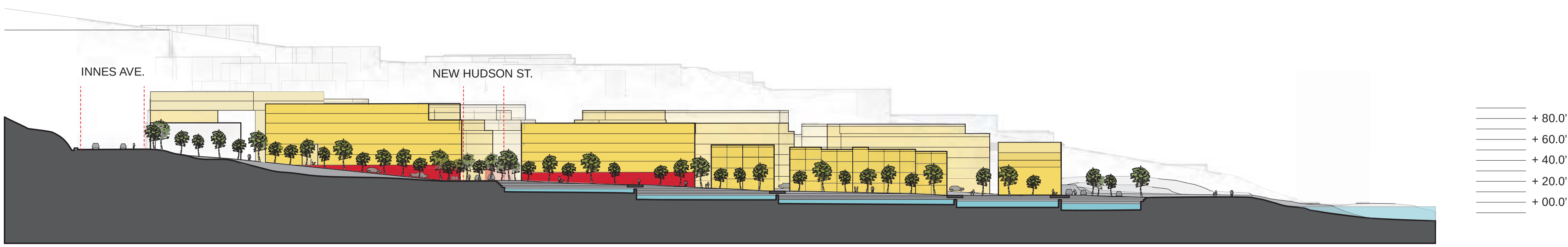


NORTHEAST ELEVATION

MAXIMUM RESIDENTIAL SCHEME

PROPOSED ELEVATIONS

RESIDENTIAL
RETAIL/COMMERCIAL



SOUTHEAST ELEVATION

NORTHWEST ELEVATION

MAXIMUM RESIDENTIAL SCHEME

PHASING DIAGRAM

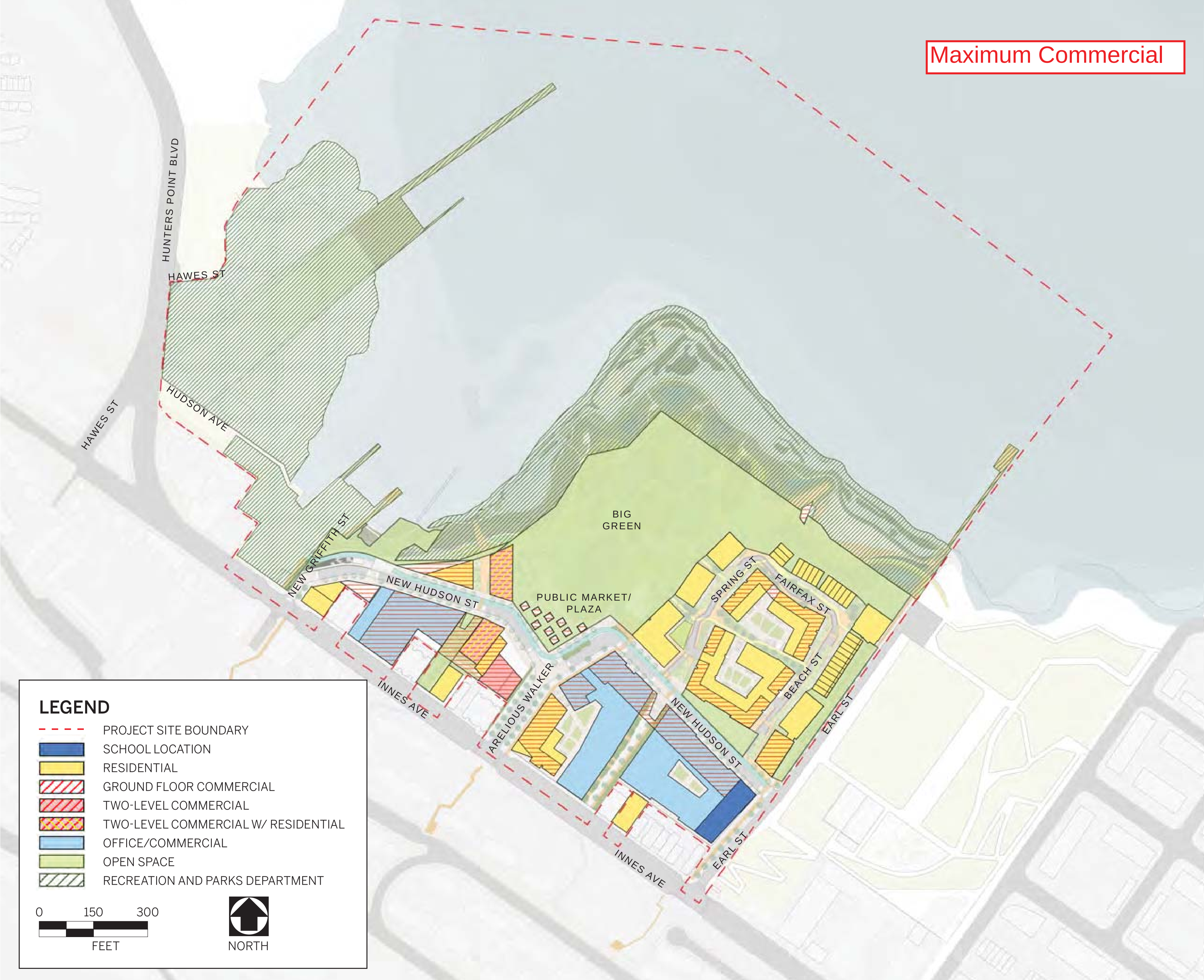
- PROJECT SITE BOUNDARY
- PHASE 1A (TO BE RELOCATED IN PHASE 2B)
- PHASE 1B
- PHASE 2A
- PHASE 2B
- PHASE 2C
- PHASE 3
- PHASE 4
- PHASE 5
- PHASE 6
- PHASE 7

MAXIMUM COMMERCIAL SCHEME

PROPOSED SITE PLAN

PROJECT SITE BOUNDARY

0 150' 300' N



Maximum Commercial
HUNTERS POINT BLVD
HAWES ST
HUDSON AVE
HAWES ST
BIG
GREEN
PUBLIC MARKET/
PLAZA
NEW GRIFFITH ST
NEW HUDSON ST
SPRING ST
FAIRFAX ST
BEACH ST
EARL ST
ARELIOUS WALKER
NEW HUDSON ST
INNES AVE
INNES AVE
EARL ST
LEGEND
PROJECT SITE BOUNDARY
SCHOOL LOCATION
RESIDENTIAL
GROUND FLOOR COMMERCIAL
TWO-LEVEL COMMERCIAL
TWO-LEVEL COMMERCIAL W/ RESIDENTIAL
OFFICE/COMMERCIAL
OPEN SPACE
RECREATION AND PARKS DEPARTMENT
0
150
300
FEET
NORTH

MAXIMUM COMMERCIAL SCHEME

PROPOSED HEIGHTS

- PROJECT SITE BOUNDARY
- 1 STORY (10' - 15')
- 3 STORIES (38' - 40')
- 4 STORIES (40' - 50')
- 5 STORIES (50' - 65')
- 6 STORIES (65' - 68')
- 7 STORIES (75' - 78')
- 4 STORIES (75' - 90')
- 4 STORIES (55' - 65')
- 5 STORIES (65' - 67')
- 6 STORIES (75' - 80')

0 150' 300' N

LOADING ZONES - COMMERCIAL VARIANT

ON-STREET PARKING - COMMERCIAL VARIANT

TOTAL ON-STREET PARKING PROVIDED:
30 SPACES

OFF-STREET PARKING - COMMERCIAL VARIANT

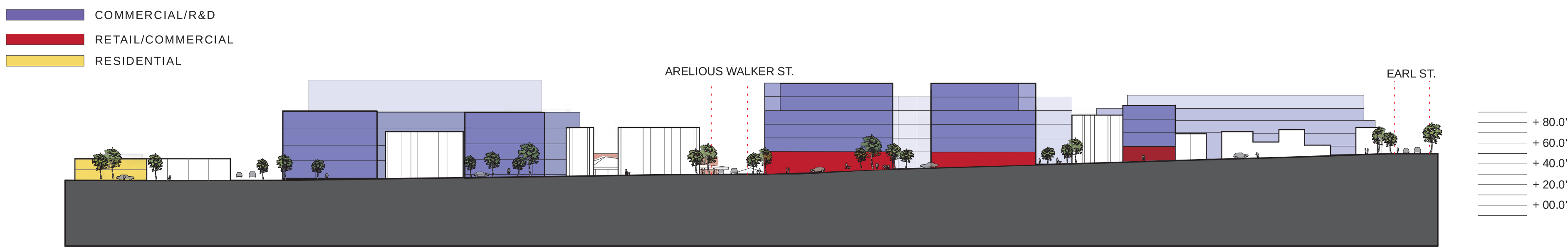
COVE PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B2	192	68	260
B3	192	68	260
TOTAL	384	136	520

FLATS PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B1	59	21	80
B2	148	52	200
TOTAL	207	73	280

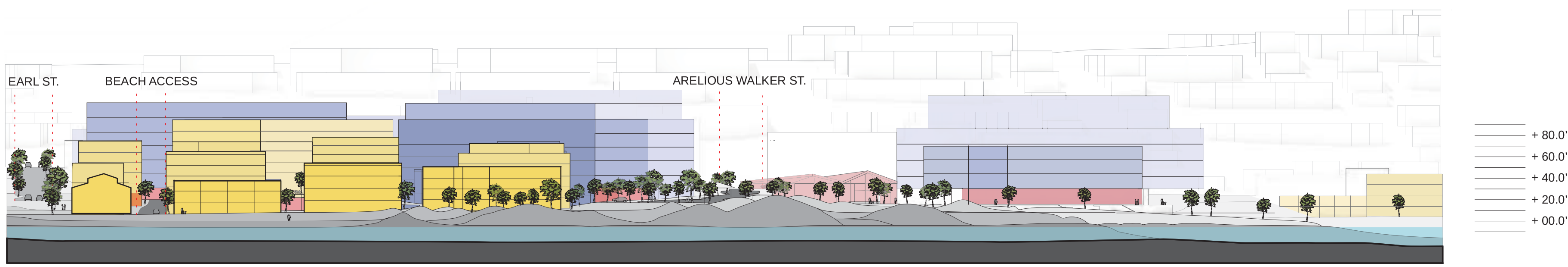
HILLSIDE PARKING GARAGE			
LEVELS	PUBLIC SPACES	PRIVATE SPACES	TOTAL
B1	186	66	252
B2	332	118	450
B3	303	107	410
TOTAL	821	291	1112

MAXIMUM COMMERCIAL SCHEME

PROPOSED ELEVATIONS



SOUTHWEST ELEVATION



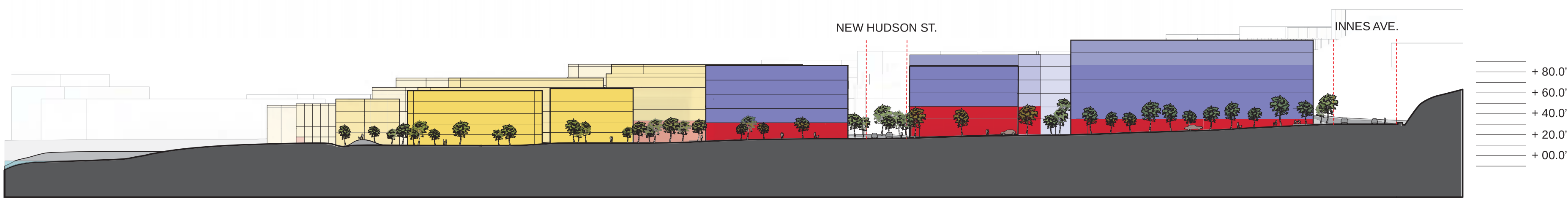
NORTHEAST ELEVATION

MAXIMUM COMMERCIAL SCHEME

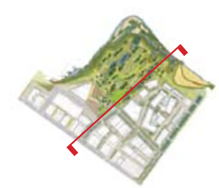
PROPOSED ELEVATIONS

COMMERCIAL/R&D
RETAIL/COMMERCIAL
RESIDENTIAL

SOUTHEAST ELEVATION



NORTHWEST ELEVATION



MAXIMUM COMMERCIAL SCHEME

PHASING DIAGRAM

- PROJECT SITE BOUNDARY
- PHASE 1A (TO BE RELOCATED IN PHASE 3B)
- PHASE 1B
- PHASE 2
- PHASE 3A
- PHASE 3B
- PHASE 3C
- PHASE 4
- PHASE 5
- PHASE 6
- PHASE 7

APPENDIX C: TDM CHECKLIST

SAN FRANCISCO
PLANNING DEPARTMENT

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

Transportation Demand Management (TDM) Checklist: Development Projects

A. GENERAL PROJECT INFORMATION:

Date: ___________September 6, 2016__________________

Project Name: ___________India Basin______________________ Case No: ________________________

Project Address and Block and Lot: _________700 Innes____

TDM Checklist Prepared By: ______Courtney Pash___________ on Date: ______September 6, 2016_______

Project Sponsor (name/phone/email): _Build, Courtney Pash, 415.551.7626 courtney@bldsf.com_______

B. CHECKLIST TABLE:

CATEGORY	MEASURE	DESCRIPTION[1]	SELECTED
ACTIVE-1	Improve Walking Conditions: Options A - B	Provide streetscape improvements to encourage walking	☒ Option:
ACTIVE-2	Bicycle Parking: Options A - D	Provide secure bicycle parking, more spaces given more points	☒ Option:
ACTIVE-3	Showers and Lockers	Provide on-site showers and lockers so commuters can travel by active modes	☒
ACTIVE-4	Bike Share Membership: Location A - B	Provide Bike Share memberships for residents and employees (1 point) Additional point if the project site is within the Bike Share network	☒ Option:
ACTIVE-5A	Bicycle Repair Station	Provide on-site tools and space for bicycle repair	☒
ACTIVE-5B	Bicycle Maintenance Services	Provide maintenance services through an on-call mechanic or vouchers to a local shop	☒
ACTIVE-6	Fleet of Bicycles	Provide an onsite fleet of bicycles for residents, employees, and/or guests to use	☒
ACTIVE-7			☒

[1] Please refer to Appendix A of the TDM Program Standards for TDM measure descriptions and specific applicability by land use category. Appendix A is available here: http://sf-planning.org/shift-encourage-sustainable-travel

CATEGORY	MEASURE	DESCRIPTION[1]	SELECTED
	Temporary Bicycle Valet Parking	For large events. Provide monitored bicycle parking for 20 percent of guests	
CSHARE-1	Car Share Options A - E	Several options for providing car-share parking and memberships, more points given for higher levels of participation	☒ Option:
DELIVERY-1	Delivery Supportive Amenities	Facilitate deliveries with a staffed reception desk, lockers, or other accommodations	☒
DELIVERY-2	Provide Delivery Services	Provide delivery of products (e.g., groceries) or services (e.g., dry cleaning)	☒
FAMILY-1	Family TDM-Amenities Options A - B	Provide storage for car seats near car-share parking, cargo bikes and shopping carts	☒ Option:
FAMILY-2	On-site Childcare	Provide an on-site childcare services	☒
FAMILY-3	Family TDM Package	Provide a combination of car-share parking and memberships and family amenities	☐
HOV-1	Contributions or Incentives for Sustainable Transportation Options A - D	25, 50, 75, or 100 percent subsidies for sustainable transportation use (e.g., Muni fast pass), more points given for higher rate of subsidy	☐ Option:
HOV-2	Shuttle Bus Service Options A - B	Provide shuttle bus services, more points given for more frequent service	~~☒~~ Option:
5/26/17 Edit: This is now an option within Mitigation Measure TR-1, not part of TDM Plan.			
HOV-3	Vanpool Program Options A - G	Provide vanpool services to employees, more points for serving larger projects	☐ Option:
INFO-1	Multimodal Wayfinding Signage	Provide directional signage for locating transportation services (shuttle stop) and amenities (bicycle parking)	☒
INFO-2	Real Time Transportation Information Displays	Large screen or monitor that displays, at a minimum, transit arrival and departure information	☒
INFO-3	Tailored Transportation	Provide residents and employees with information about travel options, more points given for providing more marketing services	☒ Option:

CATEGORY	MEASURE	DESCRIPTION[1]	SELECTED
	Marketing Services Options A - D		
LU-1	Healthy Food Retail in Underserved Area	Providing healthy food options (e.g., restaurants, grocery stores) in an area identified as underserved	☒
LU-2	On-Site Affordable Housing Options A -D	Providing on-site affordable housing as part of a residential project, more points given for a higher percentage of affordable units	☒ Option:
PKG-1	Unbundle Parking Locations A - E	Separating the cost of parking from the cost of rent, lease or ownership, more points given for projects located in areas where parking is more constrained	☒ Option:
PKG-2	Short Term Daily Parking Provision	No parking rates discounted beyond a daily pass, no weekly, monthly, or annual passes allowed.	☐
PKG-3	Parking Cash-Out: Non-residential Tenants	Employees who are provided free parking must also have the option to take the cash value of the space in lieu of the space, itself	~~☒~~
7/7/17 Edit: As no free parking will be provided, parking cash-out is not applicable			
PKG-4	Parking Supply Options A - K	Provide less accessory parking than the neighborhood parking rate, more points given for greater reductions	☐ Option:

APPENDIX D: ROADWAY NETWORK CLASSIFICATIONS (FROM SF GENERAL PLAN)

Roadway Classifications

The San Francisco Planning Department has developed a street hierarchy system for the City and County of San Francisco, in which the function and design of each street are consistent with the character and use of adjacent land. The major classifications in the Vehicle Circulation Plan of the San Francisco *General Plan* are:

- **Freeways:** Limited access, very high capacity facilities; primary function is to carry intercity traffic; they may, as a result of route location, also serve the secondary function of providing for travel between distant sections in the city.
- **Major Arterials:** Cross-town thoroughfares whose primary function is to link districts within the city and to distribute traffic from and to the freeways; these are routes generally of citywide significance; of varying capacity depending on the travel demand for the specific direction and adjacent land uses.
- **Transit Conflict Streets:** Streets with a primary transit function which are not classified as major arterials but experience significant conflicts with automobile traffic.
- **Secondary Arterials:** Primarily intra-district routes of varying capacity serving as collectors for the major thoroughfares; in some cases supplemental to the major arterial system.
- **Recreational Streets:** A special category of street whose major function is to provide for slow pleasure drives and cyclist and pedestrian use; more highly valued for recreational use than for traffic movement. The order of priority for these streets should be to accommodate: 1) pedestrians, hiking trails or wilderness routes, as appropriate; 2) cyclists; 3) equestrians; 4) automobile scenic driving. This should be slow and consistent with the topography and nature of the area.
- **Collector Streets:** Relatively low-capacity streets serving local distribution functions primarily in large, low-density areas, connecting to major and secondary arterials.
- **Local Streets:** All other streets intended for access to abutting residential and other land uses, rather than for through traffic; generally of lowest capacity.

In addition to the San Francisco Planning Department's roadway classifications, the freeways, major arterials, and transit conflict streets are included in the Congestion Management Program (CMP) Network and Metropolitan Transportation System (MTS) Network (see below).

Transit Preferential Streets

The Transit Preferential Street network classification system takes into consideration all transportation functions, and identifies the major transit routes where general traffic should be routed away from. There are two classifications of transit preferential streets: Primary Transit Streets, which are either transit-oriented or transit-important; and Secondary Transit Streets.

- **Primary Transit Street – Transit-Oriented:** Not major arterials, with either high transit ridership, a high frequency of service, or surface rail. Along these streets, the emphasis should be on moving transit vehicles, and impacts on automobile traffic should be of secondary concern.

- **Primary Transit Street – Transit-Important:** Major arterials, with either high transit ridership, high frequency of service, or surface rail. Along these streets, the goal is to improve the balance between modes of transportation, and the emphasis should be on moving people and goods, rather than on moving vehicles.
- **Secondary Transit Street:** Medium transit ridership and low-to-medium frequency of service, or medium frequency of service and low-to-medium transit ridership, or connects two or more major destinations.

In general, it is City policy that transit preferential treatments should be concentrated on the most important transit streets, and the treatments applied should respond to all transportation needs of the street. For example, on streets that are major arterials for transit and not for automobile traffic, treatments should emphasize transit priority; on streets that are major arterials for both transit and automobiles, treatments should emphasize a balance between the modes. It is also City policy that automobile facility features (such as driveways and loading docks) should be reduced, relocated or prohibited on transit preferential streets in order to avoid traffic conflicts and automobile congestion.

Citywide Pedestrian Network

The Citywide Pedestrian Network is a classification of streets throughout the City used to identify streets devoted to or primarily oriented to pedestrian use. The main classifications are:

- **Citywide Pedestrian Network Street:** An inter-neighborhood connection with "citywide significance" includes both exclusive pedestrian and pedestrian-oriented vehicular streets. These streets include the Bay, Ridge, and Coast trails, are used by commuters, tourists, general public and recreaters, and connect major institutions with transit facilities.
- **Neighborhood Network Street:** A neighborhood commercial, residential or transit street that serves pedestrians from the general vicinity. Some streets may be part of the Citywide network, but are generally oriented towards neighborhood-serving uses. Types include exclusive pedestrian and pedestrian-oriented vehicular streets. As part of the Neighborhood Network Street network, streets are classified as **Neighborhood Commercial Streets**, which are streets that are predominately commercial use with parking and loading conflicts, or **Neighborhood Network Connection Streets**, which are intra-neighborhood connection streets that connect neighborhood destinations.

In general, it is City policy that sufficient pedestrian movement space should be provided to minimize pedestrian congestion, sidewalks should be widened where intensive commercial, recreational or institutional activity is present, and efforts should be made to ensure convenient and safe pedestrian crossings at intersections.

Congestion Management Program (CMP) Network

The CMP Network is the network of freeways, state highways, major arterials and transit conflict streets (see Roadway Classifications, above) established in accordance with state Congestion Management legislation. As part of the CMP, the San Francisco County Transportation Authority is required to determine the level of service (LOS) for the CMP Network streets every two years. The LOS is based on the average travel speed for each

- **Primary Transit Street – Transit-Important:** Major arterials, with either high transit ridership, high frequency of service, or surface rail. Along these streets, the goal is to improve the balance between modes of transportation, and the emphasis should be on moving people and goods, rather than on moving vehicles.
- **Secondary Transit Street:** Medium transit ridership and low-to-medium frequency of service, or medium frequency of service and low-to-medium transit ridership, or connects two or more major destinations.

In general, it is City policy that transit preferential treatments should be concentrated on the most important transit streets, and the treatments applied should respond to all transportation needs of the street. For example, on streets that are major arterials for transit and not for automobile traffic, treatments should emphasize transit priority; on streets that are major arterials for both transit and automobiles, treatments should emphasize a balance between the modes. It is also City policy that automobile facility features (such as driveways and loading docks) should be reduced, relocated or prohibited on transit preferential streets in order to avoid traffic conflicts and automobile congestion.

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The Citywide Pedestrian Network is a classification of streets throughout the City used to identify streets devoted to or primarily oriented to pedestrian use. The main classifications are:

- **Citywide Pedestrian Network Street:** An inter-neighborhood connection with "citywide significance" includes both exclusive pedestrian and pedestrian-oriented vehicular streets. These streets include the Bay, Ridge, and Coast trails, are used by commuters, tourists, general public and recreaters, and connect major institutions with transit facilities.
- **Neighborhood Network Street:** A neighborhood commercial, residential or transit street that serves pedestrians from the general vicinity. Some streets may be part of the Citywide network, but are generally oriented towards neighborhood-serving uses. Types include exclusive pedestrian and pedestrian-oriented vehicular streets. As part of the Neighborhood Network Street network, streets are classified as **Neighborhood Commercial Streets**, which are streets that are predominately commercial use with parking and loading conflicts, or **Neighborhood Network Connection Streets**, which are intra-neighborhood connection streets that connect neighborhood destinations.

In general, it is City policy that sufficient pedestrian movement space should be provided to minimize pedestrian congestion, sidewalks should be widened where intensive commercial, recreational or institutional activity is present, and efforts should be made to ensure convenient and safe pedestrian crossings at intersections.

Congestion Management Program (CMP) Network

The CMP Network is the network of freeways, state highways, major arterials and transit conflict streets (see Roadway Classifications, above) established in accordance with state Congestion Management legislation. As part of the CMP, the San Francisco County Transportation Authority is required to determine the level of service (LOS) for the CMP Network streets every two years. The LOS is based on the average travel speed for each roadway segment during both the AM and PM peak periods. The level of service standard is LOS E, except for roadway segments that operated at LOS F in 1991 (when the first study was performed). The CMP requires development of "Deficiency Plans" for any CMP-designated roadway that operate at LOS F. These plans include an analysis of the causes of the deficiency, a list of improvements that would have to be made to prevent the deficiency from occurring (including cost estimates), a list of improvements proposed as part of the plan, and an action plan for implementation of the improvements (including an implementation schedule).

Metropolitan Transportation System (MTS) Network

The MTS Network is defined by Metropolitan Transportation Commission (MTC) as part of its Regional Transportation Plan. The MTS is a regional network of roadways, transit corridors and transfer points, identified by the MTC on the basis of specific criteria. The criteria identified facilities that provide relief to congested corridors, improve connectivity, accommodate travel demand and serve a regional transportation function. The State highways and major thoroughfares designated in San Francisco's CMP roadway network are all included in the regional MTS network. There are a few instances in which the local CMP network is not identical to the MTS network due to differences in the criteria used to define each network.

APPENDIX E: TRANSIT LINE CAPACITY CALCULATIONS

AM Transit Trip Assignment

Muni Downtown Screenlines

Region	**SD-1**		**SD-2**		**SD-3**		**SD-4**	
Direction (from project)	**IN**	**OUT**	**IN**	**OUT**	**IN**	**OUT**	**IN**	**OUT**
Baseline	1	6	1	4	3	16	0	2
Project (Max Res)	12	14	8	10	50	43	3	4
Variant (Max Com)	40	12	28	8	137	38	11	3
Project TI (Max Res)	25	28	17	19	160	86	7	8
Project TI (Max Com)	68	23	47	16	291	71	19	6
Kearny/Stockton[2]	5%	0%	20%	0%	0%	0%	0%	0%
Other lines[3]	0%	0%	10%	0%	0%	0%	0%	0%
Northeast Screenline Total	**5%**	**0%**	**30%**	**0%**	**0%**	**0%**	**0%**	**0%**
Geary[4]	0%	0%	20%	0%	0%	0%	0%	0%
California[5]	0%	0%	15%	0%	0%	0%	0%	0%
Sutter/Clement[6]	0%	0%	15%	0%	0%	0%	0%	0%
Fulton/Hayes[7]	0%	0%	10%	0%	0%	0%	0%	0%
Balboa[8]	0%	0%	10%	0%	0%	0%	0%	0%
Northwest Screenline Total	**0%**	**0%**	**70%**	**0%**	**0%**	**0%**	**0%**	**0%**
Third Street[9]	0%	80%	0%	80%	0%	5%	0%	15%
Mission[10]	0%	0%	0%	0%	0%	0%	0%	0%
San Bruno/ Bayshore[11]	0%	10%	0%	10%	0%	0%	0%	0%
Other lines[12]	0%	10%	0%	10%	0%	5%	0%	15%
Southeast Screenline Total	**0%**	**100%**	**0%**	**100%**	**0%**	**10%**	**0%**	**30%**
Subway lines[13]	0%	0%	0%	0%	0%	0%	10%	0%
Haight/Noriega[14]	0%	0%	0%	0%	0%	0%	20%	0%
Other lines[15]	0%	0%	0%	0%	0%	0%	0%	0%
Southwest Screenline Total	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**30%**	**0%**
Bart	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Total All Screenlines	**5%**	**100%**	**100%**	**100%**	**0%**	**10%**	**30%**	**30%**
does not cross screenline	*95%*	*0%*	*0%*	*0%*	*100%*	*90%*	*70%*	*70%*
44 O'Shaughnessy Inbound (cumu)		13%		13%		26%		23%
44 O'Shaughnessy Outbound (cumu)	40%		40%		28%		28%	
48 Quintara Inbound (cumu)	40%		40%		28%		28%	
48 Quintara Outbound (cumu)		13%		13%		26%		23%

Trips cross in opposite direction of peak hour travel.

1. AM peak hour; inbound (i.e. towards Downtown) only
2. 8 Bayshore, 30 Stockton, 30X Marina Express, 41 Union, 45 Union-Stockton
3. F Market & Wharves, 10 Townsend, 12 Folsom-Pacific
4. 38 Geary, 38R Geary Rapid, 38AX Geary 'A' Express, 38BX Geary 'B' Express
5. 1 California, 1AX California 'A' Express, 1AX California 'B' Express
6. 2 Sutter, 3 Clement
7. 5 Fulton, 21 Hayes
8. 31 Balboa, 31AX Balboa 'A' Express, 31BX Balboa 'B' Express
9. **T Third Street**
10. 14 Mission, 14R Mission Rapid, 14X Mission Express, 49 Van Ness-Mission
11. 8AX Bayshore 'A' Express, 8BX Bayshore 'B' Express, 8 Bayshore, 9 San Bruno, 9L San Bruno Limited

Regional Screenline Trips

Region	**East Bay**		**North Bay**		**South Bay**	
Direction	IN	OUT	IN	OUT	IN	OUT
Baseline	1	4	0	1	2	6
Project (Max Res)	10	11	2	2	32	35
Variant (Max Com)	32	10	5	2	102	30
Project TI (Max Res)	20	22	3	4	76	70
Project TI (Max Com)	54	18	9	3	182	57
BART	100%	0%	0%	0%	0%	0%
AC Transit	0%	0%	0%	0%	0%	0%
Ferries	0%	0%	0%	0%	0%	0%
East Bay	**100%**	**0%**	**0%**	**0%**	**0%**	**0%**
Golden Gate Transit Buses	0%	0%	75%	0%	0%	0%
Ferries	0%	0%	25%	0%	0%	0%
North Bay	**0%**	**0%**	**100%**	**0%**	**0%**	**0%**
BART	0%	0%	0%	0%	30%	0%
Caltrain	0%	0%	0%	0%	70%	0%
SamTrans	0%	0%	0%	0%	0%	0%
South Bay	**0%**	**0%**	**0%**	**0%**	**100%**	**0%**
Regional Total	**100%**	**0%**	**100%**	**0%**	**100%**	**0%**

Trips cross in opposite direction of peak hour travel.

away from project (westbound)
towards project (eastbound)
towards project (eastbound)
away from project (westbound)

Take HPX to SD1/SD2
67%

Take T-Third to SD1/SD2
33%

12. J Church, 10 Townsend, 12 Folsom-Pacific, **19 Polk,** 27 Bryant
13. K Ingleside, L Taraval, M Ocean View, N Judah
14. 6 Haight-Parnassus, 7/7R Haight-Noriega/Limited, 7X Noriega Express, NX Judah Express
15. F Market & Wharves

PM Transit Trip Assignment

Muni Downtown Screenlines

Region	**SD-1**		**SD-2**		**SD-3**		**SD-4**	
Direction (from project)	**IN**	**OUT**	**IN**	**OUT**	**IN**	**OUT**	**IN**	**OUT**
Baseline	6	3	4	2	16	8	2	1
Project (Max Res)	23	11	16	8	73	39	7	3
Variant (Max Com)	14	46	10	31	45	146	4	13
Project TI (Max Res)	46	31	31	21	142	123	13	9
Project TI (Max Com)	34	80	23	55	106	278	10	23
Kearny/Stockton[2]	0%	5%	0%	20%	0%	0%	0%	0%
Other lines[3]	0%	0%	0%	10%	0%	0%	0%	0%
Northeast Screenline Total	**0%**	**5%**	**0%**	**30%**	**0%**	**0%**	**0%**	**0%**
Geary[4]	0%	0%	0%	20%	0%	0%	0%	0%
California[5]	0%	0%	0%	15%	0%	0%	0%	0%
Sutter/Clement[6]	0%	0%	0%	15%	0%	0%	0%	0%
Fulton/Hayes[7]	0%	0%	0%	10%	0%	0%	0%	0%
Balboa[8]	0%	0%	0%	10%	0%	0%	0%	0%
Northwest Screenline Total	**0%**	**0%**	**0%**	**70%**	**0%**	**0%**	**0%**	**0%**
Third Street[9]	80%	0%	80%	0%	5%	0%	15%	0%
Mission[10]	0%	0%	0%	0%	0%	0%	0%	0%
San Bruno/ Bayshore[11]	10%	0%	10%	0%	0%	0%	0%	0%
Other lines[12]	10%	0%	10%	0%	5%	0%	15%	0%
Southeast Screenline Total	**100%**	**0%**	**100%**	**0%**	**10%**	**0%**	**30%**	**0%**
Subway lines[13]	0%	0%	0%	0%	0%	0%	0%	10%
Haight/Noriega[14]	0%	0%	0%	0%	0%	0%	0%	20%
Other lines[15]	0%	0%	0%	0%	0%	0%	0%	0%
Southwest Screenline Total	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**30%**
BART	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Total All Screenlines	**100%**	**5%**	**100%**	**100%**	**10%**	**0%**	**30%**	**30%**
does not cross screenline	*0%*	*95%*	*0%*	*0%*	*90%*	*100%*	*70%*	*70%*
44 O'Shaughnessy Inbound (cumu)		40%		40%		28%		28%
44 O'Shaughnessy Outbound (cumu)	13%		13%		26%		23%	
48 Quintara Inbound (cumu)	13%		13%		26%		23%	
48 Quintara Outbound (cumu)		40%		40%		28%		28%

Trips cross in opposite direction of peak hour travel.

1. PM peak hour; outbound (i.e. away from Downtown) only
2. 8 Bayshore, 30 Stockton, 30X Marina Express, 41 Union, 45 Union-Stockton
3. F Market & Wharves, 10 Townsend, 12 Folsom-Pacific
4. 38 Geary, 38R Geary Rapid, 38AX Geary 'A' Express, 38BX Geary 'B' Express
5. 1 California, 1AX California 'A' Express, 1AX California 'B' Express
6. 2 Sutter, 3 Clement
7. 5 Fulton, 21 Hayes
8. 31 Balboa, 31AX Balboa 'A' Express, 31BX Balboa 'B' Express
9. T Third Street
10. 14 Mission, 14R Mission Rapid, 14X Mission Express, 49 Van Ness-Mission
11. 8AX Bayshore 'A' Express, 8BX Bayshore 'B' Express, 8 Bayshore, 9 San Bruno, 9L San Bruno Limited

Regional Screenline Trips

Region	**East Bay**		**North Bay**		**South Bay**	
Direction	**IN**	**OUT**	**IN**	**OUT**	**IN**	**OUT**
Baseline	4	2	1	0	12	6
Project (Max Res)	19	9	3	1	59	29
Variant (Max Com)	12	37	2	6	36	115
Project TI (Max Res)	37	24	6	4	115	81
Project TI (Max Com)	27	64	4	10	85	206
BART	0%	100%	0%	0%	0%	0%
AC Transit	0%	0%	0%	0%	0%	0%
Ferries	0%	0%	0%	0%	0%	0%
East Bay	**0%**	**100%**	**0%**	**0%**	**0%**	**0%**
Golden Gate Transit Buses	0%	0%	0%	75%	0%	0%
Ferries	0%	0%	0%	25%	0%	0%
North Bay	**0%**	**0%**	**0%**	**100%**	**0%**	**0%**
BART	0%	0%	0%	0%	0%	30%
Caltrain	0%	0%	0%	0%	0%	70%
SamTrans	0%	0%	0%	0%	0%	0%
South Bay	**0%**	**0%**	**0%**	**0%**	**0%**	**100%**
Regional Total	**0%**	**100%**	**0%**	**100%**	**0%**	**100%**

does not cross screenline

Trips cross in opposite direction of peak hour travel.

away from project (westbound)
towards project (eastbound)
towards project (eastbound)
away from project (westbound)

Take HPX to SD1/SD2
67%

Take T-Third to SD1/SD2
33%

12. J Church, 10 Townsend, 12 Folsom-Pacific, 19 Polk, 27 Bryant
13. K Ingleside, L Taraval, M Ocean View, N Judah
14. 6 Haight-Parnassus, 7/7R Haight-Noriega/Limited, 7X Noriega Express, NX Judah Express
15. F Market & Wharves

Transit Trip Summary

	AM					PM				
	Baseline	Project	Variant	Project TI	Variant TI	Baseline	Project	Variant	Project TI	Variant TI
Region										
Kearny/Stockton[2]	0	3	8	4	12	0	3	8	6	15
Other lines[3]	0	1	3	2	5	0	1	3	2	6
Northeast Screenline Total	**0**	**4**	**11**	**6**	**17**	**0**	**4**	**11**	**8**	**21**
Geary[4]	0	2	6	3	9	0	2	6	4	11
California[5]	0	1	4	3	7	0	1	5	3	8
Sutter/Clement[6]	0	1	4	3	7	0	1	5	3	8
Fulton/Hayes[7]	0	1	3	2	5	0	1	3	2	6
Balboa[8]	0	1	3	2	5	0	1	3	2	6
Northwest Screenline Total	**0**	**6**	**20**	**13**	**33**	**0**	**6**	**22**	**14**	**39**
Third Street[9]	9	22	20	17	15	6	37	23	29	21
Mission[10]	0	0	0	0	0	0	0	0	0	0
San Bruno/ Bayshore[11]	1	2	2	5	4	0	4	2	8	5
Other lines[12]	2	5	5	10	9	1	9	5	17	11
Southeast Screenline Total	**12**	**29**	**27**	**32**	**28**	**7**	**50**	**30**	**54**	**37**
Subway lines[13]	0	0	1	1	2	0	0	1	1	2
Haight/Noriega[14]	0	1	2	1	4	0	1	3	2	5
Other lines[15]	0	0	0	0	0	0	0	0	0	0
Southwest Screenline Total	**0**	**1**	**3**	**2**	**6**	**0**	**1**	**4**	**3**	**7**
Bart	0	0	0	0	0	0	0	0	0	0
Total All Screenlines	**12**	**39**	**61**	**53**	**83**	**7**	**58**	**67**	**79**	**107**
44 O'Shaughnessy Inbound				26	21				38	88
44 O'Shaughnessy Outbound				48	90				43	32
48 Quintara Inbound				48	90				43	32
48 Quintara Outbound				26	21				38	88
HPX				25	20				41	30

Region										
BART	1	10	32	20	54	2	9	37	24	64
AC Transit	0	0	0	0	0	0	0	0	0	0
Ferries	0	0	0	0	0	0	0	0	0	0
East Bay	**1**	**10**	**32**	**20**	**54**	**2**	**9**	**37**	**24**	**64**
Golden Gate Transit Buses	0	1	4	2	7	0	1	4	3	8
Ferries	0	0	1	1	2	0	0	1	1	3
North Bay	**0**	**1**	**5**	**3**	**9**	**0**	**1**	**5**	**4**	**11**
BART	1	10	31	23	55	2	9	35	24	62
Caltrain	2	23	72	53	127	4	21	81	56	144
SamTrans	0	0	0	0	0	0	0	0	0	0
South Bay	**3**	**33**	**103**	**76**	**182**	**6**	**30**	**116**	**80**	**206**
Regional Total	**4**	**44**	**140**	**99**	**245**	**8**	**40**	**158**	**108**	**281**

Total Transit Trips	16	83	201	152	328	15	98	225	187	388

FIGURE A-1
SFMTA SCREENLINES

Muni Screenline

SFMTA | Municipal Transportation Agency

FALL 2013 **Route Load and Capacity by Time Period and Direction of Travel**

	PM - Outbound (Muni Operations Direction)							PM - Inbound (Muni Operations Direction)							
Line	100% capacity per vehicle	Headway (Mins)	Average Max Load	Peak Hour Load	MLP (Maximum Load Point)*	Peak Hour Capacity	Peak Hour Capacity Utilization	100% capacity per vehicle	Headway (Mins)	Average Max Load	Peak Hour Load	MLP (Maximum Load Point)*	Peak Hour Capacity	Peak Hour Capacity Utilization	Route
1	63	3.5	50	857	Sacramento/Powell	1,080	79%	63	6.0	29	290	California/Laurel	630	46%	1
1AX*	63	11.5	42	219	Pine St/Montgomery St.	329	66%								1AX*
1BX*	63	11.0	45	245	Pine St/Montgomery St.	344	71%								1BX*
2	63	12.0	48	240	Sutter/Powell	315	76%	63	12.0	28	140	Post/Hyde	315	44%	2
3	63	12.0	37	185	Sutter/Taylor	315	58%	63	12.0	27	135	Post/Hyde	315	42%	3
5	63	8.0	66	495	McAllister/Lyon	473	104%	63	8.0	31	233	McAllister/Gough	473	49%	5
5L	63	8.0	55	413	McAllister/Van Ness	473	87%	63	8.0	30	225	McAllister/Pierce	473	47%	5L
6	63	10.0	36	216	Market St/Van Ness Ave	378	57%	63	10.5	23	131	Steuart/Mission	360	36%	6
8X								94	7.5	60	480	Geneva/Paris	752	63%	8X
8AX	94	7.5	71	568	Harrison/6th St	752	75%								8AX
8BX	94	7.5	66	528	Stockton St/Sacramento St.	752	70%								8BX
9	63	12.0	43	215	Potrero/16th St	315	68%	63	12.0	36	180	11th St/Howard	315	57%	9
9L	63	12.0	45	225	Potrero/24th St	315	71%	63	12.0	35	175	11th St/Harrison	315	55%	9L
10	63	20.0	51	153	2nd/Townsend	189	80%	63	20.0	56	168	Pacific /Stockton	189	88%	10
12	63	20.0	36	108	Harrison/7th St	189	57%	63	20.0	46	138	Pacific/Stockton	189	73%	12
14	94	8.0	38	285	Mission/Precita	705	40%	63	8.0	31	233	Steuart/Mission	473	49%	14
14L	94	9.0	70	467	Mission/24th St.	627	74%	94	9.0	42	280	Mission/30th St	627	44%	14L
14X	94	10.0	53	318	6th/Harrison	564	56%								14X
16X	63	9.0	35	233	Fell/Gough	420	55%								16X
17	63	30.0	27	54	Crespi/Varela	126	42%	63	30.0	16	32	W. Portal/Sloat	126	25%	17
18	63	20.0	28	84	Balboa/37th Ave	189	44%	63	20.0	28	84	Lake Merced/Higuera	189	44%	18
19	63	15.0	42	168	8th/Mission	252	66%	63	15.0	45	180	7th St/Howard	252	71%	19
21	63	10.0	46	276	Hayes/Van Ness	378	73%	63	11.0	23	125	Market/9th St.	344	36%	21
22	63	8.0	37	278	Fillmore/Grove	473	58%	63	8.0	39	293	16th/Folsom	473	61%	22
23	63	20.0	30	90	Diamond/Bosworth	189	47%	63	20.0	33	99	Diamond/Bosworth	189	52%	23
24	63	10.0	40	240	Castro/19th St	378	63%	63	10.0	30	180	Castro/17th St	378	47%	24
27	63	15.0	29	116	Harrison/8th St	252	46%	63	15.0	38	152	5th/Market	252	60%	27
28	63	10.0	44	264	19th Ave/Judah	378	69%	63	10.0	48	288	19th Ave/Santiago	378	76%	28
28L															28L
29	63	10.5	45	257	Holloway/J. Serra	360	71%	63	12.0	47	235	Plymouth/Ocean	315	74%	29
30	83	4.0	41	615	Stockton St/Sutter St	1,248	49%	82	4.0	41	615	Stockton/Washington	1,224	50%	30
30X	63	7.0	54	463	Sansome/Washington St	540	85%								30X
31	63	14.0	45	193	Turk/Taylor	270	71%	63	15.0	27	108	Eddy St/Laguna	252	42%	31
31AX	63	10.5	47	269	Pine St/Montgomery St.	360	74%								31AX
31BX	63	11.0	30	164	Pine St/Montgomery St.	344	47%								31BX
33	63	15.0	27	108	18th St/Dolores	252	42%	63	15.0	34	136	18th St/Church	252	53%	33
35	45	20.0	24	72	Castro/19th St	135	53%	45	20.0	7	21	Eureka/21st St	135	15%	35
36	45	30.0	15	30	Fowler/Portola Dr	90	33%	45	30.0	30	60	Laguna Honda/Clarendon	90	66%	36
37	45	20.0	36	108	17th St/Diamond St	135	80%	45	20.0	21	63	14th/Sanchez	135	46%	37
38	94	6.0	64	640	Geary Blvd/Taylor St	940	68%	94	7.0	57	489	Geary Blvd/Laguna St	806	60%	38
38L	94	5.5	85	927	Geary Blvd/Leavenworth	1,025	90%	94	6.0	62	620	Geary Blvd/Laguna St	940	65%	38L
38AX	63	11.5	36	188	Pine St/Montgomery St.	329	57%								38AX
38BX	63	11.5	40	209	Pine St/Montgomery St.	329	63%								38BX
39	45	20.0	10	30	Powell/Filbert	135	22%	45	20.0	5	15	225 Telegraph Hill Blvd	135	11%	39
41	63	8.0	57	428	Union/Columbus	473	90%	63	8.0	16	120	Clay St/Montgomery St	473	25%	41
43	63	12.0	43	215	Masonic Ave/Golden Gave Ave	315	68%	63	12.0	28	140	Masonic/Fulton	315	44%	43
44	63	10.0	54	324	Silver Ave/Mission St	378	85%	63	10.0	36	216	Silver Ave/San Bruno	378	57%	44
45	63	12.0	52	260	Stockton/Sutter	315	82%	63	12.5	39	187	Stockton/Sacramento	302	61%	45
47	63	10.0	37	222	Van Ness/O'Farrell	378	58%	63	10.0	42	252	Van Ness/McAllister	378	66%	47
48	63	12.0	41	205	24th St/Folsom St	315	65%	63	12.0	36	180	24th St/Mission	315	57%	48
49	94	8.0	45	338	Van Ness Ave/McAllister	705	47%	94	8.0	46	345	Van Ness Ave/McAllister	705	48%	49
52	63	20.0	27	81	Excelsior/Paris	189	42%	63	20.0	20	60	Diamond/Sussex	189	31%	52
54	63	20.0	41	123	Howth/Geneva	189	65%	63	20.0	39	117	Geneva/Paris	189	61%	54
56	45	30.0	7	14	Leland/Bayshore	90	15%	45	30.0	13	26	Wilde Ave/Girard St	90	28%	56
66	45	20.0	14	42	9th Ave/Lawton St	135	31%	45	20.0	5	15	16th Ave/Lawton	135	11%	66
67	63	20.0	29	87	Folsom/Bessie St	189	46%	63	20.0	10	30	24th/Folsom St	189	15%	67
71								63	10.0	37	222	Haight/Buena Vista	378	58%	71/71L
71 L	63	10.0	47	282	Haight/Octavia	378	74%								71L
80X															80X
81X															81X
82X	63	15.0	23	92	Beale/Howard	252	36%								82X
83X	63	22.0	12	33	8th /Market	172	19%	63	22.0	13	35	9th/Market	172	20%	83X
88	63	20.0	26	78	Geneva/Delano	189	41%								88
108	63	15.0	30	120	Beale/Folsom	252	47%	63	15.0	26	104	Calif. St./Ave C	252	41%	108
NX	63	10.0	41	246	Sutter St/Sansome St	378	65%								
NOTE: RAIL DATA COLLECTED MANUALLY															
F	70	6.0	82	820	Steuart Loop (9/13)	700	117%	70	6.0	75	750	Steuart Loop (9/13)	700	107%	F
J	119	9.0	100	667	Duboce and Church (9/13)	793	84%	119	9.0	45	300	Duboce and Church (9/13)	793	37%	J
K/T	119	9.0	150	1,000	Van Ness Station (9/13)	793	126%	119	9.0	56	373	Van Ness Station (3/14)	793	47%	K
L	238	9.0	260	1,733	Van Ness Station (9/13)	1,587	109%	238	9.0	80	533	Van Ness Station (10/13)	1,587	33%	L
M	238	9.0	250	1,667	Van Ness Station (9/13)	1,587	105%	238	9.0	161	1,073	W.P. Station (9/13)	1,587	67%	M
N	238	6.5	277	2,557	Van Ness Station (9/13)	2,197	116%	238	6.5	142	1,311	Duboce and Church (9/13)	2,197	59%	N
T (K/T)	119	9.0	111	740	SB Embar & Harr (9/13) [3]	793	93%	119	9.0	118	787	NB Embar & Harr (9/13) [3]	793	99%	T (K/T)

Notes:
1) Updated data provided by MTA, including updates to headways, vehicle capacity, average max load, and MLP. Rest of data calculated from those values
2) MLP, maximum load point represents the stop along the route with the highest total load & may not be the same as the point with the most boardings.
3) Low Number of Samples

PM - Outbound Travel Analysis Cordon

	Line	100% capacity per vehicle	Headway (Mins)	Average Max Load	Peak Hour Load	MLP	Peak Hour Capacity	Peak Hour Capacity Utilization
TOTAL					22,516		27,328	82%
NORTHEAST					*3,301*		*4,405*	*75%*
Kearny/Stockton					2,245		3,327	67%
8X Bayshore Express (IB)	8X	94	7.5	60	480	Geneva/Paris	752	63%
30 Stockton	30	83	4.0	41	615	Stockton St/Sutter St	1,248	49%
30X Marina Express	30X	63	7.0	54	463	Sansome/Washington St	540	85%
41 Union	41	63	8.0	57	428	Union/Columbus	473	90%
45 Union-Stockton	45	63	12.0	52	260	Stockton/Sutter	315	82%
Other Lines					1,056		1,078	98%
F Market & Wharves (IB)	70	70	6.0	75	750	Steuart Loop (9/13)	700	107%
10 Townsend (IB)	10	63	20.0	56	168	Pacific /Stockton	189	88%
12 Folsom-Pacific (IB)	12	63	20.0	46	138	Pacific/Stockton	189	73%
NORTHWEST					*5,519*		*7,302*	*76%*
Geary					1,964		2,623	75%
38 Geary	38	94	6.0	64	640	Geary Blvd/Taylor St	940	68%
38L Geary Limited	38L	94	5.5	85	927	Geary Blvd/Leavenworth	1,025	90%
38AX Geary 'A' Express (OB)	38AX	63	11.5	36	188	Pine St/Montgomery St.	329	57%
38BX Geary 'B' Express (OB)	38BX	63	11.5	40	209	Pine St/Montgomery St.	329	63%
California					1,322		1,752	75%
1 California	1	63	3.5	50	857	Sacramento/Powell	1,080	79%
1AX California 'A' Express	1AX*	63	11.5	42	219	Pine St/Montgomery St.	329	66%
1AX California 'B' Express	1BX*	63	11.0	45	245	Pine St/Montgomery St.	344	71%
Sutter/Clement					425		630	67%
2 Clement	2	63	12.0	48	240	Sutter/Powell	315	76%
3 Jackson	3	63	12.0	37	185	Sutter/Taylor	315	58%
Fulton/Hayes					1,184		1,323	89%
5 Fulton	5	63	8.0	66	495	McAllister/Lyon	473	104%
5 Fulton Limited	5L	63	8.0	55	413	McAllister/Van Ness	473	87%
21 Hayes	21	63	10.0	46	276	Hayes/Van Ness	378	73%
Balboa					625		974	64%
31 Balboa	31	63	14.0	45	193	Turk/Taylor	270	71%
31AX Balboa 'A' Express	31AX	63	10.5	47	269	Pine St/Montgomery St.	360	74%
31BX Balboa 'B' Express	31BX	63	11.0	30	164	Pine St/Montgomery St.	344	47%
SOUTHEAST					*4,942*		*7,203*	*69%*
Third Street					787		793	99%
T Third Street (IB K/T)	T (K/T)	119	9.0	111	787	NB Embar & Harr (9/13) 3	793	99%
Mission					1,407		2,601	54%
14 Mission	14	94	8.0	38	285	Mission/Precita	705	40%
14L Mission Limited	14L	94	9.0	70	467	Mission/24th St.	627	74%
14X Mission Express	14X	94	10.0	53	318	6th/Harrison	564	56%
49 Van Ness-Mission	49	94	8.0	45	338	Van Ness Ave/McAllister	705	47%
San Bruno/Bayshore					1,536		2,134	72%
8X Bayshore Express (OB)	8X							
8AX Bayshore 'A' Express (OB)	8AX	94	7.5	71	568	Harrison/6th St	752	75%
8BX Bayshore 'B' Express (OB)	8BX	94	7.5	66	528	Stockton St/Sacramento St.	752	70%
9 San Bruno	9	63	12.0	43	215	Potrero/16th St	315	68%
9L San Bruno Limited	9L	63	12.0	45	225	Potrero/24th St	315	71%
Other Lines					1,212		1,675	72%
J Church	J	119	9.0	100	667	Duboce and Church (9/13)	793	84%
10 Townsend (OB)	10	63	20.0	51	153	2nd/Townsend	189	80%
12 Folsom-Pacific (OB)	12	63	20.0	36	108	Harrison/7th St	189	57%
19 Polk	19	63	15.0	42	168	8th/Mission	252	66%
27 Bryant	27	63	15.0	29	116	Harrison/8th St	252	46%
SOUTHWEST					*8,754*		*8,418*	*104%*
Subway Lines					6,957		6,164	113%
K Ingleside	K/T	119	9.0	150	1,000	Van Ness Station (9/13)	793	126%
L Taraval	L	238	9.0	260	1,733	Van Ness Station (9/13)	1,587	109%
M Ocean View	M	238	9.0	250	1,667	Van Ness Station (9/13)	1,587	105%
N Judah	N	238	6.5	277	2,557	Van Ness Station (9/13)	2,197	116%
Haight/Noriega					977		1,554	63%
6 Parnassus	6	63	10.0	36	216	Market St/Van Ness Ave	378	57%
71/71L Haight-Noriega	71 L	63	10.0	47	282	Haight/Octavia	378	74%
16X Noriega Express	16X	63	9.0	35	233	Fell/Gough	420	55%
NX Judah Express	NX	63	10.0	41	246	Sutter St/Sansome St	378	65%
Other Lines					820		700	117%
F Market & Wharves (OB)	F	70	6.0	82	820	Steuart Loop (9/13)	700	117%

FIGURE B-1
REGIONAL SCREENLINES

Regional Screenline

Baseline Transit Trip Assignment to the 19 Polk and 44 O'Shaughnessy

These tables show the downtown screenline trip assignment assumptions used in other parts of the study. The subsequent 19 Polk and 44 O'Shaughnessy route-specific trip assignments have been developed to be derivative of and consistent with these

AM Transit Trip Assignment
Muni Downtown Screenlines

Origin/Destn Superdistrict	SD-1		SD-2		SD-3		SD-4		*Total*	
Direction (relative to Project)	In	Out	In	Out	In	Out	In	Out	*In*	*Out*
Background Growth	1	6	1	4	3	16	0	2	*6*	*27*
Proposed Project	12	14	8	10	50	43	3	4	*74*	*71*
Project Variant	40	12	28	8	137	38	11	3	*216*	*61*
Background Growth	22%	22%	14%	14%	59%	59%	6%	6%	*100%*	*100%*
Proposed Project	16%	20%	11%	14%	68%	61%	5%	6%	*100%*	*100%*
Project Variant	19%	20%	13%	14%	63%	61%	5%	6%	*100%*	*100%*
Southeast Screenline:										
Third Street[1]	0%	80%	0%	80%	0%	5%	0%	15%		
Mission[2]	0%	0%	0%	0%	0%	0%	0%	0%		
San Bruno/ Bayshore[3]	0%	10%	0%	10%	0%	0%	0%	0%		
Other lines[4]	0%	10%	0%	10%	0%	5%	0%	15%		
Total	*0%*	*100%*	*0%*	*100%*	*0%*	*10%*	*0%*	*30%*		

Notes:
1. T Third Street
2. 14 Mission, 14R Mission Rapid, 14X Mission Express, 49 Van Ness-Missior
3. 8AX Bayshore 'A' Express, 8BX Bayshore 'B' Express, 8 Bayshore, 9 San Bruno, 9L San Bruno Limitec
4. J Church, 10 Townsend, 12 Folsom-Pacific, **19 Polk,** 27 Bryant

Pink shading indicates that trips cross in opposite direction of peak hour travel. As screenlines are only calculated for peak direction, these entries are zeroed out.

Source: India Basin Transit Capacity Impacts

PM Transit Trip Assignment
Muni Downtown Screenlines

Origin/Destn Superdistrict	SD-1		SD-2		SD-3		SD-4		*Total*	
Direction (relative to Project)	In	Out	In	Out	In	Out	In	Out	*In*	*Out*
Background Growth	6	3	4	2	16	8	2	1	*27*	*13*
Proposed Project	23	11	16	8	73	39	7	3	*119*	*62*
Project Variant	14	46	10	31	45	146	4	13	*73*	*236*
Background Growth	22%	22%	14%	14%	59%	59%	6%	6%	*100%*	*100%*
Proposed Project	20%	19%	14%	13%	61%	63%	6%	5%	*100%*	*100%*
Project Variant	20%	19%	14%	13%	61%	62%	6%	5%	*100%*	*100%*
Southeast Screenline:										
Third Street[1]	80%	0%	80%	0%	5%	0%	15%	0%		
Mission[2]	0%	0%	0%	0%	0%	0%	0%	0%		
San Bruno/ Bayshore[3]	10%	0%	10%	0%	0%	0%	0%	0%		
Other lines[4]	10%	0%	10%	0%	5%	0%	15%	0%		
Total	*100%*	*0%*	*100%*	*0%*	*10%*	*0%*	*30%*	*0%*		

Proportion of transit trips distributed to each Superdistrict which pass through Maximum Load Points

Route	Transit trips distributed to this Superdistrict which pass through LMLP[1,2]				Transit trips distributed to this Superdistrict which pass through GMLP[3]			
	SD-1	SD-2	SD-3	SD-4	SD-1	SD-2	SD-3	SD-4
19 Polk	90%	90%	40%	30%	10%	10%	0%	15%
44 O'Shaughnessy					0%	0%	60%	70%

Notes:

Since AM and PM peak trip distribution in and out of the project site are similar to one another (i.e. within 10%), a single set of transit route proportions was used for both the AM and PM. In addition, the inbound and outbound directions were assumed to have the same proportion.

1. Local Maximum Load Point (LMLP) is the maximum load point between the Project site and the T Third, intended to capture capacity impacts resulting from project trips that transfer between the 19 Polk and the T Third (many are expected to do this, but these trips would not pass through the GMLP, therefore require separate study). The LMLP is assessed for the 19 Polk only and it is assumed at the stop at Evans Avenue/Newhall Street to the east of Evans Avenue/Third Street.
2. Includes transfers to/from other routes, such as the T Third
3. Global Maximum Load Point method is used for all routes, consistent with typical Muni bus capacity analysis

AM Peak GMLP:
Route 19: 8th/Howard (outbound); Larkin/O'Farrell (inbound)
Route 44: Silver Ave/Dartmouth Ave (outbound); O'Shaughnessy/Del Vale (inbound)

PM Peak GMLP:
Route 19: 8th/Mission (outbound); 7th/Howard (inbound)
Route 44: Silver Ave/Mission Street (outbound); Silver Ave/San Bruno (inbound)

The previously-prepared assumptions were made with respect to transit ridership proportions by screenline, which only included routes which crossed the typical downtown screenlines used by the SFMTA. This only accounts for some of the transit trips which are made, but not all. Some transit trips may end before the route crosses the screenline and one of the routes analyzed (44 O'Shaughnessy) does not cross any of the screenlines. Therefore, the salmon-shaded cells have had further adjustments made to account for these trips.

Proportion of Transit Trip Assignment By Trip Generator and Route which Passes Through Each Maximum Load Point

Route	**Outbound (SFMTA designation)[1]**					
	Background		Proposed Project		Project Variant	
	LMLP	GMLP	LMLP	GMLP	LMLP	GMLP
19 Polk	57%	4%	53%	3%	55%	4%
44 O'Shaughnessy	-	39%	-	44%	-	42%

Route	**Inbound (SFMTA designation)[1]**					
	Background		Proposed Project		Project Variant	
	LMLP	GMLP	LMLP	GMLP	LMLP	GMLP
19 Polk	57%	4%	56%	4%	56%	4%
44 O'Shaughnessy	-	39%	-	41%	-	41%

Notes:
1. For 19 Polk: Inbound to Fisherman's Wharf, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.
For 44 O'Shaughnessy: Inbound to The Richmond, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.

Route-Specific Baseline Transit Capacity Impact Analysis (Full Buildout)

Capacity Thresholds

Route	Direction (SFMTA designation)	Capacity per Bus[1]		Significance Threshold (85% Capacity Utilization)	
		AM	PM	AM	PM
19	Outbound[2] / Inbound[2]	63	63	54	54
44	Outbound[3] / Inbound[3]	63	63	54	54

Notes:
1. Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015).
2. Inbound to Fisherman's Wharf, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.
3. Inbound to The Richmond, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.

Trips Added per Bus by Route and Scenario

Trip Generator	Peak Hour	Transit Trips Generated[3]		19 Polk (Local Maximum Load Point)[1]: Transit trip assignment on 19 Polk at LMLP[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus		19 Polk (Global Maximum Load Point)[2]: Transit trip assignment on 19 Polk at GMLP[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus		44 O'Shaughnessy (Global Maximum Load Point): Transit trip assignment on 44 O'Shaughnessy[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus	
		Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]
Proposed Project	AM	118	119	53%	56%	15	4	16	17	3%	4%	15	4	1	1	44%	41%	8	7.5	7	7
	PM	200	102					27	14					2	1			9	6.7	13	6
Project Variant	AM	355	103	55%	56%			49	14	4%	4%			4	1	42%	41%	8	7.5	20	6
	PM	123	394					17	55					1	4			9	6.7	8	24
Background Growth[7]	AM	9	44	57%	57%			1	6	4%	4%			0	0	39%	39%	8	7.5	0	2
	PM	44	21					6	3					0	0			9	6.7	3	1

Notes:
1. Local Maximum Load Point (LMLP) is the maximum load point between the Project site and the T Third, intended to capture capacity impacts resulting from project trips that transfer between the 19 Polk and the T Third (many are expected to do this, but these trips would not pass through the GMLP, therefore require separate study). The LMLP is assessed for the 19 Polk only and it is assumed at the stop at Evans Avenue/Newhall Street to the east of Evans Avenue/Third Street.
2. Global Maximum Load Point (GMLP) refers to the maximum load point across the entire route.
   Proportion of transit trips distributed to each Superdistrict which pass through Maximum Load Points
      Route 19: 8th/Howard (outbound) Larkin/O'Farrell (inbound)
      Route 44: Silver Ave/Dartmouth Ave (outbound) O'Shaughnessy/Del Vale (inbound)
   PM Peak GMLP location:
      Route 19: 8th/Mission (outbound); 7th/Howard (inbound)
      Route 44: Silver Ave/Mission Street (outbound); Silver Ave/San Bruno (inbound)
3. Total added transit trips for the Proposed Project and Project Variant is based on methodology described in TIS Chapter 4 and presented in Section 4.3.4. Total added trips for the Background Growth is based on methodology described and presented in TIS Section 3.1.
4. Proportion of trips using each route is based on a combination of trip distribution to each superdistrict and proportion of transit trips taking each route to each superdistrict (see accompanying "Transit Trip Assignment to the 19 Polk and 44 O'Shaughnessy" worksheet for detailed calculations)
5. Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015).
6. SFMTA designated direction, which is the opposite of Project-related perspective.
7. Approved & Funded Scenario: 494 residential units approved as Phase 1 of the nearby Hunters Point Shipyard development that are currently under construction.

Capacity Impact Analysis (per Hour)

Route	Peak Hour	Existing Load[1]	Background Growth	Baseline No Project Load	Added Trips: Proposed Project	Added Trips: Project Variant	Passenger Load: B + PP	Passenger Load: B + PV	Threshold	Significant Impact?: Project	Significant Impact?: Variant
Outbound (SFMTA Designation) / Inbound (Project Designation)											
19 (LMLP)	AM	24	5	29	63	195	92	224	216	NO	YES
	PM	44	25	69	106	68	175	137		NO	NO
19 (GMLP)	AM	160	0	160	4	14	164	175	216	NO	NO
	PM	168	2	170	6	5	176	175		NO	NO
44 (GMLP)	AM	300	4	304	52	149	355	453	405	NO	YES
	PM	360	17	377	88	52	465	429	360	YES	YES
Inbound (SFMTA Designation) / Outbound (Project Designation)											
19 (LMLP)	AM	84	25	109	67	58	176	167	216	NO	NO
	PM	52	12	64	57	221	121	285		NO	YES
19 (GMLP)	AM	188	2	190	5	4	195	194	216	NO	NO
	PM	180	1	181	4	16	185	197		NO	NO
44 (GMLP)	AM	368	17	385	49	42	433	427	405	YES	YES
	PM	240	8	248	42	162	290	410	360	NO	YES

Notes:
1. GMLP Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015). LMLP Source: TEP route analysis (October 2011).

Route-Specific Baseline Transit Capacity Impact Analysis (**Phase 1 Only**)

Capacity Thresholds

Route	Direction (SFMTA designation)	Capacity per Bus[1]		Significance Threshold (85% Capacity Utilization)	
		AM	PM	AM	PM
19	Outbound[2]	63	63	54	54
	Inbound[2]				
44	Outbound[3]	63	63	54	54
	Inbound[3]				

Notes:

1. Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015).
2. Inbound to Fisherman's Wharf, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.
3. Inbound to The Richmond, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.

Scenario	Phase	Residential (ksf)	Commercial (ksf)	School (ksf)	% of Total
Project	1	531.75	233	50	64%
	2	398.25	43	0	35%
	RPD	0	15	0	1%
	Total	*930*	*291*	*50*	
Variant	1	7.5	869	50	64%
	2	367.5	132	0	35%
	RPD	0	15	0	1%
	Total	*375*	*1016*	*50*	

0.75 ksf per DU

Trips Added per Bus by Route and Scenario

Trip Generator	Peak Hour	Transit Trips Generated[3]		19 Polk (Local Maximum Load Point)[1]: Transit trip assignment on 19 Polk at LMLP[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus		19 Polk (Global Maximum Load Point)[2]: Transit trip assignment on 19 Polk at GMLP[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus		44 O'Shaughnessy (Global Maximum Load Point): Transit trip assignment on 44 O'Shaughnessy[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus	
		Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]
Proposed Project	AM	76	76	53%	56%	15	4	10	11	3%	4%	15	4	1	1	44%	41%	8	7.5	4	4
	PM	128	65					17	9					1	1			9	6.7	8	4
Project Variant	AM	228	66	55%	56%			31	9	4%	4%			2	1	42%	41%	8	7.5	13	4
	PM	79	253					11	35					1	3			9	6.7	5	16
Background Growth[7]	AM	9	44	57%	57%			1	6	4%	4%			0	0	39%	39%	8	7.5	0	2
	PM	44	21					6	3					0	0			9	6.7	3	1

Notes:

1. Local Maximum Load Point (LMLP) is the maximum load point between the Project site and the T Third, intended to capture capacity impacts resulting from project trips that transfer between the 19 Polk and the T Third (many are expected to do this, but these trips would not pass through the GMLP, therefore require separate study). The LMLP is assessed for the 19 Polk only and it is assumed at the stop at Evans Avenue/Newhall Street to the east of Evans Avenue/Third Street.
2. Global Maximum Load Point (GMLP) refers to the maximum load point across the entire route.
   <u>Proportion of transit trips distributed to each Superdistrict which pass through Maximum Load Points</u>
   Route 19: 8th/Howard (outbound) Larkin/O'Farrell (inbound)
   Route 44: Silver Ave/Dartmouth Ave (outbound) O'Shaughnessy/Del Vale (inbound)
   <u>PM Peak GMLP location:</u>
   Route 19: 8th/Mission (outbound); 7th/Howard (inbound)
   Route 44: Silver Ave/Mission Street (outbound); Silver Ave/San Bruno (inbound)
3. Total added transit trips for the Proposed Project and Project Variant is based on methodology described in TIS Chapter 4 and presented in Section 4.3.4. Total added trips for the Background Growth is based on methodology described and presented in TIS Section 3.1.
4. Proportion of trips using each route is based on a combination of trip distribution to each superdistrict and proportion of transit trips taking each route to each superdistrict (see accompanying "Transit Trip Assignment to the 19 Polk and 44 O'Shaughnessy" worksheet for detailed calculations)
5. Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015).
6. SFMTA designated direction, which is the opposite of Project-related perspective.
7. Approved & Funded Scenario: 494 residential units approved as Phase 1 of the nearby Hunters Point Shipyard development that are currently under construction.

Capacity Impact Analysis (per Hour)

Outbound (SFMTA Designation) / Inbound (Project Designation)

Route	Peak Hour	Existing Load[1]	Background Growth	Baseline No Project Load	Added Trips: Proposed Project	Added Trips: Project Variant	Passenger Load: B + PP	Passenger Load: B + PV	Threshold	Significant Impact?: Project	Significant Impact?: Variant
19 (LMLP)	AM	24	5	29	40	126	69	155	216	NO	NO
	PM	44	25	69	68	43	137	113		NO	NO
19 (GMLP)	AM	160	0	160	2	9	163	169	216	NO	NO
	PM	168	2	170	4	3	174	173		NO	NO
44 (GMLP)	AM	300	4	304	33	96	337	399	405	NO	NO
	PM	360	17	377	56	33	434	410	360	YES	YES

Inbound (SFMTA Designation) / Outbound (Project Designation)

Route	Peak Hour	Existing Load[1]	Background Growth	Baseline No Project Load	Added Trips: Proposed Project	Added Trips: Project Variant	Passenger Load: B + PP	Passenger Load: B + PV	Threshold	Significant Impact?: Project	Significant Impact?: Variant
19 (LMLP)	AM	84	25	109	43	37	152	146	216	NO	NO
	PM	52	12	64	37	142	101	206		NO	NO
19 (GMLP)	AM	188	2	190	3	3	193	192	216	NO	NO
	PM	180	1	181	3	10	183	191		NO	NO
44 (GMLP)	AM	368	17	385	31	27	416	412	405	YES	YES
	PM	240	8	248	27	104	275	352	360	NO	NO

Notes:

1. GMLP Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015). LMLP Source: TEP route analysis (October 2011).

Route-Specific Baseline Transit Capacity Mitigation Analysis (Proposed Project)

Mitigation Option 1: Accelerated CPHPS Transportation Plan

Mitigations:
Increase Route 44 frequency to 6.5 minutes in AM and 6.5 minutes in PM (currently planned for 2024 under CPHPS Transportation Plan)
No Change to Route 19/48

Assumptions:
Route 19 is replaced by Route 48 under CPHPS Transportation Plan. Assumed to have same LMLP and GMLP loading as Route 19
Route 44 is re-routed to travel past India Basin to Hunters Point

Capacity Thresholds

Route	Direction (SFMTA designation)	Capacity per Bus[1]		Significance Threshold (85% Capacity Utilization)	
		AM	PM	AM	PM
19 / 48	Outbound[2]	63	63	54	54
	Inbound[2]				
44	Outbound[3]	63	63	54	54
	Inbound[3]				

Notes:
1. Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015).
2. Inbound to Fisherman's Wharf, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.
3. Inbound to The Richmond, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.

Trips Added per Bus by Route and Scenario

Trip Generator	Peak Hour	Transit Trips Generated[3]		19 Polk / 48 Quintara (Local Maximum Load Point)[1]: Transit trip assignment at LMLP[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus		19 Polk / 48 Quintara (Global Maximum Load Point)[2]: Transit trip assignment at GMLP[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus		44 O'Shaughnessy (Global Maximum Load Point): Transit trip assignment on 44 O'Shaughnessy[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus	
		Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]
Proposed Project	AM	118	119	53%	56%	15	4	16	17	3%	4%	15	4	1	1	44%	41%	6.5	9.2	6	5
	PM	200	102					27	14					2	1			6.5	9.2	10	5
Background Growth[7]	AM	9	44	57%	57%			1	6	4%	4%			0	0	39%	39%	6.5	9.2	0	2
	PM	44	21					6	3					0	0			6.5	9.2	2	1

Notes:
1. Local Maximum Load Point (LMLP) is the maximum load point between the Project site and the T Third, intended to capture capacity impacts resulting from project trips that transfer between the 19 Polk and the T Third (many are expected to do this, but these trips would not pass through the GMLP, therefore require separate study). The LMLP is assessed for the 19 Polk only and it is assumed at the stop at Evans Avenue/Newhall Street to the east of Evans Avenue/Third Street.
2. Global Maximum Load Point (GMLP) refers to the maximum load point across the entire route.
   Proportion of transit trips distributed to each Superdistrict which pass through Maximum Load Points
   Route 19: 8th/Howard (outbound) Larkin/O'Farrell (inbound)
   Route 44: Silver Ave/Dartmouth Ave (outbound) O'Shaughnessy/Del Vale (inbound)
   PM Peak GMLP location:
   Route 19: 8th/Mission (outbound); 7th/Howard (inbound)
   Route 44: Silver Ave/Mission Street (outbound); Silver Ave/San Bruno (inbound)
3. Total added transit trips for the Proposed Project and Project Variant is based on methodology described in TIS Chapter 4 and presented in Section 4.3.4. Total added trips for the Background Growth is based on methodology described and presented in TIS Section 3.1.
4. Proportion of trips using each route is based on a combination of trip distribution to each superdistrict and proportion of transit trips taking each route to each superdistrict (see accompanying "Transit Trip Assignment to the 19 Polk and 44 O'Shaughnessy" worksheet for detailed calculations)
5. Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015).
6. SFMTA designated direction, which is the opposite of Project-related perspective.
7. Approved & Funded Scenario: 494 residential units approved as Phase 1 of the nearby Hunters Point Shipyard development that are currently under construction.

Capacity Impact Analysis (per Hour)

Route	Peak Hour	Outbound (SFMTA Designation) / Inbound (Project Designation): Existing Load[1]	Background Growth	Baseline No Project Load	Project-Added Trips	Passenger Load: B + PP	Passenger Load: Threshold	Significant Impact?
19/48 (LMLP)	AM	24	5	29	63	92	216	NO
	PM	44	25	69	106	175		NO
19/48 (GMLP)	AM	160	0	160	4	164	216	NO
	PM	168	2	170	6	176		NO
44 (GMLP)	AM	300	4	304	52	355	498	NO
	PM	362	17	379	88	467	498	NO

Route	Peak Hour	Inbound (SFMTA Designation) / Outbound (Project Designation): Existing Load[1]	Background Growth	Baseline No Project Load	Project-Added Trips	Passenger Load: B + PP	Passenger Load: Threshold	Significant Impact?
19/48 (LMLP)	AM	84	25	109	67	176	216	NO
	PM	52	12	64	57	121		NO
19/48 (GMLP)	AM	188	2	190	5	195	216	NO
	PM	180	1	181	4	185		NO
44 (GMLP)	AM	368	17	385	49	433	498	NO
	PM	241	8	249	42	291	498	NO

Notes:
1. GMLP Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015). LMLP Source: TEP route analysis (October 2011).

Route-Specific Baseline Transit Capacity Mitigation Analysis (Project Variant)

Mitigation Option 1: Accelerated CPHPS Transportation Plan

Mitigations:
Increase Route 48 frequency to 10 min in AM and PM (currently planned for 2024 under CPHPS Transportation Plan)
Increase Route 44 frequency to 6.5 min in AM and 7.5 min in PM (currently planned for 2023, 2024 respectively in CPHPS Transportation Plan)

Assumptions:
Route 19 is replaced by Route 48 under CPHPS Transportation Plan. Assumed to have same LMLP and GMLP loading as Route 19
Route 44 is re-routed to travel past India Basin to Hunters Point

Capacity Thresholds

Route	Direction (SFMTA designation)	Capacity per Bus[1] AM	Capacity per Bus[1] PM	Significance Threshold (85% Capacity Utilization) AM	Significance Threshold (85% Capacity Utilization) PM
19 / 48	Outbound[2] / Inbound[2]	63	63	54	54
44	Outbound[3] / Inbound[3]	63	63	54	54

Notes:
1. Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015).
2. Inbound to Fisherman's Wharf, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.
3. Inbound to The Richmond, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.

Trips Added per Bus by Route and Scenario

Trip Generator	Peak Hour	Transit Trips Generated[3]		19 Polk / 48 Quintara (Local Maximum Load Point)[1]						19 Polk / 48 Quintara (Global Maximum Load Point)[2]						44 O'Shaughnessy (Global Maximum Load Point)					
				Transit trip assignment at LMLP[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus		Transit trip assignment at GMLP[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus		Transit trip assignment on 44 O'Shaughnessy[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus	
		Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]
Project Variant	AM	355	103	55%	56%	10	6	33	10	4%	4%	10	6	2	1	42%	41%	6.5	9.2	16	5
	PM	123	394					11	37					1	3			7.5	8.0	6	20
Background Growth[7]	AM	9	44	57%	57%			1	4	4%	4%			0	0	39%	39%	6.5	9.2	0	2
	PM	44	21					4	2					0	0			7.5	8.0	2	1

Notes:
1. Local Maximum Load Point (LMLP) is the maximum load point between the Project site and the T Third, intended to capture capacity impacts resulting from project trips that transfer between the 19 Polk and the T Third (many are expected to do this, but these trips would not pass through the GMLP, therefore require separate study). The LMLP is assessed for the 19 Polk only and it is assumed at the stop at Evans Avenue/Newhall Street to the east of Evans Avenue/Third Street.
2. Global Maximum Load Point (GMLP) refers to the maximum load point across the entire route.
Proportion of transit trips distributed to each Superdistrict which pass through Maximum Load Points
Route 19: 8th/Howard (outbound) Larkin/O'Farrell (inbound)
Route 44: Silver Ave/Dartmouth Ave (outbound) O'Shaughnessy/Del Vale (inbound)
PM Peak GMLP location:
Route 19: 8th/Mission (outbound); 7th/Howard (inbound)
Route 44: Silver Ave/Mission Street (outbound); Silver Ave/San Bruno (inbound)
3. Total added transit trips for the Proposed Project and Project Variant is based on methodology described in TIS Chapter 4 and presented in Section 4.3.4. Total added trips for the Background Growth is based on methodology described and presented in TIS Section 3.1.
4. Proportion of trips using each route is based on a combination of trip distribution to each superdistrict and proportion of transit trips taking each route to each superdistrict (see accompanying "Transit Trip Assignment to the 19 Polk and 44 O'Shaughnessy" worksheet for detailed calculations)
5. Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015).
6. SFMTA designated direction, which is the opposite of Project-related perspective.
7. Approved & Funded Scenario: 494 residential units approved as Phase 1 of the nearby Hunters Point Shipyard development that are currently under construction.

Capacity Impact Analysis (per Hour)

Route	Peak Hour	Existing Load[1]	Background Growth	Baseline No Project Load	Variant-Added Trips	Passenger Load B + PV	Passenger Load Threshold	Significant Impact?
Outbound (SFMTA Designation) / Inbound (Project Designation)								
19/48 (LMLP)	AM	24	5	29	195	224	324	NO
	PM	44	25	69	68	137		NO
19/48 (GMLP)	AM	160	0	160	14	175	324	NO
	PM	168	2	170	5	175		NO
44 (GMLP)	AM	300	4	304	149	453	498	NO
	PM	362	17	379	52	431	432	NO
Inbound (SFMTA Designation) / Outbound (Project Designation)								
19/48 (LMLP)	AM	84	25	109	58	167	324	NO
	PM	52	12	64	221	285		NO
19/48 (GMLP)	AM	188	2	190	4	194	324	NO
	PM	180	1	181	16	197		NO
44 (GMLP)	AM	368	17	385	42	427	498	NO
	PM	241	8	249	162	411	432	NO

Notes:
1. GMLP Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015). LMLP Source: TEP route analysis (October 2011).

Route-Specific Baseline Transit Capacity Mitigation Analysis

Mitigation Option 2: Provide Dedicated Shuttle

Mitigations:
Proposed Project: Shuttle run every 15 min in AM and PM
Project Variant: Shuttle run every 15 min in AM, 10 min in PM

Assumptions:
Shuttle would travel to 22nd Street Caltrain Station and 24th Street Mission BART. Trips destined for western neighborhoods would transfer to Route 48
Round trip travel time of 40 minutes (estimated via Google Maps)
Shuttle vehicles would seat up to 25 people each
Shuttle would serve the added demand from Project and Variant for those lines which are significantly impacted, thereby mitigating impact

Capacity Thresholds

Route	Direction (SFMTA designation)	Capacity per Bus[1]		Significance Threshold (85% Capacity Utilization)	
		AM	PM	AM	PM
19	Outbound[2] / Inbound[2]	63	63	54	54
44	Outbound[3] / Inbound[3]	63	63	54	54

Notes:
1. Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015).
2. Inbound to Fisherman's Wharf, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.
3. Inbound to The Richmond, Outbound to Hunters Point. SFMTA Outbound designation is Inbound relative to Project and vice versa.

Trips Added per Bus by Route and Scenario

Trip Generator	Peak Hour	Transit Trips Generated[3]		19 Polk (Local Maximum Load Point)[1]: Transit trip assignment on 19 Polk at LMLP[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus		19 Polk (Global Maximum Load Point)[2]: Transit trip assignment on 19 Polk at GMLP[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus		44 O'Shaughnessy (Global Maximum Load Point): Transit trip assignment on 44 O'Shaughnessy[4]		Frequency (min)[5]	Buses per hour per direction	Trips per bus	
		Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]	Outbound[6]	Inbound[6]			Outbound[6]	Inbound[6]
Proposed Project	AM	118	119	53%	56%			16	17	3%	4%			1	1	44%	41%	8	7.5	7	7
	PM	200	102					27	14					2	1			9	6.7	13	6
Project Variant	AM	355	103	55%	56%	15	4	49	14	4%	4%	15	4	4	1	42%	41%	8	7.5	20	6
	PM	123	394					17	55					1	4			9	6.7	8	24
Background Growth[7]	AM	9	44	57%	57%			1	6	4%	4%			0	0	39%	39%	8	7.5	0	2
	PM	44	21					6	3					0	0			9	6.7	3	1

Notes:
1. Local Maximum Load Point (LMLP) is the maximum load point between the Project site and the T Third, intended to capture capacity impacts resulting from project trips that transfer between the 19 Polk and the T Third (many are expected to do this, but these trips would not pass through the GMLP, therefore require separate study). The LMLP is assessed for the 19 Polk only and it is assumed at the stop at Evans Avenue/Newhall Street to the east of Evans Avenue/Third Street.
2. Global Maximum Load Point (GMLP) refers to the maximum load point across the entire route.
   Proportion of transit trips distributed to each Superdistrict which pass through Maximum Load Points
   Route 19: 8th/Howard (outbound) Larkin/O'Farrell (inbound)
   Route 44: Silver Ave/Dartmouth Ave (outbound) O'Shaughnessy/Del Vale (inbound)
   PM Peak GMLP location:
   Route 19: 8th/Mission (outbound); 7th/Howard (inbound)
   Route 44: Silver Ave/Mission Street (outbound); Silver Ave/San Bruno (inbound)
3. Total added transit trips for the Proposed Project and Project Variant is based on methodology described in TIS Chapter 4 and presented in Section 4.3.4. Total added trips for the Background Growth is based on methodology described and presented in TIS Section 3.1.
4. Proportion of trips using each route is based on a combination of trip distribution to each superdistrict and proportion of transit trips taking each route to each superdistrict (see accompanying "Transit Trip Assignment to the 19 Polk and 44 O'Shaughnessy" worksheet for detailed calculations)
5. Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015).
6. SFMTA designated direction, which is the opposite of Project-related perspective.
7. Approved & Funded Scenario: 494 residential units approved as Phase 1 of the nearby Hunters Point Shipyard development that are currently under construction.

Capacity Impact Analysis (per Hour)

Route	Peak Hour	Existing Load[1]	Background Growth	Baseline No Project Load	Added Trips: Proposed Project	Added Trips: Project Variant	Passenger Load: B + PP	Passenger Load: B + PV	Threshold	Significant Impact? Project	Significant Impact? Variant
Outbound (SFMTA Designation) / Inbound (Project Designation)											
19 (LMLP)	AM	24	5	29	63	195	92	224	216	NO	YES
	PM	44	25	69	106	68	175	137		NO	NO
44 (GMLP)	AM	300	4	304	52	149	355	453	405	NO	YES
	PM	360	17	377	88	52	465	429	360	YES	YES
Inbound (SFMTA Designation) / Outbound (Project Designation)											
19 (LMLP)	AM	84	25	109	67	58	176	167	216	NO	NO
	PM	52	12	64	57	221	121	285		NO	YES
44 (GMLP)	AM	368	17	385	49	42	433	427	405	YES	YES
	PM	240	8	248	42	162	290	410	360	NO	YES

Notes:
1. GMLP Source: San Francisco Planning Department's *Transit Data for Transportation Impact Studies* (May 2015). LMLP Source: TEP route analysis (October 2011).

20% Wiggle room factor (to accommodate induced demand, etc)
25 seats per shuttle
44 min round-trip travel time (includes 10% layover time)
Bold indicates selected shuttle frequency to serve demand

Shuttle Trips (Outbound)

Peak Hour	Trips to Serve (per hour): Proposed Project	Trips to Serve (per hour): Project Variant	Shuttle Frequency (min): Proposed Project	Shuttle Frequency (min): Project Variant	Shuttle Route Capacity (trips/hour): Proposed Project	Shuttle Route Capacity (trips/hour): Project Variant	Number of Vehicles Required: Proposed Project	Number of Vehicles Required: Project Variant
AM	No impact	67	N/A	**20**	N/A	75	N/A	**3**
PM	106	62	**20**	15	75	100	**3**	3

Shuttle Trips (Inbound)

Peak Hour	Added Trips (per hour): Proposed Project	Added Trips (per hour): Project Variant	Shuttle Frequency (min): Proposed Project	Shuttle Frequency (min): Project Variant	Shuttle Route Capacity (trips/hour): Proposed Project	Shuttle Route Capacity (trips/hour): Project Variant	Number of Vehicles Required: Proposed Project	Number of Vehicles Required: Project Variant
AM	34	26	**20**	20	75	75	**3**	3
PM	No impact	88	N/A	**10**	N/A	150	N/A	**5**

APPENDIX G: PARKING SUPPLY AND OCCUPANCY

City of San Francisco
Hunters Point - On-street Parking Survey
Tuesday, 5-5-2015

	Jennings St.		Wills St	W.Point St	Hare St.	Hawes St (to Park)	Hawes St. n/o Innes		Arelious Walker			Donahue St		Innes Ave		
	West side	East Side	All	All	All	All	West side	East side	West side	East side	End	West side	East side	North side	South side	**Total**
Supply	**14**	**24**	**23**	**22**	**21**	**18**	**8**	**9**	**40**	**40**	**15**	**14**	**9**	**119**	**157**	**533**
1:30 - 3:00 pm	0	3	20	23	18	4	0	2	0	5	3	13	8	48	41	188
6:30 - 8:00 pm	0	5	25	29	16	0	0	1	0	3	1	0	0	46	38	164

Notes:
The whole area w/o Middle Point Rd is under construction; Middle Point Rd is just one-way street s/o Wills;
Wills St., W. Point St, and Hare St. are just driveways to apartment complexes; cars park every which way out there; supply is approximate, it seems the whole area is going to be demolished.
Hudson Ave. is not really a street, it's just a driveway to scrap yard.
Hudson Ave. with an adjacent lot at Donahue St. serve as parking for construction employees, the area is fenced off and the gate was closed at 6:30 pm.
Whole area e/o Donahue St. is under construction, it seems Donahue St. also serves as parking for the construction crews.
Supply numbers on Innes Ave. and Arelious Walker are approximate.

APPENDIX G: CPHPS TRAVEL DEMAND MEMO

May 11, 2009

Mr. Bill Wycko
San Francisco Planning Department
1650 Mission Street, 4th Floor
San Francisco, CA 94103

Re: Proposed Trip Generation, Distribution, and Transit Mode Split Forecasts for the Bayview Waterfront Project Transportation Study

Dear Bill:

This letter report presents the methodology proposed for conducting trip generation, trip distribution, and mode split forecasts for the Bayview Waterfront Project Transportation Study. The results are also presented. The proposed trip generation forecasts were developed using methods developed by Fehr & Peers and others (known as the 4D's method) to estimate trip generation as a function of design variables, such as:

- Development Scale
- Density
- Diversity of uses
- Design of the street network to accommodate pedestrian and bicycle travel

A brief description of the proposed project and the resulting traffic generation forecasts follows.

Following the discussion of the project's trip generation, the tool used to estimate transit mode share is discussed. This is a tool that was developed specifically for this project's context and location. It assumes that travel times and travel costs between various San Francisco neighborhoods have the greatest influence on transit travel in the City.

1. BAYVIEW WATERFRONT PROJECT DEVELOPMENT

The Bayview Waterfront Project includes three areas: Candlestick Point, Hunters Point Shipyard, and India Basin. Lennar Urban is proposing a redevelopment plan for Candlestick Point/Hunters Point Shipyard that would include redeveloping most existing land in the area, which primarily consists of residential and heavy industrial development, into a new mixed-use development that includes housing, retail/commercial, recreational open space, and community facilities. India Basin is located adjacent to Hunters Point Shipyard and will be included in this analysis. A site plan is included in Appendix B.

Specifically, the proposed project would replace the existing uses on the site with the following:

- Up to 11,740 new dwelling units, broken down as follows:
    - 7,850 townhomes/condominium flats in Candlestick Point
    - 2,650 townhomes/condominium flats in Hunters Point
    - 1,240 townhomes/condominium flats in India Basin

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TRANSPORTATION CONSULTANTS

- 30,000 square feet of artist space, not including the renovation of 225,000 square feet of existing studio space;
- 985,000 square feet of retail uses, including neighborhood-serving, lifestyle, and entertainment;
- 4,070,000 square feet of new office and research and development space;
- 220 hotel rooms;
- A 75,000 square foot arena (approximately 10,000 seats)
- A 69,000 seat football stadium;
- 335 acres of public recreational open space

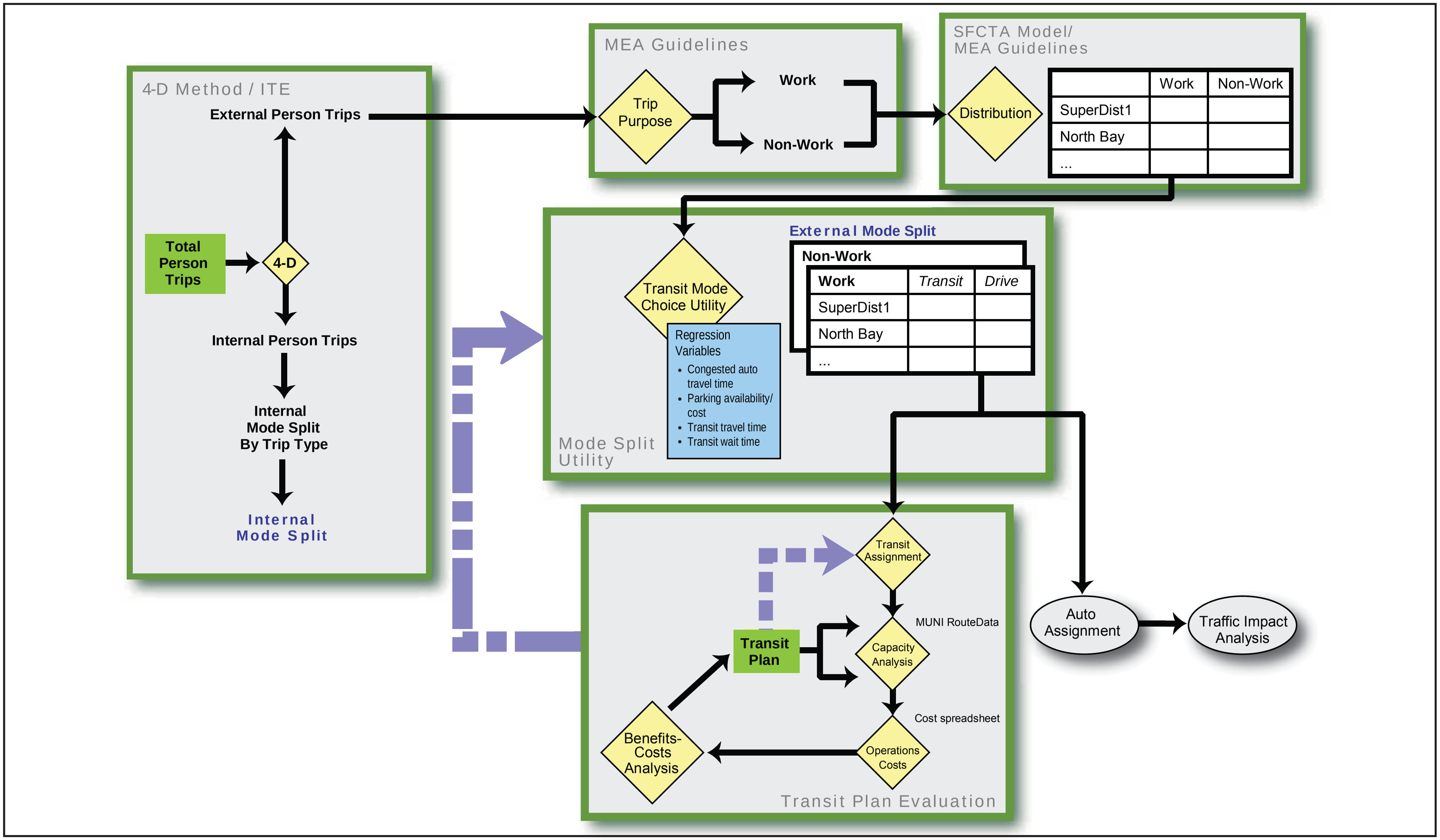
2. METHODOLOGY

The methodology used to estimate trip generation, distribution, and mode split for this project was based on the process outlined in the 2002 *Transportation Impact Analysis Guidelines for Environmental Review* (*SF Guidelines*). However, because of the unique nature and location of this project, some project-specific modifications to the *SF Guidelines* methodology were required.

For purposes of estimating trip generation, Fehr & Peers based our analysis using tools used developed by leading industry researchers (including Fehr & Peers staff) and recommended for use by Caltrans for use in assessing the effects of various land development characteristics in travel demand forecasts. We have applied this process, known as the “4D’s” on other large-scale projects Fehr & Peers has worked on in the City of San Francisco. This approach, which deviates from the standard *SF Guidelines* methodology, is appropriate for this site because the proposed project:

- Is located in a relatively isolated area within the City and would redevelop an area comparable in size to a number of entire neighborhoods in other parts of San Francisco;
- Includes residential, employment, and recreational opportunities within the project;
- Follows a development pattern designed to facilitate walking and cycling for internal trips and bus service for external trips;
- Has streets designed to accommodate a variety of modes of travel and slow and moderate speeds and situated around small, pedestrian-oriented blocks;
- Locates all homes within a five-minute walk of a transit stop; and
- Proposes to make substantial investments in the transit system within the project site.

The methodology developed to analyze this type of project has the following five steps, as illustrated on Figure 1:



Candlestick Point

FEHR & PEERS
TRANSPORTATION CONSULTANTS

ANALYSIS METHODOLOGY

January 2009
SF08-0407\graphics\0407-1 analysis methodology

FIGURE 1

The overall process is summarized in the following steps:

1. *Trip Generation – 4D/ITE*: The number of person trips generated by the development was calculated using the 4D methodology. This process calculates the number of person trips generated by the development and estimates the percentage of those trips that occur internal to the project. The remaining external trips are then taken and used in the project off-site impact analysis.

2. *Trip Purpose*: The external trips calculated in Step 1 are separated into work and non-work trips, as per *SF Guidelines*.

3. *Trip Distribution*: Once the trips are calculated by purpose, they are distributed to districts, or catchment areas, throughout the Bay area. These districts are defined within the San Francisco CHAMP travel demand forecasting model, maintained by the San Francisco County Transportation Authority. To account for more nuanced trip patterns in San Francisco, the four superdistricts located within San Francisco identified in the *SF Guidelines* were subdivided into 13 smaller districts and Northern San Mateo County was divided into three new districts. The remaining Bay Area was divided into larger districts for trips to/from the North Bay, East Bay and South Bay.

4. *Transit Mode Utility:* Using drive and transit travel times between various districts through San Francisco, regression-based utility models were developed for work and non-work trips to determine the relationship between travel time and cost and transit mode share for each trip type. The input data for this regression model was obtained from the Bay Area Transportation Survey (BATS), conducted in year 2000. The resulting mode split models were used to predict the transit mode share the project would capture to and from each of the model districts, given the proposed investments towards public transit.

5. *Auto and Vehicle Trips:* Auto person trips are calculated by subtracting transit trips from all external person trips for each destination zone. The number of automobile trips is determined based on an average vehicle occupancy of 1.6.

6. *Project Transit Plan*: After estimating the transit mode share between Candlestick Point/Hunters Point Shipyard and each of the districts, the number of transit riders were assigned to specific transit routes serving or proposed to serve the area. With this refined information about transit travel to and from the project, the proposed transit plan can be analyzed to optimize route capacity and estimate route operational costs. This information can be used to refine the proposed plan and strategize investments to transit. Once the transit plan is revised, steps 4 and 5 will be iterated.

3. PERSON TRIP GENERATION

The methods commonly used for forecasting trip generation of projects in San Francisco are based on person-trip generation rates, trip distribution information, and mode split data described in the *SF Guidelines.* These data are based on a number of detailed travel behavior surveys conducted within San Francisco. The data in the *SF Guidelines* are generally accepted as more appropriate for use in the complex environs of San Francisco than more conventional methods because of the relatively unique mix of uses, density, availability of transit, and cost of parking commonly found in San Francisco. However, the methods described in the *SF Guidelines* cannot be directly applied to the proposed project because of its large scale, unique location, and distinctive character.

Similarly, standard vehicle-traffic generation rates, such as those provided by *Trip Generation*, 8th Edition, 2008, Institute of Transportation Engineers (ITE), would not be suitable for the Bayview Waterfront Project, unless appropriate adjustments were made to account for the project size, mix, and availability of transit. This trip generation report describes an exercise conducted by Fehr & Peers to estimate traffic generation of the proposed project using state-of-the-practice methods for adjusting standard traffic generation rates. This method was originally developed by Fehr & Peers and others for the US Environmental Protection Agency (EPA) and has been endorsed for use in project-specific and planning-level analyses by a number of jurisdictions, including the California Department of Transportation (Caltrans). This method is commonly referred to as the "4D" method, and generally accounts for the following factors that may influence traffic generation:

- **Development scale** – this "D" is the only one of the 4D's that is used in virtually all transportation impact analyses and accounts for the fact that as development scale increases, trip generation increases.
- **Density of the project** – although trip generation increases with development scale, the higher the proposed project's density, the less vehicular traffic generated per unit of development
- **Diversity of uses** – an appropriate mix of uses can lead to internalization of trips within a project
- **Design of project** – a walkable, pedestrian- and bicycle-oriented circulation system can help to reduce automobile dependence within a project site

This methodology was applied in the transportation study conducted for the redevelopment of Treasure Island, and a detailed description of how these factors can be used to adjust standard traffic generation rates was provided in a separate letter related to that project. That letter is attached as Appendix A. However, the general concept behind the 4D method is that projects that deviate from the base case (in this case, ITE methods) with respect to the four bulleted variables above exhibit different traffic generation patterns. Elasticities have been derived from travel behavior surveys to help estimate how traffic generation changes as a function of changes in the 4D's.

Internal Trips

The first step in the 4D method is to define the base case. In this case, the ITE trip generation methodology was selected as the base case, as it represents typical suburban, automobile-oriented development. The estimated project traffic generation using ITE methods is shown below in Tables 1 and 2 for the AM and PM peak hours, respectively.

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Table 1
Bayview Waterfront Project Person Trip Generation Estimates (ITE Methodology[1])
AM Peak Hour - Base Case

Land Use	Size	Units	ITE Land Use Code	Rate or Eqn.[2]	AM Trip Generation		
					AM Trips	In	Out
Retail[1]							
Neighborhood Serving + Ancillary	**985.0**	**ksf**					
Shopping Center – Candlestick	635.0	ksf	820	Eqn	1,293	789	504
Specialty Retail – Candlestick	125.0	ksf	814	Rate	237	104	133
Specialty Retail – Hunters Point Shipyard	125.0	ksf	814	Rate	237	104	133
Specialty Retail – India Basin	100.0	ksf	814	Rate	192	85	107
Commercial / Adaptive Reuse							
General Office + Arena	**4,085.0**	**ksf**					
General Office – Candlestick	150.0	ksf	710	Eqn	418	366	51
Arena – Candlestick	25.0	ksf	710	Eqn	101	88	13
Stadium/Artist Space – Hunters Point Shipyard	--[3]	ksf	710	Eqn	160	141	19
Research and Development – HPS	2,500.0	ksf	760	Eqn	3,392	2,814	578
General Office – India Basin	1,365.0	ksf	710	Eqn	2,430	2,138	293
Residential							
All	**11,484**	**Units**					
Townhomes + Flats (Net New)– Candlestick	7,594	Units	230	Rate	5,349	910	4,438
Townhomes – Hunters Point Shipyard	2,650	Units	230	Rate	1,867	318	1,549
Townhomes – India Basin	1,240	Units	230	Rate	874	149	725
Hotel							
Hotel Facilities	**220**	**Rooms**					
Full-Service Hotel – Candlestick	220	Rooms	310	Eqn	176	107	69
Institutional							
Miscellaneous Institutional Uses	**335**	**ksf**					
Recreational Open Space – Candlestick	97	Acres	412	Rate	3	2	2
Recreational Open Space – HPS	238	Acres	412	Rate	5	3	2
				Grand Total	**16,734**	**8,118**	**8,616**

Notes:
1. Vehicle trip generation for retail uses increased by 70 percent from ITE methodology based on evidence that retail uses in San Francisco generate approximately 70 percent more person-trips than typical suburban uses. This is a conservative assumption because a higher portion of the additional person trips generated by San Francisco retail uses are likely walk trips due to land use proximity.
2. Trip Generation generally provides both average rates and fitted curve equations for forecasting trip generation. The choice of which method to use is described in the Trip Generation Handbook. The analysis described in this table is consistent with the ITE methodology.
3. Equivalent ITE trip generation was derived for Artist's Space and weekday stadium use based on adjusted net square footage.

Source: Institute of Transportation Engineers, *Trip Generation,* 7th Edition (2003).
Prepared by: Fehr & Peers, May 2009

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Table 2
Bayview Waterfront Project Person Trip Generation Estimates (ITE Methodology[1])
PM Peak Hour - Base Case

Land Use	Size	Units	ITE Land Use Code	Rate or Eqn.[2]	PM Trip Generation		
					PM Trips	In	Out
Retail[1]							
Neighborhood Serving + Ancillary	**985.0**	**ksf**					
Shopping Center – Candlestick	635.0	ksf	820	Eqn	5,770	2,770	3,000
Specialty Retail – Candlestick	125.0	ksf	814	Rate	877	386	491
Specialty Retail – Hunters Point Shipyard	125.0	ksf	814	Rate	877	386	491
Specialty Retail – India Basin	100.0	ksf	814	Rate	712	314	398
Commercial / Adaptive Reuse							
General Office + Arena	**4,085.0**	**ksf**					
General Office – Candlestick	150.0	ksf	710	Eqn	395	67	328
Arena – Candlestick	25.0	ksf	710	Eqn	173	30	142
Stadium/Artist Space – Hunters Point Shipyard	--[3]	ksf	710	Eqn	208	35	173
Research and Development – HPS	2,500	ksf	760	Eqn	2,910	437	2,474
General Office – India Basin	1,365.0	ksf	710	Eqn	2,574	438	2,136
Residential							
All	**11,484**	**Units**					
Townhomes + Flats (Net New) – Candlestick	7,594	Units	230	Rate	6,320	4,234	2,086
Townhomes – Hunters Point Shipyard	2,650	Units	230	Rate	2,206	1,478	728
Townhomes – India Basin	1,240	Units	230	Rate	1,034	693	341
Hotel							
Hotel Facilities	**220**	**Rooms**					
Full-Service Hotel – Candlestick	220	Rooms	310	Eqn	210	110	99
Institutional							
Miscellaneous Institutional Uses	**335**	**ksf**					
Recreational Open Space – Candlestick	97	Acres	412	Rate	11	5	6
Recreational Open Space – HPS	238	Acres	412	Rate	24	10	14
				Grand Total	**24,301**	**11,393**	**12,907**

Notes:

1. Vehicle trip generation for retail uses increased by 70 percent from ITE methodology based on evidence that retail uses in San Francisco generate approximately 70 percent more person-trips than typical suburban uses. This is a conservative assumption because a higher portion of the additional person trips generated by San Francisco retail uses are likely walk trips due to land use proximity.
2. Trip Generation generally provides both average rates and fitted curve equations for forecasting trip generation. The choice of which method to use is described in the Trip Generation Handbook. The analysis described in this table is consistent with the ITE methodology.
3. Equivalent ITE trip generation was derived for Artist's Space and weekday stadium use based on adjusted net square footage.

Source: Institute of Transportation Engineers, *Trip Generation,* 7th Edition (2003).
Prepared by: Fehr & Peers, May 2009

Once the base case is defined, the next step in the 4D process is to define the application area (i.e., the catchment area for trip internalization). For purposes of this analysis, we assumed the Bayview Waterfront Project development would be contained within a three catchment areas (Candlestick Point, Hunters Point Shipyard, and India Basin). However, trips from one catchment area to another in the development could be internalized to the project area through bike, walk, transit, or auto trips.

The third step in the 4D process is to determine the characteristics of the proposed project, as they relate to the 4D variables described earlier. This process was done by comparing the project with typical suburban development patterns. The proposed project's percentage differences from typical developments were applied against elasticities developed from travel behavior surveys conducted by the Contra Costa Transportation Authority (CCTA)[1]. The elasticities from the CCTA work are reasonable for application to this project as they represent typical, suburban development, similar to the ITE trip generation rates, but are also located in the Bay Area and account for regional differences between the Bay Area and the national average. The resulting output from the 4D analysis tool is provided in Appendix B. Generally, the 4D analysis found that approximately 34 percent of all AM peak hour trips and 30 percent of all PM peak hour trips would be internal to the development.

Comparison to Other High-Density, Mixed-Use Developments

The conclusion that between 34 and 30 percent of all peak hour person-trips generated by Bayview Waterfront Project development would be internal to the development is relatively high compared to typical reductions taken to account for trip internalization. Therefore, a comparison was made to other high-density, mixed-use development projects around the United States, including those that comprise the sample used to develop the methodology described in the *ITE Trip Generation Handbook*, to determine if this conclusion is reasonable. This comparison is summarized in Table 3.

As shown in Table 3, there are a number of sites with similar land use mixtures and densities where trip internalization rates between 30 and 50 percent have been observed. Additionally, all of the sites shown in Table 3 are smaller than that proposed at Candlestick Point, Hunters Point Shipyard and India Basin. As development sites grow in size, the rate of internalization increases, so the conclusion that the proposed project would have internalization rates similar to those observed at smaller sites appears reasonable. In addition, at the sample sites, application of the 4D method improved the accuracy of trip generation forecasting, with standard errors of +/- 25 percent, compared to typical standard errors of +/- 90 to +/- 140 percent for office and residential land uses, respectively, when estimated directly from the ITE *Trip Generation* manual.

In light of the above, the conclusion that approximately 34 to 41 percent of Candlestick Point/Hunters Point Shipyard and India Basin trips would be internal to the project appears reasonable.

[1] The CCTA travel demand model was refined to correct for accurate sidewalk cover and residential density in the region.

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Table 3
Predicted Using 4D Method vs. Observed Internalization at Other Mixed-use Sites

Site	Project Description	Internal % Count	Internal % 4D Estimate	Error
Large Sites (>300 acres)				
Moraga, California[1]	6,109 Acre Site: • 1,720 ksf Office • 180 ksf Retail • 0 Hotel Rooms • 6,000 Residential Units	47%	36%	**-11%**
South Davis, California[1]	791 Acre Site: • 550 ksf Office • 559 ksf Retail • 0 Hotel Rooms • 4,402 Residential Units	45%	50%	**5%**
Medium Sites (<300 acres, >100 acres)				
Boca del Mar[2]	253 Acre Site: • 303 ksf Office • 198 ksf Retail • 0 Hotel Rooms • 1,144 Residential Units	33%	38%	**5%**
Galleria[1]	165 Acre Site: • 137 ksf Office • 1,150 ksf Retail • 229 Hotel Rooms • 722 Residential Units	38%	17%	**-21%**
Small Sites (<100 acres)				
Village Commons[2]	72 Acre Site: • 293 ksf Office • 231 ksf Retail • 0 Hotel Rooms • 317 Residential Units	28%	46%	**18%**
Country Isles[2]	61 Acre Site: • 59 ksf Office • 193 ksf Retail • 0 Hotel Rooms • 368 Residential Units	33%	42%	**9%**
Mizner[2]	30 Acre Site: • 88 ksf Office • 163 ksf Retail • 0 Hotel Rooms • 136 Residential Units	40%	43%	**3%**
Crocker[2]	26 Acre Site: • 209 ksf Office • 87 ksf Retail • 256 Hotel Rooms • 0 Residential Units	41%	18%	**-23%**

Notes:
1. Cordon counts conducted by Fehr & Peers
2. From mixed-use trip generation estimation methodology, *ITE Handbook*, Appendix C

Fehr & Peers, October 2008

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4. TRIP PURPOSE

The internal trips for the project were subtracted from the overall trip generation and, per *SF Guidelines*, the external trips associated with the project were separated into trip purpose group – work and non-work trips. Table 4 summarizes the work/non-work splits for the land uses specific to the Bayview Waterfront Project

Table 4
Bayview Waterfront Project – Peak Hour Trip Purpose by Land Use

Place of Trip Origin/Destination	% Work Trips	% Non-Work Trips
Retail (Shopping Center and Other Retail)	4%	96%
Office and R & D	83%	17%
Stadium and Arena	83%	17%
County Park	83%	17%
Hotel	60%	40%
Residential	50%	50%

Source: 2002 *Transportation Impact Analysis Guidelines for Environmental Review* (*SF Guidelines*), San Francisco Planning Department.

5. TRIP DISTRIBUTION

The next component of the analysis is an estimation of the trip distribution of external project trips by trip purpose. The proposed project trip distribution was determined using the San Francisco CHAMP travel demand forecasting model, maintained by the San Francisco County Transportation Authority (SFCTA).

The SF CHAMP model divides the city and region into "superdistricts" to which traffic is typically distributed. The City is divided into four superdistricts, with the surrounding region aggregated into larger geographical areas (North Bay, East Bay, South Bay). The Bayview Waterfront Project is located in Superdistrict 3. A map of the Superdistricts is located in Appendix C.

To confirm that the use of the SF CHAMP model was appropriate, the trip distribution percentages predicted by the SF CHAMP model for the traffic analysis zones containing the proposed project to each of the four San Francisco Superdistricts and the larger regional districts (North Bay, East Bay, and South Bay) were compared with the distribution percentages predicted by the MTC model, those contained in the *SF Guidelines*, and those from the 2000 Census Journey-to-Work data set for the same area. Table 5 summarizes these percentages.

Table 5
Bayview Waterfront Project
PM Peak Period Trip Distribution for Project TAZ

	SFCTA Work[1]	MTC Work[2]	MEA Work[3]	Census Travel Flows[4]	SFCTA Non-Work[1]	MTC Non-Work[2]	MEA Non-Work[3]
Superdistrict 1	20%	16%	12%	18%	7%	21%	9%
Superdistrict 2	11%	6%	13%	19%	6%	5%	11%
Superdistrict 3	29%	43%	26%	35%	44%	50%	57%
Superdistrict 4	4%	4%	12%	17%	3%	3%	5%
East Bay	12%	10%	24%	1%	6%	3%	4%
North Bay	2%	2%	0%	0%	1%	0%	2%
South Bay + Other	22%	19%	13%	2%	32%	18%	12%

Notes:
1. Source: SF CHAMP model, 2030 PM model run
2. Source: Metropolitan Transportation Commission, 2030 PM Model Run, Projections 2003.
3. Source: *SF Guidelines,* SF Planning Department, 2002.
4. Source: Census 2000 Journey-to-Work Travel Flows, Prepared by Fehr & Peers.

Prepared by: Fehr & Peers, May 2009

As shown in Table 5, the work-trip distribution percentages from the SF CHAMP model for the project site area are generally consistent with the census journey-to-work travel flows, and in most cases are closer to the census data than other sources. The primary difference between the SF CHAMP distribution and the census data is that the census indicates that there are currently a higher portion of work trips between the project area and superdistricts 2-4 (i.e. non-Downtown areas of San Francisco), and a lower percentage to regional locations such as the East Bay and South Bay. The SF CHAMP model predicts a higher portion of trips from the proposed project to/from Downtown San Francisco, the East Bay, and the South Bay.. Given that the proposed project intends to introduce land uses in the area that will likely be a more regional draw than existing land uses in the area (R&D space, office space, regional retail, etc.), the fact that the SF CHAMP model predicts a higher portion of trips to the East Bay than currently exists makes sense, and appears reasonable.

For non-work trips, all three sources (the SF CHAMP model, the MTC model, and the *SF Guidelines*) are all relatively consistent. The primary difference between the SF CHAMP model and the *SF Guidelines* trip distribution is the SF CHAMP model predicts a higher portion of the trips to the South Bay and lower portion to Superdistrict 3. Given the project's location at the southern edge of San Francisco, there are many uses classified in the "South Bay" category that may be closer and more convenient to the project site than those in Superdistrict 3. Thus, the descrepancies between the SF CHAMP model and *SF Guidelines* non-work trip distribution also appear reasonable.

Therefore, the SF CHAMP model should be considered an acceptable source for determining the work and non-work trip distribution for the Bayview Waterfront Project.

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Model Refinement

In order to develop a more detailed transportation analysis, the SF CHAMP trip distribution information was disaggregated from four Superdistricts in San Francisco into 13 "super neighborhoods." Northern San Mateo County was disaggregated into three zones. The remainder of the land uses remained in the North Bay, South Bay, and East Bay Superdistricts. Figure 2 illustrates the zone structure used in for this analysis. The SF CHAMP model output was then formatted into these 19 zones to determine the project's trip distribution by purpose.

The trip distribution patterns from the SF CHAMP model were applied to the trip generation described earlier. Table 6 provides a summary of the project trip distribution from each zone. The percent distribution shown has been normalized to reflect the in-and-out percent splits in the trip generation table (i.e., inbound and outbound trip distribution may be slightly different from one another for a given origin-destination pair).

Table 6
Bayview Waterfront Development
External Trip Distribution Patterns, PM Peak Hour

Zone Number	Place of Trip Origin/Destination	% Work Trips[2]	Work Trips	% Non-Work Trips[2]	Non-Work Trips
1	Downtown	9%	666	4%	322
2	South of Market (SoMa)	5%	330	3%	208
3	North Beach / Chinatown	4%	293	2%	180
4	Western Market	6%	403	5%	370
5	Mission / Potrero Hill	9%	666	12%	860
6	Noe Valley / Glen Park / Bernal	3%	247	7%	483
7	Marina / Northern Heights	3%	228	3%	194
8	Richmond	2%	116	1%	64
9	Bayshore	8%	559	28%	2044
10	Outer Mission	3%	195	6%	447
11	Hill Districts	2%	126	3%	207
12	Sunset	4%	289	4%	274
13	South Bay	7%	485	6%	466
14	East Bay	14%	1029	8%	575
15	North Bay	2%	177	1%	82
16	Bayview Waterfront Project[3]	1%	83	4%	305
17	Brisbane / Eastern Daly City	3%	230	14%	1041
18	Western Daly City / Colma	11%	824	14%	1046
19	San Bruno / South San Francisco	4%	306	9%	617
	Total SF	58%	4199	60%	5960
	Total EB	14%	1029	6%	575
	Total SB	26%	1844	33%	3170
	Total NB	2%	177	1%	82

Notes:

1. Trips within the Bayview Waterfront development are considered internal to the project; therefore, no trips were distributed to the zone in this step.
2. These percentages represent the total percentage of trips traveling to and from each zone to and from the project; however, the inbound and outbound split is not represented in this table. Appendix C contains a trip distribution matrix showing each origin-destination pair's distribution and should be referenced for the project's inbound and outbound split for each zone.
3. For the Bayview Waterfront Project area, "external trips" refers to trips between Candlestick Point, Hunters Point Shipyard, and India Basin. "Internal" trips were assumed to be within each site. Trips to/from Bayview Waterfront were reallocated from the Bayshore district trip percentage based on land use type.

Source: Fehr & Peers, May 2009

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BAYVIEW WATERFRONT PROJECT
PROPOSED SUPERDISTRICT/ZONE STRUCTURE

May 2009
SF08-0407\GIS\TAZ_Dist Zones\0407-2 zone

FIGURE 2

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6. TRANSIT MODE SHARE UTILITY

The Bayview Waterfront Project has proposed substantial changes to the transit infrastructure in the neighborhood, including extending existing routes into the project site and establishing new transit routes. The proposed transit plan is specified in Appendix D.

The *SF Guidelines* provide a general transit mode share percentage by Superdistrict; however, the more refined zone structure used in this analysis allows prediction of transit mode share to be specific to neighborhoods and transit routes. For example, the original, SF CHAMP Superdistrict 2 included all neighborhoods in the northwestern quadrant of the City (generally north of Golden Gate Park and west of Van Ness Avenue) and was served by numerous major bus lines (e.g., Routes 38, 24, 45, N-Judah, 48). The more refined structure used in this analysis better delineates neighborhoods in the area (into the Richmond, Marina, and Western Market), so that the predicted transit mode share better reflects actual transit connectivity between the proposed project and a specific neighborhood.

Mode Choice Model Development

A statistical model was constructed to determine the correlation between a number of variables that may influence mode choice for the neighborhood zones and Superdistricts. The model was designed to predict transit mode shares. The data set used to construct the model was published in 2000 *Bay Area Travel Survey*, Public Data Release #3, Metropolitan Transportation Commission (MTC), March 2005, (BATS2000), as well as information mined from U.S. Census Journey-to-Work data.

Additionally, mode choice for work and non-work trips may be different for a given origin – destination pair. Therefore, unique models were developed to predict transit mode share for work and non-work trips.

Mode Choice Model Calibration

Five neighborhoods in San Francisco and their corresponding travel characteristics were used to construct the model. The neighborhoods used – Downtown, Richmond, Outer Mission, Hill Districts, Sunset – were chosen because they each are outlying areas like similar to the Bayview Waterfront Project. For each origin-destination (OD) pair, base year auto travel time data from the SF CHAMP model, transit travel time data from Muni, and known travel costs between zones (e.g., tolls, transit fares, and parking costs) were compiled. Using this data, the following variables were created:

> Drive Time *(Drive Time):* Drive time was taken from the SF CHAMP model, and represents the PM peak hour average travel time between the central TAZ within each zone.
>
> Parking Cost *(Parking Cost):* The cost to park in each zone was calculated by taking an hourly parking rate for that zone multiplied by the proportion of trips to that zone that pay for parking to obtain an average hourly parking rate for this zone. The SF CHAMP model land use file provides an hourly parking rate for work and for non-work trips. The average

hourly parking rate was then multiplied by 8 hours for a work trip and 2 hours for a non-work trip; assumptions of the average parking time.

Transit Average Wait Time *(TransitAvgWait)*: The sum of half of the headway of each transit line taken between a particular origin/destination pair by transit.

Transit Transfers *(TransitXfers)*: This is the number of transfers needed to take public transportation between the origin and destination.

Transit Travel Time *(TransitTime)*: The average travel time taken by public transit between a given origin/destination pair. This data was taken from the 2006 Muni transit survey data.

This information was compiled into a series of matrices by origin-destination pair, entered into SPSS statistical software and used to perform a regression analysis. Appendix E includes the model input factors and Appendix F contains the model's validation statistics. Ultimately, the model showed that for work trips, only *DriveTime, DrivePkgCost, TransitAvgWait,* and *TransitXfers* affected the transit mode share. For non-work trips, *DriveTime, DrivePkgCost, TransitXfers,* and *TransitTime* affected the transit mode share. The following coefficients and equations were derived from the output:

Work Trips:

Transit Mode Share = 0.009(DriveTime) + 0.102*(DrivePkgCost) – 0.008*(TransitAvgWait) – 0.092*(TransitXfers) + 0.028*

Non-Work Trips:

Transit Mode Share = 0.012(DriveTime) + 0.079*(DrivePkgCost) – 0.023*(TransitXfers) – 0.002*(TransitTime) -0.095*

Mode Choice Model Validation

Table 7 includes the sample origin/destination pairs used to develop the regression model, the actual transit mode share for that OD pair, and the corresponding mode share prediction from the mode choice model. The predicted mode share was compared to BATS data. Tables 7 & 8 and Figures 3 & 4 show the predicted versus actual (BATS) transit mode share for each origin-destination pair for work and non-work trips included in the model.

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Table 7
Model Results by Origin - Destination Pair: Transit Mode Share for Daily Work Trips

Origin	Destination	BATS Mode Share[1, 2]	Predicted Mode Share[3]	BATS-to-Model Difference
Downtown	*Richmond*	72%	73%	-1%
Downtown	*Outer Mission*	91%	75%	16%
Downtown	*Hill Districts*	58%	74%	-16%
Downtown	*Sunset*	64%	68%	-4%
Richmond	*Downtown*	76%	73%	4%
Richmond	*Outer Mission*	0%	13%	-13%
Richmond	*Hill Districts*	7%	7%	0%
Richmond	*Sunset*	25%	20%	6%
Outer Mission	*Downtown*	75%	75%	1%
Outer Mission	*Richmond*	26%	13%	13%
Outer Mission	*Hill Districts*	10%	14%	-5%
Outer Mission	*Sunset*	0%	9%	-9%
Hill Districts	*Downtown*	66%	74%	-8%
Hill Districts	*Richmond*	15%	7%	8%
Hill Districts	*Outer Mission*	2%	14%	-12%
Hill Districts	*Sunset*	7%	2%	6%
Sunset	*Downtown*	67%	68%	-1%
Sunset	*Richmond*	36%	20%	16%
Sunset	*Outer Mission*	0%	9%	-9%
Sunset	*Hill Districts*	6%	15%	-9%

Notes:
1. 2000 *Bay Area Travel Survey*, Public Data Release #3, Metropolitan Transportation Commission, March 2005.
2. Transit mode shares between inbound and outbound directions may be different depending on origin. Reverse O-D pairs may have different mode shares because travel characteristics such as time and route vary by direction.
3. Results of applying transit mode share prediction model.

Source: Fehr & Peers, May 2009

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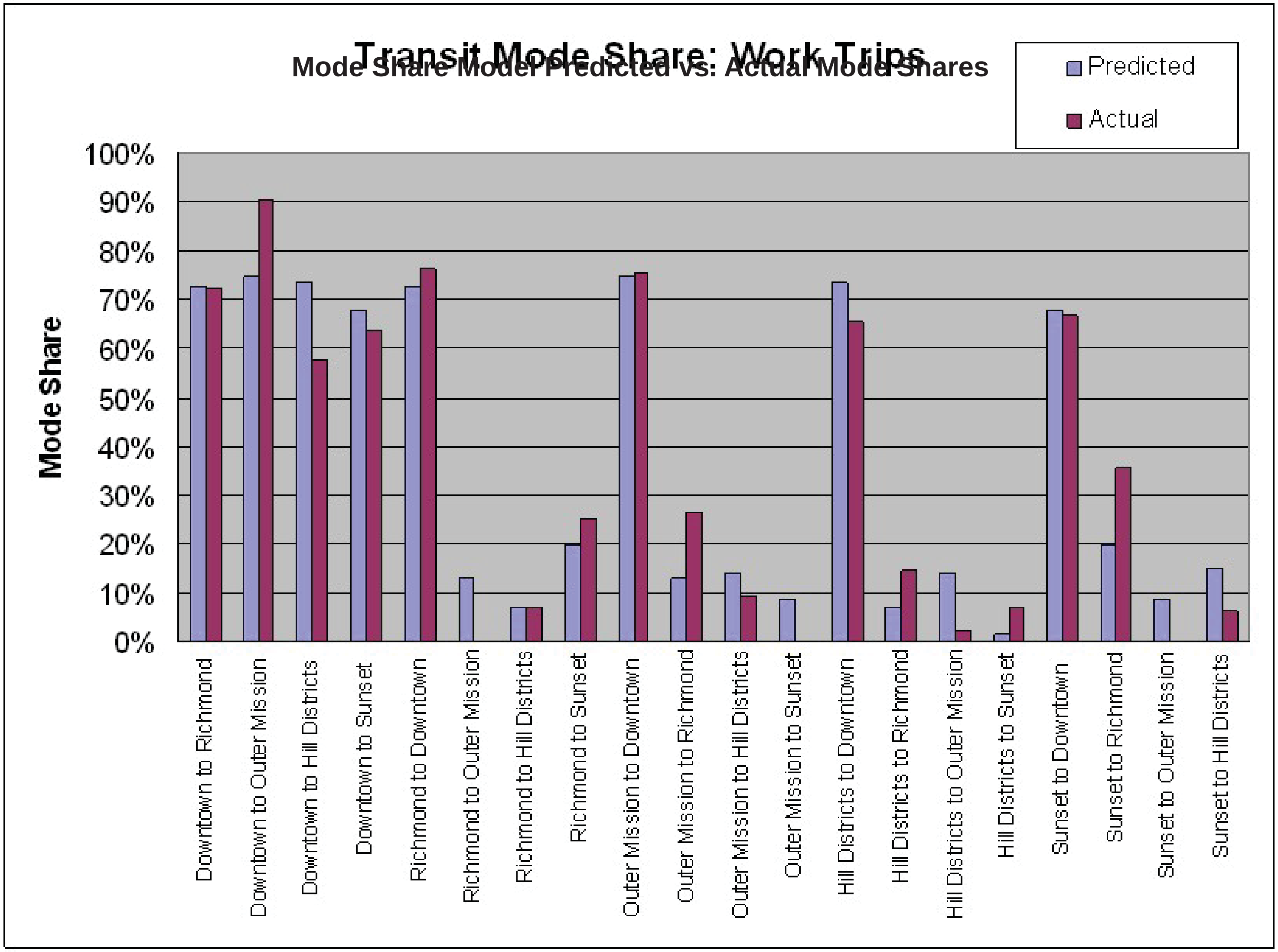
Table 8
Model Results by Origin - Destination Pair: Transit Mode Share for Daily Non-Work Trips

Origin	Destination	BATS Mode Share[1, 2]	Predicted Mode Share[3]	BATS-to-Model Difference
Downtown	*Richmond*	31%	40%	9%
Downtown	*Outer Mission*	49%	44%	-5%
Downtown	*Hill Districts*	54%	46%	-8%
Downtown	*Sunset*	46%	46%	1%
Richmond	*Downtown*	33%	40%	7%
Richmond	*Outer Mission*	11%	8%	-3%
Richmond	*Hill Districts*	0%	4%	4%
Richmond	*Sunset*	3%	8%	4%
Outer Mission	*Downtown*	57%	44%	-13%
Outer Mission	*Richmond*	8%	8%	0%
Outer Mission	*Hill Districts*	3%	2%	-1%
Outer Mission	*Sunset*	10%	4%	-6%
Hill Districts	*Downtown*	45%	46%	1%
Hill Districts	*Richmond*	0%	4%	4%
Hill Districts	*Outer Mission*	4%	2%	-3%
Hill Districts	*Sunset*	6%	0%	-6%
Sunset	*Downtown*	44%	46%	3%
Sunset	*Richmond*	3%	8%	5%
Sunset	*Outer Mission*	7%	4%	-3%
Sunset	*Hill Districts*	6%	2%	-4%

Notes:
1. 2000 *Bay Area Travel Survey*, Public Data Release #3, Metropolitan Transportation Commission, March 2005.
2. Transit mode shares between inbound and outbound directions may be different depending on origin. Reverse OD pairs may have different mode shares because travel characteristics such as time and route vary by direction.
3. Results of applying transit mode share prediction model.

Source: Fehr & Peers, May 2009



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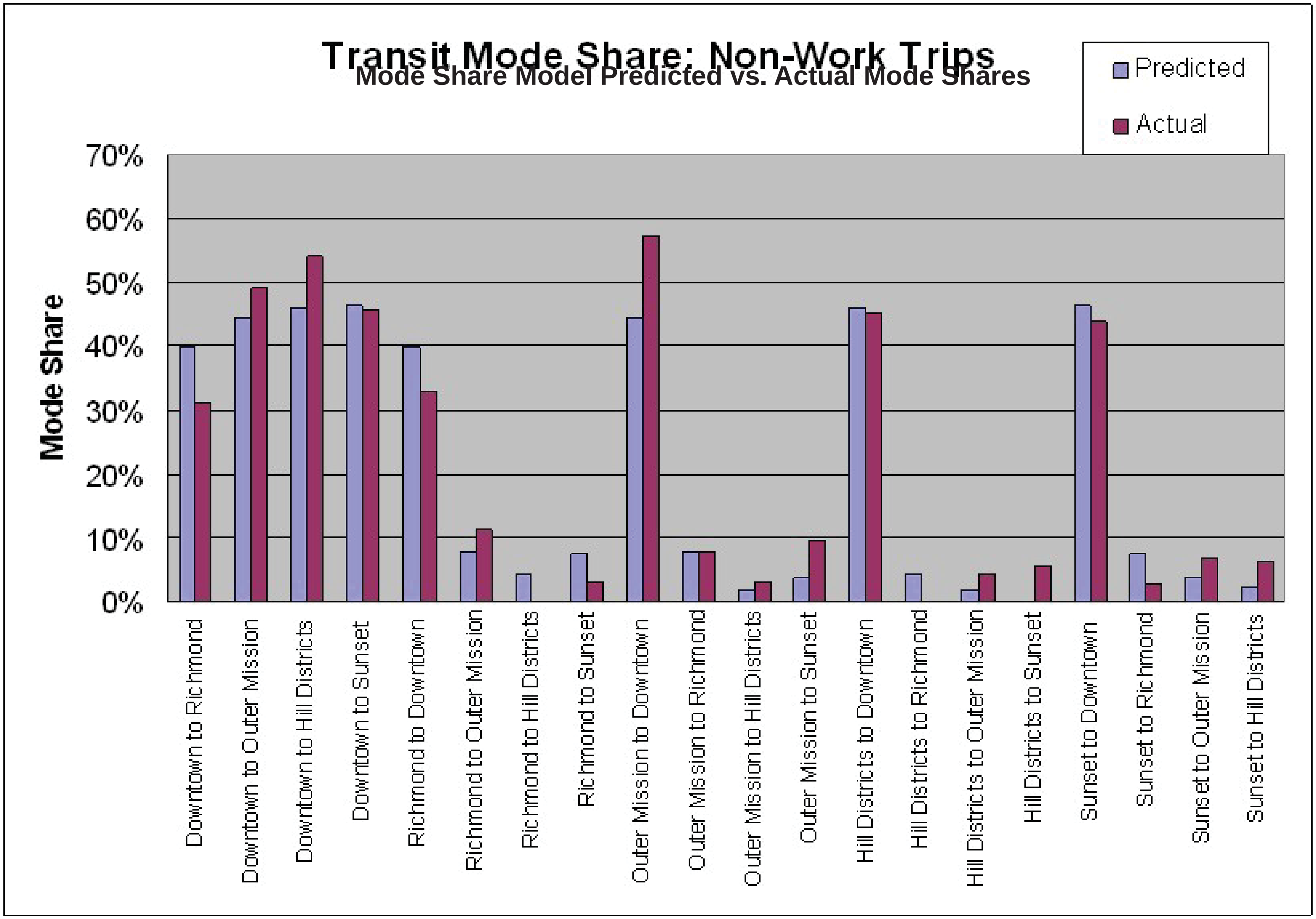
PREDICTED VS. ACTUAL DAILY TRANSIT MODE SHARE: WORK TRIPS

April 2009
SF08-0407\graphics\0407-3 transit_work trips

FIGURE 3



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PREDICTED VS. ACTUAL DAILY TRANSIT MODE SHARE: NON-WORK TRIPS

April 2009
SF08-0407\graphics\0407-4 transit_non_work trips

FIGURE 4

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Comparison to SF CHAMP Model

To confirm the reasonableness of the mode choice model's predictions, its results were compared to transit mode share predicted by the SF CHAMP model and BATS survey data. Table 9 compares the mode choice model's predictions of transit mode share for trips between Downtown and the outer neighborhoods of San Francisco with mode share data from BATS and predictions from the SF CHAMP model. These neighborhoods have similar transportation characteristics as the southeastern portion of the city (Bayshore) – limited access to express transit routes, medium residential and job densities, and a location relatively remote from downtown.

Table 9
Daily Transit Mode Choice Utility Comparison

Origin-Destination[1]	Mode Choice Model Predicted Mode Share[1]	SF CHAMP Mode Share[2]	BATS Mode Share
Downtown – Sunset + Hill District + Richmond	55%	34%	52%
Sunset + Hill District + Richmond – Downtown	55%	39%	53%

Notes:
1. Sunset, Hill District, and Richmond were combined in this comparison to adjust for the small sample size in BATS surveys.
2. Source: SF CHAMP model, San Francisco County Transportation Authority, 2030 year model run. Percentage shows total percent of daily trips made to and from each zone on transit.

Source: Fehr & Peers, May 2009

As shown in Table 9, the transit mode share utility model predicts higher transit mode shares for some origin-destination pairs compared to the SF CHAMP model but similar mode shares as the BATS survey data. Given that BATS data represents actual surveys, the mode choice model appears to reasonably predict transit mode share for other outer areas of San Francisco and may be more accurate than the SF CHAMP model for uses in this area of San Francisco.

Project Mode Share

Since the model performed well for the selected origin-destination pairs during calibration and validation, the mode choice model was applied to the proposed project, assuming that the proposed transit improvements described in the project's Transportation Plan would be fully implemented.

As proposed, the Bayview Waterfront Project would provide a high level of transit service during peak hours. The transit plan can be found in Appendix D.

The mode choice model predictions for the proposed project's transit mode share and trip distribution are summarized in Tables 10 & 11. Appendix G contains the model inputs for the project's transit mode share. The transit mode shares for the project shown in the table reflect only external trips. The mode choice model was designed specifically for purposes of predicting transit ridership between given origin-destination pairs within San Francisco and northern San Mateo County zones in near proximity - including Brisbane, Daly City/Colma, and San Bruno/South San Francisco - which have fundamentally different transit characteristics than areas further outside of San Francisco. The mode share for the North Bay, South Bay, and East Bay was estimated from the SF CHAMP and MTC model.

Table 10
PM Peak Hour Work Trips: Bayview Waterfront Project Transit Mode Share

Trip Endpoint 1	Trip Endpoint 2	Predicted Transit Mode Share	Number of Transit Trips
Candlestick Point/Hunters Point Shipyard	Downtown	75%	501
	South of Market (SoMa)	73%	238
	North Beach/Chinatown	75%[1]	220
	Western Market	31%	125
	Mission / Potrero Hill	15%	103
	Noe Valley / Glen Park / Bernal	24%	59
	Marina / Northern Heights	31%	71
	Richmond	23%	27
	Bayshore	19%	106
	Outer Mission	22%	43
	Hill Districts	23%	29
	Sunset	33%	95
	Bayview Waterfront Project	19%[3]	16
	South Bay[2]	13%	63
	East Bay[2]	8%	82
	North Bay[2]	1%	2
	Brisbane	9%	21
	Daly City / Colma	17%	142
	San Bruno / S. San Francisco	13%	41

Notes:
1. Due to variables for trips between North-Beach/Chinatown that exceeded the range of values used in the model calibration the transit mode share between the project and this area was capped at 75%, the highest reported transit mode share in the BATS survey data used to develop the model.
2. Due to the distance from the project site and difference in transit characteristics for persons traveling to the North Bay, East Bay, and South Bay, transit mode share percentages were derived from BATS transit mode shares for the Bayshore District instead of using the Transit Mode Choice Utility.
3. Uses same transit mode share as Bayshore district.

Source: Fehr & Peers, May 2009

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Table 11
PM Peak Period Non-Work Trips: Bayview Waterfront Project Transit Mode Share

Trip Endpoint 1	Trip Endpoint 2	Predicted Transit Mode Share	Number of Transit Trips
Candlestick Point/Hunters Point Shipyard	Downtown	42%	135
	South of Market (SoMa)	41%	86
	North Beach/Chinatown	41%[1]	74
	Western Market	21%	78
	Mission / Potrero Hill	13%	110
	Noe Valley / Glen Park / Bernal	15%	72
	Marina / Northern Heights	28%	55
	Richmond	26%	17
	Bayshore	13%	267
	Outer Mission	14%	64
	Hill Districts	13%	26
	Sunset	24%	66
	Bayview Waterfront Project	13%[3]	40
	South Bay[2]	13%	61
	East Bay[2]	3%	17
	North Bay[2]	5%	4
	Brisbane	8%	87
	Daly City / Colma	10%	106
	San Bruno / S. San Francisco	9%	56

Notes:
1. Due to variables for trips between North-Beach/Chinatown that exceeded the range of values used in the model calibration the transit mode share between the project and this area was capped at 41%, approximately the highest reported transit mode share in the BATS survey data used to develop the model.
2. Due to the distance from the project site and difference in transit characteristics for persons traveling to the North Bay, East Bay, and South Bay, transit mode share percentages were derived from BATS transit mode shares for the Bayshore District instead of using the Transit Mode Choice Utility.
3. Uses same transit mode share as Bayshore district.

Source: Fehr & Peers, May 2009

7. BAYVIEW WATERFRONT PRELIMINARY TRAVEL DEMAND SUMMARY

External person trips by auto and bicycling were calculated by subtracting transit person trips from total external person trips. BATS data for the Bayshore/Bayview neighborhood indicate that approximately two percent of trips are currently made by bicycle. Assuming a similar bicycle mode share for the proposed project, the number of external bike trips for the Bayview Waterfront Project was calculated. The remainder of external person trips was assumed to be vehicle (auto) person trips. A vehicle occupancy factor of 1.6 was used to convert person trips by auto into vehicle trips. The following tables summarize the PM peak hour mode split calculations and trip distribution patterns for the Bayview Waterfront Plan.

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Table 12
Bayview Waterfront Project PM Peak Hour Trip Generation Summary

	Net New	Person Trips					Vehicle Trips
		auto	transit	bicycle	internal	total	
Hunters Point Shipyard							
residential	2650 units	1,182	347	47	630	2206	739
retail	125 ksf	513	94	19	250	877	321
R&D	2500 ksf	1,533	484	62	831	2910	958
park	238 acres	12	4	1	7	24	8
stadium/artists	--[1]	109	35	4	59	208	68
subtotal		**3349**	**964**	**133**	**1778**	**6226**	**2093**
mode split %		54%	15%	2%	29%		
mode split of external trips %		75%	22%	3%			
Candlestick							
residential	7594 units	3,409	1001	136	1773	6320	2131
retail	760 ksf	3,919	720	143	1,865	6646	2449
hotel	220 rooms	112	34	5	59	210	70
office/arena	150 ksf	301	96	12	159	568	188
park	97 acres	6	2	0	3	11	4
subtotal		**7746**	**1853**	**297**	**3859**	**13755**	**4841**
mode split %		56%	13%	2%	28%		
mode split of external trips %		78%	19%	3%			
India Basin							
residential	1240 units	483	142	19	389	1034	302
retail	100 ksf	364	67	13	268	712	227
office	1365 ksf	1,181	376	48	969	2574	738
subtotal		**2028**	**585**	**81**	**1626**	**4320**	**1268**
mode split %		47%	14%	2%	38%		
mode split of external trips %		75%	22%	3%			
TOTAL BWP		**13124**	**3402**	**511**	**7264**	**24301**	**8203**
mode split %		54%	14%	2%	30%		
mode split of external trips only%		77%	20%	3%			

Notes:
1. Equivalent ITE trip generation was derived for Artist's Space and weekday stadium use based on adjusted net square footage.
Source: Fehr & Peers, May 2009

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Table 13
Bayview Waterfront Project PM Peak Hour Distribution for Work and Non-Work Trips

	Person Trips		Transit Trips		Vehicle Trips	
	Work	Non-work	Work	Non-work	Work	Non-work
San Francisco						
Downtown	9%	3%	25%	10%	3%	2%
Rest of SD 1	9%	4%	23%	11%	3%	3%
SD 2	10%	6%	11%	11%	10%	6%
SD 3	26%	44%	17%	41%	29%	45%
SD 4	4%	3%	5%	5%	4%	3%
Subtotal SF	*58%*	*60%*	*82%*	*78%*	*49%*	*59%*
Brisbane, DC, Colma, SB, SSF	19%	28%	10%	16%	22%	29%
Rest of SB	7%	5%	3%	4%	8%	5%
EB	14%	6%	4%	1%	18%	7%
NB	2%	1%	0%	0%	3%	1%

Source: Fehr & Peers, 2009

8. TRANSIT ASSIGNMENT

The total number of transit person trips during the PM peak hour between the project site and each of the 19 zones is summarized in Table 14. The number of transit trips shown is bi-directional.

Table 14
Bayview Waterfront Project: PM Peak Hour Transit Trip Distribution

Trip Endpoint 1	Trip Endpoint2	Transit Person Trips
Candlestick Point/Hunters Point Shipyard	Downtown	636
	South of Market (SoMa)	323
	North Beach/Chinatown	293
	Western Market	203
	Mission / Potrero Hill	213
	Noe Valley / Glen Park / Bernal	131
	Marina / Northern Heights	126
	Richmond	44
	Bayshore	372
	Outer Mission	107
	Hill Districts	55
	Sunset	161
	Bayview Waterfront Project	55
	South Bay	124
	East Bay	100
	North Bay	6
	Brisbane	108
	Daly City / Colma	248
	San Bruno / S. San Francisco	97

Source: Fehr & Peers, May 2009

The transit passengers for the Bayview Waterfront Project area were then split up into groups sharing similar travel patterns. For example, the Candlestick Point area is served by different transit routes than the Hunters Point Shipyard/India Basin area and was grouped accordingly. These groups of transit riders were assumed to use the same transit routes from their respective areas to the regional destinations. Using the person trips calculated for each development area, referenced in Table 2, the person trip group split was calculated at 41% of person trips for the Hunters Point Shipyard/India Basin area and 59% for Candlestick Point for the PM peak hour. Furthermore, inbound and outbound trips were calculated for the entire project. In all, 48% of person trips were inbound while 52% were outbound during the PM peak hour. Combining these factors, Table 15 shows the split by transit person trip travel pattern.

Table 15
Bayview Waterfront Project Transit Travel Pattern for Each Origin-Destination

Travel Pattern	Mode Choice Model Predicted Mode Share
Hunters Point Shipyard/India Basin Inbound	19%
Hunters Point Shipyard/India Basin Outbound	21%
Candlestick Point Inbound	28%
Candlestick Point Outbound	31%

Source: Fehr & Peers, January 2009

Transit riders were assigned to specific transit routes for each origin-destination zone and for each travel pattern cohort. The transit assignment assumed an enhanced service scenario as described in Appendix D.

Since it is possible to use many different routes to get to the same destination, each travel pattern was further split up to reflect the choice transit riders have in traveling to their destination. Since large zones were used to determine mode choice and transit assignment, there is a diversity of destinations to reach within each zone; some destinations are better reached using different transit routes. Actual route preference is also a combination of many non-quantifiable factors. For the purposes of this exercise, probabilities were produced for each route of travel to and from each zone. The probabilities were subject to the following general conditions in descending order of importance: faster routes were always preferred, routes serving major activity centers such as business districts and transit hubs were more preferred to those not directly serving those areas, rail transportation was generally preferred when travel times were approximate to non-rail routes.

In order to aid the accounting of major travel patterns within each route, some routes were further disaggregated into discrete route segments for which large groups of passengers will follow the same travel pattern. Some passengers may ride a route for a short segment before transferring to another route. Others will continue on that route to other parts of San Francisco and potentially through the maximum load point of the entire route. For purposes of the capacity analysis, these segments were separated for some routes that carry groups of passengers to different destinations.

The transit assignment can be found in Appendix H.

The final step was to sum the transit passengers by route segment and analyze how ridership will affect the capacity of each transit line. Passengers traveling to and from Hunters Point Shipyard and Third Street, a major transfer point, are served by multiple routes that use similar streets to get there. Since such passengers would have no particular route preference, they were assigned to the routes in proportion to their frequency.

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Year 2006 Muni transit route characteristics were obtained to determine the maximum existing loads, headways, and existing hourly capacity along each route segment. Since the transit proposal calls for reduced headways along some routes in the area, transit ridership would increase off-site as a result. An elasticity of 0.5 was used[2] for increased ridership as a function of increased capacity. This was multiplied by the existing peak load along the route segment and added to the route segment increased ridership. Table 16 presents a summary of the transit assignment.

Table 16
Bayview Waterfront Project: PM Peak Hour Transit Trip Assignment

Route (direction with respect to project site)	Route Segment	Existing Headway	Proposed Headway	Increased Service Capacity	Existing Hourly Max Load	Induced Ridership at Max Load[1]	BWP Transit Ridership at Max Load
CPX Inbound		0.0	10.0	0%	0	0	246
HPX Inbound		0.0	12.0	0%	0	0	163
Route 48 Inbound	From Noe Valley to Third	12.0	10.0	17%	160	13	28
	From Third to Project	12.0	10.0	17%	74	6	76
Route 28L Inbound	From Sunset to Balboa	0.0	10.0	0%	0	0	87
	From Balboa to Project	0.0	5.0	0%	0	0	460
	Between CP and HPS	0.0	5.0	0%	0	0	73
Route 29 Inbound	From Sunset to Balboa	10.0	10.0	0%	160	0	8
	From Balboa to Third	10.0	5.0	50%	123	31	17
	From Third to Project	10.0	5.0	50%	21	5	309
Route 44 Inbound	From Hill Districts to Third	7.5	6.0	20%	334	33	40
	From Third to Project	7.5	6.0	20%	84	8	162
T-Third Inbound	From Downtown to Mariposa	8.5	4.0	26%	333	44	340
	From Mariposa to Project	8.5	8.0	3%	330	5	340
Route 24 Inbound	From Third to Project	10.0	6.0	40%	15	3	165
	From Noe Valley to Third	10.0	6.0	40%	147	29	117
	From W. Market to Noe Valley	10.0	6.0	40%	215	43	80
Route 9 Inbound		7.5	10.0	0%	274	0	41
Route 45 Inbound		9.0	10.0	0%	316	0	40
Caltrain Inbound		60.0	60.0	0%	226	0	89
BART Inbound		3.0	3.0	0%	4230	0	196
GGT Inbound		20.0	20.0	0%	100	0	3
Route 43 Inbound		10.0	10.0	0%	229	0	15
SAM Inbound		7.5	7.5	0%	245	0	66

[2] Victoria Transport Policy Institue, http://www.vtpi.org/tranelas.pdf

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Table 16
Bayview Waterfront Project: PM Peak Hour Transit Trip Assignment

Route (direction with respect to project site)	Route Segment	Existing Headway	Proposed Headway	Increased Service Capacity	Existing Hourly Max Load	Induced Ridership at Max Load[1]	BWP Transit Ridership at Max Load
CPX Outbound		0.0	10.0	0%	0	0	364
HPX Outbound		0.0	12.0	0%	0	0	173
Route 48 Outbound	From Third to Noe Valley	12.0	10.0	17%	180	15	31
	From Project to Third	12.0	10.0	17%	87	7	89
Route 28L Outbound	From Balboa to Sunset	0.0	10.0	0%	0	0	93
	From Project to Balboa	0.0	5.0	0%	0	0	524
	Between CP and HPS	0.0	5.0	0%	0	0	79
Route 29 Outbound	From Third to Sunset	10.0	10.0	0%	124	0	13
	From Third to Balboa Park	10.0	5.0	50%	101	25	22
	From Project to Third	10.0	5.0	50%	71	18	250
Route 44 Outbound	From Third to Hill Districts	7.5	6.0	20%	187	19	46
	From Project to Third	7.5	6.0	20%	114	11	187
T-Third Outbound	From Mariposa to Downtown	8.5	4.0	26%	369	49	364
	From Project to Mariposa	8.5	8.0	3%	278	4	364
Route 24 Outbound	From Project to Third	10.0	6.0	40%	15	3	180
	From Third to Noe Valley	10.0	6.0	40%	114	23	122
	From Noe Valley to W. Market	10.0	6.0	40%	144	29	84
Route 9 Outbound		7.5	10.0	0%	429	0	46
Route 45 Outbound		9.0	10.0	0%	300	0	46
Caltrain Outbound		60.0	60.0	0%	274	0	101
BART Outbound		3.0	3.0	0%	16000	0	219
GGT Outbound		20.0	20.0	0%	120	0	3
Route 43 Outbound		10.0	10.0	0%	152	0	17
SAM Outbound		7.5	7.5	0%	261	0	72

Notes:
1. Assumes 0.5 elasticity of demand for ridership compared to percentage of hourly seat capacity increases based on proposed service enhancements. Source: Victoria Transport Policy Institute.

Source: Fehr & Peers May 2009

Additionally, analysis of cumulative transit ridership conditions were analyzed and are presented on Table 17. The SFCTA CHAMP model was used to extrapolate growth factors for cumulative background (no Bayview Waterfront Project) transit ridership between years 2005 and 2030. Project and induced transit trips were added to the cumulative background transit ridership to obtain cumulative "with project" transit ridership volumes. Additionally, several planned developments' impacts on transit ridership in the area were taken into account. Forecasted transit ridership was obtained for planned projects at Visitacion Valley and Executive Park and were manually added to routes serving the Bayview Waterfront Project. Table 17 displays a summary of the capacity analysis by transit route.

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Table 17
Bayview Waterfront Project PM Peak Hour Transit Line Capacity Analysis

Route (direction with respect to project site)	Route Segment	Existing Max Load (2006)	2005-2030 Background Growth Factor[2]	Induced Ridership	BWP Ridership	Visitacion Valley, Executive Park Ridership	Future Hourly Max Load (2030)	Existing Hourly Capacity	Future Hourly Capacity	Existing Load-Capacity Ratio[1]	With Project Load-Capacity[1]
CPX Inbound		0	0	0	246	32	278	0	324	0%	86%
HPX Inbound		0	+11	0	163	0	174	0	270	0%	64%
Route 48 Inbound	From Noe Valley to Third	160	1.36	13	28	0	260	270	324	59%	80%
	From Third to Project	74	1.36	6	76	0	183	270	324	27%	57%
Route 28L Inbound	From Sunset to Balboa	0	+524	0	87	59	670	0	480	0%	140%
	From Balboa to Project	0	+319	0	460	250	1029	0	960	0%	107%
	Between CP and HPS	0	0	0	73	17	90	0	960	0%	9%
Route 29 Inbound	From Sunset to Balboa	160	1.20	0	8	0	199	324	324	49%	61%
	From Balboa to Third	123	1.20	31	17	0	195	324	648	38%	30%
	From Third to Project	21	1.20	5	309	0	340	324	648	6%	52%
Route 44 Inbound	From Hill Districts to Third	334	1.00	33	40	0	407	432	540	77%	75%
	From Third to Project	84	1.00	8	162	0	254	432	540	19%	47%
T-Third Inbound	From Downtown to Mariposa	333	2.57	44	340	13	1254	808	3030	41%	41%
	From Mariposa to Project	330	2.51	44	340	18	1190	808	1616	41%	74%
Route 24 Inbound	From Third to Project	15	1.00	3	165	17	200	324	540	5%	37%
	From Noe Valley to Third	147	1.00	29	117	19	312	324	540	45%	58%
	From W. Market to Noe Valley	215	1.00	43	80	19	357	324	540	66%	66%
Route 9 Inbound		274	1.00	0	41	5	320	640	480	43%	67%
Route 45 Inbound		316	1.00	0	40	0	356	378	324	84%	110%
Caltrain Inbound		226	1.14	0	89	0	347	560	560	40%	62%
BART Inbound		4230	1.33	0	196	0	5821	16000	20000	26%	29%
GGT Inbound		100	1.00	0	3	0	103	162	162	62%	64%
Route 43 Inbound		229	1.00	0	15	0	244	324	324	71%	75%
SAM Inbound		245	1.10	0	66	0	336	320	320	77%	105%

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Table 17
Bayview Waterfront Project PM Peak Hour Transit Line Capacity Analysis

Route (direction with respect to project site)	Route Segment	Existing Max Load (2006)	2005-2030 Background Growth Factor[2]	Induced Ridership	BWP Ridership	Visitacion Valley, Executive Park Ridership	Future Hourly Max Load (2030)	Existing Hourly Capacity	Future Hourly Capacity	Existing Load-Capacity Ratio[1]	With Project Load-Capacity[1]
CPX Outbound		0	1.00	0	364	22	386	0	324	0%	119%
HPX Outbound		0	+34	0	173	0	207	0	270	0%	77%
Route 48 Outbound	From Third to Noe Valley	180	1.23	15	31	0	267	270	324	67%	82%
	From Project to Third	87	1.23	7	89	0	203	270	324	32%	63%
Route 28L Outbound	From Balboa to Sunset	0	+297	0	93	43	433	0	480	0%	90%
	From Project to Balboa	0	+2	0	524	178	704	0	960	0%	73%
	Between CP and HPS	0	0	0	79	12	91	0	960	0%	9%
Route 29 Outbound	From Third to Sunset	124	1.29	0	13	0	173	324	324	38%	53%
	From Third to Balboa Park	101	1.29	25	22	0	177	330	660	31%	27%
	From Project to Third	71	1.29	18	250	0	359	324	648	22%	55%
Route 44 Outbound	From Third to Hill Districts	187	1.08	19	46	0	266	432	540	43%	49%
	From Project to Third	114	1.08	11	187	0	321	432	540	26%	59%
T-Third Outbound	From Mariposa to Downtown	369	3.30	49	364	9	1639	808	3030	46%	54%
	From Project to Mariposa	278	2.82	49	364	12	1165	808	1616	34%	72%
Route 24 Outbound	From Project to Third	15	1.14	3	180	12	212	324	540	5%	39%
	From Third to Noe Valley	114	1.14	23	122	13	287	324	540	35%	53%
	From Noe Valley to W. Market	144	1.14	29	84	13	289	324	540	44%	54%
Route 9 Outbound		429	1.32	0	46	4	616	640	480	67%	128%
Route 45 Outbound		300	1.13	0	46	0	385	378	324	79%	119%
Caltrain Outbound		274	1.01	0	101	0	378	560	560	49%	67%
BART Outbound		16000	1.74	0	219	0	28059	16000	20000	100%	140%
GGT Outbound		120	1.00	0	3	0	3	162	162	74%	76%
Route 43 Outbound		152	1.00	0	17	0	169	324	324	47%	52%
SAM Outbound		261	1.10	0	72	0	359	320	320	82%	112%

Notes:
1. Uses SFMTA's 85% transit vehicle capacity standard for maximum permissible loads. The maximum vehicle passenger capacity (all seats and standing room spaces occupied) is multiplied by 0.85 to obtain the 85% threshold for maximum vehicle loads. SamTrans uses a seat capacity standard of 40 seats per standard 40 ft. bus; assumed BART capacity of 100 passengers per car; assumed Caltrain seat capacity standard of 112 seats per car.
2. SFCTA: 2005 CHAMP model, 2030 Baseline CHAMP model (no project; existing transit service); Growth Factors taken at each route's 2006 maximum load point. For routes that did not exist in 2005, background ridership was taken directly from the SF CHAMP model for areas outside the project limits, Executive Park area, and Visitacion Valley development area.
3. Represents forecasted background ridership at the max load point for the 28L without BWP project trips.

Source: Fehr & Peers May 2009

As shown in Table 17, most transit lines do not exceed their proposed future capacity as a result of the Bayview Waterfront project. Exceptions include Route 28L inbound, the Candlestick Point Express outbound, Route 9 outbound, Route 45 inbound and outbound, and SamTrans inbound and outbound. Many of these routes are forecasted to exceed capacity due to background cumulative growth regardless of the project contribution to ridership growth.

CONCLUSION

The person trip generation forecasts developed using the 4D method and transit mode share utility are reasonable, and have similar internalization rates to other large, high-density, mixed-use sites observed by Fehr & Peers and ITE. Furthermore, the transit utility tool that was developed for the project predicted reasonable preliminary transit mode share percentages for the project, and can be used to analyze the impact the project will have on transit serving the site. We therefore recommend using the person-trip generation and mode split information described in this report.

This letter report is is the product of a number of refinements and incorporates a number changes reflecting input from a variety of City agencies. Please feel free to call if you have any questions.

Sincerely,
FEHR & PEERS

Chris Mitchell, PE
Associate

SF08-0407

APPENDIX H: SF SUPERDISTRICT MAP

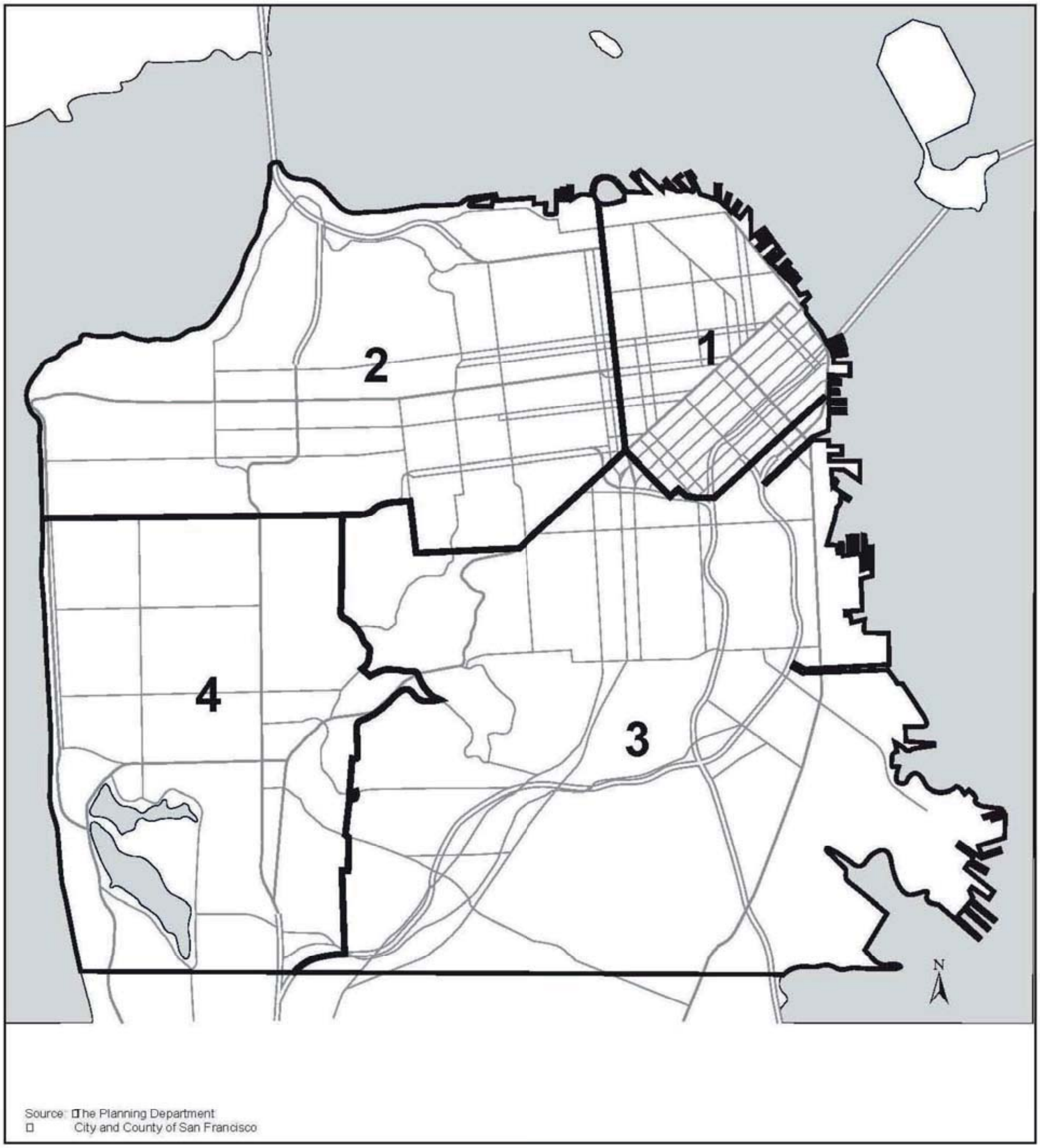

Figure A: Map of San Francisco Showing Superdistrict Boundaries

APPENDIX I: TRAVEL DEMAND ESTIMATES

<u>Land Use Configuration</u>

Source: India Basin Notice of Preparation of an Environmental Impact Report and Public Scoping Meeting, April 30, 2015, modified September 15, 2015 per Monica Melkesian's email dated September 10, 2015.

Land Use	Proposed Project	Maximum Commercial Variant	% unit breakdown	
			Proposed Project	Maximum Commercial Variant
RESIDENTIAL (units)	**1,239**	**499**		
Studio	198	50	16%	10%
1 BR	236	125	19%	25%
2 BR[1]	669	274	54%	55%
3+ BR	136	50	11%	10%
Senior Housing	-	-		
RETAIL (sf)	**100,400**	**140,000**		
General Retail	40,400	70,000		
Supermarket	25,000	25,000		
Sit-down Restaurant	15,000	25,000		
Composite Rate	20,000	20,000		
Fast Food	-	-		
OFFICE (sf)	**174,930**	**860,000**		
General	174,930	675,000		
Gov't - Admin	-	100,000		
Gov't - High Public Use	-	85,000		
R&D - India Basin	-			
OTHER	-			
School (students)	450	450		
Open Space (acres)	**19.05**	**19.05**		
Open Space (sf)	**829,700**	**829,700**		
Big Green open space	237,400	237,400		
India Basin Open Space	270,000	270,000		
900 Innes	78,400	78,400		
India Basin Shoreline Park	243,900	243,900		
PARKING (spaces)				
Vehicle Parking	1370	1912		
Bicycle Parking	1240	500		

1. This count does not include the 2-bedroom house on the existing site that will be part of the new project but will not generate new trips as compared to existing conditions.

Open Space Trip Generation Rate

ITE Trip Generation, 9th Edition[1]

	ITE Name	ITE Code	Trips (per acre)	In	Out
AM	City Park	411	4.5	56%	44%
PM			3.5	57%	43%

Data Collection

City of San Francisco
Heron's Head Park
Thursday, 6-25-2015

Size (acres): 22 [2]

Period	Start Time	Vehicle Trips IN	Vehicle Trips OUT	AVO[3]	Auto Person Trips IN	Auto Person Trips OUT	Bicycles IN	Bicycles OUT	Pedestrians IN	Pedestrians OUT	Person Trips TOTAL	Person Trips Hourly	
AM	7:00	3	0	1.05	3	0	0	0	0	0	3	19	
	:15	4	3		4	3	0	0	0	0	7	20	
	:30	2	3		2	3	0	0	0	0	5	15	
	:45	2	1		2	1	0	0	0	0	3	17	
	8:00	1	3		1	3	0	0	0	0	4	24	<< peak hour
	:15	2	0		2	0	0	0	0	0	2		
	:30	4	1		4	1	2	0	0	0	7		
	:45	6	2		6	2	1	0	1	0	10		
	Total	**24**	**13**		**25**	**14**	**3**	**0**	**1**	**0**	**43**		
PM	4:00	2	0	1.05	2	0	1	1	1	0	5	22	
	:15	0	0		0	0	0	2	1	3	6	22	<< peak hour
	:30	3	4		3	4	0	1	0	1	9	19	
	:45	0	1		0	1	0	0	0	0	1	16	
	5:00	2	2		2	2	0	0	1	0	5	17	
	:15	1	2		1	2	0	0	0	0	3		
	:30	3	1		3	1	1	0	0	1	6		
	:45	0	2		0	2	0	0	0	0	2		
	Total	**11**	**12**		**12**	**13**	**2**	**4**	**3**	**5**	**38**		

Rate Calculation

Person Trip rate per acre[4]					
Vehicle	Bicycle	Ped	**Total**	% IN	% OUT
4.73	0.71	0.24	**5.67**	**56%**	**44%**
83%	13%	4%	**100%**		
3.68	0.88	1.75	**6.30**	**57%**	**43%**
58%	14%	28%	**100%**		

ITE Land Use 412 - County Park[1]
2.28 daily
0.59 PM peak hour of generator

Convert PM to daily factor:
3.86

DAILY Vehicle trip rate	DAILY Person Trip rate per acre Vehicle	Bicycle	Ped	**Total**	% IN	% OUT
13.52	14.20	3.38	6.76	**24.34**	50%	50%

AM as % of Daily	PM as % of daily	AM as % of PM
23%	26%	90%

Notes:

1. Source: ITE Trip Generation, 9th Edition
   ITE Code 411 - City Park
   AM: T = 4.5(X); Enter: 56%, Exit 44%
   PM: T = 3.5(X); Enter: 57%, Exit: 43%
   ITE Code 412 - County Park
   Daily: T = 2.28(X); Enter: 50%, Exit: 50%
   PM: T = 0.59(X); Enter: 35%, Exit: 65%
2. Source: http://www.sfport.com/index.aspx?page=210
3. AVO of 1.05 was observed (based on 95% single occupancy and 5% 2-person occupancy
4. Person trips were calculated by applying the mode split from the Heron's Head data collection to the ITE rates for City Park (411)

Heron's Head Data Collection:
All pedestrians and bicycles used the trail
Except for 3 vehicles, all others came to park with dogs during AM period
There is a total of 25 stalls available including 22 regular and 3 for handicapped
There was 1 car in the lot at 7 am, and 2 cars at 4 pm

School Trip Generation Rate

Determining AM to PM and AM to Daily Conversion Rate

Land Use		Trip Generation (per student)			Conversion Rate
ITE Name	ITE Code	AM	PM	Daily	PM as a Percent of AM
Elementary School	520	0.45	0.15	1.29	
Middle School/Junior High	522	0.54	0.16	1.62	
Average		**0.50**	**0.16**	**1.46**	**31%**

Determining Student Person Trip Generation Rates Using Data from Sacred Heart School

	Student person trips												
	AM peak hour - to campus							PM peak hour - from campus			Daily		
	Mode split for students, not incl. parents[1]	Total Trips per Student[2,3]	Trips In Per Student	Trips Out Per Student	Student Mode Split	AVO[4]	AM to PM conversion rate[5]	Total Trips per Student	Trips In Per Student	Trips Out Per Student	Trips	In	Out
Auto (One Student)	24%	3	2	1	92%	1.54	31%	0.94	0.31	0.63			
Auto (2+ Students)	59%	2	1.5	0.5			31%	0.63	0.16	0.47			
Walk	13%	1	1	0	6%		31%	0.31	0	0.31			
Transit	3%	1	1	0	1%		31%	0.31	0	0.31			
Other	1%	1	1	0	0%		31%	0.31	0	0.31			
Total	**100%**	**8**	**6.5**	**1.5**	**100%**			**2.5**	**0.47**	**2.03**			
Person trips per student, weighted by mode		2.1	1.5	0.5			31%	0.7	0.2	0.5	4.2		
			% In	% Out					% In	% Out		% In	% Out
Auto Mode[6]			72%	28%					30%	70%		50%	50%
Non-auto Modes			100%	0%					0%	100%		50%	50%
All Modes			**74%**	**26%**					**26%**	**74%**		**50%**	**50%**

0% Auto mode split reduction as fewer drivers expected at this site than at Sacred Heart School

PM as % of daily	AM as % of PM
15.7%	318.2%

Notes:

1. Observed student mode split from Table 7 of *Sacred Heart Campus Circulation Study*, by Fehr & Peers, dated April 24, 2015
2. Person trips for "Auto (One Student)" is 3 because it is 2 parent trips (one in, one out) plus 1 student trip.
3. Person trips for "Auto (2 Students)" is 1.5 because the two parent trips (1 in, 1 out) are distributed amongst the 2 students in the car. Plus 2 student trips in.
4. Automobile vehicle occupancy calculated by proportional average of Auto-1 Student and Auto-2 Student, factoring inbound and outbound trips.
5. AM to PM conversion rate taken from ITE assessment as per table above because PM peak hour data not available for Sacred Heart.
6. Auto mode has a different in/out split because there are parents making return leg in opposite direction. All other modes are not chaperoned and therefore do not have bidirectionality

Determining Staff Person Trip Generation Rates Using Data from Sacred Heart School

	Person trip rates[1]		
	staff	% in	% out
AM	0.5	100%	0%
PM	0.5	0%	100%
Daily	2	50%	50%

PM as % of daily	AM as % of PM
25%	100%

	Mode split[2]
Auto	100%
Walk	0%
Transit	0%

Notes:

1. Observed staff trip rates from Table 4 of *Sacred Heart Campus Circulation Study*, by Fehr & Peers, dated April 24, 2015
2. Staff mode split was observed to be almost entirely automobile, and so mode split is slightly conservatively estimated to be 100% auto

PM to AM Conversion Factor

Land Use			Trip Generation				
			AM Peak			PM Peak	
Project	ITE Name	ITE Code	Trips	% IN[1]	% OUT[1]	Trips	AM to PM Conversion factor
Residential	Mid-Rise Apartment	223	0.3	31%	69%	0.39	77%
R&D Lab Area	Research and Development C	760	1.22	83%	17%	1.07	114%
Clinical Use	General Office Building	710	1.56	88%	12%	1.49	105%
Administrative Use	General Office Building	710	1.56	88%	12%	1.49	105%
General Office	General Office Building	710	1.56	88%	12%	1.49	105%
Restaurant	Quality Restaurant	931	0.81	82%	18%	7.49	11%
Café	High-Turnover (sit-down) res	932	10.81	55%	45%	9.85	110%
Supermarket	Supermarket	850	3.4	62%	38%	9.48	36%
General Retail	Shopping Center	820	0.96	62%	38%	3.71	26%
Alternates not used:							
Administrative Use[2]	Government Office Complex	733	2.21			2.85	78%
General Office[3]	Office Park	750	1.71			1.48	116%

Notes:

1. In/out splits are for peak hour of nearby traffic, except for Quality Restaurant where data not available and peak hour of generator was used instead
2. Not used because sample size unacceptably low
3. Not used because suburban land uses represented only - not applicable to project
4. Since all office types used in/out split for general office, they have been summed in that row

Weighted Average AM Conversion Factors and In/Out Splits

	Proposed Project				Maximum Commercial Variant			
Land Use Type	Amount (units, ksf, etc)	Weighted Average PM to AM Conversion Factor	AM - Weighted Average In %	AM - Weighted Average Out %	Amount (units, ksf, etc)[4]	Weighted Average PM to AM Conversion Factor	AM - Weighted Average In %	AM - Weighted Average Out %
Residential	1239	77%	31%	69%	499	77%	31%	69%
Office	175	105%	88%	12%	0	105%	88%	12%
	0				860			
	0				0			
	0				0			
Retail	15				25			
	20	48%	64%	36%	20	41%	65%	35%
	25				25			
	40.4				70			

Purpose of this table:
In this table, weighted average AM/PM conversion factors and in/out splits are developed for use in vehicle trip generation in/out calculation for AM and PM. By the vehicle trip generation stage, some uses (such as retail, office, and residential) are aggregated for simplicity.

SF Guidelines Trip Generation Rates

Land Use Type	Unit	Rate	PM Peak Hour %	Employee Density	Notes
General	KSF	18.1	8.5%	276	
Gov't - Admin	KSF	36.4	16.2%	276	
Gov't - High Public Use	KSF	43.3	14.5%	276	
Studio	DU	7.5	17.3%		
1 BR	DU	7.5	17.3%		
2 BR	DU	10	17.3%		
3+ BR	DU	10	17.3%		
Senior Housing	DU	5	6.0%		
General Retail	KSF	150	9.0%	350	
Supermarket	KSF	297	7.3%	350	
Sit-down Restaurant	KSF	200	13.5%	350	
Composite Rate	KSF	600	13.5%	350	
Fast Food	KSF	1400	13.5%	240	
Hotel/Motel	Room	7	10.0%	0.9	
Manufacturing/Industrial	KSF	7.9	12.4%	567	
Athletic Club	KSF	57	10.5%		
Cineplex Theater	Seat	1.13	23.0%	0.023	employees/seat
Daycare Center	KSF	67	18.0%		

Source: *SF TIA Guidelines* Appendix C Table C-1

Work/Non-work Splits	Daily		PM Peak Hour	
Land Use Type	Work	Non-Work	Work	Non-Work
General	36%	64%	83%	17%
Government	20%	80%	83%	17%
Retail	4%	96%	4%	96%
Hotel/Motel	12%	88%	60%	40%
Manufacturing/Industrial	40%	60%	67%	33%
Residential	33%	67%	50%	50%

American Community Survey Mode Choice Calculations

Workplace mode - to be applied to residential trips

Census Tract 231.03
2009-2013 ACS 5-year estimates
B08301: MEANS OF TRANSPORTATION TO WORK - Universe: Workers 16 years and over
..\..\Data Collection\Census Data\ACS_13_5YR_B08301.xls

Car, truck, or van - drove alone:	379	50.9%	
Car, truck, or van - carpooled	53	7.1%	
Public Tranportation (excluding taxicab):	247	33.2%	
Walked:	7	0.9%	
Taxicab, motorcycle, bicycle, or other means:	59	7.9%	
Worked at home:	10	<- excluded from mode share	
Total	**755**	**100.0%**	

Calculate Vehicle Occupancy	People	Occupancy	Vehicles
Drove alone	379	1	379
In 2-person carpool	53	2	26.5
In 3-person carpool	0	3	0
In 4-person carpool	0	4	0
In 5- or 6-person carpool	0	5	0
In 7-or-more-person carpool	0	7	0
Total Vehicles:	**432**		**405.5**

Average Vehicle Occupancy: 1.0653514

Using CPHPS Memo to Determine Mode Split for Cumulative Scenario

& Applying Differences in 2015 and 2040 CHAMP Models to Arrive at Mode Split For Baseline

	Mode	Central SoMa CHAMP Model Runs				SF Guidelines (SD-3)[3]				CPHPS Memo (2009)			CPHPS - Cumulative		Convert...	CPHPS - Existing/Baseline (post CHAMP adjustment)	
		SD-3		TAZ 446													
		2015	2040	2015	2040	Work	Non-Work: Retail	Non-Work: Other	Aggregate based on Proposed Project	Aggregate	Work[1]	Non-work[1]	Work[2]	Non-Work[2]	2015 TAZ to 2040 TAZ	Work[2]	Non-Work[2]
Mode split	Auto	58%	56%	64%	55%	71%	64%	57%	64%	75%	70%	83%	58%	69%	-8%	67%	78%
	Transit	14%	17%	12%	20%	20%	12%	19%	16%	22%	27%	15%	23%	12%	8%	15%	4%
	Walk	17%	19%	8%	19%	6%	22%	16%	16%				16%	16%	10%	16%	16%
	Bike	2%	3%	3%	3%	-	-	-	-	3%	3%	3%	3%	3%	1%	2%	2%
	Other	7%	5%	14%	2%	3%	2%	8%	4%						-11%		
Trips	Total					1008	1639	939	3586				100.0%	100.0%		100.0%	100.0%
	%					28%	46%	26%									

Notes:

1. See "Deriving Aggregated Work and Non-Work Mode Splits from CPHPS Memo" Appendix sheet for derivation of these aggregate figure:
2. Walk mode split fixed at 16% = Guidelines walk mode share for Project. This represents a fixed internalization rate
3. Source: *SF Guidelines, 2002* Tables E-5, E-14, and E-15

Deriving Aggregated Work and Non-Work Mode Splits from CPHPS Memo

Zone #	Neighborhood	Total Work Trips[1]	Transit Work Trips[2]	Bicycle Work Trips[3]	Auto Work Trips	Total Non-work Trips[1]	Transit Non-work Trips[4]	Bicycle Non-work Trips[3]	Auto Non-work Trips
1	Downtown	666	501	20	145	322	135	10	177
2	SoMa	330	238	10	82	208	86	6	116
3	North Beach	293	220	9	64	180	74	5	101
4	Western Market	403	125	12	266	370	78	11	281
5	Mission	666	103	20	543	860	110	26	724
6	Noe Valley	247	59	7	181	483	72	14	397
7	Marina	228	71	7	150	194	55	6	133
8	Richmond	116	27	3	86	64	17	2	45
9	Bayshore	559	106	17	436	2044	267	61	1716
10	Outer Mission	195	43	6	146	447	64	13	370
11	Hill District	126	29	4	93	207	26	6	175
12	Sunset	289	95	9	185	274	66	8	200
16	Bayview Project	83	16	2	65	305	40	9	256
13, 17, 18, 19	South Bay	1845	267	55	1523	3170	310	95	2765
14	East Bay	1029	82	31	916	575	17	17	541
15	North Bay	177	2	5	170	82	4	2	76
	Total	***7252***	***1984***	***217***	***5051***	***9785***	***1421***	***291***	***8073***
			27%	***3%***	***70%***		***15%***	***3%***	***83%***

Source:

1. CPHPS Memo (2009) - Table 6
2. CPHPS Memo (2009) - Table 10
3. Assumed that 3% of all external trips are by bicycle, as shown in Table 12 of CPHPS Memo
4. CPHPS Memo (2009) - Table 11

American Community Survey Trip Distribution Calculations

Workplace locations - to be applied to residential trips

SF County v Non SF County work split

Census Tract 231.03

2009-2013 ACS 5-year estimates

B08130: MEANS OF TRANSPORTATION TO WORK BY PLACE OF WORK--STATE AND COUNTY LEVEL - Universe: Workers 16 years and over

..\..\Data Collection\Census Data\ACS_13_5YR_B08130.xls

Worked in County of Residence:		620	82.1%
Worked ouside County of Residence:		135	17.9%
	Total	**755**	**100.0%**

Total Distribution for Residential based work trips via census data

SD-1	49.3%
SD-2	10.9%
SD-3	10.9%
SD-4	10.9%
East Bay	4.7%
North Bay	1.6%
South Bay	10.9%
Other	0.7%

Summary:

SF/Non-SF work place was determined using 231.03 census tract data.
SF work trips were split between superdistricts as per SF Guidelines with 60% working in SD-1 and the remaining 40% split uniformly between other superdistricts.

For Non-SF work trips, data was gathered from Bay Area Census for county-to-county commute flows. Work trips to SF County were excluded. Distribution of Non-SF work trips was then calculated for North Bay, East Bay, South Bay, and other. These % were applied to the Non-SF work trips above.

Out of SF County Place of Work Split

2006-2010 ACS County to County Commute Flows

http://www.bayareacensus.ca.gov/transportation.htm

..\..\Data Collection\Census Data\2006-2010_ACS_Commute_Flows_Bay_Area_residence.xls

Bay Area Aggregates, Place of Work	Number	%				
San Francisco County	330,965	76.3%				
North Bay (Marin, Sonoma, Napa, Solano)	9,299	2.1%	Marin Count	Sonoma Co	Napa Count	Solano County
East Bay (Alameda, Contra Costa)	26,860	6.2%	Alameda Co	Contra Costa County		
South Bay (San Mateo, Santa Clara)	62,510	14.4%	San Mateo C	Santa Clara County		
Other	4,040	0.9%				
Total	433,674	100.0%				

Bay Area Aggregates, EXCLUDING SF County

North Bay (Marin, Sonoma, Napa, Solano)	9,299	9.1%
East Bay (Alameda, Contra Costa)	26,860	26.2%
South Bay (San Mateo, Santa Clara)	62,510	60.9%
Other	4,040	3.9%
Total	102,709	100.0%

Proposed Project

Project Land Use Inputs

Land Use Inputs

Type	Residential Qty	Type	Retail KSF		Type	Office KSF	Type	Other Unit		
									Project Location:	
Studio	198	General Retail	40.4		General	174.93	Hotel/Motel (Rooms)		SD-3	<- for your reference
1 BR	236	Supermarket	25		Gov't - Admin	0	Manufacturing/Industrial (KSF)			
2 BR	669	Sit-down Restaurant	15	Restaurant	Gov't - High Public Use	0	Athletic Club (KSF)			
3+ BR	136	Sit-down Restaurant	20	Café	R&D - India Basin	0	Cineplex Theater (Seats)			
Senior Housing		Fast Food	0				Daycare Center (KSF)			
Total	1239	Total	100.4		Total	174.93	Total	0		

User inputs land use data

Yellow shade indicates manual entry

Daily Trip Generation Calcs

Daily Trip Generation, Trip Type, Trip Direction

Residential			Retail			Office			Other			
Studio	1,485		General Retail	6,060		General	3166.233		Hotel/Motel	0		
1 BR	1,770		Supermarket	7,425		Gov't - Admin	0		Manufacturing/Indu:	0		
2 BR	6,690		Sit-down Restaurant	3,000		Gov't - High Public Use	0		Athletic Club	0		
3+ BR	1,360		Sit-down Restaurant	4,000		General	0	R&D - India Basin	Cineplex Theater	0		
Senior Housing	0		Fast Food	0					Daycare Center	0		
Total	11,305		Total	20,485		Total	3166.233		Total	0		Total Daily Project Trip Generation: 34956.23
	Inbound	Outbound		Inbound	Outbound		Inbound	Outbound		Inbound	Outbound	* in/out distribution is 50/50 for daily, all trip types
	50%	50%		50%	50%		50%	50%		50%	50%	
	IN	OUT		IN	OUT		IN	OUT		IN	OUT	
Work Trips	1,865	1,865	Work Trips	410	410	Work Trips	569.92194	569.92194	Work Trips	0	0	*Total Work Trips: 2844.947*
Non-Work Trips	3,787	3,787	Non-Work Trips	9,833	9,833	Non-Work Trips	1013.19456	1013.19456	Non-Work Trips	0	0	

Generate total person trips based on land use type * lookup of the daily rate from SFG_Tables tab.

Total person trips is split into work/non-work and in/out matrix:
e.g., work trip inbound = total trips*split of work trips*split of inbound trips
Work/non-work split is based on a lookup of the daily split according to land use from SFG_Tables tab.
In/out distribution for daily is assumed at 50/50 (hardcoded in light blue), but can be modified.

PM Peak Hour Trip Generation Calcs

PM Peak Trip Generation, Trip Type, Trip Direction

Residential			Retail			Office			Other			
Studio	257		General Retail	545		General	269.129805		Hotel/Motel	0		
1 BR	306		Supermarket	542		Gov't - Admin	0		Manufacturing/Indu:	0		
2 BR	1,157		Sit-down Restaurant	405		Gov't - High Public Use	0		Athletic Club	0		
3+ BR	235		Sit-down Restaurant	540		General	0 R&D - India Basin		Cineplex Theater	0		
Senior Housing	0		Fast Food	0					Daycare Center	0		
Total	1,956		Total	2,032		Total	269.129805		Total	0		Total PM Peak Project Trip Generation: 4257.32
	Inbound	Outbound		Inbound	Outbound		Inbound	Outbound		Inbound	Outbound	(Plus School, Open Space:) 4401.716
Work Trips	100%	0%	Work Trips	0%	100%	Work Trips	0%	100%	Work Trips	0%	100%	* in/out distributions from SFG Table C-2
Non-Work Trips	33%	67%	Non-Work Trips	50%	50%	Non-Work Trips	50%	50%	Non-Work Trips	50%	50%	
	IN	OUT		IN	OUT		IN	OUT		IN	0	
Work Trips	978	0	Work Trips	0	81	Work Trips	0	223.3777382	Total Work Trips	0	0	
Non-Work Trips	323	655	Non-Work Trips	976	976	Non-Work Trips	22.87603343	22.87603343	Work Trips IN	0	0	

Generate total person trips based on land use type * lookup of the PM peak rate from SFG_Tables tab.

Total person trips is split into work/non-work and in/out matrix.
e.g., work trip inbound = total trips*split of work trips*split of inbound trips
Work/non-work split is based on a lookup of the PM Peak split according to land use from SFG_Tables tab.
In/out distribution for PM Peak is based on text from Table C-2. Can be modified if need be.

Maximum Commercial Program Variant

Project Land Use Inputs

Land Use Inputs

Type	Residential Qty	Type	Retail KSF		Type	Office KSF	Type	Other Unit
Studio	50	General Retail	70		General	675	Hotel/Motel (Rooms)	
1 BR	125	Supermarket	25		Gov't - Admin	100	Manufacturing/Industrial (KSF)	
2 BR	274	Sit-down Restaurant	25	Restaurant	Gov't - High Public U	85	Athletic Club (KSF)	
3+ BR	50	Sit-down Restaurant	20	Café	R&D - India Basin	0	Cineplex Theater (Seats)	
Senior Housing		Fast Food	0				Daycare Center (KSF)	
Total	499	Total	140		Total	860	Total	0

Project Location:
SD-3 <- for your reference

User inputs land use data

Yellow shade indicates manual entry

Daily Trip Generation Calcs

Daily Trip Generation, Trip Type, Trip Direction

Type	Residential	Type	Retail	Type	Office		Type	Other
Studio	375	General Retail	10,500	General	12,218		Hotel/Motel	0
1 BR	938	Supermarket	7,425	Gov't - Admin	3,640		Manufacturing/Indu:	0
2 BR	2,740	Sit-down Restaurant	5,000	Gov't - High Public U	3,681		Athletic Club	0
3+ BR	500	Sit-down Restaurant	4,000	General	0	R&D - India Basin	Cineplex Theater	0
Senior Housing	0	Fast Food	0				Daycare Center	0
Total	4,553	Total	26,925	Total	19,538		Total	0

Total Daily Project Trip Generation: 51015.5

	Residential Inbound	Residential Outbound		Retail Inbound	Retail Outbound		Office Inbound	Office Outbound		Other Inbound	Other Outbound
	50%	50%		50%	50%		50%	50%		50%	50%
	IN	OUT		IN	OUT		IN	OUT		IN	OUT
Work Trips	751	751	Work Trips	539	539	Work Trips	2,931	2,931	Work Trips	0	0
Non-Work Trips	1,525	1,525	Non-Work Trips	12,924	12,924	Non-Work Trips	6,838	6,838	Non-Work Trips	0	0

* in/out distribution is 50/50 for daily, all trip types

Total Work Trips: 4220.863

Generate total person trips based on land use type * lookup of the daily rate from SFG_Tables tab.

Total person trips is split into work/non-work and in/out matrix:
e.g., work trip inbound = total trips*split of work trips*split of inbound trips
Work/non-work split is based on a lookup of the daily split according to land use from SFG_Tables tab.
In/out distribution for daily is assumed at 50/50 (hardcoded in light blue), but can be modified.

PM Peak Hour Trip Generation Calcs

PM Peak Trip Generation, Trip Type, Trip Direction

Type	Residential	Type	Retail	Type	Office		Type	Other
Studio	65	General Retail	945	General	1,038		Hotel/Motel	0
1 BR	162	Supermarket	542	Gov't - Admin	590		Manufacturing/Indu:	0
2 BR	474	Sit-down Restaurant	675	Gov't - High Public U	534		Athletic Club	0
3+ BR	87	Sit-down Restaurant	540	General	0	R&D - India Basin	Cineplex Theater	0
Senior Housing	0	Fast Food	0				Daycare Center	0
Total	788	Total	2,702	Total	2,162		Total	0

Total PM Peak Project Trip Generation: 5651.448
(Plus School, Open Space:) 5795.844

	Residential Inbound	Residential Outbound		Retail Inbound	Retail Outbound		Office Inbound	Office Outbound		Other Inbound	Other Outbound
Work Trips	100%	0%	Work Trips	0%	100%	Work Trips	0%	100%	Work Trips	0%	100%
Non-Work Trips	33%	67%	Non-Work Trips	50%	50%	Non-Work Trips	50%	50%	Non-Work Trips	50%	50%
	IN	OUT		IN	OUT		IN	OUT		IN	0
Work Trips	394	0	Work Trips	0	108	Work Trips	0	1,794	Total Work Trips	0	0
Non-Work Trips	130	264	Non-Work Trips	1,297	1,297	Non-Work Trips	184	184	Work Trips IN	0	0

* in/out distributions from SFG Table C-2

Generate total person trips based on land use type * lookup of the PM peak rate from SFG_Tables tab.

Total person trips is split into work/non-work and in/out matrix.
e.g., work trip inbound = total trips*split of work trips*split of inbound trips
Work/non-work split is based on a lookup of the PM Peak split according to land use from SFG_Tables tab.
In/out distribution for PM Peak is based on text from Table C-2. Can be modified if need be.

Report Table: Project Person Trip Generation

Land Use	Size	Trip Generation Rates				Person Trips Generated		
		Daily Trip Rate	AM Peak Hour as % of Daily	PM Peak Hour as % of Daily	AM Peak Hour as % of PM	Daily	AM Peak Hour	PM Peak Hour
Proposed Project								
Residential	198 studio units	7.5 per unit	13.3%	17.3%	77%	1,485	198	257
	236 1-bedroom units	7.5 per unit	13.3%	17.3%	77%	1,770	235	306
	805 2+ bedroom units	10 per unit	13.3%	17.3%	77%	8,050	1,072	1,393
	Subtotal					**11,305**	**1,505**	**1,956**
Commercial	174,930 sf General Office	18.1 per ksf	8.9%	8.5%	105%	3,166	282	269
	Subtotal					**3,166**	**282**	**269**
Retail	15,000 sf Restaurant	200 per ksf	1.5%	13.5%	11%	3,000	44	405
	20,000 sf Café	200 per ksf	14.8%	13.5%	110%	4,000	593	540
	25,000 sf Supermarket	297 per ksf	2.6%	7.3%	36%	7,425	194	542
	40,400 sf General Retail	150 per ksf	2.3%	9.0%	26%	6,060	141	545
	Subtotal					**20,485**	**972**	**2,032**
Educational	450 students	4.2 per student	50.0%	15.7%	318%	1,890	945	297
	95 staff	2.0 per staff	25.0%	25.0%	100%	190	48	48
	Subtotal					**2,080**	**993**	**345**
Open Space	19.05 acres	24.3 per acre	23.3%	25.9%	90%	**464**	**108**	**120**
Total		--		--	--	**37,500**	**3,860**	**4,722**
Maximum Commercial Program Variant								
Residential	50 studio units	7.5 per unit	13.3%	17.3%	77%	375	50	65
	125 1-bedroom units	7.5 per unit	13.3%	17.3%	77%	938	125	162
	324 2+ bedroom units	10 per unit	13.3%	17.3%	77%	3,240	432	561
	Subtotal					**4,553**	**607**	**788**
Commercial	85,000 sf Clinical Use	43.3 per ksf	15.2%	14.5%	105%	3,681	559	534
	100,000 sf Administrative	36.4 per ksf	17.0%	16.2%	105%	3,640	618	590
	400,000 sf General Office & 275,000 sf R&D Lab Area	18.1 per ksf	8.9%	8.5%	105%	12,218	1,087	1,038
	Subtotal					**19,539**	**2,264**	**2,162**
Retail	25,000 sf Restaurant	200 per ksf	1.5%	13.5%	11%	5,000	73	675
	20,000 sf Café	200 per ksf	14.8%	13.5%	110%	4,000	593	540
	25,000 sf Supermarket	297 per ksf	2.6%	7.3%	36%	7,425	194	542
	70,000 sf General Retail	150 per ksf	2.3%	9.0%	26%	10,500	245	945
	Subtotal					**26,925**	**1,105**	**2,702**
Educational	450 students	4.2 per student	50.0%	15.7%	318%	1,890	945	297
	95 staff	2.0 per staff	25.0%	25.0%	100%	190	48	48
	Subtotal					**2,080**	**993**	**345**
Open Space	19.05 acres	24.3 per acre	23.3%	25.9%	90%	**464**	**108**	**120**
Total		--		--	--	**53,561**	**5,077**	**6,117**

Trip Generation By Mode

Retail Pass-by Rate 10%

PROPOSED PROJECT

Land Use	Net New Land Use	Person Trip Generation: Work Trips	Person Trip Generation: Non-Work Trips	Person Trip Generation: *Total*	Mode Share Percentage[1]: Auto (Work)	Auto (Non-Work)	Transit (Work)	Transit (Non-Work)	Bike (Work)	Bike (Non-Work)	Walk (Work)	Walk (Non-Work)	Person Trip Generation (by Mode): Automobile	Transit	Bike	Walk	*Total*	Vehicle Trip Generation: In %[2]	Out %[2]	In	Out	*Total*[3]	Transit Trips: In %[4]	Out %[4]	In	Out	*Total*
AM PEAK HOUR																											
Open Space	829.7 ksf	0	*108*	*108*		83%		0%		13%		4%	90	0	14	5	*109*	56%	44%	48	38	*86*			0	0	*0*
School	40 ksf	48	945	*993*	100%	92%	0%	1%	0%	0%	0%	6%	915	14	5	59	*993*	72%	28%	427	167	*594*	100%	0%	14	0	*14*
Retail	100.4 ksf	39	933	*972*									754	43	29	146	*972*	64%	36%	253	145	*398*	63%	37%	27	16	*43*
Office	174.93 ksf	234	48	*282*	67%	78%	15%	4%	3%	3%	15%	15%	194	37	8	42	*281*	88%	12%	122	17	*139*	89%	11%	33	4	*37*
Residential	1,239 DU	752	752	*1504*									1091	143	45	226	*1505*	31%	69%	201	447	*648*	31%	69%	44	99	*143*
Total	-	***1073***	***2786***	***3859***	-	-	-	-	-	-	-	-	***3044***	***237***	***101***	***478***	***3860***	**56%**	**44%**	***1051***	***814***	***1865***	**50%**	**50%**	***118***	***119***	***237***
													79%	*6%*	*3%*	*12%*	*100%*			*56%*	*44%*				*50%*	*50%*	
																		Retail Pass-by Trips		*25*	*15*	*40*					
PM PEAK HOUR																											
Open Space	829.7 ksf	0	*120*	*120*		58%		0%		14%		28%	70	0	17	33	*120*	57%	43%	38	29	*67*			0	0	*0*
School	40 ksf	48	297	*345*	100%	92%	0%	1%	0%	0%	0%	6%	321	4	1	19	*345*	30%	70%	62	146	*208*	0%	100%	0	4	*4*
Retail	100.4 ksf	81	1951	*2032*									1476	89	41	427	*2033*	48%	52%	376	403	*779*	44%	56%	39	50	*89*
Office	174.93 ksf	223	46	*269*	63%	73%	14%	4%	2%	2%	21%	21%	175	33	5	57	*270*	10%	90%	12	113	*125*	3%	97%	1	32	*33*
Residential	1,239 DU	978	978	*1956*									1330	176	39	411	*1956*	64%	36%	506	284	*790*	91%	9%	160	16	*176*
Total	-	***1331***	***3392***	***4722***	-	-	-	-	-	-	-	-	***3372***	***302***	***103***	***947***	***4724***	**50%**	**50%**	***994***	***975***	***1969***	**66%**	**34%**	***200***	***102***	***302***
													71%	*6%*	*2%*	*20%*	*100%*			*50%*	*50%*				*66%*	*34%*	
																		Retail Pass-by Trips		*38*	*40*	*78*					

Trip Generation By Mode

MAXIMUM COMMERCIAL VARIANT

Land Use	Net New Land Use	Person Trip Generation: Work Trips	Non-Work Trips	Total	Mode Share Percentage[1]: Auto (Work)	Auto (Non-Work)	Transit (Work)	Transit (Non-Work)	Bike (Work)	Bike (Non-Work)	Walk (Work)	Walk (Non-Work)	Person Trip Generation (by Mode): Automobile	Transit	Bike	Walk	Total	Vehicle Trip Generation: In %[2]	Out %[2]	In	Out	Total[3]	Transit Trips: In %[4]	Out %[4]	In	Out	Total
AM PEAK HOUR																											
Open Space	829.7 ksf	0	*108*	*108*		83%		0%		13%		4%	90	0	14	5	*109*	56%	44%	48	38	*86*			0	0	*0*
School	40 ksf	48	945	*993*	100%	92%	0%	1%	0%	0%	0%	6%	915	14	5	59	*993*	72%	28%	427	167	*594*	100%	0%	14	0	*14*
Retail	140 ksf	44	1060	*1105*									901	60	33	110	*1104*	64%	36%	307	169	*476*	65%	35%	39	21	*60*
R&D/Office	860 ksf	1879	385	*2263*	71%	82%	16%	5%	3%	3%	10%	10%	1649	320	68	226	*2263*	88%	12%	1039	142	*1181*	88%	12%	282	38	*320*
Residential	499 DU	*303*	*303*	*606*									463	64	18	61	*606*	31%	69%	85	190	*275*	31%	69%	20	44	*64*
Total				***5075***									***4018***	***458***	***138***	***461***	***5075***	***73%***	***27%***	***1906***	***706***	***2612***	***78%***	***22%***	***355***	***103***	***458***
													79%	*9%*	*3%*	*9%*	*100%*			*73%*	*27%*				*78%*	*22%*	
																		Retail Pass-by Trips		*31*	*17*	*48*					
PM PEAK HOUR																											
Open Space	829.7 ksf	0	*120*	*120*		58%		0%		14%		28%	70	0	17	33	*120*	57%	43%	38	29	*67*			0	0	*0*
School	40 ksf	48	297	*345*	100%	92%	0%	1%	0%	0%	0%	6%	321	4	1	19	*345*	30%	70%	62	146	*208*	0%	100%	0	4	*4*
Retail	140 ksf	108	2594	*2702*									2043	146	54	459	*2702*	49%	51%	534	545	*1079*	36%	64%	52	94	*146*
R&D/Office	860 ksf	1794	368	*2162*	66%	76%	15%	5%	2%	2%	17%	17%	1464	288	43	368	*2163*	10%	90%	100	948	*1048*	2%	98%	7	281	*288*
Residential	499 DU	*394*	*394*	*788*									559	79	16	134	*788*	64%	36%	213	119	*332*	81%	19%	64	15	*79*
Total	**-**	**-**	**-**	***6116***	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	***4457***	***517***	***131***	***1013***	***6118***	***35%***	***65%***	***947***	***1787***	***2734***	***24%***	***76%***	***123***	***394***	***517***
													73%	*8%*	*2%*	*17%*	*100%*			*35%*	*65%*				*24%*	*76%*	
																		Retail Pass-by Trips		*53*	*55*	*108*					

Notes:

1. Mode Share Percentages are taken from two sources:
   - For Open Space and School they are taken from observation data as documented in other appendices
   - For retail, office, and residential, they are taken from CP-HPS 2009 memo, with a fixed 17% walk mode split, and are adjusted based on difference between 2015 and 2040 CHAMP model to reflect absence of transit improvements that CPHPS assumed.
2. In/Out Rates are taken from two sources:
   - For Open Space and School they are taken from observation data as documented in other appendices
   - For retail, office, and residential, they are taken from SF Guidelines for PM (weighted by work/non-work percentages from CPHPS memo), and from ITE Trip Generation Handbook for AM
3. Vehicle Trip Generation Totals are taken from two sources:
   - For Open Space and School they are based off observation data (factoring in AVO and auto in/out percentages) as documented in other appendices
   - For retail, office, and residential, they are taken from a separate appendix spreadsheet, "Vehicle Trip Generation By Land Use Category", where SF-CHAMP trip distribution is combined with in/out splits (unique for each origin/destination) and AVOs from the SF Guidelines for each land use category.
4. Transit In/Out Rates are taken from two sources:
   - For Open Space and School they are taken from observation data as documented in other appendices
   - For retail, office, and residential, they are taken from SF Guidelines for PM by work/non-work (weighted by work/non-work transit percentages from SF CHAMP), and from ITE Trip Generation Handbook for AM
5. Retail Pass-By Rate
   - Taken from ITE for land use code 820 Shopping Center

Indicates numbers for Traffix

Trip Generation By Mode

Retail Pass-by Rate 10%

PROPOSED PROJECT (CUMULATIVE SCENARIO)

		Person Trip Generation			Mode Share Percentage[1]								Person Trip Generation (by Mode)					Vehicle Trip Generation					Transit Trips				
Land Use	Net New Land Use	Work Trips	Non-Work Trips	Total	Auto (Work)	Auto (Non-Work)	Transit (Work)	Transit (Non-Work)	Bike (Work)	Bike (Non-Work)	Walk (Work)	Walk (Non-Work)	Automobile	Transit	Bike	Walk	*Total*	In %[2]	Out %[2]	In	Out	*Total*[3]	In %[4]	Out %[4]	In	Out	*Total*
AM PEAK HOUR																											
Open Space	829.7 ksf	0	108	*108*	0%	75%	0%	8%	0%	13%	0%	4%	81	9	14	5	*109*	56%	44%	43	34	*77*	50%	50%	5	5	*9*
School	40 ksf	48	945	*993*	92%	84%	8%	9%	0%	0%	0%	6%	836	93	5	59	*993*	72%	28%	390	153	*543*	100%	0%	93	0	*93*
Retail	100.4 ksf	39	933	*972*									676	121	29	146	*972*	64%	36%	227	130	*357*	64%	36%	77	44	*121*
Office	174.93 ksf	234	48	*282*	59%	70%	23%	12%	3%	3%	15%	15%	172	60	8	42	*282*	88%	12%	108	15	*123*	88%	12%	53	7	*60*
Residential	1,239 DU	752	752	*1504*									970	263	45	226	*1504*	31%	69%	178	397	*575*	31%	69%	82	181	*263*
Total	-	-	-	***3859***	-	-	-	-	-	-	-	-	***2735***	***546***	***101***	***478***	***3860***	**56%**	**44%**	***946***	***729***	***1675***	**57%**	**43%**	***310***	***237***	***546***
													71%	*14%*	*3%*	*12%*	*100%*			*56%*	*44%*				*57%*	*43%*	
																		Retail Pass-by Trips		*23*	*13*	*36*					
PM PEAK HOUR																											
Open Space	829.7 ksf	0	120	*120*	0%	50%	0%	8%	0%	14%	0%	28%	60	10	17	33	*120*	57%	43%	33	25	*58*	50%	50%	5	5	*10*
School	40 ksf	48	297	*345*	92%	84%	8%	9%	0%	0%	0%	6%	293	32	1	19	*345*	30%	70%	57	133	*190*	0%	100%	0	32	*32*
Retail	100.4 ksf	81	1951	*2032*									1313	252	41	427	*2033*	52%	48%	361	333	*694*	46%	54%	117	135	*252*
Office	174.93 ksf	223	46	*269*	55%	65%	22%	12%	2%	2%	21%	21%	153	55	5	57	*270*	10%	90%	11	98	*109*	5%	95%	3	52	*55*
Residential	1,239 DU	978	978	*1956*									1173	332	39	411	*1955*	68%	32%	476	219	*695*	80%	20%	264	68	*332*
Total	-	-	-	***4722***	-	-	-	-	-	-	-	-	***2992***	***681***	***103***	***947***	***4723***	**54%**	**46%**	***938***	***808***	***1746***	**57%**	**43%**	***389***	***292***	***681***
													63%	*14%*	*2%*	*20%*	*100%*			*54%*	*46%*				*57%*	*43%*	
																		Retail Pass-by Trips		*36*	*33*	*69*					

Trip Generation By Mode

PROJECT VARIANT (CUMULATIVE SCENARIO)

		Person Trip Generation			Mode Share Percentage[1]								Person Trip Generation (by Mode)					Vehicle Trip Generation					Transit Trips				
Land Use	Net New Land Use	Work Trips	Non-Work Trips	Total	Auto (Work)	Auto (Non-Work)	Transit (Work)	Transit (Non-Work)	Bike (Work)	Bike (Non-Work)	Walk (Work)	Walk (Non-Work)	Automobile	Transit	Bike	Walk	*Total*	In %[2]	Out %[2]	In	Out	*Total*[3]	In %[4]	Out %[4]	In	Out	*Total*
AM PEAK HOUR																											
Open Space	829.7 ksf	0	108	*108*	0%	75%	0%	8%	0%	13%	0%	4%	81	9	14	5	*109*	56%	44%	43	34	*77*	50%	50%	5	5	*9*
School	40 ksf	48	945	*993*	92%	84%	8%	9%	0%	0%	0%	6%	836	93	5	59	*993*	72%	28%	390	153	*543*	100%	0%	93	0	*93*
Retail	140 ksf	44	1060	*1105*									813	148	33	110	*1104*	65%	35%	278	152	*430*	65%	35%	96	52	*148*
R&D/Office	860 ksf	1879	385	*2263*	63%	74%	24%	13%	3%	3%	10%	10%	1468	501	68	226	*2263*	88%	12%	924	126	*1050*	88%	12%	441	60	*501*
Residential	499 DU	303	303	*606*									415	112	18	61	*606*	31%	69%	76	170	*246*	31%	69%	35	77	*112*
Total	-	-	-	***5075***									***3613***	***863***	***138***	***461***	***5075***	***73%***	***27%***	***1711***	***635***	***2346***	***78%***	***22%***	***670***	***194***	***863***
													71%	*17%*	*3%*	*9%*	*100%*			*73%*	*27%*				*78%*	*22%*	
																		Retail Pass-by Trips		*28*	*15*	*43*					
PM PEAK HOUR																											
Open Space	829.7 ksf	0	120	*120*	0%	50%	0%	8%	0%	14%	0%	28%	60	10	17	33	*120*	57%	43%	33	25	*58*	50%	50%	5	5	*10*
School	40 ksf	48	297	*345*	92%	84%	8%	9%	0%	0%	0%	6%	293	32	1	19	*345*	30%	70%	57	133	*190*	0%	100%	0	32	*32*
Retail	140 ksf	108	2594	*2702*									1827	362	54	459	*2702*	50%	50%	480	485	*965*	43%	57%	156	206	*362*
R&D/Office	860 ksf	1794	368	*2162*	58%	68%	23%	13%	2%	2%	17%	17%	1291	460	43	368	*2162*	10%	90%	92	831	*923*	5%	95%	22	438	*460*
Residential	499 DU	394	394	*788*									496	142	16	134	*788*	65%	35%	191	103	*294*	75%	25%	106	36	*142*
Total	-	-	-	***6116***									***3967***	***1006***	***131***	***1013***	***6117***	***35%***	***65%***	***853***	***1577***	***2430***	***29%***	***71%***	***289***	***717***	***1006***
													65%	*16%*	*2%*	*17%*	*100%*			*35%*	*65%*				*29%*	*71%*	
																		Retail Pass-by Trips		*48*	*49*	*97*					

	Auto (Work)	Auto (Non-Work)	Transit (Work)	Transit (Non-Work)	Bike (Work)	Bike (Non-Work)	Walk (Work)	Walk (Non-Work)
Open Space Mode Share Adjustment		-8%		8%		0%		0%
School Mode Share Adjustment	-8%	-8%	8%	8%	0%	0%	0%	0%

Notes:

1. Mode Share Percentages are all adjusted using the same source:
   - For school and open space they are taken from CP-HPS 2009 memo, with all non-walk modes adjusted based on difference between 2015 and 2040 CHAMP model to reflect absence of transit improvements that CPHPS assumed.
   - For residential, retail, and office uses they are taken from CP-HPS 2009 memo, with a fixed 17% walk mode split, with all non-walk modes adjusted based on difference between 2015 and 2040 CHAMP model to reflect absence of transit improvements that CPHPS assumed.

2. In/Out Rates are taken from two sources:
   - For Open Space and School they are taken from observation data as documented in other appendices
   - For retail, office, and residential, they are taken from SF Guidelines for PM (weighted by work/non-work percentages from CPHPS memo), and from ITE Trip Generation Handbook for AM

3. Vehicle Trip Generation Totals are taken from two sources:
   - For Open Space and School they are based off observation data (factoring in AVO and auto in/out percentages) as documented in other appendices
   - For retail, office, and residential, they are taken from a separate appendix spreadsheet, "Vehicle Trip Generation By Land Use Category", where SF-CHAMP trip distribution is combined with in/out splits (unique for each origin/destination) and AVOs from the SF Guidelines for each land use category.

4. Transit In/Out Rates are taken from two sources:
   - For Open Space and School they are taken from observation data as documented in other appendices
   - For retail, office, and residential, they are taken from SF Guidelines for PM by work/non-work (weighted by work/non-work transit percentages from SF CHAMP), and from ITE Trip Generation Handbook for AM

5. Retail Pass-By Rate
   - Taken from ITE for land use code 820 Shopping Center

Vehicle Trip Generation By Land Use Category

Proposed Project - AM Peak Hour - Residential

Total Automobile Trips	1091
Auto Work Trips (All)	504
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	587

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	100.8	0.0	41.1	1.3	1.76	2.03	78	0	20	
SD-2	11%	6%	55.4	0.0	35.2	1.26	1.52	1.97	44	0	18	
SD-3	29%	44%	146.2	0.0	258.3	1.25	2.04	2.43	117	0	106	
SD-4	4%	3%	20.2	0.0	17.6	1.48	1.78	2.51	14	0	7	
East Bay	12%	6%	60.5	0.0	35.2	1.61	1.77	2.59	38	0	14	
North Bay	2%	1%	10.1	0.0	5.9	1.44	1.44	2.11	7	0	3	
South Bay	22%	33%	110.9	0.0	193.7	1.13	1.98	2.28	98	0	85	
									395	**0**	**253**	**648 Total Vehicle Trips**

Proposed Project - PM Peak Hour - Residential

Total Automobile Trips	1330
Auto Work Trips (All)	616
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	714

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	123.2	0.0	50.0	1.3	1.76	2.03	95	0	25	
SD-2	11%	6%	67.8	0.0	42.8	1.26	1.52	1.97	54	0	22	
SD-3	29%	44%	178.6	0.0	314.2	1.25	2.04	2.43	143	0	129	
SD-4	4%	3%	24.6	0.0	21.4	1.48	1.78	2.51	17	0	9	
East Bay	12%	6%	73.9	0.0	42.8	1.61	1.77	2.59	46	0	17	
North Bay	2%	1%	12.3	0.0	7.1	1.44	1.44	2.11	9	0	3	
South Bay	22%	33%	135.5	0.0	235.6	1.13	1.98	2.28	120	0	103	
									483	**0**	**307**	**790 Total Vehicle Trips**

Max Commercial Variant - AM Peak Hour - Residential

Total Automobile Trips	463
Auto Work Trips (All)	215
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	248

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	43.0	0.0	17.4	1.3	1.76	2.03	33	0	9	
SD-2	11%	6%	23.7	0.0	14.9	1.26	1.52	1.97	19	0	8	
SD-3	29%	44%	62.4	0.0	109.1	1.25	2.04	2.43	50	0	45	
SD-4	4%	3%	8.6	0.0	7.4	1.48	1.78	2.51	6	0	3	
East Bay	12%	6%	25.8	0.0	14.9	1.61	1.77	2.59	16	0	6	
North Bay	2%	1%	4.3	0.0	2.5	1.44	1.44	2.11	3	0	1	
South Bay	22%	33%	47.3	0.0	81.8	1.13	1.98	2.28	42	0	36	
									168	**0**	**107**	**275 Total Vehicle Trips**

Max Commercial Variant - PM Peak Hour - Residential

Total Automobile Trips	559
Auto Work Trips (All)	260
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	299

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	52.0	0.0	20.9	1.3	1.76	2.03	40	0	10	
SD-2	11%	6%	28.6	0.0	17.9	1.26	1.52	1.97	23	0	9	
SD-3	29%	44%	75.4	0.0	131.6	1.25	2.04	2.43	60	0	54	
SD-4	4%	3%	10.4	0.0	9.0	1.48	1.78	2.51	7	0	4	
East Bay	12%	6%	31.2	0.0	17.9	1.61	1.77	2.59	19	0	7	
North Bay	2%	1%	5.2	0.0	3.0	1.44	1.44	2.11	4	0	1	
South Bay	22%	33%	57.2	0.0	98.7	1.13	1.98	2.28	51	0	43	
									204	**0**	**129**	**332 Total Vehicle Trips**

Vehicle Trip Generation By Land Use Category

Proposed Project (Cumulative Scenario) - AM Peak Hour - Residential

Total Automobile Trips	970
Auto Work Trips (All)	444
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	527

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	88.8	0.0	36.9	1.3	1.76	2.03	68	0	18	
SD-2	11%	6%	48.8	0.0	31.6	1.26	1.52	1.97	39	0	16	
SD-3	29%	44%	128.8	0.0	231.9	1.25	2.04	2.43	103	0	95	
SD-4	4%	3%	17.8	0.0	15.8	1.48	1.78	2.51	12	0	6	
East Bay	12%	6%	53.3	0.0	31.6	1.61	1.77	2.59	33	0	12	
North Bay	2%	1%	8.9	0.0	5.3	1.44	1.44	2.11	6	0	2	
South Bay	22%	33%	97.7	0.0	173.9	1.13	1.98	2.28	86	0	76	
									348	**0**	**227**	**575 Total Vehicle Trips**

Proposed Project (Cumulative Scenario) - PM Peak Hour - Residential

Total Automobile Trips	1173
Auto Work Trips (All)	538
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	636

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	107.6	0.0	44.5	1.3	1.76	2.03	83	0	22	
SD-2	11%	6%	59.2	0.0	38.2	1.26	1.52	1.97	47	0	19	
SD-3	29%	44%	156.0	0.0	279.8	1.25	2.04	2.43	125	0	115	
SD-4	4%	3%	21.5	0.0	19.1	1.48	1.78	2.51	15	0	8	
East Bay	12%	6%	64.6	0.0	38.2	1.61	1.77	2.59	40	0	15	
North Bay	2%	1%	10.8	0.0	6.4	1.44	1.44	2.11	7	0	3	
South Bay	22%	33%	118.4	0.0	209.9	1.13	1.98	2.28	105	0	92	
									421	**0**	**274**	**695 Total Vehicle Trips**

Project Variant (Cumulative Scenario) - AM Peak Hour - Residential

Total Automobile Trips	415
Auto Work Trips (All)	191
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	224

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	38.2	0.0	15.7	1.3	1.76	2.03	29	0	8	
SD-2	11%	6%	21.0	0.0	13.4	1.26	1.52	1.97	17	0	7	
SD-3	29%	44%	55.4	0.0	98.6	1.25	2.04	2.43	44	0	41	
SD-4	4%	3%	7.6	0.0	6.7	1.48	1.78	2.51	5	0	3	
East Bay	12%	6%	22.9	0.0	13.4	1.61	1.77	2.59	14	0	5	
North Bay	2%	1%	3.8	0.0	2.2	1.44	1.44	2.11	3	0	1	
South Bay	22%	33%	42.0	0.0	73.9	1.13	1.98	2.28	37	0	32	
									150	**0**	**96**	**246 Total Vehicle Trips**

Project Variant (Cumulative Scenario) - PM Peak Hour - Residential

Total Automobile Trips	496
Auto Work Trips (All)	228
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	268

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	45.6	0.0	18.8	1.3	1.76	2.03	35	0	9	
SD-2	11%	6%	25.1	0.0	16.1	1.26	1.52	1.97	20	0	8	
SD-3	29%	44%	66.1	0.0	117.9	1.25	2.04	2.43	53	0	49	
SD-4	4%	3%	9.1	0.0	8.0	1.48	1.78	2.51	6	0	3	
East Bay	12%	6%	27.4	0.0	16.1	1.61	1.77	2.59	17	0	6	
North Bay	2%	1%	4.6	0.0	2.7	1.44	1.44	2.11	3	0	1	
South Bay	22%	33%	50.2	0.0	88.4	1.13	1.98	2.28	44	0	39	
									179	**0**	**115**	**294 Total Vehicle Trips**

Vehicle Trip Generation By Land Use Category

Proposed Project - AM Peak Hour - Retail

Total Automobile Trips	754
Auto Work Trips (All)	26
Auto Non-Work: Retail Trips	728
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	5.2	51.0	0.0	1.3	1.76	2.03	4	29	0	
SD-2	11%	6%	2.9	43.7	0.0	1.26	1.52	1.97	2	29	0	
SD-3	29%	44%	7.5	320.3	0.0	1.25	2.04	2.43	6	157	0	
SD-4	4%	3%	1.0	21.8	0.0	1.48	1.78	2.51	1	12	0	
East Bay	12%	6%	3.1	43.7	0.0	1.61	1.77	2.59	2	25	0	
North Bay	2%	1%	0.5	7.3	0.0	1.44	1.44	2.11	0	5	0	
South Bay	22%	33%	5.7	240.2	0.0	1.13	1.98	2.28	5	121	0	
									20	**378**	**0**	**398** Total Vehicle Trips

Proposed Project - PM Peak Hour - Retail

Total Automobile Trips	1476
Auto Work Trips (All)	51
Auto Non-Work: Retail Trips	1424
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	10.2	99.7	0.0	1.3	1.76	2.03	8	57	0	
SD-2	11%	6%	5.6	85.4	0.0	1.26	1.52	1.97	4	56	0	
SD-3	29%	44%	14.8	626.6	0.0	1.25	2.04	2.43	12	307	0	
SD-4	4%	3%	2.0	42.7	0.0	1.48	1.78	2.51	1	24	0	
East Bay	12%	6%	6.1	85.4	0.0	1.61	1.77	2.59	4	48	0	
North Bay	2%	1%	1.0	14.2	0.0	1.44	1.44	2.11	1	10	0	
South Bay	22%	33%	11.2	469.9	0.0	1.13	1.98	2.28	10	237	0	
									40	**739**	**0**	**779** Total Vehicle Trips

Maximum Commercial Variant - AM Peak Hour - Retail

Total Automobile Trips	901
Auto Work Trips (All)	31
Auto Non-Work: Retail Trips	870
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	6.2	60.9	0.0	1.3	1.76	2.03	5	35	0	
SD-2	11%	6%	3.4	52.2	0.0	1.26	1.52	1.97	3	34	0	
SD-3	29%	44%	9.0	382.8	0.0	1.25	2.04	2.43	7	188	0	
SD-4	4%	3%	1.2	26.1	0.0	1.48	1.78	2.51	1	15	0	
East Bay	12%	6%	3.7	52.2	0.0	1.61	1.77	2.59	2	29	0	
North Bay	2%	1%	0.6	8.7	0.0	1.44	1.44	2.11	0	6	0	
South Bay	22%	33%	6.8	287.1	0.0	1.13	1.98	2.28	6	145	0	
									24	**452**	**0**	**476** Total Vehicle Trips

Maximum Commercial Variant - PM Peak Hour - Retail

Total Automobile Trips	2043
Auto Work Trips (All)	71
Auto Non-Work: Retail Trips	1971
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	14.2	138.0	0.0	1.3	1.76	2.03	11	78	0	
SD-2	11%	6%	7.8	118.3	0.0	1.26	1.52	1.97	6	78	0	
SD-3	29%	44%	20.6	867.2	0.0	1.25	2.04	2.43	16	425	0	
SD-4	4%	3%	2.8	59.1	0.0	1.48	1.78	2.51	2	33	0	
East Bay	12%	6%	8.5	118.3	0.0	1.61	1.77	2.59	5	67	0	
North Bay	2%	1%	1.4	19.7	0.0	1.44	1.44	2.11	1	14	0	
South Bay	22%	33%	15.6	650.4	0.0	1.13	1.98	2.28	14	329	0	
									56	**1024**	**0**	**1079** Total Vehicle Trips

Vehicle Trip Generation By Land Use Category

Proposed Project (Cumulative Scenario) - AM Peak Hour - Retail

Total Automobile Trips	676
Auto Work Trips (All)	23
Auto Non-Work: Retail Trips	653
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	4.6	45.7	0.0	1.3	1.76	2.03	4	26	0
SD-2	11%	6%	2.5	39.2	0.0	1.26	1.52	1.97	2	26	0
SD-3	29%	44%	6.7	287.3	0.0	1.25	2.04	2.43	5	141	0
SD-4	4%	3%	0.9	19.6	0.0	1.48	1.78	2.51	1	11	0
East Bay	12%	6%	2.8	39.2	0.0	1.61	1.77	2.59	2	22	0
North Bay	2%	1%	0.5	6.5	0.0	1.44	1.44	2.11	0	5	0
South Bay	22%	33%	5.1	215.5	0.0	1.13	1.98	2.28	4	109	0
									18	**339**	**0**

357 Total Vehicle Trips

Proposed Project (Cumulative Scenario) - PM Peak Hour - Retail

Total Automobile Trips	1313
Auto Work Trips (All)	45
Auto Non-Work: Retail Trips	1268
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	9.0	88.8	0.0	1.3	1.76	2.03	7	50	0
SD-2	11%	6%	5.0	76.1	0.0	1.26	1.52	1.97	4	50	0
SD-3	29%	44%	13.1	557.9	0.0	1.25	2.04	2.43	10	273	0
SD-4	4%	3%	1.8	38.0	0.0	1.48	1.78	2.51	1	21	0
East Bay	12%	6%	5.4	76.1	0.0	1.61	1.77	2.59	3	43	0
North Bay	2%	1%	0.9	12.7	0.0	1.44	1.44	2.11	1	9	0
South Bay	22%	33%	9.9	418.4	0.0	1.13	1.98	2.28	9	211	0
									35	**658**	**0**

694 Total Vehicle Trips

Project Variant (Cumulative Scenario) - AM Peak Hour - Retail

Total Automobile Trips	813
Auto Work Trips (All)	28
Auto Non-Work: Retail Trips	785
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	5.6	55.0	0.0	1.3	1.76	2.03	4	31	0
SD-2	11%	6%	3.1	47.1	0.0	1.26	1.52	1.97	2	31	0
SD-3	29%	44%	8.1	345.4	0.0	1.25	2.04	2.43	6	169	0
SD-4	4%	3%	1.1	23.6	0.0	1.48	1.78	2.51	1	13	0
East Bay	12%	6%	3.4	47.1	0.0	1.61	1.77	2.59	2	27	0
North Bay	2%	1%	0.6	7.9	0.0	1.44	1.44	2.11	0	5	0
South Bay	22%	33%	6.2	259.1	0.0	1.13	1.98	2.28	5	131	0
									22	**408**	**0**

430 Total Vehicle Trips

Project Variant (Cumulative Scenario) - PM Peak Hour - Retail

Total Automobile Trips	1827
Auto Work Trips (All)	63
Auto Non-Work: Retail Trips	1764
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	12.6	123.5	0.0	1.3	1.76	2.03	10	70	0
SD-2	11%	6%	6.9	105.8	0.0	1.26	1.52	1.97	6	70	0
SD-3	29%	44%	18.3	776.2	0.0	1.25	2.04	2.43	15	380	0
SD-4	4%	3%	2.5	52.9	0.0	1.48	1.78	2.51	2	30	0
East Bay	12%	6%	7.6	105.8	0.0	1.61	1.77	2.59	5	60	0
North Bay	2%	1%	1.3	17.6	0.0	1.44	1.44	2.11	1	12	0
South Bay	22%	33%	13.9	582.1	0.0	1.13	1.98	2.28	12	294	0
									49	**916**	**0**

965 Total Vehicle Trips

Vehicle Trip Generation By Land Use Category

Proposed Project - AM Peak Hour - Office

Total Automobile Trips	194
Auto Work Trips (All)	157
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	37

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	31.4	0.0	2.6	1.3	1.76	2.03	24	0	1	
SD-2	11%	6%	17.3	0.0	2.2	1.26	1.52	1.97	14	0	1	
SD-3	29%	44%	45.5	0.0	16.3	1.25	2.04	2.43	36	0	7	
SD-4	4%	3%	6.3	0.0	1.1	1.48	1.78	2.51	4	0	0	
East Bay	12%	6%	18.8	0.0	2.2	1.61	1.77	2.59	12	0	1	
North Bay	2%	1%	3.1	0.0	0.4	1.44	1.44	2.11	2	0	0	
South Bay	22%	33%	34.5	0.0	12.2	1.13	1.98	2.28	31	0	5	
									123	**0**	**16**	**139 Total Vehicle Trips**

Proposed Project - PM Peak Hour - Office

Total Automobile Trips	175
Auto Work Trips (All)	141
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	33

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	28.2	0.0	2.3	1.3	1.76	2.03	22	0	1	
SD-2	11%	6%	15.5	0.0	2.0	1.26	1.52	1.97	12	0	1	
SD-3	29%	44%	40.9	0.0	14.5	1.25	2.04	2.43	33	0	6	
SD-4	4%	3%	5.6	0.0	1.0	1.48	1.78	2.51	4	0	0	
East Bay	12%	6%	16.9	0.0	2.0	1.61	1.77	2.59	11	0	1	
North Bay	2%	1%	2.8	0.0	0.3	1.44	1.44	2.11	2	0	0	
South Bay	22%	33%	31.0	0.0	10.9	1.13	1.98	2.28	27	0	5	
									110	**0**	**14**	**125 Total Vehicle Trips**

Maximum Commercial Variant - AM Peak Hour - Office/R&D

Total Automobile Trips	1649
Auto Work Trips (All)	1334
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	316

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	266.8	0.0	22.1	1.3	1.76	2.03	205	0	11	
SD-2	11%	6%	146.7	0.0	19.0	1.26	1.52	1.97	116	0	10	
SD-3	29%	44%	386.9	0.0	139.0	1.25	2.04	2.43	309	0	57	
SD-4	4%	3%	53.4	0.0	9.5	1.48	1.78	2.51	36	0	4	
East Bay	12%	6%	160.1	0.0	19.0	1.61	1.77	2.59	99	0	7	
North Bay	2%	1%	26.7	0.0	3.2	1.44	1.44	2.11	19	0	1	
South Bay	22%	33%	293.5	0.0	104.3	1.13	1.98	2.28	260	0	46	
									1045	**0**	**136**	**1181 Total Vehicle Trips**

Maximum Commercial Variant - PM Peak Hour - Office/R&D

Total Automobile Trips	1464
Auto Work Trips (All)	1184
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	279

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	236.8	0.0	19.5	1.3	1.76	2.03	182	0	10	
SD-2	11%	6%	130.2	0.0	16.7	1.26	1.52	1.97	103	0	8	
SD-3	29%	44%	343.4	0.0	122.8	1.25	2.04	2.43	275	0	51	
SD-4	4%	3%	47.4	0.0	8.4	1.48	1.78	2.51	32	0	3	
East Bay	12%	6%	142.1	0.0	16.7	1.61	1.77	2.59	88	0	6	
North Bay	2%	1%	23.7	0.0	2.8	1.44	1.44	2.11	16	0	1	
South Bay	22%	33%	260.5	0.0	92.1	1.13	1.98	2.28	231	0	40	
									927	**0**	**120**	**1048 Total Vehicle Trips**

Vehicle Trip Generation By Land Use Category

Proposed Project (Cumulative Scenario) - AM Peak Hour - Office

Total Automobile Trips	172
Auto Work Trips (All)	138
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	34

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	27.6	0.0	2.4	1.3	1.76	2.03	21	0	1
SD-2	11%	6%	15.2	0.0	2.0	1.26	1.52	1.97	12	0	1
SD-3	29%	44%	40.0	0.0	15.0	1.25	2.04	2.43	32	0	6
SD-4	4%	3%	5.5	0.0	1.0	1.48	1.78	2.51	4	0	0
East Bay	12%	6%	16.6	0.0	2.0	1.61	1.77	2.59	10	0	1
North Bay	2%	1%	2.8	0.0	0.3	1.44	1.44	2.11	2	0	0
South Bay	22%	33%	30.4	0.0	11.2	1.13	1.98	2.28	27	0	5
									108	**0**	**15**

123 Total Vehicle Trips

Proposed Project (Cumulative Scenario) - PM Peak Hour - Office

Total Automobile Trips	153
Auto Work Trips (All)	123
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	29

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	24.6	0.0	2.0	1.3	1.76	2.03	19	0	1
SD-2	11%	6%	13.5	0.0	1.7	1.26	1.52	1.97	11	0	1
SD-3	29%	44%	35.7	0.0	12.8	1.25	2.04	2.43	29	0	5
SD-4	4%	3%	4.9	0.0	0.9	1.48	1.78	2.51	3	0	0
East Bay	12%	6%	14.8	0.0	1.7	1.61	1.77	2.59	9	0	1
North Bay	2%	1%	2.5	0.0	0.3	1.44	1.44	2.11	2	0	0
South Bay	22%	33%	27.1	0.0	9.6	1.13	1.98	2.28	24	0	4
									96	**0**	**12**

109 Total Vehicle Trips

Project Variant (Cumulative Scenario) - AM Peak Hour - Office/R&D

Total Automobile Trips	1468
Auto Work Trips (All)	1184
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	285

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	236.8	0.0	20.0	1.3	1.76	2.03	182	0	10
SD-2	11%	6%	130.2	0.0	17.1	1.26	1.52	1.97	103	0	9
SD-3	29%	44%	343.4	0.0	125.4	1.25	2.04	2.43	275	0	52
SD-4	4%	3%	47.4	0.0	8.6	1.48	1.78	2.51	32	0	3
East Bay	12%	6%	142.1	0.0	17.1	1.61	1.77	2.59	88	0	7
North Bay	2%	1%	23.7	0.0	2.9	1.44	1.44	2.11	16	0	1
South Bay	22%	33%	260.5	0.0	94.1	1.13	1.98	2.28	231	0	41
									927	**0**	**123**

1050 Total Vehicle Trips

Project Variant (Cumulative Scenario) - PM Peak Hour - Office/R&D

Total Automobile Trips	1291
Auto Work Trips (All)	1041
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	250

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	208.2	0.0	17.5	1.3	1.76	2.03	160	0	9
SD-2	11%	6%	114.5	0.0	15.0	1.26	1.52	1.97	91	0	8
SD-3	29%	44%	301.9	0.0	110.0	1.25	2.04	2.43	242	0	45
SD-4	4%	3%	41.6	0.0	7.5	1.48	1.78	2.51	28	0	3
East Bay	12%	6%	124.9	0.0	15.0	1.61	1.77	2.59	78	0	6
North Bay	2%	1%	20.8	0.0	2.5	1.44	1.44	2.11	14	0	1
South Bay	22%	33%	229.0	0.0	82.5	1.13	1.98	2.28	203	0	36
									815	**0**	**108**

923 Total Vehicle Trips

Vehicle Trip Distribution By Land Use Category

Trip distribution (from Travel Demand Memo)

Zone	School	All other land uses	Baseline
SD-1		12%	13.5%
SD-2		8%	8.5%
SD-3	87%	37%	36.5%
SD-4		3%	3.5%
East Bay		9%	9.0%
North Bay		2%	1.5%
South Bay	13%	29%	27.5%

Proportion of trips to/from locations allocated to each gate

Zone	1	2	3	4	5	6	7	8	9	Check
SD-1	67.0%	16.7%	16.7%							100%
SD-2			75.0%	12.5%		12.5%				100%
SD-3	25.0%	10.0%	15.0%	25.0%	5.0%	5.0%	5.0%	5.0%	5.0%	100%
SD-4			10.0%	90.0%						100%
East Bay		10.0%	90.0%							100%
North Bay			75.0%	25.0%						100%
South Bay				20.0%	80.0%					100%

Traffix Gates (outbound direction)

1	I-280 Northbound
2	Third Street Northbound
3	Cesar Chavez Westbound
4	I-280 Southbound
5	Third Street Southbound
6	Bayshore Boulevard Southbound
7	Hunters Point
8	Candlestick Park
9	Paul Avenue Westbound

Trip Dist for Traffix

Land Use	1	2	3	4	5	6	7	8	9	
School	21.8%	8.7%	13.1%	24.4%	14.8%	4.4%	4.4%	4.4%	4.4%	100%
All Other LU	17.0%	6.5%	23.4%	19.4%	25.4%	2.8%	1.8%	1.8%	1.8%	100%
Baseline	18.2%	6.8%	23.7%	19.2%	23.8%	2.9%	1.8%	1.8%	1.8%	100%

APPENDIX J: ELIGIBILITY CHECKLIST: CEQA SECTION 21099 – MODERNIZATION OF TRANSPORTATION ANALYSIS

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Eligibility Checklist: CEQA Section 21099 – Modernization of Transportation Analysis

Date of Preparation:	February 15, 2017
Case No.:	**2014-002541ENV**
Project Title:	**700 Innes Avenue, 900 Innes Avenue, India Basin Shoreline Park and India Basin Open Space Projects**
Zoning:	P Use District M-1 Use District NC-2 Use District *OS* Height and Bulk District *40-X* Height and Bulk District
Block/Lot:	4644/Lots 001-018, 004, 004A, 005, 005S, 006, 006A, 007, 008, 009, 010, 010A, 010B, 010C, 011 4631/Lots 001, 002 4620/Lots 001, 002 4607/Lots 025, 024 4596/Lot 026 4597/Lot 026 4606/Lots 026, 100 4621/016, 018, 021, 100, 101 4630/005, 007, 100 4645/001, 003A, 004, 006, 007, 007A, 010, 010A, 011, 012, 013 4630/002 4629A/010, 011 4646/001, 002, 003, 003A, 019, 020 4629A/012, 013, 003, 004, 005, 006 4622/007, 008, 016, 017, 018, 019, 012, 013 4605/010,011,012,013,014,015,016,017,018,019 4645/Lots 014, 015
Lot Size:	38.84 acres (1,691,870 square feet)
Project Sponsors	Courtney Pash, Build Inc. (415) 551-7626 or courtney@bldsf.com Nicole Avril, San Francisco Recreation and Parks (415) 305-8438 or Nicole.Avril@sfgov.org
Lead Agency:	San Francisco Planning Department
Staff Contact:	Michael Li—(415) 575-9107 Michael.J.Li@sfgov.org

This checklist is in response to California Environmental Quality Act (CEQA) Section 21099 – Modernization of Transportation Analysis for Transit Oriented Projects and Planning Commission Resolution 19579. CEQA Section 21099 allows for a determination that aesthetic and parking effects of a project need not be considered significant environmental effects. Planning Commission Resolution 19579 replaces automobile delay with vehicle miles traveled analysis. This checklist provides screening criteria for determining when detailed VMT analysis is required for a project.

Aesthetics and Parking

In accordance with California Environmental Quality Act (CEQA) Section 21099 – Modernization of Transportation Analysis for Transit Oriented Projects – aesthetics and parking shall not be considered in determining if a project has the potential to result in significant environmental effects, provided the project meets all of the following three criteria (Attachment A sets forth the definitions of the terms below):

a) The project is residential, mixed-use residential, or an employment center; and
b) The project is on an infill site; and
c) The project is in a transit priority area.

Pursuant to Table 1 on page 3, while the proposed project described below satisfies criteria a) and c), it does not satisfy criterion b). A large portion of the site is vacant and it is surrounded on three sides by water. Therefore, it is not surrounded by parcels that are developed with qualified urban uses. Therefore, the proposed project does not qualify as an infill project for the purpose of CEQA Section 21099. Aesthetics and Parking shall be considered as topic areas for the environmental review of this project.

Automobile Delay and Vehicle Miles Traveled

In addition, CEQA Section 21099(b)(1) requires that the State Office of Planning and Research (OPR) develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." CEQA Section 21099(b)(2) states that upon certification of the revised guidelines for determining transportation impacts pursuant to Section 21099(b)(1), automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment under CEQA.

In January 2016, OPR published for public review and comment a *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA* recommending that transportation impacts for projects be measured using a vehicle miles traveled (VMT) metric. On March 3, 2016, in anticipation of the future certification of the revised CEQA Guidelines, the San Francisco Planning Commission adopted OPR's recommendation to use the VMT metric instead of automobile delay to evaluate the transportation impacts of projects. (Note: the VMT metric does not apply to the analysis of project impacts on non-automobile modes of travel such as riding transit, walking, and bicycling.)

The Planning Department has identified screening criteria to identify types, characteristics, or locations of projects and a list of transportation project types that would not result in significant transportation impacts under the VMT metric. These screening criteria are consistent with CEQA Section 21099 and the screening criteria recommended by OPR.

Project Description:
As co-project sponsors, Build Inc and the San Francisco Recreation and Parks Department (RPD) propose to redevelop their respective adjacent parcels along the India Basin shoreline of San Francisco Bay. The project would encompass publicly and privately owned parcels, including existing streets, totaling approximately 38.84 acres (referred to herein as the project site). The larger India Basin area also includes properties owned by Lennar, Pacific Gas & Electric Company, and the Port of San Francisco.

Build Inc would develop 17.12 acres of privately owned land plus 5.94 acres of developed and undeveloped public rights-of-way in phases with residential; retail; commercial; office; research and development/laboratory and clinical carespace; institutional; flex space; and recreational and art uses. Two Build Inc project options are being considered for the 700 Innes property: the proposed Residential Project or proposed project would include 1,240 dwelling units, 275,330 gross square feet (gsf) of ground-floor retail, commercial, or flex space; and 1,800 total parking spaces for all proposed uses. The Maximum Commercial Variant or proposed project variant would include up to 1,000,000 gsf of commercial/institutional uses and 500 dwelling units. The proposed development at 700 Innes would include residential units and commercial uses (including retail, office, R&D, laboratory and clinical care, and institutional), parking, and a shoreline network of publicly accessible open space.

As part of the proposed project and proposed project variant, RPD would improve 14.2 acres of publicly owned parcels along the shoreline plus 1.58 acres of unimproved paper streets[1] to create a publicly accessible network of new and/or improved parkland and open space. All of the project-related RPD properties (i.e., 900 Innes, India Basin Shoreline Park, India Basin Open Space) would be enhanced for park and open space use and would be combined to create a network of new and/or improved parkland and open space. This new shoreline network would extend the Blue Greenway/Bay Trail and would provide pedestrian and bicycle connections to and along the shoreline, fronting the San Francisco Bay.

Table 1: Transit-Oriented Infill Project Eligibility Checklist The project must meet all three criteria below for <u>aesthetics and parking</u> to be excluded from CEQA review. See Attachment A for definitions and other terms.	
☒	**Criterion 1. Does the project consist of residential, mixed-use residential, or *"employment center"*[2] uses and** Build Inc would develop 17.12 acres of privately owned land plus 5.94 acres of developed and undeveloped public rights-of-way in phases with residential; retail; commercial; office; research and development/laboratory and clinical carespace; institutional; flex space; and recreational and art uses. Two Build Inc project options are being considered for the 700 Innes property: the proposed Residential Project or proposed project (a residential-focused mixed-use development including 1,240 dwelling units and 275,330 gross square feet (gsf) of ground-floor retail, commercial, or flex space); and the Maximum Commercial Variant or proposed project variant (with up to 1,000,000 gsf of commercial/institutional uses and 500 dwelling units). The proposed development at 700 Innes would include residential units and commercial uses (including retail,

[1] Roadways that appear on maps but have not been built.
[2] See **Attachment A** for definitions.

	office, R&D, laboratory and clinical care, and institutional), parking, and a shoreline network of publicly accessible open space.
☐	**Criterion 2. Is the proposed project located on an *"infill site"* and** The 700 Innes property consists of 30 parcels, totaling 17.12 acres. The property generally is undeveloped, except for approximately six buildings and structures. One dilapidated, wood-framed storage structure sits on the concrete wharf that fronts a wood dock, in a western portion of the property that once was part of the Allemand Brothers Boat Yard. A second structure, at 702 Earl Street (also known as the Heerdt Building and Repair), built in 1935, is on the southwestern corner of the property. The building at 702 Earl Street is a timber-framed industrial building with two stories over a basement, a compound shed, and a shallow pitch gable roof. The 900 Innes property consists of seven parcels totaling 2.4 acres, 0.6 acre of which is submerged. It is located between India Basin Shoreline Park and India Basin Open Space (see Figure 2). The property is a former maritime industrial site that contains five buildings and structures, totaling approximately 7,760 square feet. A one-story, 900-square-foot wood-framed house is on the northwestern corner of Innes Avenue and the unimproved Griffith Street ROW. A large portion of the project site is undeveloped. In addition, the project site is surrounded by water on three sides. Therefore, project site does not meet the definition of an "infill site."
☒	**Criterion 3. Is the proposed project site located within a *"transit priority area?"*** **Map:** See Attachment B. **Muni Bus Line Stops:** 19 Polk at Innes Avenue and Griffith Street; 44 O'Shaughnessy at Middle Point Road and Innes Avenue; 54 Felton at Northridge Road and Dormitory Road within ½ mile of the project site (with AM and PM headways of 15 minutes or less).

Table 2a: Vehicle Miles Traveled Analysis – Screening Criterion If a project meets the screening criterion listed below, then a detailed VMT analysis is not required.[3] See Attachment A for definitions and other terms.	
☒	**Criterion 1. Is the proposed project site located within the *"map-based screening"* area?** The proposed project site is located in transportation analysis zone (TAZ) 446. The proposed project would include 1,240 dwelling units, office and ground-floor retail space. Residential: Existing average daily VMT per capita is 9.0 for the transportation analysis zone 446. This is 38 percent below the existing regional average daily VMT per capita of 14.6. Future 2040 average daily VMT per capita is 8.9 for the transportation analysis zone 446. This is 35 percent below the future 2040 regional average daily VMT per capita of 13.7. Office: Existing average daily VMT per capita is 15.3 for the transportation analysis zone the project site is located in, 446. This is 6 percent below the existing regional average daily VMT per capita of 16.2. Future 2040 average daily VMT per capita is 13.4 for the transportation analysis zone 446. This is 8 percent below the future 2040 regional average daily VMT per capita of 14.5. Retail: Existing average daily VMT per retail employee is 8.1 for the transportation analysis zone 446. This is 36 percent below the existing regional average daily VMT per retail employee of 12.6. Future 2040 average daily VMT per retail employee is 8.8 for the transportation analysis zone 446. This is 30 percent below the future 2040 regional average daily work-related VMT per retail employee of 12.4.

Table 2b: Vehicle Miles Traveled Analysis – Additional Screening Criteria Identify whether a projects meets any of the additional screening criteria. See Attachment A for definitions and other terms.	
☐	**Criterion 1. Does the proposed project qualify as a "*small project*"? or** No
☒	**Criterion 2. Proximity to Transit Stations (must meet all four sub-criteria)** Is the proposed project site located within a half mile of an existing major transit stop; and Yes, as evidenced below: **Map:** See Attachment B. **Muni Bus Line Stops:** 19 Polk at Innes Avenue and Griffith Street; 44 O'Shaughnessy at Middle Point Road and Innes Avenue; 54 Felton at Northridge Road and Dormitory Road within ½ mile of the project site (with AM and PM headways of 15 minutes or less).

[3] For projects that propose multiple land use types (e.g, residential, office, retail, etc.), each land use type must qualify under the three screening criterion in Table 2a.

Table 2b: Vehicle Miles Traveled Analysis – Additional Screening Criteria Identify whether a projects meets any of the additional screening criteria. See Attachment A for definitions and other terms.	
	Would the proposed project have a floor area ratio of greater than or equal to 0.75, and Yes. The combined gross floor area of the new buildings would be greater than 0.75 floor area ratio.
	Would the project result in an amount of parking that is less than or equal to that required or allowed by the Planning Code without a conditional use authorization, and Yes. The minimum required vehicle parking for the proposed project is zero spaces and the maximum allowed is one (1) space for each dwelling unit, plus car share spaces. The proposed project would include 1,240 dwelling units, 275,330 gross square feet (gsf) of ground-floor retail, commercial, or flex space; and 1,800 total parking spaces for all proposed uses within the allowable vehicle parking spaces for the NC-2 zoning district.
	Is the proposed project consistent with the Sustainable Communities Strategy?[4] The project site is located in a priority development area in Plan Bay Area. The project would have a floor area ratio greater than 0.75, and is located in a priority development area identified in the Bay Area's sustainable community's strategy (Plan Bay Area).[5] The project would not require a conditional use authorization for the amount of parking proposed.

[4] A project is considered to be inconsistent with the Sustainable Communities Strategy if development is located outside of areas contemplated for development in the Sustainable Communities Strategy.

[5] Sarah Dennis Phillips, San Francisco Planning Department. *Memorandum re: Plan Bay Area: Review and Comment on the draft Sustainable Communities Strategy*, May 2, 2013. Available online at: http://www.sf-planning.org/ftp/files/plans-and-programs/emerging_issues/scs/Plan-Bay-Area-Memo-5_02_13.pdf, accessed March 24, 2016.

Table 3: Induce Automobile Travel Analysis If a project contains transportation elements and fits within the general types of projects described below, then a detailed VMT analysis is not required. See Attachment A for definitions and other terms.	
☒	**Project Type 1. Does the proposed project qualify as an "*active transportation, rightsizing (aka Road Diet) and Transit Project*"? or** Yes. The proposed projects would include a network of new pedestrian pathways and Class I and II bicycle lanes, to enable a continuous Blue Greenway/Bay Trail as well as multiple points of access between the 700 Innes, 900 Innes, India Basin Open Space, and India Basin Shorelines Park properties. The proposed projects also would enable continuous access to the future Northside Park, which will be part of the Candlestick-Hunters Point Shipyard project, immediately to the east. These elements fit within the "infrastructure projects, including safety and accessibility improvements, for people walking or bicycling" category.
☒	**Project Type 2. Does the proposed project qualify as an "*other minor transportation project*"?** Yes. The proposed projects would include changes to the existing public ROWs. The roadway network would adhere to the standards outlined in the San Francisco Better Streets Plan. Primary accesses to the project site would continue to be from Innes Avenue and Hunters Point Boulevard. New roadways within the project site would provide access to the park and open space areas, and would allow circulation within the residential and commercial/retail areas. Hudson Street east and west of Arelious Walker Drive would be vacated and realigned through dedication to the City of a new alignment, generally north of the existing ROW. The realigned segment of Hudson Street would be named New Hudson Street. The vacated Hudson Street ROW east and west of Arelious Walker Drive would become part of the 700 Innes property development. The Arelious Walker Drive ROW immediately north of New Hudson Street would shift to the northeast, to connect to New Hudson Street, while the remainder of the Arelious Walker Drive ROW beyond the intersection of New Hudson Street would be vacated for new parkland. Earl Street would be re-graded to meet City standards for vehicular access, descending from Innes Avenue and connecting with New Hudson Street. The remainder of Earl Street along the eastern side of the project site would be vacated and converted to a publicly accessible pedestrian path and a stormwater-wetland treatment canal, called Earl Canal. New Hudson Street would serve as the neighborhood "spine," providing a connection to the edge of the future Northside Park to the east and to the India Basin Cove to the west. The proposed project would include filling in curb cuts, adding new curb cuts, removing on-street parking, and adding new on-street loading zones. These elements fit within the "removal of off- or on-street parking spaces" and "adoption, removal, or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)" categories. In addition, the proposed project may include signalization of three new intersections along Innes Ave created to access the proposed project site. This element fits within the "Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features" category.

ATTACHMENT A
DEFINITIONS

Active transportation, rightsizing (aka road diet) and transit project means any of the following:

- Reduction in number of through lanes
- Infrastructure projects, including safety and accessibility improvements, for people walking or bicycling
- Installation or reconfiguration of traffic calming devices
- Creation of new or expansion of existing transit service
- Creation of new or conversion of existing general purpose lanes (including vehicle ramps) to transit lanes
- Creation of new or addition of roadway capacity on local or collector streets, provided the project also substantially improves conditions for people walking, bicycling, and, if applicable, riding transit (e.g., by improving neighborhood connectivity or improving safety)

Employment center project means a project located on property zoned for commercial uses with a floor area ratio of no less than 0.75 and that is located within a transit priority area.

Floor area ratio means the ratio of gross building area of the development, excluding structured parking areas, proposed for the project divided by the net lot area.

Gross building area means the sum of all finished areas of all floors of a building included within the outside faces of its exterior walls.

Infill opportunity zone means a specific area designated by a city or county, pursuant to subdivision (c) of Section 65088.4, that is within one-half mile of a major transit stop or high-quality transit corridor included in a regional transportation plan. A major transit stop is as defined in Section 21064.3 of the Public Resources Code, except that, for purposes of this section, it also includes major transit stops that are included in the applicable regional transportation plan. For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

Infill site means a lot located within an urban area that has been previously developed, or on a vacant site where at least 75 percent of the perimeter of the site adjoins, or is separated only by an improved public right-of-way from, parcels that are developed with qualified urban uses.

Lot means all parcels utilized by the project.

Major transit stop is defined in CEQA Section 21064.3 as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.

Map-based screening means the proposed project site is located within a transportation analysis zone that exhibits low levels of VMT.

Net lot area means the area of a lot, excluding publicly dedicated land and private streets that meet local standards, and other public use areas as determined by the local land use authority.

Other land use projects mean a land use other than residential, retail, and office. OPR has not provided proposed screening criteria or thresholds of significance for other types of land uses, other than those that meet the definition of a small project.

- Tourist hotels, student housing, single room occupancy hotels, and group housing land uses should be treated as residential for screening and analysis.
- Childcare, K-12 schools, post-secondary institutional (non-student housing), Medical, and production, distribution, and repair (PDR) land uses should be treated as office for screening and analysis.
- Grocery stores, local-serving entertainment venues, religious institutions, parks, and athletic clubs land uses should be treated as retail for screening and analysis.
- Public services (e.g., police, fire stations, public utilities) and do not generally generate VMT. Instead, these land uses are often built in response to development from other land uses (e.g., office and residential). Therefore, these land uses can be presumed to have less-than-significant impacts on VMT. However, this presumption would not apply if the project is sited in a location that would require employees or visitors to travel substantial distances and the project is not located within ½ mile of a major transit stop or does not meet the small project screening criterion.
- Event centers and regional-serving entertainment venues would most likely require a detailed VMT analysis. Therefore, no screening criterion is applicable.

Other minor transportation project means any of the following:

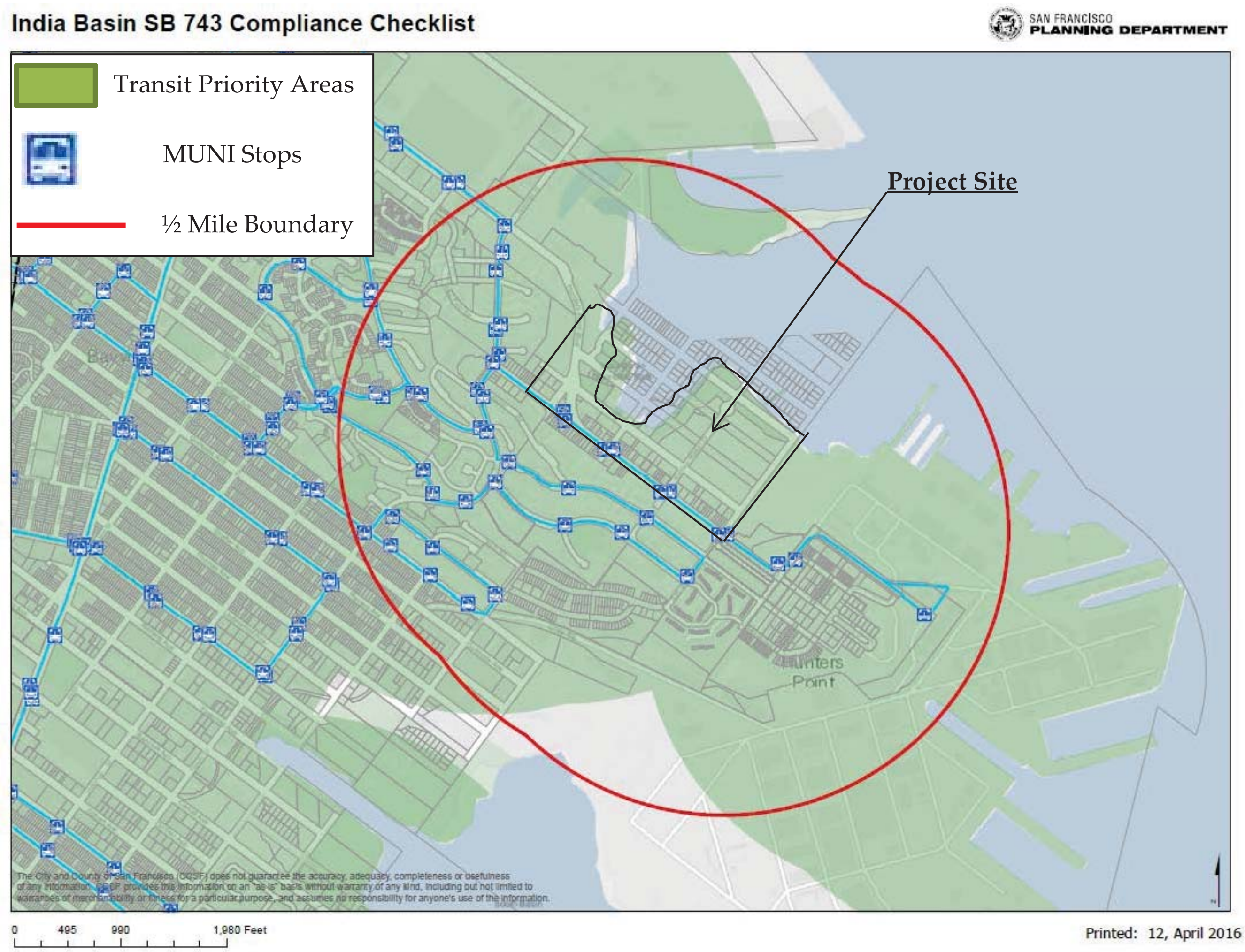
- Rehabilitation, maintenance, replacement and repair projects designed to improve the condition of existing transportation assets (e.g., highways, roadways, bridges, culverts, tunnels, transit systems, and bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, or emergency breakdown lanes that are not used as through lanes
- Conversion of existing general purpose lanes (including vehicle ramps) to managed lanes (e.g., HOV, HOT, or trucks) or transit lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g. HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Traffic metering systems
- Timing of signals to optimize vehicle, bicycle or pedestrian flow on local or collector streets
- Installation of roundabouts
- Adoption of or increase in tolls
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Addition of transportation wayfinding signage
- Removal of off- or on-street parking spaces
- Adoption, removal, or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)

Small project means the project would not result in over 100 vehicle trips per day.

Transit priority area means an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program adopted pursuant to Section 450.216 or 450.322 of Title 23 of the Code of Federal Regulations.

Vehicle miles traveled measures the amount and distance that a project might cause people to drive and accounts for the number of passengers per vehicle.

ATTACHMENT B
MAJOR TRANSIT STOPS



APPENDIX K: TRANSIT DELAY CALCULATIONS

APPENDIX L: TRAFFIC PERFORMANCE MEASURE CALCULATIONS

APPENDIX M: TRANSIT MODE SHIFT CALCULATIONS

APPENDIX N: LEVEL OF SERVICE CALCULATIONS

APPENDIX O: TRAFFIC VOLUME AND INTERSECTION TURNING MOVEMENT COUNTS

APPENDIX P: CUMULATIVE SCENARIO QUEUE LENGTHS – PLUS PROPOSED PROJECT AND PLUS PROJECT VARIANT

AM Transit Trip Assignment

Muni Downtown Screenlines

Region	SD-1		SD-2		SD-3		SD-4	
Direction (from project)	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Baseline	1	6	1	4	3	16	0	2
Project (Max Res)	12	14	8	10	50	43	3	4
Variant (Max Com)	40	12	28	8	137	38	11	3
Baseline	22%	22%	14%	14%	59%	59%	6%	6%
Project (Max Res)	16%	20%	11%	14%	68%	61%	5%	6%
Variant (Max Com)	19%	20%	13%	14%	63%	61%	5%	6%
Third Street[9]	0%	80%	0%	80%	0%	5%	0%	15%
Mission[10]	0%	0%	0%	0%	0%	0%	0%	0%
San Bruno/ Bayshore[11]	0%	10%	0%	10%	0%	0%	0%	0%
Other lines[12]	0%	10%	0%	10%	0%	5%	0%	15%
Southeast Screenline Total	**0%**	**100%**	**0%**	**100%**	**0%**	**10%**	**0%**	**30%**
does not cross any screenline	*95%*	*0%*	*0%*	*0%*	*100%*	*90%*	*70%*	*70%*

Notes:

Source is Transit Impacts spreadsheet (N:\Projects\2015 Projects\SF15-0820_India_Basin_TIA\Analysis\Transit Impacts)

9. T Third Street

10. 14 Mission, 14R Mission Rapid, 14X Mission Express, 49 Van Ness-Mission

11. 8AX Bayshore 'A' Express, 8BX Bayshore 'B' Express, 8 Bayshore, 9 San Bruno, 9L San Bruno Limited

12. J Church, 10 Townsend, 12 Folsom-Pacific, 19 Polk, 27 Bryant

Trips cross in opposite direction of peak hour travel.

PM Transit Trip Assignment

Muni Downtown Screenlines

Region	SD-1		SD-2		SD-3		SD-4	
Direction (from project)	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Baseline	6	3	4	2	16	8	2	1
Project (Max Res)	23	11	16	8	73	39	7	3
Variant (Max Com)	14	46	10	31	45	146	4	13
Baseline	22%	22%	14%	14%	59%	59%	6%	6%
Project (Max Res)	20%	19%	14%	13%	61%	63%	6%	5%
Variant (Max Com)	20%	19%	14%	13%	61%	62%	6%	5%
Third Street[9]	80%	0%	80%	0%	5%	0%	15%	0%
Mission[10]	0%	0%	0%	0%	0%	0%	0%	0%
San Bruno/ Bayshore[11]	10%	0%	10%	0%	0%	0%	0%	0%
Other lines[12]	10%	0%	10%	0%	5%	0%	15%	0%
Southeast Screenline Total	**100%**	**0%**	**100%**	0%	**10%**	**0%**	**30%**	**0%**
does not cross any screenline	*0%*	*95%*	*0%*	*0%*	*90%*	*100%*	*70%*	*70%*

Route Proportions by Superdistrict at Local Maximum Load Point and Global Maximum Load Point

Route	Proportion at LMLP[1]				Proportion at GMLP[2]			
	SD-1	SD-2	SD-3	SD-4	SD-1	SD-2	SD-3	SD-4
19 Polk	90%	90%	40%	30%	20%	10%	30%	15%
44 O'Shaughnessy					0%	10%	60%	70%
T Third					80%	80%	10%	15%
All other routes	10%	10%	60%	70%	0%	0%	0%	0%
Total	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*

Notes:

Since AM and PM peak trip distribution in and out of the project site (calculated above) are similar to one another (i.e. within 10%), a single set of transit route proportions was used for both the AM and PM. In addition, the inbound and outbound directions were assumed to have the same proportion

1. Local Maximum Load Point method is for Route 19 only and is taken at the stop at Evans/Newhall east of Third Street

2. Global Maximum Load Point method is used for all routes, consistent with typical Muni bus capacity analysis

AM Peak GMLP:

Route 19: 8th/Howard (outbound) Larkin/O'Farrell (inbound)

Route 44: Silver Ave/Dartmouth Ave (outbound) O'Shaughnessy/Del Vale (inbound)

PM Peak GMLP:

Route 19: 8th/Mission (outbound); 7th/Howard (inbound)

Route 44: Silver Ave/Mission Street (outbound); Silver Ave/San Bruno (inbound)

The previously-prepared assumptions with respect to transit ridership proportions by screenline included only routes which crossed the typical downtown screenlines used by the SFMTA. This only accounts for some of the transit trips which are made, but not all. In addition, some transit trips may end before the route crosses the screenline and one of the routes analyzed (44 O'Shaughnessy) does not cross any of the screenlines. Therefore, the highlighted cells have had further adjustments made to account for these trips.

Proportion of Total Transit Trips by Route

Route	**Outbound Direction (Transit)[1]**					
	Baseline		Project		Variant	
	Total Proportion of Transit Trips					
	LMLP	GMLP	LMLP	GMLP	LMLP	GMLP
19 Polk	57%	24%	53%	25%	55%	25%
44 O'Shaughnessy	0%	41%	0%	45%	0%	43%
T Third	0%	35%	0%	30%	0%	32%
All other lines	43%	0%	47%	0%	45%	0%
Total	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*

Route	**Inbound Direction (Transit)[1]**					
	Baseline		Project		Variant	
	Total Proportion of Transit Trips					
	LMLP	GMLP	LMLP	GMLP	LMLP	GMLP
19 Polk	57%	24%	56%	24%	56%	24%
44 O'Shaughnessy	0%	41%	0%	42%	0%	42%
T Third	0%	35%	0%	34%	0%	34%
All other lines	43%	0%	44%	0%	44%	0%
Total	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*

Notes:

refers to trips headed towards downtown SF, consistent with the terminology the SFMTA uses. From the perspective of the project site, Outbound trips are headed to the project site, while Inbound trips are headed away from the project site.

Transit Delay Thresholds	Route	AM	PM	
	Route 19	7.5	7.5	minutes
		450	450	seconds

Notes:

1. Transit delay impact thresholds half of the headway of the route being analyzed. Route 19 operates at 15 minute headways in the AM and PM peak. This is based on the SFMTA Transit Data Memorandum for TIS (May 2015) (N:\Reference\TIA Guidelines\San Francisco\Transit Data)

Route 19 Polk

AM Peak

Round Trip Results

	Baseline Plus Project	Baseline Plus Variant
Total Added Intersection Delay (sec)	22	45
Total Added Boarding Delay (sec)	65	123
Total Added Delay (sec)	86	168
Threshold (sec)	450	450
Impact?	NO	NO

Outbound Direction (Eastbound)[1]

Intersection Delay[2]

Intersection	Control	Baseline	Plus Project/Variant Control	Baseline + Project (No TI)	*Change (from Baseline)*	Baseline + Variant (No TI)	*Change (from Baseline)*
Third Street	Signal	42.6	Signal	37.9	*-5*	38.9	*-4*
Mendell Street	Signal	42.6	Signal	37.9	*-5*	38.9	*-4*
Jennings/Evans	Signal	17.3	Signal	18	*1*	19.3	*2*
West Point Road[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Ingalls Street[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Innes Avenue	Side-Street Stop	8.9	Signal	19.4	*11*	30.5	*22*
Griffith Street	Side-Street Stop	0	Signal	2.1	*2*	1.5	*2*
Arelious Walker	Side-Street Stop	0	Signal	0.5	*1*	1	*1*
Earl Street	Side-Street Stop	0	Signal	1.9	*2*	0.5	*1*
Donahue Street	Signal	30.0	Signal	28.0	*-2*	29.1	*-1*
Outbound Intersection Delay		***141.4***		***145.7***	***4***	***159.7***	***18***

Boarding Delay

	Baseline Plus Project		Baseline Plus Variant
Total Transit Trips[4]	118		355
Percentage using 19 Polk[5]	53%		55%
Buses per Hour		4.0	
Added Trips per Bus	16		47
Time per Pax (sec)[6]		2	
Outbound Boarding Delay	***31***		***94***

Inbound Direction (Westbound)[1]

Intersection Delay[2]

Intersection	Control	Baseline	Plus Project/Variant Control	Baseline + Project (No TI)	*Change (from Baseline)*	Baseline + Variant (No TI)	*Change (from Baseline)*
Donahue Street	Signal	23.4	Signal	18.1	*-5*	18.3	*-5*
Earl Street	Side-Street Stop	0	Signal	7.1	*7*	10.1	*10*
Arelious Walker	Side-Street Stop	0	Signal	15.7	*16*	24	*24*
Griffith Street	Side-Street Stop	0	Signal	3.3	*3*	2.5	*3*
Innes Avenue	Side-Street Stop	2.8	Signal	20.1	*17*	17.5	*15*
Ingalls Street[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
West Point Road[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Jennings/Evans	Signal	8.6	Signal	8.1	*-1*	8.1	*-1*
Mendell Street	Signal	38.2	Signal	28.1	*-10*	28.5	*-10*
Third Street	Signal	38.2	Signal	28.1	*-10*	28.5	*-10*
Inbound Intersection Delay		***111.2***		***128.6***	***17***	***137.5***	***26***

Boarding Delay

	Baseline Plus Project		Baseline Plus Variant
Total Transit Trips[4]	119		103
Percentage using 19 Polk[5]	56%		56%
Buses per Hour		4.0	
Added Trips per Bus	17		14
Time per Pax (sec)[6]		2	
Inbound Boarding Delay	***33***		***29***

PM Peak

Round Trip Results

	Baseline Plus Project	Baseline Plus Variant
Total Added Intersection Delay (sec)	31	49
Total Added Boarding Delay (sec)	82	143
Total Added Delay (sec)	113	192
Threshold (sec)	450	450
Impact?	NO	NO

Outbound Direction (Eastbound)[1]

Intersection Delay[2]

Intersection	Control	Baseline	Plus Project/Variant Control	Baseline + Project (No TI)	*Change (from Baseline)*	Baseline + Variant (No TI)	*Change (from Baseline)*
Third Street	Signal	40.4	Signal	35.7	*-5*	33.4	*-7*
Mendell Street	Signal	40.4	Signal	35.7	*-5*	33.4	*-7*
Jennings/Evans	Signal	19.9	Signal	20.7	*1*	18.2	*-2*
West Point Road[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Ingalls Street[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Innes Avenue	Side-Street Stop	9.1	Signal	19.5	*10*	17.4	*8*
Griffith Street	Side-Street Stop	0	Signal	2.3	*2*	1	*1*
Arelious Walker	Side-Street Stop	0	Signal	0.8	*1*	1.3	*1*
Earl Street	Side-Street Stop	0	Signal	1.9	*2*	0.7	*1*
Donahue Street	Signal	30.2	Signal	28.2	*-2*	25.8	*-4*
Outbound Intersection Delay		***140.0***		***144.8***	***5***	***131.2***	***-9***

Boarding Delay

	Baseline Plus Project		Baseline Plus Variant
Total Transit Trips[4]	200		123
Percentage using 19 Polk[5]	53%		55%
Buses per Hour		4.0	
Added Trips per Bus	27		16
Time per Pax (sec)[6]		2	
Outbound Boarding Delay	***53***		***33***

Inbound Direction (Westbound)[1]

Intersection Delay[2]

Intersection	Control	Baseline	Plus Project/Variant Control	Baseline + Project (No TI)	*Change (from Baseline)*	Baseline + Variant (No TI)	*Change (from Baseline)*
Donahue Street	Signal	21.4	Signal	17.1	*-4*	17.8	*-4*
Earl Street	Side-Street Stop	0	Signal	7.8	*8*	16.9	*17*
Arelious Walker	Side-Street Stop	0	Signal	17.6	*18*	30.1	*30*
Griffith Street	Side-Street Stop	0	Signal	4.1	*4*	4.3	*4*
Innes Avenue	Side-Street Stop	3.6	Signal	21.6	*18*	28.8	*25*
Ingalls Street[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
West Point Road[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Jennings/Evans	Signal	8.6	Signal	8	*-1*	9.2	*1*
Mendell Street	Signal	34.2	Signal	26.1	*-8*	26.4	*-8*
Third Street	Signal	34.2	Signal	26.1	*-8*	26.4	*-8*
Inbound Intersection Delay		***102.0***		***128.4***	***26***	***159.9***	***58***

Boarding Delay

	Baseline Plus Project		Baseline Plus Variant
Total Transit Trips[4]	102		394
Percentage using 19 Polk[5]	56%		56%
Buses per Hour		4.0	
Added Trips per Bus	14		55
Time per Pax (sec)[6]		2	
Inbound Boarding Delay	***29***		***110***

Notes:

1. Outbound refers to trips headed away from downtown SF (Financial District, SoMa, Mission Bay), while Inbound refers to trips headed towards downtown SF, consistent with the terminology the SFMTA uses. From the perspective of the project site, Outbound trips are headed to the project site, while Inbound trips are headed away from the project site.

2. Intersection delays are provided from Synchro LOS reports (N:\Projects\2015 Projects\SF15-0820_India_Basin_TIA\Analysis\Synchro\Results)

3. Since the Project/Variant would not add any vehicle trips at the West Point Road and Ingalls Street intersections, there would be no change in transit delay.

4. Total added transit trips for the Project and Variant is based on methodology described in Trip Generation Memo and summarized in Trip Generation summary spreadsheet (N:\Projects\2015 Projects\SF15-0820_India_Basin_TIA\Analysis\Trip Gen and Assignment)

5. Proportion of trips using each route is based on a combination of trip distribution to each superdistrict and proportion of transit trips taking each route to each superdistrict (see "Proportions" tab for detailed calculations). Proportions used for the 19 Polk are for the Local Maximum Load Point, since the transit delay analysis is for the Evans Avenue corridor

6. Time per passenger represents the average amount of time needed per passenger to board the bus, which includes time to enter the bus and pay fare. The CPHPS EIR assumed an average of 2 seconds per passenger, so this analysis is consistent with that assumption

Transit Delay Thresholds[1]	Route	AM	PM	
	Route 44	4	4.5	minutes
		240	270	seconds

Notes:
1. Transit delay impact thresholds half of the headway of the route being analyzed. Route 44 operates at 8 minute headways in the AM peak and 9 minute headways in the PM peak. This is based on the SFMTA Transit Data Memorandum for TIS (May 2015) (N:\Reference\TIA Guidelines\San Francisco\Transit Data)

Route 44 O'Shaughnessy

AM Peak

Round Trip Results

	Baseline Plus Project	Baseline Plus Variant
Total Added Intersection Delay (sec)	15	18
Total Added Boarding Delay (sec)	27	54
Total Added Delay (sec)	42	72
Threshold (sec)	240	240
Impact?	**NO**	**NO**

Outbound Direction (Eastbound)[1]

Intersection Delay[2]

Intersection	Control	Baseline	Plus Project/Variant Control	Baseline + Project (No TI)	*Change (from Baseline)*	Baseline + Variant (No TI)	*Change (from Baseline)*
Third Street	Signal	32.7	Signal	47.8	*15*	49	*16*
Mendell Street	Signal	42.6	Signal	37.9	*-5*	38.9	*-4*
Jennings/Evans	Signal	17.3	Signal	18	*1*	19.3	*2*
West Point Road[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Ingalls Street[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Outbound Intersection Delay		***92.6***		***103.7***	***11***	***107.2***	***15***

Boarding Delay

	Baseline Plus Project		Baseline Plus Variant
Total Transit Trips[4]	118		355
Percentage using 44 O'Shaughnessy[5]	45%		43%
Buses per Hour		7.5	
Added Trips per Bus	7		21
Time per Pax (sec)[6]		2	
Outbound Boarding Delay	***14***		***43***

Inbound Direction (Westbound)[1]

Intersection Delay[2]

Intersection	Control	Baseline	Plus Project/Variant Control	Baseline + Project (No TI)	*Change (from Baseline)*	Baseline + Variant (No TI)	*Change (from Baseline)*
Ingalls Street[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
West Point Road[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Jennings/Evans	Signal	8.6	Signal	8.1	*-1*	8.1	*-1*
Mendell Street	Signal	9.9	Signal	14.0	*4*	13.3	*3*
Inbound Intersection Delay		***18.5***		***22.1***	***4***	***21.4***	***3***

Boarding Delay

	Baseline Plus Project		Baseline Plus Variant
Total Transit Trips[4]	119		103
Percentage using 44 O'Shaughnessy[5]	42%		42%
Buses per Hour		7.5	
Added Trips per Bus	7		6
Time per Pax (sec)[6]		2	
Inbound Boarding Delay	***13***		***12***

PM Peak

Round Trip Results

	Baseline Plus Project	Baseline Plus Variant
Total Added Intersection Delay (sec)	14	27
Total Added Boarding Delay (sec)	40	66
Total Added Delay (sec)	54	93
Threshold (sec)	270	270
Impact?	**NO**	**NO**

Outbound Direction (Eastbound)[1]

Intersection Delay[2]

Intersection	Control	Baseline	Plus Project/Variant Control	Baseline + Project (No TI)	*Change (from Baseline)*	Baseline + Variant (No TI)	*Change (from Baseline)*
Third Street	Signal	42.6	Signal	54.6	*12*	55.9	*13*
Mendell Street	Signal	40.4	Signal	35.7	*-5*	33.4	*-7*
Jennings/Evans	Signal	19.9	Signal	20.7	*1*	18.2	*-2*
West Point Road[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Ingalls Street[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Outbound Intersection Delay		***102.9***		***111.0***	***8***	***107.5***	***5***

Boarding Delay

	Baseline Plus Project		Baseline Plus Variant
Total Transit Trips[4]	200		123
Percentage using 44 O'Shaughnessy[5]	45%		43%
Buses per Hour		6.7	
Added Trips per Bus	14		8
Time per Pax (sec)[6]		2	
Outbound Boarding Delay	***27***		***17***

Inbound Direction (Westbound)[1]

Intersection Delay[2]

Intersection	Control	Baseline	Plus Project/Variant Control	Baseline + Project (No TI)	*Change (from Baseline)*	Baseline + Variant (No TI)	*Change (from Baseline)*
Ingalls Street[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
West Point Road[3]	All-Way Stop	-	All-Way Stop	-	-	-	-
Jennings/Evans	Signal	8.6	Signal	8.0	*-1*	9.2	*1*
Mendell Street	Signal	9.8	Signal	16.4	*7*	31.4	*22*
Inbound Intersection Delay		***18.4***		***24.4***	***6***	***40.6***	***22***

Boarding Delay

	Baseline Plus Project		Baseline Plus Variant
Total Transit Trips[4]	102		394
Percentage using 44 O'Shaughnessy[5]	42%		42%
Buses per Hour		6.7	
Added Trips per Bus	6		25
Time per Pax (sec)[6]		2	
Inbound Boarding Delay	***13***		***50***

Notes:
1. Outbound refers to trips headed away from downtown SF (Financial District, SoMa, Mission Bay), while Inbound refers to trips headed towards downtown SF, consistent with the terminology the SFMTA uses. From the perspective of the project site, Outbound trips are headed to the project site, while Inbound trips are headed away from the project site.

2. Intersection delays are provided from Synchro LOS reports (N:\Projects\2015 Projects\SF15-0820_India_Basin_TIA\Analysis\Synchro\Results)
3. Since the Project/Variant would not add any vehicle trips at the West Point Road and Ingalls Street intersections, there would be no change in transit delay.
4. Total added transit trips for the Project and Variant is based on methodology described in Trip Generation Memo and summarized in Trip Generation summary spreadsheet (N:\Projects\2015 Projects\SF15-0820_India_Basin_TIA\Analysis\Trip Gen and Assignment)
5. Proportion of trips using each route is based on a combination of trip distribution to each superdistrict and proportion of transit trips taking each route to each superdistrict (see "Proportions" tab for detailed calculations). Proportions used for the 19 Polk are for the Local Maximum Load Point, since the transit delay analysis is for the Evans Avenue corridor
6. Time per passenger represents the average amount of time needed per passenger to board the bus, which includes time to enter the bus and pay fare. The CPHPS EIR assumed an average of 2 seconds per passenger, so this analysis is consistent with that assumption

Transit Delay Impacts By Year for Proposed Project

		India Basin Vehicle Trips as % of Full Proposed Project			CPHPS Vehicle Trips as % of Full Project		India Basin Proposed Project Added Transit Delay (min:sec)		Half-Headway Threshold (min:sec)		Significant Impact Triggered?	
Year	IB Phase	AM	PM	CPHPS Major Phase	AM	PM	AM	PM	AM	PM	AM	PM
2018		0%	0%		0%	0%	**01:26**	**01:53**	07:30	07:30	No	No
2019		0%	0%		0%	0%	*01:35*	*01:44*	07:30	07:30	No	No
2020		0%	0%		0%	0%	*01:35*	*01:44*	07:30	07:30	No	No
2021	1	80%	75%	1	32%	51%	*03:41*	*04:30*	07:30	07:30	No	No
2022	2	100%	100%		32%	51%	**03:55**	**04:30**	07:30	07:30	No	No
2023		100%	100%		32%	51%	*03:55*	*04:59*	03:45	03:45	YES	YES
2024		100%	100%		32%	51%	*03:55*	*04:59*	03:15	03:15	YES	YES
2025		100%	100%	2	54%	69%	*05:10*	*07:17*	03:15	03:15	YES	YES
2026		100%	100%		54%	69%	*05:10*	*07:17*	03:15	03:15	YES	YES
2027		100%	100%		54%	69%	*05:10*	*07:17*	03:15	03:15	YES	YES
2028		100%	100%		54%	69%	*05:10*	*07:17*	03:15	03:15	YES	YES
2029		100%	100%		54%	69%	*05:10*	*07:17*	03:15	03:15	YES	YES
2030		100%	100%		54%	69%	*05:10*	*07:17*	03:15	03:15	YES	YES
2031		100%	100%	3	82%	87%	*07:01*	*10:40*	03:15	03:15	YES	YES
2032		100%	100%		82%	87%	*07:01*	*10:40*	03:15	03:15	YES	YES
2033		100%	100%		82%	87%	*07:01*	*10:40*	03:15	03:15	YES	YES
2034		100%	100%	4	100%	100%	*08:08*	*14:03*	03:15	03:15	YES	YES
2035		100%	100%		100%	100%	*08:08*	*14:03*	03:15	03:15	YES	YES
2036		100%	100%		100%	100%	*08:08*	*14:03*	03:15	03:15	YES	YES
2037		100%	100%		100%	100%	*08:08*	*14:03*	03:15	03:15	YES	YES
2038		100%	100%		100%	100%	*08:08*	*14:03*	03:15	03:15	YES	YES
2039		100%	100%		100%	100%	*08:08*	*14:03*	03:15	03:15	YES	YES
2040		100%	100%		100%	100%	**08:08**	**15:21**	03:15	03:15	YES	YES

Notes:

1. Delay calculations for 2018, 2022, and 2040 are based on Synchro calculations/SimTraffic microsimulation and are **bolded**. Delay for other years is based on linear (AM) or exponential (PM) interpolation.
2. The half-headway significance threshold decreases in 2023 and 2024 because headways on the 44 O'Shaughnessy bus line are anticipated to decrease to 7.5 and 6.5 minutes, respectively, in those years, according to the CPHPS Transportation Plan.

Transit Delay Impacts By Year for Project Variant

		India Basin Vehicle Trips as % of Full Proposed Project			CPHPS Vehicle Trips as % of Full Project		India Basin Proposed Project Added Transit Delay (min:sec)		Half-Headway Threshold (min:sec)		Significant Impact Triggered?	
Year	IB Phase	AM	PM	CPHPS Major Phase	AM	PM	AM	PM	AM	PM	AM	PM
2018		0%	0%		0%	0%	**02:48**	**03:12**	07:30	07:30	No	No
2019		0%	0%		0%	0%	*05:37*	*03:19*	07:30	07:30	No	No
2020		0%	0%		0%	0%	*05:37*	*03:19*	07:30	07:30	No	No
2021	1	70%	47%	1	32%	51%	*08:27*	*03:57*	07:30	07:30	YES	No
2022	2	100%	100%		32%	51%	**11:59**	**08:21**	07:30	07:30	YES	YES

Notes:

1. Delay calculations for 2018 and 2022 are based on Synchro calculations/SimTraffic microsimulation and are **bolded**. Delay for other years is based on linear (AM) or exponential (PM) interpolation.

Route 44 O'Shaughnessy - CPP AM

Note: Route 44 was selected for this analysis because it will be the most frequent route along the corridor in the Cumulative scenario. As such, the threshold of significance is low, so if an identified significant impact is mitigated for this line, it is highly likely that the impact would be mitigated for other lines as well

2040 No Project (CPHPS)		
CPHPS Headway	6.5	min
	390	sec
Sig Threshold	195	sec

2040 Plus Project Averages		
Average Speed	9.1	mph
Change	-6.9	mph
Travel Time	1132	seconds
Change	488	seconds
Significant Impact?	YES	

2040 No Project AM - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	142	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	31	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	19	mph	From SimTraffic Model
	27.9	ft/s	
Distance	4480	ft	
Initial Time	161	seconds	
Added Time	31	*due to ridership*	
Travel Time	192	seconds	
Speed	15.9	mph	

Totals - Route 44		
Total Travel Time	323	sec
Total Distance	7560	ft
Average Speed	16.0	mph

2040 No Project AM - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	169	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	37	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	20	mph	From SimTraffic Model
	29.3	ft/s	
Distance	4480	ft	
Initial Time	153	seconds	
Added Time	37	*due to ridership*	
Travel Time	190	seconds	
Speed	16.1	mph	

Totals - Route 44		
Total Travel Time	321	sec
Total Distance	7560	ft
Average Speed	16.1	mph

CPP - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Add'l Riders	217	*Source: Transit Ridership Forecasts*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	47	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	18	mph	From SimTraffic Model
	26.4	ft/s	
Distance	4480	ft	
Initial Time	170	seconds	
Added Time	47	seconds	
Travel Time	217	seconds	
Speed	14.1	mph	

Totals - Route 44, Eastbound		
Total Travel Time	348	sec
Total Distance	7560	ft
Average Speed	14.8	mph

CPP - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Time	131	seconds	

Dwell Time Due to Ridership			
Add'l Riders	195	*Source: Transit Ridership Forecasts*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	42	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	5	mph	From SimTraffic Model
	7.3	ft/s	
Distance	4480	ft	
Initial Time	611	seconds	
Added Time	42	seconds	
Time	653	seconds	
Speed	4.7	mph	

Totals - Route 44, Westbound		
Total Travel Time	784	sec
Total Distance	7560	ft
Average Speed	6.6	mph

Route 44 O'Shaughnessy - CPP PM

Note: Route 44 was selected for this analysis because it will be the most frequent route along the corridor in the Cumulative scenario. As such, the threshold of significance is low, so if an identified significant impact is mitigated for this line, it is highly likely that the impact would be mitigated for other lines as well

2040 No Project (CPHPS)		
CPHPS Headway	6.5	min
	390	sec
Sig Threshold	195	sec

2040 Plus Project Averages		
Average Speed	6.5	mph
Change	-8.9	mph
Travel Time	1590	seconds
Change	921	seconds
Significant Impact?	YES	

2040 No Project PM - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	190	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	41	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	18	mph	From SimTraffic Model
	26.4	ft/s	
Distance	4480	ft	
Initial Time	170	seconds	
Added Time	41	*due to ridership*	
Travel Time	211	seconds	
Speed	14.5	mph	

Totals - Route 44 (average)		
Total Travel Time	342	sec
Total Distance	7560	ft
Average Speed	15.1	mph

2040 No Project PM - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	234	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	51	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	21	mph	From SimTraffic Model
	30.8	ft/s	
Distance	4480	ft	
Initial Time	145	seconds	
Added Time	51	*due to ridership*	
Travel Time	196	seconds	
Speed	15.5	mph	

Totals - Route 44 (average)		
Total Travel Time	327	sec
Total Distance	7560	ft
Average Speed	15.7	mph

CPP - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Add'l Riders	277	*Source: Transit Ridership Forecasts*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	60	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	16	mph	From SimTraffic Model
	23.5	ft/s	
Distance	4480	ft	
Initial Time	191	seconds	
Added Time	60	seconds	
Travel Time	251	seconds	
Speed	12.2	mph	

Totals - Route 44, Eastbound		
Total Travel Time	382	sec
Total Distance	7560	ft
Average Speed	13.5	mph

CPP - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Time	131	seconds	

Dwell Time Due to Ridership			
Add'l Riders	272	*Source: Transit Ridership Forecasts*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	59	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	3	mph	From SimTraffic Model
	4.4	ft/s	
Distance	4480	ft	
Initial Time	1018	seconds	
Added Time	59	seconds	
Time	1077	seconds	
Speed	2.8	mph	

Totals - Route 44, Westbound		
Total Travel Time	1208	sec
Total Distance	7560	ft
Average Speed	4.3	mph

Route 44 O'Shaughnessy - CPP AM (Mitigated)

Note: Route 44 was selected for this analysis because it will be the most frequent route along the corridor in the Cumulative scenario. As such, the threshold of significance is low, so if an identified significant impact is mitigated for this line, it is highly likely that the impact would be mitigated for other lines as well

2040 No Project (CPHPS)

CPHPS Headway	6.5	min
	390	sec
Sig Threshold	195	sec

2040 Plus Project Averages

Average Speed	16.0	mph
Change	0.0	mph
Travel Time	644	seconds
Change	0	seconds
Significant Impact?	NO	

2040 No Project AM - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	
Dwell Time Due to Ridership			
Ridership	142	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	31	seconds	
Travel Time Between Jennings-Donahue			
Initial Speed	19	mph	From SimTraffic Model
	27.9	ft/s	
Distance	4480	ft	
Initial Time	161	seconds	
Added Time	31	*due to ridership*	
Travel Time	192	seconds	
Speed	15.9	mph	
Totals - Route 44			
Total Travel Time	323	sec	
Total Distance	7560	ft	
Average Speed	16.0	mph	

2040 No Project AM - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	
Dwell Time Due to Ridership			
Ridership	169	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	37	seconds	
Travel Time Between Jennings-Donahue			
Initial Speed	20	mph	From SimTraffic Model
	29.3	ft/s	
Distance	4480	ft	
Initial Time	153	seconds	
Added Time	37	*due to ridership*	
Travel Time	190	seconds	
Speed	16.1	mph	
Totals - Route 44			
Total Travel Time	321	sec	
Total Distance	7560	ft	
Average Speed	16.1	mph	

CPP - Eastbound Direction

Travel Time Between Third-Donahue			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	7560	ft	
Travel Time	322	seconds	
Totals - Route 44, Eastbound			
Total Travel Time	322	sec	
Total Distance	7560	ft	
Average Speed	16.0	mph	

CPP - Westbound Direction

Travel Time Between Third-Donahue			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	7560	ft	
Time	322	seconds	
Totals - Route 44, Westbound			
Total Travel Time	322	sec	
Total Distance	7560	ft	
Average Speed	16.0	mph	

Route 44 O'Shaughnessy - CPP PM (Mitigated)

Note: Route 44 was selected for this analysis because it will be the most frequent route along the corridor in the Cumulative scenario. As such, the threshold of significance is low, so if an identified significant impact is mitigated for this line, it is highly likely that the impact would be mitigated for other lines as well

2040 No Project (CPHPS)

CPHPS Headway	6.5	min
	390	sec
Sig Threshold	195	sec

2040 Plus Project Averages

Average Speed	16.0	mph
Change	0.6	mph
Travel Time	644	seconds
Change	-25	seconds
Significant Impact?	NO	

2040 No Project PM - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	190	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	41	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	18	mph	From SimTraffic Model
	26.4	ft/s	
Distance	4480	ft	
Initial Time	170	seconds	
Added Time	41	*due to ridership*	
Travel Time	211	seconds	
Speed	14.5	mph	

Totals - Route 44 (average)		
Total Travel Time	342	sec
Total Distance	7560	ft
Average Speed	15.1	mph

2040 No Project PM - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	234	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	51	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	21	mph	From SimTraffic Model
	30.8	ft/s	
Distance	4480	ft	
Initial Time	145	seconds	
Added Time	51	*due to ridership*	
Travel Time	196	seconds	
Speed	15.5	mph	

Totals - Route 44 (average)		
Total Travel Time	327	sec
Total Distance	7560	ft
Average Speed	15.7	mph

CPP - Eastbound Direction

Travel Time Between Third-Donahue			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	7560	ft	
Travel Time	322	seconds	

Totals - Route 44, Eastbound		
Total Travel Time	322	sec
Total Distance	7560	ft
Average Speed	16.0	mph

CPP - Westbound Direction

Travel Time Between Third-Donahue			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	7560	ft	
Time	322	seconds	

Totals - Route 44, Westbound		
Total Travel Time	322	sec
Total Distance	7560	ft
Average Speed	16.0	mph

Route 44 O'Shaughnessy - CPV AM

Note: Route 44 was selected for this analysis because it will be the most frequent route along the corridor in the Cumulative scenario. As such, the threshold of significance is low, so if an identified significant impact is mitigated for this line, it is highly likely that the impact would be mitigated for other lines as well

2040 No Project (CPHPS)		
CPHPS Headway	6.5	min
	390	sec
Sig Threshold	195	sec

2040 Plus Project Averages		
Average Speed	7.9	mph
Change	-8.1	mph
Travel Time	1302	seconds
Change	658	seconds
Significant Impact?	YES	

2040 No Project AM - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	142	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	31	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	19	mph	From SimTraffic Model
	27.9	ft/s	
Distance	4480	ft	
Initial Time	161	seconds	
Added Time	31	*due to ridership*	
Travel Time	192	seconds	
Speed	15.9	mph	

Totals - Route 44		
Total Travel Time	323	sec
Total Distance	7560	ft
Average Speed	16.0	mph

2040 No Project AM - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	169	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	37	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	20	mph	From SimTraffic Model
	29.3	ft/s	
Distance	4480	ft	
Initial Time	153	seconds	
Added Time	37	*due to ridership*	
Travel Time	190	seconds	
Speed	16.1	mph	

Totals - Route 44		
Total Travel Time	321	sec
Total Distance	7560	ft
Average Speed	16.1	mph

CPV - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Add'l Riders	259	*Source: Transit Ridership Forecasts*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	56	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	17	mph	From SimTraffic Model
	24.9	ft/s	
Distance	4480	ft	
Initial Time	180	seconds	
Added Time	56	seconds	
Travel Time	236	seconds	
Speed	12.9	mph	

Totals - Route 44, Eastbound		
Total Travel Time	367	sec
Total Distance	7560	ft
Average Speed	14.0	mph

CPV - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Time	131	seconds	

Dwell Time Due to Ridership			
Add'l Riders	190	*Source: Transit Ridership Forecasts*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	41	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	4	mph	From SimTraffic Model
	5.9	ft/s	
Distance	4480	ft	
Initial Time	763	seconds	
Added Time	41	seconds	
Time	804	seconds	
Speed	3.8	mph	

Totals - Route 44, Westbound		
Total Travel Time	935	sec
Total Distance	7560	ft
Average Speed	5.5	mph

Route 44 O'Shaughnessy - CPV PM

Note: Route 44 was selected for this analysis because it will be the most frequent route along the corridor in the Cumulative scenario. As such, the threshold of significance is low, so if an identified significant impact is mitigated for this line, it is highly likely that the impact would be mitigated for other lines as well

2040 No Project (CPHPS)		
CPHPS Headway	6.5	min
	390	sec
Sig Threshold	195	sec

2040 Plus Project Averages		
Average Speed	6.3	mph
Change	-9.1	mph
Average Travel Time	1643	seconds
Change	974	seconds
Significant Impact?	YES	

2040 No Project PM - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	190	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	41	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	18	mph	From SimTraffic Model
	26.4	ft/s	
Distance	4480	ft	
Initial Time	170	seconds	
Added Time	41	*due to ridership*	
Travel Time	211	seconds	
Speed	14.5	mph	

Totals - Route 44 (average)		
Total Travel Time	342	sec
Total Distance	7560	ft
Average Speed	15.1	mph

2040 No Project PM - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	234	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	51	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	21	mph	From SimTraffic Model
	30.8	ft/s	
Distance	4480	ft	
Initial Time	145	seconds	
Added Time	51	*due to ridership*	
Travel Time	196	seconds	
Speed	15.5	mph	

Totals - Route 44 (average)		
Total Travel Time	327	sec
Total Distance	7560	ft
Average Speed	15.7	mph

CPV - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Add'l Riders	266	*Source: Transit Ridership Forecasts*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	58	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	13	mph	From SimTraffic Model
	19.1	ft/s	
Distance	4480	ft	
Initial Time	235	seconds	
Added Time	58	seconds	
Travel Time	293	seconds	
Speed	10.4	mph	

Totals - Route 44, Eastbound		
Total Travel Time	424	sec
Total Distance	7560	ft
Average Speed	12.2	mph

CPV - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Time	131	seconds	

Dwell Time Due to Ridership			
Add'l Riders	322	*Source: Transit Ridership Forecasts*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	70	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	3	mph	From SimTraffic Model
	4.4	ft/s	
Distance	4480	ft	
Initial Time	1018	seconds	
Added Time	70	seconds	
Time	1088	seconds	
Speed	2.8	mph	

Totals - Route 44, Westbound		
Total Travel Time	1219	sec
Total Distance	7560	ft
Average Speed	4.2	mph

Route 44 O'Shaughnessy - CPV AM (Mitigated)

Note: Route 44 was selected for this analysis because it will be the most frequent route along the corridor in the Cumulative scenario. As such, the threshold of significance is low, so if an identified significant impact is mitigated for this line, it is highly likely that the impact would be mitigated for other lines as well

2040 No Project (CPHPS)		
CPHPS Headway	6.5	min
	390	sec
Sig Threshold	195	sec

2040 Plus Project Averages		
Average Speed	16.0	mph
Change	0.0	mph
Travel Time	644	seconds
Change	0	seconds
Significant Impact?	NO	

2040 No Project AM - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	142	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	31	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	19	mph	From SimTraffic Model
	27.9	ft/s	
Distance	4480	ft	
Initial Time	161	seconds	
Added Time	31	*due to ridership*	
Travel Time	192	seconds	
Speed	15.9	mph	

Totals - Route 44		
Total Travel Time	323	sec
Total Distance	7560	ft
Average Speed	16.0	mph

2040 No Project AM - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	169	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	37	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	20	mph	From SimTraffic Model
	29.3	ft/s	
Distance	4480	ft	
Initial Time	153	seconds	
Added Time	37	*due to ridership*	
Travel Time	190	seconds	
Speed	16.1	mph	

Totals - Route 44		
Total Travel Time	321	sec
Total Distance	7560	ft
Average Speed	16.1	mph

CPV - Eastbound Direction

Travel Time Between Third-Donahue			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	7560	ft	
Travel Time	322	seconds	

Totals - Route 44, Eastbound		
Total Travel Time	322	sec
Total Distance	7560	ft
Average Speed	16.0	mph

CPV - Westbound Direction

Travel Time Between Third-Donahue			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	7560	ft	
Time	322	seconds	

Totals - Route 44, Westbound		
Total Travel Time	322	sec
Total Distance	7560	ft
Average Speed	16.0	mph

Route 44 O'Shaughnessy - CPV PM (Mitigated)

Note: Route 44 was selected for this analysis because it will be the most frequent route along the corridor in the Cumulative scenario. As such, the threshold of significance is low, so if an identified significant impact is mitigated for this line, it is highly likely that the impact would be mitigated for other lines as well

2040 No Project (CPHPS)

CPHPS Headway	6.5	min
	390	sec
Sig Threshold	195	sec

2040 Plus Project Averages

Average Speed	16.0	mph
Change	0.6	mph
Travel Time	644	seconds
Change	-25	seconds
Significant Impact?	NO	

2040 No Project PM - Eastbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	190	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	41	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	18	mph	From SimTraffic Model
	26.4	ft/s	
Distance	4480	ft	
Initial Time	170	seconds	
Added Time	41	*due to ridership*	
Travel Time	211	seconds	
Speed	14.5	mph	

Totals - Route 44 (average)		
Total Travel Time	342	sec
Total Distance	7560	ft
Average Speed	15.1	mph

2040 No Project PM - Westbound Direction

Travel Time Between Third-Jennings			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	3080	ft	
Travel Time	131	seconds	

Dwell Time Due to Ridership			
Ridership	234	*Source: SF-CHAMP CC Model Run Rid*	
Time per Person	2	sec/pax	
Buses per Hour	9.2	buses	
Time	51	seconds	

Travel Time Between Jennings-Donahue			
Initial Speed	21	mph	From SimTraffic Model
	30.8	ft/s	
Distance	4480	ft	
Initial Time	145	seconds	
Added Time	51	*due to ridership*	
Travel Time	196	seconds	
Speed	15.5	mph	

Totals - Route 44 (average)		
Total Travel Time	327	sec
Total Distance	7560	ft
Average Speed	15.7	mph

CPV - Eastbound Direction

Travel Time Between Third-Donahue			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	7560	ft	
Travel Time	322	seconds	

Totals - Route 44, Eastbound		
Total Travel Time	322	sec
Total Distance	7560	ft
Average Speed	16.0	mph

CPV - Westbound Direction

Travel Time Between Third-Donahue			
Speed	16	mph	*Bus lane in place*
	23.5	ft/s	
Distance	7560	ft	
Time	322	seconds	

Totals - Route 44, Westbound		
Total Travel Time	322	sec
Total Distance	7560	ft
Average Speed	16.0	mph

APPENDIX L: TRAFFIC PERFORMANCE MEASURE CALCULATIONS

BUILDOUT NO PROJECT

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	11	2.3	36.2	0.3	33
Hunters Point Boulev	9	0.3	6.9	0.1	40
Griffith Street	1	1.3	11.3	0.1	22
Arelious Walker Driv	2	0.5	15.9	0.1	29
Earl Street	3	0.2	15.7	0.1	29
Donahue Street	5	21.9	35.8	0.1	13
Total		26.6	121.8	0.9	25

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	3	2.1	17.5	0.1	27
Arelious Walker Driv	2	0.3	15.7	0.1	29
Griffith Street	1	1.7	17.2	0.1	27
Hunters Point Boulev	9	0.7	8.1	0.1	31
Hawes Street	11	0.2	6.7	0.1	41
Jennings Street	6	11.9	46.7	0.3	25
Total		17.0	111.9	0.9	28

Intersection: 1: Griffith Street & Innes Avenue

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	52	53	75	91	46	50
Average Queue (ft)	10	9	18	22	18	18
95th Queue (ft)	34	34	54	62	45	45
Link Distance (ft)	309	309	621	621	869	917
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Innes Avenue & Arelious Walker Drive

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	40	39
Average Queue (ft)	4	12
95th Queue (ft)	23	38
Link Distance (ft)	621	1203
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Innes Avenue & Earl Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	33	37
Average Queue (ft)	2	8
95th Queue (ft)	16	32
Link Distance (ft)	620	1273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	93	111	182	62	125	116
Average Queue (ft)	40	53	77	22	60	51
95th Queue (ft)	77	95	145	54	104	90
Link Distance (ft)	615	615	1320	711	1513	1513
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	LT	T	R	LT	T	R	LTR	L	TR
Maximum Queue (ft)	94	68	49	131	155	89	30	32	55
Average Queue (ft)	49	28	15	68	78	16	5	6	17
95th Queue (ft)	81	63	41	112	127	54	23	25	43
Link Distance (ft)	3033	3033		1671	1671		1157		1110
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			100			100		100	
Storage Blk Time (%)					2				
Queuing Penalty (veh)					1				

Intersection: 9: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	60	50
Average Queue (ft)	21	9
95th Queue (ft)	50	36
Link Distance (ft)	851	309
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: Innes Avenue & Hawes Street

Movement	EB
Directions Served	LR
Maximum Queue (ft)	64
Average Queue (ft)	27
95th Queue (ft)	56
Link Distance (ft)	897
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 1

5: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1
Total Delay (hr)	1.3	0.1	0.0	0.1	0.9	0.0	0.1	0.1	0.0	0.1	0.1	0.7
Total Del/Veh (s)	26.7	21.9	14.2	26.9	30.2	16.0	24.0	31.0	6.1	29.3	27.4	6.3
Stop Delay (hr)	1.2	0.1	0.0	0.1	0.8	0.0	0.1	0.1	0.0	0.1	0.1	0.6
Stop Del/Veh (s)	24.9	19.2	13.4	23.5	26.1	14.5	22.2	29.0	5.9	26.4	23.7	5.1
Total Stops	130	6	7	6	87	8	8	8	7	9	9	254
Stop/Veh	0.76	0.55	0.78	0.75	0.77	0.80	0.73	0.80	0.78	0.82	0.75	0.62
Travel Dist (mi)	21.7	1.3	1.2	2.1	28.0	2.5	1.4	1.3	1.2	3.2	3.3	116.4
Travel Time (hr)	2.1	0.1	0.1	0.1	1.9	0.1	0.1	0.1	0.1	0.2	0.2	5.7
Avg Speed (mph)	10	11	14	16	15	18	11	9	17	14	15	21
Fuel Used (gal)	0.7	0.0	0.0	0.1	0.9	0.1	0.1	0.1	0.0	0.1	0.1	3.0
Fuel Eff. (mpg)	29.1	29.4	36.9	33.7	30.5	34.5	27.6	24.6	38.0	33.1	32.5	38.7
HC Emissions (g)	6	1	0	0	10	0	0	0	0	0	0	29
CO Emissions (g)	124	17	3	11	253	14	7	6	3	11	11	678
NOx Emissions (g)	15	3	0	1	28	1	1	1	0	1	1	92
Vehicles Entered	170	11	9	8	112	10	11	10	9	11	12	405
Vehicles Exited	169	11	9	8	112	10	11	10	9	11	12	407
Hourly Exit Rate	169	11	9	8	112	10	11	10	9	11	12	407
Input Volume	172	11	10	10	110	10	10	10	10	10	10	402
% of Volume	98	98	88	78	102	98	107	98	88	107	117	101
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	2	0	0	0	2	0	0	0	0	0	0	6

5: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	3.5
Total Del/Veh (s)	16.0
Stop Delay (hr)	3.1
Stop Del/Veh (s)	14.1
Total Stops	539
Stop/Veh	0.68
Travel Dist (mi)	183.6
Travel Time (hr)	10.9
Avg Speed (mph)	17
Fuel Used (gal)	5.2
Fuel Eff. (mpg)	35.2
HC Emissions (g)	48
CO Emissions (g)	1137
NOx Emissions (g)	145
Vehicles Entered	778
Vehicles Exited	779
Hourly Exit Rate	779
Input Volume	778
% of Volume	100
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	589
Occupancy (veh)	11

6: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	3.7	0.2	0.2	0.1
Total Delay (hr)	0.3	0.5	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	2.7
Total Del/Veh (s)	18.8	10.0	2.7	11.1	11.8	4.4	6.6	6.2	9.1	6.4	3.7	10.5
Stop Delay (hr)	0.2	0.3	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
Stop Del/Veh (s)	15.9	6.5	2.0	7.7	6.9	2.2	5.2	5.1	7.7	4.8	3.4	6.8
Total Stops	45	88	23	7	265	17	6	1	7	5	23	487
Stop/Veh	0.85	0.51	0.55	0.64	0.52	0.53	0.46	0.33	0.54	0.42	0.49	0.53
Travel Dist (mi)	29.9	98.5	23.3	3.7	172.4	10.7	2.9	0.6	2.6	2.5	9.8	357.0
Travel Time (hr)	1.2	3.3	0.7	0.1	6.7	0.4	0.1	0.0	0.2	0.1	0.5	13.4
Avg Speed (mph)	25	30	31	25	26	28	20	21	18	21	21	27
Fuel Used (gal)	0.7	2.4	0.5	0.1	4.2	0.2	0.1	0.0	0.1	0.1	0.2	8.6
Fuel Eff. (mpg)	41.7	41.4	43.1	42.1	41.1	43.7	39.3	37.7	36.7	36.8	40.1	41.3
HC Emissions (g)	7	39	11	0	54	7	0	0	0	0	2	120
CO Emissions (g)	146	829	197	12	1109	118	8	2	9	9	55	2494
NOx Emissions (g)	24	125	33	2	177	19	1	0	1	1	8	391
Vehicles Entered	52	171	40	11	506	32	13	3	12	12	46	898
Vehicles Exited	52	172	40	11	508	31	13	3	12	12	47	901
Hourly Exit Rate	52	172	40	11	508	31	13	3	12	12	47	901
Input Volume	52	168	38	11	498	32	15	2	14	11	44	886
% of Volume	100	102	105	98	102	96	88	150	87	107	107	102
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												1327
Occupancy (veh)	1	3	1	0	7	0	0	0	0	0	0	13

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	11	3.2	36.9	0.3	32
Hunters Point Boulev	9	0.5	7.1	0.1	39
Griffith Street	1	1.7	11.8	0.1	22
Arelious Walker Driv	2	0.8	16.3	0.1	28
Earl Street	3	0.5	15.9	0.1	29
Donahue Street	5	34.9	50.4	0.1	9
Total		41.6	138.3	0.9	22

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	3	1.9	16.6	0.1	28
Arelious Walker Driv	2	0.3	15.7	0.1	29
Griffith Street	1	1.7	17.3	0.1	27
Hunters Point Boulev	9	0.7	8.2	0.1	31
Hawes Street	11	0.2	6.7	0.1	42
Jennings Street	6	11.3	46.3	0.3	26
Total		16.1	110.7	0.9	28

Intersection: 1: Griffith Street & Innes Avenue

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	61	75	62	66	44	46
Average Queue (ft)	15	18	17	19	17	17
95th Queue (ft)	45	52	49	55	45	45
Link Distance (ft)	309	309	621	621	869	917
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Innes Avenue & Arelious Walker Drive

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	42	35
Average Queue (ft)	4	13
95th Queue (ft)	22	38
Link Distance (ft)	621	1203
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Innes Avenue & Earl Street

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	35	2	38
Average Queue (ft)	4	0	11
95th Queue (ft)	20	2	37
Link Distance (ft)	620	615	1273
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	168	201	101	66	124	115
Average Queue (ft)	90	123	37	23	56	49
95th Queue (ft)	150	186	82	55	100	90
Link Distance (ft)	615	615	1320	711	1513	1513
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	LT	T	R	LT	T	R	LTR	L	TR
Maximum Queue (ft)	96	116	68	105	121	49	32	69	38
Average Queue (ft)	54	57	22	54	62	15	5	22	10
95th Queue (ft)	84	98	53	90	102	42	23	53	31
Link Distance (ft)	3033	3033		1671	1671		1157		1110
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			100			100		100	
Storage Blk Time (%)		1			1			0	
Queuing Penalty (veh)		0			0			0	

Intersection: 9: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB
Directions Served	LR	LT	T
Maximum Queue (ft)	61	61	8
Average Queue (ft)	26	17	0
95th Queue (ft)	54	49	8
Link Distance (ft)	851	309	309
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: Innes Avenue & Hawes Street

Movement	EB
Directions Served	LR
Maximum Queue (ft)	49
Average Queue (ft)	20
95th Queue (ft)	49
Link Distance (ft)	897
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 1

5: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1
Total Delay (hr)	2.6	0.9	0.1	0.1	0.3	0.0	0.1	0.1	0.0	0.1	0.1	0.6
Total Del/Veh (s)	30.0	34.8	23.8	30.7	28.0	13.3	28.2	31.7	8.5	31.4	29.3	6.3
Stop Delay (hr)	2.3	0.8	0.1	0.1	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.5
Stop Del/Veh (s)	27.0	29.7	21.9	28.1	24.7	12.6	26.5	29.4	7.9	28.7	26.2	5.1
Total Stops	248	78	12	9	27	10	8	10	7	10	8	233
Stop/Veh	0.80	0.83	0.92	0.90	0.75	0.83	0.80	0.83	0.78	0.83	0.80	0.63
Travel Dist (mi)	39.7	12.0	1.7	2.6	9.0	2.9	1.4	1.6	1.3	3.3	2.7	105.6
Travel Time (hr)	4.1	1.3	0.2	0.2	0.6	0.2	0.1	0.2	0.1	0.2	0.2	5.1
Avg Speed (mph)	10	9	11	15	15	19	10	10	16	14	14	21
Fuel Used (gal)	1.5	0.5	0.1	0.1	0.3	0.1	0.1	0.1	0.0	0.1	0.1	2.7
Fuel Eff. (mpg)	27.3	26.1	31.0	30.7	31.8	36.5	26.8	25.6	35.3	31.7	33.0	38.7
HC Emissions (g)	8	3	0	0	3	0	0	0	0	0	0	25
CO Emissions (g)	217	74	5	14	68	13	5	8	5	12	9	597
NOx Emissions (g)	25	9	1	1	8	1	1	1	1	1	1	80
Vehicles Entered	308	93	13	10	36	12	10	12	9	12	10	367
Vehicles Exited	308	93	13	10	36	11	10	12	9	11	9	366
Hourly Exit Rate	308	93	13	10	36	11	10	12	9	11	9	366
Input Volume	318	92	10	10	35	10	10	10	10	10	10	358
% of Volume	97	101	127	98	102	107	98	117	88	107	88	102
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	4	1	0	0	1	0	0	0	0	0	0	5

5: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	5.0
Total Del/Veh (s)	20.2
Stop Delay (hr)	4.4
Stop Del/Veh (s)	17.8
Total Stops	660
Stop/Veh	0.73
Travel Dist (mi)	183.7
Travel Time (hr)	12.4
Avg Speed (mph)	15
Fuel Used (gal)	5.5
Fuel Eff. (mpg)	33.5
HC Emissions (g)	41
CO Emissions (g)	1028
NOx Emissions (g)	130
Vehicles Entered	892
Vehicles Exited	888
Hourly Exit Rate	888
Input Volume	886
% of Volume	100
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	517
Occupancy (veh)	12

6: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	3.6	0.4	0.2
Total Delay (hr)	0.1	1.1	0.1	0.1	1.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	16.4	11.3	3.9	15.7	11.2	3.8	7.9	7.0	2.2	9.0	6.4	3.6
Stop Delay (hr)	0.1	0.7	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Stop Del/Veh (s)	12.7	6.9	2.3	13.1	6.9	2.1	6.5	5.6	2.0	7.3	4.9	3.3
Total Stops	18	196	33	10	189	18	5	1	1	29	7	8
Stop/Veh	0.75	0.54	0.59	0.77	0.52	0.56	0.56	0.33	0.50	0.54	0.41	0.53
Travel Dist (mi)	13.6	205.6	31.6	4.4	122.0	10.8	1.9	0.7	0.5	11.3	3.5	3.1
Travel Time (hr)	0.5	7.1	1.0	0.2	4.7	0.4	0.1	0.0	0.0	0.7	0.2	0.2
Avg Speed (mph)	26	29	31	23	26	28	19	20	22	19	21	21
Fuel Used (gal)	0.3	4.9	0.8	0.1	2.9	0.2	0.1	0.0	0.0	0.3	0.1	0.1
Fuel Eff. (mpg)	40.3	41.7	41.9	39.5	41.8	44.5	35.8	36.0	41.1	34.9	37.5	40.8
HC Emissions (g)	3	55	12	1	35	4	0	0	0	3	0	0
CO Emissions (g)	60	1251	247	15	712	71	5	2	1	61	12	9
NOx Emissions (g)	9	190	40	2	116	13	1	0	0	8	1	1
Vehicles Entered	24	357	55	13	357	32	9	3	2	54	17	15
Vehicles Exited	24	358	55	13	359	32	9	3	2	54	17	15
Hourly Exit Rate	24	358	55	13	359	32	9	3	2	54	17	15
Input Volume	24	374	54	12	351	29	10	4	2	51	18	16
% of Volume	100	96	102	106	102	110	88	75	100	106	96	95
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	1	7	1	0	5	0	0	0	0	1	0	0

6: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.3
Total Delay (hr)	2.7
Total Del/Veh (s)	10.3
Stop Delay (hr)	1.8
Stop Del/Veh (s)	6.6
Total Stops	515
Stop/Veh	0.54
Travel Dist (mi)	409.1
Travel Time (hr)	15.0
Avg Speed (mph)	27
Fuel Used (gal)	9.9
Fuel Eff. (mpg)	41.4
HC Emissions (g)	113
CO Emissions (g)	2449
NOx Emissions (g)	383
Vehicles Entered	938
Vehicles Exited	941
Hourly Exit Rate	941
Input Volume	945
% of Volume	100
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	1188
Occupancy (veh)	15

BUILDOUT + PROJECT

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	12	15.3	47.7	0.3	24
Hunters Point Boulev	10	15.4	22.5	0.1	13
Griffith Street	1	9.6	19.7	0.1	13
Arelious Walker Driv	2	5.2	21.6	0.1	22
Earl Street	3	5.6	21.0	0.1	22
Donahue Street	5	30.3	45.3	0.1	10
Total		81.4	177.7	0.9	17

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	3	19.6	34.6	0.1	13
Arelious Walker Driv	2	14.4	29.7	0.1	16
New Griffith St	1	7.7	23.8	0.1	20
Hunters Point Boulev	10	11.8	19.5	0.1	14
Hawes Street	12	4.0	11.2	0.1	26
Jennings Street	6	12.2	45.5	0.3	25
Total		69.7	164.2	0.9	19

Intersection: 1: Griffith Street/New Griffith St & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	LT	TR	LTR	LT	R
Maximum Queue (ft)	215	299	163	260	262	58	70	209
Average Queue (ft)	100	165	53	105	119	16	11	101
95th Queue (ft)	187	284	122	203	217	47	48	177
Link Distance (ft)		310	310	634	634	499	1149	
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		1						
Storage Bay Dist (ft)	160							200
Storage Blk Time (%)	1	7						0
Queuing Penalty (veh)	4	14						0

Intersection: 2: Arelious Walker Drive & Innes Avenue

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	384	239	84	296	310	77	242
Average Queue (ft)	200	41	18	154	172	14	113
95th Queue (ft)	348	152	58	250	274	43	205
Link Distance (ft)		634	634	606	606		1236
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	350					180	
Storage Blk Time (%)	1	0					2
Queuing Penalty (veh)	3	0					0

Intersection: 3: Earl Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	231	74	99	196	213	84	305
Average Queue (ft)	112	15	29	108	114	13	152
95th Queue (ft)	201	50	74	176	191	52	268
Link Distance (ft)		606	606	609	609		1334
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	390					160	
Storage Blk Time (%)							7
Queuing Penalty (veh)							1

Intersection: 5: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	145	165	172	72	156	132
Average Queue (ft)	61	85	79	21	67	51
95th Queue (ft)	120	139	142	56	123	98
Link Distance (ft)	609	609	1421	794	1412	1412
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	LT	T	R	LT	T	R	LTR	L	TR
Maximum Queue (ft)	285	259	70	199	232	160	37	159	316
Average Queue (ft)	137	105	14	94	106	66	9	123	73
95th Queue (ft)	241	212	50	174	197	137	32	175	224
Link Distance (ft)	3102	3102		1604	1604		1230		1087
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			100			100		100	
Storage Blk Time (%)		4			6	0		19	0
Queuing Penalty (veh)		2			18	1		13	0

Intersection: 10: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	T
Maximum Queue (ft)	179	179	278	296	276	253
Average Queue (ft)	81	77	127	157	206	88
95th Queue (ft)	136	151	240	262	308	201
Link Distance (ft)	876		310	310	252	252
Upstream Blk Time (%)			0	0	6	0
Queuing Penalty (veh)			0	0	28	1
Storage Bay Dist (ft)		120				
Storage Blk Time (%)		1	4			
Queuing Penalty (veh)		5	7			

Intersection: 12: Innes Avenue & Hawes Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	T	T	T	TR
Maximum Queue (ft)	65	149	185	499	418
Average Queue (ft)	25	33	46	138	76
95th Queue (ft)	57	110	135	407	316
Link Distance (ft)	805	252	252	1604	1604
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 99

5: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.2	0.2	0.1	0.2	0.1	0.3	0.4	0.1
Total Delay (hr)	2.1	0.1	0.1	0.1	1.0	0.0	0.1	0.1	0.0	0.1	0.1	0.8
Total Del/Veh (s)	28.4	31.0	21.9	28.8	32.0	19.6	28.9	25.3	6.2	33.7	29.7	7.2
Stop Delay (hr)	1.9	0.1	0.1	0.1	0.9	0.0	0.1	0.1	0.0	0.1	0.1	0.7
Stop Del/Veh (s)	25.2	25.5	19.5	25.8	27.8	18.3	27.2	23.2	5.8	30.6	25.2	5.8
Total Stops	201	11	9	6	88	9	7	8	10	10	7	259
Stop/Veh	0.76	0.79	0.82	0.67	0.79	1.00	0.78	0.80	0.91	0.83	0.70	0.63
Travel Dist (mi)	33.3	1.8	1.3	2.3	29.3	2.5	1.3	1.5	1.7	3.2	2.6	107.8
Travel Time (hr)	3.3	0.2	0.1	0.2	2.0	0.1	0.1	0.1	0.1	0.2	0.2	4.8
Avg Speed (mph)	10	10	11	15	15	18	10	12	18	14	15	23
Fuel Used (gal)	1.3	0.1	0.0	0.1	1.0	0.1	0.0	0.0	0.0	0.1	0.1	2.7
Fuel Eff. (mpg)	25.0	25.0	27.0	32.2	30.6	35.4	27.0	30.2	39.5	31.7	33.6	40.1
HC Emissions (g)	14	0	0	0	10	0	0	0	0	0	0	36
CO Emissions (g)	397	14	8	12	242	12	6	6	5	12	11	780
NOx Emissions (g)	42	2	1	1	28	1	1	1	1	1	1	98
Vehicles Entered	262	14	10	9	109	9	9	10	11	12	10	402
Vehicles Exited	262	14	10	9	109	9	9	10	11	12	10	404
Hourly Exit Rate	262	14	10	9	109	9	9	10	11	12	10	404
Input Volume	264	15	10	10	106	10	10	10	10	10	10	410
% of Volume	99	92	98	88	103	88	88	98	107	117	98	99
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	3	0	0	0	2	0	0	0	0	0	0	5

5: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	4.6
Total Del/Veh (s)	18.7
Stop Delay (hr)	4.0
Stop Del/Veh (s)	16.2
Total Stops	625
Stop/Veh	0.71
Travel Dist (mi)	188.6
Travel Time (hr)	11.4
Avg Speed (mph)	17
Fuel Used (gal)	5.6
Fuel Eff. (mpg)	33.9
HC Emissions (g)	62
CO Emissions (g)	1505
NOx Emissions (g)	177
Vehicles Entered	867
Vehicles Exited	869
Hourly Exit Rate	869
Input Volume	877
% of Volume	99
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	559
Occupancy (veh)	11

6: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.4
Denied Del/Veh (s)	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.1	3.4	1.3	1.1	0.6
Total Delay (hr)	0.6	3.4	0.1	0.1	2.8	0.7	0.1	0.0	2.1	0.1	0.1	10.0
Total Del/Veh (s)	39.5	17.1	5.2	23.4	12.1	9.5	13.8	12.2	23.1	15.7	9.3	15.4
Stop Delay (hr)	0.5	2.0	0.0	0.0	1.2	0.2	0.1	0.0	1.7	0.1	0.1	6.0
Stop Del/Veh (s)	33.3	10.3	1.7	18.7	5.4	2.3	12.3	9.8	19.2	11.8	7.3	9.3
Total Stops	52	360	16	8	341	131	10	1	280	17	35	1251
Stop/Veh	0.96	0.51	0.43	0.89	0.42	0.47	0.62	0.50	0.85	0.74	0.78	0.54
Travel Dist (mi)	30.1	410.6	21.3	2.9	262.2	89.7	3.8	0.5	66.6	4.7	9.3	901.8
Travel Time (hr)	1.5	15.3	0.7	0.1	10.3	3.6	0.2	0.0	5.2	0.3	0.5	37.8
Avg Speed (mph)	20	27	30	20	25	25	17	19	14	16	18	24
Fuel Used (gal)	0.8	10.4	0.5	0.1	6.9	2.3	0.1	0.0	2.3	0.1	0.3	23.8
Fuel Eff. (mpg)	37.3	39.4	41.5	34.5	37.8	39.4	36.5	35.3	29.6	33.0	35.8	37.9
HC Emissions (g)	9	132	8	0	94	27	0	0	18	1	4	293
CO Emissions (g)	190	3040	170	16	2201	621	10	2	464	32	91	6838
NOx Emissions (g)	28	439	26	2	317	94	1	0	58	3	12	982
Vehicles Entered	51	699	37	9	809	276	16	2	321	22	45	2287
Vehicles Exited	52	696	36	9	807	277	16	2	323	23	45	2286
Hourly Exit Rate	52	696	36	9	807	277	16	2	323	23	45	2286
Input Volume	52	687	38	11	808	275	15	2	325	23	44	2280
% of Volume	100	101	95	80	100	101	105	100	99	101	102	100
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												474
Occupancy (veh)	1	15	1	0	10	4	0	0	5	0	1	37

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	12	21.2	53.4	0.3	21
Hunters Point Boulev	10	16.3	23.4	0.1	12
Griffith Street	1	11.2	21.3	0.1	12
Arelious Walker Driv	2	5.8	22.1	0.1	22
Earl Street	3	3.5	19.0	0.1	24
Donahue Street	5	40.1	55.4	0.1	8
Total		98.2	194.7	0.9	16

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	3	20.1	35.4	0.1	13
Arelious Walker Driv	2	28.2	43.1	0.1	11
New Griffith St	1	11.5	27.5	0.1	17
Hunters Point Boulev	10	11.5	19.2	0.1	14
Hawes Street	12	3.5	10.7	0.1	27
Jennings Street	6	11.9	45.1	0.3	25
Total		86.8	181.1	0.9	17

Intersection: 1: Griffith Street/New Griffith St & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	LT	TR	LTR	LT	R
Maximum Queue (ft)	220	325	281	287	296	55	57	194
Average Queue (ft)	109	207	101	149	156	16	8	94
95th Queue (ft)	221	340	219	251	255	46	41	163
Link Distance (ft)		310	310	634	634	499	1149	
Upstream Blk Time (%)		1	0					
Queuing Penalty (veh)		5	0					
Storage Bay Dist (ft)	160							200
Storage Blk Time (%)	1	11						0
Queuing Penalty (veh)	4	19						0

Intersection: 2: Arelious Walker Drive & Innes Avenue

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	324	142	139	252	252	128	340
Average Queue (ft)	155	42	32	142	149	17	165
95th Queue (ft)	280	112	96	223	237	70	284
Link Distance (ft)		634	634	606	606		1236
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	350					180	
Storage Blk Time (%)	0						6
Queuing Penalty (veh)	1						1

Intersection: 3: Earl Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	171	78	110	133	141	48	278
Average Queue (ft)	72	12	23	65	64	11	128
95th Queue (ft)	131	48	72	112	119	37	229
Link Distance (ft)		606	606	609	609		1334
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	390					160	
Storage Blk Time (%)							5
Queuing Penalty (veh)							1

Intersection: 5: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	206	236	87	72	123	85
Average Queue (ft)	100	134	34	22	51	34
95th Queue (ft)	179	213	72	57	93	66
Link Distance (ft)	609	609	1421	794	1412	1412
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	LT	T	R	LT	T	R	LTR	L	TR
Maximum Queue (ft)	260	242	97	183	214	159	34	160	290
Average Queue (ft)	126	115	20	86	96	73	8	126	67
95th Queue (ft)	219	201	65	157	179	148	28	178	219
Link Distance (ft)	3102	3102		1604	1604		1230		1087
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			100			100		100	
Storage Blk Time (%)		7	0		5	1		21	0
Queuing Penalty (veh)		4	0		18	2		10	0

Intersection: 10: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	T
Maximum Queue (ft)	190	179	294	296	276	271
Average Queue (ft)	95	99	118	147	218	125
95th Queue (ft)	162	176	233	248	310	246
Link Distance (ft)	876		310	310	252	252
Upstream Blk Time (%)			0	0	8	1
Queuing Penalty (veh)			0	1	46	3
Storage Bay Dist (ft)		120				
Storage Blk Time (%)		4	3			
Queuing Penalty (veh)		23	6			

Intersection: 12: Innes Avenue & Hawes Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	T	T	T	TR
Maximum Queue (ft)	42	147	195	511	472
Average Queue (ft)	19	22	36	181	120
95th Queue (ft)	46	88	125	589	521
Link Distance (ft)	805	252	252	1604	1604
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 145

5: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.1
Total Delay (hr)	3.1	1.0	0.1	0.1	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.5
Total Del/Veh (s)	32.5	40.0	28.1	26.8	27.6	13.8	29.3	25.7	7.6	32.0	29.2	5.8
Stop Delay (hr)	2.7	0.9	0.1	0.1	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.4
Stop Del/Veh (s)	28.5	33.4	24.1	24.6	24.4	13.1	27.7	23.5	7.0	29.0	25.2	4.8
Total Stops	267	83	10	8	22	10	8	7	10	8	8	174
Stop/Veh	0.79	0.88	0.83	0.80	0.76	0.91	0.80	0.70	0.83	0.89	0.80	0.62
Travel Dist (mi)	42.4	11.8	1.4	2.6	7.6	2.9	1.4	1.5	1.8	2.4	2.6	74.5
Travel Time (hr)	4.7	1.4	0.2	0.2	0.5	0.1	0.1	0.1	0.1	0.2	0.2	3.2
Avg Speed (mph)	9	8	9	16	16	20	10	11	17	15	15	23
Fuel Used (gal)	1.8	0.5	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	1.8
Fuel Eff. (mpg)	24.2	22.6	26.5	33.3	33.4	38.4	27.3	27.2	35.8	32.7	33.7	41.0
HC Emissions (g)	14	5	0	0	3	0	0	0	0	0	0	19
CO Emissions (g)	430	129	8	10	55	11	6	6	6	11	11	444
NOx Emissions (g)	43	15	1	1	7	1	1	1	1	1	1	53
Vehicles Entered	334	93	11	9	28	11	10	10	12	9	10	279
Vehicles Exited	335	93	11	9	28	11	9	10	12	9	10	278
Hourly Exit Rate	335	93	11	9	28	11	9	10	12	9	10	278
Input Volume	326	92	10	10	30	10	10	10	10	10	10	280
% of Volume	103	101	107	88	93	107	88	98	117	88	98	99
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	5	1	0	0	0	0	0	0	0	0	0	3

5: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	5.3
Total Del/Veh (s)	23.3
Stop Delay (hr)	4.6
Stop Del/Veh (s)	20.2
Total Stops	615
Stop/Veh	0.75
Travel Dist (mi)	152.9
Travel Time (hr)	10.9
Avg Speed (mph)	14
Fuel Used (gal)	4.8
Fuel Eff. (mpg)	31.6
HC Emissions (g)	43
CO Emissions (g)	1128
NOx Emissions (g)	125
Vehicles Entered	816
Vehicles Exited	815
Hourly Exit Rate	815
Input Volume	810
% of Volume	101
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	584
Occupancy (veh)	11

6: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Denied Del/Veh (s)	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.1	3.4	1.2	1.1
Total Delay (hr)	0.3	3.7	0.1	0.1	2.3	0.9	0.0	0.0	0.0	2.2	0.1	0.0
Total Del/Veh (s)	34.8	15.0	5.9	20.9	11.8	9.9	10.8	10.3	3.8	22.5	15.1	6.6
Stop Delay (hr)	0.2	1.9	0.0	0.1	1.0	0.2	0.0	0.0	0.0	1.8	0.1	0.0
Stop Del/Veh (s)	28.3	7.8	1.7	16.9	5.4	2.3	9.4	8.6	3.7	18.3	11.6	4.4
Total Stops	24	424	24	11	294	153	6	3	1	298	22	9
Stop/Veh	0.92	0.48	0.44	0.92	0.42	0.45	0.60	0.60	0.33	0.84	0.65	0.64
Travel Dist (mi)	14.6	505.1	32.0	3.8	223.0	108.8	2.3	1.1	0.6	72.6	6.9	2.8
Travel Time (hr)	0.7	18.3	1.1	0.2	8.7	4.4	0.1	0.1	0.0	5.6	0.4	0.2
Avg Speed (mph)	21	28	30	20	26	25	19	19	21	14	16	19
Fuel Used (gal)	0.4	12.6	0.7	0.1	5.7	2.7	0.1	0.0	0.0	2.4	0.2	0.1
Fuel Eff. (mpg)	37.9	40.1	42.7	37.2	38.8	40.4	39.1	38.0	42.2	29.9	32.7	37.4
HC Emissions (g)	3	149	12	0	74	36	0	0	0	18	4	0
CO Emissions (g)	78	3437	259	17	1742	756	6	3	1	486	80	11
NOx Emissions (g)	12	503	40	2	253	120	1	0	0	60	11	1
Vehicles Entered	25	859	54	12	686	335	10	4	3	350	33	14
Vehicles Exited	25	859	54	12	689	335	10	5	3	350	34	14
Hourly Exit Rate	25	859	54	12	689	335	10	5	3	350	34	14
Input Volume	24	841	54	12	700	342	10	4	2	353	31	16
% of Volume	105	102	100	98	98	98	98	125	150	99	110	86
Denied Entry Before	0	0	0	0	0	0	0	0	0	1	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	1	18	1	0	9	4	0	0	0	5	0	0

6: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.4
Denied Del/Veh (s)	0.6
Total Delay (hr)	9.7
Total Del/Veh (s)	14.4
Stop Delay (hr)	5.4
Stop Del/Veh (s)	8.1
Total Stops	1269
Stop/Veh	0.52
Travel Dist (mi)	973.6
Travel Time (hr)	39.7
Avg Speed (mph)	25
Fuel Used (gal)	25.1
Fuel Eff. (mpg)	38.8
HC Emissions (g)	298
CO Emissions (g)	6877
NOx Emissions (g)	1003
Vehicles Entered	2385
Vehicles Exited	2390
Hourly Exit Rate	2390
Input Volume	2390
% of Volume	100
Denied Entry Before	1
Denied Entry After	0
Density (ft/veh)	451
Occupancy (veh)	39

BUILDOUT + VARIANT

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	12	152.8	182.6	0.3	6
Hunters Point Boulev	10	37.4	44.4	0.1	6
Griffith Street	1	30.4	40.6	0.1	7
Arelious Walker Driv	2	21.1	37.4	0.1	13
Earl Street	3	5.3	20.6	0.1	22
Donahue Street	5	30.1	44.7	0.1	10
Total		277.0	370.3	0.9	8

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	3	32.2	47.3	0.1	10
Arelious Walker Driv	2	39.8	54.9	0.1	8
New Griffith St	1	34.9	50.7	0.1	9
Hunters Point Boulev	10	5.5	13.2	0.1	20
Hawes Street	12	1.1	8.3	0.1	35
Jennings Street	6	22.6	55.8	0.3	20
Total		136.1	230.3	0.9	13

Intersection: 1: Griffith Street/New Griffith St & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	LT	TR	LTR	LT	R
Maximum Queue (ft)	220	360	362	567	578	57	37	168
Average Queue (ft)	205	297	281	257	276	16	9	62
95th Queue (ft)	265	389	414	521	545	46	31	122
Link Distance (ft)		310	310	634	634	499	1149	
Upstream Blk Time (%)		9	7	0	0			
Queuing Penalty (veh)		77	58	1	1			
Storage Bay Dist (ft)	160							200
Storage Blk Time (%)	13	43						0
Queuing Penalty (veh)	93	137						0

Intersection: 2: Arelious Walker Drive & Innes Avenue

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	410	690	695	442	475	49	215
Average Queue (ft)	398	591	511	256	277	11	93
95th Queue (ft)	466	861	901	502	521	38	173
Link Distance (ft)		634	634	606	606		1236
Upstream Blk Time (%)		13	4	1	1		
Queuing Penalty (veh)		97	32	3	5		
Storage Bay Dist (ft)	350					180	
Storage Blk Time (%)	50	1					1
Queuing Penalty (veh)	197	9					0

Intersection: 3: Earl Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	431	284	74	305	316	41	189
Average Queue (ft)	219	20	24	165	178	10	84
95th Queue (ft)	389	155	61	309	324	35	165
Link Distance (ft)		606	606	609	609		1334
Upstream Blk Time (%)		0		0			
Queuing Penalty (veh)		0		0			
Storage Bay Dist (ft)	390					160	
Storage Blk Time (%)	1	0					1
Queuing Penalty (veh)	1	0					0

Intersection: 5: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	108	124	186	78	159	141
Average Queue (ft)	32	58	89	23	72	59
95th Queue (ft)	78	105	159	59	129	106
Link Distance (ft)	609	609	1421	794	1412	1412
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	LT	T	R	LT	T	R	LTR	L	TR
Maximum Queue (ft)	1159	1154	160	377	437	160	38	160	1021
Average Queue (ft)	505	516	52	169	192	96	8	158	673
95th Queue (ft)	1370	1370	164	319	361	194	27	171	1237
Link Distance (ft)	3102	3102		1604	1604		1230		1087
Upstream Blk Time (%)									22
Queuing Penalty (veh)									0
Storage Bay Dist (ft)			100			100		100	
Storage Blk Time (%)		53			21	0		60	0
Queuing Penalty (veh)		20			52	2		56	2

Intersection: 10: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	T
Maximum Queue (ft)	520	176	287	292	290	291
Average Queue (ft)	252	94	67	84	254	251
95th Queue (ft)	459	181	201	197	310	316
Link Distance (ft)	876		310	310	252	252
Upstream Blk Time (%)			0	0	28	23
Queuing Penalty (veh)			1	1	207	168
Storage Bay Dist (ft)		120				
Storage Blk Time (%)		9	0			
Queuing Penalty (veh)		50	0			

Intersection: 12: Innes Avenue & Hawes Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	T	T	T	TR
Maximum Queue (ft)	80	6	16	1629	1637
Average Queue (ft)	28	0	1	1006	1013
95th Queue (ft)	66	5	8	1999	2017
Link Distance (ft)	805	252	252	1604	1604
Upstream Blk Time (%)				3	3
Queuing Penalty (veh)				20	23
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 1314

5: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.2	0.2	0.1	0.2	0.1	0.3	0.4	0.1
Total Delay (hr)	1.2	0.1	0.0	0.1	1.2	0.1	0.1	0.1	0.0	0.1	0.1	1.0
Total Del/Veh (s)	26.8	31.5	16.0	29.1	32.6	18.9	25.7	30.7	8.7	27.4	32.6	7.3
Stop Delay (hr)	1.1	0.1	0.0	0.1	1.0	0.1	0.1	0.1	0.0	0.1	0.1	0.8
Stop Del/Veh (s)	24.2	26.5	14.5	25.4	28.3	17.1	24.1	28.6	8.2	24.0	27.5	5.6
Total Stops	118	6	8	7	105	9	10	8	9	7	9	321
Stop/Veh	0.73	0.75	0.80	0.78	0.79	0.82	0.83	0.80	0.82	0.78	0.82	0.64
Travel Dist (mi)	20.2	1.0	1.2	2.3	35.4	2.9	1.7	1.5	1.7	2.3	3.0	133.2
Travel Time (hr)	2.0	0.1	0.1	0.2	2.4	0.2	0.2	0.1	0.1	0.2	0.2	5.9
Avg Speed (mph)	10	10	13	15	15	18	11	10	17	15	15	23
Fuel Used (gal)	0.8	0.0	0.0	0.1	1.1	0.1	0.1	0.1	0.0	0.1	0.1	3.3
Fuel Eff. (mpg)	25.0	23.2	29.1	31.0	30.9	32.8	28.0	26.6	36.8	34.8	34.6	40.4
HC Emissions (g)	10	0	0	0	13	0	0	0	0	0	0	41
CO Emissions (g)	283	10	9	12	303	13	7	6	6	9	12	914
NOx Emissions (g)	29	1	1	1	36	1	1	1	1	1	1	113
Vehicles Entered	159	8	10	8	131	11	11	10	11	8	11	497
Vehicles Exited	159	8	10	8	131	11	11	10	11	8	11	497
Hourly Exit Rate	159	8	10	8	131	11	11	10	11	8	11	497
Input Volume	180	10	10	10	139	10	10	10	10	10	10	500
% of Volume	88	78	98	78	94	107	107	98	107	78	107	99
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	2	0	0	0	2	0	0	0	0	0	0	6

5: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	4.0
Total Del/Veh (s)	16.4
Stop Delay (hr)	3.5
Stop Del/Veh (s)	14.1
Total Stops	617
Stop/Veh	0.70
Travel Dist (mi)	206.5
Travel Time (hr)	11.5
Avg Speed (mph)	18
Fuel Used (gal)	5.8
Fuel Eff. (mpg)	35.5
HC Emissions (g)	66
CO Emissions (g)	1585
NOx Emissions (g)	186
Vehicles Entered	875
Vehicles Exited	875
Hourly Exit Rate	875
Input Volume	912
% of Volume	96
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	554
Occupancy (veh)	12

6: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.2	0.2	2.9
Denied Del/Veh (s)	0.2	0.2	0.3	0.0	0.0	0.0	0.1	0.1	16.6	16.8	14.8	3.8
Total Delay (hr)	2.0	28.7	0.9	0.1	5.4	1.0	0.1	0.0	16.2	1.3	1.1	56.7
Total Del/Veh (s)	132.7	107.7	87.2	43.1	22.5	14.8	13.2	19.7	108.6	99.1	87.8	72.8
Stop Delay (hr)	1.9	26.5	0.9	0.1	3.3	0.4	0.1	0.0	14.9	1.2	1.1	50.3
Stop Del/Veh (s)	127.2	99.5	82.0	38.0	14.0	5.4	11.9	17.6	100.4	91.3	81.6	64.5
Total Stops	63	889	38	12	507	172	9	2	659	55	58	2464
Stop/Veh	1.17	0.93	1.00	1.00	0.59	0.72	0.56	1.00	1.23	1.20	1.23	0.88
Travel Dist (mi)	30.4	537.8	21.7	3.7	275.8	76.6	3.6	0.5	107.4	9.2	9.4	1076.2
Travel Time (hr)	2.9	44.2	1.6	0.3	13.4	3.4	0.2	0.0	23.1	1.8	1.7	92.7
Avg Speed (mph)	10	12	14	14	21	22	17	16	5	6	6	12
Fuel Used (gal)	1.1	18.4	0.7	0.1	7.4	1.9	0.1	0.0	6.9	0.6	0.5	37.7
Fuel Eff. (mpg)	26.9	29.3	31.0	33.1	37.3	41.4	34.9	34.2	15.6	16.3	17.6	28.6
HC Emissions (g)	6	175	15	0	86	20	0	0	40	2	6	350
CO Emissions (g)	166	4040	282	13	1889	407	10	2	1087	89	138	8123
NOx Emissions (g)	21	534	41	2	285	64	1	0	105	7	15	1075
Vehicles Entered	52	929	38	11	849	236	15	2	526	45	46	2749
Vehicles Exited	50	878	34	12	851	235	15	2	513	44	45	2679
Hourly Exit Rate	50	878	34	12	851	235	15	2	513	44	45	2679
Input Volume	52	947	38	11	857	242	15	2	522	49	44	2780
% of Volume	97	93	89	107	99	97	98	100	98	89	102	96
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	5	0	0	5
Density (ft/veh)												198
Occupancy (veh)	3	44	2	0	13	3	0	0	21	2	2	90

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	12	12.1	44.4	0.3	26
Hunters Point Boulev	10	13.2	20.3	0.1	14
Griffith Street	1	12.2	22.4	0.1	12
Arelious Walker Driv	2	4.6	21.0	0.1	23
Earl Street	3	8.2	23.5	0.1	20
Donahue Street	5	47.6	62.9	0.1	7
Total		97.8	194.5	0.9	16

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	3	29.7	43.5	0.1	11
Arelious Walker Driv	2	87.5	101.6	0.1	5
New Griffith St	1	52.8	68.4	0.1	7
Hunters Point Boulev	10	17.2	24.9	0.1	11
Hawes Street	12	5.0	12.2	0.1	24
Jennings Street	6	16.1	49.4	0.3	23
Total		208.4	300.0	0.9	10

Intersection: 1: Griffith Street/New Griffith St & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	LT	TR	LTR	LT	R
Maximum Queue (ft)	220	326	290	632	643	56	529	260
Average Queue (ft)	121	218	114	436	457	17	193	206
95th Queue (ft)	231	363	235	664	678	47	551	303
Link Distance (ft)		310	310	634	634	499	1149	
Upstream Blk Time (%)		3	0	0	0			
Queuing Penalty (veh)		18	2	2	3			
Storage Bay Dist (ft)	160							200
Storage Blk Time (%)	6	13					1	33
Queuing Penalty (veh)	36	18					2	4

Intersection: 2: Arelious Walker Drive & Innes Avenue

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	410	610	78	597	616	240	1208
Average Queue (ft)	304	162	5	400	411	50	875
95th Queue (ft)	470	589	57	672	687	191	1483
Link Distance (ft)		634	634	606	606		1236
Upstream Blk Time (%)		2		4	8		27
Queuing Penalty (veh)		12		17	34		0
Storage Bay Dist (ft)	350					180	
Storage Blk Time (%)	15	0					45
Queuing Penalty (veh)	55	0					10

Intersection: 3: Earl Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	182	138	142	177	166	172	764
Average Queue (ft)	74	40	65	90	87	27	365
95th Queue (ft)	139	102	127	161	163	123	849
Link Distance (ft)		606	606	609	609		1334
Upstream Blk Time (%)							4
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	390					160	
Storage Blk Time (%)							33
Queuing Penalty (veh)							6

Intersection: 5: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	273	298	87	71	138	120
Average Queue (ft)	141	173	32	22	55	35
95th Queue (ft)	241	269	71	58	103	75
Link Distance (ft)	609	609	1421	794	1412	1412
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	LT	T	R	LT	T	R	LTR	L	TR
Maximum Queue (ft)	537	540	160	277	335	160	30	159	271
Average Queue (ft)	210	196	38	137	151	124	6	115	51
95th Queue (ft)	448	447	127	234	271	187	24	170	174
Link Distance (ft)	3102	3102		1604	1604		1230		1087
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			100			100		100	
Storage Blk Time (%)		19			12	5		14	0
Queuing Penalty (veh)		10			72	29		8	0

Intersection: 10: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	T
Maximum Queue (ft)	192	180	347	340	274	261
Average Queue (ft)	97	156	262	273	200	115
95th Queue (ft)	168	216	373	369	303	222
Link Distance (ft)	876		310	310	252	252
Upstream Blk Time (%)			2	3	6	0
Queuing Penalty (veh)			18	25	34	2
Storage Bay Dist (ft)		120				
Storage Blk Time (%)		19	14			
Queuing Penalty (veh)		158	39			

Intersection: 12: Innes Avenue & Hawes Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	T	T	T	TR
Maximum Queue (ft)	51	199	229	386	329
Average Queue (ft)	18	39	59	104	53
95th Queue (ft)	47	135	179	309	215
Link Distance (ft)	805	252	252	1604	1604
Upstream Blk Time (%)		0	0		
Queuing Penalty (veh)		0	0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 613

5: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1
Total Delay (hr)	4.4	1.5	0.1	0.1	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.5
Total Del/Veh (s)	37.8	47.1	36.2	24.8	28.7	10.9	25.5	31.8	9.5	30.2	31.7	6.7
Stop Delay (hr)	3.8	1.3	0.1	0.0	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.4
Stop Del/Veh (s)	32.4	39.0	31.3	22.5	25.5	10.2	23.7	29.9	9.1	27.4	27.5	5.6
Total Stops	362	110	11	6	23	9	8	8	10	8	10	174
Stop/Veh	0.86	0.94	0.92	0.75	0.77	0.90	0.73	0.80	0.83	0.80	0.83	0.63
Travel Dist (mi)	53.1	14.7	1.4	2.1	7.9	2.8	1.6	1.5	1.7	2.6	3.1	73.5
Travel Time (hr)	6.4	2.0	0.2	0.1	0.5	0.1	0.1	0.1	0.1	0.2	0.2	3.2
Avg Speed (mph)	8	7	8	16	16	21	11	10	16	15	15	23
Fuel Used (gal)	2.5	0.7	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	1.8
Fuel Eff. (mpg)	21.5	19.8	21.4	32.3	32.4	38.0	28.5	27.5	35.7	33.6	33.4	40.4
HC Emissions (g)	22	7	0	0	5	0	0	0	0	0	0	19
CO Emissions (g)	649	180	10	9	91	10	7	5	6	13	15	452
NOx Emissions (g)	70	22	1	1	12	1	1	1	1	1	1	54
Vehicles Entered	417	116	11	8	30	10	11	10	12	10	12	274
Vehicles Exited	417	114	11	8	30	10	11	10	12	10	12	275
Hourly Exit Rate	417	114	11	8	30	10	11	10	12	10	12	275
Input Volume	413	112	10	10	30	10	10	10	10	10	10	280
% of Volume	101	102	107	78	100	98	107	98	117	98	117	98
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	6	2	0	0	1	0	0	0	0	0	0	3

5: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	7.3
Total Del/Veh (s)	28.3
Stop Delay (hr)	6.2
Stop Del/Veh (s)	24.2
Total Stops	739
Stop/Veh	0.80
Travel Dist (mi)	166.1
Travel Time (hr)	13.4
Avg Speed (mph)	12
Fuel Used (gal)	5.8
Fuel Eff. (mpg)	28.6
HC Emissions (g)	55
CO Emissions (g)	1448
NOx Emissions (g)	167
Vehicles Entered	921
Vehicles Exited	920
Hourly Exit Rate	920
Input Volume	917
% of Volume	100
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	477
Occupancy (veh)	13

6: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.4
Denied Del/Veh (s)	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.1	3.4	1.2	0.8	0.5
Total Delay (hr)	0.6	8.1	0.2	0.1	4.7	2.5	0.0	0.0	1.8	0.1	0.0	18.2
Total Del/Veh (s)	94.4	31.0	14.5	28.9	16.0	16.1	9.7	12.6	20.3	13.3	8.1	21.7
Stop Delay (hr)	0.6	5.7	0.1	0.1	2.0	0.7	0.0	0.0	1.5	0.1	0.0	10.8
Stop Del/Veh (s)	86.7	21.7	8.0	22.9	7.0	4.4	8.4	10.7	16.5	9.8	6.3	12.8
Total Stops	28	635	36	10	505	336	5	2	254	24	10	1845
Stop/Veh	1.22	0.67	0.68	1.00	0.48	0.60	0.50	0.50	0.79	0.63	0.62	0.61
Travel Dist (mi)	13.1	540.1	30.3	3.4	334.8	179.5	2.2	1.0	65.0	7.7	3.2	1180.3
Travel Time (hr)	1.0	23.8	1.1	0.2	14.3	8.3	0.1	0.1	4.8	0.5	0.2	54.3
Avg Speed (mph)	13	23	27	18	23	22	18	19	14	17	18	22
Fuel Used (gal)	0.4	14.4	0.7	0.1	9.2	4.7	0.1	0.0	2.1	0.2	0.1	32.1
Fuel Eff. (mpg)	29.9	37.4	40.6	36.2	36.5	38.1	37.2	34.3	30.3	33.6	37.8	36.7
HC Emissions (g)	3	161	10	0	115	56	0	0	18	4	0	369
CO Emissions (g)	82	3744	222	15	2839	1268	5	4	458	92	13	8743
NOx Emissions (g)	11	540	34	2	403	195	1	0	58	13	1	1259
Vehicles Entered	22	920	52	10	1031	553	10	4	314	37	15	2968
Vehicles Exited	23	913	51	10	1031	553	10	4	315	37	16	2963
Hourly Exit Rate	23	913	51	10	1031	553	10	4	315	37	16	2963
Input Volume	24	910	54	12	1065	576	10	4	319	38	16	3029
% of Volume	97	100	95	82	97	96	98	100	99	97	98	98
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												329
Occupancy (veh)	1	24	1	0	14	8	0	0	5	0	0	54

BUILDOUT + VARIANT + BUS LANE

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	12	136.1	166.2	0.3	7
Hunters Point Boulev	10	21.6	29.1	0.1	10
Griffith Street	1	16.2	25.8	0.1	10
Arelious Walker Driv	2	15.7	32.0	0.1	15
Earl Street	3	7.6	23.0	0.1	20
Donahue Street	5	18.2	34.2	0.1	14
Total		215.3	310.3	0.9	10

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	3	172.7	189.8	0.1	2
Arelious Walker Driv	2	90.1	104.9	0.1	4
New Griffith St	1	14.3	30.2	0.1	16
Hunters Point Boulev	10	6.8	14.6	0.1	18
Hawes Street	12	1.4	8.8	0.1	33
Jennings Street	6	32.2	65.2	0.3	17
Total		317.5	413.5	0.9	8

Intersection: 1: Griffith Street/New Griffith St & Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	LT	R
Maximum Queue (ft)	220	336	101	55	504	120	58	42	160
Average Queue (ft)	173	294	6	12	243	10	17	8	69
95th Queue (ft)	264	367	55	41	412	62	47	31	129
Link Distance (ft)		316			634		502	1156	
Upstream Blk Time (%)		4			0				
Queuing Penalty (veh)		70			1				
Storage Bay Dist (ft)	160		100	10		100			200
Storage Blk Time (%)	14	25		11	39				0
Queuing Penalty (veh)	195	83		122	10				0

Intersection: 2: Arelious Walker Drive & Innes Avenue

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	391	510	660	160	47	237
Average Queue (ft)	308	243	628	38	11	115
95th Queue (ft)	437	541	714	142	37	202
Link Distance (ft)		634	605			1239
Upstream Blk Time (%)		1	22			
Queuing Penalty (veh)		16	193			
Storage Bay Dist (ft)	350			100	180	
Storage Blk Time (%)	14	0	59			2
Queuing Penalty (veh)	115	1	20			0

Intersection: 3: Earl Street & Innes Avenue

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	329	125	646	160	40	226
Average Queue (ft)	198	33	631	33	10	107
95th Queue (ft)	309	86	642	138	33	196
Link Distance (ft)		605	621			1336
Upstream Blk Time (%)			47			
Queuing Penalty (veh)			303			
Storage Bay Dist (ft)	390			100	160	
Storage Blk Time (%)	0		79			3
Queuing Penalty (veh)	0		16			0

Intersection: 5: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR	LTR
Maximum Queue (ft)	140	49	646	108	1474
Average Queue (ft)	63	11	356	32	1334
95th Queue (ft)	117	38	746	84	1776
Link Distance (ft)	621	621	1431	794	1424
Upstream Blk Time (%)					78
Queuing Penalty (veh)					0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	230	3154	160	130	600	160	43	160	1143
Average Queue (ft)	99	3017	42	13	360	100	9	159	1026
95th Queue (ft)	263	3596	156	77	607	204	33	160	1371
Link Distance (ft)		3102			1604		1236		1093
Upstream Blk Time (%)		86							74
Queuing Penalty (veh)		0							0
Storage Bay Dist (ft)	170		100	170		100		100	
Storage Blk Time (%)		68			36	0		75	1
Queuing Penalty (veh)		61			90	1		70	3

Intersection: 10: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	SB
Directions Served	R	L	T	T
Maximum Queue (ft)	948	171	293	294
Average Queue (ft)	905	84	135	268
95th Queue (ft)	1005	147	239	308
Link Distance (ft)	900		316	284
Upstream Blk Time (%)	90		0	7
Queuing Penalty (veh)	0		3	96
Storage Bay Dist (ft)		120		
Storage Blk Time (%)		3	9	
Queuing Penalty (veh)		28	13	

Intersection: 12: Innes Avenue & Hawes Street

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	R
Maximum Queue (ft)	84	26	1608	130
Average Queue (ft)	29	2	1575	10
95th Queue (ft)	68	14	1642	73
Link Distance (ft)	817	284	1604	
Upstream Blk Time (%)			1	
Queuing Penalty (veh)			12	
Storage Bay Dist (ft)				100
Storage Blk Time (%)			36	
Queuing Penalty (veh)			3	

Network Summary

Network wide Queuing Penalty: 1526

5: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.9	86.4
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.3	0.2	0.2	0.1	0.1	629.3	625.5	610.9
Total Delay (hr)	0.7	0.0	0.0	0.9	10.4	0.7	0.3	0.2	0.1	0.8	1.1	48.9
Total Del/Veh (s)	19.8	16.6	5.9	259.1	268.3	244.5	132.3	50.3	30.8	487.2	496.2	550.7
Stop Delay (hr)	0.6	0.0	0.0	0.9	10.3	0.7	0.3	0.1	0.1	0.8	1.1	50.9
Stop Del/Veh (s)	17.0	13.8	5.0	256.9	265.2	243.9	130.4	48.1	30.3	506.3	514.0	572.7
Total Stops	89	5	8	12	142	10	9	8	8	2	2	100
Stop/Veh	0.69	0.56	0.89	1.00	1.01	0.91	1.00	0.73	0.73	0.33	0.25	0.31
Travel Dist (mi)	16.3	1.1	1.2	3.2	35.6	2.7	1.3	1.6	1.6	1.3	1.7	74.8
Travel Time (hr)	1.3	0.1	0.1	1.0	11.6	0.8	0.4	0.2	0.2	2.6	3.1	138.0
Avg Speed (mph)	12	14	19	3	3	3	3	7	10	2	1	1
Fuel Used (gal)	0.6	0.0	0.0	0.3	3.3	0.2	0.1	0.1	0.1	0.6	0.7	32.6
Fuel Eff. (mpg)	27.1	28.2	31.9	11.4	10.9	11.5	12.0	21.4	26.2	2.1	2.4	2.3
HC Emissions (g)	7	0	0	0	17	0	0	0	0	0	0	112
CO Emissions (g)	197	13	12	30	511	26	9	9	8	35	41	3142
NOx Emissions (g)	21	1	1	2	38	1	1	1	1	1	1	132
Vehicles Entered	128	9	9	12	135	10	9	10	11	5	7	299
Vehicles Exited	127	9	9	11	122	10	9	11	11	5	6	263
Hourly Exit Rate	127	9	9	11	122	10	9	11	11	5	6	263
Input Volume	180	10	10	10	139	10	10	10	10	10	10	500
% of Volume	70	88	88	107	88	98	88	107	107	49	59	53
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	5	4	210
Density (ft/veh)												
Occupancy (veh)	1	0	0	1	12	1	0	0	0	1	1	52

5: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	90.0
Denied Del/Veh (s)	375.6
Total Delay (hr)	64.3
Total Del/Veh (s)	342.7
Stop Delay (hr)	66.0
Stop Del/Veh (s)	352.2
Total Stops	395
Stop/Veh	0.59
Travel Dist (mi)	142.5
Travel Time (hr)	159.4
Avg Speed (mph)	2
Fuel Used (gal)	38.7
Fuel Eff. (mpg)	3.7
HC Emissions (g)	137
CO Emissions (g)	4034
NOx Emissions (g)	200
Vehicles Entered	644
Vehicles Exited	593
Hourly Exit Rate	593
Input Volume	912
% of Volume	65
Denied Entry Before	0
Denied Entry After	219
Density (ft/veh)	72
Occupancy (veh)	69

6: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Delay (hr)	6.8	145.4	6.2	0.0	0.0	0.0	0.0	0.0	41.2	3.8	3.5	206.9
Denied Del/Veh (s)	512.7	543.1	570.4	0.0	0.0	0.0	0.1	0.1	282.0	281.8	267.9	289.3
Total Delay (hr)	4.9	92.5	3.6	0.1	6.2	1.1	0.1	0.0	28.4	2.4	2.2	141.6
Total Del/Veh (s)	494.1	471.5	462.1	49.0	32.3	20.2	22.0	21.6	221.6	195.6	189.5	227.9
Stop Delay (hr)	5.0	93.7	3.7	0.1	3.7	0.5	0.1	0.0	28.1	2.4	2.1	139.4
Stop Del/Veh (s)	501.5	477.6	472.4	37.8	19.3	9.7	20.5	19.7	219.1	193.4	188.4	224.5
Total Stops	42	438	15	10	461	162	9	2	384	34	34	1591
Stop/Veh	1.17	0.62	0.54	1.25	0.67	0.80	0.69	0.67	0.83	0.77	0.83	0.71
Travel Dist (mi)	18.4	358.6	14.4	2.7	220.2	64.1	3.1	0.7	89.9	8.5	7.9	788.6
Travel Time (hr)	12.3	248.2	10.2	0.2	12.6	3.2	0.2	0.0	73.4	6.5	6.0	372.9
Avg Speed (mph)	3	3	4	14	17	20	15	15	3	3	3	5
Fuel Used (gal)	3.0	60.7	2.5	0.1	6.1	1.6	0.1	0.0	18.2	1.6	1.5	95.4
Fuel Eff. (mpg)	6.1	5.9	5.8	34.1	36.2	40.8	32.7	33.6	4.9	5.2	5.3	8.3
HC Emissions (g)	3	195	21	0	65	19	0	0	65	8	13	389
CO Emissions (g)	227	5903	405	11	1320	386	9	3	1864	211	263	10602
NOx Emissions (g)	7	240	22	1	199	58	1	0	100	12	18	658
Vehicles Entered	32	643	25	8	681	198	13	3	442	41	39	2125
Vehicles Exited	32	597	24	8	682	199	13	3	429	41	38	2066
Hourly Exit Rate	32	597	24	8	682	199	13	3	429	41	38	2066
Input Volume	52	947	38	11	857	242	15	2	522	49	44	2780
% of Volume	62	63	63	71	80	82	85	150	82	83	86	74
Denied Entry Before	0	0	0	0	0	0	0	0	1	0	0	1
Denied Entry After	16	321	14	0	0	0	0	0	84	7	8	450
Density (ft/veh)												106
Occupancy (veh)	5	103	4	0	13	3	0	0	32	3	3	166

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	12	134.3	165.3	0.3	7
Hunters Point Boulev	10	23.2	30.7	0.1	9
Griffith Street	1	18.9	28.5	0.1	9
Arelious Walker Driv	2	15.3	31.6	0.1	15
Earl Street	3	8.7	24.2	0.1	19
Donahue Street	5	16.2	31.6	0.1	15
Total		216.6	311.8	0.9	10

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	3	65.0	78.7	0.1	6
Arelious Walker Driv	2	119.0	136.1	0.1	3
New Griffith St	1	65.3	84.0	0.1	6
Hunters Point Boulev	10	13.9	21.6	0.1	12
Hawes Street	12	3.4	10.8	0.1	27
Jennings Street	6	20.9	53.9	0.3	21
Total		287.5	385.2	0.9	8

Intersection: 1: Griffith Street/New Griffith St & Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	LT	R
Maximum Queue (ft)	220	335	117	56	661	85	138	463	260
Average Queue (ft)	127	310	7	11	649	6	42	106	183
95th Queue (ft)	254	359	56	40	660	52	125	414	284
Link Distance (ft)		316			634		502	1156	
Upstream Blk Time (%)		6			22				
Queuing Penalty (veh)		78			359				
Storage Bay Dist (ft)	160		100	10		100			200
Storage Blk Time (%)	2	30		17	39			0	18
Queuing Penalty (veh)	24	46		278	7			1	2

Intersection: 2: Arelious Walker Drive & Innes Avenue

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	408	596	648	134	240	1289
Average Queue (ft)	310	215	627	15	45	1261
95th Queue (ft)	440	506	639	88	188	1278
Link Distance (ft)		634	605			1239
Upstream Blk Time (%)		1	49			100
Queuing Penalty (veh)		11	436			0
Storage Bay Dist (ft)	350			100	180	
Storage Blk Time (%)	15	0	66			83
Queuing Penalty (veh)	111	1	8			18

Intersection: 3: Earl Street & Innes Avenue

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	163	174	468	160	220	1387
Average Queue (ft)	70	84	242	23	36	1358
95th Queue (ft)	131	147	436	109	170	1376
Link Distance (ft)		605	621			1336
Upstream Blk Time (%)			0			99
Queuing Penalty (veh)			0			0
Storage Bay Dist (ft)	390			100	160	
Storage Blk Time (%)			59			95
Queuing Penalty (veh)			6			17

Intersection: 5: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR	LTR
Maximum Queue (ft)	345	119	92	66	190
Average Queue (ft)	171	48	29	22	79
95th Queue (ft)	293	101	71	54	141
Link Distance (ft)	621	621	1431	794	1424
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	229	3154	160	96	486	160	46	160	601
Average Queue (ft)	54	2273	60	10	270	118	11	151	297
95th Queue (ft)	193	4116	183	58	500	206	35	181	692
Link Distance (ft)		3102			1604		1236		1093
Upstream Blk Time (%)		56							1
Queuing Penalty (veh)		0							0
Storage Bay Dist (ft)	170		100	170		100		100	
Storage Blk Time (%)		56	0		21	0		61	0
Queuing Penalty (veh)		43	0		122	5		33	1

Intersection: 10: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	SB
Directions Served	R	L	T	T
Maximum Queue (ft)	375	180	346	297
Average Queue (ft)	193	139	295	279
95th Queue (ft)	368	215	377	304
Link Distance (ft)	900		316	284
Upstream Blk Time (%)			5	8
Queuing Penalty (veh)			87	99
Storage Bay Dist (ft)		120		
Storage Blk Time (%)		10	21	
Queuing Penalty (veh)		165	61	

Intersection: 12: Innes Avenue & Hawes Street

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	R
Maximum Queue (ft)	68	66	1604	160
Average Queue (ft)	23	4	1516	29
95th Queue (ft)	57	30	1889	129
Link Distance (ft)	817	284	1604	
Upstream Blk Time (%)			1	
Queuing Penalty (veh)			9	
Storage Bay Dist (ft)				100
Storage Blk Time (%)			38	0
Queuing Penalty (veh)			13	0

Network Summary

Network wide Queuing Penalty: 2044

5: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.3
Total Delay (hr)	2.3	0.4	0.0	0.0	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.7
Total Del/Veh (s)	23.4	16.2	9.9	17.9	19.0	10.3	31.1	20.4	7.2	22.3	22.0	9.0
Stop Delay (hr)	1.7	0.3	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.5
Stop Del/Veh (s)	18.1	12.9	8.5	15.8	16.1	9.5	29.3	18.5	6.7	18.4	17.6	6.9
Total Stops	250	54	6	7	20	8	9	8	9	7	6	222
Stop/Veh	0.72	0.60	0.67	0.70	0.65	0.80	0.90	0.73	0.82	0.78	0.67	0.80
Travel Dist (mi)	43.8	11.4	1.1	2.5	8.2	2.7	1.5	1.7	1.6	2.4	2.3	73.6
Travel Time (hr)	3.9	0.8	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	3.4
Avg Speed (mph)	11	14	16	18	19	21	10	13	17	17	17	22
Fuel Used (gal)	1.7	0.4	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	1.8
Fuel Eff. (mpg)	26.4	28.0	30.3	39.0	35.4	39.3	27.5	30.3	36.1	38.1	35.8	40.3
HC Emissions (g)	18	5	0	0	2	0	0	0	0	0	0	20
CO Emissions (g)	487	164	13	10	53	10	6	7	6	9	11	443
NOx Emissions (g)	57	15	1	1	7	1	1	1	1	1	1	55
Vehicles Entered	342	89	9	9	31	10	10	11	10	9	8	272
Vehicles Exited	342	89	9	9	30	10	10	11	11	9	8	273
Hourly Exit Rate	342	89	9	9	30	10	10	11	11	9	8	273
Input Volume	413	112	10	10	30	10	10	10	10	10	10	280
% of Volume	83	79	88	88	100	98	98	107	107	88	78	98
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	4	1	0	0	0	0	0	0	0	0	0	3

5: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	3.9
Total Del/Veh (s)	17.1
Stop Delay (hr)	3.1
Stop Del/Veh (s)	13.5
Total Stops	606
Stop/Veh	0.74
Travel Dist (mi)	152.9
Travel Time (hr)	9.5
Avg Speed (mph)	16
Fuel Used (gal)	4.6
Fuel Eff. (mpg)	33.4
HC Emissions (g)	47
CO Emissions (g)	1220
NOx Emissions (g)	141
Vehicles Entered	810
Vehicles Exited	811
Hourly Exit Rate	811
Input Volume	917
% of Volume	88
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	530
Occupancy (veh)	9

6: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Delay (hr)	1.1	37.4	2.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	41.0
Denied Del/Veh (s)	160.9	146.5	150.4	0.0	0.0	0.0	0.1	0.1	3.9	1.2	1.5	61.0
Total Delay (hr)	1.8	65.5	3.4	0.1	4.0	1.4	0.1	0.0	7.9	0.7	0.3	85.2
Total Del/Veh (s)	285.8	284.8	271.2	39.2	20.9	14.1	26.2	26.6	88.5	63.0	58.0	130.6
Stop Delay (hr)	1.8	62.6	3.3	0.1	1.8	0.5	0.1	0.0	7.5	0.6	0.2	78.5
Stop Del/Veh (s)	277.7	272.3	262.4	29.3	9.5	4.6	24.8	24.4	84.3	58.1	54.6	120.4
Total Stops	31	684	35	8	332	210	10	4	353	43	18	1728
Stop/Veh	1.35	0.83	0.78	1.00	0.48	0.58	0.77	1.00	1.10	1.08	1.12	0.74
Travel Dist (mi)	11.9	450.3	24.5	2.4	218.2	114.2	3.0	1.0	64.9	8.2	3.2	901.9
Travel Time (hr)	3.3	115.8	6.3	0.2	10.3	5.1	0.2	0.1	10.9	1.0	0.4	153.6
Avg Speed (mph)	5	6	6	15	21	23	14	14	6	8	8	8
Fuel Used (gal)	0.9	31.8	1.7	0.1	5.8	2.7	0.1	0.0	3.5	0.4	0.1	47.2
Fuel Eff. (mpg)	13.1	14.2	14.3	33.8	37.4	42.0	31.9	32.8	18.5	21.8	22.2	19.1
HC Emissions (g)	1	165	17	0	61	30	0	0	17	4	0	297
CO Emissions (g)	82	4171	343	9	1386	610	9	3	532	106	19	7270
NOx Emissions (g)	4	288	29	1	209	100	1	0	52	12	2	698
Vehicles Entered	22	807	43	8	676	354	13	4	314	40	16	2297
Vehicles Exited	19	728	40	8	676	353	13	4	307	39	16	2203
Hourly Exit Rate	19	728	40	8	676	353	13	4	307	39	16	2203
Input Volume	24	910	54	12	1065	576	10	4	319	38	16	3029
% of Volume	80	80	74	65	63	61	127	100	96	103	98	73
Denied Entry Before	0	1	0	0	0	0	0	0	0	0	0	1
Denied Entry After	3	111	8	0	0	0	0	0	0	0	0	122
Density (ft/veh)												157
Occupancy (veh)	2	78	4	0	10	5	0	0	11	1	0	113

CUMULATIVE NO PROJECT

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	6	2.8	36.9	0.3	32
Hunters Point Boulev	4	4.3	10.7	0.1	25
Griffith Street	11	2.9	19.0	0.1	23
Arelious Walker Driv	12	1.0	10.9	0.1	27
Earl Street	13	1.0	16.7	0.1	28
	1	51.2	66.4	0.1	7
Total		63.1	160.5	0.9	19

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Donahue Avenue	1	34.6	61.7	0.2	11
Earl Street	13	1.9	17.8	0.1	26
Arelious Walker Driv	12	0.6	16.3	0.1	29
New Griffith St	11	1.4	11.3	0.1	26
Hunters Point Boulev	4	4.8	17.3	0.1	25
Hawes Street	6	1.5	8.2	0.1	33
Jennings Street	9	25.1	59.8	0.3	20
Total		69.9	192.4	1.1	20

Intersection: 1: Innes Avenue & Donahue Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	395	424	203	75	150	152
Average Queue (ft)	239	258	101	26	71	72
95th Queue (ft)	366	387	171	63	124	124
Link Distance (ft)	615	615	988	557	1924	1924
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	TR
Maximum Queue (ft)	49	60	162	114	141	151
Average Queue (ft)	18	22	58	40	57	63
95th Queue (ft)	47	51	123	93	118	133
Link Distance (ft)	1190		572	572	217	217
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		120				
Storage Blk Time (%)			1			
Queuing Penalty (veh)			0			

Intersection: 6: Innes Avenue & Hawes Street

Movement	EB
Directions Served	LR
Maximum Queue (ft)	40
Average Queue (ft)	11
95th Queue (ft)	36
Link Distance (ft)	794
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	229	518	136	195	535	131	94	56	108
Average Queue (ft)	126	190	16	30	256	18	40	13	39
95th Queue (ft)	222	400	69	117	469	92	77	40	78
Link Distance (ft)		1547			1693	1693	452		669
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	170		100	170				100	
Storage Blk Time (%)	3	13	0		17				0
Queuing Penalty (veh)	23	30	0		3				0

Intersection: 11: Griffith Street/New Griffith St & Innes Avenue

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	109	117	75	89	52	54
Average Queue (ft)	25	31	24	25	19	17
95th Queue (ft)	74	92	63	68	49	47
Link Distance (ft)	572	572	379	379	457	1535
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 12: Innes Avenue & Arelious Walker Drive

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	50	47
Average Queue (ft)	7	22
95th Queue (ft)	32	50
Link Distance (ft)	379	1627
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Innes Avenue & Earl Street

Movement	EB	EB	SB
Directions Served	LT	T	LR
Maximum Queue (ft)	53	5	46
Average Queue (ft)	6	0	18
95th Queue (ft)	30	0	45
Link Distance (ft)	635	635	1738
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 56

1: Innes Avenue & Donahue Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.2	0.3	0.1	0.1	0.1	0.2	0.3	0.1
Total Delay (hr)	9.3	0.6	0.1	0.1	1.4	0.1	0.1	0.1	0.0	0.1	0.1	1.3
Total Del/Veh (s)	43.4	51.6	45.4	34.7	34.6	24.7	34.6	33.8	8.2	33.3	36.0	7.5
Stop Delay (hr)	8.0	0.5	0.1	0.1	1.2	0.1	0.1	0.1	0.0	0.1	0.1	0.9
Stop Del/Veh (s)	37.1	43.0	39.2	32.2	31.3	23.5	33.0	31.5	7.7	29.7	30.8	5.3
Total Stops	708	40	11	7	116	10	9	10	9	8	9	355
Stop/Veh	0.92	1.00	1.00	0.78	0.81	0.91	0.82	0.83	0.90	0.80	0.82	0.58
Travel Dist (mi)	97.2	5.0	1.4	1.6	26.4	2.0	1.1	1.3	1.1	3.4	3.9	218.3
Travel Time (hr)	12.9	0.7	0.2	0.2	2.5	0.2	0.2	0.2	0.1	0.2	0.2	9.1
Avg Speed (mph)	8	7	7	10	11	12	7	8	15	16	16	24
Fuel Used (gal)	4.3	0.2	0.1	0.1	1.0	0.1	0.1	0.1	0.0	0.1	0.1	5.3
Fuel Eff. (mpg)	22.6	21.4	22.7	25.5	26.0	29.2	21.7	21.7	35.3	34.7	35.7	40.9
HC Emissions (g)	29	3	0	0	9	0	0	0	0	0	0	63
CO Emissions (g)	731	64	6	7	227	9	6	8	4	12	14	1303
NOx Emissions (g)	82	8	1	1	27	1	1	1	0	1	2	175
Vehicles Entered	757	39	11	8	140	10	11	12	10	10	10	597
Vehicles Exited	763	40	11	9	141	11	11	12	10	10	10	599
Hourly Exit Rate	763	40	11	9	141	11	11	12	10	10	10	599
Input Volume	763	40	10	10	137	10	10	10	10	10	10	587
% of Volume	100	101	110	90	103	110	110	120	100	100	100	102
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	13	1	0	0	2	0	0	0	0	0	0	9

1: Innes Avenue & Donahue Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.0
Denied Del/Veh (s)	0.1
Total Delay (hr)	13.3
Total Del/Veh (s)	29.0
Stop Delay (hr)	11.3
Stop Del/Veh (s)	24.6
Total Stops	1292
Stop/Veh	0.78
Travel Dist (mi)	362.7
Travel Time (hr)	26.6
Avg Speed (mph)	14
Fuel Used (gal)	11.4
Fuel Eff. (mpg)	31.7
HC Emissions (g)	106
CO Emissions (g)	2391
NOx Emissions (g)	298
Vehicles Entered	1615
Vehicles Exited	1627
Hourly Exit Rate	1627
Input Volume	1606
% of Volume	101
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	254
Occupancy (veh)	27

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	3.4	2.1	3.4	0.0	0.0	0.0	0.1	0.1	0.2	3.9	0.2	0.2
Total Delay (hr)	2.1	3.2	0.1	0.2	4.8	0.0	0.3	0.1	0.0	0.1	0.1	0.3
Total Del/Veh (s)	41.1	14.8	9.0	46.8	25.1	4.3	29.3	29.2	12.2	27.6	25.1	13.5
Stop Delay (hr)	1.7	1.1	0.0	0.2	2.6	0.0	0.3	0.1	0.0	0.1	0.1	0.3
Stop Del/Veh (s)	32.6	5.2	2.2	36.7	13.5	3.4	27.3	26.5	11.4	25.8	22.6	13.0
Total Stops	184	269	14	22	415	16	32	9	8	15	16	58
Stop/Veh	0.98	0.34	0.35	1.16	0.61	0.52	0.84	0.90	0.89	0.79	0.76	0.82
Travel Dist (mi)	53.9	226.9	11.7	6.4	227.8	10.5	3.2	0.9	0.8	2.4	2.7	9.0
Travel Time (hr)	4.0	10.2	0.5	0.4	11.3	0.4	0.4	0.1	0.1	0.3	0.3	0.7
Avg Speed (mph)	14	23	25	14	20	29	7	8	12	10	11	13
Fuel Used (gal)	1.7	5.9	0.3	0.2	6.3	0.2	0.2	0.0	0.0	0.1	0.1	0.3
Fuel Eff. (mpg)	31.6	38.2	41.3	31.4	36.2	42.7	21.1	22.3	28.3	24.1	26.6	31.2
HC Emissions (g)	14	79	6	1	65	7	1	0	0	0	0	3
CO Emissions (g)	388	1802	127	29	1495	126	33	6	5	15	15	72
NOx Emissions (g)	44	244	18	4	233	20	3	0	0	1	1	8
Vehicles Entered	183	773	40	19	672	31	38	10	9	19	21	70
Vehicles Exited	185	774	40	19	669	31	38	10	9	19	21	70
Hourly Exit Rate	185	774	40	19	669	31	38	10	9	19	21	70
Input Volume	186	783	39	19	666	29	39	10	10	19	19	68
% of Volume	100	99	102	99	100	106	97	100	90	99	109	102
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	4	10	0	0	11	0	0	0	0	0	0	1

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.7
Denied Del/Veh (s)	1.3
Total Delay (hr)	11.5
Total Del/Veh (s)	21.6
Stop Delay (hr)	6.5
Stop Del/Veh (s)	12.3
Total Stops	1058
Stop/Veh	0.55
Travel Dist (mi)	556.2
Travel Time (hr)	28.7
Avg Speed (mph)	20
Fuel Used (gal)	15.4
Fuel Eff. (mpg)	36.2
HC Emissions (g)	177
CO Emissions (g)	4114
NOx Emissions (g)	576
Vehicles Entered	1885
Vehicles Exited	1885
Hourly Exit Rate	1885
Input Volume	1888
% of Volume	100
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	419
Occupancy (veh)	28

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	6	2.5	36.7	0.3	33
Hunters Point Boulev	4	4.1	10.5	0.1	25
Griffith Street	11	2.9	19.1	0.1	23
Arelious Walker Driv	12	1.1	11.0	0.1	26
Earl Street	13	1.1	16.8	0.1	28
	1	60.5	75.8	0.1	6
Total		72.2	169.9	0.9	18

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Donahue Avenue	1	29.2	56.3	0.2	12
Earl Street	13	1.9	16.9	0.1	28
Arelious Walker Driv	12	0.8	16.6	0.1	28
New Griffith St	11	1.7	11.7	0.1	25
Hunters Point Boulev	4	6.4	19.0	0.1	23
Hawes Street	6	2.1	8.8	0.1	30
Jennings Street	9	21.9	56.7	0.3	21
Total		64.2	185.9	1.1	21

Intersection: 1: Innes Avenue & Donahue Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	373	408	148	60	232	234
Average Queue (ft)	212	247	62	21	113	121
95th Queue (ft)	356	385	120	52	198	203
Link Distance (ft)	615	615	988	557	1924	1924
Upstream Blk Time (%)	0	1				
Queuing Penalty (veh)	1	2				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	TR
Maximum Queue (ft)	57	98	202	196	130	143
Average Queue (ft)	23	32	90	70	52	53
95th Queue (ft)	51	73	166	150	104	114
Link Distance (ft)	1190		572	572	217	217
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		120				
Storage Blk Time (%)			2			
Queuing Penalty (veh)			1			

Intersection: 6: Innes Avenue & Hawes Street

Movement	EB	NB
Directions Served	LR	T
Maximum Queue (ft)	40	5
Average Queue (ft)	9	0
95th Queue (ft)	33	4
Link Distance (ft)	794	217
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	203	494	160	194	634	119	98	93	159
Average Queue (ft)	86	164	57	36	264	10	34	31	64
95th Queue (ft)	178	480	141	111	559	82	77	72	127
Link Distance (ft)		1547			1693	1693	452		669
Upstream Blk Time (%)		0							
Queuing Penalty (veh)		0							
Storage Bay Dist (ft)	170		100	170				100	
Storage Blk Time (%)	5	8	0		12			0	3
Queuing Penalty (veh)	41	24	1		5			0	1

Intersection: 11: Griffith Street/New Griffith St & Innes Avenue

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	83	104	108	107	57	58
Average Queue (ft)	27	29	31	32	17	19
95th Queue (ft)	69	81	77	82	47	50
Link Distance (ft)	572	572	379	379	438	1535
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 12: Innes Avenue & Arelious Walker Drive

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	74	24	5	2	59
Average Queue (ft)	16	1	0	0	23
95th Queue (ft)	54	18	5	2	54
Link Distance (ft)	379	379	635	635	1627
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 13: Innes Avenue & Earl Street

Movement	EB	EB	SB
Directions Served	LT	T	LR
Maximum Queue (ft)	54	15	52
Average Queue (ft)	8	2	18
95th Queue (ft)	38	25	45
Link Distance (ft)	635	635	1738
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 76

1: Innes Avenue & Donahue Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.2
Total Delay (hr)	7.7	2.6	0.2	0.1	0.7	0.1	0.1	0.1	0.0	0.1	0.1	3.2
Total Del/Veh (s)	49.9	60.6	55.2	29.4	29.2	19.0	26.5	31.3	6.7	39.5	33.7	11.7
Stop Delay (hr)	6.8	2.2	0.1	0.1	0.6	0.1	0.1	0.1	0.0	0.1	0.1	2.1
Stop Del/Veh (s)	44.0	52.4	49.6	27.3	26.5	18.2	24.9	29.2	6.2	33.7	27.4	7.8
Total Stops	571	173	11	8	63	12	6	8	9	8	8	684
Stop/Veh	1.03	1.13	1.10	0.80	0.77	1.00	0.75	0.80	0.90	0.89	0.80	0.70
Travel Dist (mi)	69.9	19.2	1.3	1.8	15.2	2.3	0.8	1.0	1.0	3.3	3.4	352.4
Travel Time (hr)	10.3	3.2	0.2	0.2	1.3	0.2	0.1	0.1	0.1	0.2	0.2	15.9
Avg Speed (mph)	7	6	6	12	12	14	8	8	16	16	16	22
Fuel Used (gal)	3.4	1.0	0.1	0.1	0.5	0.1	0.0	0.0	0.0	0.1	0.1	8.8
Fuel Eff. (mpg)	20.8	19.1	20.5	27.5	27.9	31.9	23.5	23.4	35.6	32.9	34.7	39.9
HC Emissions (g)	19	7	0	0	5	0	0	0	0	0	0	109
CO Emissions (g)	526	163	5	9	132	11	4	5	4	13	13	2228
NOx Emissions (g)	56	18	0	1	16	1	0	0	0	1	1	299
Vehicles Entered	547	150	10	10	81	12	7	10	10	9	9	964
Vehicles Exited	543	149	10	10	81	12	7	10	10	9	10	966
Hourly Exit Rate	543	149	10	10	81	12	7	10	10	9	10	966
Input Volume	542	148	10	10	79	10	10	10	10	10	10	967
% of Volume	100	100	100	100	102	120	70	100	100	90	100	100
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	10	3	0	0	1	0	0	0	0	0	0	16

1: Innes Avenue & Donahue Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.1
Total Delay (hr)	14.8
Total Del/Veh (s)	28.8
Stop Delay (hr)	12.4
Stop Del/Veh (s)	24.1
Total Stops	1561
Stop/Veh	0.84
Travel Dist (mi)	471.7
Travel Time (hr)	31.9
Avg Speed (mph)	15
Fuel Used (gal)	14.2
Fuel Eff. (mpg)	33.1
HC Emissions (g)	143
CO Emissions (g)	3113
NOx Emissions (g)	396
Vehicles Entered	1819
Vehicles Exited	1817
Hourly Exit Rate	1817
Input Volume	1818
% of Volume	100
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	211
Occupancy (veh)	32

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	3.4	2.0	3.3	0.0	0.0	0.0	0.1	0.2	0.1	4.0	0.4	0.3
Total Delay (hr)	1.9	2.5	0.4	0.3	5.8	0.0	0.2	0.1	0.0	0.4	0.5	0.4
Total Del/Veh (s)	76.7	13.7	8.4	31.0	21.9	2.5	30.2	27.1	7.7	31.7	30.6	23.3
Stop Delay (hr)	1.8	0.9	0.1	0.2	1.8	0.0	0.2	0.1	0.0	0.4	0.5	0.4
Stop Del/Veh (s)	70.4	5.2	2.8	17.3	6.9	1.3	28.2	24.9	6.8	29.5	27.6	22.2
Total Stops	90	210	72	36	420	9	24	7	8	37	48	53
Stop/Veh	1.00	0.32	0.38	0.90	0.44	0.31	0.86	0.78	0.73	0.82	0.81	0.83
Travel Dist (mi)	25.7	189.4	55.5	13.2	316.3	9.7	2.4	0.8	0.9	5.7	7.5	8.0
Travel Time (hr)	2.8	8.3	2.4	0.7	14.9	0.3	0.3	0.1	0.1	0.7	0.8	0.8
Avg Speed (mph)	9	24	25	18	21	30	7	8	14	9	9	10
Fuel Used (gal)	1.0	5.0	1.3	0.4	8.8	0.2	0.1	0.0	0.0	0.3	0.3	0.3
Fuel Eff. (mpg)	25.2	37.7	41.8	33.9	35.8	42.4	20.7	21.8	32.5	22.4	24.2	26.4
HC Emissions (g)	6	58	18	3	109	6	2	0	0	2	2	3
CO Emissions (g)	185	1473	413	75	2483	128	38	5	6	58	64	88
NOx Emissions (g)	19	185	55	11	377	19	4	0	0	6	7	10
Vehicles Entered	88	645	189	39	930	28	28	9	11	44	59	63
Vehicles Exited	88	646	189	39	931	29	28	9	11	44	59	62
Hourly Exit Rate	88	646	189	39	931	29	28	9	11	44	59	62
Input Volume	88	642	197	39	928	29	29	10	10	49	59	59
% of Volume	99	101	96	99	100	99	96	90	110	89	100	105
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	3	8	2	1	15	0	0	0	0	1	1	1

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.7
Denied Del/Veh (s)	1.2
Total Delay (hr)	12.6
Total Del/Veh (s)	21.0
Stop Delay (hr)	6.4
Stop Del/Veh (s)	10.6
Total Stops	1014
Stop/Veh	0.47
Travel Dist (mi)	635.1
Travel Time (hr)	32.3
Avg Speed (mph)	20
Fuel Used (gal)	17.9
Fuel Eff. (mpg)	35.6
HC Emissions (g)	208
CO Emissions (g)	5016
NOx Emissions (g)	693
Vehicles Entered	2133
Vehicles Exited	2135
Hourly Exit Rate	2135
Input Volume	2141
% of Volume	100
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	371
Occupancy (veh)	32

CUMULATIVE + PROJECT

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	7	8.8	41.8	0.3	28
Hunters Point Boulev	5	9.5	15.7	0.1	17
Griffith Street	11	11.2	22.6	0.1	13
	12	4.3	19.7	0.1	23
	13	3.3	19.1	0.1	25
Donahue Street	1	35.7	54.1	0.1	9
Total		72.9	173.0	0.9	18

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	13	66.9	79.2	0.1	6
Arelious Walker Driv	12	82.8	97.7	0.1	5
New Griffith Street	11	61.9	76.9	0.1	6
Hunters Point Boulev	5	41.2	49.5	0.1	6
Hawes Street	7	24.8	31.0	0.1	9
Jennings Street	9	261.5	293.7	0.3	4
Total		539.1	628.1	0.9	5

Intersection: 1: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	295	325	462	81	592	573
Average Queue (ft)	170	190	148	25	147	144
95th Queue (ft)	271	290	389	62	477	471
Link Distance (ft)	615	615	988	557	1924	1924
Upstream Blk Time (%)			0			
Queuing Penalty (veh)			0			
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	TR
Maximum Queue (ft)	147	180	373	375	207	204
Average Queue (ft)	70	132	281	289	146	112
95th Queue (ft)	120	230	454	451	222	199
Link Distance (ft)	869		349	349	189	189
Upstream Blk Time (%)			8	11	3	1
Queuing Penalty (veh)			56	73	22	6
Storage Bay Dist (ft)		120				
Storage Blk Time (%)		2	49			
Queuing Penalty (veh)		11	77			

Intersection: 7: Innes Avenue & Hawes Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	38	215	226	273	200
Average Queue (ft)	8	161	166	109	68
95th Queue (ft)	32	267	268	236	169
Link Distance (ft)	777	189	189	1641	1641
Upstream Blk Time (%)		11	13		
Queuing Penalty (veh)		69	78		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	230	1601	146	229	1663	1667	99	160	531
Average Queue (ft)	168	1562	19	39	1552	1529	37	151	263
95th Queue (ft)	281	1655	93	159	1866	1930	82	180	504
Link Distance (ft)		1547			1641	1641	452		667
Upstream Blk Time (%)		53			13	10			0
Queuing Penalty (veh)		0			78	63			0
Storage Bay Dist (ft)	170		100	170				100	
Storage Blk Time (%)	13	33			50			53	2
Queuing Penalty (veh)	175	75			10			53	7

Intersection: 11: Griffith Street/New Griffith Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	LT	TR	LTR	LT	R
Maximum Queue (ft)	219	313	267	634	628	46	183	236
Average Queue (ft)	120	174	126	396	404	13	25	111
95th Queue (ft)	214	298	239	738	743	41	120	204
Link Distance (ft)		349	349	606	606	912	1508	
Upstream Blk Time (%)		0	0	3	4			
Queuing Penalty (veh)		0	0	18	24			
Storage Bay Dist (ft)	160							200
Storage Blk Time (%)	3	7					0	3
Queuing Penalty (veh)	26	14					0	0

Intersection: 12: Innes Avenue & Arelious Walker Drive

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	377	286	107	645	647	75	234
Average Queue (ft)	208	45	30	424	431	18	109
95th Queue (ft)	344	192	78	727	727	56	203
Link Distance (ft)		606	606	623	623		1621
Upstream Blk Time (%)		0		12	14		
Queuing Penalty (veh)		0		58	72		
Storage Bay Dist (ft)	350					180	
Storage Blk Time (%)	2	0					2
Queuing Penalty (veh)	12	0					0

Intersection: 13: Innes Avenue & Earl Street

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	277	94	103	605	601	187	383
Average Queue (ft)	131	21	30	269	274	25	169
95th Queue (ft)	229	63	75	620	620	102	319
Link Distance (ft)		623	623	615	615		1733
Upstream Blk Time (%)				13	14		
Queuing Penalty (veh)				47	49		
Storage Bay Dist (ft)	390					160	
Storage Blk Time (%)	0						13
Queuing Penalty (veh)	0						2

Network Summary

Network wide Queuing Penalty: 1178

1: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.7	0.3	0.1	0.1	0.1	0.1	0.2	0.1
Total Delay (hr)	5.7	0.3	0.1	0.2	3.4	0.2	0.1	0.1	0.0	0.2	0.2	7.0
Total Del/Veh (s)	32.2	35.9	27.3	66.9	86.1	70.4	58.4	29.8	16.3	76.7	79.9	45.7
Stop Delay (hr)	5.0	0.3	0.1	0.2	3.3	0.2	0.1	0.1	0.0	0.2	0.2	6.8
Stop Del/Veh (s)	28.0	29.7	23.9	64.3	83.0	69.0	56.6	27.8	15.9	74.0	75.4	44.3
Total Stops	495	28	6	8	120	9	8	7	8	9	9	379
Stop/Veh	0.77	0.80	0.75	0.80	0.85	0.90	0.89	0.70	0.89	0.82	0.90	0.69
Travel Dist (mi)	81.0	4.5	0.9	1.6	25.2	1.9	1.0	1.0	1.0	3.9	3.5	194.5
Travel Time (hr)	9.2	0.5	0.1	0.3	4.4	0.3	0.2	0.1	0.1	0.4	0.3	14.0
Avg Speed (mph)	9	8	9	6	6	7	5	8	11	10	10	14
Fuel Used (gal)	3.4	0.2	0.0	0.1	1.4	0.1	0.1	0.0	0.0	0.1	0.1	6.1
Fuel Eff. (mpg)	24.1	23.1	25.7	19.1	17.4	20.2	16.9	23.6	28.5	27.5	27.4	31.9
HC Emissions (g)	26	2	0	0	11	0	0	0	0	0	0	58
CO Emissions (g)	676	42	4	10	281	11	6	6	4	14	16	1288
NOx Emissions (g)	83	5	0	1	30	1	0	0	0	1	2	159
Vehicles Entered	632	35	7	9	139	10	9	10	9	11	10	542
Vehicles Exited	632	35	8	8	127	10	9	9	9	10	9	502
Hourly Exit Rate	632	35	8	8	127	10	9	9	9	10	9	502
Input Volume	794	40	10	10	138	10	10	10	10	10	10	550
% of Volume	80	88	80	80	92	100	90	90	90	100	90	91
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	1	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	9	1	0	0	4	0	0	0	0	0	0	14

1: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.1
Denied Del/Veh (s)	0.1
Total Delay (hr)	17.6
Total Del/Veh (s)	44.0
Stop Delay (hr)	16.4
Stop Del/Veh (s)	41.0
Total Stops	1086
Stop/Veh	0.75
Travel Dist (mi)	319.8
Travel Time (hr)	29.8
Avg Speed (mph)	11
Fuel Used (gal)	11.7
Fuel Eff. (mpg)	27.3
HC Emissions (g)	99
CO Emissions (g)	2357
NOx Emissions (g)	283
Vehicles Entered	1423
Vehicles Exited	1368
Hourly Exit Rate	1368
Input Volume	1602
% of Volume	85
Denied Entry Before	0
Denied Entry After	1
Density (ft/veh)	226
Occupancy (veh)	30

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	33.9	236.5	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Denied Del/Veh (s)	642.4	648.4	629.6	0.0	0.0	0.0	0.1	0.1	0.2	3.7	1.2	1.3
Total Delay (hr)	7.1	32.1	0.9	1.6	64.0	11.7	0.3	0.1	0.0	5.5	0.4	0.7
Total Del/Veh (s)	183.5	122.4	113.3	306.6	261.9	172.0	29.4	29.7	10.6	59.5	47.5	38.1
Stop Delay (hr)	5.4	20.2	0.6	1.6	59.5	11.0	0.3	0.1	0.0	5.0	0.4	0.7
Stop Del/Veh (s)	140.0	77.2	70.8	296.0	243.3	162.0	27.5	27.4	9.9	53.5	41.6	34.1
Total Stops	330	1522	45	44	1672	448	28	7	7	367	35	79
Stop/Veh	2.36	1.61	1.61	2.32	1.90	1.84	0.76	0.70	0.70	1.10	1.06	1.13
Travel Dist (mi)	39.2	265.0	7.9	5.7	272.9	77.2	3.1	0.9	0.8	41.8	4.1	8.9
Travel Time (hr)	42.2	276.2	8.1	1.8	71.9	14.1	0.4	0.1	0.1	7.6	0.6	1.2
Avg Speed (mph)	5	7	7	3	4	5	7	7	12	6	7	8
Fuel Used (gal)	10.5	68.9	2.0	0.5	21.2	4.8	0.1	0.0	0.0	2.5	0.2	0.4
Fuel Eff. (mpg)	3.7	3.8	3.9	11.3	12.9	16.2	20.7	20.4	29.7	16.7	19.2	21.5
HC Emissions (g)	36	257	17	0	127	35	1	0	0	18	3	4
CO Emissions (g)	1010	7051	316	53	3516	1329	36	8	5	511	70	104
NOx Emissions (g)	52	392	21	4	351	109	4	1	0	52	8	11
Vehicles Entered	132	904	27	18	842	236	36	10	10	328	32	69
Vehicles Exited	134	902	27	16	801	228	36	10	10	327	32	69
Hourly Exit Rate	134	902	27	16	801	228	36	10	10	327	32	69
Input Volume	188	1256	39	20	950	269	39	10	10	326	31	69
% of Volume	71	72	69	80	84	85	92	100	100	100	102	100
Denied Entry Before	9	60	2	0	0	0	0	0	0	0	0	0
Denied Entry After	58	409	13	0	0	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	8	40	1	2	72	14	0	0	0	7	1	1

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	277.8
Denied Del/Veh (s)	320.1
Total Delay (hr)	124.5
Total Del/Veh (s)	163.0
Stop Delay (hr)	104.6
Stop Del/Veh (s)	137.0
Total Stops	4584
Stop/Veh	1.67
Travel Dist (mi)	727.5
Travel Time (hr)	424.4
Avg Speed (mph)	5
Fuel Used (gal)	111.2
Fuel Eff. (mpg)	6.5
HC Emissions (g)	497
CO Emissions (g)	14008
NOx Emissions (g)	1005
Vehicles Entered	2644
Vehicles Exited	2592
Hourly Exit Rate	2592
Input Volume	3208
% of Volume	81
Denied Entry Before	71
Denied Entry After	480
Density (ft/veh)	79
Occupancy (veh)	147

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	7	9.0	41.9	0.3	28
Hunters Point Boulev	5	9.2	15.4	0.1	17
Griffith Street	11	13.1	24.4	0.1	12
	12	5.3	20.8	0.1	22
	13	6.8	22.5	0.1	21
Donahue Street	1	49.0	67.2	0.1	7
Total		92.5	192.3	0.9	16

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	13	215.3	236.3	0.1	2
Arelious Walker Driv	12	169.6	184.0	0.1	3
New Griffith Street	11	109.4	125.2	0.1	4
Hunters Point Boulev	5	55.4	63.7	0.1	5
Hawes Street	7	30.8	37.0	0.1	7
Jennings Street	9	267.3	300.2	0.3	4
Total		847.9	946.4	0.9	3

Intersection: 1: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	292	308	861	110	1972	1965
Average Queue (ft)	162	197	399	31	1531	1526
95th Queue (ft)	259	286	943	84	2666	2657
Link Distance (ft)	615	615	988	557	1924	1924
Upstream Blk Time (%)			9		67	66
Queuing Penalty (veh)			0		0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	TR
Maximum Queue (ft)	190	180	379	379	208	199
Average Queue (ft)	86	164	354	355	148	98
95th Queue (ft)	149	232	384	391	218	177
Link Distance (ft)	869		349	349	189	189
Upstream Blk Time (%)			13	18	4	1
Queuing Penalty (veh)			129	181	32	8
Storage Bay Dist (ft)		120				
Storage Blk Time (%)		3	69			
Queuing Penalty (veh)		23	143			

Intersection: 7: Innes Avenue & Hawes Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	38	218	221	274	212
Average Queue (ft)	11	190	193	69	43
95th Queue (ft)	36	228	225	337	284
Link Distance (ft)	777	189	189	1641	1641
Upstream Blk Time (%)		10	12		
Queuing Penalty (veh)		83	107		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	230	1601	160	229	1667	1677	92	160	689
Average Queue (ft)	107	1566	92	50	1647	1648	36	156	432
95th Queue (ft)	237	1655	202	175	1685	1684	79	173	748
Link Distance (ft)		1547			1641	1641	452		667
Upstream Blk Time (%)		53			20	15			14
Queuing Penalty (veh)		0			172	135			0
Storage Bay Dist (ft)	170		100	170				100	
Storage Blk Time (%)	0	35	0		45			65	5
Queuing Penalty (veh)	2	99	1		18			85	17

Intersection: 11: Griffith Street/New Griffith Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	LT	TR	LTR	LT	R
Maximum Queue (ft)	219	355	327	639	640	72	1354	260
Average Queue (ft)	135	205	127	596	596	23	797	253
95th Queue (ft)	229	351	258	722	720	60	1552	296
Link Distance (ft)		349	349	606	606	912	1508	
Upstream Blk Time (%)		2	0	9	14		13	
Queuing Penalty (veh)		19	3	77	118		0	
Storage Bay Dist (ft)	160							200
Storage Blk Time (%)	9	12					0	84
Queuing Penalty (veh)	65	22					1	22

Intersection: 12: Innes Avenue & Arelious Walker Drive

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	401	517	124	660	651	167	396
Average Queue (ft)	314	185	20	630	628	33	185
95th Queue (ft)	456	596	83	694	686	114	336
Link Distance (ft)		606	606	623	623		1621
Upstream Blk Time (%)		2		20	29		
Queuing Penalty (veh)		16		138	201		
Storage Bay Dist (ft)	350					180	
Storage Blk Time (%)	18	0					11
Queuing Penalty (veh)	92	0					3

Intersection: 13: Innes Avenue & Earl Street

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	337	184	158	661	652	129	369
Average Queue (ft)	163	48	70	598	599	18	175
95th Queue (ft)	294	143	133	770	759	80	316
Link Distance (ft)		623	623	615	615		1733
Upstream Blk Time (%)				60	64		
Queuing Penalty (veh)				325	342		
Storage Bay Dist (ft)	390					160	
Storage Blk Time (%)	0						16
Queuing Penalty (veh)	1						3

Network Summary

Network wide Queuing Penalty: 2681

1: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	1.5	1.6	152.8
Denied Del/Veh (s)	0.0	0.0	0.0	15.8	13.5	23.9	0.1	0.1	0.1	556.6	520.6	556.6
Total Delay (hr)	5.0	1.8	0.1	1.2	12.4	1.3	0.3	0.2	0.1	0.9	1.4	118.3
Total Del/Veh (s)	38.6	49.2	35.8	460.8	524.5	531.0	113.0	63.0	25.2	674.0	733.6	761.7
Stop Delay (hr)	4.4	1.6	0.1	1.2	12.4	1.3	0.3	0.2	0.1	1.0	1.5	120.8
Stop Del/Veh (s)	34.2	43.0	32.1	461.4	524.9	532.3	111.1	60.4	24.5	688.7	748.1	778.2
Total Stops	419	134	8	8	81	9	10	8	7	3	4	317
Stop/Veh	0.90	1.00	1.00	0.89	0.95	1.00	1.00	0.80	0.78	0.60	0.57	0.57
Travel Dist (mi)	59.1	16.9	1.1	1.5	13.6	1.5	1.1	1.1	0.9	1.4	2.1	170.5
Travel Time (hr)	7.5	2.5	0.1	1.3	13.3	1.5	0.4	0.2	0.1	2.5	3.1	277.1
Avg Speed (mph)	8	7	8	1	1	1	3	5	9	1	1	1
Fuel Used (gal)	2.8	0.9	0.0	0.3	3.3	0.4	0.1	0.1	0.0	0.6	0.7	66.5
Fuel Eff. (mpg)	21.3	19.4	23.7	4.6	4.1	4.2	10.6	15.6	24.9	2.3	2.8	2.6
HC Emissions (g)	20	7	0	0	21	0	0	0	0	0	0	228
CO Emissions (g)	543	175	5	23	466	25	9	8	5	34	44	6485
NOx Emissions (g)	66	22	0	1	30	1	1	1	0	1	2	336
Vehicles Entered	460	132	8	9	84	9	10	10	9	5	6	538
Vehicles Exited	461	132	8	7	56	7	10	10	9	3	5	403
Hourly Exit Rate	461	132	8	7	56	7	10	10	9	3	5	403
Input Volume	560	148	10	10	79	10	10	10	10	10	10	986
% of Volume	82	89	80	70	71	70	100	100	90	30	50	41
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	2	0	0	0	0	5	5	450
Density (ft/veh)												
Occupancy (veh)	8	3	0	1	13	1	0	0	0	1	1	124

1: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	156.3
Denied Del/Veh (s)	323.0
Total Delay (hr)	143.0
Total Del/Veh (s)	391.4
Stop Delay (hr)	144.8
Stop Del/Veh (s)	396.4
Total Stops	1008
Stop/Veh	0.77
Travel Dist (mi)	270.6
Travel Time (hr)	309.5
Avg Speed (mph)	2
Fuel Used (gal)	75.7
Fuel Eff. (mpg)	3.6
HC Emissions (g)	277
CO Emissions (g)	7823
NOx Emissions (g)	461
Vehicles Entered	1280
Vehicles Exited	1111
Hourly Exit Rate	1111
Input Volume	1854
% of Volume	60
Denied Entry Before	0
Denied Entry After	462
Density (ft/veh)	44
Occupancy (veh)	153

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	12.5	162.3	29.1	0.0	0.2	0.0	0.0	0.0	0.0	1.1	0.2	0.2
Denied Del/Veh (s)	505.5	513.0	511.0	0.0	1.0	0.0	0.2	0.2	0.1	10.9	8.4	8.7
Total Delay (hr)	3.2	30.0	4.9	2.2	70.3	12.0	0.3	0.1	0.0	9.5	1.5	1.4
Total Del/Veh (s)	163.7	121.6	112.6	322.5	267.3	192.7	30.5	25.0	14.0	94.6	79.5	77.3
Stop Delay (hr)	2.4	19.0	3.1	2.1	66.1	11.6	0.2	0.1	0.0	8.8	1.4	1.2
Stop Del/Veh (s)	122.0	77.0	70.2	312.2	251.5	187.0	28.6	22.7	13.1	86.9	71.9	71.2
Total Stops	159	1481	275	58	1756	393	25	7	10	467	86	85
Stop/Veh	2.27	1.67	1.75	2.42	1.85	1.75	0.81	0.64	0.83	1.29	1.25	1.35
Travel Dist (mi)	19.2	250.1	44.3	7.6	292.3	70.6	2.6	0.9	1.0	44.3	8.5	7.8
Travel Time (hr)	16.3	199.5	35.4	2.4	79.0	14.2	0.4	0.1	0.1	12.5	2.0	1.9
Avg Speed (mph)	5	7	7	3	4	5	7	8	11	4	5	5
Fuel Used (gal)	4.1	50.9	8.9	0.7	23.3	4.7	0.1	0.0	0.0	3.7	0.6	0.6
Fuel Eff. (mpg)	4.7	4.9	5.0	11.3	12.5	15.2	20.6	22.3	27.9	11.9	13.6	13.8
HC Emissions (g)	10	222	37	0	143	34	2	0	0	21	4	4
CO Emissions (g)	362	5912	967	69	3871	1283	38	8	8	607	117	117
NOx Emissions (g)	18	371	59	6	379	105	4	1	1	57	11	11
Vehicles Entered	66	852	150	22	875	211	30	11	12	350	66	61
Vehicles Exited	66	849	151	22	867	211	30	11	12	347	67	60
Hourly Exit Rate	66	849	151	22	867	211	30	11	12	347	67	60
Input Volume	88	1110	197	39	1367	338	29	10	10	348	72	59
% of Volume	75	76	77	56	63	62	103	110	120	100	93	101
Denied Entry Before	2	42	8	0	0	0	0	0	0	1	0	0
Denied Entry After	23	287	55	0	0	0	0	0	0	6	1	1
Density (ft/veh)												
Occupancy (veh)	4	37	6	2	79	14	0	0	0	11	2	2

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	205.5
Denied Del/Veh (s)	240.3
Total Delay (hr)	135.4
Total Del/Veh (s)	170.6
Stop Delay (hr)	116.0
Stop Del/Veh (s)	146.2
Total Stops	4802
Stop/Veh	1.68
Travel Dist (mi)	749.2
Travel Time (hr)	363.8
Avg Speed (mph)	5
Fuel Used (gal)	97.7
Fuel Eff. (mpg)	7.7
HC Emissions (g)	479
CO Emissions (g)	13360
NOx Emissions (g)	1022
Vehicles Entered	2706
Vehicles Exited	2693
Hourly Exit Rate	2693
Input Volume	3669
% of Volume	73
Denied Entry Before	53
Denied Entry After	373
Density (ft/veh)	73
Occupancy (veh)	158

CUMULATIVE + PROJECT + BUS LANE

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	7	186.4	217.0	0.3	5
Hunters Point Boulev	5	23.3	30.1	0.1	9
Griffith Street	11	17.1	27.8	0.1	10
	12	5.9	21.3	0.1	21
	13	2.0	17.7	0.1	27
Donahue Street	1	15.4	33.4	0.1	14
Total		250.1	347.2	0.9	9

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	13	166.1	185.1	0.1	3
Arelious Walker Driv	12	119.7	134.7	0.1	3
New Griffith Street	11	53.8	69.0	0.1	7
Hunters Point Boulev	5	16.1	24.5	0.1	12
Hawes Street	7	7.2	13.8	0.1	19
Jennings Street	9	32.5	66.2	0.3	18
Total		395.4	493.2	0.9	6

Intersection: 1: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR	LTR
Maximum Queue (ft)	390	68	699	144	1988
Average Queue (ft)	227	18	390	52	1873
95th Queue (ft)	356	51	801	135	2266
Link Distance (ft)	627	627	999	557	1936
Upstream Blk Time (%)			4		84
Queuing Penalty (veh)			0		0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	SB
Directions Served	R	L	T	T
Maximum Queue (ft)	184	180	367	259
Average Queue (ft)	81	89	266	243
95th Queue (ft)	145	190	393	282
Link Distance (ft)	902		354	244
Upstream Blk Time (%)			1	13
Queuing Penalty (veh)			15	208
Storage Bay Dist (ft)		120		
Storage Blk Time (%)		0	21	
Queuing Penalty (veh)		3	34	

Intersection: 7: Innes Avenue & Hawes Street

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	R
Maximum Queue (ft)	40	254	1651	160
Average Queue (ft)	7	103	1636	28
95th Queue (ft)	30	262	1653	126
Link Distance (ft)	803	244	1641	
Upstream Blk Time (%)		1	5	
Queuing Penalty (veh)		11	79	
Storage Bay Dist (ft)				100
Storage Blk Time (%)			51	
Queuing Penalty (veh)			15	

Intersection: 9: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	230	1601	160	175	601	160	102	160	720
Average Queue (ft)	188	1575	49	21	344	115	35	159	655
95th Queue (ft)	309	1600	169	95	551	212	78	160	820
Link Distance (ft)		1547			1641		451		667
Upstream Blk Time (%)		95							78
Queuing Penalty (veh)		0							0
Storage Bay Dist (ft)	170		100	170		100		100	
Storage Blk Time (%)	1	80	0		35	0		89	1
Queuing Penalty (veh)	18	181	0		101	2		90	3

Intersection: 11: Griffith Street/New Griffith Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	T	R	LTR	LT	R
Maximum Queue (ft)	220	361	103	625	133	57	127	223
Average Queue (ft)	126	273	6	532	9	14	16	99
95th Queue (ft)	236	389	52	705	64	40	72	182
Link Distance (ft)		354		605		910	1509	
Upstream Blk Time (%)		0		3				
Queuing Penalty (veh)		8		36				
Storage Bay Dist (ft)	160		100		100			200
Storage Blk Time (%)	1	21		45			0	0
Queuing Penalty (veh)	20	43		8			0	0

Intersection: 12: Innes Avenue & Arelious Walker Drive

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	321	139	650	160	70	243
Average Queue (ft)	174	59	637	42	20	114
95th Queue (ft)	298	112	649	154	52	204
Link Distance (ft)		605	622			1620
Upstream Blk Time (%)			39			
Queuing Penalty (veh)			385			
Storage Bay Dist (ft)	350			100	180	
Storage Blk Time (%)	0		71	0		2
Queuing Penalty (veh)	3		21	0		0

Intersection: 13: Innes Avenue & Earl Street

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	214	88	654	160	220	1781
Average Queue (ft)	106	19	636	47	44	1625
95th Queue (ft)	184	57	648	166	187	2102
Link Distance (ft)		622	627			1732
Upstream Blk Time (%)			40			78
Queuing Penalty (veh)			275			0
Storage Bay Dist (ft)	390			100	160	
Storage Blk Time (%)			88			98
Queuing Penalty (veh)			17			18

Network Summary

Network wide Queuing Penalty: 1591

1: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	2.0	1.7	97.2
Denied Del/Veh (s)	0.0	0.0	0.0	6.5	9.5	13.7	0.1	0.1	0.1	588.2	540.9	630.5
Total Delay (hr)	3.2	0.1	0.0	0.9	11.6	0.9	0.7	0.4	0.3	1.4	1.6	69.5
Total Del/Veh (s)	24.3	15.6	3.1	314.8	303.9	273.2	215.3	122.8	85.7	716.3	707.4	692.8
Stop Delay (hr)	2.6	0.1	0.0	0.9	11.6	0.9	0.7	0.4	0.3	1.5	1.6	72.6
Stop Del/Veh (s)	19.8	14.0	2.9	315.5	304.1	274.8	213.9	120.9	85.2	747.3	735.7	724.3
Total Stops	344	15	3	9	131	11	11	9	11	2	2	93
Stop/Veh	0.72	0.62	0.60	0.90	0.96	0.92	1.00	0.82	0.85	0.29	0.25	0.26
Travel Dist (mi)	60.2	3.1	0.6	1.7	23.7	2.1	1.1	1.1	1.3	2.2	2.4	108.6
Travel Time (hr)	5.7	0.2	0.0	1.0	12.9	1.0	0.7	0.4	0.4	3.4	3.3	170.5
Avg Speed (mph)	10	14	20	2	2	2	2	3	4	1	1	1
Fuel Used (gal)	2.1	0.1	0.0	0.3	3.4	0.3	0.2	0.1	0.1	0.8	0.8	40.4
Fuel Eff. (mpg)	28.2	32.2	38.6	6.8	7.0	7.4	6.3	9.3	12.3	2.7	3.0	2.7
HC Emissions (g)	17	1	0	0	22	0	0	0	0	0	0	123
CO Emissions (g)	402	28	2	20	523	23	15	12	12	47	47	3780
NOx Emissions (g)	51	4	0	1	36	1	1	1	1	2	2	170
Vehicles Entered	468	24	5	9	132	12	11	10	12	7	7	323
Vehicles Exited	467	24	5	9	116	10	11	10	13	5	6	284
Hourly Exit Rate	467	24	5	9	116	10	11	10	13	5	6	284
Input Volume	794	40	10	10	138	10	10	10	10	10	10	540
% of Volume	59	60	50	90	84	100	110	100	130	50	60	53
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	1	0	0	0	0	5	4	232
Density (ft/veh)												
Occupancy (veh)	6	0	0	1	13	1	1	0	0	1	2	73

1: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	101.2
Denied Del/Veh (s)	288.8
Total Delay (hr)	90.4
Total Del/Veh (s)	303.5
Stop Delay (hr)	93.1
Stop Del/Veh (s)	312.4
Total Stops	641
Stop/Veh	0.60
Travel Dist (mi)	208.2
Travel Time (hr)	199.6
Avg Speed (mph)	2
Fuel Used (gal)	48.5
Fuel Eff. (mpg)	4.3
HC Emissions (g)	164
CO Emissions (g)	4913
NOx Emissions (g)	269
Vehicles Entered	1020
Vehicles Exited	960
Hourly Exit Rate	960
Input Volume	1592
% of Volume	60
Denied Entry Before	0
Denied Entry After	242
Density (ft/veh)	49
Occupancy (veh)	98

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	63.0	411.3	13.5	0.0	0.0	0.0	0.0	0.0	0.0	21.3	2.0	4.5
Denied Del/Veh (s)	1122.3	1116.7	1133.5	0.0	0.0	0.0	0.2	0.2	0.2	232.2	218.4	235.8
Total Delay (hr)	7.2	43.6	1.2	0.2	6.0	1.1	0.3	0.1	0.1	18.7	1.5	2.9
Total Del/Veh (s)	266.1	253.7	221.7	58.3	32.4	20.6	26.9	28.7	20.7	232.5	187.6	168.2
Stop Delay (hr)	7.0	42.2	1.1	0.2	3.3	0.5	0.3	0.1	0.1	18.7	1.5	2.9
Stop Del/Veh (s)	257.6	245.8	215.8	45.5	18.1	8.5	25.1	26.3	20.3	232.8	186.2	168.4
Total Stops	117	324	10	16	444	154	32	7	10	214	26	54
Stop/Veh	1.19	0.52	0.53	1.23	0.67	0.77	0.74	0.78	0.83	0.74	0.90	0.87
Travel Dist (mi)	26.1	166.9	5.0	4.1	216.8	65.6	3.7	0.8	1.0	34.7	3.5	7.4
Travel Time (hr)	71.0	459.7	14.9	0.3	12.3	3.2	0.5	0.1	0.1	41.5	3.7	7.8
Avg Speed (mph)	3	3	4	12	18	20	8	8	9	2	2	2
Fuel Used (gal)	16.9	108.6	3.5	0.1	6.5	1.7	0.2	0.0	0.0	10.1	0.9	1.9
Fuel Eff. (mpg)	1.5	1.5	1.4	29.1	33.1	37.5	21.6	21.4	23.0	3.4	3.9	3.9
HC Emissions (g)	28	395	33	0	73	23	1	0	0	39	3	8
CO Emissions (g)	1188	10103	564	21	1612	483	43	6	7	1054	102	218
NOx Emissions (g)	32	353	27	3	252	76	5	0	1	53	6	12
Vehicles Entered	88	570	18	12	655	198	42	9	12	279	28	59
Vehicles Exited	91	570	16	12	655	199	43	9	12	268	27	58
Hourly Exit Rate	91	570	16	12	655	199	43	9	12	268	27	58
Input Volume	188	1256	39	20	950	269	39	10	10	326	31	69
% of Volume	48	45	41	60	69	74	110	90	120	82	86	84
Denied Entry Before	15	72	2	0	0	0	0	0	0	1	0	0
Denied Entry After	114	756	25	0	0	0	0	0	0	52	5	10
Density (ft/veh)												
Occupancy (veh)	8	48	1	0	12	3	0	0	0	20	2	3

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	515.7
Denied Del/Veh (s)	633.2
Total Delay (hr)	82.9
Total Del/Veh (s)	144.9
Stop Delay (hr)	77.8
Stop Del/Veh (s)	136.1
Total Stops	1408
Stop/Veh	0.68
Travel Dist (mi)	535.7
Travel Time (hr)	615.0
Avg Speed (mph)	5
Fuel Used (gal)	150.7
Fuel Eff. (mpg)	3.6
HC Emissions (g)	603
CO Emissions (g)	15401
NOx Emissions (g)	820
Vehicles Entered	1970
Vehicles Exited	1960
Hourly Exit Rate	1960
Input Volume	3208
% of Volume	61
Denied Entry Before	90
Denied Entry After	962
Density (ft/veh)	115
Occupancy (veh)	99

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	7	184.2	214.8	0.3	5
Hunters Point Boulev	5	26.6	33.8	0.1	8
Griffith Street	11	19.7	30.3	0.1	10
	12	5.5	20.9	0.1	22
	13	9.2	24.9	0.1	19
Donahue Street	1	28.8	47.2	0.1	10
Total		274.0	372.0	0.9	8

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	13	365.7	378.5	0.1	1
Arelious Walker Driv	12	133.5	146.6	0.1	3
New Griffith Street	11	60.2	75.6	0.1	6
Hunters Point Boulev	5	14.8	23.3	0.1	12
Hawes Street	7	4.2	10.9	0.1	24
Jennings Street	9	32.0	65.7	0.3	18
Total		610.4	700.5	0.9	4

Intersection: 1: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR	LTR
Maximum Queue (ft)	380	150	1026	271	1986
Average Queue (ft)	232	66	846	100	1952
95th Queue (ft)	357	124	1266	269	1970
Link Distance (ft)	627	627	999	557	1936
Upstream Blk Time (%)			57		100
Queuing Penalty (veh)			0		0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	SB
Directions Served	R	L	T	T
Maximum Queue (ft)	217	179	370	261
Average Queue (ft)	107	89	268	250
95th Queue (ft)	186	185	396	261
Link Distance (ft)	902		354	244
Upstream Blk Time (%)			1	20
Queuing Penalty (veh)			25	291
Storage Bay Dist (ft)		120		
Storage Blk Time (%)		0	19	
Queuing Penalty (veh)		8	40	

Intersection: 7: Innes Avenue & Hawes Street

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	R
Maximum Queue (ft)	33	216	1652	160
Average Queue (ft)	10	41	1633	40
95th Queue (ft)	35	152	1665	153
Link Distance (ft)	803	244	1641	
Upstream Blk Time (%)		0	4	
Queuing Penalty (veh)		1	63	
Storage Bay Dist (ft)				100
Storage Blk Time (%)			53	0
Queuing Penalty (veh)			21	0

Intersection: 9: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	230	1601	160	229	651	160	76	160	721
Average Queue (ft)	127	1576	127	32	378	103	27	159	674
95th Queue (ft)	288	1601	230	124	643	209	62	160	764
Link Distance (ft)		1547			1641		451		667
Upstream Blk Time (%)		92							87
Queuing Penalty (veh)		0							0
Storage Bay Dist (ft)	170		100	170		100		100	
Storage Blk Time (%)		72	0		32	0		89	3
Queuing Penalty (veh)		207	0		121	1		117	10

Intersection: 11: Griffith Street/New Griffith Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	T	R	LTR	LT	R
Maximum Queue (ft)	220	370	119	625	77	68	466	260
Average Queue (ft)	127	313	6	576	5	19	159	200
95th Queue (ft)	240	410	50	692	50	55	500	297
Link Distance (ft)		354		605		910	1509	
Upstream Blk Time (%)		2		5				
Queuing Penalty (veh)		27		85				
Storage Bay Dist (ft)	160		100		100			200
Storage Blk Time (%)	2	24		46			1	30
Queuing Penalty (veh)	25	45		7			2	5

Intersection: 12: Innes Avenue & Arelious Walker Drive

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	272	153	645	160	173	333
Average Queue (ft)	151	47	632	37	29	159
95th Queue (ft)	243	111	642	146	103	272
Link Distance (ft)		605	622			1620
Upstream Blk Time (%)			43			
Queuing Penalty (veh)			592			
Storage Bay Dist (ft)	350			100	180	
Storage Blk Time (%)	0		81	0		6
Queuing Penalty (veh)	1		28	0		2

Intersection: 13: Innes Avenue & Earl Street

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	233	213	644	112	202	612
Average Queue (ft)	118	118	633	9	37	298
95th Queue (ft)	200	200	640	68	158	594
Link Distance (ft)		622	627			1732
Upstream Blk Time (%)			83			
Queuing Penalty (veh)			882			
Storage Bay Dist (ft)	390			100	160	
Storage Blk Time (%)			99			44
Queuing Penalty (veh)			19			7

Network Summary

Network wide Queuing Penalty: 2631

1: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	1.7	12.7	1.8	0.0	0.0	0.0	5.2	4.8	558.8
Denied Del/Veh (s)	0.0	0.0	0.0	616.8	573.6	510.5	0.1	0.2	0.1	1877.4	1734.3	1832.1
Total Delay (hr)	4.4	0.8	0.0	3.0	28.0	4.2	1.1	1.0	1.5	1.2	1.2	77.1
Total Del/Veh (s)	42.4	28.6	12.2	1822.3	1904.4	1892.5	489.0	390.9	435.2	2157.0	2119.1	1768.8
Stop Delay (hr)	3.9	0.7	0.0	3.0	28.1	4.2	1.1	1.0	1.4	1.2	1.2	78.1
Stop Del/Veh (s)	37.2	26.0	11.3	1826.6	1908.5	1897.5	486.7	388.2	433.7	2184.0	2146.0	1791.9
Total Stops	331	73	5	4	32	5	8	8	11	0	0	0
Stop/Veh	0.89	0.72	0.71	0.67	0.60	0.62	1.00	0.89	0.92	0.00	0.00	0.00
Travel Dist (mi)	47.4	12.8	0.9	0.6	5.3	0.8	0.8	0.9	1.2	0.4	0.5	28.9
Travel Time (hr)	6.4	1.3	0.1	4.8	41.0	6.1	1.1	1.0	1.5	6.4	6.0	637.0
Avg Speed (mph)	7	10	14	0	0	0	1	1	1	0	0	0
Fuel Used (gal)	2.3	0.5	0.0	1.1	9.6	1.4	0.3	0.3	0.4	1.5	1.4	148.5
Fuel Eff. (mpg)	20.9	24.5	32.0	0.5	0.5	0.5	2.8	3.5	3.2	0.3	0.3	0.2
HC Emissions (g)	16	7	0	0	30	0	0	0	0	0	0	510
CO Emissions (g)	443	159	4	56	828	72	18	17	26	73	69	13086
NOx Emissions (g)	53	19	0	1	27	1	1	1	1	1	1	416
Vehicles Entered	368	99	7	5	42	7	8	9	12	1	1	80
Vehicles Exited	367	100	7	2	19	3	6	7	10	1	2	79
Hourly Exit Rate	367	100	7	2	19	3	6	7	10	1	2	79
Input Volume	560	148	10	10	79	10	10	10	10	10	10	976
% of Volume	65	67	70	20	24	30	60	70	100	10	20	8
Denied Entry Before	0	0	0	0	0	0	0	0	0	1	1	97
Denied Entry After	0	0	0	5	38	6	0	0	0	9	9	1018
Density (ft/veh)												
Occupancy (veh)	6	1	0	3	28	4	1	1	2	1	1	78

1: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	585.1
Denied Del/Veh (s)	1221.8
Total Delay (hr)	123.5
Total Del/Veh (s)	602.6
Stop Delay (hr)	124.0
Stop Del/Veh (s)	605.0
Total Stops	477
Stop/Veh	0.65
Travel Dist (mi)	100.3
Travel Time (hr)	712.7
Avg Speed (mph)	1
Fuel Used (gal)	167.3
Fuel Eff. (mpg)	0.6
HC Emissions (g)	563
CO Emissions (g)	14852
NOx Emissions (g)	520
Vehicles Entered	639
Vehicles Exited	603
Hourly Exit Rate	603
Input Volume	1844
% of Volume	33
Denied Entry Before	99
Denied Entry After	1085
Density (ft/veh)	38
Occupancy (veh)	128

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	24.5	307.6	54.4	0.0	0.0	0.0	0.0	0.0	0.0	40.6	8.3	7.3
Denied Del/Veh (s)	947.4	960.4	964.0	0.0	0.0	0.0	0.1	0.2	0.1	413.0	438.4	400.7
Total Delay (hr)	3.5	40.0	6.2	0.3	6.7	1.1	0.2	0.1	0.1	18.9	3.0	2.6
Total Del/Veh (s)	242.7	228.7	206.6	58.4	32.0	21.6	27.7	26.8	22.7	236.5	197.0	182.9
Stop Delay (hr)	3.3	37.3	5.8	0.2	3.5	0.5	0.2	0.1	0.1	18.8	2.9	2.6
Stop Del/Veh (s)	228.2	213.7	193.4	45.4	16.7	8.9	26.1	24.5	22.4	235.7	194.6	181.9
Total Stops	67	458	71	23	504	142	21	8	8	217	47	50
Stop/Veh	1.29	0.73	0.66	1.21	0.66	0.75	0.75	0.73	0.80	0.76	0.87	0.96
Travel Dist (mi)	14.0	171.0	29.6	5.9	246.5	61.4	2.4	0.9	0.9	34.3	6.6	6.4
Travel Time (hr)	28.4	352.5	61.5	0.5	13.9	3.1	0.3	0.1	0.1	60.9	11.5	10.3
Avg Speed (mph)	4	4	4	12	18	20	8	8	8	2	2	2
Fuel Used (gal)	6.8	84.0	14.7	0.2	7.1	1.6	0.1	0.0	0.0	14.7	2.8	2.5
Fuel Eff. (mpg)	2.1	2.0	2.0	30.1	34.8	38.7	22.0	21.8	23.6	2.3	2.3	2.6
HC Emissions (g)	17	269	58	1	78	21	1	0	0	36	5	6
CO Emissions (g)	567	7463	1449	25	1630	424	29	8	6	1222	228	220
NOx Emissions (g)	20	265	57	3	264	68	3	1	0	49	10	10
Vehicles Entered	48	583	101	18	746	186	28	10	10	274	52	51
Vehicles Exited	48	583	101	18	744	186	27	11	10	266	51	49
Hourly Exit Rate	48	583	101	18	744	186	27	11	10	266	51	49
Input Volume	88	1110	197	39	1367	338	29	10	10	348	72	59
% of Volume	54	53	51	46	54	55	92	110	100	77	71	83
Denied Entry Before	4	48	8	0	0	0	0	0	0	2	0	0
Denied Entry After	45	570	102	0	0	0	0	0	0	80	16	15
Density (ft/veh)												
Occupancy (veh)	4	45	7	0	14	3	0	0	0	20	3	3

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	442.7
Denied Del/Veh (s)	543.0
Total Delay (hr)	82.7
Total Del/Veh (s)	135.5
Stop Delay (hr)	75.3
Stop Del/Veh (s)	123.5
Total Stops	1616
Stop/Veh	0.74
Travel Dist (mi)	580.1
Travel Time (hr)	543.1
Avg Speed (mph)	6
Fuel Used (gal)	134.5
Fuel Eff. (mpg)	4.3
HC Emissions (g)	494
CO Emissions (g)	13269
NOx Emissions (g)	749
Vehicles Entered	2107
Vehicles Exited	2094
Hourly Exit Rate	2094
Input Volume	3669
% of Volume	57
Denied Entry Before	62
Denied Entry After	828
Density (ft/veh)	114
Occupancy (veh)	100

CUMULATIVE + VARIANT

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	7	17.9	50.7	0.3	23
Hunters Point Boulev	5	11.0	17.2	0.1	15
Griffith Street	11	11.1	22.5	0.1	13
	12	3.1	18.5	0.1	25
	13	4.8	20.5	0.1	23
Donahue Street	1	34.3	52.7	0.1	9
Total		82.2	182.1	0.9	17

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	13	66.8	80.0	0.1	6
Arelious Walker Driv	12	92.3	106.9	0.1	4
New Griffith Street	11	83.7	99.4	0.1	5
Hunters Point Boulev	5	41.7	50.1	0.1	6
Hawes Street	7	30.0	36.2	0.1	7
Jennings Street	9	297.4	329.4	0.3	4
Total		612.0	702.0	0.9	4

Intersection: 1: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	249	273	594	74	788	776
Average Queue (ft)	135	153	182	25	189	187
95th Queue (ft)	222	243	526	61	651	639
Link Distance (ft)	615	615	988	557	1924	1924
Upstream Blk Time (%)			2			
Queuing Penalty (veh)			0			
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	TR
Maximum Queue (ft)	867	180	374	380	211	214
Average Queue (ft)	748	132	237	244	171	121
95th Queue (ft)	1104	225	459	464	244	218
Link Distance (ft)	869		349	349	189	189
Upstream Blk Time (%)	57		5	10	9	2
Queuing Penalty (veh)	0		29	61	94	16
Storage Bay Dist (ft)		120				
Storage Blk Time (%)		7	49			
Queuing Penalty (veh)		40	68			

Intersection: 7: Innes Avenue & Hawes Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	51	218	223	566	506
Average Queue (ft)	10	159	163	218	136
95th Queue (ft)	37	272	273	484	394
Link Distance (ft)	777	189	189	1641	1641
Upstream Blk Time (%)		17	19		
Queuing Penalty (veh)		98	109		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	230	1601	159	228	1667	1671	103	160	721
Average Queue (ft)	142	1575	22	35	1576	1544	39	159	689
95th Queue (ft)	268	1599	106	143	1840	1930	87	160	714
Link Distance (ft)		1547			1641	1641	452		667
Upstream Blk Time (%)		69			18	15			82
Queuing Penalty (veh)		0			102	86			0
Storage Bay Dist (ft)	170		100	170				100	
Storage Blk Time (%)	4	41			54			70	2
Queuing Penalty (veh)	60	93			11			88	12

Intersection: 11: Griffith Street/New Griffith Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	LT	TR	LTR	LT	R
Maximum Queue (ft)	220	368	304	635	639	57	189	225
Average Queue (ft)	196	245	81	512	517	17	37	108
95th Queue (ft)	251	397	201	772	770	46	197	208
Link Distance (ft)		349	349	606	606	912	1508	
Upstream Blk Time (%)		3	0	6	7			
Queuing Penalty (veh)		41	2	35	39			
Storage Bay Dist (ft)	160							200
Storage Blk Time (%)	30	6					0	6
Queuing Penalty (veh)	271	33					1	1

Intersection: 12: Innes Avenue & Arelious Walker Drive

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	358	196	132	650	651	100	282
Average Queue (ft)	174	32	21	429	432	23	118
95th Queue (ft)	291	137	77	761	757	69	215
Link Distance (ft)		606	606	623	623		1621
Upstream Blk Time (%)		0		10	13		
Queuing Penalty (veh)		0		47	58		
Storage Bay Dist (ft)	350					180	
Storage Blk Time (%)	1						2
Queuing Penalty (veh)	4						0

Intersection: 13: Innes Avenue & Earl Street

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	377	111	120	640	648	60	237
Average Queue (ft)	187	33	49	304	314	16	104
95th Queue (ft)	309	88	107	650	650	48	197
Link Distance (ft)		623	623	615	615		1733
Upstream Blk Time (%)				15	16		
Queuing Penalty (veh)				52	56		
Storage Bay Dist (ft)	390					160	
Storage Blk Time (%)	0						3
Queuing Penalty (veh)	1						0

Network Summary

Network wide Queuing Penalty: 1607

1: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	2.0	2.6	9.5	0.1	0.1	0.1	0.2	0.2	0.1
Total Delay (hr)	4.2	0.3	0.0	0.3	4.6	0.3	0.1	0.1	0.0	0.2	0.3	10.1
Total Del/Veh (s)	29.0	33.7	18.8	119.4	118.2	114.4	50.0	41.5	13.2	88.3	93.4	62.7
Stop Delay (hr)	3.6	0.2	0.0	0.3	4.5	0.3	0.1	0.1	0.0	0.2	0.2	10.0
Stop Del/Veh (s)	25.3	28.4	15.9	117.2	115.4	113.2	48.2	39.3	12.8	85.4	89.5	61.6
Total Stops	392	21	5	8	117	9	7	9	8	8	8	414
Stop/Veh	0.76	0.78	0.71	0.89	0.83	1.00	0.78	0.82	0.89	0.80	0.80	0.71
Travel Dist (mi)	65.4	3.4	0.9	1.6	24.5	1.6	0.9	1.2	1.0	3.5	3.5	203.4
Travel Time (hr)	6.9	0.4	0.1	0.4	5.7	0.4	0.2	0.2	0.1	0.4	0.4	17.4
Avg Speed (mph)	9	9	11	4	4	4	6	7	13	9	9	12
Fuel Used (gal)	2.7	0.1	0.0	0.1	1.7	0.1	0.1	0.1	0.0	0.1	0.1	7.0
Fuel Eff. (mpg)	24.4	22.7	29.1	14.3	14.1	14.1	17.4	20.2	31.6	25.3	24.6	29.0
HC Emissions (g)	23	3	0	0	9	0	0	0	0	0	0	65
CO Emissions (g)	589	59	3	12	272	11	6	6	4	17	16	1461
NOx Emissions (g)	73	8	0	1	26	1	0	1	0	2	2	172
Vehicles Entered	511	26	7	9	137	9	9	11	9	10	10	571
Vehicles Exited	511	26	7	8	121	8	8	11	9	9	9	521
Hourly Exit Rate	511	26	7	8	121	8	8	11	9	9	9	521
Input Volume	788	40	10	10	138	10	10	10	10	10	10	562
% of Volume	65	65	70	80	87	80	80	110	90	90	90	93
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	1	0	0	0	0	0	0	0
Density (ft/veh)												
Occupancy (veh)	7	0	0	0	6	0	0	0	0	0	0	17

1: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.4
Total Delay (hr)	20.6
Total Del/Veh (s)	55.2
Stop Delay (hr)	19.7
Stop Del/Veh (s)	52.8
Total Stops	1006
Stop/Veh	0.75
Travel Dist (mi)	310.8
Travel Time (hr)	32.4
Avg Speed (mph)	10
Fuel Used (gal)	12.3
Fuel Eff. (mpg)	25.4
HC Emissions (g)	102
CO Emissions (g)	2456
NOx Emissions (g)	285
Vehicles Entered	1319
Vehicles Exited	1248
Hourly Exit Rate	1248
Input Volume	1608
% of Volume	78
Denied Entry Before	0
Denied Entry After	1
Density (ft/veh)	209
Occupancy (veh)	32

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	60.7	549.9	13.7	0.0	0.0	0.0	0.0	0.0	0.0	47.1	5.3	6.6
Denied Del/Veh (s)	1104.1	1110.3	1122.7	0.0	0.0	0.0	0.2	0.1	0.3	320.7	314.9	323.2
Total Delay (hr)	5.6	36.4	0.8	1.6	67.6	11.4	0.3	0.1	0.0	18.0	1.9	2.1
Total Del/Veh (s)	192.6	147.4	136.5	329.8	297.9	196.7	25.6	24.8	10.9	144.3	129.3	120.7
Stop Delay (hr)	4.5	26.6	0.6	1.6	63.7	10.9	0.3	0.1	0.0	16.7	1.7	2.0
Stop Del/Veh (s)	155.9	108.0	99.8	320.4	280.7	188.2	23.7	22.3	10.0	133.7	119.4	111.8
Total Stops	221	1305	34	39	1575	400	29	8	7	535	60	78
Stop/Veh	2.12	1.47	1.62	2.17	1.93	1.91	0.74	0.67	0.64	1.19	1.15	1.24
Travel Dist (mi)	28.4	248.3	5.9	5.2	252.2	65.7	3.3	1.0	0.9	54.9	6.4	7.9
Travel Time (hr)	67.2	593.4	14.7	1.8	74.9	13.5	0.4	0.1	0.1	67.5	7.5	9.0
Avg Speed (mph)	4	6	6	3	3	5	8	8	12	3	3	3
Fuel Used (gal)	16.1	142.1	3.5	0.5	21.5	4.3	0.1	0.0	0.0	16.7	1.9	2.2
Fuel Eff. (mpg)	1.8	1.7	1.7	10.5	11.7	15.1	22.3	20.7	29.3	3.3	3.4	3.5
HC Emissions (g)	57	461	14	0	117	35	2	0	0	54	13	5
CO Emissions (g)	1498	12681	336	52	3361	1229	40	10	6	1573	277	205
NOx Emissions (g)	62	503	12	4	321	101	5	1	0	85	18	11
Vehicles Entered	97	846	20	16	776	204	38	12	10	431	49	61
Vehicles Exited	97	845	20	16	739	192	38	12	11	430	50	61
Hourly Exit Rate	97	845	20	16	739	192	38	12	11	430	50	61
Input Volume	188	1606	39	20	886	237	39	10	10	521	57	69
% of Volume	52	53	51	80	83	81	97	120	110	82	87	88
Denied Entry Before	17	162	4	0	0	0	0	0	0	10	2	2
Denied Entry After	101	937	24	0	0	0	0	0	0	98	12	12
Density (ft/veh)												
Occupancy (veh)	6	44	1	2	75	14	0	0	0	20	2	2

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	683.4
Denied Del/Veh (s)	657.1
Total Delay (hr)	145.8
Total Del/Veh (s)	195.8
Stop Delay (hr)	128.7
Stop Del/Veh (s)	172.9
Total Stops	4291
Stop/Veh	1.60
Travel Dist (mi)	680.2
Travel Time (hr)	850.1
Avg Speed (mph)	4
Fuel Used (gal)	209.0
Fuel Eff. (mpg)	3.3
HC Emissions (g)	758
CO Emissions (g)	21270
NOx Emissions (g)	1123
Vehicles Entered	2560
Vehicles Exited	2511
Hourly Exit Rate	2511
Input Volume	3683
% of Volume	68
Denied Entry Before	197
Denied Entry After	1184
Density (ft/veh)	70
Occupancy (veh)	167

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	7	56.9	89.3	0.3	13
Hunters Point Boulev	5	17.7	23.9	0.1	11
Griffith Street	11	17.4	28.7	0.1	10
	12	6.9	22.3	0.1	20
	13	9.9	25.5	0.1	18
Donahue Street	1	36.9	55.2	0.1	8
Total		145.7	244.9	0.9	13

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	13	223.7	238.3	0.1	2
Arelious Walker Driv	12	210.9	229.4	0.1	2
New Griffith Street	11	100.0	115.6	0.1	4
Hunters Point Boulev	5	42.3	50.6	0.1	6
Hawes Street	7	25.0	31.2	0.1	9
Jennings Street	9	236.4	268.8	0.3	4
Total		838.3	933.9	0.9	3

Intersection: 1: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LTR	LTR	R
Maximum Queue (ft)	274	298	1006	285	1970	1970
Average Queue (ft)	153	182	710	116	1866	1862
95th Queue (ft)	249	277	1226	343	2255	2260
Link Distance (ft)	615	615	988	557	1924	1924
Upstream Blk Time (%)			41	2	87	86
Queuing Penalty (veh)			0	0	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	TR
Maximum Queue (ft)	703	180	390	380	223	235
Average Queue (ft)	357	166	319	319	179	134
95th Queue (ft)	848	219	446	459	235	243
Link Distance (ft)	869		349	349	189	189
Upstream Blk Time (%)	15		4	6	27	6
Queuing Penalty (veh)	0		48	74	180	44
Storage Bay Dist (ft)		120				
Storage Blk Time (%)		21	60			
Queuing Penalty (veh)		238	185			

Intersection: 7: Innes Avenue & Hawes Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	36	217	220	937	877
Average Queue (ft)	9	179	184	439	380
95th Queue (ft)	33	249	253	1178	1119
Link Distance (ft)	777	189	189	1641	1641
Upstream Blk Time (%)		7	10		
Queuing Penalty (veh)		76	115		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	230	1601	160	212	1662	1673	101	160	640
Average Queue (ft)	121	1547	98	42	1633	1634	36	152	370
95th Queue (ft)	248	1719	207	155	1723	1734	81	182	719
Link Distance (ft)		1547			1641	1641	452		667
Upstream Blk Time (%)		44			11	10			11
Queuing Penalty (veh)		0			125	120			0
Storage Bay Dist (ft)	170		100	170				100	
Storage Blk Time (%)	3	32	0		42			60	6
Queuing Penalty (veh)	38	91	0		17			83	19

Intersection: 11: Griffith Street/New Griffith Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	LT	TR	LTR	LT	R
Maximum Queue (ft)	220	378	386	645	635	66	1540	260
Average Queue (ft)	211	323	172	619	616	21	1264	259
95th Queue (ft)	244	453	372	635	630	54	1882	269
Link Distance (ft)		349	349	606	606	912	1508	
Upstream Blk Time (%)		24	3	16	19		53	
Queuing Penalty (veh)		180	24	182	210		0	
Storage Bay Dist (ft)	160							200
Storage Blk Time (%)	61	7						88
Queuing Penalty (veh)	371	21						25

Intersection: 12: Innes Avenue & Arelious Walker Drive

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	400	501	296	656	658	240	1653
Average Queue (ft)	242	142	55	636	637	93	1561
95th Queue (ft)	433	492	181	650	650	266	1855
Link Distance (ft)		606	606	623	623		1621
Upstream Blk Time (%)		2		24	47		74
Queuing Penalty (veh)		15		201	397		0
Storage Bay Dist (ft)	350					180	
Storage Blk Time (%)	15	0				0	67
Queuing Penalty (veh)	70	0				0	27

Intersection: 13: Innes Avenue & Earl Street

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	307	194	191	653	651	220	1782
Average Queue (ft)	149	73	86	633	629	62	1554
95th Queue (ft)	283	192	154	647	643	221	2221
Link Distance (ft)		623	623	615	615		1733
Upstream Blk Time (%)				75	79		74
Queuing Penalty (veh)				402	425		0
Storage Bay Dist (ft)	390					160	
Storage Blk Time (%)	1						88
Queuing Penalty (veh)	4						21

Network Summary

Network wide Queuing Penalty: 4029

1: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.5	6.4	0.9	0.0	0.0	0.0	2.8	3.1	271.9
Denied Del/Veh (s)	0.0	0.0	0.0	282.2	291.8	269.3	13.6	0.1	0.1	1006.3	1015.0	997.8
Total Delay (hr)	4.5	1.3	0.1	2.0	23.3	3.6	1.4	1.2	1.8	1.2	1.8	147.4
Total Del/Veh (s)	32.7	37.0	29.9	1475.8	1329.6	1280.9	568.5	477.6	531.2	1120.7	1319.8	1269.6
Stop Delay (hr)	4.0	1.1	0.1	2.1	23.3	3.6	1.4	1.2	1.8	1.3	1.9	150.4
Stop Del/Veh (s)	28.6	31.0	25.3	1480.5	1333.9	1286.7	566.6	475.0	529.9	1144.8	1346.7	1295.1
Total Stops	378	97	8	4	47	7	8	8	12	2	2	149
Stop/Veh	0.76	0.77	0.80	0.80	0.75	0.70	0.89	0.89	1.00	0.50	0.40	0.36
Travel Dist (mi)	63.2	15.9	1.2	0.7	7.7	1.2	0.7	0.8	1.1	1.1	1.4	105.9
Travel Time (hr)	7.2	1.9	0.1	2.6	30.0	4.5	1.5	1.2	1.8	4.1	5.0	423.1
Avg Speed (mph)	9	8	9	0	0	0	1	1	1	1	1	1
Fuel Used (gal)	2.8	0.7	0.1	0.6	7.1	1.1	0.4	0.3	0.4	1.0	1.2	99.6
Fuel Eff. (mpg)	22.7	21.8	23.5	1.1	1.1	1.1	2.1	2.8	2.5	1.1	1.2	1.1
HC Emissions (g)	23	7	0	0	35	0	0	0	0	0	0	332
CO Emissions (g)	613	159	6	34	787	58	22	20	28	52	64	9293
NOx Emissions (g)	76	21	1	1	34	1	1	1	1	2	2	423
Vehicles Entered	494	124	10	5	57	9	8	9	12	3	5	351
Vehicles Exited	493	124	10	2	30	5	6	6	8	2	4	260
Hourly Exit Rate	493	124	10	2	30	5	6	6	8	2	4	260
Input Volume	576	148	10	10	79	10	10	10	10	10	10	984
% of Volume	86	84	100	20	38	50	60	60	80	20	40	26
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	2	22	3	0	0	0	7	6	630
Density (ft/veh)												
Occupancy (veh)	7	2	0	2	24	4	1	1	2	1	2	151

1: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	285.7
Denied Del/Veh (s)	585.3
Total Delay (hr)	189.7
Total Del/Veh (s)	582.6
Stop Delay (hr)	192.0
Stop Del/Veh (s)	589.7
Total Stops	722
Stop/Veh	0.62
Travel Dist (mi)	201.0
Travel Time (hr)	483.1
Avg Speed (mph)	1
Fuel Used (gal)	115.2
Fuel Eff. (mpg)	1.7
HC Emissions (g)	398
CO Emissions (g)	11137
NOx Emissions (g)	562
Vehicles Entered	1087
Vehicles Exited	950
Hourly Exit Rate	950
Input Volume	1868
% of Volume	51
Denied Entry Before	0
Denied Entry After	670
Density (ft/veh)	34
Occupancy (veh)	197

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	9.3	111.3	20.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.2	0.2
Denied Del/Veh (s)	364.7	368.5	359.2	0.0	0.0	0.0	0.1	0.1	0.1	11.1	10.8	9.3
Total Delay (hr)	3.8	28.4	5.0	1.8	64.5	15.1	0.3	0.1	0.0	8.2	1.6	1.2
Total Del/Veh (s)	174.8	111.6	105.0	272.2	236.4	170.5	35.3	33.3	12.8	92.3	79.5	71.3
Stop Delay (hr)	2.9	16.2	2.8	1.7	59.8	14.4	0.3	0.1	0.0	7.6	1.5	1.1
Stop Del/Veh (s)	129.9	63.5	58.8	261.1	219.1	163.5	33.4	31.0	12.0	85.3	72.6	66.1
Total Stops	181	1557	314	56	1848	546	24	8	9	405	88	80
Stop/Veh	2.29	1.70	1.85	2.33	1.88	1.72	0.83	0.80	0.82	1.26	1.19	1.29
Travel Dist (mi)	21.6	257.8	48.5	7.2	306.4	100.8	2.5	0.9	0.9	39.7	9.1	7.8
Travel Time (hr)	13.8	147.1	27.0	2.0	73.3	18.3	0.4	0.1	0.1	10.9	2.2	1.7
Avg Speed (mph)	5	7	7	4	4	6	6	7	11	4	5	5
Fuel Used (gal)	3.6	39.0	7.0	0.6	22.1	6.1	0.1	0.0	0.0	3.2	0.7	0.5
Fuel Eff. (mpg)	6.1	6.6	6.9	12.3	13.9	16.5	19.0	19.7	29.0	12.3	13.4	14.6
HC Emissions (g)	17	169	38	1	112	57	1	0	0	20	6	4
CO Emissions (g)	429	4764	902	70	3393	1834	35	9	7	559	149	107
NOx Emissions (g)	28	336	65	6	337	160	4	1	1	53	15	11
Vehicles Entered	74	879	165	22	927	305	29	10	11	312	72	61
Vehicles Exited	76	878	165	21	907	299	29	10	11	311	70	60
Hourly Exit Rate	76	878	165	21	907	299	29	10	11	311	70	60
Input Volume	88	1056	197	39	1696	570	29	10	10	314	79	59
% of Volume	86	83	84	54	53	53	99	100	110	99	88	101
Denied Entry Before	1	20	4	0	0	0	0	0	0	1	0	0
Denied Entry After	18	208	40	0	0	0	0	0	0	2	1	1
Density (ft/veh)												
Occupancy (veh)	5	36	7	2	73	18	0	0	0	10	2	2

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	142.4
Denied Del/Veh (s)	163.4
Total Delay (hr)	130.1
Total Del/Veh (s)	156.2
Stop Delay (hr)	108.4
Stop Del/Veh (s)	130.2
Total Stops	5116
Stop/Veh	1.71
Travel Dist (mi)	803.3
Travel Time (hr)	296.9
Avg Speed (mph)	5
Fuel Used (gal)	83.0
Fuel Eff. (mpg)	9.7
HC Emissions (g)	425
CO Emissions (g)	12257
NOx Emissions (g)	1015
Vehicles Entered	2867
Vehicles Exited	2837
Hourly Exit Rate	2837
Input Volume	4148
% of Volume	68
Denied Entry Before	26
Denied Entry After	270
Density (ft/veh)	75
Occupancy (veh)	155

CUMULATIVE + VARIANT + BUS LANE

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	7	170.3	200.8	0.3	6
Hunters Point Boulev	5	21.2	28.0	0.1	10
Griffith Street	11	18.7	29.3	0.1	10
	12	3.4	18.9	0.1	24
	13	7.2	22.9	0.1	21
Donahue Street	1	15.7	34.4	0.1	14
Total		236.5	334.3	0.9	9

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	13	260.1	296.6	0.1	2
Arelious Walker Driv	12	131.6	146.3	0.1	3
New Griffith Street	11	66.9	82.3	0.1	6
Hunters Point Boulev	5	8.5	16.9	0.1	17
Hawes Street	7	5.6	12.3	0.1	22
Jennings Street	9	30.7	64.5	0.3	18
Total		503.3	619.1	0.9	5

Intersection: 1: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR	LTR
Maximum Queue (ft)	329	62	1029	164	1982
Average Queue (ft)	185	16	797	65	1941
95th Queue (ft)	284	47	1267	199	2063
Link Distance (ft)	627	627	999	557	1936
Upstream Blk Time (%)			48		94
Queuing Penalty (veh)			0		0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	SB
Directions Served	R	L	T	T
Maximum Queue (ft)	906	169	293	259
Average Queue (ft)	663	77	80	246
95th Queue (ft)	1033	136	213	270
Link Distance (ft)	902		354	244
Upstream Blk Time (%)	22		0	16
Queuing Penalty (veh)	0		1	328
Storage Bay Dist (ft)		120		
Storage Blk Time (%)		4	3	
Queuing Penalty (veh)		41	4	

Intersection: 7: Innes Avenue & Hawes Street

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	R
Maximum Queue (ft)	53	254	1652	160
Average Queue (ft)	9	83	1635	9
95th Queue (ft)	35	245	1658	69
Link Distance (ft)	803	244	1641	
Upstream Blk Time (%)		1	5	
Queuing Penalty (veh)		12	101	
Storage Bay Dist (ft)				100
Storage Blk Time (%)			46	
Queuing Penalty (veh)			14	

Intersection: 9: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	230	1601	160	156	586	160	84	160	719
Average Queue (ft)	160	1573	39	18	289	90	30	159	690
95th Queue (ft)	313	1596	151	77	532	198	68	160	710
Link Distance (ft)		1547			1641		451		667
Upstream Blk Time (%)		98							94
Queuing Penalty (veh)		0							0
Storage Bay Dist (ft)	170		100	170		100		100	
Storage Blk Time (%)	1	78	0		32	0		84	1
Queuing Penalty (veh)	8	177	0		82	0		107	7

Intersection: 11: Griffith Street/New Griffith Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	LT	R	LTR	LT	R
Maximum Queue (ft)	220	368	101	625	134	50	46	160
Average Queue (ft)	190	306	4	579	13	13	13	76
95th Queue (ft)	257	422	42	688	76	36	41	140
Link Distance (ft)		354		605		910	1509	
Upstream Blk Time (%)		2		5				
Queuing Penalty (veh)		59		59				
Storage Bay Dist (ft)	160		100		100			200
Storage Blk Time (%)	15	20		54				0
Queuing Penalty (veh)	276	110		10				0

Intersection: 12: Innes Avenue & Arelious Walker Drive

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	258	104	644	160	57	230
Average Queue (ft)	151	24	627	48	18	109
95th Queue (ft)	242	67	666	167	48	198
Link Distance (ft)		605	622			1620
Upstream Blk Time (%)			27			
Queuing Penalty (veh)			249			
Storage Bay Dist (ft)	350			100	180	
Storage Blk Time (%)	0		78	0		2
Queuing Penalty (veh)	1		28	0		0

Intersection: 13: Innes Avenue & Earl Street

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	251	174	646	160	87	289
Average Queue (ft)	127	81	634	37	14	120
95th Queue (ft)	216	160	643	147	52	238
Link Distance (ft)		622	627			1732
Upstream Blk Time (%)			62			
Queuing Penalty (veh)			435			
Storage Bay Dist (ft)	390			100	160	
Storage Blk Time (%)			93	0		7
Queuing Penalty (veh)			23	0		1

Network Summary

Network wide Queuing Penalty: 2133

1: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.5	8.9	0.6	0.0	0.0	0.0	3.1	3.4	160.8
Denied Del/Veh (s)	0.0	0.0	0.0	194.2	225.0	234.3	0.2	0.1	0.1	1100.6	1103.5	1062.1
Total Delay (hr)	2.7	0.1	0.0	1.9	28.1	1.7	0.8	0.6	0.6	1.2	1.5	75.1
Total Del/Veh (s)	24.2	14.9	4.9	761.7	904.7	880.5	311.0	182.4	201.6	1043.3	1323.2	1060.1
Stop Delay (hr)	2.2	0.1	0.0	1.9	28.4	1.7	0.8	0.6	0.6	1.2	1.5	77.2
Stop Del/Veh (s)	20.0	13.2	4.4	766.7	911.9	888.9	309.6	180.4	201.5	1072.4	1357.3	1090.0
Total Stops	292	12	4	7	80	5	9	9	10	1	0	32
Stop/Veh	0.74	0.57	0.80	0.78	0.71	0.71	1.00	0.82	0.91	0.25	0.00	0.13
Travel Dist (mi)	50.2	2.6	0.7	1.4	16.8	1.1	0.9	1.2	1.2	1.1	1.2	65.7
Travel Time (hr)	4.8	0.2	0.0	2.5	37.7	2.3	0.8	0.6	0.7	4.3	4.9	238.2
Avg Speed (mph)	11	14	18	1	1	1	1	2	2	1	1	1
Fuel Used (gal)	1.9	0.1	0.0	0.6	9.0	0.6	0.2	0.2	0.2	1.0	1.2	55.9
Fuel Eff. (mpg)	26.4	29.7	36.1	2.3	1.9	1.9	4.6	7.2	6.6	1.1	1.1	1.2
HC Emissions (g)	19	1	0	0	28	0	0	0	0	0	0	172
CO Emissions (g)	447	28	5	35	827	32	15	15	16	52	60	4971
NOx Emissions (g)	59	3	0	1	35	1	1	1	1	1	1	196
Vehicles Entered	390	20	5	8	106	7	9	11	11	3	4	195
Vehicles Exited	390	20	5	6	75	5	9	11	11	3	3	178
Hourly Exit Rate	390	20	5	6	75	5	9	11	11	3	3	178
Input Volume	788	40	10	10	138	10	10	10	10	10	10	552
% of Volume	49	50	50	60	54	50	90	110	110	30	30	32
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	2	36	2	0	0	0	7	7	350
Density (ft/veh)												
Occupancy (veh)	5	0	0	2	29	2	1	1	1	1	2	77

1: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	177.2
Denied Del/Veh (s)	543.9
Total Delay (hr)	114.2
Total Del/Veh (s)	488.2
Stop Delay (hr)	116.1
Stop Del/Veh (s)	496.6
Total Stops	461
Stop/Veh	0.55
Travel Dist (mi)	144.1
Travel Time (hr)	297.0
Avg Speed (mph)	1
Fuel Used (gal)	70.7
Fuel Eff. (mpg)	2.0
HC Emissions (g)	221
CO Emissions (g)	6504
NOx Emissions (g)	301
Vehicles Entered	769
Vehicles Exited	716
Hourly Exit Rate	716
Input Volume	1598
% of Volume	45
Denied Entry Before	0
Denied Entry After	404
Density (ft/veh)	41
Occupancy (veh)	120

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	78.6	708.9	15.5	0.0	0.0	0.0	0.0	0.0	0.0	109.0	12.2	15.3
Denied Del/Veh (s)	1401.4	1422.5	1398.7	0.0	0.0	0.0	0.2	0.2	0.2	737.5	733.8	734.4
Total Delay (hr)	5.3	46.8	1.0	0.2	5.2	0.8	0.3	0.1	0.1	19.9	1.8	2.1
Total Del/Veh (s)	296.1	282.1	263.3	58.7	30.7	18.7	23.6	25.3	19.6	201.5	165.2	152.7
Stop Delay (hr)	5.2	45.8	0.9	0.2	3.0	0.4	0.2	0.1	0.1	19.7	1.8	2.1
Stop Del/Veh (s)	292.0	276.3	260.6	47.5	17.8	8.2	21.8	22.9	19.2	199.1	161.6	150.8
Total Stops	69	259	6	13	373	116	28	7	9	255	29	38
Stop/Veh	1.08	0.43	0.46	1.08	0.62	0.72	0.70	0.70	0.82	0.72	0.72	0.76
Travel Dist (mi)	17.2	160.4	3.6	3.9	197.5	53.0	3.4	0.9	1.0	42.5	4.9	6.1
Travel Time (hr)	84.4	760.3	16.6	0.3	10.9	2.5	0.4	0.1	0.1	130.7	14.3	17.7
Avg Speed (mph)	3	3	3	12	18	21	8	8	9	2	2	3
Fuel Used (gal)	19.9	178.5	3.9	0.1	5.8	1.4	0.1	0.0	0.0	31.0	3.4	4.2
Fuel Eff. (mpg)	0.9	0.9	0.9	30.2	34.3	38.4	23.2	22.5	24.1	1.4	1.4	1.4
HC Emissions (g)	75	587	21	0	59	16	1	0	0	94	10	12
CO Emissions (g)	1861	15572	436	19	1299	339	34	7	7	2672	304	364
NOx Emissions (g)	62	481	16	2	207	54	3	1	1	96	11	14
Vehicles Entered	59	547	12	12	597	160	39	10	11	332	38	47
Vehicles Exited	58	546	12	12	597	161	39	10	11	333	38	48
Hourly Exit Rate	58	546	12	12	597	161	39	10	11	333	38	48
Input Volume	188	1606	39	20	886	237	39	10	10	521	57	69
% of Volume	31	34	31	60	67	68	99	100	110	64	66	69
Denied Entry Before	21	187	4	0	0	0	0	0	0	16	2	2
Denied Entry After	143	1247	28	0	0	0	0	0	0	200	22	28
Density (ft/veh)												
Occupancy (veh)	6	51	1	0	11	3	0	0	0	22	2	2

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	939.6
Denied Del/Veh (s)	957.7
Total Delay (hr)	83.5
Total Del/Veh (s)	153.2
Stop Delay (hr)	79.4
Stop Del/Veh (s)	145.8
Total Stops	1202
Stop/Veh	0.61
Travel Dist (mi)	494.3
Travel Time (hr)	1038.3
Avg Speed (mph)	5
Fuel Used (gal)	248.4
Fuel Eff. (mpg)	2.0
HC Emissions (g)	875
CO Emissions (g)	22915
NOx Emissions (g)	948
Vehicles Entered	1864
Vehicles Exited	1865
Hourly Exit Rate	1865
Input Volume	3683
% of Volume	51
Denied Entry Before	232
Denied Entry After	1668
Density (ft/veh)	116
Occupancy (veh)	99

Arterial Level of Service: EB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hawes Street	7	172.5	203.3	0.3	6
Hunters Point Boulev	5	24.2	31.0	0.1	9
Griffith Street	11	22.5	33.1	0.1	9
	12	5.7	21.2	0.1	21
	13	3.4	19.1	0.1	25
Donahue Street	1	22.2	40.7	0.1	12
Total		250.6	348.5	0.9	9

Arterial Level of Service: WB Innes Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Earl Street	13	267.7	300.0	0.1	2
Arelious Walker Driv	12	188.8	202.9	0.1	2
New Griffith Street	11	73.8	91.4	0.1	5
Hunters Point Boulev	5	13.0	21.4	0.1	14
Hawes Street	7	4.0	10.6	0.1	25
Jennings Street	9	25.3	59.0	0.3	20
Total		572.5	685.3	0.9	5

Intersection: 1: Donahue Street & Innes Avenue

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR	LTR
Maximum Queue (ft)	388	120	1024	218	1985
Average Queue (ft)	218	57	820	77	1955
95th Queue (ft)	344	107	1215	203	1969
Link Distance (ft)	627	627	999	557	1936
Upstream Blk Time (%)			47		100
Queuing Penalty (veh)			0		0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Innes Avenue & Hunters Point Boulevard

Movement	EB	NB	NB	SB
Directions Served	R	L	T	T
Maximum Queue (ft)	348	179	346	260
Average Queue (ft)	149	103	198	249
95th Queue (ft)	307	178	379	260
Link Distance (ft)	902		354	244
Upstream Blk Time (%)			1	21
Queuing Penalty (veh)			15	283
Storage Bay Dist (ft)		120		
Storage Blk Time (%)		6	9	
Queuing Penalty (veh)		142	27	

Intersection: 7: Innes Avenue & Hawes Street

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	R
Maximum Queue (ft)	43	200	1652	160
Average Queue (ft)	11	40	1628	30
95th Queue (ft)	38	153	1696	132
Link Distance (ft)	803	244	1641	
Upstream Blk Time (%)		0	5	
Queuing Penalty (veh)		1	68	
Storage Bay Dist (ft)				100
Storage Blk Time (%)			49	0
Queuing Penalty (veh)			19	0

Intersection: 9: Jennings Street & Evans Avenue/Innes Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	T	R	LTR	L	TR
Maximum Queue (ft)	230	1601	160	193	609	160	80	160	715
Average Queue (ft)	140	1573	129	28	294	98	28	159	644
95th Queue (ft)	294	1621	227	114	557	202	66	168	822
Link Distance (ft)		1547			1641		451		667
Upstream Blk Time (%)		87							72
Queuing Penalty (veh)		0							0
Storage Bay Dist (ft)	170		100	170		100		100	
Storage Blk Time (%)	1	67	0		24	0		86	5
Queuing Penalty (veh)	8	190	1		145	2		119	16

Intersection: 11: Griffith Street/New Griffith Street & Innes Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	LT	R	LTR	LT	R
Maximum Queue (ft)	220	371	101	632	130	120	1439	260
Average Queue (ft)	195	350	7	618	9	40	1090	260
95th Queue (ft)	260	389	53	630	66	102	1766	265
Link Distance (ft)		354		605		910	1509	
Upstream Blk Time (%)		7		30			28	
Queuing Penalty (veh)		104		662			0	
Storage Bay Dist (ft)	160		100		100			200
Storage Blk Time (%)	20	25		54			0	82
Queuing Penalty (veh)	246	75		9			2	23

Intersection: 12: Innes Avenue & Arelious Walker Drive

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	372	426	648	160	240	1671
Average Queue (ft)	246	115	636	33	91	1641
95th Queue (ft)	421	440	645	136	274	1675
Link Distance (ft)		605	622			1620
Upstream Blk Time (%)		1	55			98
Queuing Penalty (veh)		11	919			0
Storage Bay Dist (ft)	350			100	180	
Storage Blk Time (%)	12	0	88			81
Queuing Penalty (veh)	118	0	36			32

Intersection: 13: Innes Avenue & Earl Street

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	281	122	645	144	220	1781
Average Queue (ft)	144	35	633	10	43	1753
95th Queue (ft)	254	109	641	73	187	1769
Link Distance (ft)		622	627			1732
Upstream Blk Time (%)			70			100
Queuing Penalty (veh)			748			0
Storage Bay Dist (ft)	390			100	160	
Storage Blk Time (%)	0		100			98
Queuing Penalty (veh)	2		17			24

Network Summary

Network wide Queuing Penalty: 4065

1: Donahue Street & Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.8	6.8	0.7	0.0	0.0	0.0	6.1	6.3	506.4
Denied Del/Veh (s)	0.0	0.0	0.0	334.8	297.7	233.6	0.1	0.1	0.1	1842.8	1880.0	1713.5
Total Delay (hr)	3.4	0.6	0.0	2.8	26.6	3.7	1.0	0.6	0.8	0.8	0.6	77.9
Total Del/Veh (s)	31.5	22.2	7.7	1464.3	1453.5	1470.9	316.8	200.7	247.3	1428.3	1090.1	1240.7
Stop Delay (hr)	2.9	0.6	0.0	2.9	26.8	3.7	1.0	0.6	0.8	0.8	0.6	79.8
Stop Del/Veh (s)	27.1	20.0	7.0	1471.9	1461.1	1479.4	315.5	198.7	246.5	1460.7	1113.7	1271.0
Total Stops	315	68	5	5	42	6	10	9	10	0	0	0
Stop/Veh	0.81	0.67	0.71	0.71	0.64	0.67	0.91	0.82	0.83	0.00	0.00	0.00
Travel Dist (mi)	48.8	12.8	0.9	0.9	7.8	1.1	1.0	1.1	1.2	0.5	0.4	53.9
Travel Time (hr)	5.4	1.1	0.1	3.7	33.7	4.4	1.0	0.7	0.9	7.0	6.9	586.2
Avg Speed (mph)	9	11	16	0	0	0	1	2	1	1	1	1
Fuel Used (gal)	1.9	0.4	0.0	0.9	7.9	1.1	0.3	0.2	0.2	1.6	1.6	136.9
Fuel Eff. (mpg)	25.1	28.8	36.4	1.0	1.0	1.0	4.0	6.3	5.2	0.3	0.3	0.4
HC Emissions (g)	15	3	0	0	36	0	0	0	0	0	0	395
CO Emissions (g)	361	82	3	47	840	57	19	16	21	79	77	11317
NOx Emissions (g)	44	10	0	1	34	1	1	1	1	1	1	355
Vehicles Entered	379	99	7	6	56	8	10	10	11	1	1	147
Vehicles Exited	379	99	7	4	33	4	10	10	11	1	1	147
Hourly Exit Rate	379	99	7	4	33	4	10	10	11	1	1	147
Input Volume	576	148	10	10	79	10	10	10	10	10	10	974
% of Volume	66	67	70	40	42	40	100	100	110	10	10	15
Denied Entry Before	0	0	0	0	0	0	0	0	0	1	0	91
Denied Entry After	0	0	0	3	26	3	0	0	0	11	11	917
Density (ft/veh)												
Occupancy (veh)	5	1	0	3	27	4	1	1	1	1	1	80

1: Donahue Street & Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	527.2
Denied Del/Veh (s)	1112.4
Total Delay (hr)	118.9
Total Del/Veh (s)	508.3
Stop Delay (hr)	120.5
Stop Del/Veh (s)	515.0
Total Stops	470
Stop/Veh	0.56
Travel Dist (mi)	130.4
Travel Time (hr)	651.2
Avg Speed (mph)	1
Fuel Used (gal)	153.1
Fuel Eff. (mpg)	0.9
HC Emissions (g)	450
CO Emissions (g)	12918
NOx Emissions (g)	449
Vehicles Entered	735
Vehicles Exited	706
Hourly Exit Rate	706
Input Volume	1858
% of Volume	38
Denied Entry Before	92
Denied Entry After	971
Density (ft/veh)	39
Occupancy (veh)	124

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	21.7	249.4	48.5	0.0	0.0	0.0	0.0	0.0	0.0	20.1	4.3	4.1
Denied Del/Veh (s)	823.8	827.6	823.7	0.0	0.0	0.0	0.2	0.1	0.1	231.0	203.0	253.8
Total Delay (hr)	4.1	37.5	6.5	0.3	5.0	1.1	0.3	0.1	0.1	17.1	3.4	2.3
Total Del/Veh (s)	238.6	204.4	183.1	61.5	25.3	17.4	30.8	32.2	30.6	217.0	180.1	161.7
Stop Delay (hr)	3.8	33.6	5.8	0.2	2.3	0.4	0.3	0.1	0.1	16.8	3.3	2.3
Stop Del/Veh (s)	221.1	183.3	164.7	49.7	11.8	5.8	29.2	29.7	30.5	213.7	175.4	158.5
Total Stops	89	604	107	19	374	142	23	7	9	278	74	54
Stop/Veh	1.44	0.91	0.84	1.19	0.53	0.60	0.74	0.78	0.90	0.98	1.10	1.04
Travel Dist (mi)	16.7	181.7	34.9	5.2	230.6	76.6	2.7	0.8	0.9	34.2	8.3	6.4
Travel Time (hr)	26.4	292.2	56.1	0.4	11.6	3.6	0.4	0.1	0.1	38.7	8.0	6.7
Avg Speed (mph)	4	4	5	12	20	21	7	7	7	2	2	2
Fuel Used (gal)	6.4	70.2	13.5	0.2	6.4	1.9	0.1	0.0	0.0	9.5	2.0	1.7
Fuel Eff. (mpg)	2.6	2.6	2.6	28.8	36.1	39.6	20.7	20.0	21.1	3.6	4.1	3.8
HC Emissions (g)	20	234	49	2	64	25	1	0	0	30	10	10
CO Emissions (g)	578	6421	1303	51	1398	499	31	7	7	912	269	227
NOx Emissions (g)	23	250	54	7	228	82	3	1	1	46	19	15
Vehicles Entered	57	622	119	16	700	232	31	9	10	274	66	50
Vehicles Exited	58	619	119	16	699	232	31	9	10	264	64	49
Hourly Exit Rate	58	619	119	16	699	232	31	9	10	264	64	49
Input Volume	88	1056	197	39	1696	570	29	10	10	314	79	59
% of Volume	66	59	60	41	41	41	106	90	100	84	81	83
Denied Entry Before	3	36	7	0	0	0	0	0	0	1	0	0
Denied Entry After	38	463	93	0	0	0	0	0	0	40	10	8
Density (ft/veh)												
Occupancy (veh)	5	43	8	0	12	4	0	0	0	19	4	3

9: Jennings Street & Evans Avenue/Innes Avenue Performance by movement

Movement	All
Denied Delay (hr)	348.2
Denied Del/Veh (s)	441.7
Total Delay (hr)	77.7
Total Del/Veh (s)	123.4
Stop Delay (hr)	69.0
Stop Del/Veh (s)	109.5
Total Stops	1780
Stop/Veh	0.79
Travel Dist (mi)	598.9
Travel Time (hr)	444.3
Avg Speed (mph)	6
Fuel Used (gal)	111.9
Fuel Eff. (mpg)	5.4
HC Emissions (g)	446
CO Emissions (g)	11704
NOx Emissions (g)	728
Vehicles Entered	2186
Vehicles Exited	2170
Hourly Exit Rate	2170
Input Volume	4148
% of Volume	52
Denied Entry Before	47
Denied Entry After	652
Density (ft/veh)	119
Occupancy (veh)	96

APPENDIX M: TRANSIT MODE SHIFT CALCULATIONS

Model Limitations

The transit delay impact analysis is based primarily on microsimulation of traffic flow conducted using SimTraffic software. Intersection geometries and vehicle turning movement volumes were used to estimate congestion and travel time along the Evans Avenue–Hunters Point Boulevard–Innes Avenue corridor.

A limitation of this modeling approach is that vehicle travel demand is not responsive to changing levels of congestion along the corridor. In reality, it is reasonable to assume that individual travelers would select their mode of travel based upon the attributes of each transportation mode available, including travel time. In theory, if one mode's attributes improve in comparison to another mode's, travelers would be more likely to use the improved mode. Congestion due to high vehicle volumes can have the effect of increasing driving travel time, in turn reducing the comparable attractiveness of driving. If such a change would result in a shift from driving to transit, walking, or bicycling trips, this dynamic could effectively decrease the vehicle travel demand used as an input to microsimulation analysis.

This dynamic is potentially relevant to the analysis of the Proposed Project. Especially in the mitigated Cumulative Plus Project Variant Scenario, where a dedicated bus lane along Evans Avenue, Hunters Point Boulevard, Innes Avenue, and Donahue Street would increase transit vehicles' speed relative to general automobile traffic, it is likely that the longer driving travel time and shorter transit travel time would cause a mode shift of some magnitude away from driving and toward transit. This mode shift would cause vehicle volumes to decrease throughout the network, potentially reducing vehicular congestion.

The analytical methodology generally used in Transportation Impact Studies does not incorporate this potential mode shift dynamic. Instead, vehicle turning movement volumes are treated as a fixed input resulting in fixed outputs of congestion, queueing, and delay. It would be prohibitively difficult to fully address this consideration within the TIS context because of the iterative nature of the analysis, which would have to alternate between calculating the mode split, determining demand volumes, analyzing congestion and travel delay, calculating the impact of delay on mode split, and so forth. Furthermore, an iterative mode split analysis is relevant only where alternative modes of travel are readily available, and where those alternative modes' attributes are divergent from the attributes of driving. Most TIS contexts do not include a dedicated transit lane. Without such a facility, transit vehicles and automobiles would share the congested roadway and their travel speeds would be approximately equal, eliminating the need for an iterative mode split analysis.

However, it is feasible to evaluate the potential mode shift associated with implementation of a dedicated bus lane mitigation measure on Innes Avenue. In 2009, Fehr & Peers prepared a memorandum (included as **Appendix G**) connected with the CPHPS project that used a statistical model to predict transit mode shares based on a range of travel mode attributes. Regression models were developed using Bay Area Travel Survey data from 2000 to predict transit mode share for work and non-work trips; each model was found to be highly accurate in its transit mode share predictions. Variables found to be significant in this analysis include drive time, parking cost, and three measures of transit speed (transit average wait time, number of transfers, and transit travel time), as shown on page 15 of **Appendix G**.

Comparing the Cumulative Plus Project Variant and mitigated Cumulative Plus Project Variant Scenarios (selected as the worst case), parking cost, transit average wait time, and number of transfers remain consistent between scenarios, while drive time and transit travel time change with the introduction of the bus lane mitigation. A mode shift analysis was performed using the 2009 CPHPS methodology, using travel time outputs from a road network including no bus lanes and a road network including bus lanes along the entire Evans–Hunters Point Boulevard–Innes corridor. This mode shift analysis examined the average driving and transit travel time between Jennings Street and Donahue Street in the PM peak hour. In addition to SimTraffic travel time outputs, the mode shift analysis estimated the effect of additional delay associated with queues outside the modeled network that would accumulate as vehicles wait to enter the restricted-capacity network with bus lanes.

Based on the regression methodology outlined in the 2009 CPHPS memorandum, the addition of a bus lane along the entire Evans Avenue–Hunters Point Boulevard–Innes Avenue corridor could result in a 4.5 percentage point increase in transit mode share for work trips and a 6.6 percentage point increase in transit mode share for non-work trips. Based on the assumption of work trips representing 38 percent of all project trips in the PM peak hour, this equates to an overall 5.8 percentage point increase in transit mode share and a corresponding 5.8 percentage point decrease in driving mode share. Such a mode shift could reduce India Basin PM peak hour project vehicle trips from 2,734 to 2,516, a decrease of 218 vehicle trips. Furthermore, this mode shift would likely apply to all trips along the study corridor, not only trips associated with the Proposed Project (although only Project trips are considered here). As this is the worst case, the mode shift for other times of day and project configurations would be lower although at the same order of magnitude.

The calculations underpinning this estimated mode shift are presented on the next page. The effect of this reduction in vehicle volumes on vehicular congestion and delay was not analyzed.

Transit Mode Shift Calculations

Regression Model Source

Work Trips:

Transit Mode Share = 0.009(DriveTime) + 0.102*(DrivePkgCost) – 0.008*(TransitAvgWait) – 0.092*(TransitXfers) + 0.028*

Non-Work Trips:

Transit Mode Share = 0.012(DriveTime) + 0.079*(DrivePkgCost) – 0.023*(TransitXfers) – 0.002*(TransitTime) -0.095*

Proposed Trip Generation, Distribution, and Transit Mode Split Forecasts for the Bayview Waterfront Project Transportation Study
5/11/2009
Fehr & Peers Memorandum

Change in Travel Time

	Cumulative Plus Variant (No Bus Lanes) PM	**Cumulative Plus Variant Plus Bus Lanes PM**	**Difference**
Corridor Distance (ft)	7560	7560	
Westbound Drive Time (min)	11.4	14.8	
Eastbound Drive Time (min)	5.8	12.2	
Average Drive Time (min)	**8.6**	**13.6**	**5.0**
Transit Speed (mph)	-	16	
Westbound Transit Time (min)	11.4	5.4	
Eastbound Transit Time (min)	5.8	5.4	
Average Transit Time (min)	**8.6**	**5.4**	**-3.2**

Delta Transit Mode Share (%) for Work Trips	4.50%
Delta Transit Mode Share (%) for Non-Work Trips	6.65%
% of Project Trips that are Work Trips	38%
Weighted Average Delta Transit Mode Share (%)	**5.83%**

Change in Project Variant Trips

Scenario	Mode share	Vehicle trips
No bus lanes	73.0%	2,734
Bus lanes	67.2%	2,516
Difference	-5.8%	-218

Notes:

"Cumulative Plus Variant (No Bus Lanes)" refers to a scenario with no bus lanes anywhere along Innes Avenue, Hunters Point Boulevard, or Evans Avenue. Such a scenario will not exist in the Cumulative year 2040, because the CPHPS Transportation Plan calls for the installation of bus lanes on Evans Avenue between Napoleon and Jennings Streets before 2040. However, this scenario enables examination of the impact of the full complement of bus lanes from Napoleon to Donahue Streets on transit mode share.

Drive Time and Transit Time (no bus lane) are based on SimTraffic model travel time outputs. Transit Time (bus lane) is based on corridor distance divided by average transit vehicle speed in dedicated bus lanes.

Change in Average Drive Time is fixed at 5 minutes, as the SimTraffic model is unable to accurately model the eastbound upstream bottleneck as the start of the bus lane is outside of the model. Five minutes was selected by engineering judgment as an approximation of total additional delay.

The percentage of project trips that are work trips, total project vehicle trips, and project drive mode share were derived from India Basin Project Variant Master Trip Generation calculations.

APPENDIX N: LEVEL OF SERVICE CALCULATIONS

Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	247	34	38	214	128	121	581	41	129	222	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2976		1540	3079	1028	1540	3028		1540	2972	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2976		1540	3079	1028	1540	3028		1540	2972	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	60	271	37	42	235	141	133	638	45	142	244	33
RTOR Reduction (vph)	0	12	0	0	0	122	0	5	0	0	9	0
Lane Group Flow (vph)	60	296	0	42	235	19	133	678	0	142	268	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	9.4	17.5		5.5	13.6	13.6	14.1	43.3		13.7	42.9	
Effective Green, g (s)	9.4	17.5		5.5	13.6	13.6	14.1	43.3		13.7	42.9	
Actuated g/C Ratio	0.09	0.18		0.06	0.14	0.14	0.14	0.43		0.14	0.43	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	144	520		84	418	139	217	1311		210	1274	
v/s Ratio Prot	0.04	c0.10		0.03	c0.08		c0.09	c0.22		c0.09	0.09	
v/s Ratio Perm						0.02						
v/c Ratio	0.42	0.57		0.50	0.56	0.14	0.61	0.52		0.68	0.21	
Uniform Delay, d1	42.7	37.8		45.9	40.4	38.0	40.4	20.7		41.0	17.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.58		1.26	1.33	
Incremental Delay, d2	1.9	1.4		4.6	1.7	0.5	5.0	1.4		8.1	0.4	
Delay (s)	44.7	39.2		50.5	42.1	38.5	45.5	34.2		60.0	24.3	
Level of Service	D	D		D	D	D	D	C		E	C	
Approach Delay (s)		40.1			41.8			36.0			36.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	52	111	38	11	193	20	15	2	0	12	11	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	55	117	40	12	203	21	16	2	0	13	12	46

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	113	98	113	123	18	71
Volume Left (vph)	55	0	12	0	16	13
Volume Right (vph)	0	40	0	21	0	46
Hadj (s)	0.28	-0.25	0.09	-0.09	0.21	-0.32
Departure Headway (s)	5.2	4.7	5.0	4.8	5.2	4.6
Degree Utilization, x	0.16	0.13	0.16	0.16	0.03	0.09
Capacity (veh/h)	676	746	698	726	636	719
Control Delay (s)	8.0	7.2	7.7	7.6	8.3	8.0
Approach Delay (s)	7.6		7.6		8.3	8.0
Approach LOS	A		A		A	A

Intersection Summary			
Delay	7.7		
Level of Service	A		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	32	0	1	110	99	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	0	1	120	108	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	174	58	116			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174	58	116			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	100	100			
cM capacity (veh/h)	799	996	1470			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	35	41	80	72	45
Volume Left	35	1	0	0	0
Volume Right	0	0	0	0	9
cSH	799	1470	1700	1700	1700
Volume to Capacity	0.04	0.00	0.05	0.04	0.03
Queue Length 95th (ft)	3	0	0	0	0
Control Delay (s)	9.7	0.2	0.0	0.0	0.0
Lane LOS	A	A			
Approach Delay (s)	9.7	0.1		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	14.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	24	21	109	98	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2	26	22	116	104	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	207	53	105			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	207	53	105			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	98			
cM capacity (veh/h)	750	1004	1484			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	28	61	77	70	36
Volume Left	2	22	0	0	0
Volume Right	26	0	0	0	1
cSH	978	1484	1700	1700	1700
Volume to Capacity	0.03	0.02	0.05	0.04	0.02
Queue Length 95th (ft)	2	1	0	0	0
Control Delay (s)	8.8	2.8	0.0	0.0	0.0
Lane LOS	A	A			
Approach Delay (s)	8.8	1.2		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	18.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	105	5	5	97	5	5	0	5	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	114	5	5	105	5	5	0	5	5	0	5
Pedestrians					100			100			100	
Lane Width (ft)					11.0			11.0			11.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					8			8			8	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	211			220			297	449	260	392	449	155
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	211			220			297	449	260	392	449	155
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	99	99	100	99
cM capacity (veh/h)	1253			1244			512	426	630	404	426	797

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	62	62	58	58	11	11
Volume Left	5	0	5	0	5	5
Volume Right	0	5	0	5	5	5
cSH	1253	1700	1244	1700	565	536
Volume to Capacity	0.00	0.04	0.00	0.03	0.02	0.02
Queue Length 95th (ft)	0	0	0	0	1	2
Control Delay (s)	0.7	0.0	0.8	0.0	11.5	11.9
Lane LOS	A		A		B	B
Approach Delay (s)	0.4		0.4		11.5	11.9
Approach LOS					B	B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	106	92	0	1	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	118	102	0	1	17
Pedestrians					100	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					8	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	202				281	151
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	202				281	151
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1263				628	802

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	49	79	68	34	18
Volume Left	10	0	0	0	1
Volume Right	0	0	0	0	17
cSH	1263	1700	1700	1700	788
Volume to Capacity	0.01	0.05	0.04	0.02	0.02
Queue Length 95th (ft)	1	0	0	0	2
Control Delay (s)	1.6	0.0	0.0	0.0	9.7
Lane LOS	A				A
Approach Delay (s)	0.6		0.0		9.7
Approach LOS					A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	102	87	5	5	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	111	95	5	5	5
Pedestrians					100	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					8	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	200				264	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	200				264	150
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1265				647	803

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	42	74	63	37	11
Volume Left	5	0	0	0	5
Volume Right	0	0	0	5	5
cSH	1265	1700	1700	1700	716
Volume to Capacity	0.00	0.04	0.04	0.02	0.02
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	1.0	0.0	0.0	0.0	10.1
Lane LOS	A				B
Approach Delay (s)	0.4		0.0		10.1
Approach LOS					B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	198	32	51	241	134	110	391	46	150	441	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.86	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2960		1540	3079	1031	1540	2996		1540	3025	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2960		1540	3079	1031	1540	2996		1540	3025	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	40	218	35	56	265	147	121	430	51	165	485	31
RTOR Reduction (vph)	0	15	0	0	0	122	0	9	0	0	4	0
Lane Group Flow (vph)	40	238	0	56	265	25	121	472	0	165	512	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.7	15.1		7.4	16.8	16.8	13.3	38.7		18.8	44.2	
Effective Green, g (s)	5.7	15.1		7.4	16.8	16.8	13.3	38.7		18.8	44.2	
Actuated g/C Ratio	0.06	0.15		0.07	0.17	0.17	0.13	0.39		0.19	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	87	446		113	517	173	204	1159		289	1337	
v/s Ratio Prot	0.03	c0.08		0.04	c0.09		c0.08	c0.16		c0.11	0.17	
v/s Ratio Perm						0.02						
v/c Ratio	0.46	0.53		0.50	0.51	0.14	0.59	0.41		0.57	0.38	
Uniform Delay, d1	45.7	39.2		44.5	37.9	35.5	40.8	22.3		36.9	18.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.95	1.55		1.25	1.30	
Incremental Delay, d2	3.8	1.2		3.4	0.9	0.4	4.4	1.0		2.6	0.8	
Delay (s)	49.5	40.4		47.9	38.7	35.8	43.1	35.6		48.9	25.1	
Level of Service	D	D		D	D	D	D	D		D	C	
Approach Delay (s)		41.7			38.9			37.1			30.9	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
2: Jennings Street & Evans Avenue/Hunters Point Boulevard

9/9/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	24	87	54	12	225	23	10	4	2	16	18	39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	92	57	13	237	24	11	4	2	17	19	41

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	71	103	131	143	17	77
Volume Left (vph)	25	0	13	0	11	17
Volume Right (vph)	0	57	0	24	2	41
Hadj (s)	0.21	-0.35	0.08	-0.08	0.08	-0.24
Departure Headway (s)	5.2	4.6	5.0	4.8	5.1	4.7
Degree Utilization, x	0.10	0.13	0.18	0.19	0.02	0.10
Capacity (veh/h)	676	753	702	730	653	711
Control Delay (s)	7.6	7.1	7.9	7.7	8.2	8.2
Approach Delay (s)	7.3		7.8		8.2	8.2
Approach LOS	A		A		A	A

Intersection Summary			
Delay	7.7		
Level of Service	A		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	22	2	0	132	83	33
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	26	2	0	155	98	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	195	68	136			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	195	68	136			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	776	981	1445			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	28	52	104	65	71
Volume Left	26	0	0	0	0
Volume Right	2	0	0	0	39
cSH	790	1445	1700	1700	1700
Volume to Capacity	0.04	0.00	0.06	0.04	0.04
Queue Length 95th (ft)	3	0	0	0	0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.7	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	14.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	26	39	128	83	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	2	27	41	133	86	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	235	44	89			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	235	44	89			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	97			
cM capacity (veh/h)	712	1016	1505			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	29	85	89	58	31
Volume Left	2	41	0	0	0
Volume Right	27	0	0	0	2
cSH	986	1505	1700	1700	1700
Volume to Capacity	0.03	0.03	0.05	0.03	0.02
Queue Length 95th (ft)	2	2	0	0	0
Control Delay (s)	8.8	3.7	0.0	0.0	0.0
Lane LOS	A	A			
Approach Delay (s)	8.8	1.8		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	76	5	5	133	5	5	0	5	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	83	5	5	145	5	5	0	5	5	0	5
Pedestrians					100			100			100	
Lane Width (ft)					11.0			11.0			11.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					8			8			8	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	250			188			285	457	244	416	457	175
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	250			188			285	457	244	416	457	175
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	99	99	100	99
cM capacity (veh/h)	1212			1278			522	421	645	389	421	774

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	47	47	78	78	11	11
Volume Left	5	0	5	0	5	5
Volume Right	0	5	0	5	5	5
cSH	1212	1700	1278	1700	577	517
Volume to Capacity	0.00	0.03	0.00	0.05	0.02	0.02
Queue Length 95th (ft)	0	0	0	0	1	2
Control Delay (s)	1.0	0.0	0.6	0.0	11.4	12.1
Lane LOS	A		A		B	B
Approach Delay (s)	0.5		0.3		11.4	12.1
Approach LOS					B	B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	13	73	132	0	2	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	81	147	0	2	12
Pedestrians					100	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					8	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	247				316	173
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	247				316	173
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1216				595	776

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	41	54	98	49	14
Volume Left	14	0	0	0	2
Volume Right	0	0	0	0	12
cSH	1216	1700	1700	1700	741
Volume to Capacity	0.01	0.03	0.06	0.03	0.02
Queue Length 95th (ft)	1	0	0	0	1
Control Delay (s)	2.8	0.0	0.0	0.0	10.0
Lane LOS	A				A
Approach Delay (s)	1.2		0.0		10.0
Approach LOS					A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	70	127	5	5	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	76	138	5	5	5
Pedestrians					100	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					8	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	243				290	172
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	243				290	172
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1219				623	778

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	31	51	92	51	11
Volume Left	5	0	0	0	5
Volume Right	0	0	0	5	5
cSH	1219	1700	1700	1700	692
Volume to Capacity	0.00	0.03	0.05	0.03	0.02
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	1.4	0.0	0.0	0.0	10.3
Lane LOS	A				B
Approach Delay (s)	0.5		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

Baseline Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	250	34	53	229	166	121	581	44	137	222	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2977		1540	3079	1028	1540	3025		1540	2973	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2977		1540	3079	1028	1540	3025		1540	2973	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	56	253	34	54	231	168	122	587	44	138	224	30
RTOR Reduction (vph)	0	12	0	0	0	145	0	4	0	0	8	0
Lane Group Flow (vph)	56	275	0	54	231	23	122	627	0	138	246	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	8.6	14.9		7.3	13.6	13.6	13.3	43.8		14.0	44.5	
Effective Green, g (s)	8.6	14.9		7.3	13.6	13.6	13.3	43.8		14.0	44.5	
Actuated g/C Ratio	0.09	0.15		0.07	0.14	0.14	0.13	0.44		0.14	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	132	443		112	418	139	204	1324		215	1322	
v/s Ratio Prot	0.04	c0.09		0.04	c0.08		c0.08	c0.21		c0.09	0.08	
v/s Ratio Perm						0.02						
v/c Ratio	0.42	0.62		0.48	0.55	0.16	0.60	0.47		0.64	0.19	
Uniform Delay, d1	43.4	39.9		44.5	40.4	38.2	40.8	19.9		40.6	16.8	
Progression Factor	1.00	1.00		0.93	0.91	1.58	0.98	1.58		1.26	1.31	
Incremental Delay, d2	2.2	2.7		3.2	1.6	0.6	4.6	1.2		6.3	0.3	
Delay (s)	45.5	42.6		44.5	38.2	60.9	44.5	32.7		57.4	22.4	
Level of Service	D	D		D	D	E	D	C		E	C	
Approach Delay (s)		43.1			47.4			34.6			34.7	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	124	38	11	260	32	15	2	0	14	11	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.98		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		1.00			0.91	
Flt Protected		0.99	1.00		1.00	1.00		0.96			0.99	
Satd. Flow (prot)		3006	1320		3073	1347		1551			1282	
Flt Permitted		0.83	1.00		0.94	1.00		0.85			0.96	
Satd. Flow (perm)		2541	1320		2908	1347		1381			1247	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	90%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	52	138	42	12	289	36	17	2	0	16	12	49
RTOR Reduction (vph)	0	0	24	0	0	21	0	0	0	0	28	0
Lane Group Flow (vph)	0	190	18	0	301	15	0	19	0	0	49	0
Confl. Peds. (#/hr)	1		2	2		1			7	7		
Confl. Bikes (#/hr)						1						
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		21.0	21.0		21.0	21.0		21.0			21.0	
Effective Green, g (s)		21.0	21.0		21.0	21.0		21.0			21.0	
Actuated g/C Ratio		0.42	0.42		0.42	0.42		0.42			0.42	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		1067	554		1221	565		580			523	
v/s Ratio Prot												
v/s Ratio Perm		0.07	0.01		c0.10	0.01		0.01			c0.04	
v/c Ratio		0.18	0.03		0.25	0.03		0.03			0.09	
Uniform Delay, d1		9.1	8.5		9.4	8.5		8.5			8.8	
Progression Factor		1.12	2.02		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.3	0.1		0.5	0.1		0.1			0.4	
Delay (s)		10.5	17.3		9.9	8.6		8.6			9.1	
Level of Service		B	B		A	A		A			A	
Approach Delay (s)		11.7			9.7			8.6			9.1	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	32	0	1	189	115	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	0	1	205	125	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	234	67	134			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	234	67	134			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	733	983	1449			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	35	70	137	83	50
Volume Left	35	1	0	0	0
Volume Right	0	0	0	0	9
cSH	733	1449	1700	1700	1700
Volume to Capacity	0.05	0.00	0.08	0.05	0.03
Queue Length 95th (ft)	4	0	0	0	0
Control Delay (s)	10.2	0.1	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	10.2	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	16.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	27	35	188	114	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2	29	37	200	121	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	296	61	122			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	296	61	122			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	97			
cM capacity (veh/h)	654	991	1463			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	31	104	133	81	41
Volume Left	2	37	0	0	0
Volume Right	29	0	0	0	1
cSH	957	1463	1700	1700	1700
Volume to Capacity	0.03	0.03	0.08	0.05	0.02
Queue Length 95th (ft)	2	2	0	0	0
Control Delay (s)	8.9	2.8	0.0	0.0	0.0
Lane LOS	A	A			
Approach Delay (s)	8.9	1.2		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	20.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	124	0	0	190	5	0	0	0	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	135	0	0	207	5	0	0	0	5	0	5
Pedestrians					100			100			100	
Lane Width (ft)					11.0			11.0			11.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					8			8			8	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	312			235			354	558	267	488	555	206
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	312			235			354	558	267	488	555	206
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	98	100	99
cM capacity (veh/h)	1150			1228			467	371	623	349	372	739

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	73	67	103	109	0	11
Volume Left	5	0	0	0	0	5
Volume Right	0	0	0	5	0	5
cSH	1150	1700	1228	1700	1700	474
Volume to Capacity	0.00	0.04	0.00	0.06	0.00	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.6	0.0	0.0	0.0	0.0	12.8
Lane LOS	A				A	B
Approach Delay (s)	0.3		0.0		0.0	12.8
Approach LOS					A	B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	125	185	0	1	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	139	206	0	1	17
Pedestrians					100	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					8	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	306				395	203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	306				395	203
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1156				533	743

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	56	93	137	69	18
Volume Left	10	0	0	0	1
Volume Right	0	0	0	0	17
cSH	1156	1700	1700	1700	725
Volume to Capacity	0.01	0.05	0.08	0.04	0.02
Queue Length 95th (ft)	1	0	0	0	2
Control Delay (s)	1.5	0.0	0.0	0.0	10.1
Lane LOS	A				B
Approach Delay (s)	0.6		0.0		10.1
Approach LOS					B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	121	180	5	5	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	132	196	5	5	5
Pedestrians					100	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					8	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	301				375	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	301				375	201
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1161				551	745

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	49	88	130	71	11
Volume Left	5	0	0	0	5
Volume Right	0	0	0	5	5
cSH	1161	1700	1700	1700	633
Volume to Capacity	0.00	0.05	0.08	0.04	0.02
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.9	0.0	0.0	0.0	10.8
Lane LOS	A				B
Approach Delay (s)	0.3		0.0		10.8
Approach LOS					B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	212	32	58	248	152	110	391	60	187	441	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.86	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2967		1540	3079	1031	1540	2975		1540	3025	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2967		1540	3079	1031	1540	2975		1540	3025	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	40	233	35	64	273	167	121	430	66	205	485	31
RTOR Reduction (vph)	0	14	0	0	0	138	0	12	0	0	4	0
Lane Group Flow (vph)	40	254	0	64	273	29	121	484	0	205	512	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.7	15.6		7.5	17.4	17.4	13.2	33.4		23.5	43.7	
Effective Green, g (s)	5.7	15.6		7.5	17.4	17.4	13.2	33.4		23.5	43.7	
Actuated g/C Ratio	0.06	0.16		0.08	0.17	0.17	0.13	0.33		0.24	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	87	462		115	535	179	203	993		361	1321	
v/s Ratio Prot	0.03	c0.09		0.04	c0.09		c0.08	c0.16		c0.13	0.17	
v/s Ratio Perm						0.03						
v/c Ratio	0.46	0.55		0.56	0.51	0.16	0.60	0.49		0.57	0.39	
Uniform Delay, d1	45.7	39.0		44.6	37.4	35.1	40.9	26.5		33.8	19.1	
Progression Factor	1.00	1.00		0.89	0.89	1.46	1.01	1.54		1.34	1.43	
Incremental Delay, d2	3.8	1.4		5.7	0.8	0.4	4.5	1.7		2.0	0.8	
Delay (s)	49.5	40.4		45.6	34.2	51.8	45.9	42.6		47.2	28.1	
Level of Service	D	D		D	C	D	D	D		D	C	
Approach Delay (s)		41.6			41.5			43.2			33.5	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	39.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑	↱		↰↑	↱		✥			✥	
Volume (vph)	24	153	54	12	257	29	10	4	2	51	18	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.98			0.97	
Flt Protected		0.99	1.00		1.00	1.00		0.97			0.97	
Satd. Flow (prot)		3027	1313		3071	1347		1540			1334	
Flt Permitted		0.90	1.00		0.94	1.00		0.89			0.86	
Satd. Flow (perm)		2753	1313		2902	1347		1423			1187	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	161	57	13	271	31	11	4	2	54	19	17
RTOR Reduction (vph)	0	0	33	0	0	18	0	1	0	0	10	0
Lane Group Flow (vph)	0	186	24	0	284	13	0	16	0	0	80	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		21.0	21.0		21.0	21.0		21.0			21.0	
Effective Green, g (s)		21.0	21.0		21.0	21.0		21.0			21.0	
Actuated g/C Ratio		0.42	0.42		0.42	0.42		0.42			0.42	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		1156	551		1218	565		597			498	
v/s Ratio Prot												
v/s Ratio Perm		0.07	0.02		c0.10	0.01		0.01			c0.07	
v/c Ratio		0.16	0.04		0.23	0.02		0.03			0.16	
Uniform Delay, d1		9.0	8.6		9.3	8.5		8.5			9.0	
Progression Factor		1.15	2.31		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.3	0.1		0.4	0.1		0.1			0.7	
Delay (s)		10.6	19.9		9.8	8.6		8.6			9.7	
Level of Service		B	B		A	A		A			A	
Approach Delay (s)		12.8			9.7			8.6			9.7	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Hunters Point Boulevard & Hawes Street

9/9/2016

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	22	2	0	170	160	33
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	26	2	0	200	188	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	308	114	227			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	308	114	227			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	100	100			
cM capacity (veh/h)	660	918	1338			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	28	67	133	125	102
Volume Left	26	0	0	0	0
Volume Right	2	0	0	0	39
cSH	676	1338	1700	1700	1700
Volume to Capacity	0.04	0.00	0.08	0.07	0.06
Queue Length 95th (ft)	3	0	0	0	0
Control Delay (s)	10.6	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.6	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	40	46	166	160	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	2	42	48	173	167	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	350	84	169			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	350	84	169			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	97			
cM capacity (veh/h)	600	958	1406			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	44	106	115	111	58
Volume Left	2	48	0	0	0
Volume Right	42	0	0	0	2
cSH	931	1406	1700	1700	1700
Volume to Capacity	0.05	0.03	0.07	0.07	0.03
Queue Length 95th (ft)	4	3	0	0	0
Control Delay (s)	9.1	3.6	0.0	0.0	0.0
Lane LOS	A	A			
Approach Delay (s)	9.1	1.7		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	167	0	0	178	5	0	0	0	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	182	0	0	193	5	0	0	0	5	0	5
Pedestrians					100			100			100	
Lane Width (ft)					11.0			11.0			11.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					8			8			8	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	299			282			395	591	291	498	589	199
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	299			282			395	591	291	498	589	199
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	98	100	99
cM capacity (veh/h)	1163			1180			437	355	602	343	356	746

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	96	91	97	102	0	11
Volume Left	5	0	0	0	0	5
Volume Right	0	0	0	5	0	5
cSH	1163	1700	1180	1700	1700	470
Volume to Capacity	0.00	0.05	0.00	0.06	0.00	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.5	0.0	0.0	0.0	0.0	12.8
Lane LOS	A				A	B
Approach Delay (s)	0.3		0.0		0.0	12.8
Approach LOS					A	B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	13	164	177	0	2	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	182	197	0	2	12
Pedestrians					100	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					8	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	297				417	198
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	297				417	198
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1165				515	748

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	75	121	131	66	14
Volume Left	14	0	0	0	2
Volume Right	0	0	0	0	12
cSH	1165	1700	1700	1700	699
Volume to Capacity	0.01	0.07	0.08	0.04	0.02
Queue Length 95th (ft)	1	0	0	0	2
Control Delay (s)	1.6	0.0	0.0	0.0	10.3
Lane LOS	A				B
Approach Delay (s)	0.6		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	26.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	161	172	5	5	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	175	187	5	5	5
Pedestrians					100	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					8	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	292				388	196
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	292				388	196
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1169				541	750

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	64	117	125	68	11
Volume Left	5	0	0	0	5
Volume Right	0	0	0	5	5
cSH	1169	1700	1700	1700	628
Volume to Capacity	0.00	0.07	0.07	0.04	0.02
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.7	0.0	0.0	0.0	10.8
Lane LOS	A				B
Approach Delay (s)	0.3		0.0		10.8
Approach LOS					B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Baseline Plus Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	296	34	180	279	371	121	581	192	410	222	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2992		1540	3079	1033	1540	2886		1540	2973	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2992		1540	3079	1033	1540	2886		1540	2973	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	56	299	34	182	282	375	122	587	194	414	224	30
RTOR Reduction (vph)	0	10	0	0	0	268	0	31	0	0	9	0
Lane Group Flow (vph)	56	323	0	182	282	107	122	750	0	414	245	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.8	19.2		10.0	21.4	21.4	12.1	35.9		14.9	38.7	
Effective Green, g (s)	7.8	19.2		10.0	21.4	21.4	12.1	35.9		14.9	38.7	
Actuated g/C Ratio	0.08	0.19		0.10	0.21	0.21	0.12	0.36		0.15	0.39	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	120	574		154	658	221	186	1036		229	1150	
v/s Ratio Prot	0.04	c0.11		c0.12	0.09		0.08	c0.26		c0.27	0.08	
v/s Ratio Perm						0.10						
v/c Ratio	0.47	0.56		1.18	0.43	0.48	0.66	0.72		1.81	0.21	
Uniform Delay, d1	44.1	36.6		45.0	34.0	34.5	42.0	27.8		42.5	20.5	
Progression Factor	1.00	1.00		0.83	0.82	1.94	0.89	1.57		0.99	0.77	
Incremental Delay, d2	2.9	1.3		124.6	0.4	1.4	7.6	4.2		379.1	0.4	
Delay (s)	47.0	37.9		161.9	28.1	68.4	45.0	47.8		421.4	16.2	
Level of Service	D	D		F	C	E	D	D		F	B	
Approach Delay (s)		39.2			75.1			47.4			267.4	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	107.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	592	38	11	642	305	15	2	0	361	24	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		1.00			0.99	
Flt Protected		1.00	1.00		1.00	1.00		0.96			0.96	
Satd. Flow (prot)		3036	1313		3076	1347		1551			1334	
Flt Permitted		0.86	1.00		0.94	1.00		0.76			0.75	
Satd. Flow (perm)		2625	1313		2901	1347		1232			1039	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	55	623	40	12	676	321	16	2	0	380	25	46
RTOR Reduction (vph)	0	0	24	0	0	193	0	0	0	0	8	0
Lane Group Flow (vph)	0	678	16	0	688	128	0	18	0	0	443	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Effective Green, g (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Actuated g/C Ratio		0.40	0.40		0.40	0.40		0.44			0.44	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		1050	525		1160	538		542			457	
v/s Ratio Prot												
v/s Ratio Perm		c0.26	0.01		0.24	0.10		0.01			c0.43	
v/c Ratio		0.65	0.03		0.59	0.24		0.03			0.97	
Uniform Delay, d1		12.1	9.1		11.8	9.9		8.0			13.7	
Progression Factor		1.26	1.97		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.3	0.0		2.2	1.0		0.1			34.9	
Delay (s)		15.6	18.0		14.0	11.0		8.1			48.6	
Level of Service		B	B		B	B		A			D	
Approach Delay (s)		15.7			13.1			8.1			48.6	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	0	0	0	0	0	1	856	0	0	964	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		1.00						1.00			1.00	
Flt Protected		0.95						1.00			1.00	
Satd. Flow (prot)		1540						3079			3075	
Flt Permitted		0.76						0.95			1.00	
Satd. Flow (perm)		1227						2938			3075	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	0	0	0	0	0	1	930	0	0	1048	9
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	35	0	0	0	0	0	931	0	0	1056	0
Turn Type	custom	NA					Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		368						1566			1640	
v/s Ratio Prot											c0.34	
v/s Ratio Perm		c0.03						0.32				
v/c Ratio		0.10						0.59			0.64	
Uniform Delay, d1		15.1						9.6			10.0	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.5						1.7			0.9	
Delay (s)		15.6						11.2			10.8	
Level of Service		B						B			B	
Approach Delay (s)		15.6			0.0			11.2			10.8	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	184	158	855	963	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3079	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3079	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	196	168	910	1024	1
RTOR Reduction (vph)	0	67	0	0	0	0
Lane Group Flow (vph)	0	129	168	910	1025	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		11.3	11.3	32.2	32.2	
Effective Green, g (s)		11.3	11.3	32.2	32.2	
Actuated g/C Ratio		0.21	0.21	0.60	0.60	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		296	325	1853	1853	
v/s Ratio Prot			c0.11	0.30	c0.33	
v/s Ratio Perm		0.09				
v/c Ratio		0.44	0.52	0.49	0.55	
Uniform Delay, d1		18.3	18.7	6.0	6.4	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.0	1.4	0.9	0.4	
Delay (s)		19.4	20.1	7.0	6.7	
Level of Service		B	C	A	A	
Approach Delay (s)	19.4			9.0	6.7	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	214	921	813	15	10	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3412		1711	1531
Flt Permitted	0.27	1.00	1.00		0.95	1.00
Satd. Flow (perm)	495	3421	3412		1711	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	1001	884	16	11	187
RTOR Reduction (vph)	0	0	1	0	0	172
Lane Group Flow (vph)	233	1001	899	0	11	15
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					8
Actuated Green, G (s)	84.2	84.2	71.9		7.8	7.8
Effective Green, g (s)	84.2	84.2	71.9		7.8	7.8
Actuated g/C Ratio	0.84	0.84	0.72		0.08	0.08
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	517	2880	2453		133	119
v/s Ratio Prot	c0.04	0.29	0.26		0.01	
v/s Ratio Perm	c0.34					c0.01
v/c Ratio	0.45	0.35	0.37		0.08	0.12
Uniform Delay, d1	2.3	1.8	5.4		42.8	42.9
Progression Factor	1.00	1.00	0.54		1.00	1.00
Incremental Delay, d2	0.6	0.3	0.4		0.3	0.5
Delay (s)	2.9	2.1	3.3		43.0	43.4
Level of Service	A	A	A		D	D
Approach Delay (s)		2.3	3.3		43.4	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	488	448	531	34	13	302
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes	0.98	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1501	2887	2757		1347	1203
Flt Permitted	0.32	1.00	1.00		0.95	1.00
Satd. Flow (perm)	506	2887	2757		1347	1203
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	567	521	617	40	15	351
RTOR Reduction (vph)	0	0	3	0	0	10
Lane Group Flow (vph)	567	521	654	0	15	341
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	88.3	88.3	52.0		3.2	36.0
Effective Green, g (s)	88.3	88.3	52.0		3.2	36.0
Actuated g/C Ratio	0.88	0.88	0.52		0.03	0.36
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	768	2549	1433		43	481
v/s Ratio Prot	0.24	0.18	0.24		0.01	c0.23
v/s Ratio Perm	c0.41					0.05
v/c Ratio	0.74	0.20	0.46		0.35	0.71
Uniform Delay, d1	6.9	0.8	15.1		47.4	27.5
Progression Factor	0.72	0.38	0.97		1.00	1.00
Incremental Delay, d2	3.6	0.2	1.0		4.9	4.8
Delay (s)	8.6	0.5	15.7		52.2	32.3
Level of Service	A	A	B		D	C
Approach Delay (s)		4.7	15.7		33.1	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	340	121	198	15	14	367
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	0.97
Flpb, ped/bikes	0.86	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1326	2858	2771		1347	1167
Flt Permitted	0.57	1.00	1.00		0.95	1.00
Satd. Flow (perm)	799	2858	2771		1347	1167
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	370	132	215	16	15	399
RTOR Reduction (vph)	0	0	2	0	0	354
Lane Group Flow (vph)	370	132	229	0	15	45
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)	80.8	80.8	64.3		11.2	11.2
Effective Green, g (s)	80.8	80.8	64.3		11.2	11.2
Actuated g/C Ratio	0.81	0.81	0.64		0.11	0.11
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	711	2309	1781		150	130
v/s Ratio Prot	c0.06	0.05	0.08		0.01	
v/s Ratio Perm	c0.36					c0.04
v/c Ratio	0.52	0.06	0.13		0.10	0.34
Uniform Delay, d1	2.7	1.9	6.9		39.9	41.0
Progression Factor	1.49	0.96	1.00		1.00	1.00
Incremental Delay, d2	0.7	0.0	0.1		0.3	1.6
Delay (s)	4.7	1.9	7.1		40.2	42.6
Level of Service	A	A	A		D	D
Approach Delay (s)		4.0	7.1		42.5	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	321	32	225	341	411	110	391	237	449	441	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.96		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	3002		1540	3079	1035	1540	2788		1540	3025	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	3002		1540	3079	1035	1540	2788		1540	3025	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	40	353	35	247	375	452	121	430	260	493	485	31
RTOR Reduction (vph)	0	8	0	0	0	282	0	95	0	0	4	0
Lane Group Flow (vph)	40	380	0	247	375	170	121	595	0	493	512	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	4.8	22.3		10.0	27.5	27.5	11.3	30.4		17.3	36.4	
Effective Green, g (s)	4.8	22.3		10.0	27.5	27.5	11.3	30.4		17.3	36.4	
Actuated g/C Ratio	0.05	0.22		0.10	0.28	0.28	0.11	0.30		0.17	0.36	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	73	669		154	846	284	174	847		266	1101	
v/s Ratio Prot	0.03	c0.13		c0.16	0.12		0.08	c0.21		c0.32	0.17	
v/s Ratio Perm						c0.16						
v/c Ratio	0.55	0.57		1.60	0.44	0.60	0.70	0.70		1.85	0.46	
Uniform Delay, d1	46.5	34.6		45.0	29.9	31.5	42.7	30.8		41.4	24.3	
Progression Factor	1.00	1.00		0.87	0.86	1.97	0.91	1.62		1.00	0.86	
Incremental Delay, d2	8.2	1.1		295.6	0.3	2.8	10.7	4.5		397.1	1.3	
Delay (s)	54.7	35.7		334.8	26.1	64.8	49.7	54.6		438.4	22.1	
Level of Service	D	D		F	C	E	D	D		F	C	
Approach Delay (s)		37.5			113.4			53.8			225.5	
Approach LOS		D			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	123.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	701	54	12	776	381	10	4	2	391	33	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.98			1.00	
Flt Protected		1.00	1.00		1.00	1.00		0.97			0.96	
Satd. Flow (prot)		3043	1313		3077	1347		1541			1344	
Flt Permitted		0.92	1.00		0.94	1.00		0.82			0.74	
Satd. Flow (perm)		2794	1313		2898	1347		1301			1036	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	738	57	13	817	401	11	4	2	412	35	17
RTOR Reduction (vph)	0	0	34	0	0	241	0	1	0	0	3	0
Lane Group Flow (vph)	0	763	23	0	830	160	0	16	0	0	461	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Effective Green, g (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Actuated g/C Ratio		0.40	0.40		0.40	0.40		0.44			0.44	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		1117	525		1159	538		572			455	
v/s Ratio Prot												
v/s Ratio Perm		0.27	0.02		c0.29	0.12		0.01			c0.45	
v/c Ratio		0.68	0.04		0.72	0.30		0.03			1.01	
Uniform Delay, d1		12.4	9.2		12.6	10.2		7.9			14.0	
Progression Factor		1.27	2.26		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.3	0.0		3.8	1.4		0.1			45.7	
Delay (s)		16.1	20.7		16.4	11.6		8.0			59.7	
Level of Service		B	C		B	B		A			E	
Approach Delay (s)		16.4			14.9			8.0			59.7	
Approach LOS		B			B			A			E	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	0	2	0	0	0	0	1053	0	0	1072	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		0.99						1.00			1.00	
Flt Protected		0.96						1.00			1.00	
Satd. Flow (prot)		1534						3079			3065	
Flt Permitted		0.82						1.00			1.00	
Satd. Flow (perm)		1324						3079			3065	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	26	0	2	0	0	0	0	1239	0	0	1261	39
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	8	0	0	0	0	0	1239	0	0	1296	0
Turn Type	custom	NA						NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		397						1642			1634	
v/s Ratio Prot								0.40			c0.42	
v/s Ratio Perm		c0.01										
v/c Ratio		0.02						0.75			0.79	
Uniform Delay, d1		14.8						10.9			11.3	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.1						3.3			2.7	
Delay (s)		14.9						14.2			14.1	
Level of Service		B						B			B	
Approach Delay (s)		14.9			0.0			14.2			14.1	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	202	203	1049	1072	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3078	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3078	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	210	211	1093	1117	2
RTOR Reduction (vph)	0	52	0	0	0	0
Lane Group Flow (vph)	0	158	211	1093	1119	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		12.5	12.5	32.1	32.1	
Effective Green, g (s)		12.5	12.5	32.1	32.1	
Actuated g/C Ratio		0.23	0.23	0.59	0.59	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		320	352	1810	1809	
v/s Ratio Prot			c0.14	0.35	c0.36	
v/s Ratio Perm		0.11				
v/c Ratio		0.49	0.60	0.60	0.62	
Uniform Delay, d1		18.3	18.8	7.2	7.3	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.2	2.7	1.5	0.6	
Delay (s)		19.5	21.6	8.7	7.9	
Level of Service		B	C	A	A	
Approach Delay (s)	19.5			10.8	7.9	
Approach LOS	B			B	A	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: Innes Avenue & New Griffith St

9/9/2016

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	197	1049	1035	9	10	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3417		1711	1531
Flt Permitted	0.20	1.00	1.00		0.95	1.00
Satd. Flow (perm)	363	3421	3417		1711	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	1140	1125	10	11	204
RTOR Reduction (vph)	0	0	0	0	0	188
Lane Group Flow (vph)	214	1140	1135	0	11	16
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					8
Actuated Green, G (s)	84.1	84.1	70.7		7.9	7.9
Effective Green, g (s)	84.1	84.1	70.7		7.9	7.9
Actuated g/C Ratio	0.84	0.84	0.71		0.08	0.08
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	431	2877	2415		135	120
v/s Ratio Prot	c0.05	0.33	0.33		0.01	
v/s Ratio Perm	c0.37					c0.01
v/c Ratio	0.50	0.40	0.47		0.08	0.13
Uniform Delay, d1	3.5	1.9	6.4		42.7	42.9
Progression Factor	1.00	1.00	0.58		1.00	1.00
Incremental Delay, d2	0.9	0.4	0.4		0.3	0.5
Delay (s)	4.4	2.3	4.1		42.9	43.4
Level of Service	A	A	A		D	D
Approach Delay (s)		2.6	4.1		43.4	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	481	583	521	12	20	528
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	0.97	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1494	2887	2821		1347	1203
Flt Permitted	0.33	1.00	1.00		0.95	1.00
Satd. Flow (perm)	527	2887	2821		1347	1203
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	534	648	579	13	22	587
RTOR Reduction (vph)	0	0	1	0	0	13
Lane Group Flow (vph)	534	648	591	0	22	574
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	87.9	87.9	46.9		3.6	41.1
Effective Green, g (s)	87.9	87.9	46.9		3.6	41.1
Actuated g/C Ratio	0.88	0.88	0.47		0.04	0.41
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	821	2537	1323		48	542
v/s Ratio Prot	0.24	0.22	0.21		0.02	c0.39
v/s Ratio Perm	c0.33					0.09
v/c Ratio	0.65	0.26	0.45		0.46	1.06
Uniform Delay, d1	4.2	0.9	17.8		47.2	29.4
Progression Factor	0.72	0.56	0.93		1.00	1.00
Incremental Delay, d2	1.7	0.2	1.0		6.8	55.3
Delay (s)	4.8	0.8	17.6		54.0	84.7
Level of Service	A	A	B		D	F
Approach Delay (s)		2.6	17.6		83.6	
Approach LOS		A	B		F	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	421	182	186	13	12	347
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	0.97
Flpb, ped/bikes	0.86	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1319	2858	2779		1347	1166
Flt Permitted	0.58	1.00	1.00		0.95	1.00
Satd. Flow (perm)	804	2858	2779		1347	1166
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	458	198	202	14	13	377
RTOR Reduction (vph)	0	0	3	0	0	336
Lane Group Flow (vph)	458	198	213	0	13	41
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)	81.2	81.2	62.4		10.8	10.8
Effective Green, g (s)	81.2	81.2	62.4		10.8	10.8
Actuated g/C Ratio	0.81	0.81	0.62		0.11	0.11
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	729	2320	1734		145	125
v/s Ratio Prot	c0.09	0.07	0.08		0.01	
v/s Ratio Perm	c0.42					c0.03
v/c Ratio	0.63	0.09	0.12		0.09	0.33
Uniform Delay, d1	2.9	1.9	7.7		40.2	41.2
Progression Factor	1.99	0.97	1.00		1.00	1.00
Incremental Delay, d2	1.7	0.1	0.1		0.3	1.5
Delay (s)	7.4	1.9	7.8		40.4	42.8
Level of Service	A	A	A		D	D
Approach Delay (s)		5.8	7.8		42.7	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Baseline Plus Variant Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	364	34	159	260	343	121	581	316	589	222	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.96		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	3007		1540	3079	1033	1540	2808		1540	2973	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	3007		1540	3079	1033	1540	2808		1540	2973	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	56	368	34	161	263	346	122	587	319	595	224	30
RTOR Reduction (vph)	0	7	0	0	0	270	0	67	0	0	9	0
Lane Group Flow (vph)	56	395	0	161	263	76	122	839	0	595	245	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	9.4	20.3		10.0	20.9	20.9	12.1	37.8		11.9	37.6	
Effective Green, g (s)	9.4	20.3		10.0	20.9	20.9	12.1	37.8		11.9	37.6	
Actuated g/C Ratio	0.09	0.20		0.10	0.21	0.21	0.12	0.38		0.12	0.38	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	144	610		154	643	215	186	1061		183	1117	
v/s Ratio Prot	0.04	c0.13		c0.10	0.09		0.08	c0.30		c0.39	0.08	
v/s Ratio Perm						0.07						
v/c Ratio	0.39	0.65		1.05	0.41	0.35	0.66	0.79		3.25	0.22	
Uniform Delay, d1	42.6	36.6		45.0	34.2	33.8	42.0	27.6		44.0	21.2	
Progression Factor	1.00	1.00		0.82	0.82	2.29	0.91	1.57		0.99	0.78	
Incremental Delay, d2	1.7	2.4		80.1	0.4	0.9	7.8	5.8		1026.1	0.4	
Delay (s)	44.3	38.9		117.2	28.5	78.4	46.1	49.0		1069.8	17.0	
Level of Service	D	D		F	C	E	D	D		F	B	
Approach Delay (s)		39.6			69.5			48.7			754.9	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	245.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	116.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	962	38	11	574	267	15	2	0	584	54	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		1.00			0.99	
Flt Protected		1.00	1.00		1.00	1.00		0.96			0.96	
Satd. Flow (prot)		3040	1313		3076	1347		1551			1341	
Flt Permitted		0.90	1.00		0.93	1.00		0.71			0.74	
Satd. Flow (perm)		2731	1313		2866	1347		1151			1040	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	55	1013	40	12	604	281	16	2	0	615	57	46
RTOR Reduction (vph)	0	0	24	0	0	169	0	0	0	0	5	0
Lane Group Flow (vph)	0	1068	16	0	616	112	0	18	0	0	713	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Effective Green, g (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Actuated g/C Ratio		0.40	0.40		0.40	0.40		0.44			0.44	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		1092	525		1146	538		506			457	
v/s Ratio Prot												
v/s Ratio Perm		c0.39	0.01		0.21	0.08		0.02			c0.69	
v/c Ratio		0.98	0.03		0.54	0.21		0.04			1.56	
Uniform Delay, d1		14.8	9.1		11.5	9.8		8.0			14.0	
Progression Factor		1.60	2.12		1.00	1.00		1.00			1.00	
Incremental Delay, d2		4.5	0.0		1.8	0.9		0.1			262.6	
Delay (s)		28.1	19.3		13.3	10.7		8.1			276.6	
Level of Service		C	B		B	B		A			F	
Approach Delay (s)		27.8			12.5			8.1			276.6	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	87.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	102.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	0	0	0	0	0	1	748	0	0	1592	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		1.00						1.00			1.00	
Flt Protected		0.95						1.00			1.00	
Satd. Flow (prot)		1540						3079			3077	
Flt Permitted		0.76						0.95			1.00	
Satd. Flow (perm)		1227						2935			3077	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	0	0	0	0	0	1	813	0	0	1730	9
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	35	0	0	0	0	0	814	0	0	1739	0
Turn Type	custom	NA					Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		368						1565			1641	
v/s Ratio Prot											c0.57	
v/s Ratio Perm		c0.03						0.28				
v/c Ratio		0.10						0.52			1.06	
Uniform Delay, d1		15.1						9.0			14.0	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.5						1.2			39.9	
Delay (s)		15.6						10.3			53.9	
Level of Service		B						B			D	
Approach Delay (s)		15.6			0.0			10.3			53.9	
Approach LOS		B			A			B			D	

Intersection Summary			
HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	295	140	747	1591	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3079	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3079	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	314	149	795	1693	1
RTOR Reduction (vph)	0	10	0	0	0	0
Lane Group Flow (vph)	0	304	149	795	1694	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		15.8	15.8	32.1	32.1	
Effective Green, g (s)		15.8	15.8	32.1	32.1	
Actuated g/C Ratio		0.27	0.27	0.55	0.55	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		382	420	1707	1707	
v/s Ratio Prot			0.10	0.26	c0.55	
v/s Ratio Perm		c0.22				
v/c Ratio		0.80	0.35	0.47	0.99	
Uniform Delay, d1		19.5	16.9	7.7	12.8	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		10.9	0.5	0.9	19.9	
Delay (s)		30.5	17.5	8.7	32.7	
Level of Service		C	B	A	C	
Approach Delay (s)	30.5			10.1	32.7	
Approach LOS	C			B	C	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	352	1522	718	17	10	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3410		1711	1531
Flt Permitted	0.32	1.00	1.00		0.95	1.00
Satd. Flow (perm)	567	3421	3410		1711	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	383	1654	780	18	11	153
RTOR Reduction (vph)	0	0	1	0	0	66
Lane Group Flow (vph)	383	1654	797	0	11	87
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	90.5	90.5	74.3		1.5	13.7
Effective Green, g (s)	90.5	90.5	74.3		1.5	13.7
Actuated g/C Ratio	0.90	0.90	0.74		0.02	0.14
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	652	3096	2533		25	270
v/s Ratio Prot	c0.07	0.48	0.23		0.01	c0.04
v/s Ratio Perm	c0.46					0.02
v/c Ratio	0.59	0.53	0.31		0.44	0.32
Uniform Delay, d1	1.4	0.9	4.3		48.8	39.0
Progression Factor	1.00	1.00	0.52		1.00	1.00
Incremental Delay, d2	1.4	0.7	0.3		11.9	0.7
Delay (s)	2.7	1.5	2.5		60.7	39.7
Level of Service	A	A	A		E	D
Approach Delay (s)		1.8	2.5		41.1	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	744	793	432	39	13	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96		1.00	1.00
Flpb, ped/bikes	0.97	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1487	2887	2722		1347	1204
Flt Permitted	0.35	1.00	1.00		0.95	1.00
Satd. Flow (perm)	547	2887	2722		1347	1204
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	865	922	502	45	15	358
RTOR Reduction (vph)	0	0	5	0	0	11
Lane Group Flow (vph)	865	922	542	0	15	347
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	88.3	88.3	44.3		3.2	43.7
Effective Green, g (s)	88.3	88.3	44.3		3.2	43.7
Actuated g/C Ratio	0.88	0.88	0.44		0.03	0.44
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	859	2549	1205		43	574
v/s Ratio Prot	c0.40	0.32	0.20		0.01	c0.24
v/s Ratio Perm	c0.49					0.05
v/c Ratio	1.01	0.36	0.45		0.35	0.60
Uniform Delay, d1	14.5	1.0	19.4		47.4	21.5
Progression Factor	0.94	0.65	1.18		1.00	1.00
Incremental Delay, d2	30.9	0.4	1.2		4.9	1.8
Delay (s)	44.5	1.0	24.0		52.2	23.3
Level of Service	D	A	C		D	C
Approach Delay (s)		22.1	24.0		24.5	
Approach LOS		C	C		C	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	685	121	205	21	12	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96		1.00	1.00
Flpb, ped/bikes	0.87	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1336	2858	2731		1347	1204
Flt Permitted	0.56	1.00	1.00		0.95	1.00
Satd. Flow (perm)	787	2858	2731		1347	1204
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	745	132	223	23	13	289
RTOR Reduction (vph)	0	0	4	0	0	74
Lane Group Flow (vph)	745	132	242	0	13	215
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		8	5
Permitted Phases	2					8
Actuated Green, G (s)	90.3	90.3	57.5		1.7	30.5
Effective Green, g (s)	90.3	90.3	57.5		1.7	30.5
Actuated g/C Ratio	0.90	0.90	0.58		0.02	0.30
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	868	2580	1570		22	415
v/s Ratio Prot	c0.25	0.05	0.09		0.01	c0.15
v/s Ratio Perm	c0.53					0.03
v/c Ratio	0.86	0.05	0.15		0.59	0.52
Uniform Delay, d1	1.8	0.5	9.9		48.8	28.7
Progression Factor	2.22	0.99	1.00		1.00	1.00
Incremental Delay, d2	8.1	0.0	0.2		36.0	1.1
Delay (s)	12.0	0.5	10.1		84.8	29.8
Level of Service	B	A	B		F	C
Approach Delay (s)		10.3	10.1		32.2	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	303	32	354	410	598	110	391	219	425	441	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.96		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2998		1540	3079	1036	1540	2801		1540	3025	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2998		1540	3079	1036	1540	2801		1540	3025	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	40	333	35	389	451	657	121	430	241	467	485	31
RTOR Reduction (vph)	0	8	0	0	0	276	0	82	0	0	5	0
Lane Group Flow (vph)	40	360	0	389	451	381	121	589	0	467	511	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	4.8	24.0		10.0	29.2	29.2	11.1	29.1		16.9	34.9	
Effective Green, g (s)	4.8	24.0		10.0	29.2	29.2	11.1	29.1		16.9	34.9	
Actuated g/C Ratio	0.05	0.24		0.10	0.29	0.29	0.11	0.29		0.17	0.35	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	73	719		154	899	302	170	815		260	1055	
v/s Ratio Prot	0.03	c0.12		c0.25	0.15		0.08	c0.21		c0.30	0.17	
v/s Ratio Perm						c0.37						
v/c Ratio	0.55	0.50		2.53	0.50	1.26	0.71	0.72		1.80	0.48	
Uniform Delay, d1	46.5	32.8		45.0	29.4	35.4	42.9	31.8		41.5	25.5	
Progression Factor	1.00	1.00		0.91	0.89	1.61	0.94	1.60		1.00	0.87	
Incremental Delay, d2	8.2	0.5		697.7	0.3	132.3	12.4	5.2		372.1	1.5	
Delay (s)	54.7	33.4		738.6	26.4	189.3	52.8	55.9		413.6	23.6	
Level of Service	D	C		F	C	F	D	E		F	C	
Approach Delay (s)		35.5			283.0			55.5			208.9	
Approach LOS		D			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	186.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	640	54	12	1161	646	10	4	2	353	41	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.98			0.99	
Flt Protected		1.00	1.00		1.00	1.00		0.97			0.96	
Satd. Flow (prot)		3043	1314		3077	1347		1541			1346	
Flt Permitted		0.87	1.00		0.95	1.00		0.82			0.74	
Satd. Flow (perm)		2649	1314		2915	1347		1298			1044	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	674	57	13	1222	680	11	4	2	372	43	17
RTOR Reduction (vph)	0	0	32	0	0	377	0	1	0	0	3	0
Lane Group Flow (vph)	0	699	25	0	1235	303	0	16	0	0	429	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		22.0	22.0		22.0	22.0		20.0			20.0	
Effective Green, g (s)		22.0	22.0		22.0	22.0		20.0			20.0	
Actuated g/C Ratio		0.44	0.44		0.44	0.44		0.40			0.40	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		1165	578		1282	592		519			417	
v/s Ratio Prot												
v/s Ratio Perm		0.26	0.02		c0.42	0.23		0.01			c0.41	
v/c Ratio		0.60	0.04		0.96	0.51		0.03			1.03	
Uniform Delay, d1		10.7	8.0		13.6	10.1		9.1			15.0	
Progression Factor		1.21	2.27		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.2	0.0		17.8	3.1		0.1			51.6	
Delay (s)		13.1	18.2		31.4	13.3		9.2			66.6	
Level of Service		B	B		C	B		A			E	
Approach Delay (s)		13.5			24.9			9.2			66.6	
Approach LOS		B			C			A			E	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	0	2	0	0	0	0	1706	0	0	980	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		0.99						1.00			1.00	
Flt Protected		0.96						1.00			1.00	
Satd. Flow (prot)		1534						3079			3064	
Flt Permitted		0.82						1.00			1.00	
Satd. Flow (perm)		1324						3079			3064	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	26	0	2	0	0	0	0	2007	0	0	1153	39
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	8	0	0	0	0	0	2007	0	0	1188	0
Turn Type	custom	NA						NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		397						1642			1634	
v/s Ratio Prot								c0.65			0.39	
v/s Ratio Perm		c0.01										
v/c Ratio		0.02						1.22			0.73	
Uniform Delay, d1		14.8						14.0			10.7	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.1						105.7			1.6	
Delay (s)		14.9						119.7			12.3	
Level of Service		B						F			B	
Approach Delay (s)		14.9			0.0			119.7			12.3	
Approach LOS		B			A			F			B	

Intersection Summary			
HCM 2000 Control Delay	79.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	185	319	1702	980	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3078	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3078	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	193	332	1773	1021	2
RTOR Reduction (vph)	0	62	0	0	0	0
Lane Group Flow (vph)	0	131	332	1773	1023	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		15.9	15.9	32.1	32.1	
Effective Green, g (s)		15.9	15.9	32.1	32.1	
Actuated g/C Ratio		0.27	0.27	0.55	0.55	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		384	422	1704	1703	
v/s Ratio Prot			c0.22	c0.58	0.33	
v/s Ratio Perm		0.09				
v/c Ratio		0.34	0.79	1.04	0.60	
Uniform Delay, d1		16.9	19.5	12.9	8.7	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5	9.3	33.1	0.6	
Delay (s)		17.4	28.8	46.1	9.3	
Level of Service		B	C	D	A	
Approach Delay (s)	17.4			43.4	9.3	
Approach LOS	B			D	A	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	158	979	1670	8	13	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3419		1711	1531
Flt Permitted	0.08	1.00	1.00		0.95	1.00
Satd. Flow (perm)	145	3421	3419		1711	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	172	1064	1815	9	14	350
RTOR Reduction (vph)	0	0	0	0	0	12
Lane Group Flow (vph)	172	1064	1824	0	14	338
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	90.4	90.4	75.4		1.6	12.6
Effective Green, g (s)	90.4	90.4	75.4		1.6	12.6
Actuated g/C Ratio	0.90	0.90	0.75		0.02	0.13
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	303	3092	2577		27	254
v/s Ratio Prot	0.06	0.31	c0.53		0.01	c0.15
v/s Ratio Perm	0.45					0.07
v/c Ratio	0.57	0.34	0.71		0.52	1.33
Uniform Delay, d1	16.3	0.7	6.5		48.8	43.7
Progression Factor	1.00	1.00	0.64		1.00	1.00
Incremental Delay, d2	2.4	0.3	0.2		15.8	172.9
Delay (s)	18.8	1.0	4.3		64.6	216.6
Level of Service	B	A	A		E	F
Approach Delay (s)		3.4	4.3		210.8	
Approach LOS		A	A		F	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	559	438	828	13	26	855
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1540	2887	2833		1347	1202
Flt Permitted	0.19	1.00	1.00		0.95	1.00
Satd. Flow (perm)	303	2887	2833		1347	1202
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	621	487	920	14	29	950
RTOR Reduction (vph)	0	0	1	0	0	3
Lane Group Flow (vph)	621	487	933	0	29	947
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	86.1	86.1	47.1		5.4	40.9
Effective Green, g (s)	86.1	86.1	47.1		5.4	40.9
Actuated g/C Ratio	0.86	0.86	0.47		0.05	0.41
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	693	2485	1334		72	539
v/s Ratio Prot	0.31	0.17	0.33		0.02	c0.61
v/s Ratio Perm	c0.46					0.17
v/c Ratio	0.90	0.20	0.70		0.40	1.76
Uniform Delay, d1	19.2	1.2	20.9		45.7	29.6
Progression Factor	0.96	0.96	1.40		1.00	1.00
Incremental Delay, d2	13.8	0.2	1.0		3.7	348.3
Delay (s)	32.2	1.3	30.1		49.4	377.8
Level of Service	C	A	C		D	F
Approach Delay (s)		18.6	30.1		368.1	
Approach LOS		B	C		F	

Intersection Summary			
HCM 2000 Control Delay	135.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	273	191	186	10	18	655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	0.86	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1323	2858	2800		1347	1204
Flt Permitted	0.57	1.00	1.00		0.95	1.00
Satd. Flow (perm)	790	2858	2800		1347	1204
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	208	202	11	20	712
RTOR Reduction (vph)	0	0	3	0	0	67
Lane Group Flow (vph)	297	208	210	0	20	645
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		8	5
Permitted Phases	2					8
Actuated Green, G (s)	88.5	88.5	44.5		3.5	43.5
Effective Green, g (s)	88.5	88.5	44.5		3.5	43.5
Actuated g/C Ratio	0.88	0.88	0.44		0.04	0.44
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	912	2529	1246		47	571
v/s Ratio Prot	0.13	0.07	0.08		0.01	c0.45
v/s Ratio Perm	c0.16					0.08
v/c Ratio	0.33	0.08	0.17		0.43	1.13
Uniform Delay, d1	1.0	0.7	16.7		47.3	28.2
Progression Factor	1.61	0.93	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.3		6.1	78.5
Delay (s)	1.8	0.7	16.9		53.4	106.8
Level of Service	A	A	B		D	F
Approach Delay (s)		1.3	16.9		105.3	
Approach LOS		A	B		F	

Intersection Summary			
HCM 2000 Control Delay	56.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Baseline Plus Project Conditions (Transit Improvements Scenario)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	290	34	166	274	349	121	581	177	382	222	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2990		1540	3079	1033	1540	2897		1540	2973	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2990		1540	3079	1033	1540	2897		1540	2973	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	56	293	34	168	277	353	122	587	179	386	224	30
RTOR Reduction (vph)	0	10	0	0	0	270	0	27	0	0	9	0
Lane Group Flow (vph)	56	317	0	168	277	83	122	739	0	386	245	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.7	18.4		10.0	20.7	20.7	12.1	36.5		15.1	39.5	
Effective Green, g (s)	7.7	18.4		10.0	20.7	20.7	12.1	36.5		15.1	39.5	
Actuated g/C Ratio	0.08	0.18		0.10	0.21	0.21	0.12	0.36		0.15	0.40	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	550		154	637	213	186	1057		232	1174	
v/s Ratio Prot	0.04	c0.11		c0.11	0.09		0.08	c0.25		c0.25	0.08	
v/s Ratio Perm						0.08						
v/c Ratio	0.47	0.58		1.09	0.43	0.39	0.66	0.70		1.66	0.21	
Uniform Delay, d1	44.2	37.2		45.0	34.6	34.2	42.0	27.1		42.5	19.9	
Progression Factor	1.00	1.00		0.83	0.82	2.18	0.87	1.58		0.99	0.76	
Incremental Delay, d2	3.0	1.5		94.5	0.4	1.0	7.6	3.6		315.7	0.4	
Delay (s)	47.2	38.7		131.7	28.6	75.7	44.2	46.4		357.8	15.6	
Level of Service	D	D		F	C	E	D	D		F	B	
Approach Delay (s)		40.0			71.1			46.1			222.0	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	94.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	541	38	11	601	275	15	2	0	325	23	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		1.00			0.98	
Flt Protected		1.00	1.00		1.00	1.00		0.96			0.96	
Satd. Flow (prot)		3035	1313		3076	1347		1551			1333	
Flt Permitted		0.86	1.00		0.94	1.00		0.77			0.75	
Satd. Flow (perm)		2624	1313		2902	1347		1246			1041	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	55	569	40	12	633	289	16	2	0	342	24	46
RTOR Reduction (vph)	0	0	24	0	0	173	0	0	0	0	9	0
Lane Group Flow (vph)	0	624	16	0	645	116	0	18	0	0	403	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Effective Green, g (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Actuated g/C Ratio		0.40	0.40		0.40	0.40		0.44			0.44	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		1049	525		1160	538		548			458	
v/s Ratio Prot												
v/s Ratio Perm		c0.24	0.01		0.22	0.09		0.01			c0.39	
v/c Ratio		0.59	0.03		0.56	0.21		0.03			0.88	
Uniform Delay, d1		11.8	9.1		11.6	9.8		8.0			12.8	
Progression Factor		1.22	1.98		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.2	0.0		1.9	0.9		0.1			20.8	
Delay (s)		14.7	18.0		13.5	10.8		8.1			33.6	
Level of Service		B	B		B	B		A			C	
Approach Delay (s)		14.9			12.7			8.1			33.6	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	0	0	0	0	0	1	782	0	0	873	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		1.00						1.00			1.00	
Flt Protected		0.95						1.00			1.00	
Satd. Flow (prot)		1540						3079			3075	
Flt Permitted		0.76						0.95			1.00	
Satd. Flow (perm)		1227						2939			3075	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	0	0	0	0	0	1	850	0	0	949	9
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	35	0	0	0	0	0	851	0	0	957	0
Turn Type	custom	NA					Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		368						1567			1640	
v/s Ratio Prot											c0.31	
v/s Ratio Perm		c0.03						0.29				
v/c Ratio		0.10						0.54			0.58	
Uniform Delay, d1		15.1						9.2			9.5	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.5						1.4			0.5	
Delay (s)		15.6						10.6			10.0	
Level of Service		B						B			B	
Approach Delay (s)		15.6			0.0			10.6			10.0	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	168	145	781	872	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3079	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3079	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	179	154	831	928	1
RTOR Reduction (vph)	0	73	0	0	0	0
Lane Group Flow (vph)	0	106	154	831	929	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		10.7	10.7	30.2	30.2	
Effective Green, g (s)		10.7	10.7	30.2	30.2	
Actuated g/C Ratio		0.21	0.21	0.59	0.59	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		294	323	1826	1826	
v/s Ratio Prot			c0.10	0.27	c0.30	
v/s Ratio Perm		0.08				
v/c Ratio		0.36	0.48	0.46	0.51	
Uniform Delay, d1		17.2	17.6	5.8	6.0	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8	1.1	0.8	0.2	
Delay (s)		17.9	18.8	6.6	6.3	
Level of Service		B	B	A	A	
Approach Delay (s)	17.9			8.5	6.3	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	50.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	192	836	744	14	10	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3412		1711	1531
Flt Permitted	0.30	1.00	1.00		0.95	1.00
Satd. Flow (perm)	545	3421	3412		1711	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	909	809	15	11	167
RTOR Reduction (vph)	0	0	1	0	0	154
Lane Group Flow (vph)	209	909	823	0	11	13
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					8
Actuated Green, G (s)	84.4	84.4	72.6		7.6	7.6
Effective Green, g (s)	84.4	84.4	72.6		7.6	7.6
Actuated g/C Ratio	0.84	0.84	0.73		0.08	0.08
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	550	2887	2477		130	116
v/s Ratio Prot	c0.03	0.27	0.24		0.01	
v/s Ratio Perm	c0.29					c0.01
v/c Ratio	0.38	0.31	0.33		0.08	0.11
Uniform Delay, d1	2.0	1.7	4.9		43.0	43.0
Progression Factor	1.00	1.00	0.68		1.00	1.00
Incremental Delay, d2	0.4	0.3	0.3		0.3	0.4
Delay (s)	2.4	1.9	3.7		43.2	43.5
Level of Service	A	A	A		D	D
Approach Delay (s)		2.0	3.7		43.5	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	438	413	492	30	13	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	0.96	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1484	2887	2763		1347	1202
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	561	2887	2763		1347	1202
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	509	480	572	35	15	315
RTOR Reduction (vph)	0	0	3	0	0	24
Lane Group Flow (vph)	509	480	604	0	15	291
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	88.3	88.3	57.5		3.2	30.5
Effective Green, g (s)	88.3	88.3	57.5		3.2	30.5
Actuated g/C Ratio	0.88	0.88	0.58		0.03	0.30
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	742	2549	1588		43	414
v/s Ratio Prot	0.18	0.17	0.22		0.01	c0.19
v/s Ratio Perm	c0.42					0.05
v/c Ratio	0.69	0.19	0.38		0.35	0.70
Uniform Delay, d1	2.9	0.8	11.6		47.4	30.8
Progression Factor	0.59	0.25	0.92		1.00	1.00
Incremental Delay, d2	2.6	0.2	0.7		4.9	5.4
Delay (s)	4.3	0.4	11.3		52.2	36.1
Level of Service	A	A	B		D	D
Approach Delay (s)		2.4	11.3		36.8	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	304	122	195	15	13	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	0.97
Flpb, ped/bikes	0.86	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1324	2858	2770		1347	1166
Flt Permitted	0.57	1.00	1.00		0.95	1.00
Satd. Flow (perm)	801	2858	2770		1347	1166
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	330	133	212	16	14	355
RTOR Reduction (vph)	0	0	3	0	0	317
Lane Group Flow (vph)	330	133	225	0	14	38
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)	81.4	81.4	66.1		10.6	10.6
Effective Green, g (s)	81.4	81.4	66.1		10.6	10.6
Actuated g/C Ratio	0.81	0.81	0.66		0.11	0.11
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	711	2326	1830		142	123
v/s Ratio Prot	c0.05	0.05	0.08		0.01	
v/s Ratio Perm	c0.33					c0.03
v/c Ratio	0.46	0.06	0.12		0.10	0.31
Uniform Delay, d1	2.4	1.8	6.3		40.4	41.3
Progression Factor	1.23	0.96	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.0	0.1		0.3	1.4
Delay (s)	3.5	1.8	6.4		40.7	42.7
Level of Service	A	A	A		D	D
Approach Delay (s)		3.0	6.4		42.6	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	307	32	206	330	382	110	391	217	419	441	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.96		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2999		1540	3079	1035	1540	2803		1540	3025	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2999		1540	3079	1035	1540	2803		1540	3025	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	40	337	35	226	363	420	121	430	238	460	485	31
RTOR Reduction (vph)	0	9	0	0	0	288	0	77	0	0	4	0
Lane Group Flow (vph)	40	363	0	226	363	132	121	591	0	460	512	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.0	21.0		10.0	26.0	26.0	12.1	31.1		17.9	36.9	
Effective Green, g (s)	5.0	21.0		10.0	26.0	26.0	12.1	31.1		17.9	36.9	
Actuated g/C Ratio	0.05	0.21		0.10	0.26	0.26	0.12	0.31		0.18	0.37	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	77	629		154	800	269	186	871		275	1116	
v/s Ratio Prot	0.03	c0.12		c0.15	0.12		0.08	c0.21		c0.30	0.17	
v/s Ratio Perm						0.13						
v/c Ratio	0.52	0.58		1.47	0.45	0.49	0.65	0.68		1.67	0.46	
Uniform Delay, d1	46.3	35.5		45.0	31.0	31.4	41.9	30.1		41.0	24.0	
Progression Factor	1.00	1.00		0.86	0.85	2.04	0.90	1.59		1.00	0.85	
Incremental Delay, d2	5.8	1.3		238.6	0.4	1.2	7.4	4.0		317.1	1.3	
Delay (s)	52.1	36.8		277.1	26.7	65.2	45.0	51.8		357.9	21.6	
Level of Service	D	D		F	C	E	D	D		F	C	
Approach Delay (s)		38.3			98.8			50.7			180.1	
Approach LOS		D			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	104.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	637	54	12	717	342	10	4	2	353	31	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.98			0.99	
Flt Protected		1.00	1.00		1.00	1.00		0.97			0.96	
Satd. Flow (prot)		3043	1313		3076	1347		1541			1344	
Flt Permitted		0.92	1.00		0.94	1.00		0.83			0.74	
Satd. Flow (perm)		2795	1313		2900	1347		1313			1037	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	671	57	13	755	360	11	4	2	372	33	17
RTOR Reduction (vph)	0	0	34	0	0	216	0	1	0	0	3	0
Lane Group Flow (vph)	0	696	23	0	768	144	0	16	0	0	419	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Effective Green, g (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Actuated g/C Ratio		0.40	0.40		0.40	0.40		0.44			0.44	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		1118	525		1160	538		577			456	
v/s Ratio Prot												
v/s Ratio Perm		0.25	0.02		c0.26	0.11		0.01			c0.40	
v/c Ratio		0.62	0.04		0.66	0.27		0.03			0.92	
Uniform Delay, d1		12.0	9.2		12.2	10.1		7.9			13.2	
Progression Factor		1.25	2.25		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.2	0.0		3.0	1.2		0.1			26.1	
Delay (s)		15.2	20.6		15.2	11.3		8.0			39.3	
Level of Service		B	C		B	B		A			D	
Approach Delay (s)		15.6			14.0			8.0			39.3	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	0	2	0	0	0	0	953	0	0	967	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		0.99						1.00			1.00	
Flt Protected		0.96						1.00			1.00	
Satd. Flow (prot)		1534						3079			3064	
Flt Permitted		0.82						1.00			1.00	
Satd. Flow (perm)		1324						3079			3064	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	26	0	2	0	0	0	0	1121	0	0	1138	39
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	8	0	0	0	0	0	1121	0	0	1173	0
Turn Type	custom	NA						NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		397						1642			1634	
v/s Ratio Prot								0.36			c0.38	
v/s Ratio Perm		c0.01										
v/c Ratio		0.02						0.68			0.72	
Uniform Delay, d1		14.8						10.3			10.6	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.1						2.3			1.5	
Delay (s)		14.9						12.6			12.1	
Level of Service		B						B			B	
Approach Delay (s)		14.9			0.0			12.6			12.1	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	183	186	949	967	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3078	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3078	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	191	194	989	1007	2
RTOR Reduction (vph)	0	63	0	0	0	0
Lane Group Flow (vph)	0	128	194	989	1009	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		11.9	11.9	31.2	31.2	
Effective Green, g (s)		11.9	11.9	31.2	31.2	
Actuated g/C Ratio		0.22	0.22	0.59	0.59	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		314	345	1809	1808	
v/s Ratio Prot			c0.13	0.32	c0.33	
v/s Ratio Perm		0.09				
v/c Ratio		0.41	0.56	0.55	0.56	
Uniform Delay, d1		17.6	18.3	6.7	6.7	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.9	2.1	1.2	0.4	
Delay (s)		18.5	20.4	7.8	7.1	
Level of Service		B	C	A	A	
Approach Delay (s)	18.5			9.9	7.1	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	176	946	939	9	10	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3416		1711	1531
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	422	3421	3416		1711	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	1028	1021	10	11	182
RTOR Reduction (vph)	0	0	0	0	0	168
Lane Group Flow (vph)	191	1028	1031	0	11	14
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					8
Actuated Green, G (s)	84.3	84.3	72.3		7.7	7.7
Effective Green, g (s)	84.3	84.3	72.3		7.7	7.7
Actuated g/C Ratio	0.84	0.84	0.72		0.08	0.08
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	458	2883	2469		131	117
v/s Ratio Prot	c0.03	0.30	0.30		0.01	
v/s Ratio Perm	c0.32					c0.01
v/c Ratio	0.42	0.36	0.42		0.08	0.12
Uniform Delay, d1	2.5	1.8	5.5		42.9	43.0
Progression Factor	1.00	1.00	0.56		1.00	1.00
Incremental Delay, d2	0.6	0.3	0.4		0.3	0.5
Delay (s)	3.2	2.1	3.4		43.2	43.5
Level of Service	A	A	A		D	D
Approach Delay (s)		2.3	3.4		43.4	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	427	534	482	10	16	471
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	0.96	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1482	2887	2824		1347	1203
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	565	2887	2824		1347	1203
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	474	593	536	11	18	523
RTOR Reduction (vph)	0	0	1	0	0	16
Lane Group Flow (vph)	474	593	546	0	18	507
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	88.1	88.1	48.0		3.4	40.0
Effective Green, g (s)	88.1	88.1	48.0		3.4	40.0
Actuated g/C Ratio	0.88	0.88	0.48		0.03	0.40
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	828	2543	1355		45	529
v/s Ratio Prot	0.21	0.21	0.19		0.01	c0.35
v/s Ratio Perm	c0.30					0.08
v/c Ratio	0.57	0.23	0.40		0.40	0.96
Uniform Delay, d1	2.6	0.9	16.8		47.3	29.2
Progression Factor	0.58	0.53	0.94		1.00	1.00
Incremental Delay, d2	0.9	0.2	0.8		5.7	28.5
Delay (s)	2.4	0.7	16.6		53.0	57.7
Level of Service	A	A	B		D	E
Approach Delay (s)		1.4	16.6		57.5	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	372	178	184	12	12	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	0.97
Flpb, ped/bikes	0.86	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1317	2858	2785		1347	1165
Flt Permitted	0.58	1.00	1.00		0.95	1.00
Satd. Flow (perm)	807	2858	2785		1347	1165
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	404	193	200	13	13	335
RTOR Reduction (vph)	0	0	2	0	0	300
Lane Group Flow (vph)	404	193	211	0	13	35
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)	81.7	81.7	64.8		10.3	10.3
Effective Green, g (s)	81.7	81.7	64.8		10.3	10.3
Actuated g/C Ratio	0.82	0.82	0.65		0.10	0.10
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	725	2334	1804		138	119
v/s Ratio Prot	c0.07	0.07	0.08		0.01	
v/s Ratio Perm	c0.38					c0.03
v/c Ratio	0.56	0.08	0.12		0.09	0.29
Uniform Delay, d1	2.6	1.8	6.7		40.6	41.5
Progression Factor	1.85	0.96	1.00		1.00	1.00
Incremental Delay, d2	0.9	0.1	0.1		0.3	1.4
Delay (s)	5.7	1.8	6.8		40.9	42.8
Level of Service	A	A	A		D	D
Approach Delay (s)		4.4	6.8		42.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Baseline Plus Variant Conditions (Transit Improvements Scenario)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	350	34	147	257	323	121	581	286	540	222	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.96		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	3004		1540	3079	1033	1540	2824		1540	2973	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	3004		1540	3079	1033	1540	2824		1540	2973	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	56	354	34	148	260	326	122	587	289	545	224	30
RTOR Reduction (vph)	0	8	0	0	0	260	0	56	0	0	9	0
Lane Group Flow (vph)	56	380	0	148	260	66	122	820	0	545	245	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	9.7	19.8		10.0	20.1	20.1	12.1	37.7		12.5	38.1	
Effective Green, g (s)	9.7	19.8		10.0	20.1	20.1	12.1	37.7		12.5	38.1	
Actuated g/C Ratio	0.10	0.20		0.10	0.20	0.20	0.12	0.38		0.12	0.38	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	149	594		154	618	207	186	1064		192	1132	
v/s Ratio Prot	0.04	c0.13		c0.10	0.08		0.08	c0.29		c0.35	0.08	
v/s Ratio Perm						0.06						
v/c Ratio	0.38	0.64		0.96	0.42	0.32	0.66	0.77		2.84	0.22	
Uniform Delay, d1	42.3	36.8		44.8	34.9	34.1	42.0	27.4		43.8	20.9	
Progression Factor	1.00	1.00		0.82	0.83	2.29	0.90	1.58		1.00	0.78	
Incremental Delay, d2	1.6	2.3		56.8	0.4	0.8	7.7	5.2		840.5	0.4	
Delay (s)	43.9	39.1		93.6	29.2	78.8	45.7	48.3		884.1	16.7	
Level of Service	D	D		F	C	E	D	D		F	B	
Approach Delay (s)		39.7			64.2			48.0			608.3	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	201.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	111.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	869	38	11	540	242	15	2	0	522	49	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		1.00			0.99	
Flt Protected		1.00	1.00		1.00	1.00		0.96			0.96	
Satd. Flow (prot)		3040	1313		3076	1347		1551			1340	
Flt Permitted		0.89	1.00		0.93	1.00		0.72			0.75	
Satd. Flow (perm)		2727	1313		2871	1347		1171			1042	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	55	915	40	12	568	255	16	2	0	549	52	46
RTOR Reduction (vph)	0	0	24	0	0	153	0	0	0	0	6	0
Lane Group Flow (vph)	0	970	16	0	580	102	0	18	0	0	641	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Effective Green, g (s)		20.0	20.0		20.0	20.0		22.0			22.0	
Actuated g/C Ratio		0.40	0.40		0.40	0.40		0.44			0.44	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		1090	525		1148	538		515			458	
v/s Ratio Prot												
v/s Ratio Perm		c0.36	0.01		0.20	0.08		0.02			c0.62	
v/c Ratio		0.89	0.03		0.51	0.19		0.03			1.40	
Uniform Delay, d1		14.0	9.1		11.3	9.7		8.0			14.0	
Progression Factor		1.51	2.10		1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.2	0.0		1.6	0.8		0.1			193.0	
Delay (s)		22.3	19.1		12.9	10.5		8.1			207.0	
Level of Service		C	B		B	B		A			F	
Approach Delay (s)		22.2			12.2			8.1			207.0	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	66.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	0	0	0	0	0	1	688	0	0	1429	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		1.00						1.00			1.00	
Flt Protected		0.95						1.00			1.00	
Satd. Flow (prot)		1540						3079			3076	
Flt Permitted		0.76						0.95			1.00	
Satd. Flow (perm)		1227						2936			3076	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	0	0	0	0	0	1	748	0	0	1553	9
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	35	0	0	0	0	0	749	0	0	1562	0
Turn Type	custom	NA					Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		368						1565			1640	
v/s Ratio Prot											c0.51	
v/s Ratio Perm		c0.03						0.26				
v/c Ratio		0.10						0.48			0.95	
Uniform Delay, d1		15.1						8.8			13.3	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.5						1.1			12.7	
Delay (s)		15.6						9.8			25.9	
Level of Service		B						A			C	
Approach Delay (s)		15.6			0.0			9.8			25.9	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	266	128	687	1428	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3079	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3079	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	283	136	731	1519	1
RTOR Reduction (vph)	0	17	0	0	0	0
Lane Group Flow (vph)	0	266	136	731	1520	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		14.6	14.6	32.1	32.1	
Effective Green, g (s)		14.6	14.6	32.1	32.1	
Actuated g/C Ratio		0.26	0.26	0.57	0.57	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		361	396	1743	1743	
v/s Ratio Prot			0.09	0.24	c0.49	
v/s Ratio Perm		c0.19				
v/c Ratio		0.74	0.34	0.42	0.87	
Uniform Delay, d1		19.3	17.1	7.0	10.5	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		7.6	0.5	0.7	5.1	
Delay (s)		26.9	17.7	7.7	15.7	
Level of Service		C	B	A	B	
Approach Delay (s)	26.9			9.3	15.7	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	314	1368	661	16	9	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3409		1711	1531
Flt Permitted	0.34	1.00	1.00		0.95	1.00
Satd. Flow (perm)	615	3421	3409		1711	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	1487	718	17	10	137
RTOR Reduction (vph)	0	0	1	0	0	67
Lane Group Flow (vph)	341	1487	734	0	10	70
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	90.5	90.5	75.9		1.5	12.1
Effective Green, g (s)	90.5	90.5	75.9		1.5	12.1
Actuated g/C Ratio	0.90	0.90	0.76		0.02	0.12
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	672	3096	2587		25	246
v/s Ratio Prot	0.05	c0.43	0.22		0.01	c0.03
v/s Ratio Perm	c0.40					0.02
v/c Ratio	0.51	0.48	0.28		0.40	0.29
Uniform Delay, d1	1.0	0.8	3.7		48.8	40.0
Progression Factor	1.00	1.00	0.54		1.00	1.00
Incremental Delay, d2	0.6	0.5	0.2		10.2	0.6
Delay (s)	1.6	1.3	2.2		59.0	40.7
Level of Service	A	A	A		E	D
Approach Delay (s)		1.4	2.2		41.9	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	3.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	665	717	405	34	13	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes	0.96	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1477	2887	2728		1347	1204
Flt Permitted	0.37	1.00	1.00		0.95	1.00
Satd. Flow (perm)	575	2887	2728		1347	1204
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	773	834	471	40	15	322
RTOR Reduction (vph)	0	0	4	0	0	14
Lane Group Flow (vph)	773	834	507	0	15	308
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	88.3	88.3	44.3		3.2	43.7
Effective Green, g (s)	88.3	88.3	44.3		3.2	43.7
Actuated g/C Ratio	0.88	0.88	0.44		0.03	0.44
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	868	2549	1208		43	574
v/s Ratio Prot	c0.36	0.29	0.19		0.01	c0.21
v/s Ratio Perm	c0.43					0.04
v/c Ratio	0.89	0.33	0.42		0.35	0.54
Uniform Delay, d1	10.1	1.0	19.1		47.4	20.7
Progression Factor	0.93	0.61	1.20		1.00	1.00
Incremental Delay, d2	10.6	0.3	1.0		4.9	1.0
Delay (s)	20.0	0.9	23.9		52.2	21.7
Level of Service	B	A	C		D	C
Approach Delay (s)		10.1	23.9		23.0	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	609	121	201	21	11	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96		1.00	1.00
Flpb, ped/bikes	0.86	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1331	2858	2728		1347	1203
Flt Permitted	0.57	1.00	1.00		0.95	1.00
Satd. Flow (perm)	794	2858	2728		1347	1203
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	662	132	218	23	12	259
RTOR Reduction (vph)	0	0	4	0	0	83
Lane Group Flow (vph)	662	132	237	0	12	176
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		8	5
Permitted Phases	2					8
Actuated Green, G (s)	90.3	90.3	64.5		1.7	23.5
Effective Green, g (s)	90.3	90.3	64.5		1.7	23.5
Actuated g/C Ratio	0.90	0.90	0.64		0.02	0.24
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	834	2580	1759		22	330
v/s Ratio Prot	c0.17	0.05	0.09		0.01	c0.12
v/s Ratio Perm	c0.54					0.03
v/c Ratio	0.79	0.05	0.13		0.55	0.53
Uniform Delay, d1	1.3	0.5	6.9		48.8	33.4
Progression Factor	2.98	0.99	1.00		1.00	1.00
Incremental Delay, d2	5.1	0.0	0.2		24.9	1.6
Delay (s)	9.0	0.5	7.1		73.6	35.1
Level of Service	A	A	A		E	D
Approach Delay (s)		7.6	7.1		36.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	291	32	320	392	548	110	391	201	398	441	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.96		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2995		1540	3079	1036	1540	2816		1540	3025	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2995		1540	3079	1036	1540	2816		1540	3025	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	40	320	35	352	431	602	121	430	221	437	485	31
RTOR Reduction (vph)	0	8	0	0	0	276	0	69	0	0	5	0
Lane Group Flow (vph)	40	347	0	352	431	326	121	582	0	437	511	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	4.8	24.0		10.0	29.2	29.2	11.1	28.8		17.2	34.9	
Effective Green, g (s)	4.8	24.0		10.0	29.2	29.2	11.1	28.8		17.2	34.9	
Actuated g/C Ratio	0.05	0.24		0.10	0.29	0.29	0.11	0.29		0.17	0.35	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	73	718		154	899	302	170	811		264	1055	
v/s Ratio Prot	0.03	c0.12		c0.23	0.14		0.08	c0.21		c0.28	0.17	
v/s Ratio Perm						c0.31						
v/c Ratio	0.55	0.48		2.29	0.48	1.08	0.71	0.72		1.66	0.48	
Uniform Delay, d1	46.5	32.7		45.0	29.1	35.4	42.9	31.9		41.4	25.5	
Progression Factor	1.00	1.00		0.91	0.88	1.67	0.94	1.56		1.00	0.87	
Incremental Delay, d2	8.2	0.5		591.5	0.3	64.3	12.4	5.1		310.0	1.5	
Delay (s)	54.7	33.2		632.5	25.8	123.4	52.8	55.0		351.2	23.6	
Level of Service	D	C		F	C	F	D	D		F	C	
Approach Delay (s)		35.4			222.4			54.6			173.8	
Approach LOS		D			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	151.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	110.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	584	54	12	1059	576	10	4	2	319	38	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.98			0.99	
Flt Protected		1.00	1.00		1.00	1.00		0.97			0.96	
Satd. Flow (prot)		3042	1313		3077	1347		1541			1345	
Flt Permitted		0.89	1.00		0.95	1.00		0.83			0.74	
Satd. Flow (perm)		2701	1313		2915	1347		1316			1045	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	615	57	13	1115	606	11	4	2	336	40	17
RTOR Reduction (vph)	0	0	33	0	0	351	0	1	0	0	3	0
Lane Group Flow (vph)	0	640	24	0	1128	255	0	16	0	0	390	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		21.0	21.0		21.0	21.0		21.0			21.0	
Effective Green, g (s)		21.0	21.0		21.0	21.0		21.0			21.0	
Actuated g/C Ratio		0.42	0.42		0.42	0.42		0.42			0.42	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		1134	551		1224	565		552			438	
v/s Ratio Prot												
v/s Ratio Perm		0.24	0.02		c0.39	0.19		0.01			c0.37	
v/c Ratio		0.56	0.04		0.92	0.45		0.03			0.89	
Uniform Delay, d1		11.0	8.6		13.7	10.4		8.5			13.4	
Progression Factor		1.18	2.20		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.2	0.0		12.7	2.6		0.1			22.7	
Delay (s)		13.2	18.9		26.4	13.0		8.6			36.1	
Level of Service		B	B		C	B		A			D	
Approach Delay (s)		13.6			21.7			8.6			36.1	
Approach LOS		B			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	0	2	0	0	0	0	1534	0	0	888	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		0.99						1.00			0.99	
Flt Protected		0.96						1.00			1.00	
Satd. Flow (prot)		1534						3079			3063	
Flt Permitted		0.82						1.00			1.00	
Satd. Flow (perm)		1324						3079			3063	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	26	0	2	0	0	0	0	1805	0	0	1045	39
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	8	0	0	0	0	0	1805	0	0	1080	0
Turn Type	custom	NA						NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		397						1642			1633	
v/s Ratio Prot								c0.59			0.35	
v/s Ratio Perm		c0.01										
v/c Ratio		0.02						1.10			0.66	
Uniform Delay, d1		14.8						14.0			10.1	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.1						54.6			1.0	
Delay (s)		14.9						68.6			11.1	
Level of Service		B						E			B	
Approach Delay (s)		14.9			0.0			68.6			11.1	
Approach LOS		B			A			E			B	

Intersection Summary			
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	169	288	1530	888	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3078	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3078	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	176	300	1594	925	2
RTOR Reduction (vph)	0	81	0	0	0	0
Lane Group Flow (vph)	0	95	300	1594	927	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		14.9	14.9	32.1	32.1	
Effective Green, g (s)		14.9	14.9	32.1	32.1	
Actuated g/C Ratio		0.26	0.26	0.56	0.56	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		366	402	1733	1733	
v/s Ratio Prot			c0.19	c0.52	0.30	
v/s Ratio Perm		0.07				
v/c Ratio		0.26	0.75	0.92	0.53	
Uniform Delay, d1		16.7	19.3	11.3	7.8	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4	7.4	9.4	0.3	
Delay (s)		17.1	26.7	20.7	8.1	
Level of Service		B	C	C	A	
Approach Delay (s)	17.1			21.7	8.1	
Approach LOS	B			C	A	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	142	887	1503	8	12	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3418		1711	1531
Flt Permitted	0.10	1.00	1.00		0.95	1.00
Satd. Flow (perm)	184	3421	3418		1711	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	154	964	1634	9	13	311
RTOR Reduction (vph)	0	0	0	0	0	16
Lane Group Flow (vph)	154	964	1643	0	13	295
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	90.4	90.4	73.4		1.6	14.6
Effective Green, g (s)	90.4	90.4	73.4		1.6	14.6
Actuated g/C Ratio	0.90	0.90	0.73		0.02	0.15
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	364	3092	2508		27	284
v/s Ratio Prot	0.05	0.28	c0.48		0.01	c0.13
v/s Ratio Perm	0.33					0.06
v/c Ratio	0.42	0.31	0.65		0.48	1.04
Uniform Delay, d1	7.6	0.6	6.8		48.8	42.7
Progression Factor	1.00	1.00	0.53		1.00	1.00
Incremental Delay, d2	0.8	0.3	0.1		12.9	63.6
Delay (s)	8.3	0.9	3.7		61.7	106.3
Level of Service	A	A	A		E	F
Approach Delay (s)		1.9	3.7		104.5	
Approach LOS		A	A		F	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	498	406	754	12	22	762
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1540	2887	2832		1347	1203
Flt Permitted	0.22	1.00	1.00		0.95	1.00
Satd. Flow (perm)	352	2887	2832		1347	1203
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	553	451	838	13	24	847
RTOR Reduction (vph)	0	0	1	0	0	3
Lane Group Flow (vph)	553	451	850	0	24	844
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	87.9	87.9	46.9		3.6	41.1
Effective Green, g (s)	87.9	87.9	46.9		3.6	41.1
Actuated g/C Ratio	0.88	0.88	0.47		0.04	0.41
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	748	2537	1328		48	542
v/s Ratio Prot	0.27	0.16	0.30		0.02	c0.58
v/s Ratio Perm	c0.38					0.13
v/c Ratio	0.74	0.18	0.64		0.50	1.56
Uniform Delay, d1	13.1	0.9	20.2		47.3	29.4
Progression Factor	0.94	0.97	1.39		1.00	1.00
Incremental Delay, d2	3.8	0.1	1.3		8.0	259.7
Delay (s)	16.2	1.0	29.2		55.3	289.2
Level of Service	B	A	C		E	F
Approach Delay (s)		9.3	29.2		282.7	
Approach LOS		A	C		F	

Intersection Summary			
HCM 2000 Control Delay	102.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	242	186	185	10	18	581
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	0.86	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1322	2858	2800		1347	1204
Flt Permitted	0.57	1.00	1.00		0.95	1.00
Satd. Flow (perm)	792	2858	2800		1347	1204
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	263	202	201	11	20	632
RTOR Reduction (vph)	0	0	3	0	0	69
Lane Group Flow (vph)	263	202	209	0	20	563
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		8	5
Permitted Phases	2					8
Actuated Green, G (s)	88.5	88.5	45.4		3.5	42.6
Effective Green, g (s)	88.5	88.5	45.4		3.5	42.6
Actuated g/C Ratio	0.88	0.88	0.45		0.04	0.43
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	908	2529	1271		47	561
v/s Ratio Prot	0.11	0.07	0.07		0.01	c0.39
v/s Ratio Perm	c0.14					0.08
v/c Ratio	0.29	0.08	0.16		0.43	1.00
Uniform Delay, d1	0.9	0.7	16.1		47.3	28.7
Progression Factor	1.36	0.93	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.3		6.1	38.9
Delay (s)	1.5	0.7	16.4		53.4	67.6
Level of Service	A	A	B		D	E
Approach Delay (s)		1.1	16.4		67.2	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	36.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Cumulative Conditions (No Project)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	870	40	50	760	190	260	970	70	270	230	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	3042		1540	3079	1035	1540	3026		1540	2892	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	3042		1540	3079	1035	1540	3026		1540	2892	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	101	879	40	51	768	192	263	980	71	273	232	61
RTOR Reduction (vph)	0	3	0	0	0	137	0	5	0	0	24	0
Lane Group Flow (vph)	101	916	0	51	768	55	263	1046	0	273	269	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	8.0	29.2		4.8	26.0	26.0	19.7	34.0		12.0	26.3	
Effective Green, g (s)	8.0	29.2		4.8	26.0	26.0	19.7	34.0		12.0	26.3	
Actuated g/C Ratio	0.08	0.29		0.05	0.26	0.26	0.20	0.34		0.12	0.26	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	123	888		73	800	269	303	1028		184	760	
v/s Ratio Prot	0.07	c0.30		0.03	c0.25		0.17	c0.35		c0.18	0.09	
v/s Ratio Perm						0.05						
v/c Ratio	0.82	1.03		0.70	0.96	0.20	0.87	1.02		1.48	0.35	
Uniform Delay, d1	45.3	35.4		46.9	36.5	28.9	38.9	33.0		44.0	30.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.12	1.27		1.01	0.94	
Incremental Delay, d2	33.7	38.6		25.3	22.2	0.4	21.8	32.2		242.5	1.2	
Delay (s)	79.0	74.0		72.1	58.7	29.3	65.2	74.1		286.9	29.4	
Level of Service	E	E		E	E	C	E	E		F	C	
Approach Delay (s)		74.5			53.8			72.3			153.6	
Approach LOS		E			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	79.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	760	40	20	710	30	40	10	10	20	20	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		0.99	1.00	
Frt		1.00	0.85		1.00	0.85		0.98		1.00	0.88	
Flt Protected		0.99	1.00		1.00	1.00		0.97		0.95	1.00	
Satd. Flow (prot)		3017	1307		3075	1344		1525		1336	1238	
Flt Permitted		0.63	1.00		0.91	1.00		0.81		0.75	1.00	
Satd. Flow (perm)		1916	1307		2816	1344		1277		1054	1238	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	800	42	21	747	32	42	11	11	21	21	74
RTOR Reduction (vph)	0	0	16	0	0	12	0	8	0	0	53	0
Lane Group Flow (vph)	0	1000	26	0	768	20	0	56	0	21	42	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		56.0	56.0		56.0	56.0		26.0		26.0	26.0	
Effective Green, g (s)		56.0	56.0		56.0	56.0		26.0		26.0	26.0	
Actuated g/C Ratio		0.62	0.62		0.62	0.62		0.29		0.29	0.29	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Grp Cap (vph)		1192	813		1752	836		368		304	357	
v/s Ratio Prot											0.03	
v/s Ratio Perm		c0.52	0.02		0.27	0.01		c0.04		0.02		
v/c Ratio		0.84	0.03		0.44	0.02		0.15		0.07	0.12	
Uniform Delay, d1		13.4	6.6		8.8	6.5		23.8		23.2	23.6	
Progression Factor		1.00	1.00		1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		7.2	0.1		0.8	0.1		0.9		0.4	0.7	
Delay (s)		20.6	6.6		9.6	6.6		24.7		23.7	24.2	
Level of Service		C	A		A	A		C		C	C	
Approach Delay (s)		20.0			9.5			24.7			24.1	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	0	0	0	0	0	0	640	0	0	810	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		1.00						1.00			1.00	
Flt Protected		0.95						1.00			1.00	
Satd. Flow (prot)		1540						3079			3068	
Flt Permitted		0.76						1.00			1.00	
Satd. Flow (perm)		1227						3079			3068	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	0	0	0	0	0	0	674	0	0	853	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	11	0	0	0	0	0	674	0	0	871	0
Turn Type	custom	NA						NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		368						1642			1636	
v/s Ratio Prot								0.22			c0.28	
v/s Ratio Perm		c0.01										
v/c Ratio		0.03						0.41			0.53	
Uniform Delay, d1		14.8						8.4			9.1	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.2						0.8			0.3	
Delay (s)		15.0						9.1			9.5	
Level of Service		B						A			A	
Approach Delay (s)		15.0			0.0			9.1			9.5	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	30	40	640	800	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3073	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3073	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	32	42	674	842	11
RTOR Reduction (vph)	0	28	0	0	1	0
Lane Group Flow (vph)	0	4	42	674	852	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		6.2	6.2	38.2	38.2	
Effective Green, g (s)		6.2	6.2	38.2	38.2	
Actuated g/C Ratio		0.11	0.11	0.70	0.70	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		159	175	2162	2157	
v/s Ratio Prot			c0.03	0.22	c0.28	
v/s Ratio Perm		0.00				
v/c Ratio		0.02	0.24	0.31	0.40	
Uniform Delay, d1		21.4	22.0	3.1	3.3	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1	0.7	0.4	0.1	
Delay (s)		21.5	22.7	3.5	3.5	
Level of Service		C	C	A	A	
Approach Delay (s)	21.5			4.6	3.5	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	820	670	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3413		1711	1531
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	653	3421	3413		1711	1531
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	863	705	11	11	11
RTOR Reduction (vph)	0	0	0	0	0	11
Lane Group Flow (vph)	11	863	716	0	11	0
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					8
Actuated Green, G (s)	90.5	90.5	85.3		1.5	1.5
Effective Green, g (s)	90.5	90.5	85.3		1.5	1.5
Actuated g/C Ratio	0.90	0.90	0.85		0.02	0.02
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	603	3096	2911		25	22
v/s Ratio Prot	0.00	c0.25	0.21		c0.01	
v/s Ratio Perm	0.02					0.00
v/c Ratio	0.02	0.28	0.25		0.44	0.01
Uniform Delay, d1	0.5	0.6	1.4		48.8	48.5
Progression Factor	1.00	1.00	0.08		1.00	1.00
Incremental Delay, d2	0.0	0.2	0.2		11.9	0.1
Delay (s)	0.5	0.8	0.3		60.7	48.7
Level of Service	A	A	A		E	D
Approach Delay (s)		0.8	0.3		54.7	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	1.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	830	670	10	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	0.96	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1477	2887	2832		1347	1182
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	558	2887	2832		1347	1182
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	874	705	11	11	21
RTOR Reduction (vph)	0	0	1	0	0	20
Lane Group Flow (vph)	11	874	715	0	11	1
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	89.9	89.9	82.4		1.6	5.6
Effective Green, g (s)	89.9	89.9	82.4		1.6	5.6
Actuated g/C Ratio	0.90	0.90	0.82		0.02	0.06
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	533	2595	2333		21	113
v/s Ratio Prot	0.00	c0.30	0.25		c0.01	0.00
v/s Ratio Perm	0.02					0.00
v/c Ratio	0.02	0.34	0.31		0.52	0.01
Uniform Delay, d1	0.6	0.7	2.1		48.8	44.6
Progression Factor	0.99	0.90	0.31		1.00	1.00
Incremental Delay, d2	0.0	0.3	0.3		21.6	0.0
Delay (s)	0.6	1.0	1.0		70.4	44.6
Level of Service	A	A	A		E	D
Approach Delay (s)		1.0	1.0		53.5	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	2.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	830	670	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.91
Flpb, ped/bikes	0.96	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1476	2858	2861		1347	1102
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	561	2858	2861		1347	1102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	874	705	11	11	11
RTOR Reduction (vph)	0	0	0	0	0	11
Lane Group Flow (vph)	11	874	716	0	11	0
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)	89.0	89.0	83.8		3.0	3.0
Effective Green, g (s)	89.0	89.0	83.8		3.0	3.0
Actuated g/C Ratio	0.89	0.89	0.84		0.03	0.03
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	510	2543	2397		40	33
v/s Ratio Prot	0.00	c0.31	0.25		c0.01	
v/s Ratio Perm	0.02					0.00
v/c Ratio	0.02	0.34	0.30		0.28	0.01
Uniform Delay, d1	0.7	0.9	1.7		47.4	47.1
Progression Factor	1.00	0.97	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.4	0.3		3.7	0.1
Delay (s)	0.7	1.2	2.1		51.1	47.2
Level of Service	A	A	A		D	D
Approach Delay (s)		1.2	2.1		49.2	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	2.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	680	100	60	840	250	240	710	60	200	750	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.86	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2971		1540	3079	1036	1540	3018		1540	3002	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2971		1540	3079	1036	1540	3018		1540	3002	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	716	105	63	884	263	253	747	63	211	789	74
RTOR Reduction (vph)	0	11	0	0	0	134	0	6	0	0	7	0
Lane Group Flow (vph)	105	810	0	63	884	129	253	804	0	211	856	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	6.0	29.4		5.6	29.0	29.0	16.0	30.8		14.2	29.0	
Effective Green, g (s)	6.0	29.4		5.6	29.0	29.0	16.0	30.8		14.2	29.0	
Actuated g/C Ratio	0.06	0.29		0.06	0.29	0.29	0.16	0.31		0.14	0.29	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	92	873		86	892	300	246	929		218	870	
v/s Ratio Prot	0.07	c0.27		0.04	c0.29		c0.16	0.27		0.14	c0.29	
v/s Ratio Perm						0.12						
v/c Ratio	1.14	0.93		0.73	0.99	0.43	1.03	0.87		0.97	0.98	
Uniform Delay, d1	47.0	34.3		46.5	35.4	28.8	42.0	32.6		42.7	35.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.10	1.41		1.00	1.00	
Incremental Delay, d2	137.0	15.6		27.2	27.8	1.0	63.9	10.3		49.1	25.7	
Delay (s)	184.0	49.8		73.7	63.2	29.8	110.3	56.1		91.8	61.1	
Level of Service	F	D		E	E	C	F	E		F	E	
Approach Delay (s)		65.0			56.5			69.0			67.1	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	64.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	520	200	40	990	30	30	10	10	50	60	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		0.99	1.00	
Frt		1.00	0.85		1.00	0.85		0.97		1.00	0.93	
Flt Protected		0.99	1.00		1.00	1.00		0.97		0.95	1.00	
Satd. Flow (prot)		3026	1307		3073	1344		1522		1335	1302	
Flt Permitted		0.65	1.00		0.91	1.00		0.83		0.77	1.00	
Satd. Flow (perm)		1980	1307		2789	1344		1303		1076	1302	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	547	211	42	1042	32	32	11	11	53	63	63
RTOR Reduction (vph)	0	0	87	0	0	11	0	7	0	0	40	0
Lane Group Flow (vph)	0	642	124	0	1084	21	0	47	0	53	86	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		53.0	53.0		53.0	53.0		29.0		29.0	29.0	
Effective Green, g (s)		53.0	53.0		53.0	53.0		29.0		29.0	29.0	
Actuated g/C Ratio		0.59	0.59		0.59	0.59		0.32		0.32	0.32	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Grp Cap (vph)		1166	769		1642	791		419		346	419	
v/s Ratio Prot											c0.07	
v/s Ratio Perm		0.32	0.10		c0.39	0.02		0.04		0.05		
v/c Ratio		0.55	0.16		0.66	0.03		0.11		0.15	0.21	
Uniform Delay, d1		11.3	8.4		12.4	7.7		21.4		21.7	22.1	
Progression Factor		1.00	1.00		1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.9	0.5		2.1	0.1		0.5		0.9	1.1	
Delay (s)		13.1	8.9		14.5	7.8		22.0		22.7	23.2	
Level of Service		B	A		B	A		C		C	C	
Approach Delay (s)		12.1			14.3			22.0			23.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	10	0	0	0	0	1010	0	0	670	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		0.86						1.00			0.99	
Flt Protected		1.00						1.00			1.00	
Satd. Flow (prot)		1402						3079			3059	
Flt Permitted		1.00						1.00			1.00	
Satd. Flow (perm)		1402						3079			3059	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	11	0	0	0	0	1063	0	0	705	32
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	3	0	0	0	0	0	1063	0	0	731	0
Turn Type		NA						NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		420						1642			1631	
v/s Ratio Prot								c0.35			0.24	
v/s Ratio Perm		c0.00										
v/c Ratio		0.01						0.65			0.45	
Uniform Delay, d1		14.7						10.0			8.6	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.0						2.0			0.2	
Delay (s)		14.8						12.0			8.8	
Level of Service		B						B			A	
Approach Delay (s)		14.8			0.0			12.0			8.8	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	40	70	1000	670	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3073	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3073	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	42	73	1042	698	10
RTOR Reduction (vph)	0	37	0	0	1	0
Lane Group Flow (vph)	0	5	73	1042	707	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		6.6	6.6	38.0	38.0	
Effective Green, g (s)		6.6	6.6	38.0	38.0	
Actuated g/C Ratio		0.12	0.12	0.70	0.70	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		169	186	2142	2138	
v/s Ratio Prot			c0.05	c0.34	0.23	
v/s Ratio Perm		0.00				
v/c Ratio		0.03	0.39	0.49	0.33	
Uniform Delay, d1		21.2	22.1	3.8	3.3	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1	1.4	0.8	0.1	
Delay (s)		21.2	23.5	4.6	3.4	
Level of Service		C	C	A	A	
Approach Delay (s)	21.2			5.8	3.4	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	700	1060	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3416		1711	1531
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	418	3421	3416		1711	1531
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	737	1116	11	11	11
RTOR Reduction (vph)	0	0	0	0	0	11
Lane Group Flow (vph)	11	737	1127	0	11	0
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					8
Actuated Green, G (s)	90.5	90.5	85.3		1.5	1.5
Effective Green, g (s)	90.5	90.5	85.3		1.5	1.5
Actuated g/C Ratio	0.90	0.90	0.85		0.02	0.02
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	393	3096	2913		25	22
v/s Ratio Prot	0.00	c0.22	c0.33		c0.01	
v/s Ratio Perm	0.02					0.00
v/c Ratio	0.03	0.24	0.39		0.44	0.01
Uniform Delay, d1	0.7	0.6	1.6		48.8	48.5
Progression Factor	1.00	1.00	0.15		1.00	1.00
Incremental Delay, d2	0.0	0.2	0.4		11.9	0.1
Delay (s)	0.8	0.8	0.6		60.7	48.7
Level of Service	A	A	A		E	D
Approach Delay (s)		0.8	0.6		54.7	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	1.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	20	700	1060	10	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1523	2887	2842		1347	1171
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	367	2887	2842		1347	1171
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	737	1116	11	11	21
RTOR Reduction (vph)	0	0	0	0	0	20
Lane Group Flow (vph)	21	737	1127	0	11	1
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	89.9	89.9	83.5		1.6	4.5
Effective Green, g (s)	89.9	89.9	83.5		1.6	4.5
Actuated g/C Ratio	0.90	0.90	0.84		0.02	0.04
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	357	2595	2373		21	99
v/s Ratio Prot	0.00	c0.26	c0.40		c0.01	0.00
v/s Ratio Perm	0.05					0.00
v/c Ratio	0.06	0.28	0.47		0.52	0.01
Uniform Delay, d1	0.9	0.7	2.3		48.8	45.6
Progression Factor	0.95	0.83	0.30		1.00	1.00
Incremental Delay, d2	0.1	0.3	0.6		21.6	0.0
Delay (s)	0.9	0.8	1.3		70.4	45.7
Level of Service	A	A	A		E	D
Approach Delay (s)		0.8	1.3		54.2	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	2.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	700	1060	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.91
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1522	2858	2870		1347	1102
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	369	2858	2870		1347	1102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	737	1116	11	11	11
RTOR Reduction (vph)	0	0	0	0	0	11
Lane Group Flow (vph)	11	737	1127	0	11	0
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)	89.0	89.0	84.2		3.0	3.0
Effective Green, g (s)	89.0	89.0	84.2		3.0	3.0
Actuated g/C Ratio	0.89	0.89	0.84		0.03	0.03
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	337	2543	2416		40	33
v/s Ratio Prot	0.00	c0.26	c0.39		c0.01	
v/s Ratio Perm	0.03					0.00
v/c Ratio	0.03	0.29	0.47		0.28	0.01
Uniform Delay, d1	0.9	0.8	2.1		47.4	47.1
Progression Factor	1.00	0.96	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.3	0.6		3.7	0.1
Delay (s)	1.0	1.1	2.7		51.1	47.2
Level of Service	A	A	A		D	D
Approach Delay (s)		1.1	2.7		49.2	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	2.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Cumulative Plus Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	910	40	163	810	373	260	970	203	515	230	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.98		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	3044		1540	3079	1035	1540	2944		1540	2892	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	3044		1540	3079	1035	1540	2944		1540	2892	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	101	919	40	165	818	377	263	980	205	520	232	61
RTOR Reduction (vph)	0	3	0	0	0	208	0	18	0	0	23	0
Lane Group Flow (vph)	101	956	0	165	818	169	263	1167	0	520	270	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.0	27.0		6.0	26.0	26.0	19.7	35.0		12.0	27.3	
Effective Green, g (s)	7.0	27.0		6.0	26.0	26.0	19.7	35.0		12.0	27.3	
Actuated g/C Ratio	0.07	0.27		0.06	0.26	0.26	0.20	0.35		0.12	0.27	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	107	821		92	800	269	303	1030		184	789	
v/s Ratio Prot	0.07	c0.31		c0.11	0.27		0.17	c0.40		c0.34	0.09	
v/s Ratio Perm						0.16						
v/c Ratio	0.94	1.16		1.79	1.02	0.63	0.87	1.13		2.83	0.34	
Uniform Delay, d1	46.3	36.5		47.0	37.0	32.7	38.9	32.5		44.0	29.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.11	1.23		1.01	0.94	
Incremental Delay, d2	68.7	87.2		396.9	37.6	4.5	21.8	72.2		835.5	1.1	
Delay (s)	115.0	123.7		443.9	74.6	37.3	64.9	112.3		880.0	28.6	
Level of Service	F	F		F	E	D	E	F		F	C	
Approach Delay (s)		122.9			109.1			103.7			573.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	191.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	126.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	1177	40	20	1056	273	40	10	10	331	32	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		0.99	1.00	
Frt		1.00	0.85		1.00	0.85		0.98		1.00	0.90	
Flt Protected		0.99	1.00		1.00	1.00		0.97		0.95	1.00	
Satd. Flow (prot)		3027	1307		3076	1344		1525		1336	1260	
Flt Permitted		0.57	1.00		0.91	1.00		0.81		0.75	1.00	
Satd. Flow (perm)		1729	1307		2794	1344		1268		1054	1260	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	1239	42	21	1112	287	42	11	11	348	34	74
RTOR Reduction (vph)	0	0	11	0	0	96	0	8	0	0	53	0
Lane Group Flow (vph)	0	1439	31	0	1133	191	0	56	0	348	55	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		56.0	56.0		56.0	56.0		26.0		26.0	26.0	
Effective Green, g (s)		56.0	56.0		56.0	56.0		26.0		26.0	26.0	
Actuated g/C Ratio		0.62	0.62		0.62	0.62		0.29		0.29	0.29	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Grp Cap (vph)		1075	813		1738	836		366		304	364	
v/s Ratio Prot											0.04	
v/s Ratio Perm		c0.83	0.02		0.41	0.14		0.04		c0.33		
v/c Ratio		1.34	0.04		0.65	0.23		0.15		1.14	0.15	
Uniform Delay, d1		17.0	6.6		10.8	7.5		23.8		32.0	23.8	
Progression Factor		1.00	1.00		1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		158.7	0.1		1.9	0.6		0.9		96.7	0.9	
Delay (s)		175.7	6.7		12.7	8.1		24.7		128.7	24.7	
Level of Service		F	A		B	A		C		F	C	
Approach Delay (s)		170.9			11.8			24.7			104.1	
Approach LOS		F			B			C			F	

Intersection Summary			
HCM 2000 Control Delay	93.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	112.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	0	0	0	0	0	10	1238	0	0	1568	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		1.00						1.00			1.00	
Flt Protected		0.95						1.00			1.00	
Satd. Flow (prot)		1540						3078			3073	
Flt Permitted		0.76						0.90			1.00	
Satd. Flow (perm)		1227						2782			3073	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	0	0	0	0	0	11	1303	0	0	1651	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	11	0	0	0	0	0	1314	0	0	1671	0
Turn Type	custom	NA					Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		368						1483			1638	
v/s Ratio Prot											c0.54	
v/s Ratio Perm		c0.01						0.47				
v/c Ratio		0.03						0.89			1.02	
Uniform Delay, d1		14.8						12.4			14.0	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.2						8.1			27.4	
Delay (s)		15.0						20.5			41.4	
Level of Service		B						C			D	
Approach Delay (s)		15.0			0.0			20.5			41.4	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	171	150	1238	1558	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3076	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3076	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	180	158	1303	1640	11
RTOR Reduction (vph)	0	13	0	0	1	0
Lane Group Flow (vph)	0	167	158	1303	1650	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		11.6	11.6	32.2	32.2	
Effective Green, g (s)		11.6	11.6	32.2	32.2	
Actuated g/C Ratio		0.22	0.22	0.60	0.60	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		302	332	1842	1841	
v/s Ratio Prot			0.10	0.42	c0.54	
v/s Ratio Perm		c0.12				
v/c Ratio		0.55	0.48	0.71	0.90	
Uniform Delay, d1		18.8	18.4	7.5	9.4	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.2	1.1	2.3	6.2	
Delay (s)		21.0	19.5	9.8	15.5	
Level of Service		C	B	A	B	
Approach Delay (s)	21.0			10.9	15.5	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	53.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	197	1532	1229	18	15	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3414		1711	1531
Flt Permitted	0.16	1.00	1.00		0.95	1.00
Satd. Flow (perm)	281	3421	3414		1711	1531
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	207	1613	1294	19	16	167
RTOR Reduction (vph)	0	0	1	0	0	154
Lane Group Flow (vph)	207	1613	1312	0	16	13
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					8
Actuated Green, G (s)	84.3	84.3	69.8		7.7	7.7
Effective Green, g (s)	84.3	84.3	69.8		7.7	7.7
Actuated g/C Ratio	0.84	0.84	0.70		0.08	0.08
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	387	2883	2382		131	117
v/s Ratio Prot	0.06	c0.47	0.38		c0.01	
v/s Ratio Perm	0.39					0.01
v/c Ratio	0.53	0.56	0.55		0.12	0.11
Uniform Delay, d1	5.3	2.3	7.4		43.0	43.0
Progression Factor	1.00	1.00	0.31		1.00	1.00
Incremental Delay, d2	1.4	0.8	0.7		0.4	0.4
Delay (s)	6.8	3.1	2.9		43.4	43.4
Level of Service	A	A	A		D	D
Approach Delay (s)		3.5	2.9		43.4	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	443	1114	983	35	24	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1540	2887	2801		1347	1202
Flt Permitted	0.18	1.00	1.00		0.95	1.00
Satd. Flow (perm)	298	2887	2801		1347	1202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	466	1173	1035	37	25	288
RTOR Reduction (vph)	0	0	2	0	0	9
Lane Group Flow (vph)	466	1173	1070	0	25	279
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	87.8	87.8	57.8		3.7	30.2
Effective Green, g (s)	87.8	87.8	57.8		3.7	30.2
Actuated g/C Ratio	0.88	0.88	0.58		0.04	0.30
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	584	2534	1618		49	411
v/s Ratio Prot	c0.21	0.41	0.38		0.02	c0.18
v/s Ratio Perm	c0.49					0.06
v/c Ratio	0.80	0.46	0.66		0.51	0.68
Uniform Delay, d1	16.8	1.3	14.4		47.3	30.6
Progression Factor	1.13	0.63	1.04		1.00	1.00
Incremental Delay, d2	6.4	0.5	1.9		8.7	4.4
Delay (s)	25.3	1.3	16.9		55.9	35.1
Level of Service	C	A	B		E	D
Approach Delay (s)		8.1	16.9		36.7	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	310	828	686	19	18	332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.97
Flpb, ped/bikes	0.98	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1501	2858	2842		1347	1166
Flt Permitted	0.32	1.00	1.00		0.95	1.00
Satd. Flow (perm)	501	2858	2842		1347	1166
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	326	872	722	20	19	349
RTOR Reduction (vph)	0	0	1	0	0	312
Lane Group Flow (vph)	326	872	741	0	19	37
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)	81.4	81.4	64.7		10.6	10.6
Effective Green, g (s)	81.4	81.4	64.7		10.6	10.6
Actuated g/C Ratio	0.81	0.81	0.65		0.11	0.11
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	534	2326	1838		142	123
v/s Ratio Prot	c0.08	0.31	0.26		0.01	
v/s Ratio Perm	c0.42					c0.03
v/c Ratio	0.61	0.37	0.40		0.13	0.30
Uniform Delay, d1	3.3	2.5	8.4		40.5	41.3
Progression Factor	2.10	0.88	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.4	0.7		0.4	1.4
Delay (s)	8.8	2.6	9.1		41.0	42.7
Level of Service	A	A	A		D	D
Approach Delay (s)		4.3	9.1		42.6	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	775	100	208	922	480	240	710	217	432	750	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2982		1540	3079	1036	1540	2897		1540	3002	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2982		1540	3079	1036	1540	2897		1540	3002	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	816	105	219	971	505	253	747	228	455	789	74
RTOR Reduction (vph)	0	10	0	0	0	218	0	29	0	0	7	0
Lane Group Flow (vph)	105	911	0	219	971	287	253	946	0	455	856	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.0	27.0		7.0	29.0	29.0	16.0	34.0		12.0	30.0	
Effective Green, g (s)	5.0	27.0		7.0	29.0	29.0	16.0	34.0		12.0	30.0	
Actuated g/C Ratio	0.05	0.27		0.07	0.29	0.29	0.16	0.34		0.12	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	77	805		107	892	300	246	984		184	900	
v/s Ratio Prot	0.07	c0.31		c0.14	0.32		0.16	c0.33		c0.30	0.29	
v/s Ratio Perm						0.28						
v/c Ratio	1.36	1.13		2.05	1.09	0.96	1.03	0.96		2.47	0.95	
Uniform Delay, d1	47.5	36.5		46.5	35.5	34.9	42.0	32.4		44.0	34.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.09	1.30		1.01	1.00	
Incremental Delay, d2	226.9	74.4		501.9	57.2	40.0	64.3	20.4		678.2	19.7	
Delay (s)	274.4	110.9		548.4	92.7	74.9	109.9	62.5		722.6	54.0	
Level of Service	F	F		F	F	E	F	E		F	D	
Approach Delay (s)		127.7			146.2			72.2			284.8	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	160.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	115.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	1004	200	40	1450	343	30	10	10	352	73	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		0.99	1.00	
Frt		1.00	0.85		1.00	0.85		0.97		1.00	0.93	
Flt Protected		1.00	1.00		1.00	1.00		0.97		0.95	1.00	
Satd. Flow (prot)		3036	1307		3075	1344		1522		1335	1314	
Flt Permitted		0.59	1.00		0.88	1.00		0.83		0.77	1.00	
Satd. Flow (perm)		1791	1307		2721	1344		1296		1076	1314	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	1057	211	42	1526	361	32	11	11	371	77	63
RTOR Reduction (vph)	0	0	69	0	0	88	0	7	0	0	22	0
Lane Group Flow (vph)	0	1152	142	0	1568	273	0	47	0	371	118	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		53.0	53.0		53.0	53.0		29.0		29.0	29.0	
Effective Green, g (s)		53.0	53.0		53.0	53.0		29.0		29.0	29.0	
Actuated g/C Ratio		0.59	0.59		0.59	0.59		0.32		0.32	0.32	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Grp Cap (vph)		1054	769		1602	791		417		346	423	
v/s Ratio Prot											0.09	
v/s Ratio Perm		c0.64	0.11		0.58	0.20		0.04		c0.34		
v/c Ratio		1.30dl	0.18		0.98	0.35		0.11		1.07	0.28	
Uniform Delay, d1		18.5	8.5		18.0	9.5		21.4		30.5	22.7	
Progression Factor		1.00	1.00		1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		56.7	0.5		18.0	1.2		0.5		68.9	1.6	
Delay (s)		75.2	9.1		35.9	10.7		22.0		99.4	24.3	
Level of Service		E	A		D	B		C		F	C	
Approach Delay (s)		64.9			31.2			22.0			78.9	
Approach LOS		E			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	121.4%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	10	0	0	0	0	1793	0	0	1477	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		0.86						1.00			1.00	
Flt Protected		1.00						1.00			1.00	
Satd. Flow (prot)		1402						3079			3070	
Flt Permitted		1.00						1.00			1.00	
Satd. Flow (perm)		1402						3079			3070	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	11	0	0	0	0	1887	0	0	1555	32
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	3	0	0	0	0	0	1887	0	0	1585	0
Turn Type		NA						NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		420						1642			1637	
v/s Ratio Prot								c0.61			0.52	
v/s Ratio Perm		c0.00										
v/c Ratio		0.01						1.15			0.97	
Uniform Delay, d1		14.7						14.0			13.5	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.0						74.7			15.2	
Delay (s)		14.8						88.7			28.7	
Level of Service		B						F			C	
Approach Delay (s)		14.8			0.0			88.7			28.7	
Approach LOS		B			A			F			C	

Intersection Summary			
HCM 2000 Control Delay	61.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	183	210	1783	1477	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3076	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3076	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	191	219	1857	1539	10
RTOR Reduction (vph)	0	17	0	0	1	0
Lane Group Flow (vph)	0	174	219	1857	1548	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		12.7	12.7	32.1	32.1	
Effective Green, g (s)		12.7	12.7	32.1	32.1	
Actuated g/C Ratio		0.23	0.23	0.59	0.59	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		324	356	1803	1801	
v/s Ratio Prot			c0.14	c0.60	0.50	
v/s Ratio Perm		0.12				
v/c Ratio		0.54	0.62	1.03	0.86	
Uniform Delay, d1		18.5	18.9	11.3	9.5	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.7	3.1	29.3	4.4	
Delay (s)		20.2	22.0	40.6	13.8	
Level of Service		C	C	D	B	
Approach Delay (s)	20.2			38.7	13.8	
Approach LOS	C			D	B	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	54.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	181	1479	1821	14	15	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3417		1711	1531
Flt Permitted	0.06	1.00	1.00		0.95	1.00
Satd. Flow (perm)	99	3421	3417		1711	1531
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	1557	1917	15	16	181
RTOR Reduction (vph)	0	0	0	0	0	132
Lane Group Flow (vph)	191	1557	1932	0	16	49
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					8
Actuated Green, G (s)	82.9	82.9	70.9		9.1	9.1
Effective Green, g (s)	82.9	82.9	70.9		9.1	9.1
Actuated g/C Ratio	0.83	0.83	0.71		0.09	0.09
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	211	2836	2422		155	139
v/s Ratio Prot	c0.07	0.46	0.57		0.01	
v/s Ratio Perm	c0.68					c0.03
v/c Ratio	0.91	0.55	0.80		0.10	0.35
Uniform Delay, d1	30.2	2.7	9.7		41.7	42.7
Progression Factor	1.00	1.00	0.75		1.00	1.00
Incremental Delay, d2	36.8	0.8	0.3		0.3	1.6
Delay (s)	66.9	3.5	7.5		42.0	44.2
Level of Service	E	A	A		D	D
Approach Delay (s)		10.4	7.5		44.1	
Approach LOS		B	A		D	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	434	1070	1364	21	23	481
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1540	2887	2833		1347	1201
Flt Permitted	0.11	1.00	1.00		0.95	1.00
Satd. Flow (perm)	177	2887	2833		1347	1201
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	457	1126	1436	22	24	506
RTOR Reduction (vph)	0	0	1	0	0	5
Lane Group Flow (vph)	457	1126	1457	0	24	501
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	87.9	87.9	63.9		3.6	24.1
Effective Green, g (s)	87.9	87.9	63.9		3.6	24.1
Actuated g/C Ratio	0.88	0.88	0.64		0.04	0.24
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	428	2537	1810		48	337
v/s Ratio Prot	0.21	0.39	0.51		0.02	c0.30
v/s Ratio Perm	c0.72					0.12
v/c Ratio	1.07	0.44	0.81		0.50	1.49
Uniform Delay, d1	28.0	1.2	13.4		47.3	38.0
Progression Factor	1.48	0.78	0.35		1.00	1.00
Incremental Delay, d2	59.4	0.5	2.8		8.0	234.8
Delay (s)	100.8	1.4	7.5		55.3	272.8
Level of Service	F	A	A		E	F
Approach Delay (s)		30.1	7.5		262.9	
Approach LOS		C	A		F	

Intersection Summary			
HCM 2000 Control Delay	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	377	716	1072	17	16	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1540	2858	2860		1347	1165
Flt Permitted	0.16	1.00	1.00		0.95	1.00
Satd. Flow (perm)	251	2858	2860		1347	1165
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	397	754	1128	18	17	329
RTOR Reduction (vph)	0	0	1	0	0	295
Lane Group Flow (vph)	397	754	1145	0	17	34
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)	81.7	81.7	55.7		10.3	10.3
Effective Green, g (s)	81.7	81.7	55.7		10.3	10.3
Actuated g/C Ratio	0.82	0.82	0.56		0.10	0.10
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	488	2334	1593		138	119
v/s Ratio Prot	c0.18	0.26	0.40		0.01	
v/s Ratio Perm	c0.48					c0.03
v/c Ratio	0.81	0.32	0.72		0.12	0.28
Uniform Delay, d1	19.2	2.3	16.4		40.7	41.4
Progression Factor	1.36	0.89	1.00		1.00	1.00
Incremental Delay, d2	9.4	0.3	2.8		0.4	1.3
Delay (s)	35.5	2.4	19.2		41.2	42.8
Level of Service	D	A	B		D	D
Approach Delay (s)		13.8	19.2		42.7	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Cumulative Plus Variant Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	970	40	144	793	347	260	970	312	673	230	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.97		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	3046		1540	3079	1035	1540	2890		1540	2892	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	3046		1540	3079	1035	1540	2890		1540	2892	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	101	980	40	145	801	351	263	980	315	680	232	61
RTOR Reduction (vph)	0	3	0	0	0	197	0	31	0	0	23	0
Lane Group Flow (vph)	101	1017	0	145	801	154	263	1264	0	680	270	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.0	27.0		5.0	25.0	25.0	18.6	36.0		12.0	29.4	
Effective Green, g (s)	7.0	27.0		5.0	25.0	25.0	18.6	36.0		12.0	29.4	
Actuated g/C Ratio	0.07	0.27		0.05	0.25	0.25	0.19	0.36		0.12	0.29	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	107	822		77	769	258	286	1040		184	850	
v/s Ratio Prot	0.07	c0.33		c0.09	0.26		0.17	c0.44		c0.44	0.09	
v/s Ratio Perm						0.15						
v/c Ratio	0.94	1.24		1.88	1.04	0.60	0.92	1.22		3.70	0.32	
Uniform Delay, d1	46.3	36.5		47.5	37.5	33.0	40.0	32.0		44.0	27.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.84	0.88		0.74	0.58	
Incremental Delay, d2	68.7	117.2		442.2	43.8	3.7	32.2	105.9		1225.4	0.9	
Delay (s)	115.0	153.7		489.7	81.3	36.7	65.6	134.1		1258.0	17.0	
Level of Service	F	F		F	F	D	E	F		F	B	
Approach Delay (s)		150.2			114.9			122.5			884.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	276.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	140.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	1505	40	20	995	240	40	10	10	528	58	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		0.99	1.00	
Frt		1.00	0.85		1.00	0.85		0.98		1.00	0.92	
Flt Protected		0.99	1.00		1.00	1.00		0.97		0.95	1.00	
Satd. Flow (prot)		3031	1307		3076	1344		1525		1336	1291	
Flt Permitted		0.58	1.00		0.78	1.00		0.80		0.75	1.00	
Satd. Flow (perm)		1782	1307		2390	1344		1263		1052	1291	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	1584	42	21	1047	253	42	11	11	556	61	74
RTOR Reduction (vph)	0	0	9	0	0	90	0	7	0	0	48	0
Lane Group Flow (vph)	0	1784	33	0	1068	163	0	57	0	556	87	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		50.0	50.0		50.0	50.0		32.0		32.0	32.0	
Effective Green, g (s)		50.0	50.0		50.0	50.0		32.0		32.0	32.0	
Actuated g/C Ratio		0.56	0.56		0.56	0.56		0.36		0.36	0.36	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Grp Cap (vph)		990	726		1327	746		449		374	459	
v/s Ratio Prot											0.07	
v/s Ratio Perm		c1.00	0.03		0.45	0.12		0.05		c0.53		
v/c Ratio		1.80	0.05		0.80	0.22		0.13		1.49	0.19	
Uniform Delay, d1		20.0	9.1		16.1	10.1		19.6		29.0	20.0	
Progression Factor		1.00	1.00		1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		364.9	0.1		5.3	0.7		0.6		232.8	0.9	
Delay (s)		384.9	9.2		21.4	10.8		20.2		261.8	21.0	
Level of Service		F	A		C	B		C		F	C	
Approach Delay (s)		376.3			19.3			20.2			214.8	
Approach LOS		F			B			C			F	

Intersection Summary			
HCM 2000 Control Delay	221.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	135.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	0	0	0	0	0	10	1144	0	0	2124	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		1.00						1.00			1.00	
Flt Protected		0.95						1.00			1.00	
Satd. Flow (prot)		1711						3420			3416	
Flt Permitted		0.76						0.77			1.00	
Satd. Flow (perm)		1363						2627			3416	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	0	0	0	0	0	11	1204	0	0	2236	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	11	0	0	0	0	0	1215	0	0	2256	0
Turn Type	custom	NA					Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		19.0						33.0			33.0	
Actuated g/C Ratio		0.32						0.55			0.55	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		431						1444			1878	
v/s Ratio Prot											c0.66	
v/s Ratio Perm		c0.01						0.46				
v/c Ratio		0.03						0.84			1.20	
Uniform Delay, d1		14.1						11.3			13.5	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.1						6.1			96.0	
Delay (s)		14.2						17.4			109.5	
Level of Service		B						B			F	
Approach Delay (s)		14.2			0.0			17.4			109.5	
Approach LOS		B			A			B			F	

Intersection Summary			
HCM 2000 Control Delay	77.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	269	133	1144	2114	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1558	1711	3421	3419	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1558	1711	3421	3419	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	283	140	1204	2225	11
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	0	280	140	1204	2236	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		14.3	14.3	32.1	32.1	
Effective Green, g (s)		15.3	15.3	33.1	33.1	
Actuated g/C Ratio		0.27	0.27	0.59	0.59	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		422	464	2007	2006	
v/s Ratio Prot			0.08	0.35	c0.65	
v/s Ratio Perm		c0.18				
v/c Ratio		0.66	0.30	0.60	1.11	
Uniform Delay, d1		18.3	16.3	7.4	11.6	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		3.9	0.4	1.3	59.1	
Delay (s)		22.2	16.7	8.8	70.8	
Level of Service		C	B	A	E	
Approach Delay (s)	22.2			9.6	70.8	
Approach LOS	C			A	E	

Intersection Summary			
HCM 2000 Control Delay	45.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	319	2064	1146	20	14	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3412		1711	1531
Flt Permitted	0.18	1.00	1.00		0.95	1.00
Satd. Flow (perm)	315	3421	3412		1711	1531
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	336	2173	1206	21	15	138
RTOR Reduction (vph)	0	0	1	0	0	28
Lane Group Flow (vph)	336	2173	1226	0	15	110
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	89.0	89.0	69.4		3.0	18.6
Effective Green, g (s)	89.0	89.0	69.4		3.0	18.6
Actuated g/C Ratio	0.89	0.89	0.69		0.03	0.19
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	498	3044	2367		51	346
v/s Ratio Prot	0.11	c0.64	0.36		0.01	c0.05
v/s Ratio Perm	0.49					0.02
v/c Ratio	0.67	0.71	0.52		0.29	0.32
Uniform Delay, d1	8.9	1.7	7.3		47.5	35.2
Progression Factor	1.00	1.00	0.39		1.00	1.00
Incremental Delay, d2	3.6	1.5	0.7		3.2	0.5
Delay (s)	12.5	3.1	3.5		50.7	35.8
Level of Service	B	A	A		D	D
Approach Delay (s)		4.4	3.5		37.2	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	670	1418	896	39	24	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3207	3099		1497	1337
Flt Permitted	0.19	1.00	1.00		0.95	1.00
Satd. Flow (perm)	336	3207	3099		1497	1337
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	705	1493	943	41	25	295
RTOR Reduction (vph)	0	0	2	0	0	4
Lane Group Flow (vph)	705	1493	982	0	25	291
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	88.0	88.0	51.0		3.5	37.0
Effective Green, g (s)	88.0	88.0	51.0		4.0	37.0
Actuated g/C Ratio	0.88	0.88	0.51		0.04	0.37
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	749	2822	1580		59	548
v/s Ratio Prot	c0.31	0.47	0.32		0.02	c0.17
v/s Ratio Perm	c0.52					0.04
v/c Ratio	0.94	0.53	0.62		0.42	0.53
Uniform Delay, d1	20.5	1.3	17.6		46.9	24.7
Progression Factor	1.02	0.48	0.81		1.00	1.00
Incremental Delay, d2	16.0	0.5	1.7		4.8	1.0
Delay (s)	36.9	1.2	15.8		51.7	25.7
Level of Service	D	A	B		D	C
Approach Delay (s)		12.6	15.8		27.7	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	615	827	692	25	16	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3175	3143		1497	1337
Flt Permitted	0.28	1.00	1.00		0.95	1.00
Satd. Flow (perm)	497	3175	3143		1497	1337
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	647	871	728	26	17	256
RTOR Reduction (vph)	0	0	2	0	0	8
Lane Group Flow (vph)	647	871	752	0	17	248
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		8	5
Permitted Phases	2					8
Actuated Green, G (s)	88.8	88.8	51.7		3.2	36.3
Effective Green, g (s)	88.8	88.8	51.7		3.2	36.3
Actuated g/C Ratio	0.89	0.89	0.52		0.03	0.36
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	843	2819	1624		47	538
v/s Ratio Prot	c0.25	0.27	0.24		0.01	c0.15
v/s Ratio Perm	c0.43					0.03
v/c Ratio	0.77	0.31	0.46		0.36	0.46
Uniform Delay, d1	10.4	0.9	15.3		47.4	24.4
Progression Factor	1.39	1.11	1.00		1.00	1.00
Incremental Delay, d2	3.7	0.3	1.0		4.7	0.6
Delay (s)	18.2	1.2	16.3		52.1	25.0
Level of Service	B	A	B		D	C
Approach Delay (s)		8.4	16.3		26.7	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	759	100	322	984	646	240	710	201	411	750	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.86	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1540	2981		1540	3079	1036	1540	2907		1540	3002	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1540	2981		1540	3079	1036	1540	2907		1540	3002	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	799	105	339	1036	680	253	747	212	433	789	74
RTOR Reduction (vph)	0	10	0	0	0	188	0	26	0	0	7	0
Lane Group Flow (vph)	105	894	0	339	1036	492	253	933	0	433	856	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Confl. Bikes (#/hr)			10			10			10			10
Parking (#/hr)						5						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.0	27.0		9.0	31.0	31.0	15.0	34.0		10.0	29.0	
Effective Green, g (s)	5.0	27.0		9.0	31.0	31.0	15.0	34.0		10.0	29.0	
Actuated g/C Ratio	0.05	0.27		0.09	0.31	0.31	0.15	0.34		0.10	0.29	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	77	804		138	954	321	231	988		154	870	
v/s Ratio Prot	0.07	c0.30		c0.22	0.34		0.16	c0.32		c0.28	c0.29	
v/s Ratio Perm						c0.48						
v/c Ratio	1.36	1.11		2.46	1.09	1.53	1.10	0.94		2.81	0.98	
Uniform Delay, d1	47.5	36.5		45.5	34.5	34.5	42.5	32.1		45.0	35.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.07	1.30		0.98	0.97	
Incremental Delay, d2	226.9	67.0		676.7	55.3	255.3	86.3	17.7		832.3	26.2	
Delay (s)	274.4	103.5		722.2	89.8	289.8	131.9	59.5		876.5	60.3	
Level of Service	F	F		F	F	F	F	E		F	E	
Approach Delay (s)		121.3			260.3			74.6			333.0	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	211.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	119.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	951	200	40	1792	577	30	10	10	318	80	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.98		1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00		0.99	1.00	
Frt		1.00	0.85		1.00	0.85		0.97		1.00	0.94	
Flt Protected		1.00	1.00		1.00	1.00		0.97		0.95	1.00	
Satd. Flow (prot)		3035	1307		3076	1344		1522		1335	1319	
Flt Permitted		0.55	1.00		0.90	1.00		0.82		0.77	1.00	
Satd. Flow (perm)		1672	1307		2768	1344		1283		1079	1319	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	1001	211	42	1886	607	32	11	11	335	84	63
RTOR Reduction (vph)	0	0	73	0	0	120	0	8	0	0	14	0
Lane Group Flow (vph)	0	1096	138	0	1928	487	0	46	0	335	133	0
Confl. Peds. (#/hr)	2		5	5		2	2		7	7		2
Confl. Bikes (#/hr)			1									
Bus Blockages (#/hr)	0	5	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)										5	5	5
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		57.0	57.0		57.0	57.0		25.0		25.0	25.0	
Effective Green, g (s)		57.0	57.0		57.0	57.0		25.0		25.0	25.0	
Actuated g/C Ratio		0.63	0.63		0.63	0.63		0.28		0.28	0.28	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Grp Cap (vph)		1058	827		1753	851		356		299	366	
v/s Ratio Prot											0.10	
v/s Ratio Perm		0.66	0.11		c0.70	0.36		0.04		c0.31		
v/c Ratio		1.36dl	0.17		1.10	0.57		0.13		1.12	0.36	
Uniform Delay, d1		16.5	6.8		16.5	9.5		24.3		32.5	26.1	
Progression Factor		1.00	1.00		1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		37.4	0.4		54.3	2.8		0.7		88.5	2.8	
Delay (s)		53.9	7.2		70.8	12.3		25.1		121.0	28.9	
Level of Service		D	A		E	B		C		F	C	
Approach Delay (s)		46.3			56.8			25.1			92.9	
Approach LOS		D			E			C			F	

Intersection Summary			
HCM 2000 Control Delay	57.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	130.3%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	10	0	0	0	0	2374	0	0	1398	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0			5.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		0.86						1.00			1.00	
Flt Protected		1.00						1.00			1.00	
Satd. Flow (prot)		1402						3079			3069	
Flt Permitted		1.00						1.00			1.00	
Satd. Flow (perm)		1402						3079			3069	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	11	0	0	0	0	2499	0	0	1472	32
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	3	0	0	0	0	0	2499	0	0	1502	0
Turn Type		NA						NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4	4		8			2					
Actuated Green, G (s)		18.0						32.0			32.0	
Effective Green, g (s)		18.0						32.0			32.0	
Actuated g/C Ratio		0.30						0.53			0.53	
Clearance Time (s)		5.0						5.0			5.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		420						1642			1636	
v/s Ratio Prot								c0.81			0.49	
v/s Ratio Perm		c0.00										
v/c Ratio		0.01						1.52			0.92	
Uniform Delay, d1		14.7						14.0			12.8	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.0						238.0			8.5	
Delay (s)		14.8						252.0			21.3	
Level of Service		B						F			C	
Approach Delay (s)		14.8			0.0			252.0			21.3	
Approach LOS		B			A			F			C	

Intersection Summary			
HCM 2000 Control Delay	164.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	169	312	2364	1398	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1402	1540	3079	3076	
Flt Permitted		1.00	0.95	1.00	1.00	
Satd. Flow (perm)		1402	1540	3079	3076	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	176	325	2462	1456	10
RTOR Reduction (vph)	0	20	0	0	1	0
Lane Group Flow (vph)	0	156	325	2462	1465	0
Turn Type		Perm	Prot	NA	NA	
Protected Phases			4	2	6	
Permitted Phases		4				
Actuated Green, G (s)		15.7	15.7	32.1	32.1	
Effective Green, g (s)		15.7	15.7	32.1	32.1	
Actuated g/C Ratio		0.27	0.27	0.56	0.56	
Clearance Time (s)		5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		380	418	1709	1708	
v/s Ratio Prot			c0.21	c0.80	0.48	
v/s Ratio Perm		0.11				
v/c Ratio		0.41	0.78	1.44	0.86	
Uniform Delay, d1		17.3	19.4	12.8	10.9	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.7	8.8	201.7	4.5	
Delay (s)		18.0	28.3	214.5	15.4	
Level of Service		B	C	F	B	
Approach Delay (s)	18.0			192.8	15.4	
Approach LOS	B			F	B	

Intersection Summary			
HCM 2000 Control Delay	127.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	57.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: Innes Avenue & New Griffith St

9/9/2016

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	147	1420	2385	13	17	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1711	3421	3418		1711	1531
Flt Permitted	0.05	1.00	1.00		0.95	1.00
Satd. Flow (perm)	85	3421	3418		1711	1531
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	155	1495	2511	14	18	306
RTOR Reduction (vph)	0	0	0	0	0	5
Lane Group Flow (vph)	155	1495	2525	0	18	301
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	88.9	88.9	80.9		3.1	7.1
Effective Green, g (s)	88.9	88.9	80.9		3.1	7.1
Actuated g/C Ratio	0.89	0.89	0.81		0.03	0.07
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	140	3041	2765		53	169
v/s Ratio Prot	0.04	0.44	0.74		0.01	c0.07
v/s Ratio Perm	c0.94					0.13
v/c Ratio	1.11	0.49	0.91		0.34	1.78
Uniform Delay, d1	33.3	1.1	7.0		47.4	46.5
Progression Factor	1.00	1.00	0.81		1.00	1.00
Incremental Delay, d2	107.7	0.6	0.6		3.8	375.2
Delay (s)	141.0	1.7	6.2		51.2	421.7
Level of Service	F	A	A		D	F
Approach Delay (s)		14.8	6.2		401.1	
Approach LOS		B	A		F	

Intersection Summary			
HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	505	942	1636	23	29	772
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.5	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1540	2887	2835		1347	1199
Flt Permitted	0.06	1.00	1.00		0.95	1.00
Satd. Flow (perm)	97	2887	2835		1347	1199
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	532	992	1722	24	31	813
RTOR Reduction (vph)	0	0	1	0	0	2
Lane Group Flow (vph)	532	992	1745	0	31	811
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	0	5	5	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					8
Actuated Green, G (s)	86.0	86.0	63.0		5.5	25.0
Effective Green, g (s)	86.0	86.0	63.0		5.5	25.0
Actuated g/C Ratio	0.86	0.86	0.63		0.06	0.25
Clearance Time (s)	4.0	4.0	4.0		4.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	357	2482	1786		74	347
v/s Ratio Prot	0.28	0.34	0.62		0.02	c0.44
v/s Ratio Perm	c1.00					0.23
v/c Ratio	1.49	0.40	0.98		0.42	2.34
Uniform Delay, d1	33.6	1.5	17.8		45.7	37.5
Progression Factor	1.11	0.85	1.09		1.00	1.00
Incremental Delay, d2	233.7	0.4	3.0		3.8	610.3
Delay (s)	270.9	1.7	22.5		49.5	647.8
Level of Service	F	A	C		D	F
Approach Delay (s)		95.7	22.5		625.9	
Approach LOS		F	C		F	

Intersection Summary			
HCM 2000 Control Delay	173.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	247	724	1073	15	22	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1540	2858	2863		1347	1202
Flt Permitted	0.16	1.00	1.00		0.95	1.00
Satd. Flow (perm)	267	2858	2863		1347	1202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	260	762	1129	16	23	617
RTOR Reduction (vph)	0	0	1	0	0	6
Lane Group Flow (vph)	260	762	1144	0	23	611
Confl. Peds. (#/hr)	100			100		
Confl. Bikes (#/hr)				10		10
Bus Blockages (#/hr)	0	5	0	0	0	0
Parking (#/hr)		5	5		5	5
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		8	5
Permitted Phases	2					8
Actuated Green, G (s)	88.4	88.4	58.4		3.6	29.6
Effective Green, g (s)	88.4	88.4	58.4		3.6	29.6
Actuated g/C Ratio	0.88	0.88	0.58		0.04	0.30
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	567	2526	1671		48	403
v/s Ratio Prot	0.12	0.27	c0.40		0.02	c0.39
v/s Ratio Perm	0.29					0.11
v/c Ratio	0.46	0.30	0.68		0.48	1.52
Uniform Delay, d1	7.0	0.9	14.4		47.3	35.2
Progression Factor	2.52	0.94	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.3	2.3		7.4	244.3
Delay (s)	18.3	1.2	16.7		54.6	279.5
Level of Service	B	A	B		D	F
Approach Delay (s)		5.5	16.7		271.5	
Approach LOS		A	B		F	

Intersection Summary			
HCM 2000 Control Delay	70.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX O: TRAFFIC VOLUME AND INTERSECTION TURNING MOVEMENT COUNTS

Intersection ID	14-7021-005			
Jurisdiction	San Francisco		San Francisco	CA
Date		1/9/2014		
Coord1			Coord2	
Street N	Pennsylvania Street			
Street N2				
Street E	25th Street			
Street E2				
Street S	Pennsylvania Street			
Street S2				
Street W	25th Street			
Street W2				

DESCRIPTION	TIME BEGIN	TIME END	NBL	NBT	NBTR	NBLR	EBL	EBT	EBTR	EBLR	SBL	SBT	SBTR	SBLR	WBL	WBT	WBTR	WBLR
Control	0:00	0:00																
Lanes	0:00	0:00																
Signal Phasing	0:00	0:00																

MODE	TIME BEGIN	TIME END	NBL	NBT	NBR	NBU	EBL	EBT	EBR	EBU	SBL	SBT	SBR	SBU	WBL	WBT	WBR	WBU
Vehicle	7:00	7:15	2	49	10	0	2	6	13	0	21	88	5	0	22	0	2	0
Vehicle	7:15	7:30	5	28	7	0	4	5	14	0	39	71	6	0	25	2	1	0
Vehicle	7:30	7:45	8	46	12	0	2	8	19	0	29	82	7	0	25	5	0	0
Vehicle	7:45	8:00	9	58	30	0	5	8	19	0	29	93	7	2	22	2	3	0
Vehicle	8:00	8:15	8	62	15	1	7	6	23	0	23	109	9	0	32	6	6	0
Vehicle	8:15	8:30	16	66	12	1	5	6	32	0	27	102	6	0	18	6	3	0
Vehicle	8:30	8:45	25	76	9	1	10	11	23	0	16	105	14	0	25	7	2	0
Vehicle	8:45	9:00	14	67	11	1	4	14	35	0	23	126	6	0	25	8	5	0
Bicycle	7:00	7:15	0	1	0		1	0	0		0	1	0		0	0	0	
Bicycle	7:15	7:30	0	3	0		0	0	0		0	0	0		0	0	0	
Bicycle	7:30	7:45	0	2	0		3	0	0		0	0	0		0	0	0	
Bicycle	7:45	8:00	0	8	0		3	0	0		0	1	0		0	0	0	
Bicycle	8:00	8:15	0	2	0		0	0	0		0	0	0		0	0	0	
Bicycle	8:15	8:30	0	1	0		2	1	0		0	0	0		0	0	0	
Bicycle	8:30	8:45	0	4	0		1	0	0		0	1	0		0	0	0	
Bicycle	8:45	9:00	0	3	0		1	0	0		0	1	0		0	0	0	

MODE	TIME BEGIN	TIME END	N	E	S	W
Pedestrian	7:00	7:15	0	0	0	0
Pedestrian	7:15	7:30	1	1	0	1
Pedestrian	7:30	7:45	2	0	0	0
Pedestrian	7:45	8:00	5	0	1	1
Pedestrian	8:00	8:15	1	1	0	1
Pedestrian	8:15	8:30	1	0	0	0
Pedestrian	8:30	8:45	3	0	3	1
Pedestrian	8:45	9:00	1	1	3	2

Traffic Data Service

Campbell, CA
(408) 377-2988
tdsbay@cs.com

File Name : 12PM FINAL 1
Site Code : 00000012
Start Date : 6/12/2013
Page No : 1

Groups Printed- Vehicles

	PENNSYLVANIA ST Southbound					25TH ST Westbound					PENNSYLVANIA ST Northbound					25TH ST Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	10	181	20	2	213	13	3	64	2	82	10	38	11	0	59	31	7	4	5	47	401
04:15 PM	10	141	45	4	200	13	3	53	1	70	9	48	8	0	65	24	15	5	1	45	380
04:30 PM	14	164	21	2	201	11	3	59	0	73	7	36	10	1	54	26	14	3	4	47	375
04:45 PM	5	149	31	2	187	7	10	49	0	66	11	54	7	0	72	22	12	5	1	40	365
Total	39	635	117	10	801	44	19	225	3	291	37	176	36	1	250	103	48	17	11	179	1521
05:00 PM	8	177	19	0	204	7	3	69	1	80	5	51	11	0	67	18	12	7	2	39	390
05:15 PM	10	179	14	0	203	3	8	67	1	79	7	50	16	1	74	25	9	7	5	46	402
05:30 PM	5	157	5	0	167	5	1	53	3	62	11	42	8	0	61	18	9	3	2	32	322
05:45 PM	4	150	6	1	161	3	12	39	1	55	9	44	14	9	76	20	8	4	2	34	326
Total	27	663	44	1	735	18	24	228	6	276	32	187	49	10	278	81	38	21	11	151	1440
Grand Total	66	1298	161	11	1536	62	43	453	9	567	69	363	85	11	528	184	86	38	22	330	2961
Apprch %	4.3	84.5	10.5	0.7		10.9	7.6	79.9	1.6		13.1	68.8	16.1	2.1		55.8	26.1	11.5	6.7		
Total %	2.2	43.8	5.4	0.4	51.9	2.1	1.5	15.3	0.3	19.1	2.3	12.3	2.9	0.4	17.8	6.2	2.9	1.3	0.7	11.1	

	PENNSYLVANIA ST Southbound				25TH ST Westbound				PENNSYLVANIA ST Northbound				25TH ST Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**14**	164	21	199	**11**	3	59	73	7	36	10	53	**26**	**14**	3	**43**	368
04:45 PM	5	149	**31**	185	7	**10**	49	66	**11**	**54**	7	72	22	12	5	39	362
05:00 PM	8	177	19	**204**	7	3	**69**	**79**	5	51	11	67	18	12	**7**	37	387
05:15 PM	10	**179**	14	203	3	8	67	78	7	50	**16**	**73**	25	9	7	41	**395**
Total Volume	37	669	85	791	28	24	244	296	30	191	44	265	91	47	22	160	1512
% App. Total	4.7	84.6	10.7		9.5	8.1	82.4		11.3	72.1	16.6		56.9	29.4	13.8		
PHF	.661	.934	.685	.969	.636	.600	.884	.937	.682	.884	.688	.908	.875	.839	.786	.930	.957

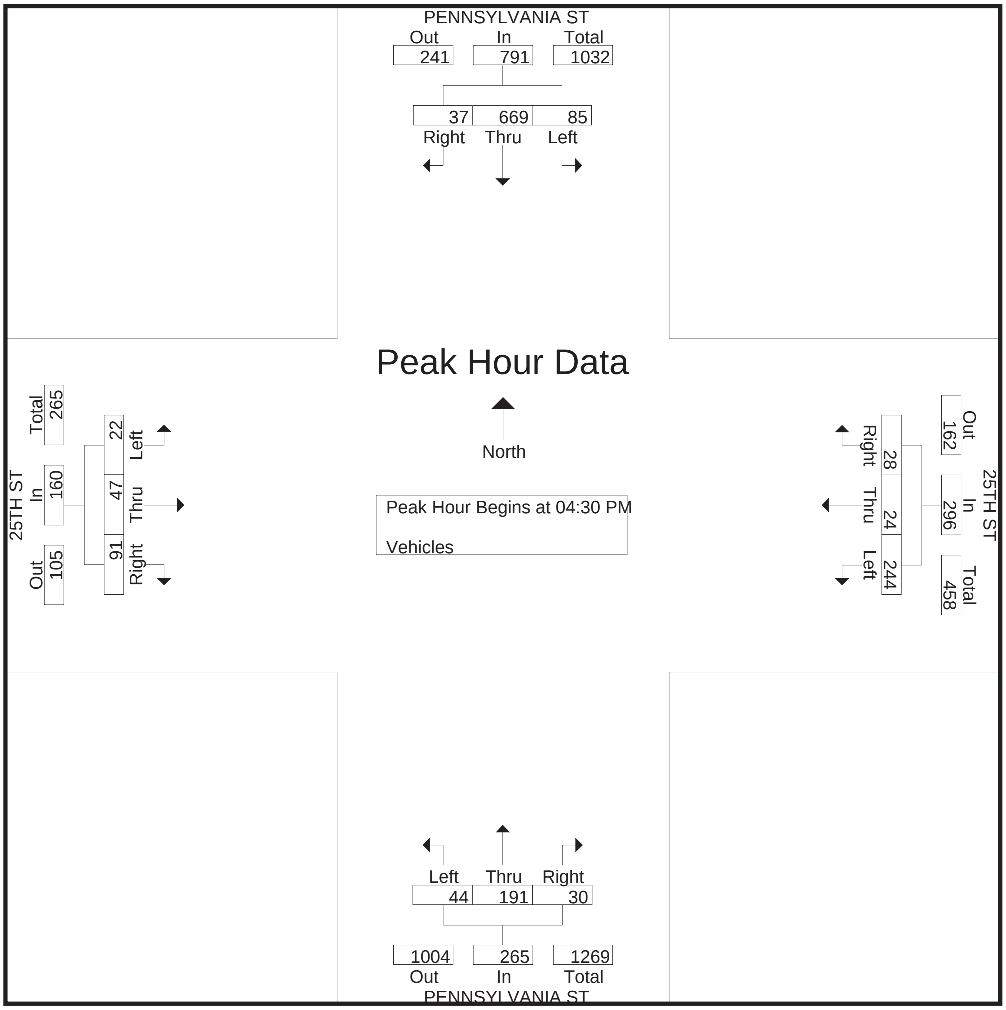
Traffic Data Service

Campbell, CA

(408) 377-2988

tdsbay@cs.com

File Name : 12PM FINAL 1
Site Code : 00000012
Start Date : 6/12/2013
Page No : 2



Intersection ID	14-7001-034			
Jurisdiction	San Francisco	San Francisco	CA	USA
Date	1/7/2014			
Coord1		Coord2		
Street N	Indiana Street			
Street N2	I-280 Northbound On-Ramp			
Street E	25th Street			
Street E2				
Street S	Indiana Street			
Street S2				
Street W	25th Street			
Street W2				

DESCRIPTION	TIME BEGIN	TIME END	NBL	NBLT	NBT	NBTR	NBLR	EBL	EBT	EBTR	EBLR	EBU	SBL	SBT	SBTR	SBR	SBLR	WBL	WBT	WBLTR	WBTR	WBLR
Control	0:00	0:00																				
Lanes	0:00	0:00																				
Signal Phasing	0:00	0:00																				

MODE	TIME BEGIN	TIME END	NBL	NBL2	NBT	NBR	NBU	EBL	EBT	EBR	EBU	EBU2	SBL	SBT	SBR	SBR2	SBU	WBL	WBT	WBT2	WBR	WBU
Vehicle	7:00	7:15	7	27	12	6	0	4	28	0	0	15	0	0	0	0	0	0	17	12	2	0
Vehicle	7:15	7:30	0	30	19	6	0	3	35	0	0	7	0	0	0	0	0	0	16	8	2	0
Vehicle	7:30	7:45	4	27	20	11	0	8	41	0	0	5	0	0	0	0	0	0	17	18	3	0
Vehicle	7:45	8:00	7	18	23	9	0	5	52	0	0	5	0	0	0	0	0	0	20	11	1	0
Vehicle	8:00	8:15	5	19	13	10	0	6	35	0	0	6	0	0	0	0	0	0	37	15	3	0
Vehicle	8:15	8:30	5	21	23	12	0	4	31	0	0	1	0	0	0	0	0	0	15	11	3	0
Vehicle	8:30	8:45	1	25	26	4	0	7	31	0	0	5	0	0	0	0	0	0	25	9	2	0
Vehicle	8:45	9:00	1	24	24	7	0	8	33	0	0	9	0	0	0	0	0	0	27	10	1	0
Vehicle	16:00	16:15	5	45	20	6	0	2	38	0	0	27	0	0	0	0	0	0	54	12	2	0
Vehicle	16:15	16:30	9	48	22	4	0	0	32	0	0	12	0	0	0	0	0	0	43	23	0	0
Vehicle	16:30	16:45	5	51	13	8	0	2	32	0	0	7	0	0	0	0	0	0	67	23	1	0
Vehicle	16:45	17:00	3	50	14	1	0	1	40	0	0	9	0	0	0	0	0	0	55	19	6	0
Vehicle	17:00	17:15	8	58	15	7	0	2	36	0	0	13	0	0	0	0	0	0	64	18	1	0
Vehicle	17:15	17:30	4	44	25	4	0	2	35	0	0	7	0	0	0	0	0	0	47	22	4	0
Vehicle	17:30	17:45	5	37	25	2	0	2	23	0	0	11	0	0	0	0	0	0	41	19	2	0
Vehicle	17:45	18:00	4	33	22	4	0	4	10	0	0	15	0	0	0	0	0	0	33	18	2	0
Bicycle	7:00	7:15	2		5	1		0	0	0			0	0	0			0	0		0	
Bicycle	7:15	7:30	1		0	0		0	0	0			0	0	0			0	0		0	
Bicycle	7:30	7:45	7		1	0		0	1	0			0	1	0			0	1		0	
Bicycle	7:45	8:00	7		4	0		0	0	0			0	0	0			0	0		0	
Bicycle	8:00	8:15	4		3	0		0	1	0			0	0	0			0	0		0	
Bicycle	8:15	8:30	4		0	0		0	0	0			0	0	0			0	0		0	
Bicycle	8:30	8:45	6		1	0		0	1	0			0	0	1			0	0		0	
Bicycle	8:45	9:00	5		2	0		0	0	0			0	0	0			0	0		0	
Bicycle	16:00	16:15	0		0	0		1	0	0			0	0	0			0	0		0	
Bicycle	16:15	16:30	0		0	0		0	0	0			0	0	0			0	2		0	
Bicycle	16:30	16:45	0		4	0		0	0	0			2	0	0			0	1		0	
Bicycle	16:45	17:00	0		2	0		0	0	0			0	1	0			0	0		0	
Bicycle	17:00	17:15	0		1	0		0	0	0			0	1	0			0	0		0	
Bicycle	17:15	17:30	0		1	1		0	0	0			0	0	0			0	0		0	
Bicycle	17:30	17:45	0		0	0		0	0	0			0	1	0			0	0		0	
Bicycle	17:45	18:00	0		1	0		0	0	0			0	1	0			0	0		0	

MODE	TIME BEGIN	TIME END	N	N2	E	S	W
Pedestrian	7:00	7:15	0		0	0	0
Pedestrian	7:15	7:30	0		1	1	0
Pedestrian	7:30	7:45	2		0	1	3
Pedestrian	7:45	8:00	4		3	4	0
Pedestrian	8:00	8:15	4		2	1	2
Pedestrian	8:15	8:30	6		1	0	0
Pedestrian	8:30	8:45	8		3	3	1
Pedestrian	8:45	9:00	8		2	1	1
Pedestrian	16:00	16:15	6		0	0	0
Pedestrian	16:15	16:30	2		4	4	0
Pedestrian	16:30	16:45	10		0	1	0
Pedestrian	16:45	17:00	8		5	1	0
Pedestrian	17:00	17:15	0		3	0	0
Pedestrian	17:15	17:30	4		3	2	0
Pedestrian	17:30	17:45	2		3	4	0
Pedestrian	17:45	18:00	2		0	1	1

MARKS TRAFFIC DATA

mietekm@comcast.net
916.806.0250

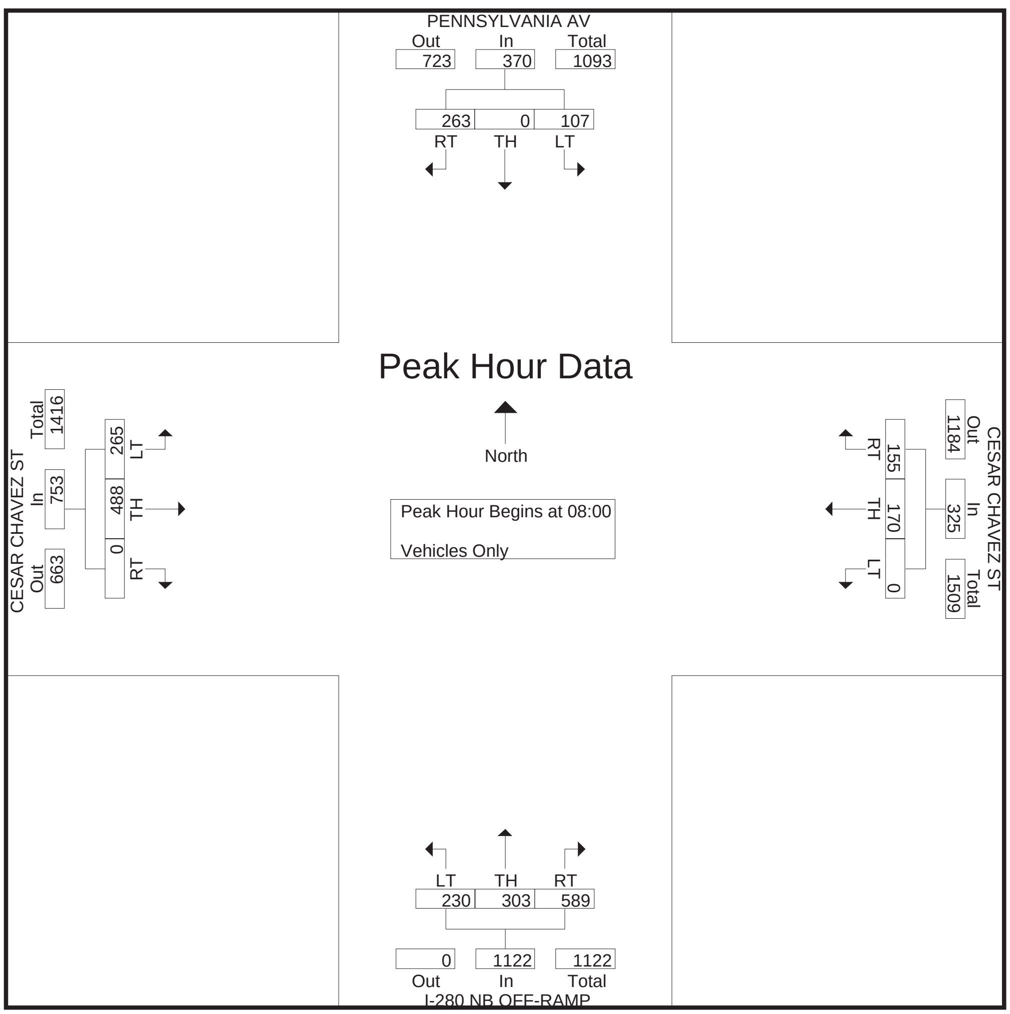
CITY OF SAN FRANCISCO

File Name : pennsylvania-280 nb off-a
Site Code : 3
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	PENNSYLVANIA AV Southbound				CESAR CHAVEZ ST Westbound				I-280 NB OFF-RAMP Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	39	0	21	60	53	29	0	82	145	53	57	255	0	94	49	143	540
07:15	58	0	17	75	52	31	0	83	136	42	42	220	0	100	52	152	530
07:30	46	0	17	63	57	46	0	103	142	47	56	245	0	99	50	149	560
07:45	62	0	17	79	41	28	0	69	170	72	58	300	0	108	59	167	615
Total	205	0	72	277	203	134	0	337	593	214	213	1020	0	401	210	611	2245
08:00	59	0	26	85	39	40	0	79	129	62	52	243	0	103	63	166	573
08:15	54	0	22	76	30	39	0	69	140	70	56	266	0	132	67	199	610
08:30	64	0	27	91	53	47	0	100	148	77	63	288	0	147	69	216	695
08:45	86	0	32	118	33	44	0	77	172	94	59	325	0	106	66	172	692
Total	263	0	107	370	155	170	0	325	589	303	230	1122	0	488	265	753	2570
Grand Total	468	0	179	647	358	304	0	662	1182	517	443	2142	0	889	475	1364	4815
Apprch %	72.3	0	27.7		54.1	45.9	0		55.2	24.1	20.7		0	65.2	34.8		
Total %	9.7	0	3.7	13.4	7.4	6.3	0	13.7	24.5	10.7	9.2	44.5	0	18.5	9.9	28.3	

	PENNSYLVANIA AV Southbound				CESAR CHAVEZ ST Westbound				I-280 NB OFF-RAMP Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	59	0	26	85	39	40	0	79	129	62	52	243	0	103	63	166	573
08:15	54	0	22	76	30	39	0	69	140	70	56	266	0	132	67	199	610
08:30	64	0	27	91	**53**	**47**	0	**100**	148	77	**63**	288	0	**147**	**69**	**216**	**695**
08:45	**86**	0	**32**	**118**	33	44	0	77	**172**	**94**	59	**325**	0	106	66	172	692
Total Volume	263	0	107	370	155	170	0	325	589	303	230	1122	0	488	265	753	2570
% App. Total	71.1	0	28.9		47.7	52.3	0		52.5	27	20.5		0	64.8	35.2		
PHF	.765	.000	.836	.784	.731	.904	.000	.813	.856	.806	.913	.863	.000	.830	.960	.872	.924



MARKS TRAFFIC DATA
mietekm@comcast.net
916.806.0250

CITY OF SAN FRANCISCO

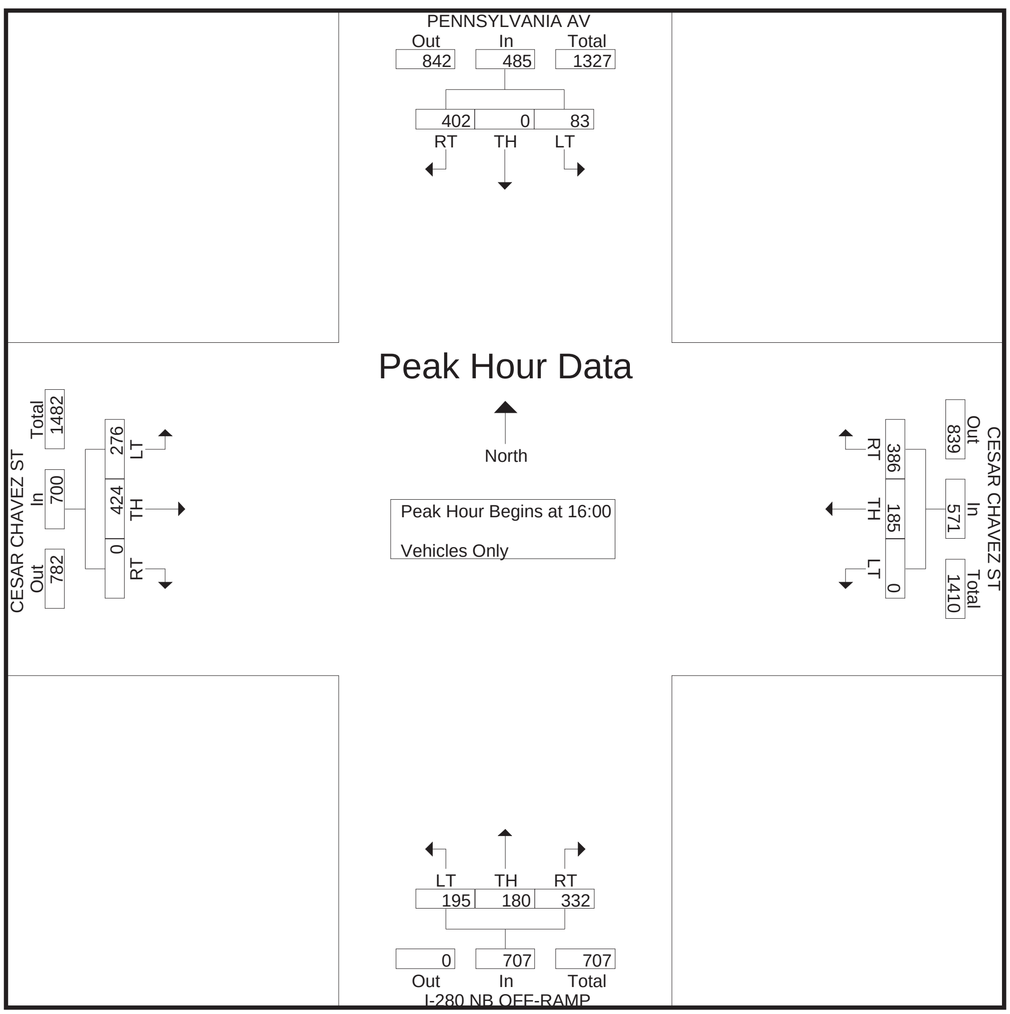
File Name : pennsylvania-280 nb off-p
Site Code : 3
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	PENNSYLVANIA AV Southbound				CESAR CHAVEZ ST Westbound				I-280 NB OFF-RAMP Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	109	0	19	128	104	41	0	145	87	42	39	168	0	127	81	208	649
16:15	104	0	18	122	83	47	0	130	90	61	55	206	0	100	66	166	624
16:30	95	0	28	123	120	43	0	163	80	33	47	160	0	101	64	165	611
16:45	94	0	18	112	79	54	0	133	75	44	54	173	0	96	65	161	579
Total	402	0	83	485	386	185	0	571	332	180	195	707	0	424	276	700	2463
17:00	80	0	20	100	106	67	0	173	87	56	37	180	0	90	71	161	614
17:15	93	0	13	106	96	71	0	167	100	52	36	188	0	106	70	176	637
17:30	91	0	9	100	103	63	0	166	105	49	39	193	0	65	50	115	574
17:45	96	0	15	111	73	65	0	138	105	53	35	193	0	62	44	106	548
Total	360	0	57	417	378	266	0	644	397	210	147	754	0	323	235	558	2373
Grand Total	762	0	140	902	764	451	0	1215	729	390	342	1461	0	747	511	1258	4836
Apprch %	84.5	0	15.5		62.9	37.1	0		49.9	26.7	23.4		0	59.4	40.6		
Total %	15.8	0	2.9	18.7	15.8	9.3	0	25.1	15.1	8.1	7.1	30.2	0	15.4	10.6	26	

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:00

	PENNSYLVANIA AV Southbound				CESAR CHAVEZ ST Westbound				I-280 NB OFF-RAMP Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	**109**	0	19	**128**	104	41	0	145	87	42	39	168	0	**127**	**81**	**208**	**649**
16:15	104	0	18	122	83	47	0	130	**90**	**61**	**55**	**206**	0	100	66	166	624
16:30	95	0	**28**	123	**120**	43	0	**163**	80	33	47	160	0	101	64	165	611
16:45	94	0	18	112	79	**54**	0	133	75	44	54	173	0	96	65	161	579
Total Volume	402	0	83	485	386	185	0	571	332	180	195	707	0	424	276	700	2463
% App. Total	82.9	0	17.1		67.6	32.4	0		47	25.5	27.6		0	60.6	39.4		
PHF	.922	.000	.741	.947	.804	.856	.000	.876	.922	.738	.886	.858	.000	.835	.852	.841	.949



MARKS TRAFFIC DATA
mietekm@comcast.net
916.806.0250

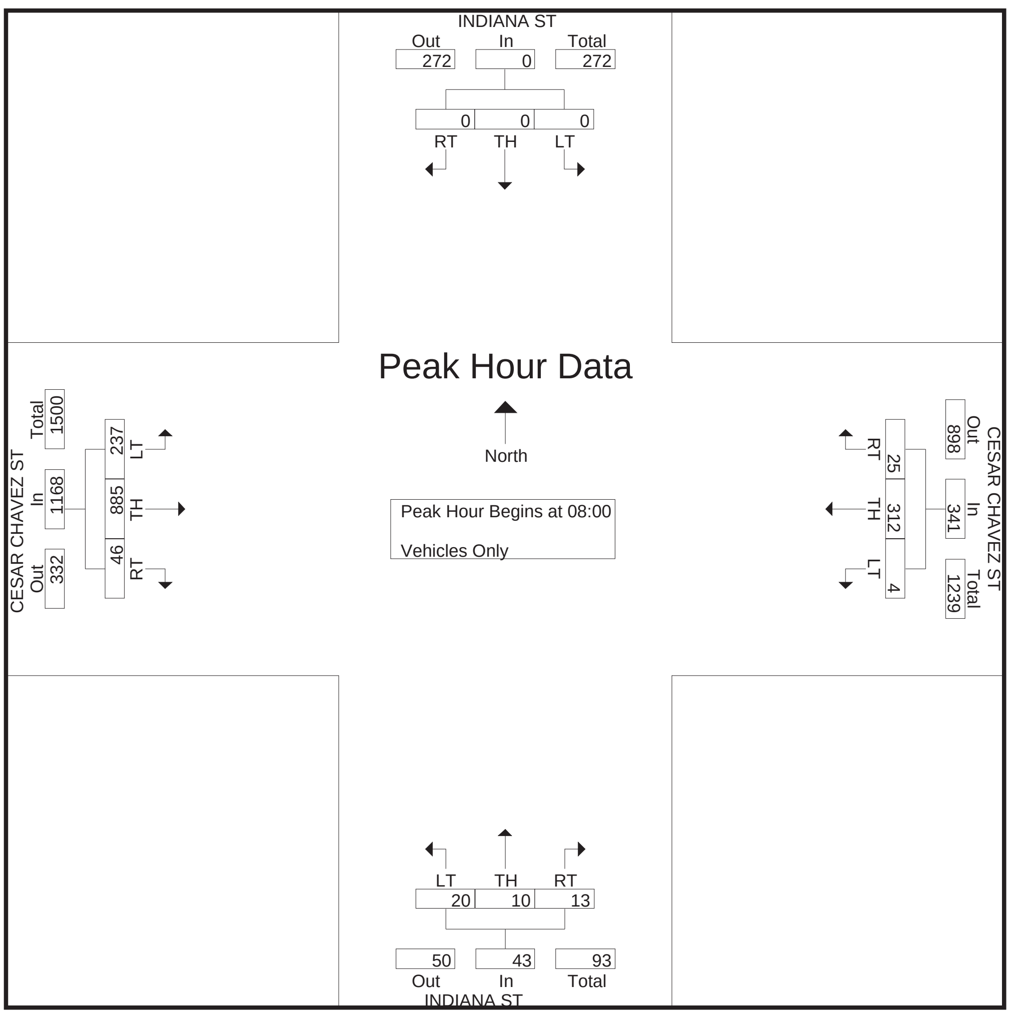
CITY OF SAN FRANCISCO

File Name : indiana-chavez-a
Site Code : 4
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	INDIANA ST Southbound				CESAR CHAVEZ ST Westbound				INDIANA ST Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	0	0	0	0	10	82	2	94	1	4	7	12	7	211	46	264	370
07:15	0	0	0	0	3	82	3	88	1	2	3	6	10	184	56	250	344
07:30	0	0	0	0	13	99	0	112	2	3	6	11	5	194	55	254	377
07:45	0	0	0	0	8	72	1	81	1	8	3	12	8	228	59	295	388
Total	0	0	0	0	34	335	6	375	5	17	19	41	30	817	216	1063	1479
08:00	0	0	0	0	5	75	2	82	3	3	8	14	14	200	53	267	363
08:15	0	0	0	0	7	68	1	76	4	4	3	11	14	205	58	277	364
08:30	0	0	0	0	8	98	0	106	5	1	5	11	9	242	68	319	436
08:45	0	0	0	0	5	71	1	77	1	2	4	7	9	238	58	305	389
Total	0	0	0	0	25	312	4	341	13	10	20	43	46	885	237	1168	1552
Grand Total	0	0	0	0	59	647	10	716	18	27	39	84	76	1702	453	2231	3031
Apprch %	0	0	0		8.2	90.4	1.4		21.4	32.1	46.4		3.4	76.3	20.3		
Total %	0	0	0	0	1.9	21.3	0.3	23.6	0.6	0.9	1.3	2.8	2.5	56.2	14.9	73.6	

	INDIANA ST Southbound				CESAR CHAVEZ ST Westbound				INDIANA ST Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	0	0	0	0	5	75	**2**	82	3	3	**8**	**14**	**14**	200	53	267	363
08:15	0	0	0	0	7	68	1	76	4	**4**	3	11	14	205	58	277	364
08:30	0	0	0	0	**8**	**98**	0	**106**	**5**	1	5	11	9	**242**	**68**	**319**	**436**
08:45	0	0	0	0	5	71	1	77	1	2	4	7	9	238	58	305	389
Total Volume	0	0	0	0	25	312	4	341	13	10	20	43	46	885	237	1168	1552
% App. Total	0	0	0		7.3	91.5	1.2		30.2	23.3	46.5		3.9	75.8	20.3		
PHF	.000	.000	.000	.000	.781	.796	.500	.804	.650	.625	.625	.768	.821	.914	.871	.915	.890



MARKS TRAFFIC DATA

mietekm@comcast.net
916.806.0250

CITY OF SAN FRANCISCO

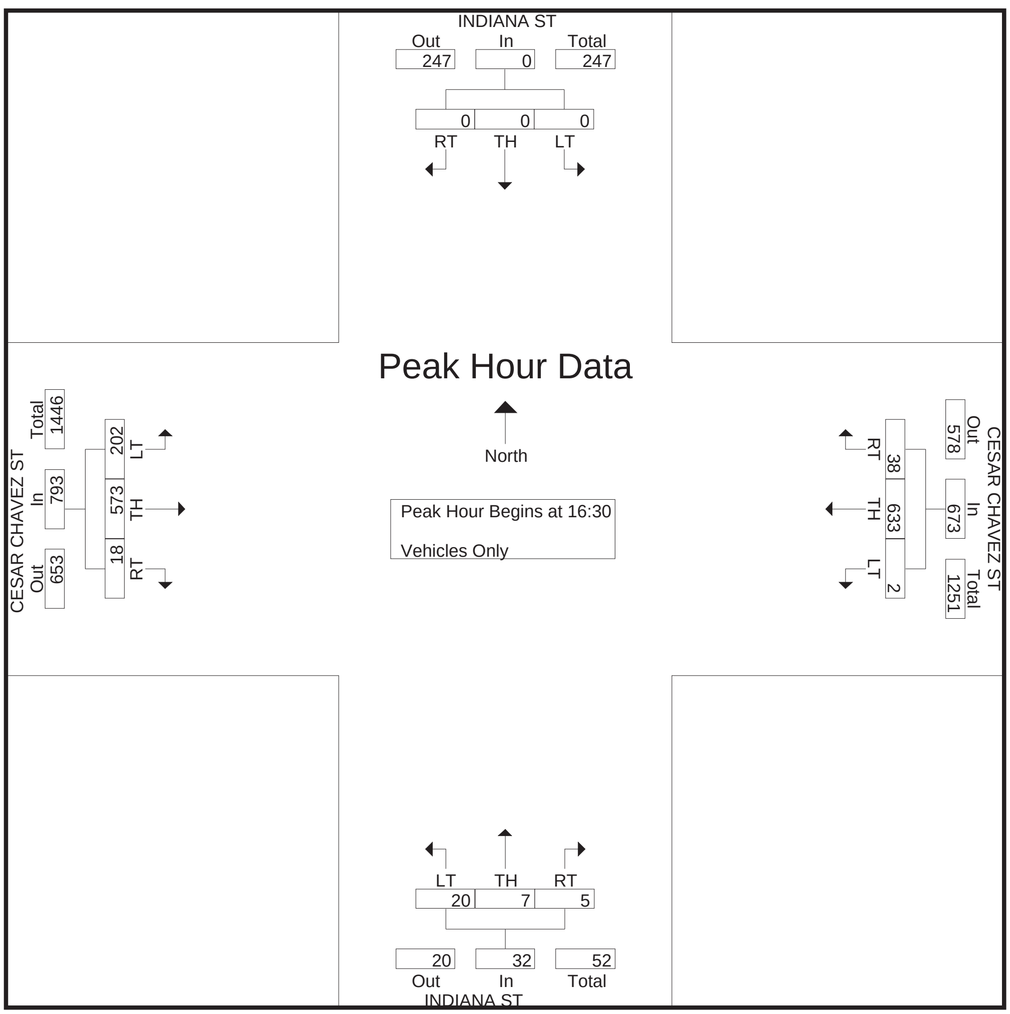
File Name : indiana-chavez-p
Site Code : 4
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	INDIANA ST Southbound				CESAR CHAVEZ ST Westbound				INDIANA ST Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	0	0	0	0	7	143	1	151	1	2	2	5	9	167	50	226	382
16:15	0	0	0	0	7	121	2	130	0	2	8	10	1	154	51	206	346
16:30	0	0	0	0	12	156	0	168	1	3	7	11	9	145	50	204	383
16:45	0	0	0	0	10	129	0	139	2	3	6	11	3	149	42	194	344
Total	0	0	0	0	36	549	3	588	4	10	23	37	22	615	193	830	1455
17:00	0	0	0	0	6	170	2	178	2	1	3	6	3	136	54	193	377
17:15	0	0	0	0	10	178	0	188	0	0	4	4	3	143	56	202	394
17:30	0	0	0	0	8	145	0	153	0	0	1	1	4	127	45	176	330
17:45	0	0	0	0	7	132	1	140	1	1	7	9	3	141	38	182	331
Total	0	0	0	0	31	625	3	659	3	2	15	20	13	547	193	753	1432
Grand Total	0	0	0	0	67	1174	6	1247	7	12	38	57	35	1162	386	1583	2887
Apprch %	0	0	0		5.4	94.1	0.5		12.3	21.1	66.7		2.2	73.4	24.4		
Total %	0	0	0	0	2.3	40.7	0.2	43.2	0.2	0.4	1.3	2	1.2	40.2	13.4	54.8	

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:30

	INDIANA ST Southbound				CESAR CHAVEZ ST Westbound				INDIANA ST Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:30	0	0	0	0	**12**	156	0	168	1	**3**	**7**	**11**	**9**	145	50	**204**	383
16:45	0	0	0	0	10	129	0	139	**2**	3	6	11	3	**149**	42	194	344
17:00	0	0	0	0	6	170	**2**	178	2	1	3	6	3	136	54	193	377
17:15	0	0	0	0	10	**178**	0	**188**	0	0	4	4	3	143	**56**	202	**394**
Total Volume	0	0	0	0	38	633	2	673	5	7	20	32	18	573	202	793	1498
% App. Total	0	0	0		5.6	94.1	0.3		15.6	21.9	62.5		2.3	72.3	25.5		
PHF	.000	.000	.000	.000	.792	.889	.250	.895	.625	.583	.714	.727	.500	.961	.902	.972	.951



MARKS TRAFFIC DATA
mietekm@comcast.net
916.806.0250

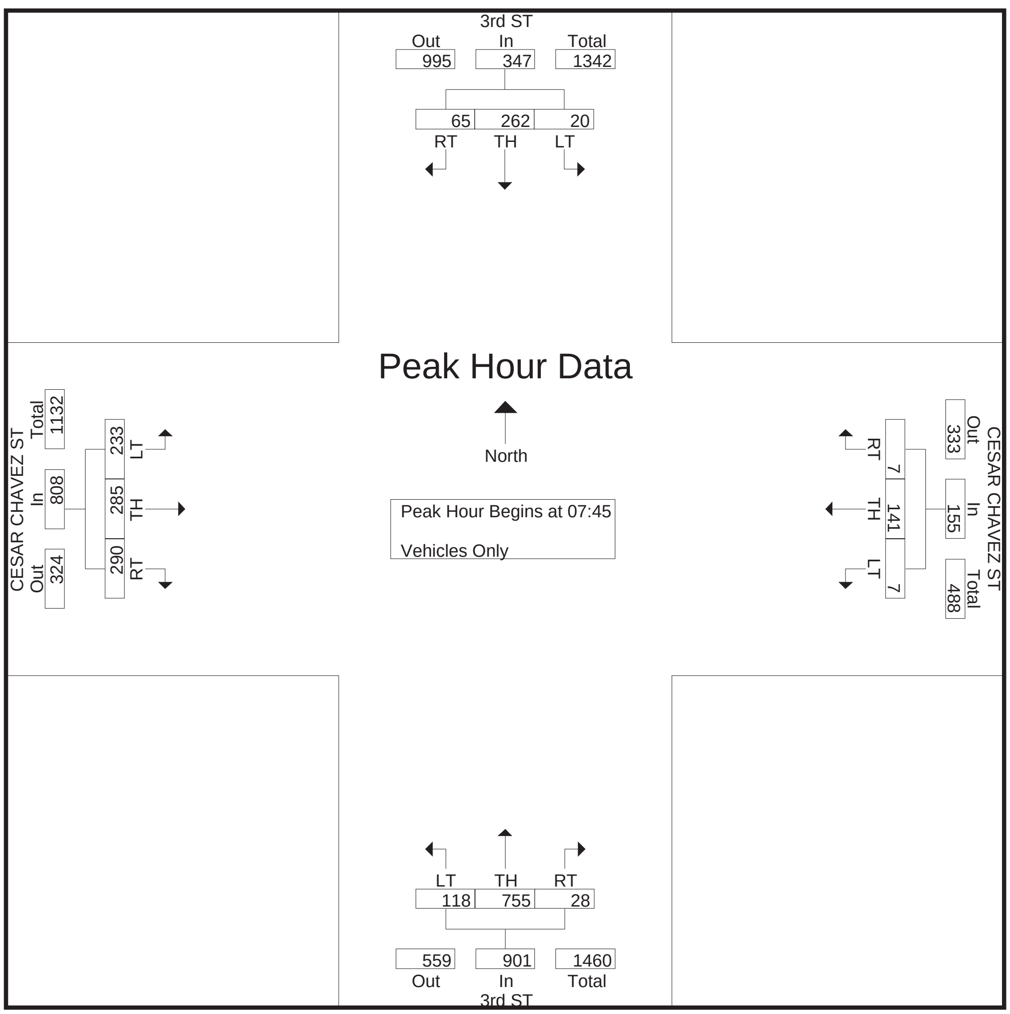
CITY OF SAN FRANCISCO

File Name : 3-chavez-a
Site Code : 5
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	3rd ST Southbound				CESAR CHAVEZ ST Westbound				3rd ST Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	10	43	3	56	3	36	1	40	2	102	35	139	63	104	38	205	440
07:15	14	60	4	78	2	45	2	49	5	129	20	154	65	79	27	171	452
07:30	15	51	1	67	3	43	0	46	8	171	59	238	56	85	35	176	527
07:45	18	58	6	82	1	33	3	37	6	194	32	232	73	85	44	202	553
Total	57	212	14	283	9	157	6	172	21	596	146	763	257	353	144	754	1972
08:00	17	60	6	83	3	32	0	35	6	181	23	210	72	57	61	190	518
08:15	11	73	6	90	2	44	3	49	11	202	14	227	72	59	60	191	557
08:30	19	71	2	92	1	32	1	34	5	178	49	232	73	84	68	225	583
08:45	15	70	3	88	4	36	3	43	3	159	26	188	40	93	65	198	517
Total	62	274	17	353	10	144	7	161	25	720	112	857	257	293	254	804	2175
Grand Total	119	486	31	636	19	301	13	333	46	1316	258	1620	514	646	398	1558	4147
Apprch %	18.7	76.4	4.9		5.7	90.4	3.9		2.8	81.2	15.9		33	41.5	25.5		
Total %	2.9	11.7	0.7	15.3	0.5	7.3	0.3	8	1.1	31.7	6.2	39.1	12.4	15.6	9.6	37.6	

	3rd ST Southbound				CESAR CHAVEZ ST Westbound				3rd ST Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	18	58	**6**	82	1	33	**3**	37	6	194	32	**232**	**73**	**85**	44	202	553
08:00	17	60	6	83	**3**	32	0	35	6	181	23	210	72	57	61	190	518
08:15	11	**73**	6	90	2	**44**	3	**49**	**11**	**202**	14	227	72	59	60	191	557
08:30	**19**	71	2	**92**	1	32	1	34	5	178	**49**	232	73	84	**68**	**225**	**583**
Total Volume	65	262	20	347	7	141	7	155	28	755	118	901	290	285	233	808	2211
% App. Total	18.7	75.5	5.8		4.5	91	4.5		3.1	83.8	13.1		35.9	35.3	28.8		
PHF	.855	.897	.833	.943	.583	.801	.583	.791	.636	.934	.602	.971	.993	.838	.857	.898	.948



MARKS TRAFFIC DATA
mietekm@comcast.net
916.806.0250

CITY OF SAN FRANCISCO

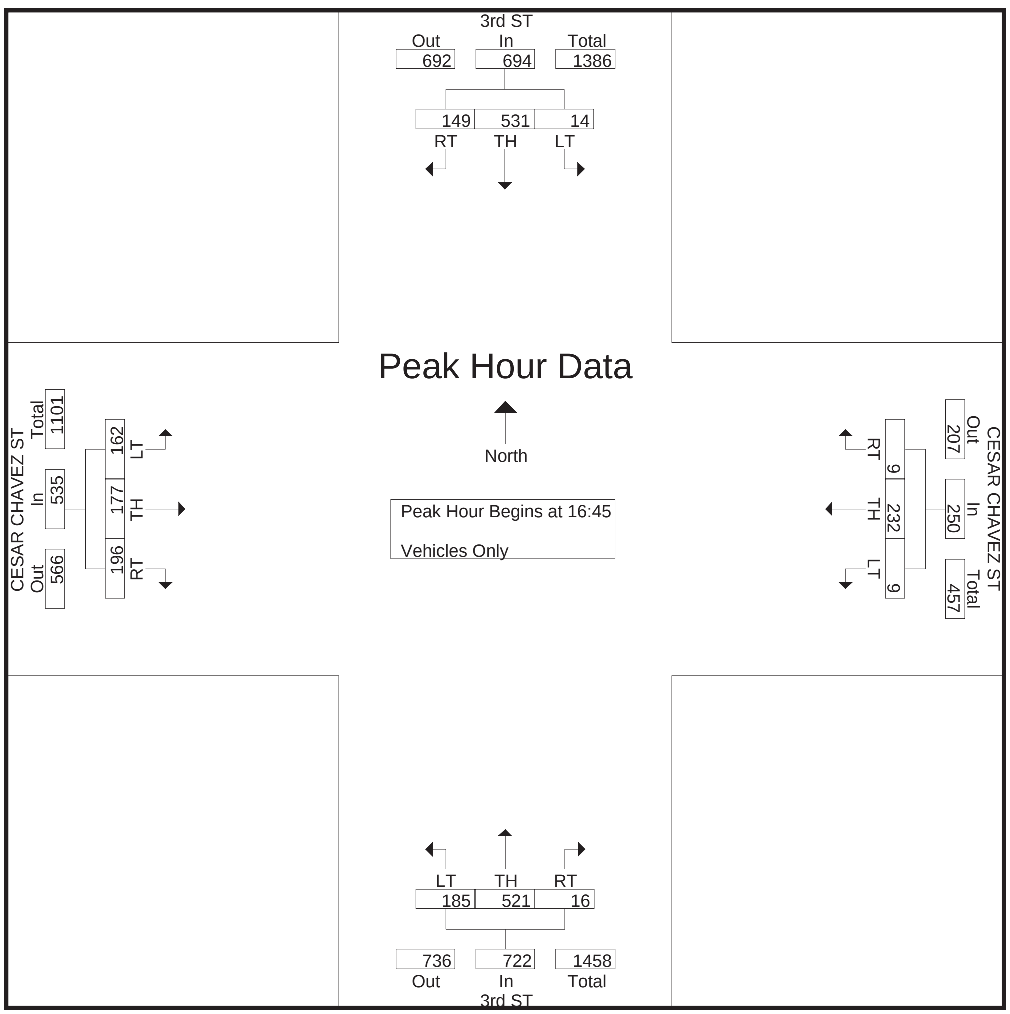
File Name : 3-chavez-p
Site Code : 5
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	3rd ST Southbound				CESAR CHAVEZ ST Westbound				3rd ST Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	24	98	6	128	3	56	2	61	2	179	50	231	55	48	46	149	569
16:15	24	86	5	115	0	55	4	59	3	151	46	200	54	48	38	140	514
16:30	23	94	6	123	3	68	1	72	6	138	58	202	44	49	36	129	526
16:45	15	131	4	150	4	41	1	46	2	114	55	171	54	46	46	146	513
Total	86	409	21	516	10	220	8	238	13	582	209	804	207	191	166	564	2122
17:00	31	86	1	118	3	73	1	77	5	160	48	213	53	31	37	121	529
17:15	59	148	4	211	0	63	3	66	4	132	44	180	45	55	49	149	606
17:30	44	166	5	215	2	55	4	61	5	115	38	158	44	45	30	119	553
17:45	51	89	6	146	1	46	1	48	4	113	35	152	51	42	33	126	472
Total	185	489	16	690	6	237	9	252	18	520	165	703	193	173	149	515	2160
Grand Total	271	898	37	1206	16	457	17	490	31	1102	374	1507	400	364	315	1079	4282
Apprch %	22.5	74.5	3.1		3.3	93.3	3.5		2.1	73.1	24.8		37.1	33.7	29.2		
Total %	6.3	21	0.9	28.2	0.4	10.7	0.4	11.4	0.7	25.7	8.7	35.2	9.3	8.5	7.4	25.2	

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

	3rd ST Southbound				CESAR CHAVEZ ST Westbound				3rd ST Northbound				CESAR CHAVEZ ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:45	15	131	4	150	**4**	41	1	46	2	114	**55**	171	**54**	46	46	146	513
17:00	31	86	1	118	3	**73**	1	**77**	**5**	**160**	48	**213**	53	31	37	121	529
17:15	**59**	148	4	211	0	63	3	66	4	132	44	180	45	**55**	**49**	**149**	**606**
17:30	44	**166**	**5**	**215**	2	55	**4**	61	5	115	38	158	44	45	30	119	553
Total Volume	149	531	14	694	9	232	9	250	16	521	185	722	196	177	162	535	2201
% App. Total	21.5	76.5	2		3.6	92.8	3.6		2.2	72.2	25.6		36.6	33.1	30.3		
PHF	.631	.800	.700	.807	.563	.795	.563	.812	.800	.814	.841	.847	.907	.805	.827	.898	.908



MARKS TRAFFIC DATA

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916.806.0250

CITY OF SAN FRANCISCO

File Name : 3-cargo-a
Site Code : 6
Start Date : 5/12/2015
Page No : 1

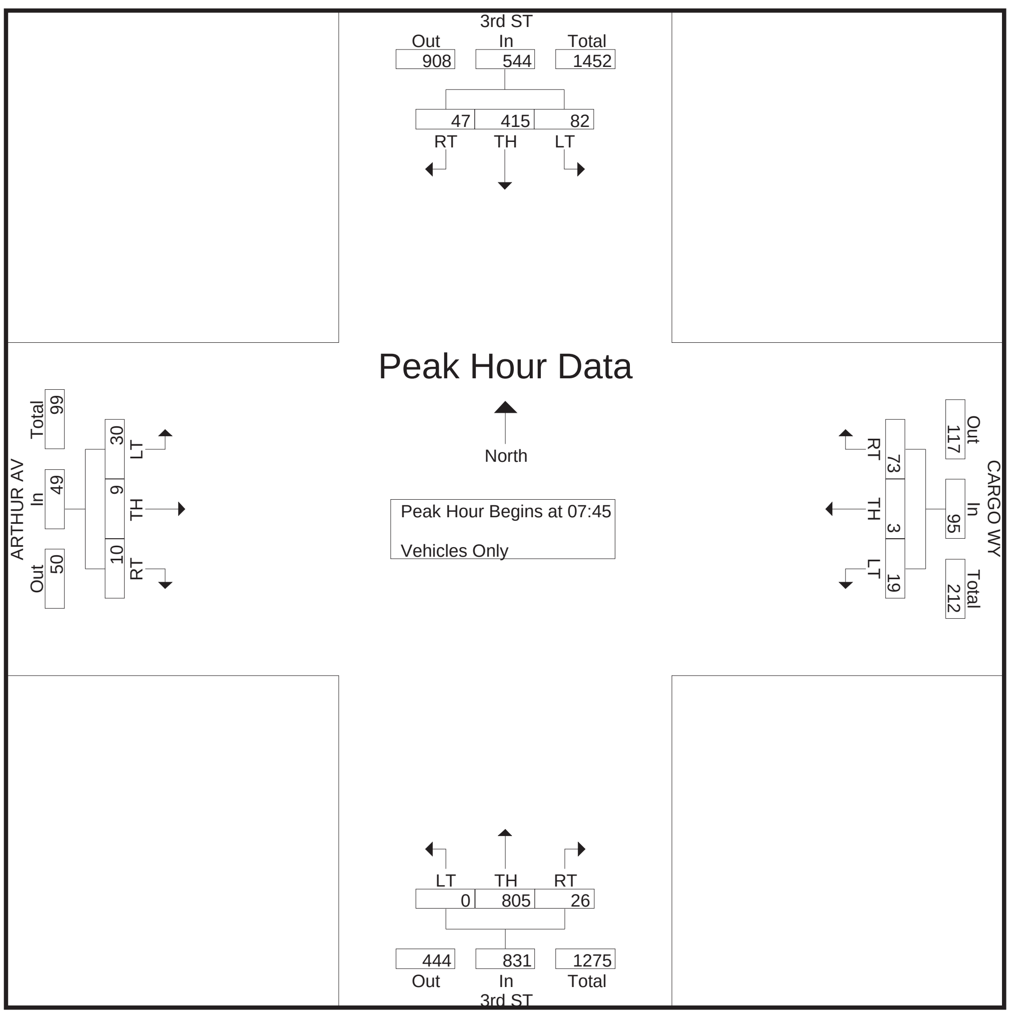
Groups Printed- Vehicles Only

	3rd ST Southbound				CARGO WY Westbound				3rd ST Northbound				ARTHUR AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	10	82	14	106	28	2	4	34	2	121	0	123	2	3	4	9	272
07:15	10	95	20	125	16	1	4	21	6	155	0	161	1	0	10	11	318
07:30	12	82	16	110	22	0	6	28	6	190	0	196	5	6	9	20	354
07:45	13	103	22	138	16	0	1	17	7	201	0	208	2	1	11	14	377
Total	45	362	72	479	82	3	15	100	21	667	0	688	10	10	34	54	1321
08:00	9	101	15	125	22	1	5	28	6	193	0	199	1	3	3	7	359
08:15	11	108	25	144	13	1	8	22	9	205	0	214	3	0	6	9	389
08:30	14	103	20	137	22	1	5	28	4	206	0	210	4	5	10	19	394
08:45	7	112	13	132	11	0	9	20	3	183	0	186	4	2	9	15	353
Total	41	424	73	538	68	3	27	98	22	787	0	809	12	10	28	50	1495
Grand Total	86	786	145	1017	150	6	42	198	43	1454	0	1497	22	20	62	104	2816
Apprch %	8.5	77.3	14.3		75.8	3	21.2		2.9	97.1	0		21.2	19.2	59.6		
Total %	3.1	27.9	5.1	36.1	5.3	0.2	1.5	7	1.5	51.6	0	53.2	0.8	0.7	2.2	3.7	

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45

	3rd ST Southbound				CARGO WY Westbound				3rd ST Northbound				ARTHUR AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:45	13	103	22	138	16	0	1	17	7	201	0	208	2	1	**11**	14	377
08:00	9	101	15	125	**22**	**1**	5	**28**	6	193	0	199	1	3	3	7	359
08:15	11	**108**	**25**	**144**	13	1	**8**	22	**9**	205	0	**214**	3	0	6	9	389
08:30	**14**	103	20	137	22	1	5	28	4	**206**	0	210	**4**	**5**	10	**19**	**394**
Total Volume	47	415	82	544	73	3	19	95	26	805	0	831	10	9	30	49	1519
% App. Total	8.6	76.3	15.1		76.8	3.2	20		3.1	96.9	0		20.4	18.4	61.2		
PHF	.839	.961	.820	.944	.830	.750	.594	.848	.722	.977	.000	.971	.625	.450	.682	.645	.964



MARKS TRAFFIC DATA

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CITY OF SAN FRANCISCO

File Name : 3-cargo-p
Site Code : 6
Start Date : 5/12/2015
Page No : 1

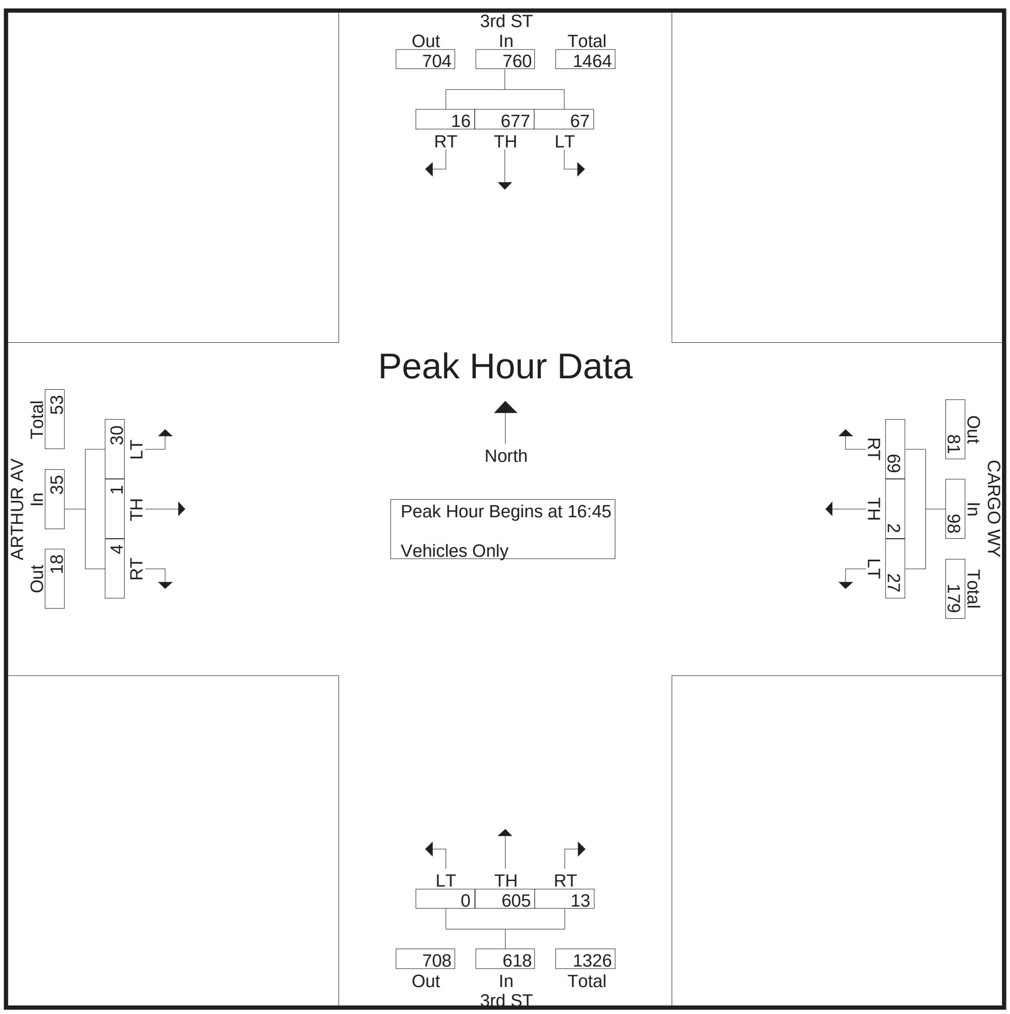
Groups Printed- Vehicles Only

	3rd ST Southbound				CARGO WY Westbound				3rd ST Northbound				ARTHUR AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	4	124	16	144	28	0	5	33	1	188	0	189	1	1	16	18	384
16:15	3	124	18	145	16	0	7	23	3	179	0	182	3	2	8	13	363
16:30	2	129	20	151	27	1	9	37	6	160	0	166	2	1	9	12	366
16:45	4	157	16	177	20	1	6	27	3	149	0	152	2	0	5	7	363
Total	13	534	70	617	91	2	27	120	13	676	0	689	8	4	38	50	1476
17:00	3	144	14	161	23	0	4	27	2	160	0	162	1	0	10	11	361
17:15	2	184	15	201	20	0	6	26	5	155	0	160	1	0	5	6	393
17:30	7	192	22	221	6	1	11	18	3	141	0	144	0	1	10	11	394
17:45	4	137	9	150	12	0	3	15	3	124	0	127	2	1	8	11	303
Total	16	657	60	733	61	1	24	86	13	580	0	593	4	2	33	39	1451
Grand Total	29	1191	130	1350	152	3	51	206	26	1256	0	1282	12	6	71	89	2927
Apprch %	2.1	88.2	9.6		73.8	1.5	24.8		2	98	0		13.5	6.7	79.8		
Total %	1	40.7	4.4	46.1	5.2	0.1	1.7	7	0.9	42.9	0	43.8	0.4	0.2	2.4	3	

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 16:45

	3rd ST Southbound				CARGO WY Westbound				3rd ST Northbound				ARTHUR AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:45	4	157	16	177	20	**1**	6	**27**	3	149	0	152	**2**	0	5	7	363
17:00	3	144	14	161	**23**	0	4	27	2	**160**	0	**162**	1	0	**10**	**11**	361
17:15	2	184	15	201	20	0	6	26	**5**	155	0	160	1	0	5	6	393
17:30	**7**	**192**	**22**	**221**	6	1	**11**	18	3	141	0	144	0	**1**	10	11	**394**
Total Volume	16	677	67	760	69	2	27	98	13	605	0	618	4	1	30	35	1511
% App. Total	2.1	89.1	8.8		70.4	2	27.6		2.1	97.9	0		11.4	2.9	85.7		
PHF	.571	.882	.761	.860	.750	.500	.614	.907	.650	.945	.000	.954	.500	.250	.750	.795	.959



MARKS TRAFFIC DATA
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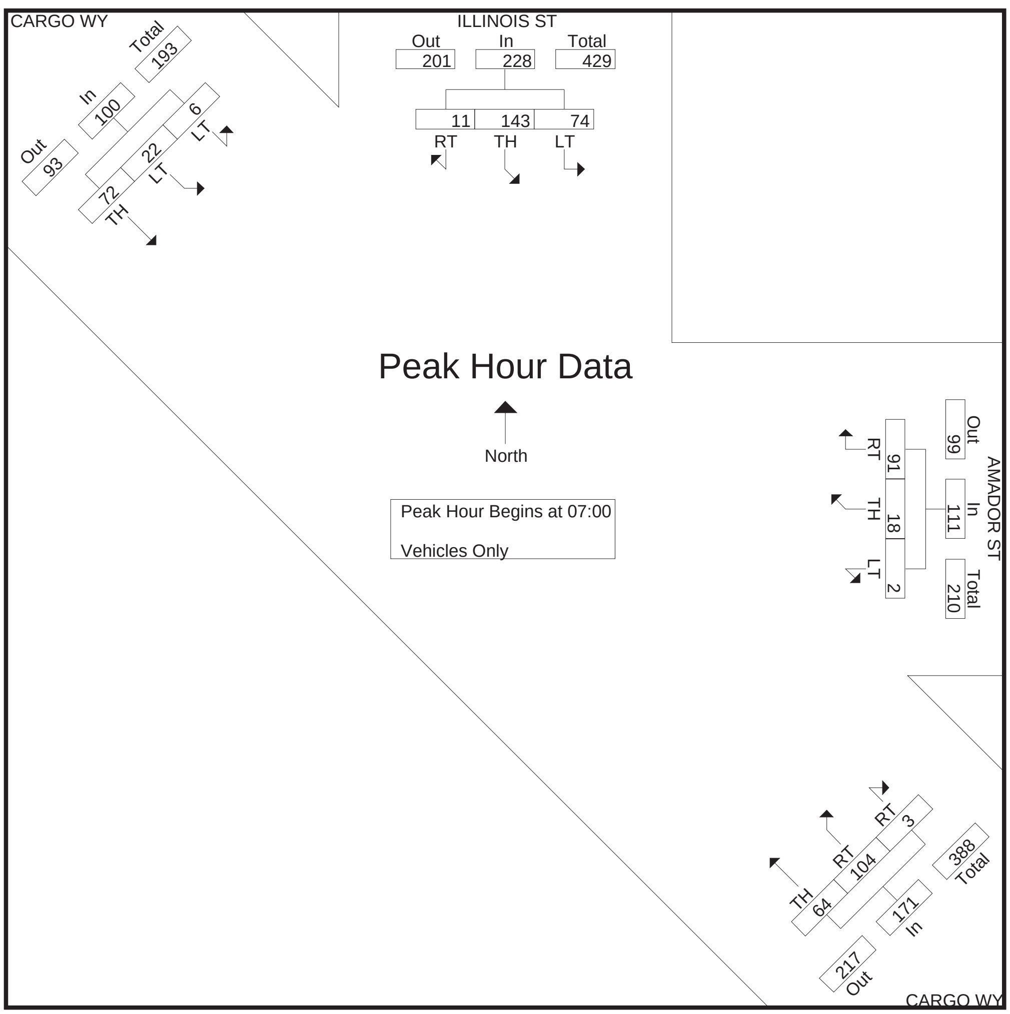
CITY OF SAN FRANCISCO

File Name : illinois-cargo-a
Site Code : 7
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	ILLINOIS ST Southbound				AMADOR ST Westbound				CARGO WY Northwestbound				CARGO WY Southeastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	RT	TH	App. Total	TH	LT	LT	App. Total	Int. Total
07:00	2	36	23	61	15	10	1	26	1	22	15	38	11	7	1	19	144
07:15	3	40	17	60	31	4	0	35	0	18	14	32	21	3	1	25	152
07:30	5	40	22	67	25	2	0	27	2	36	20	58	21	3	3	27	179
07:45	1	27	12	40	20	2	1	23	0	28	15	43	19	9	1	29	135
Total	11	143	74	228	91	18	2	111	3	104	64	171	72	22	6	100	610
08:00	6	22	8	36	21	4	1	26	3	24	18	45	19	5	2	26	133
08:15	4	29	14	47	19	3	0	22	1	32	15	48	30	4	1	35	152
08:30	2	34	10	46	20	4	0	24	2	27	21	50	19	8	2	29	149
08:45	3	31	8	42	18	3	0	21	1	24	15	40	11	5	1	17	120
Total	15	116	40	171	78	14	1	93	7	107	69	183	79	22	6	107	554
Grand Total	26	259	114	399	169	32	3	204	10	211	133	354	151	44	12	207	1164
Apprch %	6.5	64.9	28.6		82.8	15.7	1.5		2.8	59.6	37.6		72.9	21.3	5.8		
Total %	2.2	22.3	9.8	34.3	14.5	2.7	0.3	17.5	0.9	18.1	11.4	30.4	13	3.8	1	17.8	

	ILLINOIS ST Southbound				AMADOR ST Westbound				CARGO WY Northwestbound				CARGO WY Southeastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	RT	TH	App. Total	TH	LT	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	2	36	**23**	61	15	**10**	**1**	26	1	22	15	38	11	7	1	19	144
07:15	3	**40**	17	60	**31**	4	0	**35**	0	18	14	32	**21**	3	1	25	152
07:30	**5**	40	22	**67**	25	2	0	27	**2**	**36**	**20**	**58**	21	3	**3**	27	**179**
07:45	1	27	12	40	20	2	1	23	0	28	15	43	19	**9**	1	**29**	135
Total Volume	11	143	74	228	91	18	2	111	3	104	64	171	72	22	6	100	610
% App. Total	4.8	62.7	32.5		82	16.2	1.8		1.8	60.8	37.4		72	22	6		
PHF	.550	.894	.804	.851	.734	.450	.500	.793	.375	.722	.800	.737	.857	.611	.500	.862	.852



MARKS TRAFFIC DATA
mietekm@comcast.net
916.806.0250

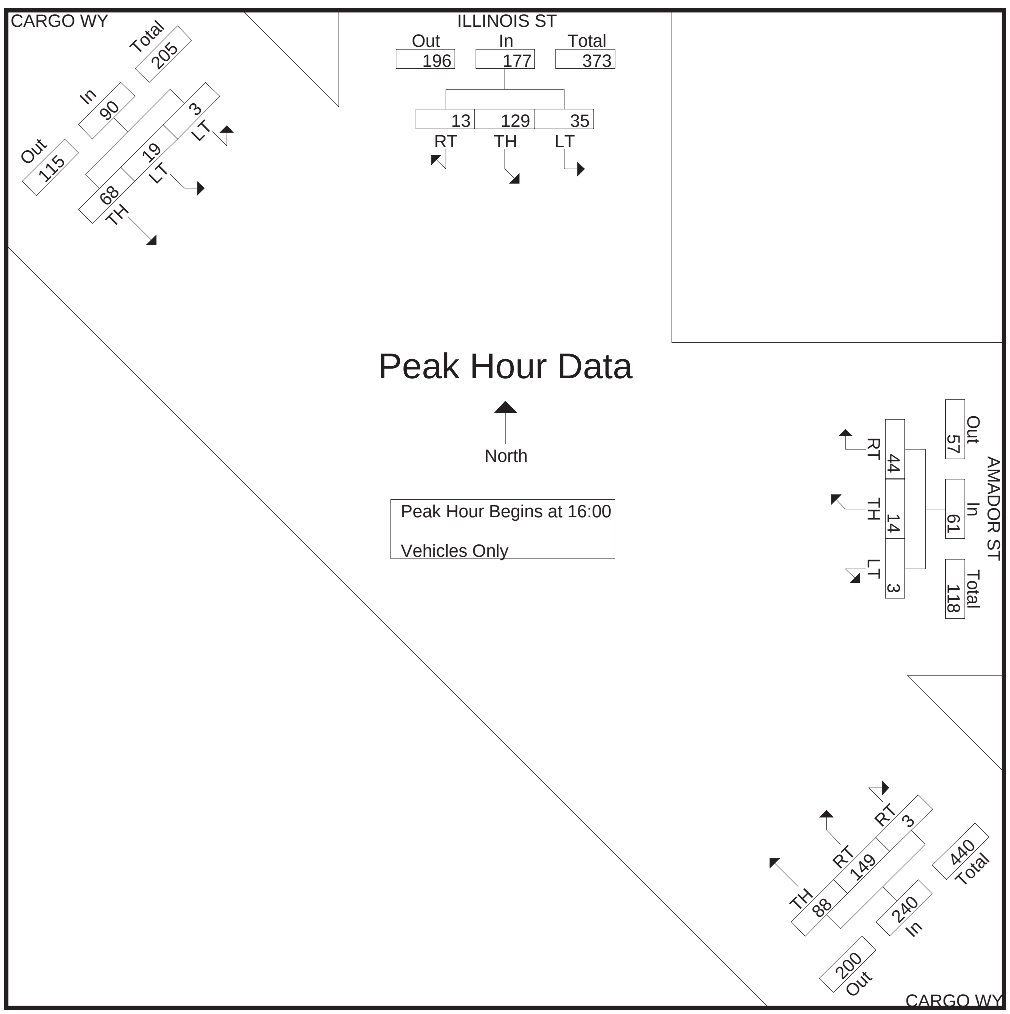
CITY OF SAN FRANCISCO

File Name : illinois-cargo-p
Site Code : 7
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	ILLINOIS ST Southbound				AMADOR ST Westbound				CARGO WY Northwestbound				CARGO WY Southeastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	RT	TH	App. Total	TH	LT	LT	App. Total	Int. Total
16:00	5	32	10	47	15	4	2	21	1	43	23	67	14	4	0	18	153
16:15	4	26	13	43	11	5	0	16	0	28	15	43	15	5	1	21	123
16:30	3	33	8	44	9	4	0	13	1	51	26	78	24	6	0	30	165
16:45	1	38	4	43	9	1	1	11	1	27	24	52	15	4	2	21	127
Total	13	129	35	177	44	14	3	61	3	149	88	240	68	19	3	90	568
17:00	3	37	6	46	7	2	1	10	1	35	22	58	10	0	0	10	124
17:15	5	48	4	57	9	1	0	10	0	40	21	61	16	4	0	20	148
17:30	5	45	5	55	11	6	0	17	3	30	9	42	23	0	0	23	137
17:45	2	41	14	57	16	2	0	18	1	27	12	40	12	0	0	12	127
Total	15	171	29	215	43	11	1	55	5	132	64	201	61	4	0	65	536
Grand Total	28	300	64	392	87	25	4	116	8	281	152	441	129	23	3	155	1104
Apprch %	7.1	76.5	16.3		75	21.6	3.4		1.8	63.7	34.5		83.2	14.8	1.9		
Total %	2.5	27.2	5.8	35.5	7.9	2.3	0.4	10.5	0.7	25.5	13.8	39.9	11.7	2.1	0.3	14	

	ILLINOIS ST Southbound				AMADOR ST Westbound				CARGO WY Northwestbound				CARGO WY Southeastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	RT	TH	App. Total	TH	LT	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	**5**	32	10	**47**	**15**	4	**2**	**21**	**1**	43	23	67	14	4	0	18	153
16:15	4	26	**13**	43	11	**5**	0	16	0	28	15	43	15	5	1	21	123
16:30	3	33	8	44	9	4	0	13	1	**51**	**26**	**78**	**24**	**6**	0	**30**	**165**
16:45	1	**38**	4	43	9	1	1	11	1	27	24	52	15	4	**2**	21	127
Total Volume	13	129	35	177	44	14	3	61	3	149	88	240	68	19	3	90	568
% App. Total	7.3	72.9	19.8		72.1	23	4.9		1.2	62.1	36.7		75.6	21.1	3.3		
PHF	.650	.849	.673	.941	.733	.700	.375	.726	.750	.730	.846	.769	.708	.792	.375	.750	.861



MARKS TRAFFIC DATA

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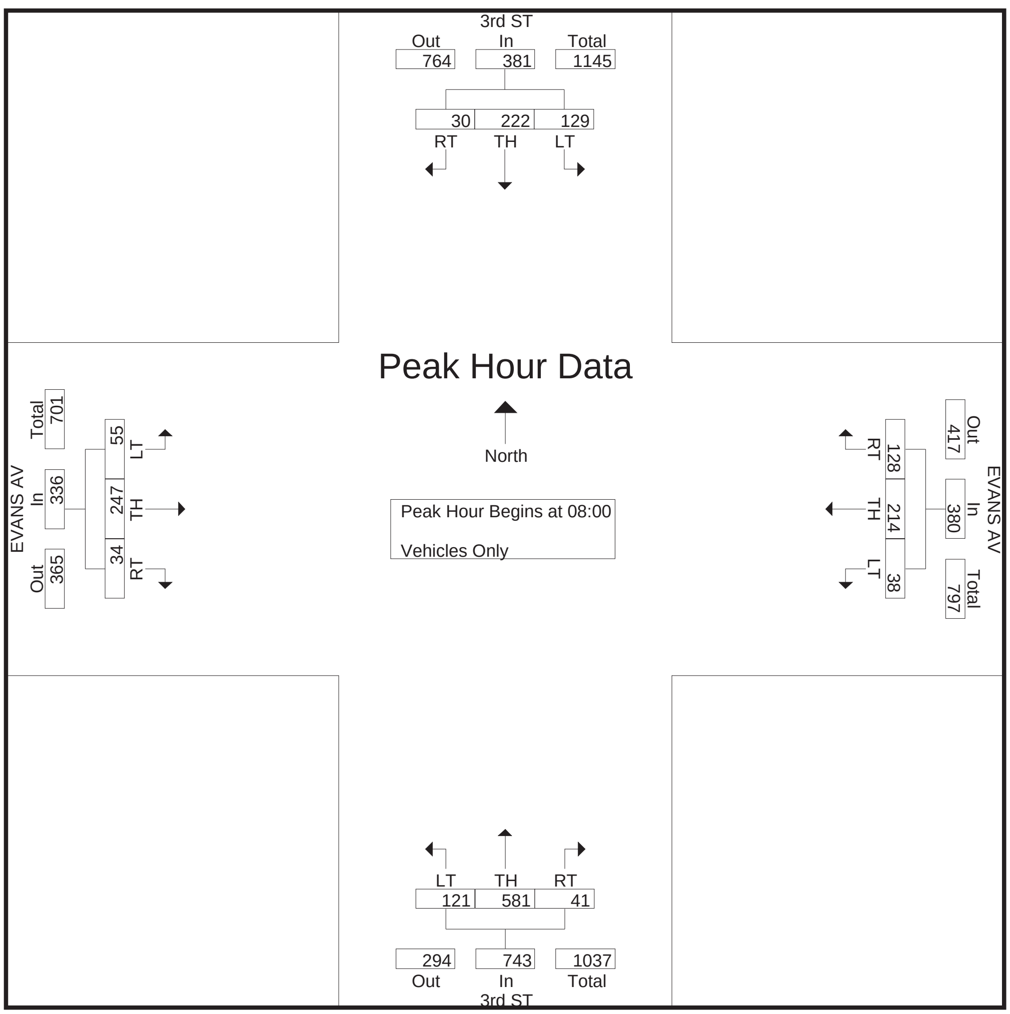
CITY OF SAN FRANCISCO

File Name : 3-evans-a
Site Code : 8
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	3rd ST Southbound				EVANS AV Westbound				3rd ST Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	1	43	33	77	30	68	8	106	11	69	19	99	5	65	10	80	362
07:15	7	42	31	80	26	53	7	86	10	104	21	135	5	67	17	89	390
07:30	3	33	29	65	27	67	11	105	13	142	33	188	11	66	15	92	450
07:45	3	45	27	75	43	45	9	97	10	151	28	189	8	55	15	78	439
Total	14	163	120	297	126	233	35	394	44	466	101	611	29	253	57	339	1641
08:00	5	45	37	87	40	51	6	97	11	136	36	183	6	55	16	77	444
08:15	8	58	28	94	36	56	11	103	7	155	28	190	9	53	14	76	463
08:30	10	59	34	103	31	55	8	94	10	148	28	186	5	65	13	83	466
08:45	7	60	30	97	21	52	13	86	13	142	29	184	14	74	12	100	467
Total	30	222	129	381	128	214	38	380	41	581	121	743	34	247	55	336	1840
Grand Total	44	385	249	678	254	447	73	774	85	1047	222	1354	63	500	112	675	3481
Apprch %	6.5	56.8	36.7		32.8	57.8	9.4		6.3	77.3	16.4		9.3	74.1	16.6		
Total %	1.3	11.1	7.2	19.5	7.3	12.8	2.1	22.2	2.4	30.1	6.4	38.9	1.8	14.4	3.2	19.4	

	3rd ST Southbound				EVANS AV Westbound				3rd ST Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	5	45	**37**	87	**40**	51	6	97	11	136	**36**	183	6	55	**16**	77	444
08:15	8	58	28	94	36	**56**	11	**103**	7	**155**	28	**190**	9	53	14	76	463
08:30	**10**	59	34	**103**	31	55	8	94	10	148	28	186	5	65	13	83	466
08:45	7	**60**	30	97	21	52	**13**	86	**13**	142	29	184	**14**	**74**	12	**100**	**467**
Total Volume	30	222	129	381	128	214	38	380	41	581	121	743	34	247	55	336	1840
% App. Total	7.9	58.3	33.9		33.7	56.3	10		5.5	78.2	16.3		10.1	73.5	16.4		
PHF	.750	.925	.872	.925	.800	.955	.731	.922	.788	.937	.840	.978	.607	.834	.859	.840	.985



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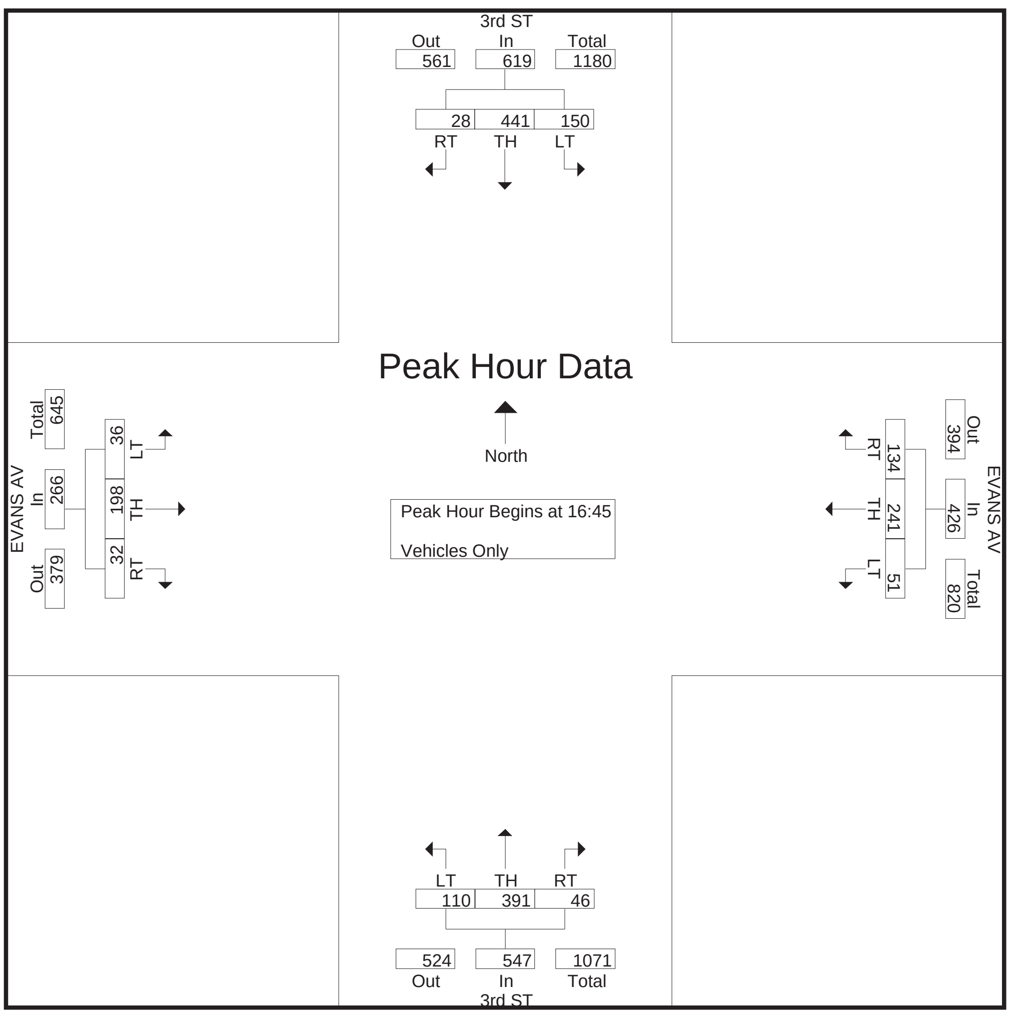
CITY OF SAN FRANCISCO

File Name : 3-evans-p
Site Code : 8
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	3rd ST Southbound				EVANS AV Westbound				3rd ST Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	3	83	44	130	34	63	16	113	8	126	32	166	9	51	16	76	485
16:15	1	75	36	112	37	50	9	96	5	114	33	152	9	42	12	63	423
16:30	4	93	39	136	37	62	18	117	4	101	26	131	7	41	9	57	441
16:45	4	100	38	142	33	60	9	102	11	98	29	138	10	49	8	67	449
Total	12	351	157	520	141	235	52	428	28	439	120	587	35	183	45	263	1798
17:00	7	88	32	127	33	65	14	112	11	95	28	134	8	48	10	66	439
17:15	11	125	43	179	32	68	14	114	10	108	29	147	8	53	12	73	513
17:30	6	128	37	171	36	48	14	98	14	90	24	128	6	48	6	60	457
17:45	5	97	43	145	40	43	13	96	9	74	23	106	8	56	6	70	417
Total	29	438	155	622	141	224	55	420	44	367	104	515	30	205	34	269	1826
Grand Total	41	789	312	1142	282	459	107	848	72	806	224	1102	65	388	79	532	3624
Apprch %	3.6	69.1	27.3		33.3	54.1	12.6		6.5	73.1	20.3		12.2	72.9	14.8		
Total %	1.1	21.8	8.6	31.5	7.8	12.7	3	23.4	2	22.2	6.2	30.4	1.8	10.7	2.2	14.7	

	3rd ST Southbound				EVANS AV Westbound				3rd ST Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	4	100	38	142	33	60	9	102	11	98	**29**	138	**10**	49	8	67	449
17:00	7	88	32	127	33	65	**14**	112	11	95	28	134	8	48	10	66	439
17:15	**11**	125	**43**	**179**	32	**68**	14	**114**	10	**108**	29	**147**	8	**53**	**12**	**73**	**513**
17:30	6	**128**	37	171	**36**	48	14	98	**14**	90	24	128	6	48	6	60	457
Total Volume	28	441	150	619	134	241	51	426	46	391	110	547	32	198	36	266	1858
% App. Total	4.5	71.2	24.2		31.5	56.6	12		8.4	71.5	20.1		12	74.4	13.5		
PHF	.636	.861	.872	.865	.931	.886	.911	.934	.821	.905	.948	.930	.800	.934	.750	.911	.905



MARKS TRAFFIC DATA

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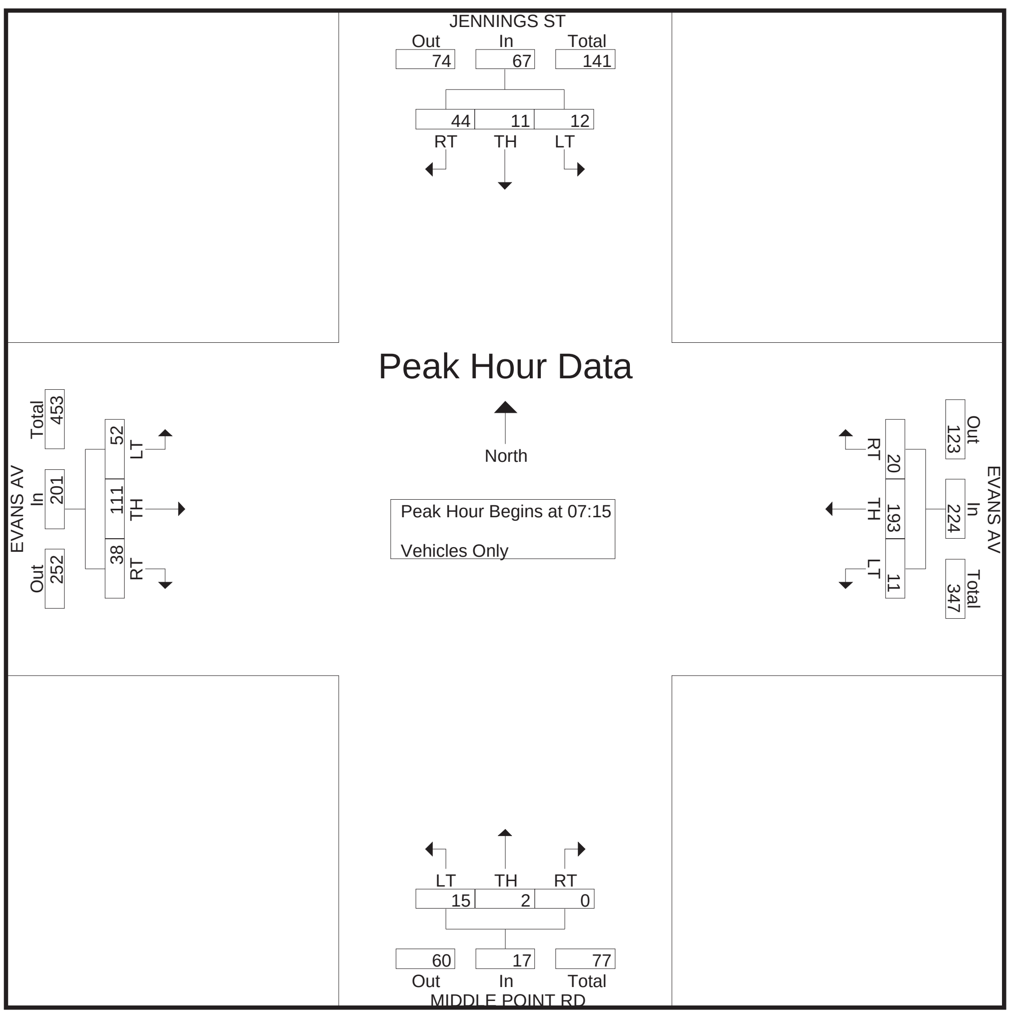
CITY OF SAN FRANCISCO

File Name : jennings-evans-a
Site Code : 9
Start Date : 5/13/2015

Groups Printed- Vehicles Only

	JENNINGS ST Southbound				**EVANS AV Westbound**				**MIDDLE POINT RD Northbound**				**EVANS AV Eastbound**				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	5	3	5	13	6	22	1	29	0	0	1	1	8	22	9	39	82
07:15	14	5	3	22	4	48	4	56	0	1	3	4	10	39	11	60	142
07:30	7	3	2	12	4	52	1	57	0	1	3	4	7	27	15	49	122
07:45	12	2	3	17	7	51	3	61	0	0	4	4	12	21	16	49	131
Total	38	13	13	64	21	173	9	203	0	2	11	13	37	109	51	197	477
08:00	11	1	4	16	5	42	3	50	0	0	5	5	9	24	10	43	114
08:15	15	1	6	22	8	39	4	51	0	0	0	0	18	32	13	63	136
08:30	7	2	2	11	5	48	1	54	0	0	1	1	16	15	8	39	105
08:45	11	4	7	22	5	35	4	44	1	0	1	2	13	25	13	51	119
Total	44	8	19	71	23	164	12	199	1	0	7	8	56	96	44	196	474
Grand Total	82	21	32	135	44	337	21	402	1	2	18	21	93	205	95	393	951
Apprch %	60.7	15.6	23.7		10.9	83.8	5.2		4.8	9.5	85.7		23.7	52.2	24.2		
Total %	8.6	2.2	3.4	14.2	4.6	35.4	2.2	42.3	0.1	0.2	1.9	2.2	9.8	21.6	10	41.3	

	JENNINGS ST Southbound				**EVANS AV Westbound**				**MIDDLE POINT RD Northbound**				**EVANS AV Eastbound**				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	**14**	**5**	3	**22**	4	48	**4**	56	0	**1**	3	4	10	**39**	11	**60**	**142**
07:30	7	3	2	12	4	**52**	1	57	0	1	3	4	7	27	15	49	122
07:45	12	2	3	17	**7**	51	3	**61**	0	0	4	4	**12**	21	**16**	49	131
08:00	11	1	**4**	16	5	42	3	50	0	0	**5**	**5**	9	24	10	43	114
Total Volume	44	11	12	67	20	193	11	224	0	2	15	17	38	111	52	201	509
% App. Total	65.7	16.4	17.9		8.9	86.2	4.9		0	11.8	88.2		18.9	55.2	25.9		
PHF	.786	.550	.750	.761	.714	.928	.688	.918	.000	.500	.750	.850	.792	.712	.813	.838	.896



MARKS TRAFFIC DATA

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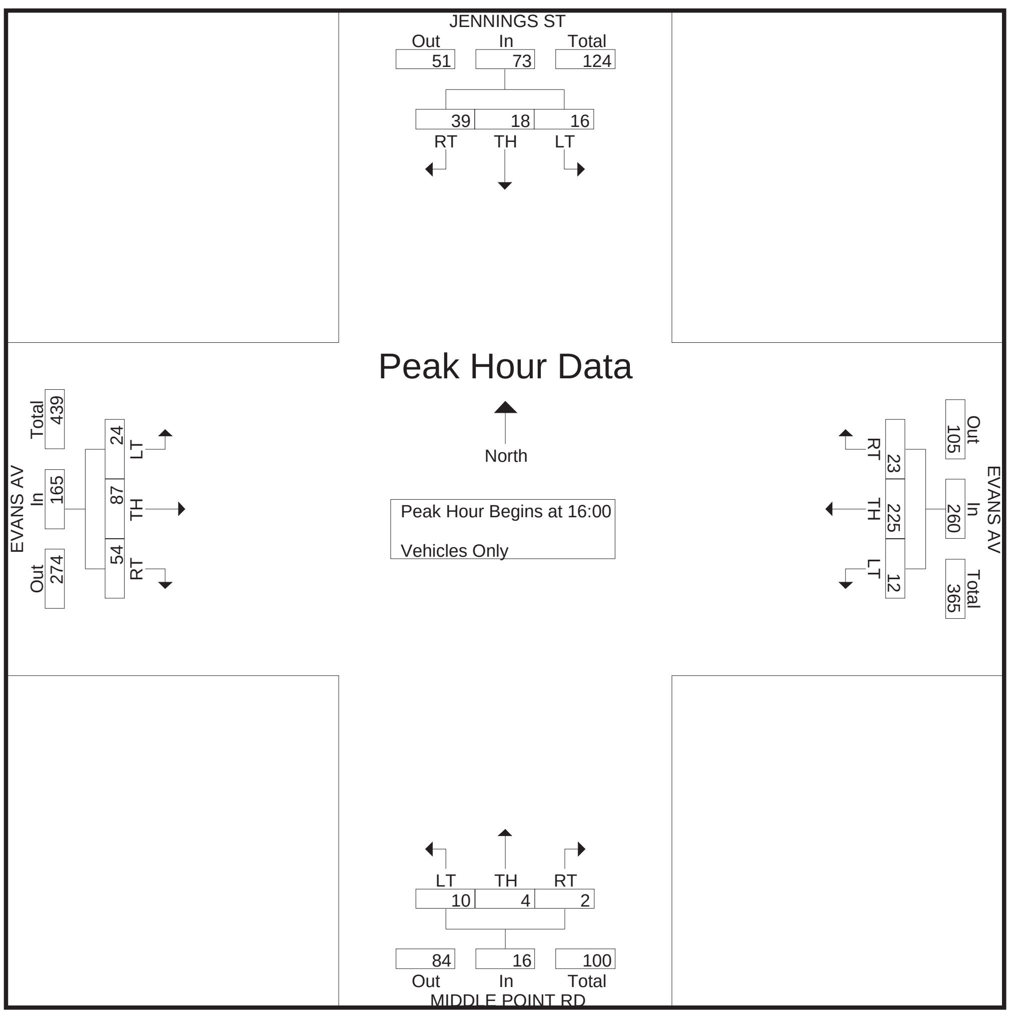
CITY OF SAN FRANCISCO

File Name : jennings-evans-p
Site Code : 9
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	JENNINGS ST Southbound				EVANS AV Westbound				MIDDLE POINT RD Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	12	7	4	23	8	53	3	64	1	0	2	3	21	20	5	46	136
16:15	9	6	4	19	5	54	4	63	0	2	4	6	13	21	10	44	132
16:30	8	2	3	13	6	53	2	61	1	1	2	4	10	23	6	39	117
16:45	10	3	5	18	4	65	3	72	0	1	2	3	10	23	3	36	129
Total	39	18	16	73	23	225	12	260	2	4	10	16	54	87	24	165	514
17:00	12	4	5	21	4	42	2	48	0	1	5	6	19	26	7	52	127
17:15	10	4	4	18	4	30	5	39	1	0	2	3	9	25	5	39	99
17:30	5	2	3	10	4	42	4	50	1	0	3	4	18	31	7	56	120
17:45	8	2	3	13	3	38	6	47	0	0	8	8	13	27	7	47	115
Total	35	12	15	62	15	152	17	184	2	1	18	21	59	109	26	194	461
Grand Total	74	30	31	135	38	377	29	444	4	5	28	37	113	196	50	359	975
Apprch %	54.8	22.2	23		8.6	84.9	6.5		10.8	13.5	75.7		31.5	54.6	13.9		
Total %	7.6	3.1	3.2	13.8	3.9	38.7	3	45.5	0.4	0.5	2.9	3.8	11.6	20.1	5.1	36.8	

	JENNINGS ST Southbound				EVANS AV Westbound				MIDDLE POINT RD Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	**12**	**7**	4	**23**	**8**	53	3	64	**1**	0	2	3	**21**	20	5	**46**	**136**
16:15	9	6	4	19	5	54	**4**	63	0	**2**	**4**	**6**	13	21	**10**	44	132
16:30	8	2	3	13	6	53	2	61	1	1	2	4	10	**23**	6	39	117
16:45	10	3	**5**	18	4	**65**	3	**72**	0	1	2	3	10	23	3	36	129
Total Volume	39	18	16	73	23	225	12	260	2	4	10	16	54	87	24	165	514
% App. Total	53.4	24.7	21.9		8.8	86.5	4.6		12.5	25	62.5		32.7	52.7	14.5		
PHF	.813	.643	.800	.793	.719	.865	.750	.903	.500	.500	.625	.667	.643	.946	.600	.897	.945



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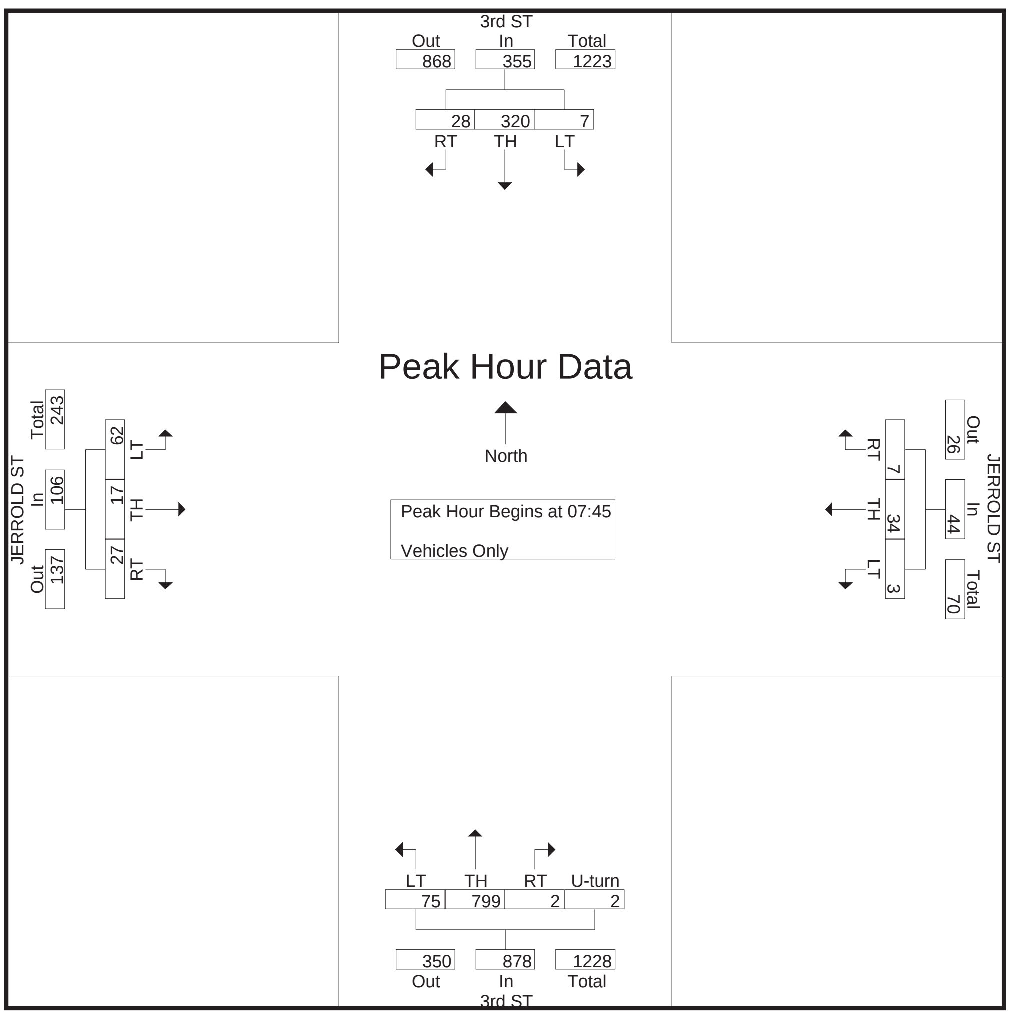
CITY OF SAN FRANCISCO

File Name : 3-jerrold-a
Site Code : 10
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	3rd ST Southbound				JERROLD ST Westbound				3rd ST Northbound					JERROLD ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	4	54	1	59	4	11	0	15	1	105	14	0	120	6	1	14	21	215
07:15	3	70	2	75	3	8	0	11	0	133	15	0	148	8	4	15	27	261
07:30	11	50	0	61	2	12	1	15	3	188	15	0	206	9	4	13	26	308
07:45	7	75	2	84	2	8	1	11	0	205	18	0	223	6	5	19	30	348
Total	25	249	5	279	11	39	2	52	4	631	62	0	697	29	14	61	104	1132
08:00	6	69	0	75	1	8	1	10	0	204	22	1	227	8	3	13	24	336
08:15	7	92	0	99	2	12	0	14	1	192	20	0	213	7	4	12	23	349
08:30	8	84	5	97	2	6	1	9	1	198	15	1	215	6	5	18	29	350
08:45	7	80	3	90	0	11	0	11	2	190	21	2	215	5	4	18	27	343
Total	28	325	8	361	5	37	2	44	4	784	78	4	870	26	16	61	103	1378
Grand Total	53	574	13	640	16	76	4	96	8	1415	140	4	1567	55	30	122	207	2510
Apprch %	8.3	89.7	2		16.7	79.2	4.2		0.5	90.3	8.9	0.3		26.6	14.5	58.9		
Total %	2.1	22.9	0.5	25.5	0.6	3	0.2	3.8	0.3	56.4	5.6	0.2	62.4	2.2	1.2	4.9	8.2	

	3rd ST Southbound				JERROLD ST Westbound				3rd ST Northbound					JERROLD ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:45																		
07:45	7	75	2	84	**2**	8	**1**	11	0	**205**	18	0	223	6	**5**	**19**	**30**	348
08:00	6	69	0	75	1	8	1	10	0	204	**22**	**1**	**227**	**8**	3	13	24	336
08:15	7	**92**	0	**99**	2	**12**	0	**14**	**1**	192	20	0	213	7	4	12	23	349
08:30	**8**	84	**5**	97	2	6	1	9	1	198	15	1	215	6	5	18	29	**350**
Total Volume	28	320	7	355	7	34	3	44	2	799	75	2	878	27	17	62	106	1383
% App. Total	7.9	90.1	2		15.9	77.3	6.8		0.2	91	8.5	0.2		25.5	16	58.5		
PHF	.875	.870	.350	.896	.875	.708	.750	.786	.500	.974	.852	.500	.967	.844	.850	.816	.883	.988



MARKS TRAFFIC DATA

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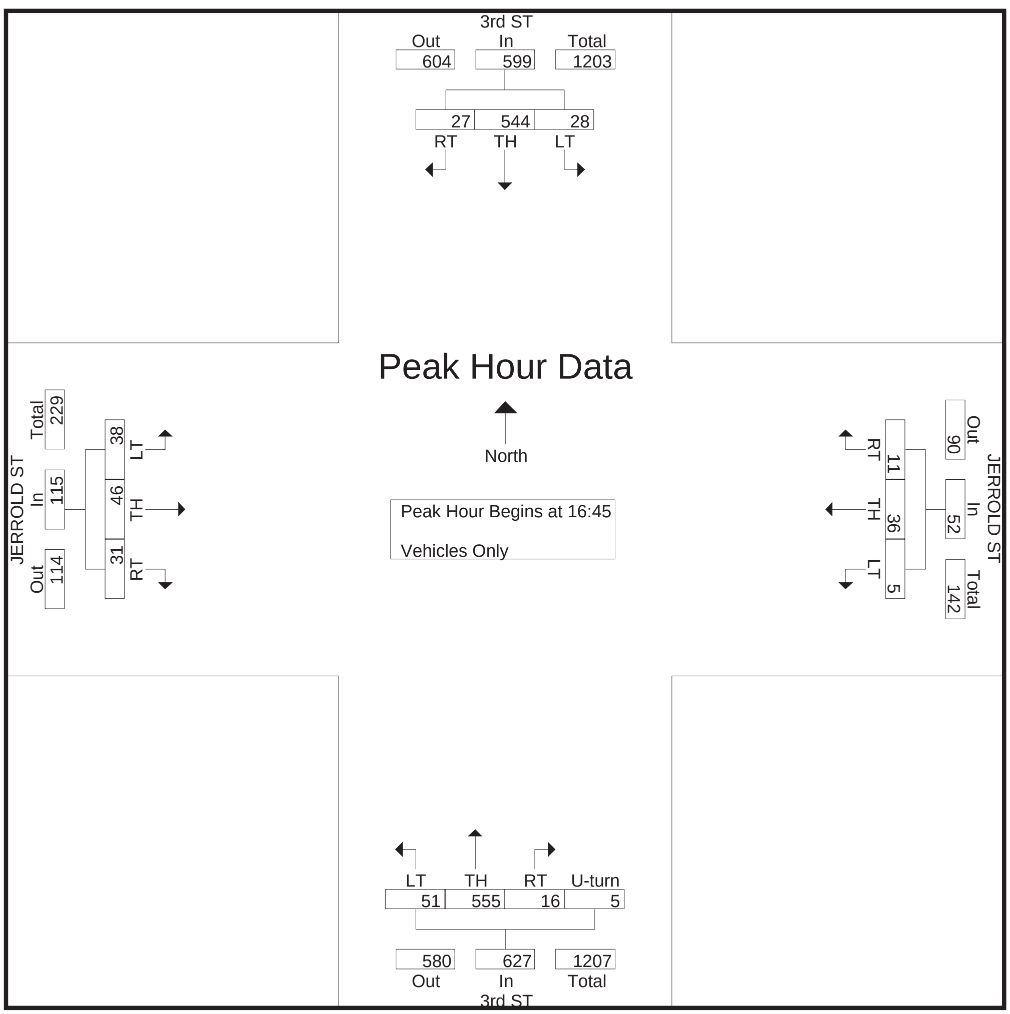
CITY OF SAN FRANCISCO

File Name : 3-jerrold-p
Site Code : 10
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	3rd ST Southbound				JERROLD ST Westbound				3rd ST Northbound					JERROLD ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	8	113	9	130	2	8	0	10	2	155	23	2	182	12	13	18	43	365
16:15	4	103	4	111	1	11	1	13	5	141	13	3	162	8	4	17	29	315
16:30	5	112	5	122	0	14	2	16	2	135	9	1	147	10	16	13	39	324
16:45	5	120	10	135	0	6	0	6	4	153	11	0	168	6	14	10	30	339
Total	22	448	28	498	3	39	3	45	13	584	56	6	659	36	47	58	141	1343
17:00	9	114	4	127	3	13	1	17	2	145	17	1	165	5	12	12	29	338
17:15	7	173	6	186	3	5	3	11	2	145	9	2	158	7	4	6	17	372
17:30	6	137	8	151	5	12	1	18	8	112	14	2	136	13	16	10	39	344
17:45	3	133	8	144	1	10	5	16	4	123	7	4	138	5	14	7	26	324
Total	25	557	26	608	12	40	10	62	16	525	47	9	597	30	46	35	111	1378
Grand Total	47	1005	54	1106	15	79	13	107	29	1109	103	15	1256	66	93	93	252	2721
Apprch %	4.2	90.9	4.9		14	73.8	12.1		2.3	88.3	8.2	1.2		26.2	36.9	36.9		
Total %	1.7	36.9	2	40.6	0.6	2.9	0.5	3.9	1.1	40.8	3.8	0.6	46.2	2.4	3.4	3.4	9.3	

	3rd ST Southbound				JERROLD ST Westbound				3rd ST Northbound					JERROLD ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 16:45																		
16:45	5	120	**10**	135	0	6	0	6	4	**153**	11	0	**168**	6	14	10	30	339
17:00	**9**	114	4	127	3	**13**	1	17	2	145	**17**	1	165	5	12	**12**	29	338
17:15	7	**173**	6	**186**	3	5	**3**	11	2	145	9	**2**	158	7	4	6	17	**372**
17:30	6	137	8	151	**5**	12	1	**18**	**8**	112	14	2	136	**13**	**16**	10	**39**	344
Total Volume	27	544	28	599	11	36	5	52	16	555	51	5	627	31	46	38	115	1393
% App. Total	4.5	90.8	4.7		21.2	69.2	9.6		2.6	88.5	8.1	0.8		27	40	33		
PHF	.750	.786	.700	.805	.550	.692	.417	.722	.500	.907	.750	.625	.933	.596	.719	.792	.737	.936



MARKS TRAFFIC DATA

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CITY OF SAN FRANCISCO

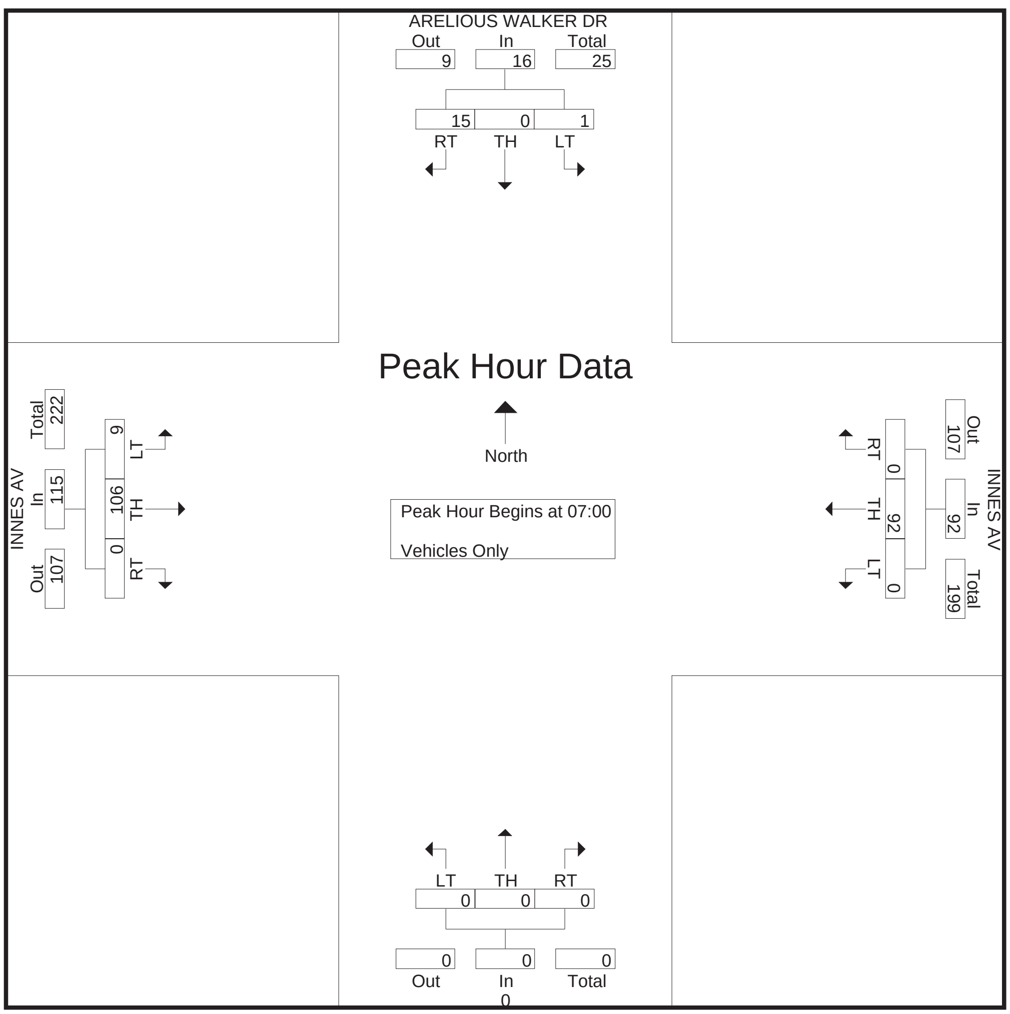
File Name : arelious walker-innes-a
Site Code : 12
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	ARELIOUS WALKER DR Southbound				INNES AV Westbound				0 Northbound				INNES AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	2	0	0	2	0	14	0	14	0	0	0	0	0	24	4	28	44
07:15	5	0	0	5	0	27	0	27	0	0	0	0	0	31	2	33	65
07:30	5	0	0	5	0	27	0	27	0	0	0	0	0	30	1	31	63
07:45	3	0	1	4	0	24	0	24	0	0	0	0	0	21	2	23	51
Total	15	0	1	16	0	92	0	92	0	0	0	0	0	106	9	115	223
08:00	0	0	0	0	0	11	0	11	0	0	0	0	0	10	0	10	21
08:15	4	0	0	4	0	19	0	19	0	0	0	0	0	33	3	36	59
08:30	1	0	0	1	0	22	0	22	0	0	0	0	0	15	4	19	42
08:45	4	0	2	6	0	18	0	18	0	0	0	0	0	29	3	32	56
Total	9	0	2	11	0	70	0	70	0	0	0	0	0	87	10	97	178
Grand Total	24	0	3	27	0	162	0	162	0	0	0	0	0	193	19	212	401
Apprch %	88.9	0	11.1		0	100	0		0	0	0		0	91	9		
Total %	6	0	0.7	6.7	0	40.4	0	40.4	0	0	0	0	0	48.1	4.7	52.9	

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:00

	ARELIOUS WALKER DR Southbound				INNES AV Westbound				0 Northbound				INNES AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	2	0	0	2	0	14	0	14	0	0	0	0	0	24	**4**	28	44
07:15	**5**	0	0	**5**	0	**27**	0	**27**	0	0	0	0	0	**31**	2	**33**	**65**
07:30	5	0	0	5	0	27	0	27	0	0	0	0	0	30	1	31	63
07:45	3	0	**1**	4	0	24	0	24	0	0	0	0	0	21	2	23	51
Total Volume	15	0	1	16	0	92	0	92	0	0	0	0	0	106	9	115	223
% App. Total	93.8	0	6.2		0	100	0		0	0	0		0	92.2	7.8		
PHF	.750	.000	.250	.800	.000	.852	.000	.852	.000	.000	.000	.000	.000	.855	.563	.871	.858



MARKS TRAFFIC DATA

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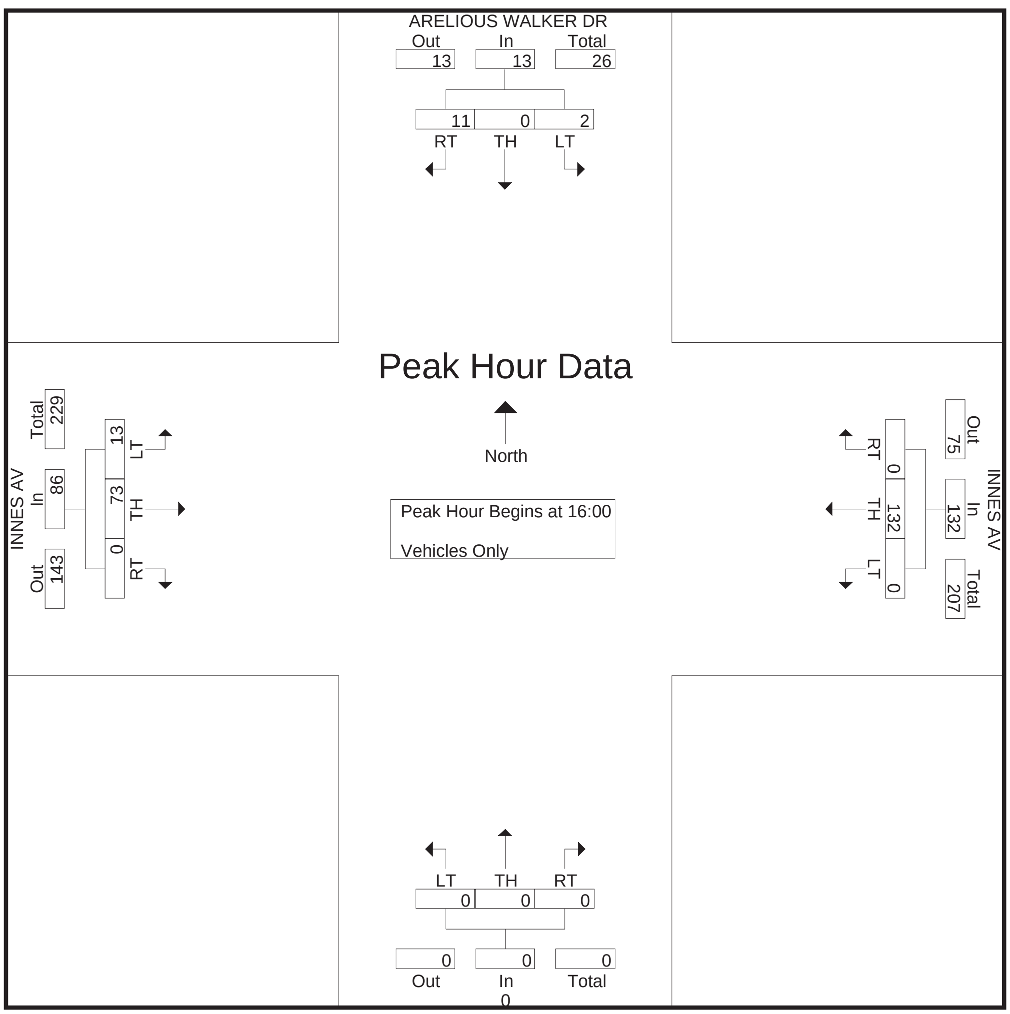
CITY OF SAN FRANCISCO

File Name : arelious walker-innes-p
Site Code : 12
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	ARELIOUS WALKER DR Southbound				INNES AV Westbound				0 Northbound				INNES AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	1	0	1	2	0	30	0	30	0	0	0	0	0	18	2	20	52
16:15	2	0	1	3	0	33	0	33	0	0	0	0	0	12	5	17	53
16:30	5	0	0	5	0	30	0	30	0	0	0	0	0	25	2	27	62
16:45	3	0	0	3	0	39	0	39	0	0	0	0	0	18	4	22	64
Total	11	0	2	13	0	132	0	132	0	0	0	0	0	73	13	86	231
17:00	2	0	0	2	0	20	0	20	0	0	0	0	0	22	4	26	48
17:15	0	0	0	0	0	13	0	13	0	0	0	0	0	10	3	13	26
17:30	14	0	0	14	0	19	0	19	0	0	0	0	0	24	3	27	60
17:45	2	0	1	3	0	15	0	15	0	0	0	0	0	23	1	24	42
Total	18	0	1	19	0	67	0	67	0	0	0	0	0	79	11	90	176
Grand Total	29	0	3	32	0	199	0	199	0	0	0	0	0	152	24	176	407
Apprch %	90.6	0	9.4		0	100	0		0	0	0		0	86.4	13.6		
Total %	7.1	0	0.7	7.9	0	48.9	0	48.9	0	0	0	0	0	37.3	5.9	43.2	

	ARELIOUS WALKER DR Southbound				INNES AV Westbound				0 Northbound				INNES AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	1	0	**1**	2	0	30	0	30	0	0	0	0	0	18	2	20	52
16:15	2	0	1	3	0	33	0	33	0	0	0	0	0	12	**5**	17	53
16:30	**5**	0	0	**5**	0	30	0	30	0	0	0	0	0	**25**	2	**27**	62
16:45	3	0	0	3	0	**39**	0	**39**	0	0	0	0	0	18	4	22	**64**
Total Volume	11	0	2	13	0	132	0	132	0	0	0	0	0	73	13	86	231
% App. Total	84.6	0	15.4		0	100	0		0	0	0		0	84.9	15.1		
PHF	.550	.000	.500	.650	.000	.846	.000	.846	.000	.000	.000	.000	.000	.730	.650	.796	.902



MARKS TRAFFIC DATA
mietekm@comcast.net
916.806.0250

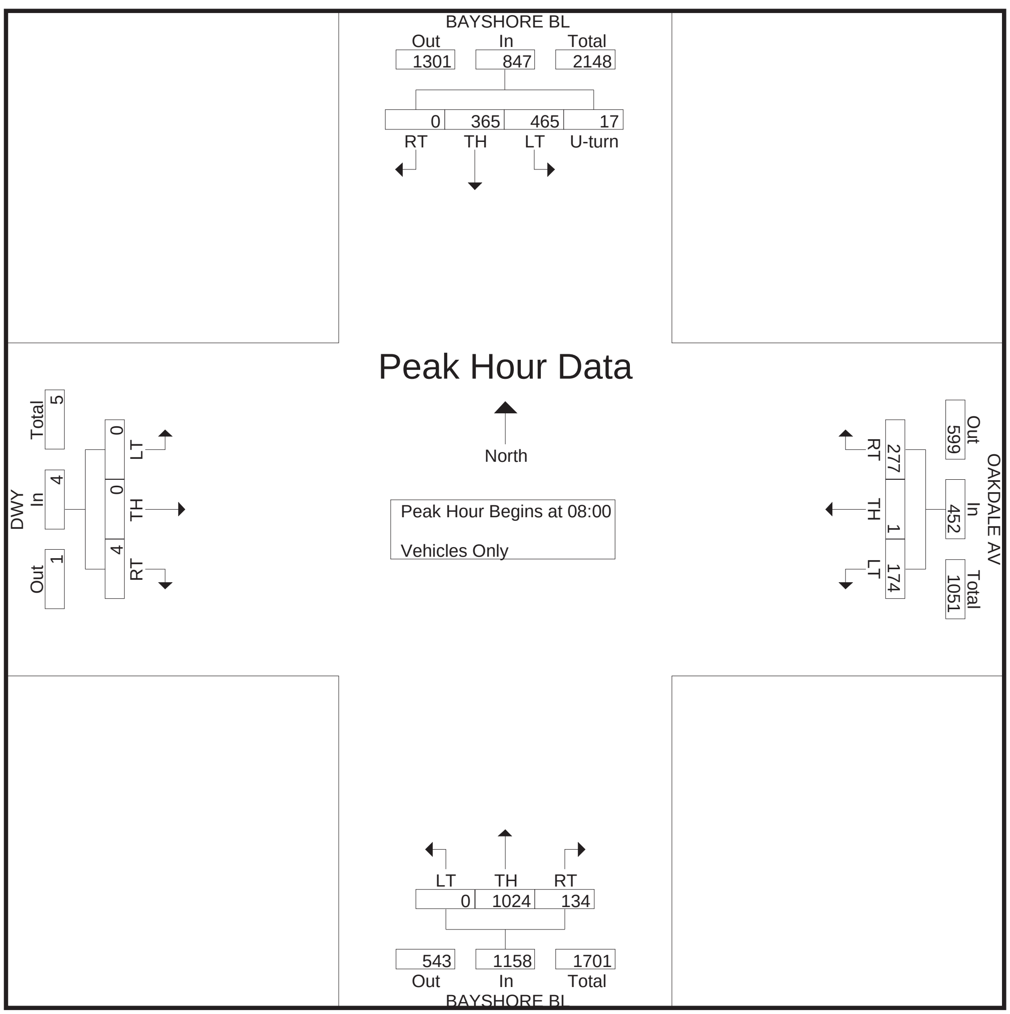
CITY OF SAN FRANCISCO

File Name : bayshore-oakdale-a
Site Code : 14
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	BAYSHORE BL Southbound					OAKDALE AV Westbound				BAYSHORE BL Northbound				DWY Eastbound				
Start Time	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	0	62	70	1	133	49	0	33	82	19	144	0	163	0	0	0	0	378
07:15	0	63	82	6	151	61	0	44	105	31	222	0	253	0	0	0	0	509
07:30	0	92	74	6	172	82	1	43	126	21	254	0	275	1	0	0	1	574
07:45	0	107	100	3	210	60	0	39	99	21	234	0	255	0	0	0	0	564
Total	0	324	326	16	666	252	1	159	412	92	854	0	946	1	0	0	1	2025
08:00	0	92	132	4	228	76	0	51	127	29	253	0	282	0	0	0	0	637
08:15	0	92	120	5	217	73	1	39	113	28	280	0	308	2	0	0	2	640
08:30	0	88	90	6	184	79	0	43	122	39	253	0	292	0	0	0	0	598
08:45	0	93	123	2	218	49	0	41	90	38	238	0	276	2	0	0	2	586
Total	0	365	465	17	847	277	1	174	452	134	1024	0	1158	4	0	0	4	2461
Grand Total	0	689	791	33	1513	529	2	333	864	226	1878	0	2104	5	0	0	5	4486
Apprch %	0	45.5	52.3	2.2		61.2	0.2	38.5		10.7	89.3	0		100	0	0		
Total %	0	15.4	17.6	0.7	33.7	11.8	0	7.4	19.3	5	41.9	0	46.9	0.1	0	0	0.1	

	BAYSHORE BL Southbound					OAKDALE AV Westbound				BAYSHORE BL Northbound				DWY Eastbound				
Start Time	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 08:00																		
08:00	0	92	**132**	4	**228**	76	0	**51**	**127**	29	253	0	282	0	0	0	0	637
08:15	0	92	120	5	217	73	**1**	39	113	28	**280**	0	**308**	**2**	0	0	**2**	**640**
08:30	0	88	90	**6**	184	**79**	0	43	122	**39**	253	0	292	0	0	0	0	598
08:45	0	**93**	123	2	218	49	0	41	90	38	238	0	276	2	0	0	2	586
Total Volume	0	365	465	17	847	277	1	174	452	134	1024	0	1158	4	0	0	4	2461
% App. Total	0	43.1	54.9	2		61.3	0.2	38.5		11.6	88.4	0		100	0	0		
PHF	.000	.981	.881	.708	.929	.877	.250	.853	.890	.859	.914	.000	.940	.500	.000	.000	.500	.961



MARKS TRAFFIC DATA

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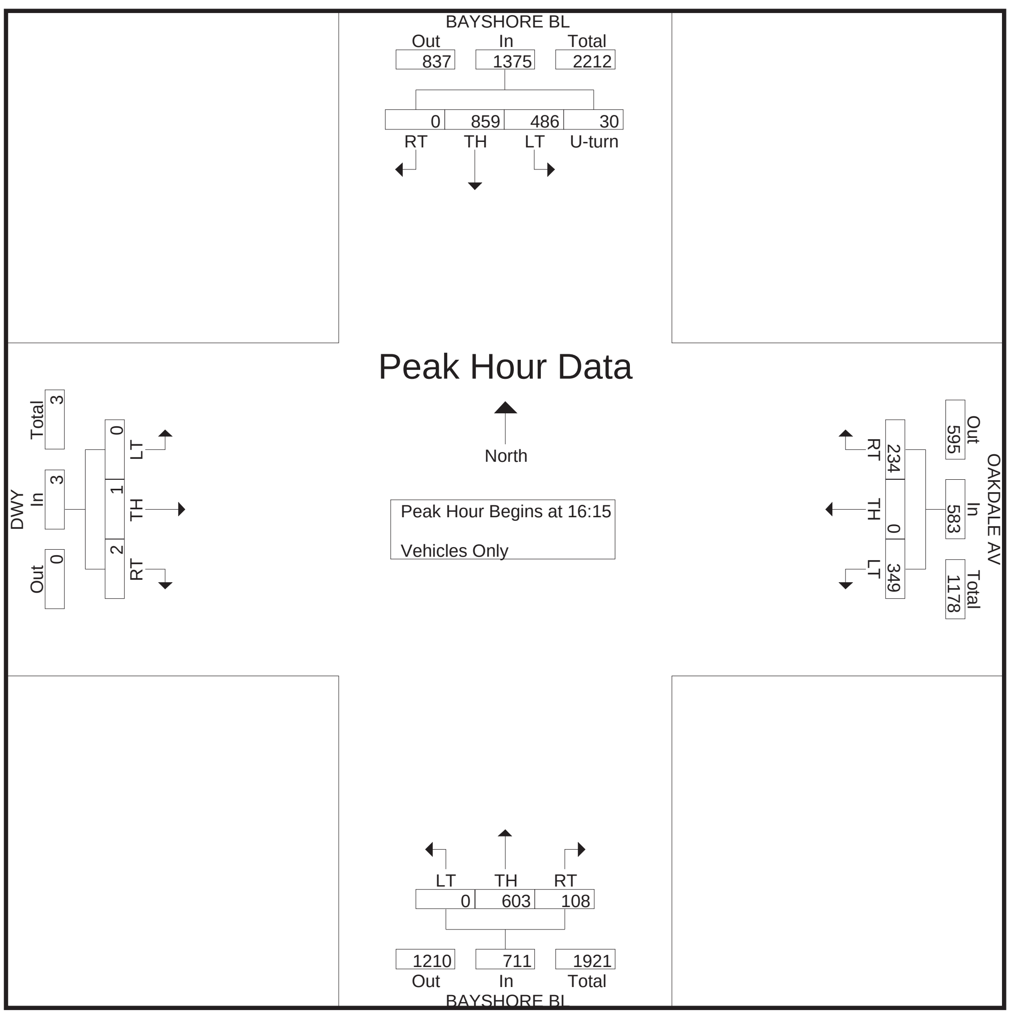
CITY OF SAN FRANCISCO

File Name : bayshore-oakdale-p
Site Code : 14
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	BAYSHORE BL Southbound					OAKDALE AV Westbound				BAYSHORE BL Northbound				DWY Eastbound				
Start Time	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	0	117	106	6	229	40	0	70	110	22	158	0	180	0	0	0	0	519
16:15	0	203	110	9	322	66	0	81	147	27	149	0	176	0	1	0	1	646
16:30	0	216	134	4	354	54	0	82	136	31	174	0	205	0	0	0	0	695
16:45	0	237	151	7	395	53	0	77	130	24	136	0	160	0	0	0	0	685
Total	0	773	501	26	1300	213	0	310	523	104	617	0	721	0	1	0	1	2545
17:00	0	203	91	10	304	61	0	109	170	26	144	0	170	2	0	0	2	646
17:15	0	178	95	6	279	56	0	81	137	20	188	0	208	0	0	0	0	624
17:30	1	188	99	7	295	56	0	74	130	25	148	0	173	0	0	0	0	598
17:45	0	212	88	9	309	43	1	78	122	24	154	0	178	0	0	0	0	609
Total	1	781	373	32	1187	216	1	342	559	95	634	0	729	2	0	0	2	2477
Grand Total	1	1554	874	58	2487	429	1	652	1082	199	1251	0	1450	2	1	0	3	5022
Apprch %	0	62.5	35.1	2.3		39.6	0.1	60.3		13.7	86.3	0		66.7	33.3	0		
Total %	0	30.9	17.4	1.2	49.5	8.5	0	13	21.5	4	24.9	0	28.9	0	0	0	0.1	

	BAYSHORE BL Southbound					OAKDALE AV Westbound				BAYSHORE BL Northbound				DWY Eastbound				
Start Time	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 16:15																		
16:15	0	203	110	9	322	**66**	0	81	147	27	149	0	176	0	**1**	0	1	646
16:30	0	216	134	4	354	54	0	82	136	**31**	**174**	0	**205**	0	0	0	0	**695**
16:45	0	**237**	**151**	7	**395**	53	0	77	130	24	136	0	160	0	0	0	0	685
17:00	0	203	91	**10**	304	61	0	**109**	**170**	26	144	0	170	**2**	0	0	**2**	646
Total Volume	0	859	486	30	1375	234	0	349	583	108	603	0	711	2	1	0	3	2672
% App. Total	0	62.5	35.3	2.2		40.1	0	59.9		15.2	84.8	0		66.7	33.3	0		
PHF	.000	.906	.805	.750	.870	.886	.000	.800	.857	.871	.866	.000	.867	.250	.250	.000	.375	.961



MARKS TRAFFIC DATA
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916.806.0250

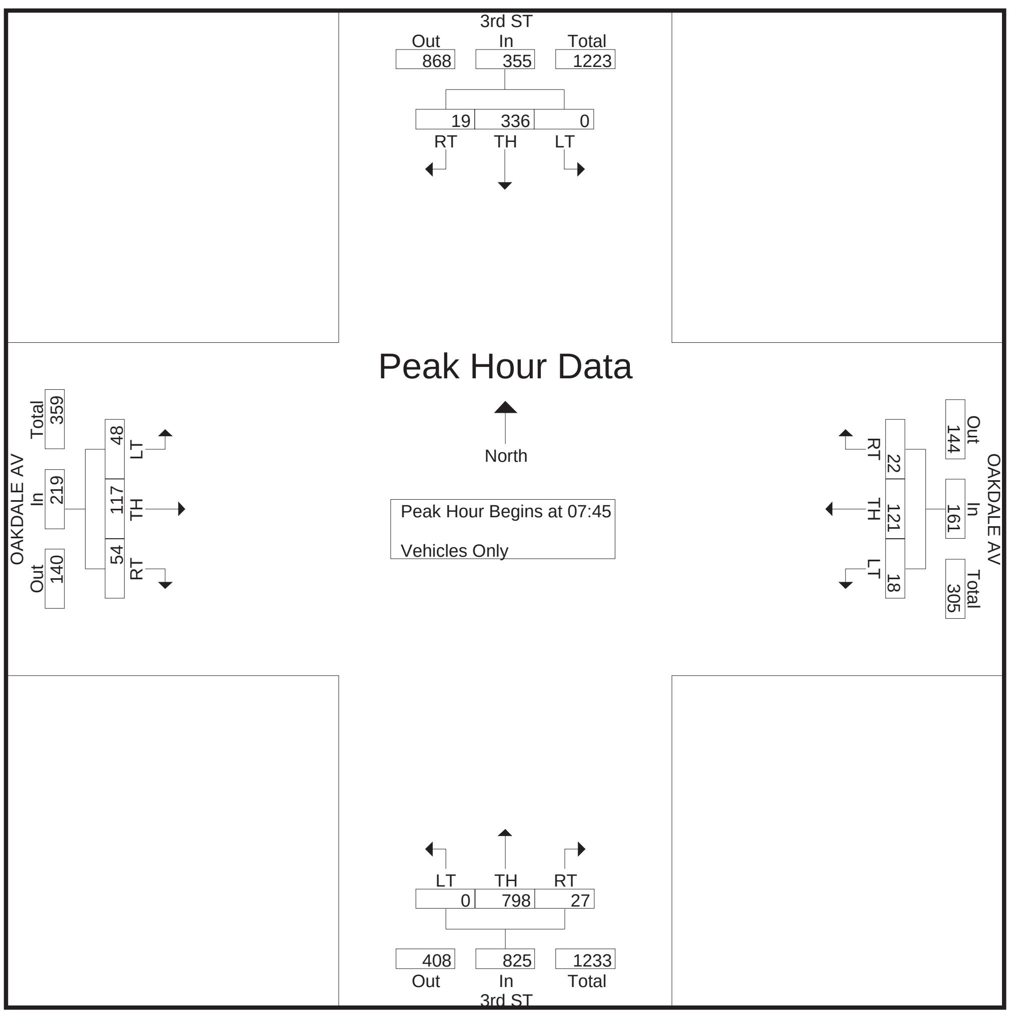
CITY OF SAN FRANCISCO

File Name : 3-oakdale-a
Site Code : 15
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	3rd ST Southbound				OAKDALE AV Westbound				3rd ST Northbound				OAKDALE AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	3	54	0	57	3	24	6	33	4	120	0	124	7	23	5	35	249
07:15	9	78	0	87	1	29	6	36	4	165	0	169	11	16	4	31	323
07:30	5	91	0	96	2	41	6	49	2	166	0	168	12	22	8	42	355
07:45	3	96	0	99	2	30	7	39	5	218	0	223	11	26	11	48	409
Total	20	319	0	339	8	124	25	157	15	669	0	684	41	87	28	156	1336
08:00	7	80	0	87	6	25	4	35	6	185	0	191	12	41	11	64	377
08:15	5	75	0	80	8	35	4	47	6	201	0	207	15	26	11	52	386
08:30	4	85	0	89	6	31	3	40	10	194	0	204	16	24	15	55	388
08:45	8	96	0	104	12	31	7	50	5	181	0	186	14	36	8	58	398
Total	24	336	0	360	32	122	18	172	27	761	0	788	57	127	45	229	1549
Grand Total	44	655	0	699	40	246	43	329	42	1430	0	1472	98	214	73	385	2885
Apprch %	6.3	93.7	0		12.2	74.8	13.1		2.9	97.1	0		25.5	55.6	19		
Total %	1.5	22.7	0	24.2	1.4	8.5	1.5	11.4	1.5	49.6	0	51	3.4	7.4	2.5	13.3	

	3rd ST Southbound				OAKDALE AV Westbound				3rd ST Northbound				OAKDALE AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	3	**96**	0	**99**	2	30	**7**	39	5	**218**	0	**223**	11	26	11	48	**409**
08:00	**7**	80	0	87	6	25	4	35	6	185	0	191	12	**41**	11	**64**	377
08:15	5	75	0	80	**8**	**35**	4	**47**	6	201	0	207	15	26	11	52	386
08:30	4	85	0	89	6	31	3	40	**10**	194	0	204	**16**	24	**15**	55	388
Total Volume	19	336	0	355	22	121	18	161	27	798	0	825	54	117	48	219	1560
% App. Total	5.4	94.6	0		13.7	75.2	11.2		3.3	96.7	0		24.7	53.4	21.9		
PHF	.679	.875	.000	.896	.688	.864	.643	.856	.675	.915	.000	.925	.844	.713	.800	.855	.954



MARKS TRAFFIC DATA

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916.806.0250

CITY OF SAN FRANCISCO

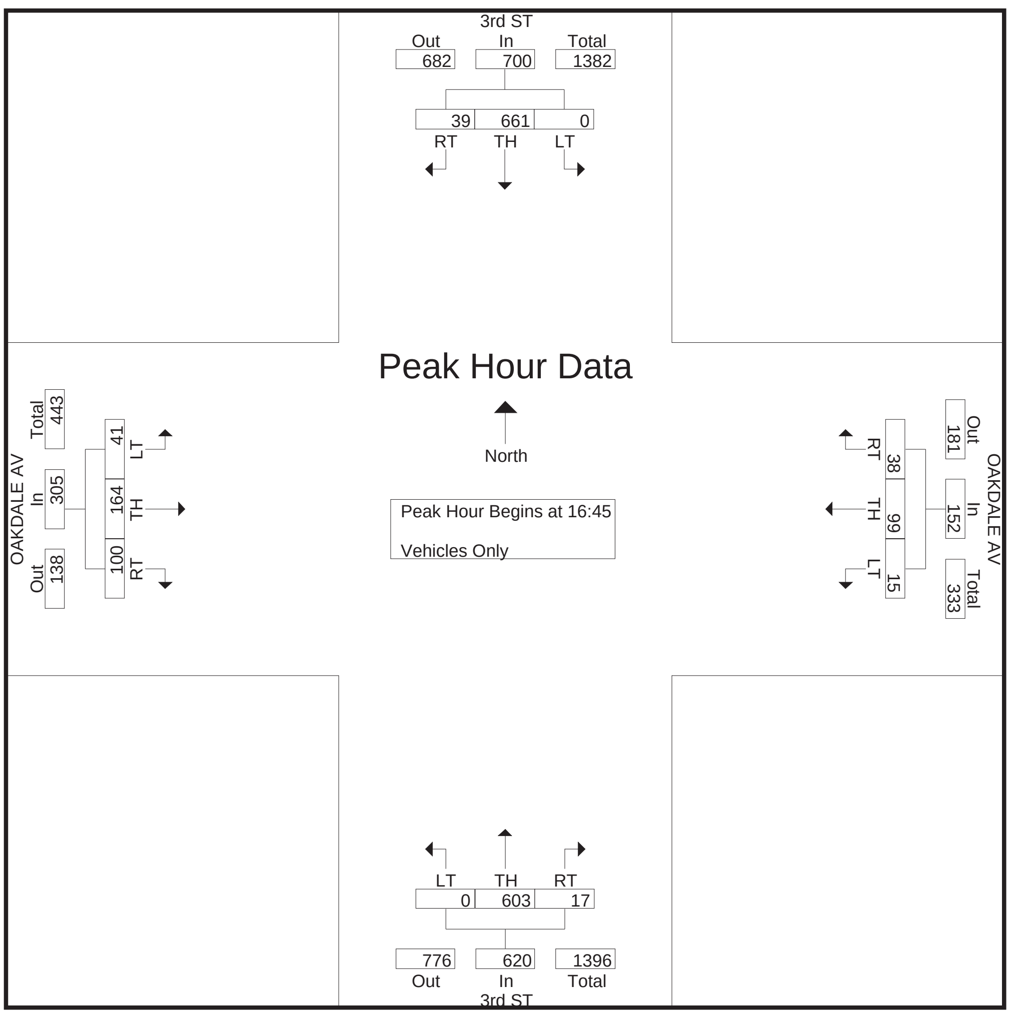
File Name : 3-oakdale-p
Site Code : 15
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	3rd ST Southbound				OAKDALE AV Westbound				3rd ST Northbound				OAKDALE AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	7	116	0	123	13	14	9	36	10	166	0	176	18	28	14	60	395
16:15	12	131	0	143	8	20	4	32	3	137	1	141	15	38	8	61	377
16:30	10	166	0	176	7	24	5	36	5	153	0	158	17	33	7	57	427
16:45	5	131	0	136	8	21	2	31	5	147	0	152	34	35	10	79	398
Total	34	544	0	578	36	79	20	135	23	603	1	627	84	134	39	257	1597
17:00	6	195	0	201	9	25	3	37	5	152	0	157	27	38	13	78	473
17:15	14	188	0	202	13	28	4	45	2	146	0	148	18	50	12	80	475
17:30	14	147	0	161	8	25	6	39	5	158	0	163	21	41	6	68	431
17:45	4	138	0	142	8	18	3	29	8	145	0	153	17	42	15	74	398
Total	38	668	0	706	38	96	16	150	20	601	0	621	83	171	46	300	1777
Grand Total	72	1212	0	1284	74	175	36	285	43	1204	1	1248	167	305	85	557	3374
Apprch %	5.6	94.4	0		26	61.4	12.6		3.4	96.5	0.1		30	54.8	15.3		
Total %	2.1	35.9	0	38.1	2.2	5.2	1.1	8.4	1.3	35.7	0	37	4.9	9	2.5	16.5	

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

	3rd ST Southbound				OAKDALE AV Westbound				3rd ST Northbound				OAKDALE AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:45	5	131	0	136	8	21	2	31	**5**	147	0	152	**34**	35	10	79	398
17:00	6	**195**	0	201	9	25	3	37	5	152	0	157	27	38	**13**	78	473
17:15	**14**	188	0	**202**	**13**	**28**	4	**45**	2	146	0	148	18	**50**	12	**80**	**475**
17:30	14	147	0	161	8	25	**6**	39	5	**158**	0	**163**	21	41	6	68	431
Total Volume	39	661	0	700	38	99	15	152	17	603	0	620	100	164	41	305	1777
% App. Total	5.6	94.4	0		25	65.1	9.9		2.7	97.3	0		32.8	53.8	13.4		
PHF	.696	.847	.000	.866	.731	.884	.625	.844	.850	.954	.000	.951	.735	.820	.788	.953	.935



MARKS TRAFFIC DATA

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916.806.0250

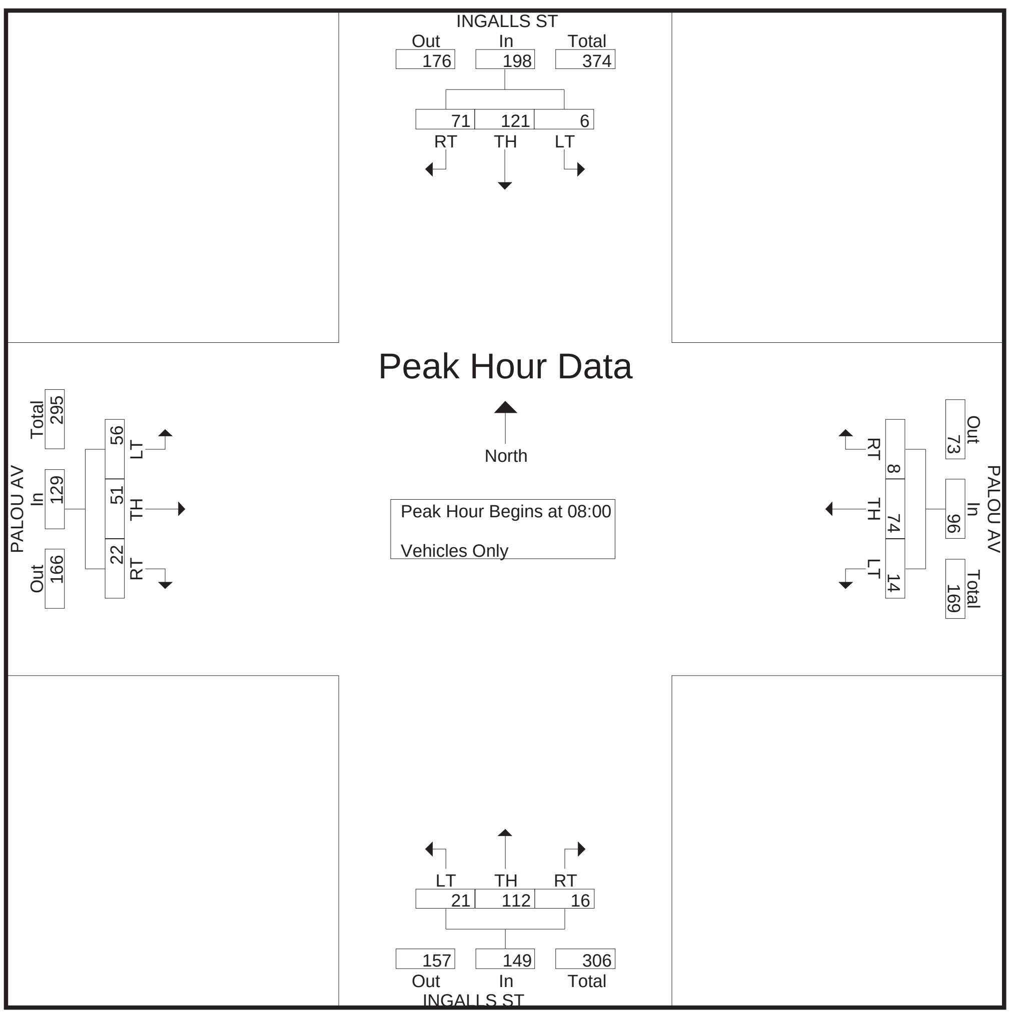
CITY OF SAN FRANCISCO

File Name : ingalls-palou-a
Site Code : 16
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	INGALLS ST Southbound				PALOU AV Westbound				INGALLS ST Northbound				PALOU AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	12	19	3	34	2	13	0	15	0	19	2	21	4	18	9	31	101
07:15	18	19	4	41	3	13	2	18	0	23	9	32	4	7	11	22	113
07:30	23	37	3	63	1	15	1	17	1	13	4	18	1	15	5	21	119
07:45	18	33	2	53	2	17	3	22	0	27	4	31	6	14	17	37	143
Total	71	108	12	191	8	58	6	72	1	82	19	102	15	54	42	111	476
08:00	21	37	3	61	3	23	0	26	3	28	2	33	8	17	16	41	161
08:15	18	32	1	51	1	19	6	26	4	25	7	36	1	13	13	27	140
08:30	21	22	1	44	1	13	3	17	4	28	7	39	6	5	16	27	127
08:45	11	30	1	42	3	19	5	27	5	31	5	41	7	16	11	34	144
Total	71	121	6	198	8	74	14	96	16	112	21	149	22	51	56	129	572
Grand Total	142	229	18	389	16	132	20	168	17	194	40	251	37	105	98	240	1048
Apprch %	36.5	58.9	4.6		9.5	78.6	11.9		6.8	77.3	15.9		15.4	43.8	40.8		
Total %	13.5	21.9	1.7	37.1	1.5	12.6	1.9	16	1.6	18.5	3.8	24	3.5	10	9.4	22.9	

	INGALLS ST Southbound				PALOU AV Westbound				INGALLS ST Northbound				PALOU AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	**21**	**37**	**3**	**61**	**3**	**23**	0	26	3	28	2	33	**8**	**17**	**16**	**41**	**161**
08:15	18	32	1	51	1	19	**6**	26	4	25	**7**	36	1	13	13	27	140
08:30	21	22	1	44	1	13	3	17	4	28	7	39	6	5	16	27	127
08:45	11	30	1	42	3	19	5	**27**	**5**	**31**	5	**41**	7	16	11	34	144
Total Volume	71	121	6	198	8	74	14	96	16	112	21	149	22	51	56	129	572
% App. Total	35.9	61.1	3		8.3	77.1	14.6		10.7	75.2	14.1		17.1	39.5	43.4		
PHF	.845	.818	.500	.811	.667	.804	.583	.889	.800	.903	.750	.909	.688	.750	.875	.787	.888



MARKS TRAFFIC DATA

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916.806.0250

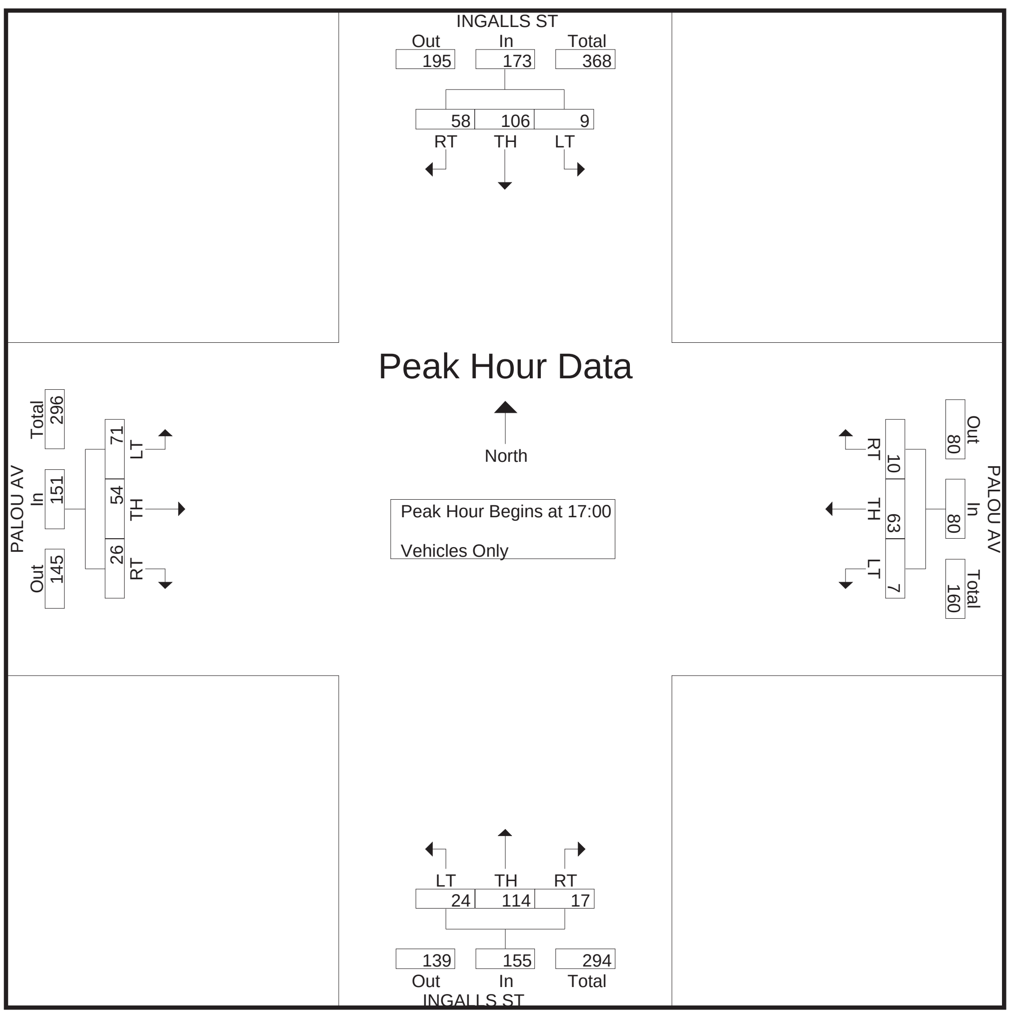
CITY OF SAN FRANCISCO

File Name : ingalls-palou-p
Site Code : 16
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	INGALLS ST Southbound				PALOU AV Westbound				INGALLS ST Northbound				PALOU AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	17	30	4	51	3	18	2	23	1	31	3	35	4	16	15	35	144
16:15	13	32	2	47	4	17	0	21	2	30	6	38	7	11	11	29	135
16:30	13	33	2	48	5	25	3	33	3	26	4	33	7	17	8	32	146
16:45	17	20	6	43	0	14	3	17	2	26	3	31	7	18	8	33	124
Total	60	115	14	189	12	74	8	94	8	113	16	137	25	62	42	129	549
17:00	13	32	3	48	1	25	3	29	7	25	4	36	5	11	17	33	146
17:15	15	20	4	39	2	16	2	20	2	24	8	34	7	16	15	38	131
17:30	6	32	2	40	5	12	1	18	3	30	7	40	6	16	21	43	141
17:45	24	22	0	46	2	10	1	13	5	35	5	45	8	11	18	37	141
Total	58	106	9	173	10	63	7	80	17	114	24	155	26	54	71	151	559
Grand Total	118	221	23	362	22	137	15	174	25	227	40	292	51	116	113	280	1108
Apprch %	32.6	61	6.4		12.6	78.7	8.6		8.6	77.7	13.7		18.2	41.4	40.4		
Total %	10.6	19.9	2.1	32.7	2	12.4	1.4	15.7	2.3	20.5	3.6	26.4	4.6	10.5	10.2	25.3	

	INGALLS ST Southbound				PALOU AV Westbound				INGALLS ST Northbound				PALOU AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	13	**32**	3	**48**	1	**25**	**3**	**29**	**7**	25	4	36	5	11	17	33	**146**
17:15	15	20	**4**	39	2	16	2	20	2	24	**8**	34	7	**16**	15	38	131
17:30	6	32	2	40	**5**	12	1	18	3	30	7	40	6	16	**21**	**43**	141
17:45	**24**	22	0	46	2	10	1	13	5	**35**	5	**45**	**8**	11	18	37	141
Total Volume	58	106	9	173	10	63	7	80	17	114	24	155	26	54	71	151	559
% App. Total	33.5	61.3	5.2		12.5	78.8	8.8		11	73.5	15.5		17.2	35.8	47		
PHF	.604	.828	.563	.901	.500	.630	.583	.690	.607	.814	.750	.861	.813	.844	.845	.878	.957



MARKS TRAFFIC DATA

mietekm@comcast.net
916.806.0250

CITY OF SAN FRANCISCO

File Name : 3-paul-a
Site Code : 17
Start Date : 5/12/2015
Page No : 1

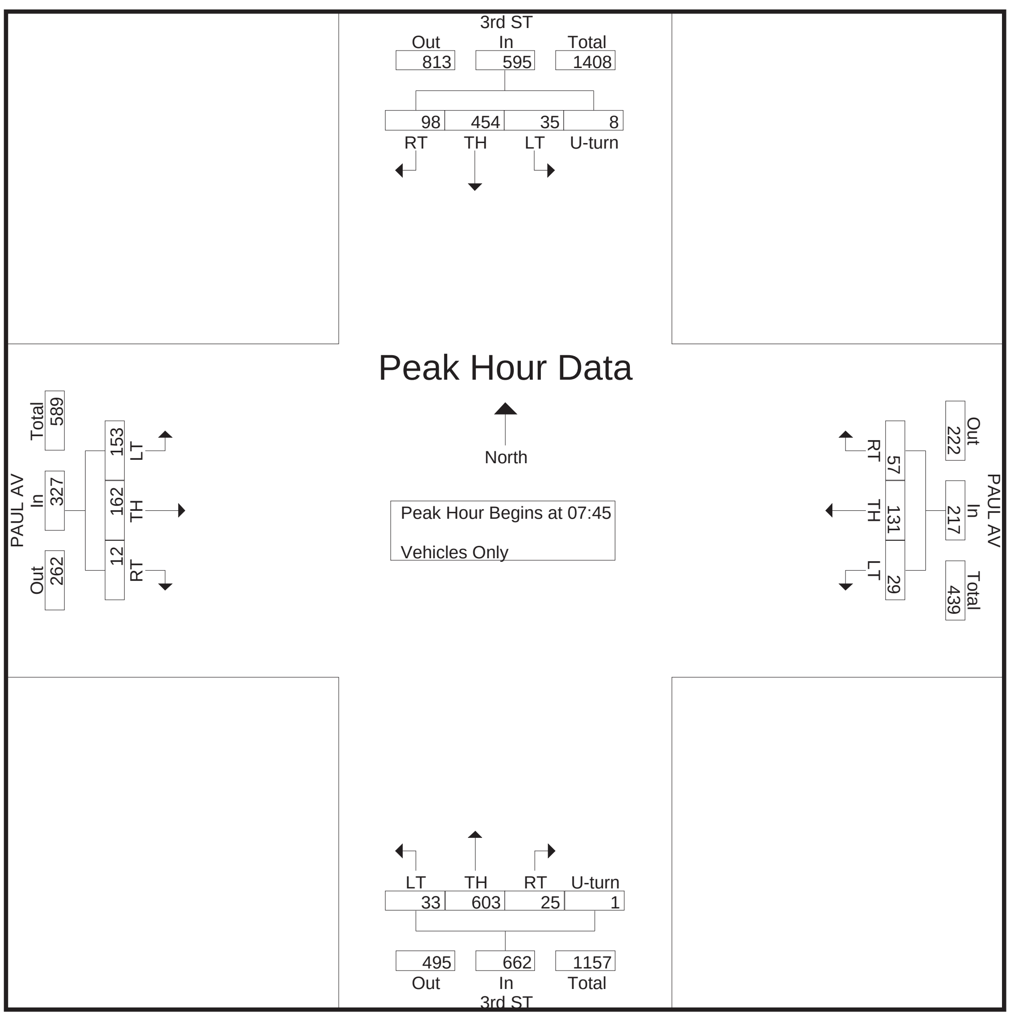
Groups Printed- Vehicles Only

	3rd ST Southbound					PAUL AV Westbound				3rd ST Northbound					PAUL AV Eastbound				
Start Time	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	13	112	6	0	131	8	23	5	36	10	129	6	1	146	1	22	21	44	357
07:15	18	123	2	1	144	12	30	11	53	12	117	3	1	133	6	34	26	66	396
07:30	27	138	8	1	174	15	34	15	64	5	126	9	1	141	0	31	26	57	436
07:45	31	115	6	2	154	10	27	7	44	9	151	10	0	170	4	29	49	82	450
Total	89	488	22	4	603	45	114	38	197	36	523	28	3	590	11	116	122	249	1639
08:00	21	125	10	2	158	21	32	7	60	6	130	3	0	139	3	36	37	76	433
08:15	20	116	6	1	143	13	35	7	55	4	170	9	0	183	1	59	34	94	475
08:30	26	98	13	3	140	13	37	8	58	6	152	11	1	170	4	38	33	75	443
08:45	23	109	6	3	141	8	23	7	38	9	135	12	1	157	5	33	34	72	408
Total	90	448	35	9	582	55	127	29	211	25	587	35	2	649	13	166	138	317	1759
Grand Total	179	936	57	13	1185	100	241	67	408	61	1110	63	5	1239	24	282	260	566	3398
Apprch %	15.1	79	4.8	1.1		24.5	59.1	16.4		4.9	89.6	5.1	0.4		4.2	49.8	45.9		
Total %	5.3	27.5	1.7	0.4	34.9	2.9	7.1	2	12	1.8	32.7	1.9	0.1	36.5	0.7	8.3	7.7	16.7	

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45

	3rd ST Southbound					PAUL AV Westbound				3rd ST Northbound					PAUL AV Eastbound				
Start Time	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	Int. Total
07:45	**31**	115	6	2	154	10	27	7	44	**9**	151	10	0	170	**4**	29	**49**	82	450
08:00	21	**125**	10	2	**158**	**21**	32	7	**60**	6	130	3	0	139	3	36	37	76	433
08:15	20	116	6	1	143	13	35	7	55	4	**170**	9	0	**183**	1	**59**	34	**94**	**475**
08:30	26	98	**13**	**3**	140	13	**37**	**8**	58	6	152	**11**	**1**	170	4	38	33	75	443
Total Volume	98	454	35	8	595	57	131	29	217	25	603	33	1	662	12	162	153	327	1801
% App. Total	16.5	76.3	5.9	1.3		26.3	60.4	13.4		3.8	91.1	5	0.2		3.7	49.5	46.8		
PHF	.790	.908	.673	.667	.941	.679	.885	.906	.904	.694	.887	.750	.250	.904	.750	.686	.781	.870	.948



MARKS TRAFFIC DATA
mietekm@comcast.net
916.806.0250

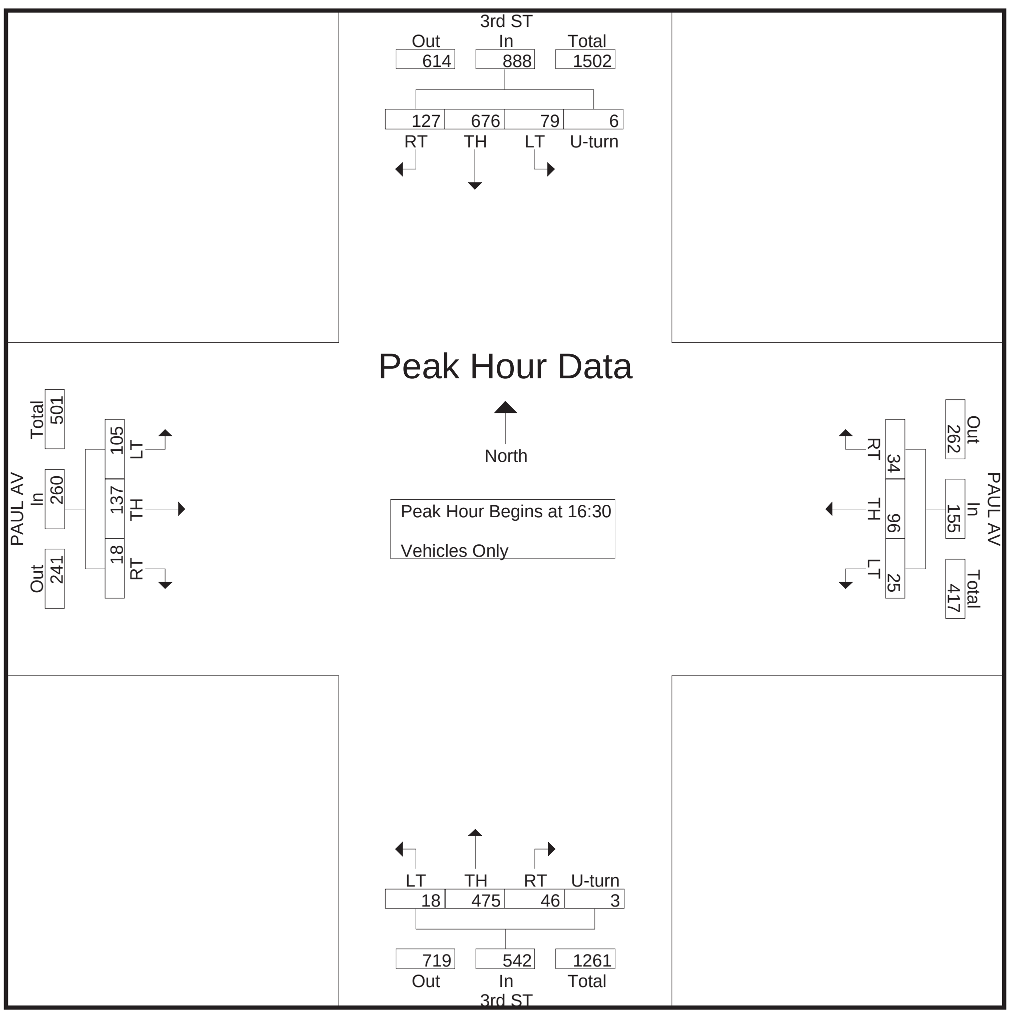
CITY OF SAN FRANCISCO

File Name : 3-paul-p
Site Code : 17
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	3rd ST Southbound					PAUL AV Westbound				3rd ST Northbound					PAUL AV Eastbound				
Start Time	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	21	143	13	3	180	10	11	6	27	17	138	7	0	162	2	31	26	59	428
16:15	38	114	14	3	169	8	22	13	43	15	111	8	0	134	1	33	23	57	403
16:30	32	184	23	1	240	7	28	10	45	11	125	4	2	142	6	34	19	59	486
16:45	32	145	20	2	199	10	24	6	40	9	120	2	0	131	2	36	30	68	438
Total	123	586	70	9	788	35	85	35	155	52	494	21	2	569	11	134	98	243	1755
17:00	30	179	15	1	225	8	26	5	39	12	134	6	0	152	4	34	34	72	488
17:15	33	168	21	2	224	9	18	4	31	14	96	6	1	117	6	33	22	61	433
17:30	34	143	25	2	204	8	22	11	41	11	103	3	0	117	4	33	25	62	424
17:45	17	122	19	4	162	6	19	0	25	17	102	3	0	122	5	31	24	60	369
Total	114	612	80	9	815	31	85	20	136	54	435	18	1	508	19	131	105	255	1714
Grand Total	237	1198	150	18	1603	66	170	55	291	106	929	39	3	1077	30	265	203	498	3469
Apprch %	14.8	74.7	9.4	1.1		22.7	58.4	18.9		9.8	86.3	3.6	0.3		6	53.2	40.8		
Total %	6.8	34.5	4.3	0.5	46.2	1.9	4.9	1.6	8.4	3.1	26.8	1.1	0.1	31	0.9	7.6	5.9	14.4	

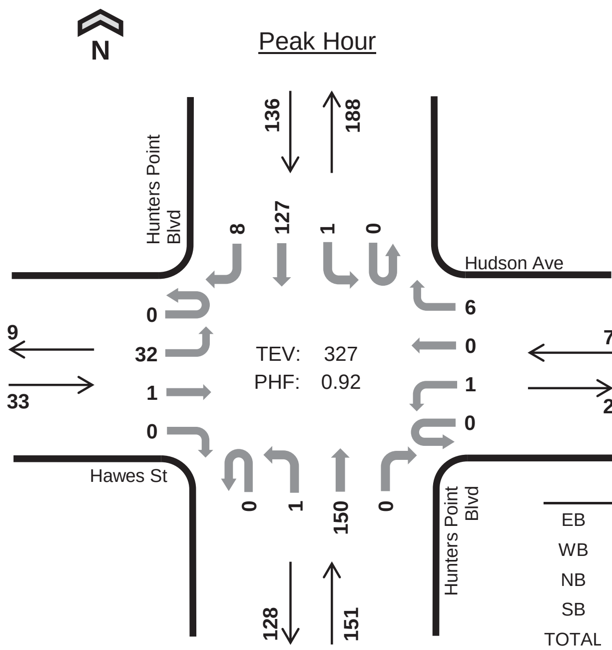
	3rd ST Southbound					PAUL AV Westbound				3rd ST Northbound					PAUL AV Eastbound				
Start Time	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 16:30																			
16:30	32	**184**	**23**	1	**240**	7	**28**	**10**	**45**	11	125	4	**2**	142	**6**	34	19	59	486
16:45	32	145	20	**2**	199	**10**	24	6	40	9	120	2	0	131	2	**36**	30	68	438
17:00	30	179	15	1	225	8	26	5	39	12	**134**	**6**	0	**152**	4	34	**34**	**72**	**488**
17:15	**33**	168	21	2	224	9	18	4	31	**14**	96	6	1	117	6	33	22	61	433
Total Volume	127	676	79	6	888	34	96	25	155	46	475	18	3	542	18	137	105	260	1845
% App. Total	14.3	76.1	8.9	0.7		21.9	61.9	16.1		8.5	87.6	3.3	0.6		6.9	52.7	40.4		
PHF	.962	.918	.859	.750	.925	.850	.857	.625	.861	.821	.886	.750	.375	.891	.750	.951	.772	.903	.945

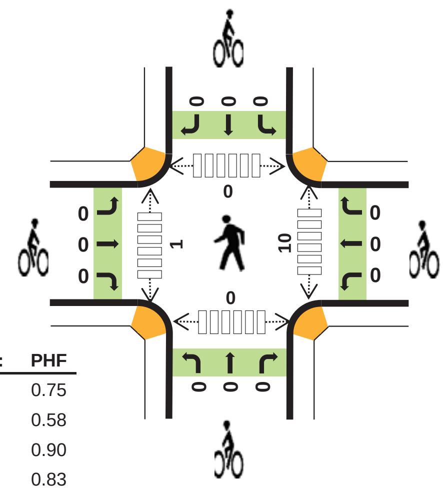


Hunters Point Blvd
Hawes St

Date: 08/30/2016
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM

Peak Hour





	HV %:	PHF
EB	0.0%	0.75
WB	0.0%	0.58
NB	2.0%	0.90
SB	0.0%	0.83
TOTAL	0.9%	0.92

Two-Hour Count Summaries

Interval Start	Hawes St Eastbound UT	LT	TH	RT	Hudson Ave Westbound UT	LT	TH	RT	Hunters Point Blvd Northbound UT	LT	TH	RT	Hunters Point Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	2	0	0	0	0	0	2	0	1	36	0	0	5	27	3	76	0
7:15 AM	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**35**	**0**	**0**	**0**	**25**	**2**	**73**	0
7:30 AM	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**42**	**0**	**0**	**0**	**27**	**1**	**84**	0
7:45 AM	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**32**	**0**	**0**	**1**	**40**	**0**	**81**	314
8:00 AM	**0**	**6**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**41**	**0**	**0**	**0**	**35**	**5**	**89**	**327**
8:15 AM	0	9	0	0	0	0	0	0	0	0	32	0	1	0	24	1	67	321
8:30 AM	0	3	0	0	0	0	0	0	0	0	28	0	1	0	30	3	65	302
8:45 AM	0	5	0	0	0	0	0	0	0	0	40	0	0	1	24	4	74	295
Count Total	0	51	1	0	0	1	0	8	0	2	286	0	2	7	232	19	609	0
Peak Hour All	**0**	**32**	**1**	**0**	**0**	**1**	**0**	**6**	**0**	**1**	**150**	**0**	**0**	**1**	**127**	**8**	**327**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**3**	**0**
Peak Hour HV%	**-**	**0%**	**0%**	**-**	**-**	**0%**	**-**	**0%**	**-**	**0%**	**2%**	**-**	**-**	**0%**	**0%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	1	0	*1*	0	0	0	0	*0*	2	0	0	0	*2*
7:15 AM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**3**	**0**	**0**	**0**	*3*
7:30 AM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**4**	**0**	**0**	**0**	*4*
7:45 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**2**	**1**	**0**	**0**	*3*
8:00 AM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	***1***
8:15 AM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	0	5	1	*6*	0	0	0	0	*0*	12	1	0	0	*13*
Peak Hour	**0**	**0**	**3**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**10**	**1**	**0**	**0**	***11***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Hawes St Eastbound UT	LT	TH	RT	Hudson Ave Westbound UT	LT	TH	RT	Hunters Point Blvd Northbound UT	LT	TH	RT	Hunters Point Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**3**
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	3
Count Total	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0	6	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**3**	**0**

Two-Hour Count Summaries - Bikes

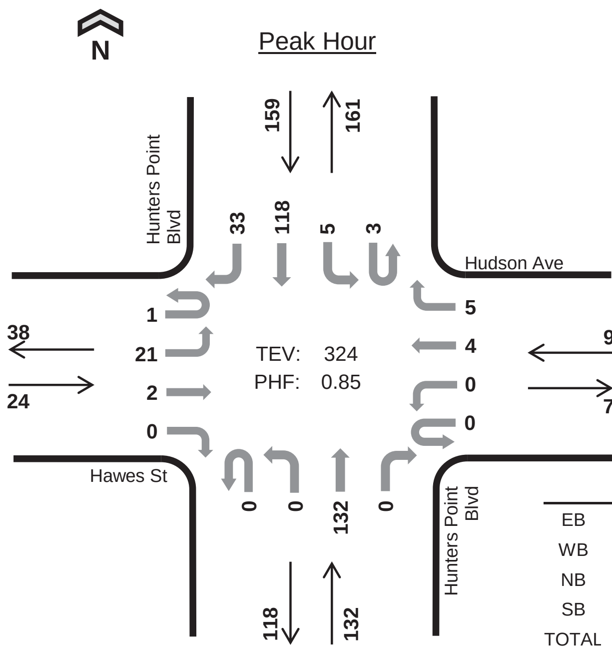
Interval Start	Hawes St Eastbound LT	TH	RT	Hudson Ave Westbound LT	TH	RT	Hunters Point Blvd Northbound LT	TH	RT	Hunters Point Blvd Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

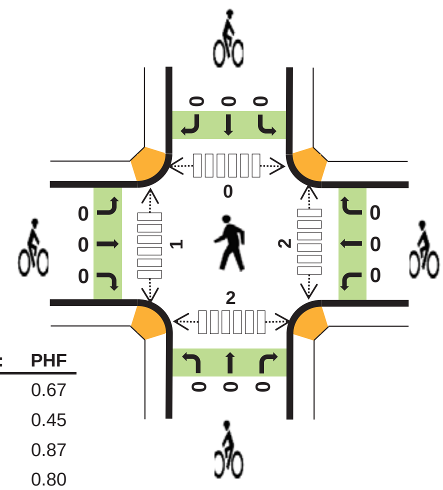
Hunters Point Blvd
Hawes St

Date: 08/30/2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Peak Hour



	HV %:	PHF
EB	4.2%	0.67
WB	0.0%	0.45
NB	0.8%	0.87
SB	0.0%	0.80
TOTAL	0.6%	0.85



Two-Hour Count Summaries

Interval Start	Hawes St Eastbound UT	LT	TH	RT	Hudson Ave Westbound UT	LT	TH	RT	Hunters Point Blvd Northbound UT	LT	TH	RT	Hunters Point Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	**1**	**5**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**38**	**0**	**1**	**2**	**33**	**14**	**95**	0
4:15 PM	**0**	**8**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**31**	**0**	**2**	**0**	**28**	**3**	**74**	0
4:30 PM	**0**	**2**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**34**	**0**	**0**	**3**	**27**	**6**	**75**	0
4:45 PM	**0**	**6**	**0**	**0**	**0**	**0**	**2**	**3**	**0**	**0**	**29**	**0**	**0**	**0**	**30**	**10**	**80**	**324**
5:00 PM	0	6	0	0	0	0	0	5	0	2	48	0	0	1	29	4	95	324
5:15 PM	0	4	1	0	0	0	0	0	0	0	28	0	0	0	23	4	60	310
5:30 PM	0	4	0	1	0	0	0	0	0	0	25	0	0	0	43	5	78	313
5:45 PM	0	1	0	0	0	1	0	0	0	1	35	0	0	1	24	4	67	300
Count Total	1	36	3	1	0	1	4	10	0	3	268	0	3	7	237	50	624	0
Peak Hour All	**1**	**21**	**2**	**0**	**0**	**0**	**4**	**5**	**0**	**0**	**132**	**0**	**3**	**5**	**118**	**33**	**324**	**0**
Peak Hour HV	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**
Peak Hour HV%	**0%**	**5%**	**0%**	**-**	**-**	**-**	**0%**	**0%**	**-**	**-**	**1%**	**-**	**0%**	**0%**	**0%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
4:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**2**	*4*
4:45 PM	**1**	**0**	**1**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	0	0	*1*
5:15 PM	0	0	0	2	*2*	0	0	0	0	*0*	3	0	0	0	*3*
5:30 PM	0	0	0	1	*1*	0	0	0	0	*0*	2	0	0	0	*2*
5:45 PM	0	0	4	1	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	1	0	5	4	*10*	0	0	0	0	*0*	8	1	0	2	*11*
Peak Hour	**1**	**0**	**1**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**2**	**1**	**0**	**2**	***5***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Hawes St Eastbound				Hudson Ave Westbound				Hunters Point Blvd Northbound				Hunters Point Blvd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**2**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5
5:45 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	5	8
Count Total	0	1	0	0	0	0	0	0	0	0	5	0	0	0	4	0	10	0
Peak Hour	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**

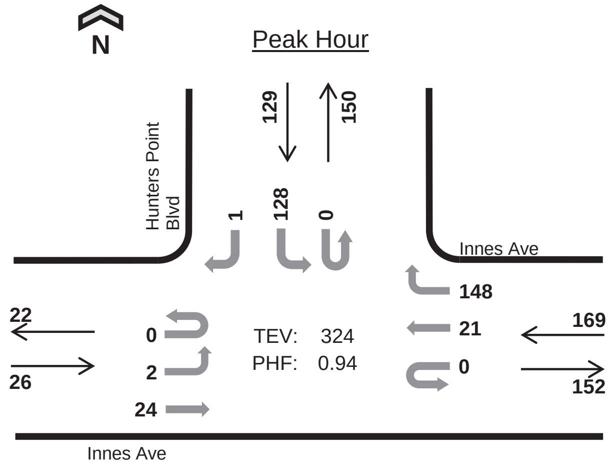
Two-Hour Count Summaries - Bikes

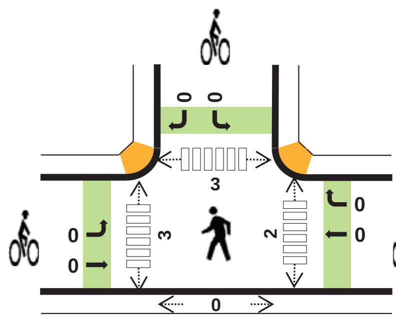
Interval Start	Hawes St Eastbound			Hudson Ave Westbound			Hunters Point Blvd Northbound			Hunters Point Blvd Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Hunters Point Blvd
Innes Ave

Date: 08/30/2016
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM





	HV %:	PHF
EB	0.0%	0.93
WB	1.8%	0.80
NB	-	-
SB	0.0%	0.83
TOTAL	0.9%	0.94

Two-Hour Count Summaries

Interval Start		Innes Ave Eastbound				Innes Ave Westbound				0 Northbound				Hunters Point Blvd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		1	0	10	0	1	0	6	35	0	0	0	0	0	27	0	0	80	0
7:15 AM		**0**	**1**	**6**	**0**	**0**	**0**	**3**	**34**	**0**	**0**	**0**	**0**	**0**	**28**	**0**	**0**	**72**	0
7:30 AM		**0**	**0**	**7**	**0**	**0**	**0**	**7**	**46**	**0**	**0**	**0**	**0**	**0**	**26**	**0**	**0**	**86**	0
7:45 AM		**0**	**0**	**6**	**0**	**0**	**0**	**5**	**33**	**0**	**0**	**0**	**0**	**0**	**39**	**0**	**0**	**83**	321
8:00 AM		**0**	**1**	**5**	**0**	**0**	**0**	**6**	**35**	**0**	**0**	**0**	**0**	**0**	**35**	**0**	**1**	**83**	**324**
8:15 AM		1	0	5	0	0	0	1	32	0	0	0	0	0	24	0	0	63	315
8:30 AM		0	1	9	0	0	0	5	36	0	0	0	0	0	30	0	0	81	310
8:45 AM		0	1	6	0	1	0	4	31	0	0	0	0	0	24	0	0	67	294
Count Total		2	4	54	0	2	0	37	282	0	0	0	0	0	233	0	1	615	0
Peak Hour	**All**	**0**	**2**	**24**	**0**	**0**	**0**	**21**	**148**	**0**	**0**	**0**	**0**	**0**	**128**	**0**	**1**	**324**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**
	HV%	**-**	**0%**	**0%**	**-**	**-**	**-**	**0%**	**2%**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**2**	**2**	**2**	**0**	*6*
7:45 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**1**	**0**	*2*
8:00 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	0	0	0	1	*1*	0	0	0	0	*0*	0	1	0	0	*1*
8:30 AM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	3	0	*3*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	5	0	1	*6*	0	0	0	0	*0*	2	4	6	0	*12*
Peak Hr	**0**	**3**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**2**	**3**	**3**	**0**	***8***

Deon Fouche: 415 - 757 - 7714
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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Innes Ave Eastbound UT	LT	TH	RT	Innes Ave Westbound UT	LT	TH	RT	0 Northbound UT	LT	TH	RT	Hunters Point Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	0	0	0	0	0	0	5	0	0	0	0	0	1	0	0	6	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**

Two-Hour Count Summaries - Bikes

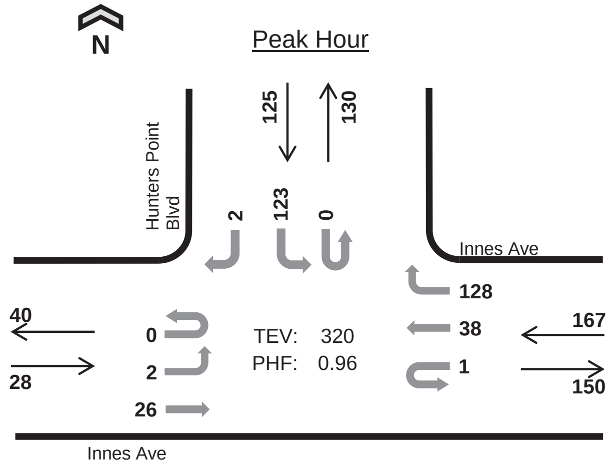
Interval Start	Innes Ave Eastbound LT	TH	RT	Innes Ave Westbound LT	TH	RT	0 Northbound LT	TH	RT	Hunters Point Blvd Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

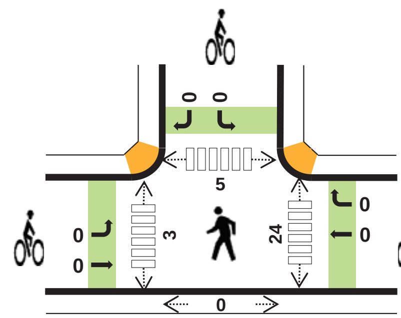
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Hunters Point Blvd
Innes Ave

Date: 08/30/2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

Peak Hour





	HV %:	PHF
EB	0.0%	0.54
WB	1.2%	0.89
NB	-	-
SB	2.4%	0.73
TOTAL	1.6%	0.96

Two-Hour Count Summaries

Interval Start	Innes Ave Eastbound UT	LT	TH	RT	Innes Ave Westbound UT	LT	TH	RT	0 Northbound UT	LT	TH	RT	Hunters Point Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	1	6	0	0	0	8	36	0	0	0	0	0	34	0	0	85	0
4:15 PM	0	0	7	0	0	0	6	29	0	0	0	0	0	26	0	0	68	0
4:30 PM	0	0	5	0	0	0	6	32	0	0	0	0	0	28	0	0	71	0
4:45 PM	**0**	**1**	**6**	**0**	**0**	**0**	**11**	**35**	**0**	**0**	**0**	**0**	**0**	**30**	**0**	**0**	**83**	307
5:00 PM	**0**	**1**	**3**	**0**	**0**	**0**	**7**	**40**	**0**	**0**	**0**	**0**	**0**	**29**	**0**	**0**	**80**	302
5:15 PM	**0**	**0**	**13**	**0**	**1**	**0**	**11**	**32**	**0**	**0**	**0**	**0**	**0**	**23**	**0**	**0**	**80**	314
5:30 PM	**0**	**0**	**4**	**0**	**0**	**0**	**9**	**21**	**0**	**0**	**0**	**0**	**0**	**41**	**0**	**2**	**77**	**320**
5:45 PM	0	0	4	0	0	0	3	36	0	0	0	0	0	24	0	1	68	305
Count Total	0	3	48	0	1	0	61	261	0	0	0	0	0	235	0	3	612	0
Peak Hour All	**0**	**2**	**26**	**0**	**1**	**0**	**38**	**128**	**0**	**0**	**0**	**0**	**0**	**123**	**0**	**2**	**320**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**5**	**0**
Peak Hour HV%	**-**	**0%**	**0%**	**-**	**0%**	**-**	**3%**	**1%**	**-**	**-**	**-**	**-**	**-**	**2%**	**-**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	3	1	0	0	*4*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	7	5	0	0	*12*
4:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	10	3	1	0	*14*
4:45 PM	**0**	**2**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**6**	**0**	**0**	**0**	*6*
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**10**	**2**	**4**	**0**	*16*
5:15 PM	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**0**	**0**	***0***	**5**	**0**	**0**	**0**	*5*
5:30 PM	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***	**3**	**1**	**1**	**0**	***5***
5:45 PM	0	4	0	1	*5*	0	0	0	0	*0*	5	3	1	0	*9*
Count Total	0	6	0	4	*10*	0	0	0	0	*0*	49	15	7	0	*71*
Peak Hr	**0**	**2**	**0**	**3**	***5***	**0**	**0**	**0**	**0**	***0***	**24**	**3**	**5**	**0**	***32***

Deon Fouche: 415 - 757 - 7714

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Innes Ave				Innes Ave				0				Hunters Point Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	2
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	4
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**5**
5:45 PM	0	0	0	0	0	0	0	4	0	0	0	0	0	1	0	0	5	8
Count Total	0	0	0	0	0	0	1	5	0	0	0	0	0	4	0	0	10	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**5**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Innes Ave			Innes Ave			0			Hunters Point Blvd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

MARKS TRAFFIC DATA
mietekm@comcast.net
916.806.0250

CITY OF SAN FRANCISCO

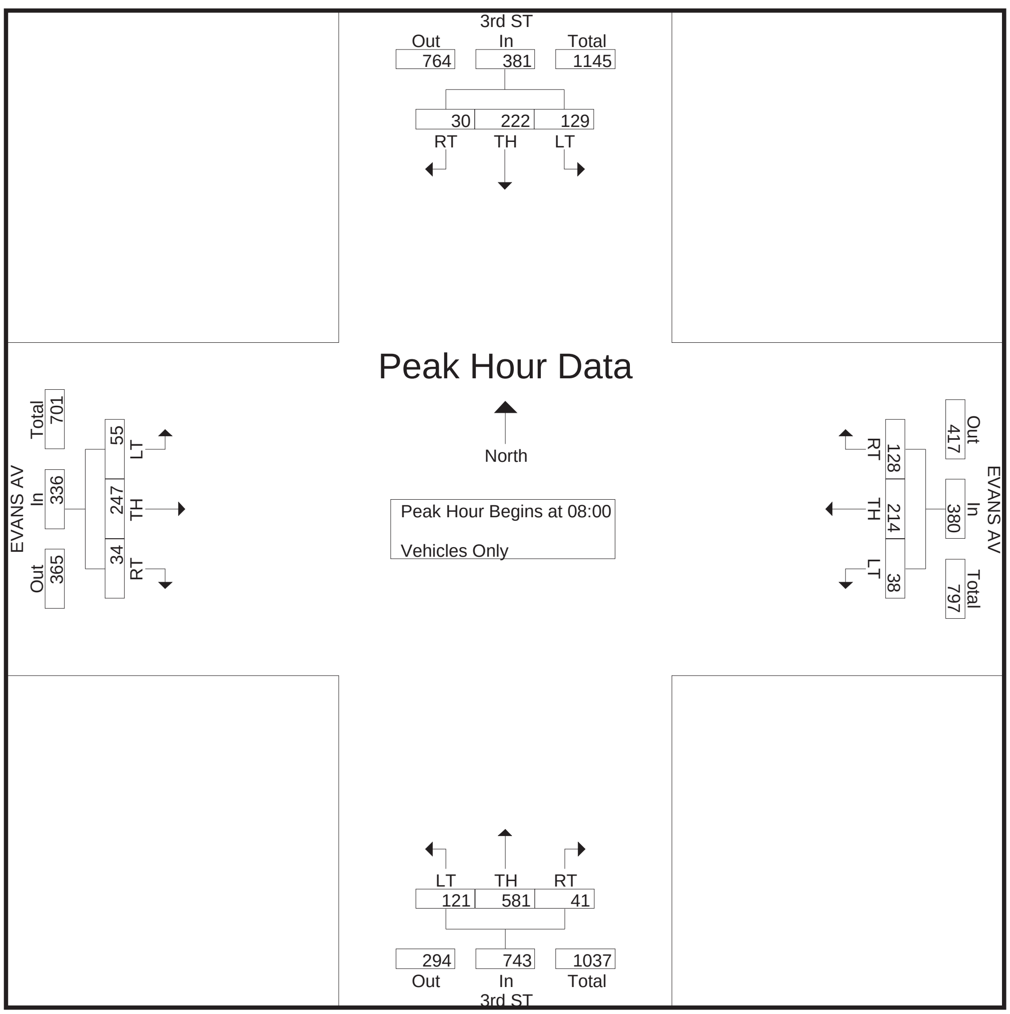
File Name : 3-evans-a
Site Code : 8
Start Date : 5/12/2015
Page No : 1

Groups Printed- Vehicles Only

	3rd ST Southbound				EVANS AV Westbound				3rd ST Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	1	43	33	77	30	68	8	106	11	69	19	99	5	65	10	80	362
07:15	7	42	31	80	26	53	7	86	10	104	21	135	5	67	17	89	390
07:30	3	33	29	65	27	67	11	105	13	142	33	188	11	66	15	92	450
07:45	3	45	27	75	43	45	9	97	10	151	28	189	8	55	15	78	439
Total	14	163	120	297	126	233	35	394	44	466	101	611	29	253	57	339	1641
08:00	5	45	37	87	40	51	6	97	11	136	36	183	6	55	16	77	444
08:15	8	58	28	94	36	56	11	103	7	155	28	190	9	53	14	76	463
08:30	10	59	34	103	31	55	8	94	10	148	28	186	5	65	13	83	466
08:45	7	60	30	97	21	52	13	86	13	142	29	184	14	74	12	100	467
Total	30	222	129	381	128	214	38	380	41	581	121	743	34	247	55	336	1840
Grand Total	44	385	249	678	254	447	73	774	85	1047	222	1354	63	500	112	675	3481
Apprch %	6.5	56.8	36.7		32.8	57.8	9.4		6.3	77.3	16.4		9.3	74.1	16.6		
Total %	1.3	11.1	7.2	19.5	7.3	12.8	2.1	22.2	2.4	30.1	6.4	38.9	1.8	14.4	3.2	19.4	

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 08:00

	3rd ST Southbound				EVANS AV Westbound				3rd ST Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
08:00	5	45	**37**	87	**40**	51	6	97	11	136	**36**	183	6	55	**16**	77	444
08:15	8	58	28	94	36	**56**	11	**103**	7	**155**	28	**190**	9	53	14	76	463
08:30	**10**	59	34	**103**	31	55	8	94	10	148	28	186	5	65	13	83	466
08:45	7	**60**	30	97	21	52	**13**	86	**13**	142	29	184	**14**	**74**	12	**100**	**467**
Total Volume	30	222	129	381	128	214	38	380	41	581	121	743	34	247	55	336	1840
% App. Total	7.9	58.3	33.9		33.7	56.3	10		5.5	78.2	16.3		10.1	73.5	16.4		
PHF	.750	.925	.872	.925	.800	.955	.731	.922	.788	.937	.840	.978	.607	.834	.859	.840	.985



MARKS TRAFFIC DATA

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916.806.0250

CITY OF SAN FRANCISCO

File Name : 3-evans-p
Site Code : 8
Start Date : 5/12/2015
Page No : 1

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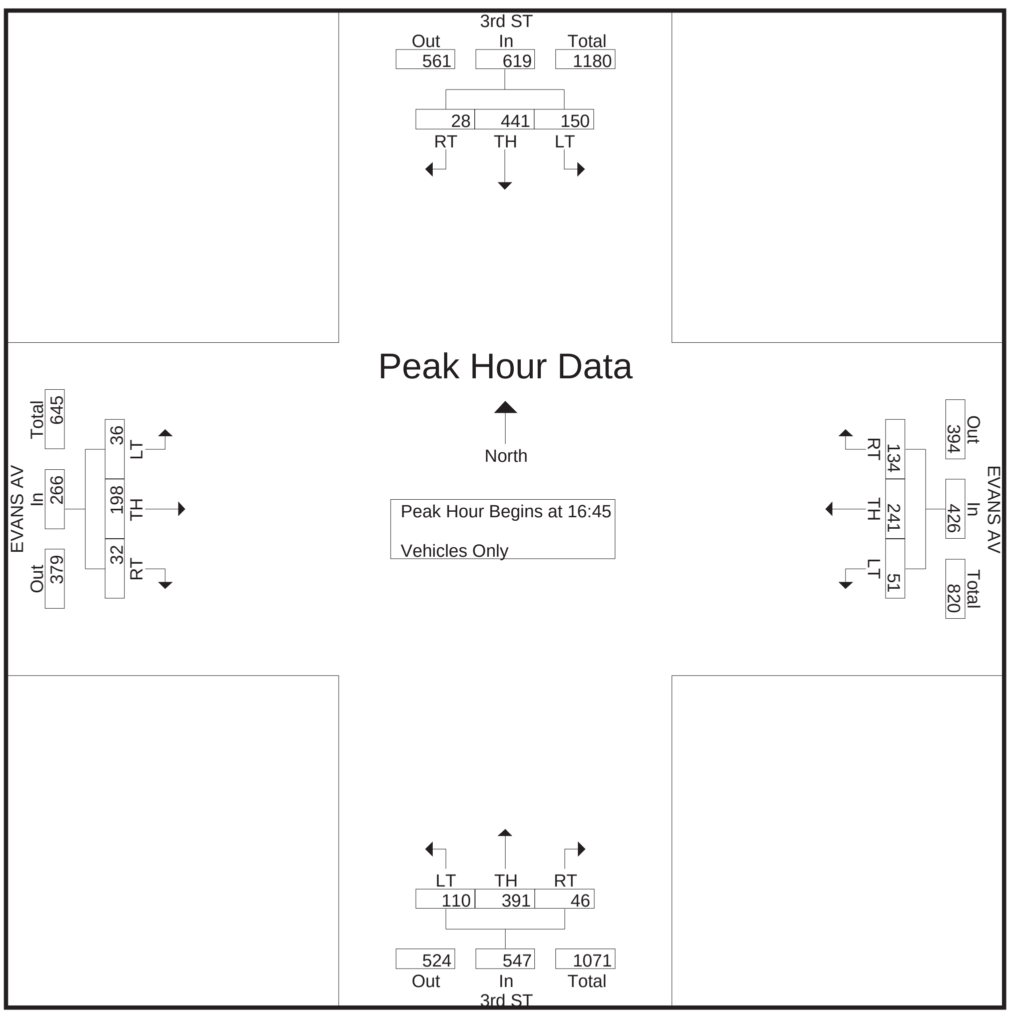
	3rd ST Southbound				EVANS AV Westbound				3rd ST Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	3	83	44	130	34	63	16	113	8	126	32	166	9	51	16	76	485
16:15	1	75	36	112	37	50	9	96	5	114	33	152	9	42	12	63	423
16:30	4	93	39	136	37	62	18	117	4	101	26	131	7	41	9	57	441
16:45	4	100	38	142	33	60	9	102	11	98	29	138	10	49	8	67	449
Total	12	351	157	520	141	235	52	428	28	439	120	587	35	183	45	263	1798
17:00	7	88	32	127	33	65	14	112	11	95	28	134	8	48	10	66	439
17:15	11	125	43	179	32	68	14	114	10	108	29	147	8	53	12	73	513
17:30	6	128	37	171	36	48	14	98	14	90	24	128	6	48	6	60	457
17:45	5	97	43	145	40	43	13	96	9	74	23	106	8	56	6	70	417
Total	29	438	155	622	141	224	55	420	44	367	104	515	30	205	34	269	1826
Grand Total	41	789	312	1142	282	459	107	848	72	806	224	1102	65	388	79	532	3624
Apprch %	3.6	69.1	27.3		33.3	54.1	12.6		6.5	73.1	20.3		12.2	72.9	14.8		
Total %	1.1	21.8	8.6	31.5	7.8	12.7	3	23.4	2	22.2	6.2	30.4	1.8	10.7	2.2	14.7	

	3rd ST Southbound				EVANS AV Westbound				3rd ST Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	4	100	38	142	33	60	9	102	11	98	**29**	138	**10**	49	8	67	449
17:00	7	88	32	127	33	65	**14**	112	11	95	28	134	8	48	10	66	439
17:15	**11**	125	**43**	**179**	32	**68**	14	**114**	10	**108**	29	**147**	8	**53**	**12**	**73**	**513**
17:30	6	**128**	37	171	**36**	48	14	98	**14**	90	24	128	6	48	6	60	457
Total Volume	28	441	150	619	134	241	51	426	46	391	110	547	32	198	36	266	1858
% App. Total	4.5	71.2	24.2		31.5	56.6	12		8.4	71.5	20.1		12	74.4	13.5		
PHF	.636	.861	.872	.865	.931	.886	.911	.934	.821	.905	.948	.930	.800	.934	.750	.911	.905



MARKS TRAFFIC DATA
mietekm@comcast.net
916.806.0250

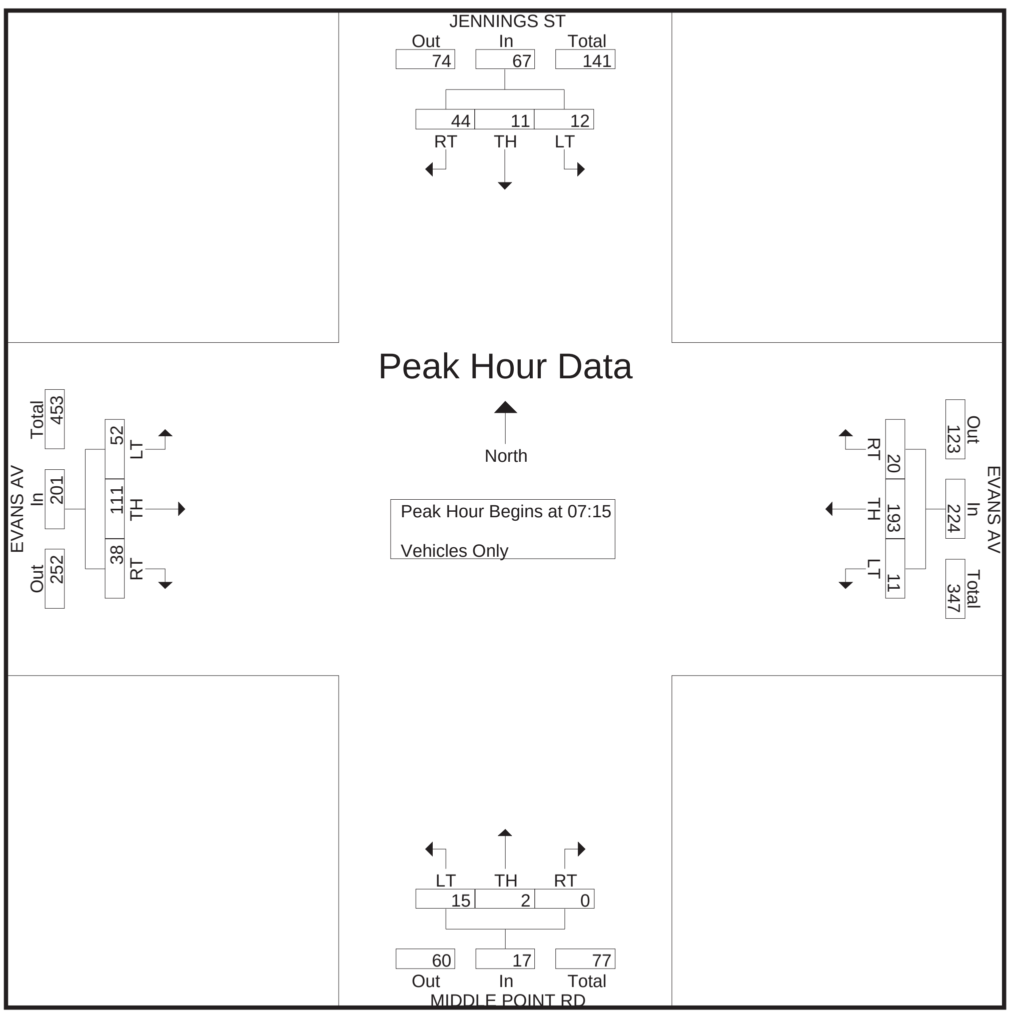
CITY OF SAN FRANCISCO

File Name : jennings-evans-a
Site Code : 9
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	JENNINGS ST Southbound				EVANS AV Westbound				MIDDLE POINT RD Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	5	3	5	13	6	22	1	29	0	0	1	1	8	22	9	39	82
07:15	14	5	3	22	4	48	4	56	0	1	3	4	10	39	11	60	142
07:30	7	3	2	12	4	52	1	57	0	1	3	4	7	27	15	49	122
07:45	12	2	3	17	7	51	3	61	0	0	4	4	12	21	16	49	131
Total	38	13	13	64	21	173	9	203	0	2	11	13	37	109	51	197	477
08:00	11	1	4	16	5	42	3	50	0	0	5	5	9	24	10	43	114
08:15	15	1	6	22	8	39	4	51	0	0	0	0	18	32	13	63	136
08:30	7	2	2	11	5	48	1	54	0	0	1	1	16	15	8	39	105
08:45	11	4	7	22	5	35	4	44	1	0	1	2	13	25	13	51	119
Total	44	8	19	71	23	164	12	199	1	0	7	8	56	96	44	196	474
Grand Total	82	21	32	135	44	337	21	402	1	2	18	21	93	205	95	393	951
Apprch %	60.7	15.6	23.7		10.9	83.8	5.2		4.8	9.5	85.7		23.7	52.2	24.2		
Total %	8.6	2.2	3.4	14.2	4.6	35.4	2.2	42.3	0.1	0.2	1.9	2.2	9.8	21.6	10	41.3	

	JENNINGS ST Southbound				EVANS AV Westbound				MIDDLE POINT RD Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	**14**	**5**	3	**22**	4	48	**4**	56	0	**1**	3	4	10	**39**	11	**60**	**142**
07:30	7	3	2	12	4	**52**	1	57	0	1	3	4	7	27	15	49	122
07:45	12	2	3	17	**7**	51	3	**61**	0	0	4	4	**12**	21	**16**	49	131
08:00	11	1	**4**	16	5	42	3	50	0	0	**5**	**5**	9	24	10	43	114
Total Volume	44	11	12	67	20	193	11	224	0	2	15	17	38	111	52	201	509
% App. Total	65.7	16.4	17.9		8.9	86.2	4.9		0	11.8	88.2		18.9	55.2	25.9		
PHF	.786	.550	.750	.761	.714	.928	.688	.918	.000	.500	.750	.850	.792	.712	.813	.838	.896



MARKS TRAFFIC DATA
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916.806.0250

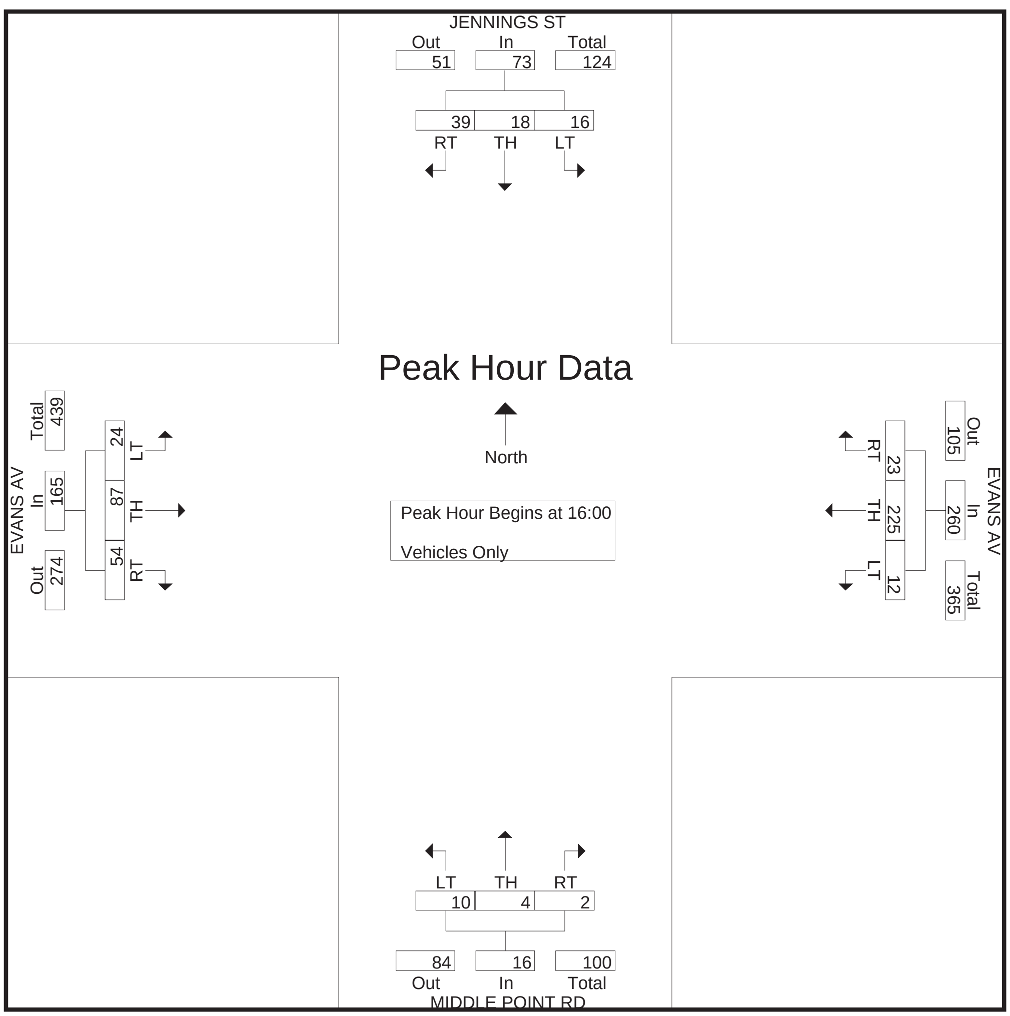
CITY OF SAN FRANCISCO

File Name : jennings-evans-p
Site Code : 9
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

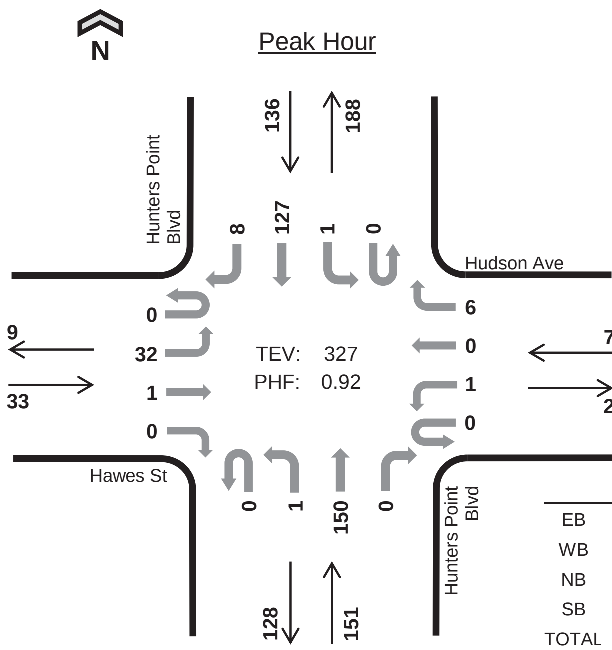
	JENNINGS ST Southbound				EVANS AV Westbound				MIDDLE POINT RD Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	12	7	4	23	8	53	3	64	1	0	2	3	21	20	5	46	136
16:15	9	6	4	19	5	54	4	63	0	2	4	6	13	21	10	44	132
16:30	8	2	3	13	6	53	2	61	1	1	2	4	10	23	6	39	117
16:45	10	3	5	18	4	65	3	72	0	1	2	3	10	23	3	36	129
Total	39	18	16	73	23	225	12	260	2	4	10	16	54	87	24	165	514
17:00	12	4	5	21	4	42	2	48	0	1	5	6	19	26	7	52	127
17:15	10	4	4	18	4	30	5	39	1	0	2	3	9	25	5	39	99
17:30	5	2	3	10	4	42	4	50	1	0	3	4	18	31	7	56	120
17:45	8	2	3	13	3	38	6	47	0	0	8	8	13	27	7	47	115
Total	35	12	15	62	15	152	17	184	2	1	18	21	59	109	26	194	461
Grand Total	74	30	31	135	38	377	29	444	4	5	28	37	113	196	50	359	975
Apprch %	54.8	22.2	23		8.6	84.9	6.5		10.8	13.5	75.7		31.5	54.6	13.9		
Total %	7.6	3.1	3.2	13.8	3.9	38.7	3	45.5	0.4	0.5	2.9	3.8	11.6	20.1	5.1	36.8	

	JENNINGS ST Southbound				EVANS AV Westbound				MIDDLE POINT RD Northbound				EVANS AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	**12**	**7**	4	**23**	**8**	53	3	64	**1**	0	2	3	**21**	20	5	**46**	**136**
16:15	9	6	4	19	5	54	**4**	63	0	**2**	**4**	**6**	13	21	**10**	44	132
16:30	8	2	3	13	6	53	2	61	1	1	2	4	10	**23**	6	39	117
16:45	10	3	**5**	18	4	**65**	3	**72**	0	1	2	3	10	23	3	36	129
Total Volume	39	18	16	73	23	225	12	260	2	4	10	16	54	87	24	165	514
% App. Total	53.4	24.7	21.9		8.8	86.5	4.6		12.5	25	62.5		32.7	52.7	14.5		
PHF	.813	.643	.800	.793	.719	.865	.750	.903	.500	.500	.625	.667	.643	.946	.600	.897	.945

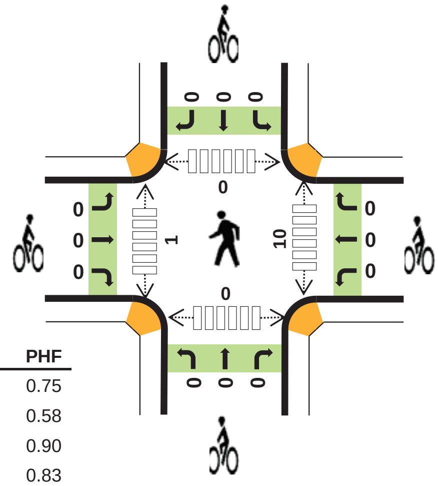


Hunters Point Blvd
Hawes St

Date: 08/30/2016
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM



	HV %:	PHF
EB	0.0%	0.75
WB	0.0%	0.58
NB	2.0%	0.90
SB	0.0%	0.83
TOTAL	0.9%	0.92



Two-Hour Count Summaries

Interval Start	Hawes St Eastbound UT	LT	TH	RT	Hudson Ave Westbound UT	LT	TH	RT	Hunters Point Blvd Northbound UT	LT	TH	RT	Hunters Point Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	2	0	0	0	0	0	2	0	1	36	0	0	5	27	3	76	0
7:15 AM	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**35**	**0**	**0**	**0**	**25**	**2**	**73**	0
7:30 AM	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**42**	**0**	**0**	**0**	**27**	**1**	**84**	0
7:45 AM	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**32**	**0**	**0**	**1**	**40**	**0**	**81**	314
8:00 AM	**0**	**6**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**41**	**0**	**0**	**0**	**35**	**5**	**89**	**327**
8:15 AM	0	9	0	0	0	0	0	0	0	0	32	0	1	0	24	1	67	321
8:30 AM	0	3	0	0	0	0	0	0	0	0	28	0	1	0	30	3	65	302
8:45 AM	0	5	0	0	0	0	0	0	0	0	40	0	0	1	24	4	74	295
Count Total	0	51	1	0	0	1	0	8	0	2	286	0	2	7	232	19	609	0
Peak Hour All	**0**	**32**	**1**	**0**	**0**	**1**	**0**	**6**	**0**	**1**	**150**	**0**	**0**	**1**	**127**	**8**	**327**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**3**	**0**
Peak Hour HV%	**-**	**0%**	**0%**	**-**	**-**	**0%**	**-**	**0%**	**-**	**0%**	**2%**	**-**	**-**	**0%**	**0%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	1	0	*1*	0	0	0	0	*0*	2	0	0	0	*2*
7:15 AM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**3**	**0**	**0**	**0**	*3*
7:30 AM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**4**	**0**	**0**	**0**	*4*
7:45 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**2**	**1**	**0**	**0**	*3*
8:00 AM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	***1***
8:15 AM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	0	5	1	*6*	0	0	0	0	*0*	12	1	0	0	*13*
Peak Hour	**0**	**0**	**3**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**10**	**1**	**0**	**0**	***11***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Hawes St				Hudson Ave				Hunters Point Blvd				Hunters Point Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**3**
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	3
Count Total	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0	6	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**3**	**0**

Two-Hour Count Summaries - Bikes

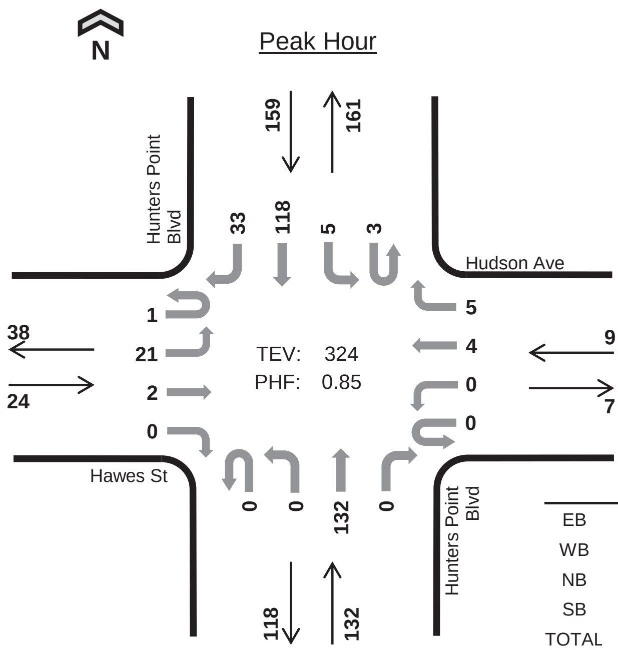
Interval Start	Hawes St			Hudson Ave			Hunters Point Blvd			Hunters Point Blvd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

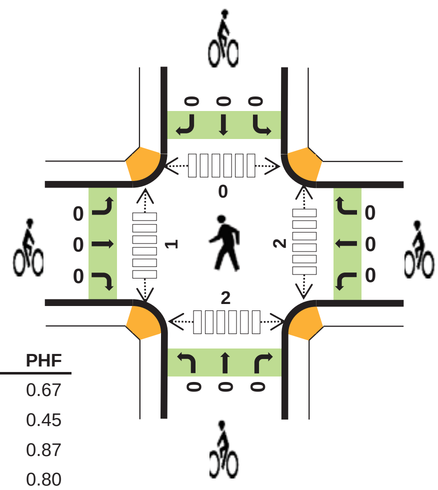
Hunters Point Blvd
Hawes St

Date: 08/30/2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Peak Hour



	HV %:	PHF
EB	4.2%	0.67
WB	0.0%	0.45
NB	0.8%	0.87
SB	0.0%	0.80
TOTAL	0.6%	0.85



Two-Hour Count Summaries

Interval Start	Hawes St Eastbound UT	LT	TH	RT	Hudson Ave Westbound UT	LT	TH	RT	Hunters Point Blvd Northbound UT	LT	TH	RT	Hunters Point Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	1	5	0	0	0	0	1	0	0	0	38	0	1	2	33	14	95	0
4:15 PM	0	8	1	0	0	0	0	1	0	0	31	0	2	0	28	3	74	0
4:30 PM	0	2	1	0	0	0	1	1	0	0	34	0	0	3	27	6	75	0
4:45 PM	0	6	0	0	0	0	2	3	0	0	29	0	0	0	30	10	80	324
5:00 PM	0	6	0	0	0	0	0	5	0	2	48	0	0	1	29	4	95	324
5:15 PM	0	4	1	0	0	0	0	0	0	0	28	0	0	0	23	4	60	310
5:30 PM	0	4	0	1	0	0	0	0	0	0	25	0	0	0	43	5	78	313
5:45 PM	0	1	0	0	0	1	0	0	0	1	35	0	0	1	24	4	67	300
Count Total	1	36	3	1	0	1	4	10	0	3	268	0	3	7	237	50	624	0
Peak Hour All	1	21	2	0	0	0	4	5	0	0	132	0	3	5	118	33	324	0
Peak Hour HV	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0
Peak Hour HV%	0%	5%	0%	-	-	-	0%	0%	-	-	1%	-	0%	0%	0%	0%	1%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	0	0	*1*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	2	0	0	2	*4*
4:45 PM	1	0	1	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	0	0	*1*
5:15 PM	0	0	0	2	*2*	0	0	0	0	*0*	3	0	0	0	*3*
5:30 PM	0	0	0	1	*1*	0	0	0	0	*0*	2	0	0	0	*2*
5:45 PM	0	0	4	1	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	1	0	5	4	*10*	0	0	0	0	*0*	8	1	0	2	*11*
Peak Hour	1	0	1	0	*2*	0	0	0	0	*0*	2	1	0	2	*5*

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Hawes St Eastbound UT	LT	TH	RT	Hudson Ave Westbound UT	LT	TH	RT	Hunters Point Blvd Northbound UT	LT	TH	RT	Hunters Point Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**2**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5
5:45 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	5	8
Count Total	0	1	0	0	0	0	0	0	0	0	5	0	0	0	4	0	10	0
Peak Hour	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**

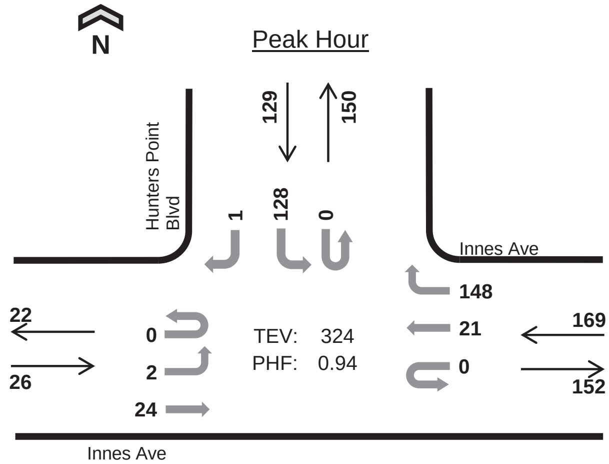
Two-Hour Count Summaries - Bikes

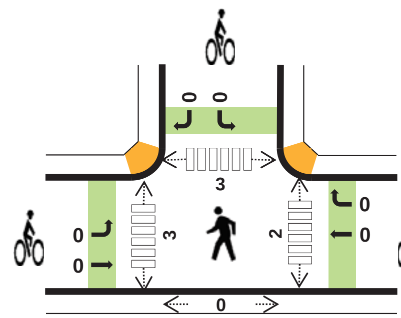
Interval Start	Hawes St Eastbound LT	TH	RT	Hudson Ave Westbound LT	TH	RT	Hunters Point Blvd Northbound LT	TH	RT	Hunters Point Blvd Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Hunters Point Blvd
Innes Ave

Date: 08/30/2016
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM





	HV %:	PHF
EB	0.0%	0.93
WB	1.8%	0.80
NB	-	-
SB	0.0%	0.83
TOTAL	0.9%	0.94

Two-Hour Count Summaries

Interval Start	Innes Ave Eastbound UT	LT	TH	RT	Innes Ave Westbound UT	LT	TH	RT	0 Northbound UT	LT	TH	RT	Hunters Point Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	1	0	10	0	1	0	6	35	0	0	0	0	0	27	0	0	80	0
7:15 AM	**0**	**1**	**6**	**0**	**0**	**0**	**3**	**34**	**0**	**0**	**0**	**0**	**0**	**28**	**0**	**0**	**72**	0
7:30 AM	**0**	**0**	**7**	**0**	**0**	**0**	**7**	**46**	**0**	**0**	**0**	**0**	**0**	**26**	**0**	**0**	**86**	0
7:45 AM	**0**	**0**	**6**	**0**	**0**	**0**	**5**	**33**	**0**	**0**	**0**	**0**	**0**	**39**	**0**	**0**	**83**	321
8:00 AM	**0**	**1**	**5**	**0**	**0**	**0**	**6**	**35**	**0**	**0**	**0**	**0**	**0**	**35**	**0**	**1**	**83**	**324**
8:15 AM	1	0	5	0	0	0	1	32	0	0	0	0	0	24	0	0	63	315
8:30 AM	0	1	9	0	0	0	5	36	0	0	0	0	0	30	0	0	81	310
8:45 AM	0	1	6	0	1	0	4	31	0	0	0	0	0	24	0	0	67	294
Count Total	2	4	54	0	2	0	37	282	0	0	0	0	0	233	0	1	615	0
Peak Hour All	**0**	**2**	**24**	**0**	**0**	**0**	**21**	**148**	**0**	**0**	**0**	**0**	**0**	**128**	**0**	**1**	**324**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**
Peak Hour HV%	**-**	**0%**	**0%**	**-**	**-**	**-**	**0%**	**2%**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**2**	**2**	**2**	**0**	*6*
7:45 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**1**	**0**	*2*
8:00 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	0	0	0	1	*1*	0	0	0	0	*0*	0	1	0	0	*1*
8:30 AM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	3	0	*3*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	5	0	1	*6*	0	0	0	0	*0*	2	4	6	0	*12*
Peak Hr	**0**	**3**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**2**	**3**	**3**	**0**	***8***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Innes Ave Eastbound UT	LT	TH	RT	Innes Ave Westbound UT	LT	TH	RT	0 Northbound UT	LT	TH	RT	Hunters Point Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	0	0	0	0	0	0	5	0	0	0	0	0	1	0	0	6	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**

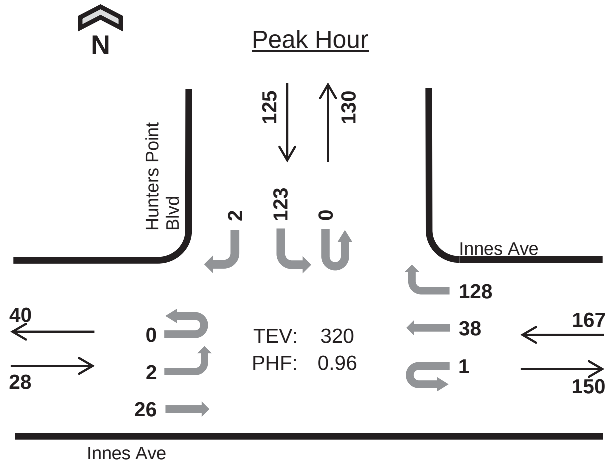
Two-Hour Count Summaries - Bikes

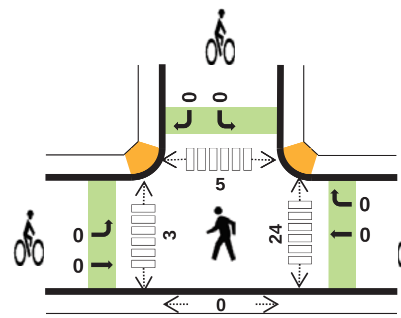
Interval Start	Innes Ave Eastbound LT	TH	RT	Innes Ave Westbound LT	TH	RT	0 Northbound LT	TH	RT	Hunters Point Blvd Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Hunters Point Blvd
Innes Ave

Date: 08/30/2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	0.0%	0.54
WB	1.2%	0.89
NB	-	-
SB	2.4%	0.73
TOTAL	1.6%	0.96

Two-Hour Count Summaries

Interval Start		Innes Ave Eastbound				Innes Ave Westbound				0 Northbound				Hunters Point Blvd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	1	6	0	0	0	8	36	0	0	0	0	0	34	0	0	85	0
4:15 PM		0	0	7	0	0	0	6	29	0	0	0	0	0	26	0	0	68	0
4:30 PM		0	0	5	0	0	0	6	32	0	0	0	0	0	28	0	0	71	0
4:45 PM		**0**	**1**	**6**	**0**	**0**	**0**	**11**	**35**	**0**	**0**	**0**	**0**	**0**	**30**	**0**	**0**	**83**	307
5:00 PM		**0**	**1**	**3**	**0**	**0**	**0**	**7**	**40**	**0**	**0**	**0**	**0**	**0**	**29**	**0**	**0**	**80**	302
5:15 PM		**0**	**0**	**13**	**0**	**1**	**0**	**11**	**32**	**0**	**0**	**0**	**0**	**0**	**23**	**0**	**0**	**80**	314
5:30 PM		**0**	**0**	**4**	**0**	**0**	**0**	**9**	**21**	**0**	**0**	**0**	**0**	**0**	**41**	**0**	**2**	**77**	**320**
5:45 PM		0	0	4	0	0	0	3	36	0	0	0	0	0	24	0	1	68	305
Count Total		0	3	48	0	1	0	61	261	0	0	0	0	0	235	0	3	612	0
Peak Hour	**All**	**0**	**2**	**26**	**0**	**1**	**0**	**38**	**128**	**0**	**0**	**0**	**0**	**0**	**123**	**0**	**2**	**320**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**5**	**0**
	HV%	**-**	**0%**	**0%**	**-**	**0%**	**-**	**3%**	**1%**	**-**	**-**	**-**	**-**	**-**	**2%**	**-**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	3	1	0	0	*4*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	7	5	0	0	*12*
4:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	10	3	1	0	*14*
4:45 PM	**0**	**2**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**6**	**0**	**0**	**0**	*6*
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**10**	**2**	**4**	**0**	*16*
5:15 PM	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**0**	**0**	***0***	**5**	**0**	**0**	**0**	*5*
5:30 PM	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***	**3**	**1**	**1**	**0**	***5***
5:45 PM	0	4	0	1	*5*	0	0	0	0	*0*	5	3	1	0	*9*
Count Total	0	6	0	4	*10*	0	0	0	0	*0*	49	15	7	0	*71*
Peak Hr	**0**	**2**	**0**	**3**	***5***	**0**	**0**	**0**	**0**	***0***	**24**	**3**	**5**	**0**	***32***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Innes Ave Eastbound				Innes Ave Westbound				0 Northbound				Hunters Point Blvd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	2
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	4
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**5**
5:45 PM	0	0	0	0	0	0	0	4	0	0	0	0	0	1	0	0	5	8
Count Total	0	0	0	0	0	0	1	5	0	0	0	0	0	4	0	0	10	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**5**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Innes Ave Eastbound			Innes Ave Westbound			0 Northbound			Hunters Point Blvd Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

MARKS TRAFFIC DATA
mietekm@comcast.net
916.806.0250

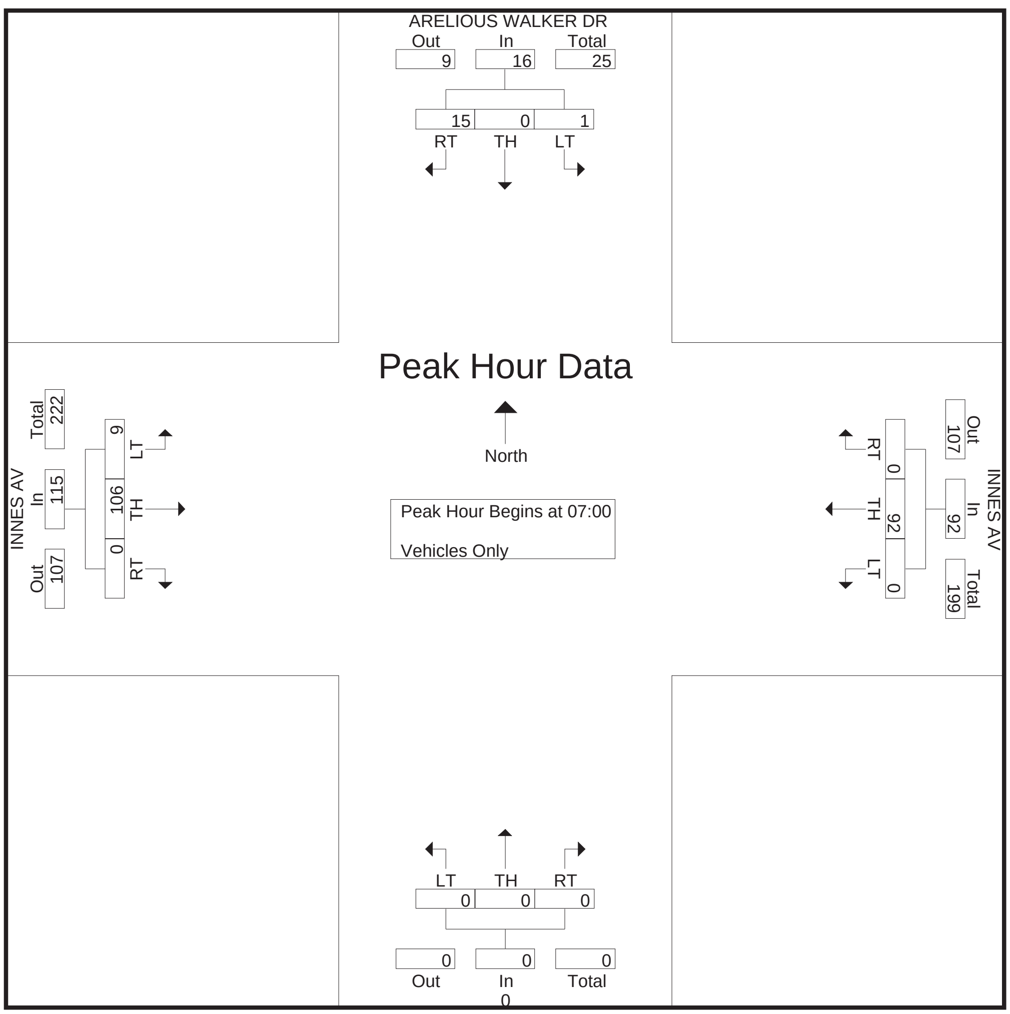
CITY OF SAN FRANCISCO

File Name : arelious walker-innes-a
Site Code : 12
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	ARELIOUS WALKER DR Southbound				INNES AV Westbound				0 Northbound				INNES AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
07:00	2	0	0	2	0	14	0	14	0	0	0	0	0	24	4	28	44
07:15	5	0	0	5	0	27	0	27	0	0	0	0	0	31	2	33	65
07:30	5	0	0	5	0	27	0	27	0	0	0	0	0	30	1	31	63
07:45	3	0	1	4	0	24	0	24	0	0	0	0	0	21	2	23	51
Total	15	0	1	16	0	92	0	92	0	0	0	0	0	106	9	115	223
08:00	0	0	0	0	0	11	0	11	0	0	0	0	0	10	0	10	21
08:15	4	0	0	4	0	19	0	19	0	0	0	0	0	33	3	36	59
08:30	1	0	0	1	0	22	0	22	0	0	0	0	0	15	4	19	42
08:45	4	0	2	6	0	18	0	18	0	0	0	0	0	29	3	32	56
Total	9	0	2	11	0	70	0	70	0	0	0	0	0	87	10	97	178
Grand Total	24	0	3	27	0	162	0	162	0	0	0	0	0	193	19	212	401
Apprch %	88.9	0	11.1		0	100	0		0	0	0		0	91	9		
Total %	6	0	0.7	6.7	0	40.4	0	40.4	0	0	0	0	0	48.1	4.7	52.9	

	ARELIOUS WALKER DR Southbound				INNES AV Westbound				0 Northbound				INNES AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	2	0	0	2	0	14	0	14	0	0	0	0	0	24	**4**	28	44
07:15	**5**	0	0	**5**	0	**27**	0	**27**	0	0	0	0	0	**31**	2	**33**	**65**
07:30	5	0	0	5	0	27	0	27	0	0	0	0	0	30	1	31	63
07:45	3	0	**1**	4	0	24	0	24	0	0	0	0	0	21	2	23	51
Total Volume	15	0	1	16	0	92	0	92	0	0	0	0	0	106	9	115	223
% App. Total	93.8	0	6.2		0	100	0		0	0	0		0	92.2	7.8		
PHF	.750	.000	.250	.800	.000	.852	.000	.852	.000	.000	.000	.000	.000	.855	.563	.871	.858



MARKS TRAFFIC DATA

mietekm@comcast.net
916.806.0250

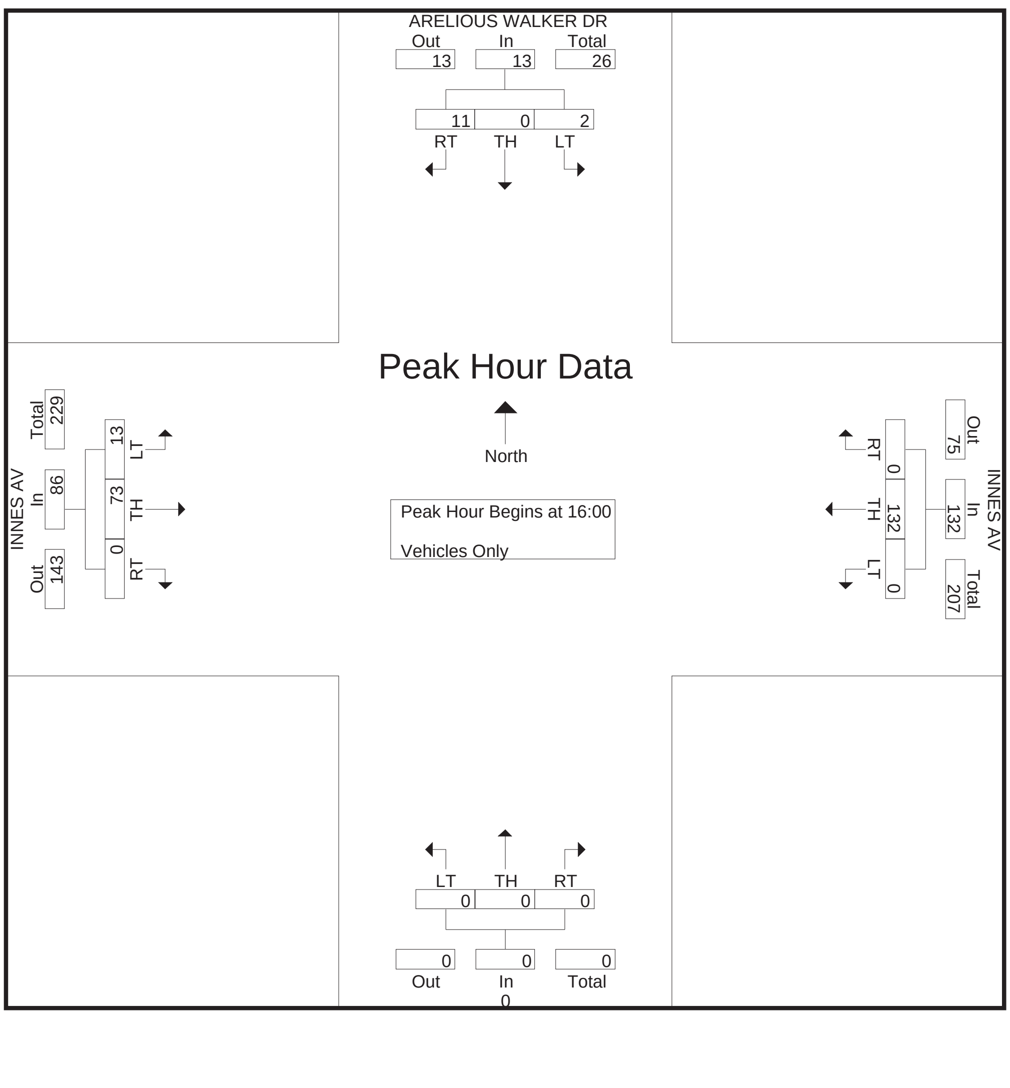
CITY OF SAN FRANCISCO

File Name : arelious walker-innes-p
Site Code : 12
Start Date : 5/13/2015
Page No : 1

Groups Printed- Vehicles Only

	ARELIOUS WALKER DR Southbound				INNES AV Westbound				0 Northbound				INNES AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	1	0	1	2	0	30	0	30	0	0	0	0	0	18	2	20	52
16:15	2	0	1	3	0	33	0	33	0	0	0	0	0	12	5	17	53
16:30	5	0	0	5	0	30	0	30	0	0	0	0	0	25	2	27	62
16:45	3	0	0	3	0	39	0	39	0	0	0	0	0	18	4	22	64
Total	11	0	2	13	0	132	0	132	0	0	0	0	0	73	13	86	231
17:00	2	0	0	2	0	20	0	20	0	0	0	0	0	22	4	26	48
17:15	0	0	0	0	0	13	0	13	0	0	0	0	0	10	3	13	26
17:30	14	0	0	14	0	19	0	19	0	0	0	0	0	24	3	27	60
17:45	2	0	1	3	0	15	0	15	0	0	0	0	0	23	1	24	42
Total	18	0	1	19	0	67	0	67	0	0	0	0	0	79	11	90	176
Grand Total	29	0	3	32	0	199	0	199	0	0	0	0	0	152	24	176	407
Apprch %	90.6	0	9.4		0	100	0		0	0	0		0	86.4	13.6		
Total %	7.1	0	0.7	7.9	0	48.9	0	48.9	0	0	0	0	0	37.3	5.9	43.2	

	ARELIOUS WALKER DR Southbound				INNES AV Westbound				0 Northbound				INNES AV Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	1	0	**1**	2	0	30	0	30	0	0	0	0	0	18	2	20	52
16:15	2	0	1	3	0	33	0	33	0	0	0	0	0	12	**5**	17	53
16:30	**5**	0	0	**5**	0	30	0	30	0	0	0	0	0	**25**	2	**27**	62
16:45	3	0	0	3	0	**39**	0	**39**	0	0	0	0	0	18	4	22	**64**
Total Volume	11	0	2	13	0	132	0	132	0	0	0	0	0	73	13	86	231
% App. Total	84.6	0	15.4		0	100	0		0	0	0		0	84.9	15.1		
PHF	.550	.000	.500	.650	.000	.846	.000	.846	.000	.000	.000	.000	.000	.730	.650	.796	.902



APPENDIX P: CUMULATIVE SCENARIO QUEUE LENGTHS – PLUS PROPOSED PROJECT AND PLUS PROJECT VARIANT

Cumulative Plus Project - New Griffith Street

FOR DISCUSSION PURPOSES ONLY
5/14/2016

Queue Lengths

Note: All queue lengths shown are 95th percentile (longer of AM or PM)

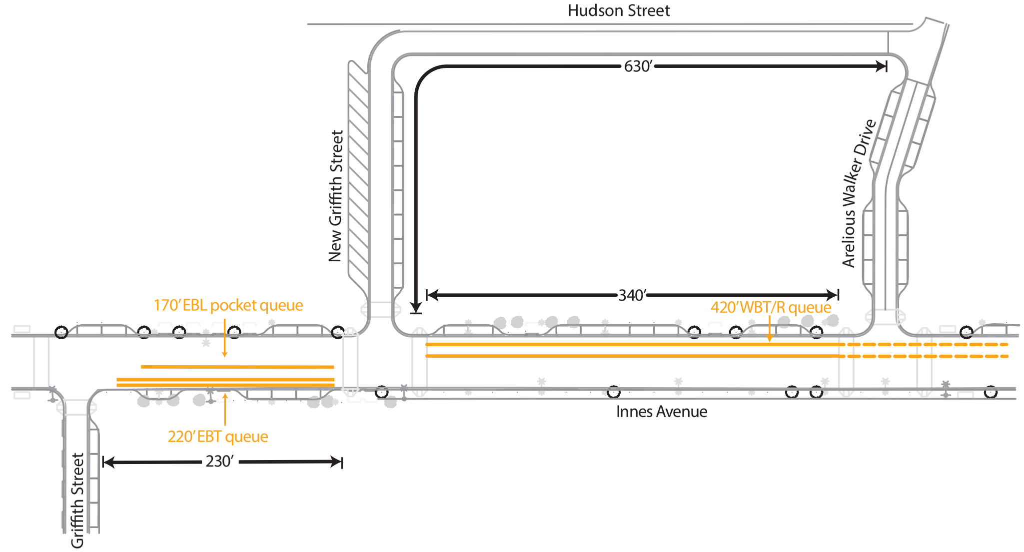


Figure 1A
Queue Lengths

Cumulative Plus Project - Arelious Walker Drive

FOR DISCUSSION PURPOSES ONLY
5/14/2016

Queue Lengths

Note: All queue lengths shown are 95th perecentile (longer of AM or PM)

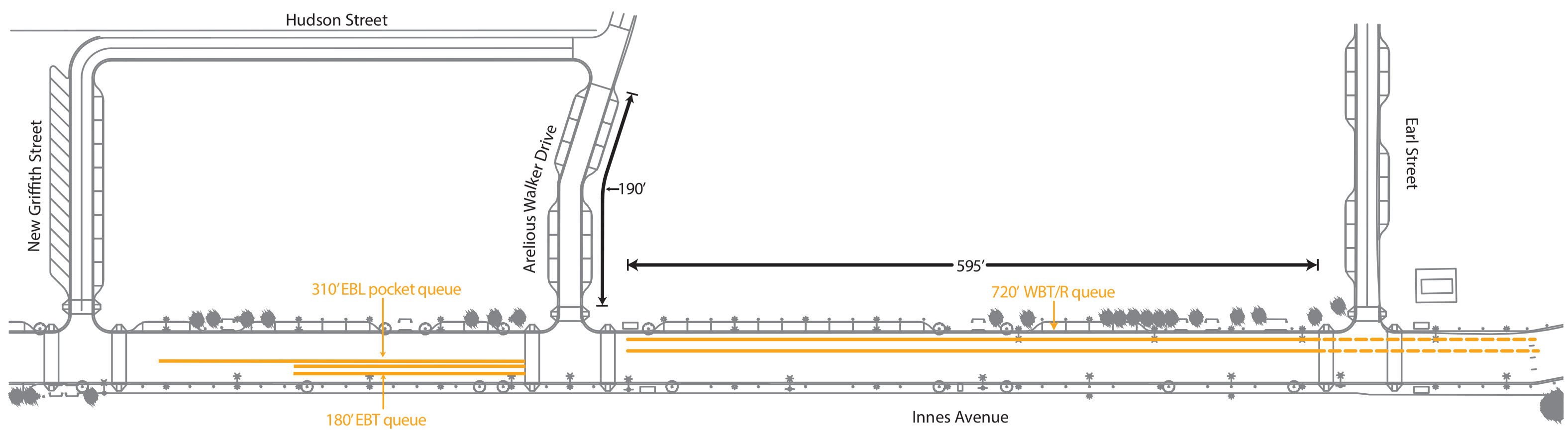


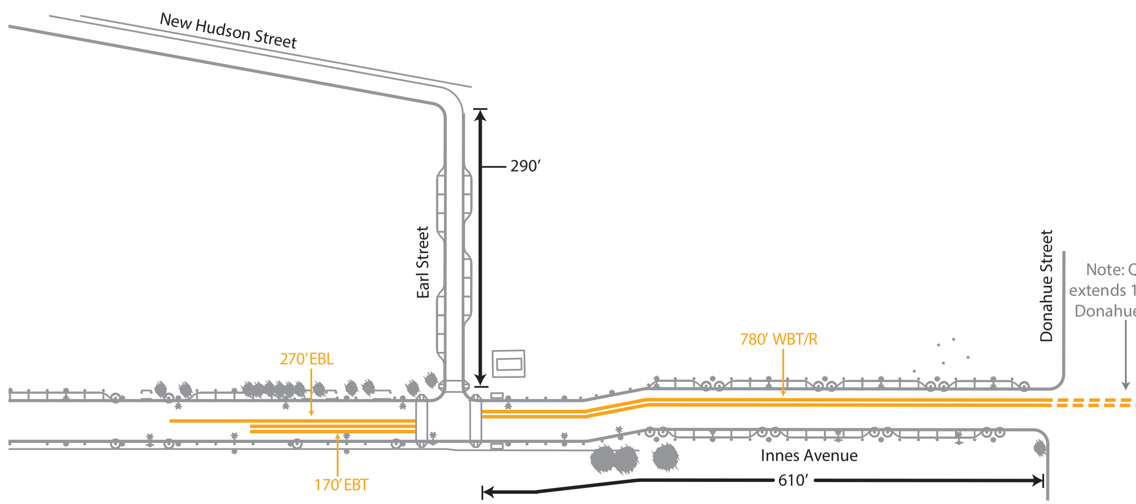
Figure 1B
Queue Lengths

Cumulative Plus Project - Earl Street

FOR DISCUSSION PURPOSES ONLY
5/14/2016

Queue Lengths

Note: All queue lengths shown are 95th percentile (longer of AM or PM)



Cumulative Plus Variant - New Griffith Street

FOR DISCUSSION PURPOSES ONLY
5/14/2016

Queue Lengths

Note: All queue lengths shown are 95th percentile (longer of AM or PM)

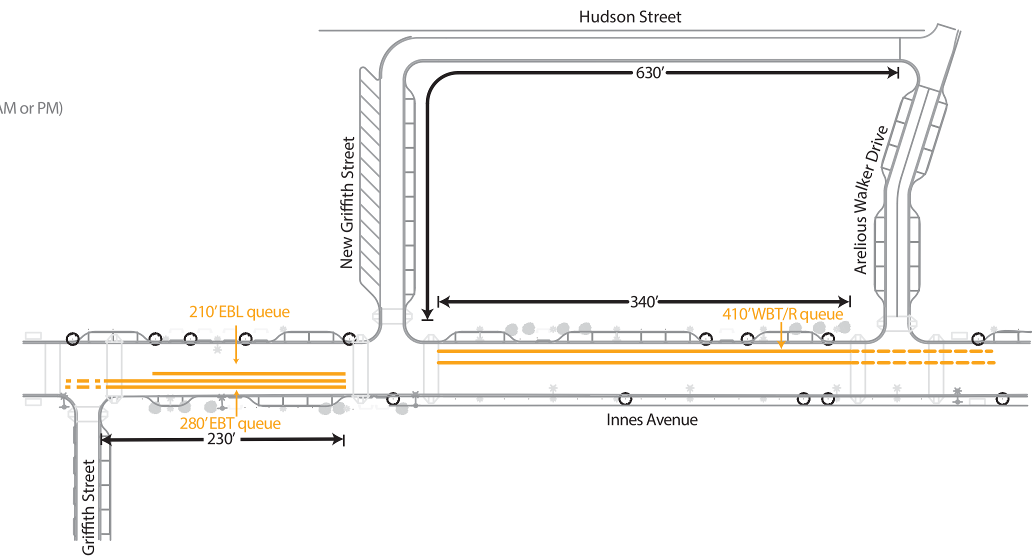


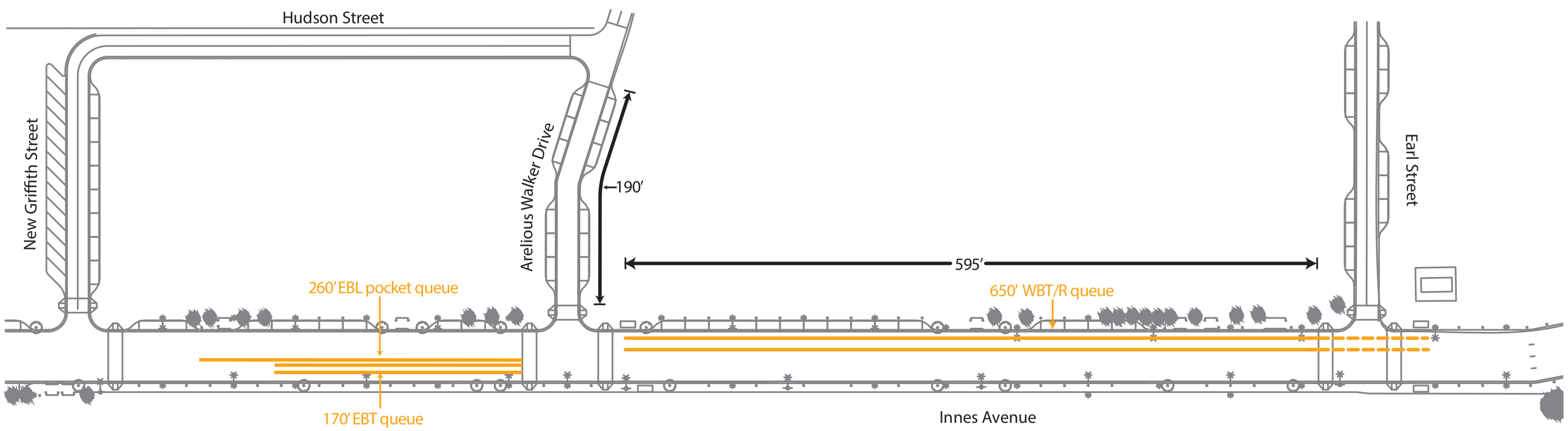
Figure 2A
Queue Lengths

Cumulative Plus Variant - Arelious Walker Drive

FOR DISCUSSION PURPOSES ONLY
5/14/2016

Queue Lengths

Note: All queue lengths shown are 95th percentile (longer of AM or PM)



Cumulative Plus Variant - Earl Street

FOR DISCUSSION PURPOSES ONLY
5/14/2016

Queue Lengths

Note: All queue lengths shown are 95th percentile (longer of AM or PM)

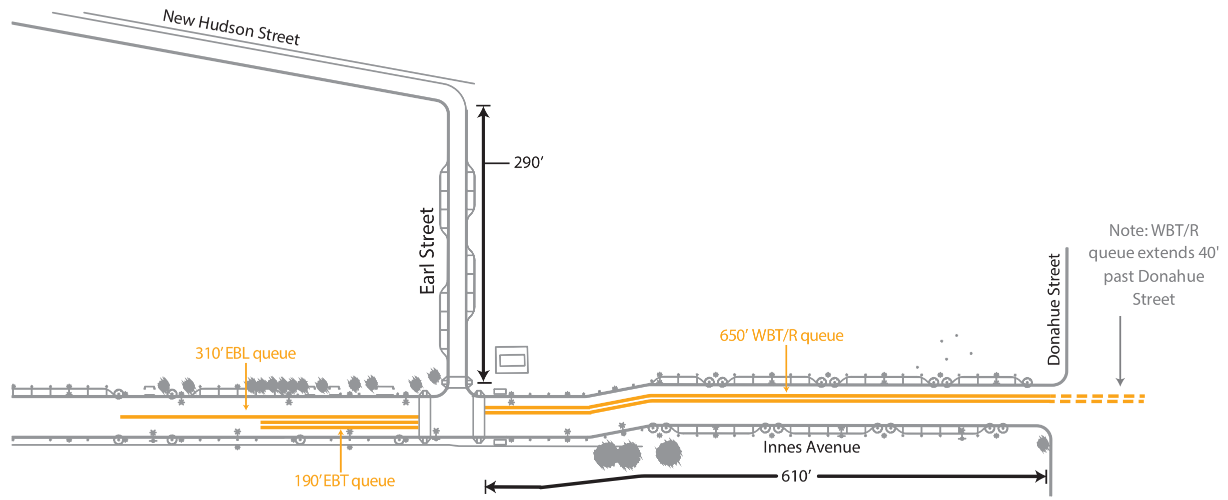


Figure 2C
Queue Lengths

MEMORANDUM

Date: July 10, 2017

To: Debra Dwyer, San Francisco Planning Department

From: Andy Kosinski, PE, and Matthew Crane

Subject: India Basin Code Compliant Alternative Analysis – Transportation and Circulation

SF15-0820

The purpose of this memorandum is to compare the transportation impacts of the Project Alternatives with those of the Proposed India Basin Project as evaluated in the India Basin Project Transportation Impact Study.[1] This memorandum examines the No Project, Reduced Development, and Code Compliant alternatives, which are described in detail in the Draft EIR for the India Basin Project (herein "Proposed Project").

The Proposed Project, co-sponsored by Build and the San Francisco Recreation and Parks Department (together, the "Project Sponsor"), would redevelop the Sponsor's parcels along the India Basin shoreline of the San Francisco Bay; it would develop the privately owned 16.94 acres plus 5.77 acres of developed and undeveloped public rights of way into a mixed-use development composed of 500 to 1,240 dwelling units, 275,330 to 1,000,000 square feet (sf) of commercial and retail uses, 50,000 square feet of educational space, and 24.5 acres of open space.

The No Project Alternative would result in no additional development at the site (i.e. retain existing conditions), while the Reduced Development Alternative would result in a mixed-use development composed of 620 dwelling units, 75,000 sf of commercial and retail uses, and 26,750 sf of educational space. Since the No Project and Reduced Development alternatives represent a level of development that is much less than the Proposed Project, a brief qualitative assessment of these scenarios is provided.

---

[1] *Transportation Impact Study for India Basin*, prepared by Fehr & Peers for the San Francisco Planning Department, July 2017. Case Study 2014.002541ENV

The Code Compliant Alternative would result in a mixed-use development composed of 1,240 dwelling units, approximately 738,000 sf of commercial and retail uses, and approximately 54,000 sf of educational space. Since the total size of the Code Compliant Alternative is similar to the Proposed Project, a more in-depth analysis of the impacts of this alternative is provided.

INTRODUCTION

Land Use Comparison

Land use summaries for the Proposed Project, Project Variant, No Project Alternative, Reduced Development Alternative, and Code Compliant Alternative are presented in **Table 1**.

TABLE 1: PROPOSED PROJECT ALTERNATIVE LAND USE SUMMARY

Land Use	Proposed Project	Project Variant	No Project Alternative	Reduced Development Alternative	Code Compliant Alternative		
					Land Use Size	Change from Project	Change from Variant
Residential (dwelling units)	1,240	500	4	620	1,240	0	+740
Commercial/ Retail (sf)	275,330	1,000,000	18,162	75,000	738,501	+463,171	-261,499
Institutional/ Educational Space	50,000	50,000	0	26,750	53,499	+3,499	+3,499
Off-street Parking (spaces)	1,820	1,932	113	900	1,820	0	-112
Open Space (acres)	24.5	24.5	11.8	11.8	11.8	-12.7	-12.7

Source: Draft India Basin Notice of Preparation of an Environmental Impact Report and Public Scoping Meeting, April 30, 2015, modified June 2017.

Mitigation and Improvement Measure Comparison

Table summarizes the improvement measures and mitigation measures that would be applicable to the Proposed Project, Project Variant, and each Project alternative.

TABLE 2: APPLICABILITY OF MITIGATION AND IMPROVEMENT MEASURES

Measure	Description	Proposed Project	Project Variant	No Project Alternative	Reduced Development Alternative	Code Compliant Alternative
Mitigation Measure M-TR-1A	Implement Transit Capacity Improvements	X			X[1]	
Mitigation Measure M-TR-1B	Implement Transit Capacity Improvements		X			X
Mitigation Measure M-TR-2	School Site Loading	X	X		X	X
Cumulative Mitigation Measure C-M-TR-3	Implement Bus-Only Lanes	X	X		X[1]	X
Improvement Measure I-TR-1	Queue Abatement	X	X		X	X
Improvement Measure I-TR-2	Active Loading Management Plan	X	X		X	X
Improvement Measure I-TR-3	Construction Management	X	X		X	X
Improvement Measure I-TR-4B	Reconfigure Southbound Approach of Jennings Street/Evans Avenue		X			X
Cumulative Improvement Measure C-I-TR-5	Reconfigure Eastbound Approach of Jennings Street/Evans Avenue	X	X		X[1]	X

Notes:

1. These measures may not be required as this alternative is about half of the total size of the Proposed Project. However, the effect of this difference on the significance of impacts has not been analyzed quantitatively. Therefore, identification of these measures as being applicable is conservative.

Source: *Transportation Impact Study for India Basin*, prepared by Fehr & Peers for the San Francisco Planning Department, July 2017. Case Study 2014.002541ENV

NO PROJECT ALTERNATIVE

The No Project Alternative would involve no change to the existing transportation network and no construction of any new land uses. Therefore, the No Project Alternative would not cause any significant impacts to the transportation system as it represents a continuation of existing conditions.

REDUCED DEVELOPMENT ALTERNATIVE

The Reduced Development Alternative would have a total development size of about 45 percent of the Proposed Project (and about 50 percent of the Project Variant). Therefore, the Reduced Development Alternative would not result in any additional significant impacts that have not already been identified under the Proposed Project or Project Variant scenarios. This alternative could result in additional less-than-significant transportation impacts from those identified in the EIR, but the extent of this has not been analyzed quantitatively. It is likely that approximately 45 percent of the Proposed Project transit trip generation would still trigger a significant transit capacity impacts for the 44 O'Shaughnessy, as the Proposed Project does.

CODE COMPLIANT ALTERNATIVE

The Code Compliant Alternative would result in a larger overall development size than either the Proposed Project or Project Variant. Therefore, the remainder of this memo is focused on the impact analysis for the Code Compliant Alternative.

Analysis Methodology

The impact analysis methodology and assumptions for the Code Compliant Alternative are similar to the analysis of the Proposed Project. The Code Compliant Alternative has the same proposed transportation network as the Proposed Project and Project Variant. The Code Compliant Alternative would include 1,820 parking spaces, the same number included in the Proposed Project and 112 fewer spaces than included in the Project Variant. The alternative has a different land use program than the Proposed Project and Project Variant. Because the difference in land use results in a different trip generation, travel demand has been recalculated as part of this study.

Travel Demand

Travel demand for the Code Compliant Alternative was analyzed using similar methodologies and assumptions as was used for the Proposed Project in the TIS. The travel demand forecasting methodology is presented in more detail in a separate memorandum, titled "*Proposed Trip Generation, Distribution, and Mode Split Forecasts for the India Basin Project Transportation Study*" dated April 12, 2016, included in Appendix I of the TIS. The travel demand forecasts for the Code Compliant Alternative are provided in **Appendix A** of this memorandum. The forecasts are based on the methodology contained in the *SF Guidelines* and supplemented with information to account for the large scale and mixed-use qualities of the Proposed Project.

As shown in **Table 3**, the Code Compliant Alternative would generate significantly more weekday AM and PM peak hour person trips (26 to 30 percent) than the Proposed Project. Compared to the Project Variant, the Code Compliant Alternative is similar, but would generate one percent more person trips during the AM peak hour and two percent fewer PM peak hour person trips. Although the overall amount of development is more under the Code Compliant Alternative than the Project Variant, the mix of uses is different such that more trips remain internal to the site in the AM peak and less in the PM peak.

TABLE 3: PROJECT AND CODE COMPLIANT ALTERNATIVE EXTERNAL TRIP GENERATION							
Trip Type	**Proposed Project**	**Project Variant**	**Code Compliant Alternative**	**Change from Project**		**Change from Variant**	
Weekday AM Peak Hour							
Total Person Trips	3,860	5,075	5,095	+1,235	+32%	+20	+1%
Auto	*3,044 (79%)*	*4,018 (79%)*	*3,978 (78%)*	+934	+31%	-40	-1%
Transit	*237 (6%)*	*458 (9%)*	*452 (9%)*	+215	+91%	-6	-1%
Walk	*478 (12%)*	*461 (9%)*	*544 (11%)*	+66	+13%	+83	+18%
Bike	*101 (3%)*	*138 (3%)*	*121 (2%)*	+20	+20%	-17	-12%
Total Vehicle Trips	1,865	2,612	2,546	+681	+37%	-66	-3%
Weekday PM Peak Hour							
Total Person Trips	4,724	6,118	6,014	+1,290	+27%	-104	-2%
Auto	*3,372 (71%)*	*4,457 (73%)*	*4,425 (74%)*	+1,053	+31%	-32	-1%
Transit	*302 (6%)*	*517 (8%)*	*520 (9%)*	+218	+72%	+3	+1%
Walk	*947 (20%)*	*1,013 (17%)*	*940 (16%)*	-7	-1%	-73	-7%
Bike	*103 (2%)*	*131 (2%)*	*129 (2%)*	+26	+25%	-2	-2%
Total Vehicle Trips	1,969	2,734	2,705	+736	+37%	-29	-1%

Source: Fehr & Peers, 2017ource: Fehr & Peers, 2017

Impact Analysis

Vehicle Miles Traveled (VMT) Impacts

Given that the Project Site is located in a Traffic Analysis Zone (TAZ) where existing VMT is more than 15 percent below the existing regional average and that the Code Compliant Alternative (similar to the Proposed Project) would incorporate similar features to other development within the TAZ that influence the lower-than-average VMT, such as density, mix of uses, and transit accessibility, the Code Compliant Alternative's residential, office, and retail (and thus, restaurant, opens space, and school) uses would not result in substantial additional VMT and impacts would be ***less-than-significant*** and no mitigation is required.

Induced Travel Impact

The Code Compliant Alternative will have a similar effect on induced travel as the Proposed Project. Similar to the Proposed Project, the Code Compliant Alternative would include features that will slightly alter the transportation network (although these are identical to those included in the Proposed Project). These features would be sidewalk widening, on-street loading zones, curb cuts, and on-street safety strategies, left-turn lanes, and intersection signalization. These features fit within the general types of projects identified that would not substantially induce automobile travel as they do not create substantial increases in roadway capacity. While a lane addition such as a turn-pocket may induce automobile travel in some situations, in this location, the left-turn pockets are minor changes to the transportation network and are being installed to provide access to the site and would not increase vehicle speeds or reduce automobile delay; therefore it is assumed that they would not induce automobile travel. Therefore, induced travel impacts would similarly be ***less-than-significant*** for the Code Compliant Alternative.

Traffic Impacts

Traffic Hazard Impacts

The Code Compliant Alternative would result in similar increases to traffic congestion as the Project Variant along Evans Avenue, Hunters Point Boulevard, and Innes Avenue, as it would generate a similar number of peak hour vehicle trips, though slightly fewer than the Project Variant. While the alternative would increase the total number of trips within the vicinity of the Project Site, increased trips alone do not cause traffic hazards. The inclusion of signalization at the project intersections along Innes Avenue removes conflicts that would otherwise exist between the substantial number of project vehicles and the substantial number of people driving along Innes Avenue in a way that does not cause any new traffic hazards. Therefore the impact under this alternative would be ***less-than-significant***.

Intersection Improvement Measures Identified

A detailed traffic analysis was conducted for informational and site planning purposes for the Proposed Project. The traffic operations analysis identified a feasible improvement measure (Improvement Measure I-TR-4B) for the intersection of Evans Avenue and Jennings Street, which would operate at LOS F in the AM peak period under the Project Variant. Improvement Measure I-TR-4B would reconfigure the southbound approach of the intersection to include a 100-foot left turn pocket. Adding this turn pocket would require removal of approximately five parking spaces on the west side of the street. Improvement Measure I-TR-4B would also apply to the Code Compliant Alternative, since the alternative would generate a similar level of traffic to the Project Variant.

Transit Impacts

Transit Capacity Impacts

The Code Compliant Alternative would generate a similar number of transit trips compared to the Project Variant, with six fewer trips in the AM peak hour and three more trips in the PM peak hour. The additional transit trips in the PM peak hour would not be sufficient to cause an additional transit capacity impact to either the 19 Polk or 44 O'Shaughnessy bus routes. Therefore, the Code Compliant Alternative would cause similar ***significant*** transit capacity impacts as those identified for the Project Variant.

Mitigation Measures M-TR-1A and M-TR-1B require that the Project Sponsors either provide fair share funding to the SFMTA to implement temporary transit service improvements or, if for any reason the SFMTA determines that the provision of increased transit frequency is not feasible at the time of its implementation, implement temporary shuttle service to provide sufficient transit capacity to meet the needs of the Project. As the Code Compliant Alternative is similar in size to the Project Variant, Mitigation Measure M-TR-1B would also apply to the Code Compliant Alternative. Implementation of Mitigation Measure M-TR-1B would increase transit capacity adjacent to the Project Site and therefore the impacts to transit capacity would become ***less-than-significant with mitigation***.

Transit Delay Impacts

The Code Compliant Alternative would generate a similar number of vehicle trips to the Project Variant, which would cause similar increases to traffic congestion at nearby intersections along Evans Avenue, Hunters Point Boulevard, and Innes Avenue to the west of the Project Site. The Code Compliant Alternative would also generate a similar number of transit trips such that the increase in bus dwell time would be similar to the Project Variant. Since the Code Compliant Alternative would generate slightly fewer vehicle trips during the AM and PM peak hour and only three more transit trips in the PM peak hour, the combination of congestion delay plus the boarding/alighting delay would increase similar to the Project Variant. As with the Proposed Project, this increase in vehicle trips would not lead to an increase in round-trip travel time greater than half of each bus route's peak-hour headway. Therefore, the Code Compliant Alternative would have a ***less-than-significant*** impact on transit delay.

Bicycle Impacts

The bicycle network and facilities for the Code Compliant Alternative would be identical to those for the Proposed Project and Project Variant. The Code Compliant Alternative generates more bicycle trips than the Proposed Project because it has more commercial and retail space than the Proposed Project. The alternative generates slightly fewer bicycle trips than the Project Variant because it has less commercial and retail space. The Code Compliant Alternative would produce 20 more bicycle trips during the AM peak hour and 26 more trips during the PM peak hour compared to the Proposed Project, as shown in **Table 3**. The Code Compliant Alternative would produce 17 fewer bicycle trips during the AM peak hour and two fewer trips during the PM peak hour compared to the Project Variant.

The alternative would not increase bicycle traffic to a level that adversely affects bicycle facilities in the area, nor would the alternative create a new hazard or substantial conflict to bicycling. The alternative would not interfere with affect bicycle accessibility to the Project Site or adjoining areas. Thus, the Code Compliant Alternative's impact to bicycle facilities and circulation would be considered ***less-than-significant*** and no mitigation is required.

Pedestrian Impacts

Similar to the Proposed Project and Project Variant, pedestrian trips generated by the Code Compliant Alternative would include walk trips to and from the local and regional transit stops, as well as some walk trips to and from nearby complementary land uses.

The Code Compliant Alternative generates more pedestrian trips than the Proposed Project during the AM peak period because it has more commercial and retail space, which encourages more internalization of trips (e.g. residents walking to nearby offices and retail shops instead of commuting/shopping off-site). Compared to the Project Variant, the Code Compliant Variant has more residential units, which yields a higher level of internalization since more residents would live close to retail and commercial uses they may utilize by walking instead of going to destinations external to the site. The Code Compliant Alternative would produce 66 more pedestrian trips during the AM peak hour, but seven fewer trips during the PM peak hour compared to the Proposed Project, as shown in **Table 3**. The Code Compliant Alternative would produce 83 more pedestrian trips during the AM peak hour, but 73 fewer during the PM peak hour compared to the Project Variant.

As with the Proposed Project, the Code Compliant Alternative's pedestrian network would be adequate to accommodate expected pedestrian demand, would not create potentially hazardous conditions for pedestrians, nor otherwise interfere with pedestrian accessibility to the site and adjoining areas, and therefore would result in a ***less-than-significant*** pedestrian impact. However, since the Code Compliant alternative would have a similar site layout to the Proposed Project, with parking structures dispersed throughout the site, the effect of vehicle queuing across sidewalks would be minimized. Improvement Measure I-TR-1 requires that the Proposed Project (specifically the 700 Innes parcel) be subject to the Planning Department's vehicle queue abatement Conditions of Approval. Improvement Measure I-TR-1 would also apply to the Code Compliant Alternative to further reduce less-than-significant impacts related to potential conflicts between vehicle queues and pedestrians.

Loading Impacts

Truck Loading

The Code Compliant Alternative would have the same amount of curb space dedicated to off-street loading as the Proposed Project (20 spaces). The Code Compliant Alternative would have slightly higher peak loading demands compared to the Proposed Project (20 versus 16 spaces) and slightly lower peak loading demands compared to the Project Variant (20 versus 25 spaces),[2] which would be fully accommodated by the proposed loading supply and therefore result in a ***less-than-significant*** and no mitigation is required.

While loading supply would be sufficient to meet the anticipated loading demand, Improvement Measure I-TR-2 was identified for the Proposed Project. Improvement Measure I-TR-2 would require that the Project Sponsor develop an Active Loading Management Plan that would seek to avoid loading conflicts and incorporate actions to address potential ongoing loading issues. Improvement Measure I-TR-2 would also apply to the Code Compliant Alternative since it would have a similar number of loading spaces to the Proposed Project.

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[2] The delivery/service vehicle trips and loading demand is determined based on rates in SF Guidelines as well as truck count data collected for the existing Whole Foods supermarket in San Francisco (as SF Guidelines do not provide loading data for supermarkets).

School Loading

Similar to the Proposed Project, the Code Compliant Alternative would include a school. Due to the comparably short periods of heavy drop-off and pick-up at the school, it will have a much higher level of passenger loading activity during its peak than any other of the proposed uses. Because of this, and because the design of the school passenger loading zone is not finalized for the Code Compliant Alternative, the school site passenger loading impacts are **significant**.

Mitigation Measure M-TR-2 requires that the school provide and enforce a pick-up/drop-off plan to ensure the safety of pedestrians (subject to review and approval by the SFMTA). Mitigation Measure M-TR-2 would also apply to the Code Compliant Alternative and therefore the impacts would be ***less-than-significant with mitigation***.

Emergency Access Impacts

Emergency access to the project site for the Code Compliant Alternative would be the same to that of the Proposed Project and Project Variant. The Project Sponsor is working with the San Francisco Fire Department to finalize the design to meet emergency access requirements for the internal roadway network. The planned internal streets as well as the shared way along Spring Lane, Fairfax Lane, and Beach Lane would be designed to provide sufficient travel width for emergency vehicles.

While final roadway designs would need to be approved by the Fire Department prior to construction, all roadways have been designed to accommodate a standard fire truck. The streetscape changes off-site would maintain a sufficient right of way for emergency vehicles and therefore would not result in a significant impact to emergency vehicle access. Thus, the Code Compliant Alternative would have a ***less-than-significant*** impact to emergency access.

Construction Impacts

The Code Compliant Alternative would have similar construction impacts as the Proposed Project and Project Variant because it would involve construction of a similar number of buildings and parking structures. The construction duration, both for the overall project and individual buildings, may be up to 10 percent longer under this alternative compared to the Proposed Project and Project Variant given the increased level of overall square footage. However, construction of the Code Compliant Alternative would not result in significant impacts on the transportation and circulation network because any effects would be of limited duration and temporary. Therefore, construction-related work for the Code Compliant Alternative would have a ***less-than-significant*** impact on transportation and no mitigation measures would be required.

To help minimize construction-related impacts, Improvement Measure I-TR-3 recommends that the Project Sponsor for each parcel (700 Innes, 900 Innes, India Basin Shoreline Parking, and India Basin Open Space) prepare a Construction Traffic Control Plan. The plan would include a traffic control plan, measures to reduce single-occupant vehicle trips by construction workers, and regular construction updates to the surrounding residents and businesses. Improvement Measure I-TR-3 would also apply to the Code Compliant Alternative to further reduce less-than-significant impacts related to potential conflicts between construction activities and pedestrians, bicyclists, transit and vehicles, and between construction activities and nearby businesses and residents.

Parking Impacts

The midday peak parking demand would be 3,087 spaces for the Code Compliant Alternative. Parking demand outside of the midday peak period will be lower than during the midday peak, approximately 2,036 spaces. These levels are higher than the midday peak parking demand of 2,553 spaces for the Proposed Project, but lower than the 3,624 spaces for the Project Variant. The Code Compliant Alternative would provide 1,820 parking spaces, so there would be a deficit of up to 1,267 spaces during the midday peak period.

While the estimated demand would result in a parking deficit for the Code Compliant Alternative (similar to the Proposed Project and Project Variant), the alternative would implement similar TDM measures to encourage the use of transit, walking, bicycling, and other modes and discourage the use of single occupancy automobiles or automobiles in general. These measures were not specifically accounted for in the travel demand forecast process and would result in a substantial shift in mode share away from automobiles and a resulting decrease in demand for parking. As a result, the parking demand estimate is conservative as it does not reflect vehicle trip reductions resulting from Travel Demand Management (TDM). Additionally, the Project Site is well served by public transit and bicycle facilities, which would be further expanded by near-term enhancements to transit described in the Baseline scenario. These would serve to further provide alternative transportation choices to the automobile. Because of these anticipated transit enhancements, any unmet parking demand associated with the project would not be substantial. Therefore, as with the Proposed Project and Project Variant, the Code Compliant Alternative would have a ***less-than-significant*** parking impact.

Cumulative Impact Analysis

VMT Impacts

An SF-CHAMP model run for the 2040 Cumulative conditions was conducted to estimate VMT by private automobiles and taxis for different land use types for the Proposed Project and Variant. Cumulative average daily VMT per capita would be more than 15 percent below the Cumulative regional average daily VMT per capita for residential, office, and retail uses in TAZ 446 where the Proposed Project is located.

Given that the Code Compliant Alternative is similar to the Proposed Project (and Project Variant) and would incorporate similar features to other development within the TAZ that influence the lower-than-average VMT, such as density, mix of uses, and transit accessibility, the Code Compliant Alternative's residential, office, and retail (and thus, restaurant, opens space, and school) uses would not result in substantial additional VMT and impacts would be ***less-than-significant*** and no mitigation is required.

Induced Travel Impact

The Code Compliant Alternative will have a similar effect on induced travel as the Proposed Project. Similar to the Proposed Project, the Code Compliant Alternative would include features that will slightly alter the transportation network (although these are identical to those included in the Proposed Project). These features would be sidewalk widening, on-street loading zones, curb cuts, and on-street safety strategies and intersection signalization. These features fit within the general types of projects identified that would not substantially induce automobile travel as they do not create substantial increases in roadway capacity. While a lane addition such as a turn-pocket may induce automobile travel in some situations, in this location, the left-turn pockets are minor changes to the transportation network and are being installed to provide access to the site and would not increase vehicle speeds or reduce automobile delay; therefore it is assumed that they would not induce automobile travel. Therefore, cumulative impacts would similarly be ***less-than-significant*** for the Code Compliant Alternative.

Traffic Impacts

Traffic Hazard Impacts

The Code Compliant Alternative would result in similar increases to traffic congestion as the Project Variant along Evans Avenue, Hunters Point Boulevard, and Innes Avenue, as it would generate a similar number of (though slightly fewer) peak hour vehicle trips. Cumulative vehicle, pedestrian, and bicycle volumes on Innes Avenue and other streets near the Project Site would be substantial. The Code Compliant Alternative would generate around 2,500 to 2,600 vehicle trips in the AM and PM peak hours, respectively. This substantial increase in vehicle volumes, added to already substantial Cumulative volumes, would worsen vehicular delay, but vehicular delay alone does not create traffic hazards. The inclusion of signalization at the project intersections along Innes Avenue removes conflicts that would otherwise exist between the substantial number of project vehicles and the substantial number of people driving along Innes Avenue. Therefore, no traffic hazard would be caused. Therefore, impacts on cumulative conditions would be ***less-than-significant*** under the Code Compliant Alternative.

Intersection Improvement Measures

A detailed traffic analysis was conducted for informational and site planning purposes for the Project. The cumulative traffic operations analysis found that the Proposed Project and Project Variant would contribute 50 to 58 percent of the traffic growth at the intersection of Evans Avenue and Jennings Street. The analysis identified a recommended improvement measure for the intersection of Evans Avenue and Jennings Street. Improvement Measure C-I-TR-5 would reconfigure the eastbound approach of the intersection to include a 100-foot left turn pocket, one through lane, and one shared through/right turn lane. No additional right-of-way would be required for this reconfiguration. Improvement Measure C-I-TR-5 would also apply to the Code Compliant Alternative, since the alternative would generate a similar level of traffic to the Proposed Project and Project Variant.

Transit Impacts

Transit Capacity

Under cumulative conditions, the Code Compliant Alternative would result in similar significant cumulative impacts to those identified for the Project Variant to downtown Muni screenlines that operate above the 85 percent threshold and BART screenlines that operate above the 100 percent threshold without the Code Compliant Alternative in the AM and PM peak hours. However, since the Code Compliant Alternative would generate a similar number of transit trips to the Project Variant, it would contribute a negligible amount (i.e. less than one percent) of riders to these screenlines. Therefore, while the Code Compliant Alternative would have a ***significant cumulative impact,*** the contribution to this significant impact would ***not be considerable*** and therefore no mitigation is required. For the remaining downtown and regional screenlines, the Code Compliant Alternative would have a ***less-than-significant*** cumulative impact.

Transit Delay

Under cumulative conditions, the Code Compliant Alternative would result in similar significant cumulative transit delay impacts to those identified for the Project Variant, since it generates a similar number of vehicle and transit trips. The three additional transit trips in the PM peak would not be sufficient to cause an additional transit delay impact beyond what has been identified for the Project Variant. Cumulative Mitigation Measure C-M-TR-3 would require the Project Sponsors to fund the implementation of transit only lanes (one in each direction) along the Innes Avenue corridor to improve transit operations. Cumulative Mitigation Measure C-M-TR-3 would also apply to the Code Compliant Alternative. Implementation of Cumulative Mitigation Measure C-M-TR-3 would reduce the Code Compliant Alternative's contribution to cumulative impacts to transit delay to acceptable levels. However, since the SFMTA cannot commit to implementing these improvements, the cumulative transit delay impact is considered ***significant and unavoidable with mitigation***.

Bicycle Impacts

In the cumulative scenario, there would be high-quality bicycle facilities throughout the Project area and the amount of bicyclists would increase. The addition of the Code Compliant Alternative would contribute to bicycle volumes (131 new AM peak trips and 144 new PM peak trips, most similar to the Project Variant's contribution of 138 AM and 131 PM trips), but the additional bike trips would not increase bicycle traffic to a level that adversely affects bicycle facilities in the area, nor would the alternative create a new hazard or substantial conflict to bicycling. Similar to the Proposed Project, the Code Compliant Alternative would not adversely affect bicycle accessibility to the Project Site or adjoining areas. For these reasons, the Code Compliant Alternative, in combination with past, present and reasonably foreseeable development in San Francisco, would result in ***less-than-significant*** cumulative impacts on bicyclists. Given that the IBTAP would retain or improve bicycle circulation compared to the CPHPS Streetscape Cumulative scenario, the Code Compliant Alternative, in combination with past, present and reasonably foreseeable development in San Francisco, would result in ***less-than-significant*** cumulative impacts on bicyclists for the IBTAP scenarios.

Pedestrian Impacts

The Code Compliant Alternative would generate between 541 and 923 pedestrian trips during the AM and PM peak hours, which is generally lower than the Project Variant but higher than the Proposed Project. As with the Proposed Project, the Code Compliant Alternative's pedestrian network would be adequate to accommodate expected pedestrian demand, would not create potentially hazardous conditions for pedestrians, nor otherwise interfere with pedestrian accessibility to the site and adjoining areas. Therefore, the Code Compliant Alternative, in combination with past, present and reasonably foreseeable development in San Francisco, would result in ***less-than-significant*** cumulative impacts on pedestrians. Given that the IBTAP would retain or improve pedestrian circulation compared to the CPHPS Streetscape Cumulative Scenario, the Code Compliant Alternative, in combination with past, present and reasonably foreseeable development in San Francisco, would result in ***less-than-significant*** cumulative impacts on bicyclists for the IBTAP scenarios.

Loading Impacts

Loading impacts are by their nature localized and site-specific, and they would not contribute to impacts from other development projects near the Project Site. While this is not true every time a proposed project aims to meet loading demand in the public right-of-way in a densely developed area, it applies to the Code Compliant Alternative similar to the Proposed Project and Project Variant given the site conditions and conditions across the street (steep hillside without development). As with the Project Variant, the Code Compliant Alternative is expected to provide adequate loading facilities for the anticipated demand. In addition, there are some existing businesses along Innes Avenue that will be retained. These businesses currently load off-street or in on-street parking spaces, and this arrangement would be expected to continue upon construction of the Code Compliant Alternative. Therefore, the Code Compliant Alternative, in combination with past, present and reasonably foreseeable development in San Francisco, would result in ***less-than-significant*** cumulative loading impacts.

Emergency Access Impacts

While there would be a general increase in vehicle traffic that is expected through the future scenario, as with the Proposed Project (and Project Variant), the Code Compliant Alternative would not create potentially hazardous conditions for emergency vehicles, or otherwise interfere with emergency vehicle accessibility to the site and adjoining areas. For these reasons, the Code Compliant Alternative, in combination with past, present and reasonably foreseeable development in San Francisco, would have ***less-than-significant*** cumulative emergency access impacts.

Construction Impacts

The Code Compliant Alternative's contribution to the cumulative construction impact would not be cumulatively considerable as the construction would be of temporary duration. Under Improvement Measure I-TR-3, the Project Sponsors would coordinate with various City departments such as SFMTA and DPW through the Transportation Advisory Staff Committee (TASC) to develop coordinated plans that would address construction-related vehicle routing and pedestrian movements adjacent to the construction area for the duration of construction overlap. Therefore, for the above reasons, the Code Compliant Alternative, in combination with past, present and reasonably foreseeable development in San Francisco, would result in ***less-than-significant*** cumulative construction-related transportation impacts.

Parking Impacts

The parking conditions for the Cumulative scenario are the same as the Baseline scenario, with 218 on-street spaces in the area under consideration. The India Basin Transportation Action Plan (IBTAP) Scenario would reduce parking by 127 on-street spaces in the portion of the street network under consideration, compared with Cumulative conditions. While IBTAP Subvariant B would also remove a parking lane on Jennings Street between Cargo Way and Evans Avenue resulting in the loss of approximately 45 spaces, this is outside of the parking area under consideration. Both of these IBTAP scenarios would reduce the total parking spaces to 91 in the Cumulative condition.

As with the Proposed Project, the Code Compliant Alternative represents the only substantial new development in the area and its robust set of TDM measures is anticipated to reduce parking demand associated with new project residents and employees. Because existing parking demand would not be in excess of supply, the Code Compliant Alternative would not result in a substantial parking deficit with the proposed on-street and off-street parking supply. Therefore, cumulative impacts related to parking would be ***less-than-significant*** under the Cumulative Scenario. Even with the comparatively fewer on-street parking spaces, cumulative impacts related to parking would also be ***less-than-significant*** under the IBTAP scenarios.

ATTACHMENT A: TRAVEL DEMAND SPREADSHEETS

Report Table: Project Person Trip Generation

Land Use	Size	Trip Generation Rates				Person Trips Generated		
		Daily Trip Rate	AM Peak Hour as % of Daily	PM Peak Hour as % of Daily	AM Peak Hour as % of PM	Daily	AM Peak Hour	PM Peak Hour
Code-Compliant Alternative								
Residential	198 studio units	7.5 per unit	13.3%	17.3%	77%	1,485	198	257
	236 1-bedroom units	7.5 per unit	13.3%	17.3%	77%	1,770	235	306
	805 2+ bedroom units	10 per unit	13.3%	17.3%	77%	8,050	1,072	1,393
	Subtotal					**11,305**	**1,505**	**1,956**
Commercial	62,800 sf Clinical Use	43.3 per ksf	15.2%	14.5%	105%	2,719	413	394
	73,900 sf Administrative	36.4 per ksf	17.0%	16.2%	105%	2,690	456	436
	498,500 sf Office	18.1 per ksf	8.9%	8.5%	105%	9,023	803	767
	Subtotal					**14,432**	**1,672**	**1,597**
Retail	18,500 sf Restaurant	200 per ksf	1.5%	13.5%	11%	3,700	54	500
	14,800 sf Café	200 per ksf	14.8%	13.5%	110%	2,960	439	400
	18,500 sf Supermarket	297 per ksf	2.6%	7.3%	36%	5,495	144	401
	51,500 sf General Retail	150 per ksf	2.3%	9.0%	26%	7,725	180	695
	Subtotal					**19,880**	**817**	**1,996**
Educational	450 students	4.2 per student	50.0%	15.7%	318%	1,890	945	297
	95 staff	2.0 per staff	25.0%	25.0%	100%	190	48	48
	Subtotal					**2,080**	**993**	**345**
Open Space	19.05 acres	24.3 per acre	23.3%	25.9%	90%	**464**	**108**	**120**
Total		--		--	--	**48,161**	**5,095**	**6,014**

Using CPHPS Memo to Determine Mode Split for Transit Improvements Scenario
& Applying Differences in 2015 and 2040 CHAMP Models to Arrive at Mode Split For Baseline

	Mode	Central SoMa CHAMP Model Runs: SD-3 2015	SD-3 2040	TAZ 446 2015	TAZ 446 2040	MXD+ Methodology: Code-Compliant Alternative AM	PM	CPHPS Memo (2009): Aggregate	Work[1]	Non-work[1]
Mode split	Auto	58%	56%	63%	55%			*75%*	70%	83%
	Transit	14%	17%	12%	20%			*22%*	27%	15%
	Walk	17%	19%	8%	19%	*12%*	*16%*			
	Bike	2%	3%	3%	4%			*3%*	3%	3%
	Other	7%	5%	14%	2%					
				100.0%	100.0%					

Trips	Total Trips
	Walk Trips

	Mode	CPHPS - Transit Improvements: Work[2]	Non-Work[2]	Convert...: 2015 TAZ to 2040 TAZ	CPHPS - Existing/Baseline (post CHAMP adjustment): Work[2]	Non-Work[2]	CPHPS - Transit Improvements: Work[2]	Non-Work[2]	Convert...: 2015 TAZ to 2040 TAZ	CPHPS - Existing/Baseline (post CHAMP adjustment): Work[2]	Non-Work[2]
		Maximum Residential (AM Peak Hour)					**Maximum Residential (PM Peak Hour)**				
	Auto	59%	70%	-8%	67%	78%	55%	65%	-8%	63%	73%
	Transit	23%	12%	8%	15%	4%	22%	12%	8%	14%	4%
	Walk	15%	15%	11%	15%	15%	21%	21%	11%	21%	21%
	Bike	3%	3%	1%	3%	3%	2%	2%	1%	2%	2%
	Other			-12%					-12%		
		100.0%	100.0%		100.0%	100.0%	100.0%	100.0%		100.0%	100.0%
		Code-Compliant Alternative(AM Peak Hour)					**Code-Compliant Alternative (PM Peak Hour)**				
Mode split	Auto	61%	72%	-8%	69%	81%	58%	69%	-8%	67%	77%
	Transit	24%	13%	8%	16%	5%	23%	13%	8%	15%	5%
	Walk	12%	12%	11%	12%	12%	16%	16%	11%	16%	16%
	Bike	3%	3%	1%	3%	2%	3%	2%	1%	2%	2%
	Other			-12%					-12%		
		100.0%	100.0%		100.0%	100.0%	100.0%	100.0%		100.0%	100.0%

Notes:

1. See "Deriving Aggregated Work and Non-Work Mode Splits from CPHPS Memo" Appendix sheet for derivation of these aggregate figures
2. Walk mode split fixed = walk mode share for the Code-Compliant Alternative during AM and PM peak. This represents a fixed internalization rate.

<u>Trip Generation By Mode</u>

Retail Pass-by Rate 10%

CODE-COMPLIANT ALTERNATIVE

Land Use	Net New Land Use	Person Trip Generation: Work Trips	Person Trip Generation: Non-Work Trips	Person Trip Generation: *Total*	Mode Share Percentage[1]: Auto (Work)	Auto (Non-Work)	Transit (Work)	Transit (Non-Work)	Bike (Work)	Bike (Non-Work)	Walk (Work)	Walk (Non-Work)	Person Trip Generation (by Mode): Automobile	Transit	Bike	Walk	*Total*	Vehicle Trip Generation: In %[2]	Out %[2]	In	Out	*Total*[3]	Transit Trips: In %[4]	Out %[4]	In	Out	*Total*
AM PEAK HOUR																											
Open Space	399.6 ksf	0	*108*	*108*		83%		0%		13%		4%	90	0	14	5	*109*	56%	44%	48	38	*86*			0	0	*0*
School	53.4 ksf	48	945	*993*	100%	92%	0%	1%	0%	0%	0%	6%	915	14	5	59	*993*	72%	28%	427	167	*594*	100%	0%	14	0	*14*
Retail	103.3 ksf	33	784	*816*									657	44	17	98	*816*	65%	35%	227	121	*348*	66%	34%	29	15	*44*
R&D/Office	635.2 ksf	1388	284	*1672*	69%	81%	16%	5%	3%	2%	12%	12%	1188	236	47	201	*1672*	88%	12%	747	102	*849*	88%	12%	208	28	*236*
Residential	1,239 DU	*752*	*752*	*1504*									1128	158	38	181	*1505*	31%	69%	207	462	*669*	31%	69%	49	109	*158*
Total				***5094***									***3978***	***452***	***121***	***544***	***5095***	**65%**	**35%**	***1656***	***890***	***2546***	**66%**	**34%**	***300***	***152***	***452***
													78%	*9%*	*2%*	*11%*	*100%*			*65%*	*35%*				*66%*	*34%*	
																		Retail Pass-by Trips		*23*	*12*	*35*					
PM PEAK HOUR																											
Open Space	399.6 ksf	0	*120*	*120*		58%		0%		14%		28%	70	0	17	33	*120*	57%	43%	38	29	*67*			0	0	*0*
School	53.4 ksf	48	297	*345*	100%	92%	0%	1%	0%	0%	0%	6%	321	4	1	19	*345*	30%	70%	62	146	*208*	0%	100%	0	4	*4*
Retail	103.3 ksf	80	1916	*1995*									1529	108	40	319	*1996*	49%	51%	394	413	*807*	35%	65%	38	70	*108*
R&D/Office	635.2 ksf	1326	271	*1597*	67%	77%	15%	5%	2%	2%	16%	16%	1097	212	32	256	*1597*	10%	90%	75	711	*786*	2%	98%	5	207	*212*
Residential	1,239 DU	*978*	*978*	*1956*									1408	196	39	313	*1956*	64%	36%	537	300	*837*	82%	18%	160	36	*196*
Total	-	-	-	***6013***	-	-	-	-	-	-	-	-	***4425***	***520***	***129***	***940***	***6014***	**41%**	**59%**	***1106***	***1599***	***2705***	**39%**	**61%**	***203***	***317***	***520***
													74%	*9%*	*2%*	*16%*	*100%*			*41%*	*59%*				*39%*	*61%*	
																		Retail Pass-by Trips		*39*	*42*	*81*					

<u>Notes:</u>

1. Mode Share Percentages are taken from two sources:
   - For Open Space and School they are taken from observation data as documented in other appendices
   - For retail, office, and residential, they are taken from CP-HPS 2009 memo and are adjusted based on difference between 2015 and 2040 CHAMP model to reflect absence of transit improvements that CPHPS assumed. The walk mode split is fixed and is dervied using the MXD+ methodology, which considers the size and mix of land uses at the site, as well as local area factors
2. In/Out Rates are taken from two sources:
   - For Open Space and School they are taken from observation data as documented in other appendices
   - For retail, office, and residential, they are taken from SF Guidelines for PM (weighted by work/non-work percentages from CPHPS memo), and from ITE Trip Generation Handbook for AM
3. Vehicle Trip Generation Totals are taken from two sources:
   - For Open Space and School they are based off observation data (factoring in AVO and auto in/out percentages) as documented in other appendices
   - For retail, office, and residential, they are taken from a separate appendix spreadsheet, "Vehicle Trip Generation By Land Use Category", where SF-CHAMP trip distribution is combined with in/out splits (unique for each origin/destination) and AVOs from the SF Guidelines for each land use category.
4. Transit In/Out Rates are taken from two sources:
   - For Open Space and School they are taken from observation data as documented in other appendices
   - For retail, office, and residential, they are taken from SF Guidelines for PM by work/non-work (weighted by work/non-work transit percentages from SF CHAMP), and from ITE Trip Generation Handbook for AM
5. Retail Pass-By Rate
   - Taken from ITE for land use code 820 Shopping Center

Indicates numbers for Traffix

Trip Generation By Mode

Retail Pass-by Rate 10%

CODE-COMPLIANT ALTERNATIVE PLUS TRANSIT IMPROVEMENTS

		Person Trip Generation			Mode Share Percentage[1]								Person Trip Generation (by Mode)					Vehicle Trip Generation					Transit Trips				
Land Use	Net New Land Use	Work Trips	Non-Work Trips	Total	Auto (Work)	Auto (Non-Work)	Transit (Work)	Transit (Non-Work)	Bike (Work)	Bike (Non-Work)	Walk (Work)	Walk (Non-Work)	Automobile	Transit	Bike	Walk	*Total*	In %[2]	Out %[2]	In	Out	*Total*[3]	In %[4]	Out %[4]	In	Out	*Total*
AM PEAK HOUR																											
Open Space	399.6 ksf	0	108	*108*	0%	75%	0%	8%	0%	13%	0%	4%	81	9	14	5	*109*	56%	44%	43	34	*77*	50%	50%	5	5	*9*
School	53.4 ksf	48	945	*993*	92%	84%	8%	9%	0%	0%	0%	6%	836	93	5	59	*993*	72%	28%	390	153	*543*	100%	0%	93	0	*93*
Retail	103.3 ksf	33	784	*816*									584	110	24	98	*816*	65%	35%	201	108	*309*	65%	35%	72	38	*110*
R&D/Office	635.2 ksf	1388	284	*1672*	61%	72%	24%	13%	3%	3%	12%	12%	1051	370	50	201	*1672*	88%	12%	662	90	*752*	88%	12%	326	44	*370*
Residential	1,239 DU	752	752	*1504*									1000	278	45	181	*1504*	31%	69%	184	409	*593*	31%	69%	86	192	*278*
Total	-	-	-	***5094***									***3552***	***860***	***138***	***544***	***5094***	**65%**	**35%**	***1480***	***794***	***2274***	**68%**	**32%**	***582***	***279***	***860***
													70%	*17%*	*3%*	*11%*	*100%*			*65%*	*35%*				*68%*	*32%*	
																	Retail Pass-by Trips		*20*	*11*	*31*						
PM PEAK HOUR																											
Open Space	399.6 ksf	0	120	*120*	0%	50%	0%	8%	0%	14%	0%	28%	60	10	17	33	*120*	57%	43%	33	25	*58*	50%	50%	5	5	*10*
School	53.4 ksf	48	297	*345*	92%	84%	8%	9%	0%	0%	0%	6%	293	32	1	19	*345*	30%	70%	57	133	*190*	0%	100%	0	32	*32*
Retail	103.3 ksf	80	1916	*1995*									1368	267	41	319	*1995*	49%	51%	354	369	*723*	43%	57%	115	152	*267*
R&D/Office	635.2 ksf	1326	271	*1597*	58%	69%	23%	13%	3%	2%	16%	16%	956	340	45	256	*1597*	10%	90%	68	615	*683*	5%	95%	16	324	*340*
Residential	1,239 DU	978	978	*1956*									1242	352	49	313	*1956*	65%	35%	475	260	*735*	75%	25%	264	88	*352*
Total	-	-	-	***6013***									***3919***	***1001***	***153***	***940***	***6013***	**41%**	**59%**	***987***	***1402***	***2389***	**40%**	**60%**	***400***	***601***	***1001***
													65%	*17%*	*3%*	*16%*	*100%*			*41%*	*59%*				*40%*	*60%*	
																	Retail Pass-by Trips		*35*	*37*	*72*						

	Auto (Work)	Auto (Non-Work)	Transit (Work)	Transit (Non-Work)	Bike (Work)	Bike (Non-Work)	Walk (Work)	Walk (Non-Work)
Open Space Mode Share Adjustment		-8%		8%		0%		0%
School Mode Share Adjustment	-8%	-8%	8%	8%	0%	0%	0%	0%

Notes:

1. Mode Share Percentages are all adjusted using the same source:
   - For school and open space they are taken from CP-HPS 2009 memo, with all non-walk modes adjusted based on difference between 2015 and 2040 CHAMP model to reflect absence of transit improvements that CPHPS assumed.
   - For retail, office, and residential, they are taken from CP-HPS 2009 memo and are adjusted based on difference between 2015 and 2040 CHAMP model to reflect absence of transit improvements that CPHPS assumed. The walk mode split is fixed and is dervied using the MXD+ methodology, which considers the size and mix of land uses at the site, as well as local area factors
2. In/Out Rates are taken from two sources:
   - For Open Space and School they are taken from observation data as documented in other appendices
   - For retail, office, and residential, they are taken from SF Guidelines for PM (weighted by work/non-work percentages from CPHPS memo), and from ITE Trip Generation Handbook for AM
3. Vehicle Trip Generation Totals are taken from two sources:
   - For Open Space and School they are based off observation data (factoring in AVO and auto in/out percentages) as documented in other appendices
   - For retail, office, and residential, they are taken from a separate appendix spreadsheet, "Vehicle Trip Generation By Land Use Category", where SF-CHAMP trip distribution is combined with in/out splits (unique for each origin/destination) and AVOs from the SF Guidelines for each land use category.
4. Transit In/Out Rates are taken from two sources:
   - For Open Space and School they are taken from observation data as documented in other appendices
   - For retail, office, and residential, they are taken from SF Guidelines for PM by work/non-work (weighted by work/non-work transit percentages from SF CHAMP), and from ITE Trip Generation Handbook for AM
5. Retail Pass-By Rate
   - Taken from ITE for land use code 820 Shopping Center

Vehicle Trip Generation By Land Use Category

Proposed Project - AM Peak Hour - Residential

Total Automobile Trips	1091
Auto Work Trips (All)	504
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	587

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	100.8	0.0	41.1	1.3	1.76	2.03	78	0	20
SD-2	11%	6%	55.4	0.0	35.2	1.26	1.52	1.97	44	0	18
SD-3	29%	44%	146.2	0.0	258.3	1.25	2.04	2.43	117	0	106
SD-4	4%	3%	20.2	0.0	17.6	1.48	1.78	2.51	14	0	7
East Bay	12%	6%	60.5	0.0	35.2	1.61	1.77	2.59	38	0	14
North Bay	2%	1%	10.1	0.0	5.9	1.44	1.44	2.11	7	0	3
South Bay	22%	33%	110.9	0.0	193.7	1.13	1.98	2.28	98	0	85
									395	**0**	**253**

648 Total Vehicle Trips

Proposed Project - PM Peak Hour - Residential

Total Automobile Trips	1330
Auto Work Trips (All)	616
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	714

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	123.2	0.0	50.0	1.3	1.76	2.03	95	0	25
SD-2	11%	6%	67.8	0.0	42.8	1.26	1.52	1.97	54	0	22
SD-3	29%	44%	178.6	0.0	314.2	1.25	2.04	2.43	143	0	129
SD-4	4%	3%	24.6	0.0	21.4	1.48	1.78	2.51	17	0	9
East Bay	12%	6%	73.9	0.0	42.8	1.61	1.77	2.59	46	0	17
North Bay	2%	1%	12.3	0.0	7.1	1.44	1.44	2.11	9	0	3
South Bay	22%	33%	135.5	0.0	235.6	1.13	1.98	2.28	120	0	103
									483	**0**	**307**

790 Total Vehicle Trips

Max Commercial Variant - AM Peak Hour - Residential

Total Automobile Trips	1128
Auto Work Trips (All)	519
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	609

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	103.8	0.0	42.6	1.3	1.76	2.03	80	0	21
SD-2	11%	6%	57.1	0.0	36.5	1.26	1.52	1.97	45	0	19
SD-3	29%	44%	150.5	0.0	268.0	1.25	2.04	2.43	120	0	110
SD-4	4%	3%	20.8	0.0	18.3	1.48	1.78	2.51	14	0	7
East Bay	12%	6%	62.3	0.0	36.5	1.61	1.77	2.59	39	0	14
North Bay	2%	1%	10.4	0.0	6.1	1.44	1.44	2.11	7	0	3
South Bay	22%	33%	114.2	0.0	201.0	1.13	1.98	2.28	101	0	88
									407	**0**	**262**

669 Total Vehicle Trips

Max Commercial Variant - PM Peak Hour - Residential

Total Automobile Trips	1408
Auto Work Trips (All)	655
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	753

Trip Distribution (SF-CHAMP)			Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	131.0	0.0	52.7	1.3	1.76	2.03	101	0	26
SD-2	11%	6%	72.1	0.0	45.2	1.26	1.52	1.97	57	0	23
SD-3	29%	44%	190.0	0.0	331.3	1.25	2.04	2.43	152	0	136
SD-4	4%	3%	26.2	0.0	22.6	1.48	1.78	2.51	18	0	9
East Bay	12%	6%	78.6	0.0	45.2	1.61	1.77	2.59	49	0	17
North Bay	2%	1%	13.1	0.0	7.5	1.44	1.44	2.11	9	0	4
South Bay	22%	33%	144.1	0.0	248.5	1.13	1.98	2.28	128	0	109
									513	**0**	**324**

837 Total Vehicle Trips

Vehicle Trip Generation By Land Use Category

Proposed Project Plus Transit - AM Peak Hour - Residential

Total Automobile Trips	970
Auto Work Trips (All)	444
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	527

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	88.8	0.0	36.9	1.3	1.76	2.03	68	0	18	
SD-2	11%	6%	48.8	0.0	31.6	1.26	1.52	1.97	39	0	16	
SD-3	29%	44%	128.8	0.0	231.9	1.25	2.04	2.43	103	0	95	
SD-4	4%	3%	17.8	0.0	15.8	1.48	1.78	2.51	12	0	6	
East Bay	12%	6%	53.3	0.0	31.6	1.61	1.77	2.59	33	0	12	
North Bay	2%	1%	8.9	0.0	5.3	1.44	1.44	2.11	6	0	2	
South Bay	22%	33%	97.7	0.0	173.9	1.13	1.98	2.28	86	0	76	
									348	**0**	**227**	**575** **Total Vehicle Trips**

Proposed Project Plus Transit - PM Peak Hour - Residential

Total Automobile Trips	1173
Auto Work Trips (All)	538
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	636

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	107.6	0.0	44.5	1.3	1.76	2.03	83	0	22	
SD-2	11%	6%	59.2	0.0	38.2	1.26	1.52	1.97	47	0	19	
SD-3	29%	44%	156.0	0.0	279.8	1.25	2.04	2.43	125	0	115	
SD-4	4%	3%	21.5	0.0	19.1	1.48	1.78	2.51	15	0	8	
East Bay	12%	6%	64.6	0.0	38.2	1.61	1.77	2.59	40	0	15	
North Bay	2%	1%	10.8	0.0	6.4	1.44	1.44	2.11	7	0	3	
South Bay	22%	33%	118.4	0.0	209.9	1.13	1.98	2.28	105	0	92	
									421	**0**	**274**	**695** **Total Vehicle Trips**

Max Commercial Variant Plus Transit - AM Peak Hour - Residential

Total Automobile Trips	1000
Auto Work Trips (All)	459
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	542

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	91.8	0.0	37.9	1.3	1.76	2.03	71	0	19	
SD-2	11%	6%	50.5	0.0	32.5	1.26	1.52	1.97	40	0	17	
SD-3	29%	44%	133.1	0.0	238.5	1.25	2.04	2.43	106	0	98	
SD-4	4%	3%	18.4	0.0	16.3	1.48	1.78	2.51	12	0	6	
East Bay	12%	6%	55.1	0.0	32.5	1.61	1.77	2.59	34	0	13	
North Bay	2%	1%	9.2	0.0	5.4	1.44	1.44	2.11	6	0	3	
South Bay	22%	33%	101.0	0.0	178.9	1.13	1.98	2.28	89	0	78	
									360	**0**	**233**	**593** **Total Vehicle Trips**

Max Commercial Variant Plus Transit - PM Peak Hour - Residential

Total Automobile Trips	1242
Auto Work Trips (All)	567
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	675

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	113.4	0.0	47.3	1.3	1.76	2.03	87	0	23	
SD-2	11%	6%	62.4	0.0	40.5	1.26	1.52	1.97	50	0	21	
SD-3	29%	44%	164.4	0.0	297.0	1.25	2.04	2.43	132	0	122	
SD-4	4%	3%	22.7	0.0	20.3	1.48	1.78	2.51	15	0	8	
East Bay	12%	6%	68.0	0.0	40.5	1.61	1.77	2.59	42	0	16	
North Bay	2%	1%	11.3	0.0	6.8	1.44	1.44	2.11	8	0	3	
South Bay	22%	33%	124.7	0.0	222.8	1.13	1.98	2.28	110	0	98	
									444	**0**	**291**	**735** **Total Vehicle Trips**

Vehicle Trip Generation By Land Use Category

Proposed Project - AM Peak Hour - Retail

Total Automobile Trips	754
Auto Work Trips (All)	26
Auto Non-Work: Retail Trips	728
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	5.2	51.0	0.0	1.3	1.76	2.03	4	29	0	
SD-2	11%	6%	2.9	43.7	0.0	1.26	1.52	1.97	2	29	0	
SD-3	29%	44%	7.5	320.3	0.0	1.25	2.04	2.43	6	157	0	
SD-4	4%	3%	1.0	21.8	0.0	1.48	1.78	2.51	1	12	0	
East Bay	12%	6%	3.1	43.7	0.0	1.61	1.77	2.59	2	25	0	
North Bay	2%	1%	0.5	7.3	0.0	1.44	1.44	2.11	0	5	0	
South Bay	22%	33%	5.7	240.2	0.0	1.13	1.98	2.28	5	121	0	
									20	**378**	**0**	**398 Total Vehicle Trips**

Proposed Project - PM Peak Hour - Retail

Total Automobile Trips	1476
Auto Work Trips (All)	51
Auto Non-Work: Retail Trips	1424
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	10.2	99.7	0.0	1.3	1.76	2.03	8	57	0	
SD-2	11%	6%	5.6	85.4	0.0	1.26	1.52	1.97	4	56	0	
SD-3	29%	44%	14.8	626.6	0.0	1.25	2.04	2.43	12	307	0	
SD-4	4%	3%	2.0	42.7	0.0	1.48	1.78	2.51	1	24	0	
East Bay	12%	6%	6.1	85.4	0.0	1.61	1.77	2.59	4	48	0	
North Bay	2%	1%	1.0	14.2	0.0	1.44	1.44	2.11	1	10	0	
South Bay	22%	33%	11.2	469.9	0.0	1.13	1.98	2.28	10	237	0	
									40	**739**	**0**	**779 Total Vehicle Trips**

Maximum Commercial Variant - AM Peak Hour - Retail

Total Automobile Trips	657
Auto Work Trips (All)	23
Auto Non-Work: Retail Trips	635
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	4.6	44.5	0.0	1.3	1.76	2.03	4	25	0	
SD-2	11%	6%	2.5	38.1	0.0	1.26	1.52	1.97	2	25	0	
SD-3	29%	44%	6.7	279.4	0.0	1.25	2.04	2.43	5	137	0	
SD-4	4%	3%	0.9	19.1	0.0	1.48	1.78	2.51	1	11	0	
East Bay	12%	6%	2.8	38.1	0.0	1.61	1.77	2.59	2	22	0	
North Bay	2%	1%	0.5	6.4	0.0	1.44	1.44	2.11	0	4	0	
South Bay	22%	33%	5.1	209.6	0.0	1.13	1.98	2.28	4	106	0	
									18	**330**	**0**	**348 Total Vehicle Trips**

Maximum Commercial Variant - PM Peak Hour - Retail

Total Automobile Trips	1529
Auto Work Trips (All)	53
Auto Non-Work: Retail Trips	1475
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	10.6	103.3	0.0	1.3	1.76	2.03	8	59	0	
SD-2	11%	6%	5.8	88.5	0.0	1.26	1.52	1.97	5	58	0	
SD-3	29%	44%	15.4	649.0	0.0	1.25	2.04	2.43	12	318	0	
SD-4	4%	3%	2.1	44.3	0.0	1.48	1.78	2.51	1	25	0	
East Bay	12%	6%	6.4	88.5	0.0	1.61	1.77	2.59	4	50	0	
North Bay	2%	1%	1.1	14.8	0.0	1.44	1.44	2.11	1	10	0	
South Bay	22%	33%	11.7	486.8	0.0	1.13	1.98	2.28	10	246	0	
									42	**766**	**0**	**807 Total Vehicle Trips**

Vehicle Trip Generation By Land Use Category

Proposed Project Plus Transit- AM Peak Hour - Retail

Total Automobile Trips	676
Auto Work Trips (All)	23
Auto Non-Work: Retail Trips	653
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	4.6	45.7	0.0	1.3	1.76	2.03	4	26	0	
SD-2	11%	6%	2.5	39.2	0.0	1.26	1.52	1.97	2	26	0	
SD-3	29%	44%	6.7	287.3	0.0	1.25	2.04	2.43	5	141	0	
SD-4	4%	3%	0.9	19.6	0.0	1.48	1.78	2.51	1	11	0	
East Bay	12%	6%	2.8	39.2	0.0	1.61	1.77	2.59	2	22	0	
North Bay	2%	1%	0.5	6.5	0.0	1.44	1.44	2.11	0	5	0	
South Bay	22%	33%	5.1	215.5	0.0	1.13	1.98	2.28	4	109	0	
									18	**339**	**0**	**357 Total Vehicle Trips**

Proposed Project Plus Transit - PM Peak Hour - Retail

Total Automobile Trips	1313
Auto Work Trips (All)	45
Auto Non-Work: Retail Trips	1268
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	9.0	88.8	0.0	1.3	1.76	2.03	7	50	0	
SD-2	11%	6%	5.0	76.1	0.0	1.26	1.52	1.97	4	50	0	
SD-3	29%	44%	13.1	557.9	0.0	1.25	2.04	2.43	10	273	0	
SD-4	4%	3%	1.8	38.0	0.0	1.48	1.78	2.51	1	21	0	
East Bay	12%	6%	5.4	76.1	0.0	1.61	1.77	2.59	3	43	0	
North Bay	2%	1%	0.9	12.7	0.0	1.44	1.44	2.11	1	9	0	
South Bay	22%	33%	9.9	418.4	0.0	1.13	1.98	2.28	9	211	0	
									35	**658**	**0**	**694 Total Vehicle Trips**

Maximum Commercial Variant Plus Transit - AM Peak Hour - Retail

Total Automobile Trips	584
Auto Work Trips (All)	20
Auto Non-Work: Retail Trips	564
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	4.0	39.5	0.0	1.3	1.76	2.03	3	22	0	
SD-2	11%	6%	2.2	33.8	0.0	1.26	1.52	1.97	2	22	0	
SD-3	29%	44%	5.8	248.2	0.0	1.25	2.04	2.43	5	122	0	
SD-4	4%	3%	0.8	16.9	0.0	1.48	1.78	2.51	1	10	0	
East Bay	12%	6%	2.4	33.8	0.0	1.61	1.77	2.59	1	19	0	
North Bay	2%	1%	0.4	5.6	0.0	1.44	1.44	2.11	0	4	0	
South Bay	22%	33%	4.4	186.1	0.0	1.13	1.98	2.28	4	94	0	
									16	**293**	**0**	**309 Total Vehicle Trips**

Maximum Commercial Variant Plus Transit - PM Peak Hour - Retail

Total Automobile Trips	1368
Auto Work Trips (All)	46
Auto Non-Work: Retail Trips	1322
Auto Non-Work:Other Trips	0

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips			
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	
SD-1	20%	7%	9.2	92.5	0.0	1.3	1.76	2.03	7	53	0	
SD-2	11%	6%	5.1	79.3	0.0	1.26	1.52	1.97	4	52	0	
SD-3	29%	44%	13.3	581.7	0.0	1.25	2.04	2.43	11	285	0	
SD-4	4%	3%	1.8	39.7	0.0	1.48	1.78	2.51	1	22	0	
East Bay	12%	6%	5.5	79.3	0.0	1.61	1.77	2.59	3	45	0	
North Bay	2%	1%	0.9	13.2	0.0	1.44	1.44	2.11	1	9	0	
South Bay	22%	33%	10.1	436.3	0.0	1.13	1.98	2.28	9	220	0	
									36	**687**	**0**	**723 Total Vehicle Trips**

Vehicle Trip Generation By Land Use Category

Proposed Project - AM Peak Hour - Office

Total Automobile Trips	194
Auto Work Trips (All)	157
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	37

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips				
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other		
SD-1	20%	7%	31.4	0.0	2.6	1.3	1.76	2.03	24	0	1		
SD-2	11%	6%	17.3	0.0	2.2	1.26	1.52	1.97	14	0	1		
SD-3	29%	44%	45.5	0.0	16.3	1.25	2.04	2.43	36	0	7		
SD-4	4%	3%	6.3	0.0	1.1	1.48	1.78	2.51	4	0	0		
East Bay	12%	6%	18.8	0.0	2.2	1.61	1.77	2.59	12	0	1		
North Bay	2%	1%	3.1	0.0	0.4	1.44	1.44	2.11	2	0	0		
South Bay	22%	33%	34.5	0.0	12.2	1.13	1.98	2.28	31	0	5		
									123	**0**	**16**	**139**	**Total Vehicle Trips**

Proposed Project - PM Peak Hour - Office

Total Automobile Trips	175
Auto Work Trips (All)	141
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	33

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips				
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other		
SD-1	20%	7%	28.2	0.0	2.3	1.3	1.76	2.03	22	0	1		
SD-2	11%	6%	15.5	0.0	2.0	1.26	1.52	1.97	12	0	1		
SD-3	29%	44%	40.9	0.0	14.5	1.25	2.04	2.43	33	0	6		
SD-4	4%	3%	5.6	0.0	1.0	1.48	1.78	2.51	4	0	0		
East Bay	12%	6%	16.9	0.0	2.0	1.61	1.77	2.59	11	0	1		
North Bay	2%	1%	2.8	0.0	0.3	1.44	1.44	2.11	2	0	0		
South Bay	22%	33%	31.0	0.0	10.9	1.13	1.98	2.28	27	0	5		
									110	**0**	**14**	**125**	**Total Vehicle Trips**

Maximum Commercial Variant - AM Peak Hour - Office/R&D

Total Automobile Trips	1188
Auto Work Trips (All)	958
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	230

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips				
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other		
SD-1	20%	7%	191.6	0.0	16.1	1.3	1.76	2.03	147	0	8		
SD-2	11%	6%	105.4	0.0	13.8	1.26	1.52	1.97	84	0	7		
SD-3	29%	44%	277.8	0.0	101.2	1.25	2.04	2.43	222	0	42		
SD-4	4%	3%	38.3	0.0	6.9	1.48	1.78	2.51	26	0	3		
East Bay	12%	6%	115.0	0.0	13.8	1.61	1.77	2.59	71	0	5		
North Bay	2%	1%	19.2	0.0	2.3	1.44	1.44	2.11	13	0	1		
South Bay	22%	33%	210.8	0.0	75.9	1.13	1.98	2.28	187	0	33		
									750	**0**	**99**	**849**	**Total Vehicle Trips**

Maximum Commercial Variant - PM Peak Hour - Office/R&D

Total Automobile Trips	1097
Auto Work Trips (All)	888
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	209

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips				
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other		
SD-1	20%	7%	177.6	0.0	14.6	1.3	1.76	2.03	137	0	7		
SD-2	11%	6%	97.7	0.0	12.5	1.26	1.52	1.97	78	0	6		
SD-3	29%	44%	257.5	0.0	92.0	1.25	2.04	2.43	206	0	38		
SD-4	4%	3%	35.5	0.0	6.3	1.48	1.78	2.51	24	0	2		
East Bay	12%	6%	106.6	0.0	12.5	1.61	1.77	2.59	66	0	5		
North Bay	2%	1%	17.8	0.0	2.1	1.44	1.44	2.11	12	0	1		
South Bay	22%	33%	195.4	0.0	69.0	1.13	1.98	2.28	173	0	30		
									696	**0**	**90**	**786**	**Total Vehicle Trips**

Vehicle Trip Generation By Land Use Category

Proposed Project Plus Transit - AM Peak Hour - Office

Total Automobile Trips	172
Auto Work Trips (All)	138
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	34

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	27.6	0.0	2.4	1.3	1.76	2.03	21	0	1
SD-2	11%	6%	15.2	0.0	2.0	1.26	1.52	1.97	12	0	1
SD-3	29%	44%	40.0	0.0	15.0	1.25	2.04	2.43	32	0	6
SD-4	4%	3%	5.5	0.0	1.0	1.48	1.78	2.51	4	0	0
East Bay	12%	6%	16.6	0.0	2.0	1.61	1.77	2.59	10	0	1
North Bay	2%	1%	2.8	0.0	0.3	1.44	1.44	2.11	2	0	0
South Bay	22%	33%	30.4	0.0	11.2	1.13	1.98	2.28	27	0	5
									108	**0**	**15**

123 Total Vehicle Trips

Proposed Project Plus Transit - PM Peak Hour - Office

Total Automobile Trips	153
Auto Work Trips (All)	123
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	29

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	24.6	0.0	2.0	1.3	1.76	2.03	19	0	1
SD-2	11%	6%	13.5	0.0	1.7	1.26	1.52	1.97	11	0	1
SD-3	29%	44%	35.7	0.0	12.8	1.25	2.04	2.43	29	0	5
SD-4	4%	3%	4.9	0.0	0.9	1.48	1.78	2.51	3	0	0
East Bay	12%	6%	14.8	0.0	1.7	1.61	1.77	2.59	9	0	1
North Bay	2%	1%	2.5	0.0	0.3	1.44	1.44	2.11	2	0	0
South Bay	22%	33%	27.1	0.0	9.6	1.13	1.98	2.28	24	0	4
									96	**0**	**12**

109 Total Vehicle Trips

Maximum Commercial Variant Plus Transit - AM Peak Hour - Office/R&D

Total Automobile Trips	1051
Auto Work Trips (All)	847
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	205

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	169.4	0.0	14.4	1.3	1.76	2.03	130	0	7
SD-2	11%	6%	93.2	0.0	12.3	1.26	1.52	1.97	74	0	6
SD-3	29%	44%	245.6	0.0	90.2	1.25	2.04	2.43	197	0	37
SD-4	4%	3%	33.9	0.0	6.2	1.48	1.78	2.51	23	0	2
East Bay	12%	6%	101.6	0.0	12.3	1.61	1.77	2.59	63	0	5
North Bay	2%	1%	16.9	0.0	2.1	1.44	1.44	2.11	12	0	1
South Bay	22%	33%	186.3	0.0	67.7	1.13	1.98	2.28	165	0	30
									663	**0**	**88**

752 Total Vehicle Trips

Maximum Commercial Variant Plus Transit - PM Peak Hour - Office/R&D

Total Automobile Trips	956
Auto Work Trips (All)	769
Auto Non-Work: Retail Trips	0
Auto Non-Work:Other Trips	187

	Trip Distribution (SF-CHAMP)		Auto Person Trip Distribution			Persons Per Auto (SF Guidelines)			Vehicle Trips		
Zone	Work	Non-Work	Auto Work	Auto Non-work:Retail	Auto Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other	Work Trips	Non-work: Retail	Non-work: Other
SD-1	20%	7%	153.8	0.0	13.1	1.3	1.76	2.03	118	0	6
SD-2	11%	6%	84.6	0.0	11.2	1.26	1.52	1.97	67	0	6
SD-3	29%	44%	223.0	0.0	82.3	1.25	2.04	2.43	178	0	34
SD-4	4%	3%	30.8	0.0	5.6	1.48	1.78	2.51	21	0	2
East Bay	12%	6%	92.3	0.0	11.2	1.61	1.77	2.59	57	0	4
North Bay	2%	1%	15.4	0.0	1.9	1.44	1.44	2.11	11	0	1
South Bay	22%	33%	169.2	0.0	61.7	1.13	1.98	2.28	150	0	27
									602	**0**	**81**

683 Total Vehicle Trips