APPENDIX A

Freeway and Ramp Analysis

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MEMORANDUM

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Project #: 148190

To: Andrew Thomas/Virendra Patel
City of Alameda

From: Amy López / Pratyush Bhatia / Alice Chen
Project: Alameda Point EIR
Subject: Freeways and Ramps Analysis – Impacts and Mitigations

INTRODUCTION

This memo documents our analysis of freeway segments and ramp merge/diverge areas that would potentially be impacted by the changes in traffic due to the Alameda Point project. This information will be used to support the Alameda Point EIR.

STUDY LOCATIONS

Per our scope of work and in response to Caltrans requirements, the impacts were assessed for up to 6 freeway mainline locations and up to 10 freeway ramps that would be affected by the change in volumes due to the Alameda Point project. To determine which locations would be studied, a preliminary list of locations was proposed based on the proximity to the project and then refined based on a review of volume difference plots from the travel demand model.

Existing Conditions

The changes in traffic volumes on the freeway mainline and ramps under existing conditions are shown in Tables 1 and 2. While all of these locations have been carried forth for analysis for this memo, only those freeway mainline locations where the change in volumes due to the project represent a measureable change (more than 2 to 3 percent of total volumes) that is beyond normal daily fluctuations in volumes may be presented in the EIR.

Table 1: Change in Total Volume on Mainline Due to Project, Existing Conditions

			AM PEAK				PM PEAK			
FWY	DIR	SEGMENT	Total Volume w/o Project	Total Volume w/ Project	Volume Change	Percent Change	Total Volume w/o Project	Total Volume w/ Project	Volume Change	Change
580	EB	w/o 980	6,708	6,780	72	1.1%	10,074	10,056	-18	-0.2%
580	WB	w/o 980	14,214	14,208	-6	0.0%	8,160	8,244	84	1.0%
880	NB	e/o 980	7,605	7,565	-40	-0.5%	7,970	7,940	-30	-0.4%
880	SB	e/o 980	4,515	4,490	-25	-0.6%	4,830	4,840	10	0.2%
880	NB	w/o Adeline	7,360	7,384	24	0.3%	7,868	7,908	40	0.5%
880	SB	w/o Adeline	5,076	5,160	84	1.7%	5,348	5,360	12	0.2%
880	NB	e/o High	7,585	7,585	0	0.0%	8,015	7,980	-35	-0.4%
880	SB	e/o High	7,475	7,465	-10	-0.1%	7,780	7,745	-35	-0.4%
880	NB	w/o 23rd	10,048	10,080	32	0.3%	9,212	9,208	-4	0.0%
880	SB	w/o 23rd	8,396	8,376	-20	-0.2%	7,968	8,004	36	0.5%
980	EB	s/o 580	3,655	3,675	20	0.5%	6,630	6,850	220	3.3%
980	WB	s/o 580	8,050	8,290	240	3.0%	4,725	4,765	40	0.8%

Table 2: Total Volume Change Due to Project in Ramp Merge/Diverge Areas, Existing Conditions

FWY	DIR	RAMP	AM	PM
880	SB	5th St. off (to Broadway)	99	24
880	NB	Broadway off	38	17
880	NB	Jackson St. on	31	33
880	NB	High St. off	3	11
880	SB	High St. on	-3	2
880	SB	Jackson St. off	19	2
880	SB	Oak St. on	4	3
980	EB	12th St. off	5	2
980	EB	12th St. on	-37	74
980	WB	18th St. off	-29	-9

2035 Cumulative Conditions

The changes in traffic volume on the freeway mainline and ramps under future (2035 cumulative) conditions are shown in Tables 3 and 4. While all of these locations have been carried forth for analysis for this memo, only those mainline locations where the change in volumes due to the project represent a measureable change (more than 2 to 3 percent of total volumes) that is beyond normal daily fluctuations in volumes and where the project contribution may be considered cumulatively considerable may be presented in the EIR.

Table 3: Change in Total Volume on Mainline Due to Project, 2035 Cumulative Conditions

			AM PEAK				PM PEAK			
FWY	DIR	SEGMENT	Total Volume w/o Project	Total Volume w/ Project	Volume Change	Percent Change	Total Volume w/o Project	Total Volume w/ Project	Volume Change	Percent Change
580	EB	w/o 980	15,582	15,570	-12	-0.1%	9,888	9,876	-12	-0.1%
580	WB	w/o 980	8,244	8,298	54	0.7%	11,268	11,136	-132	-1.2%
880	NB	e/o 980	8,020	8,035	15	0.2%	9,200	9,210	10	0.1%
880	SB	e/o 980	5,990	6,095	105	1.8%	5,860	5,880	20	0.3%
880	NB	w/o Adeline	8,524	8,460	-64	-0.8%	8,984	8,984	0	0.0%
880	SB	w/o Adeline	6,216	6,276	60	1.0%	6,904	6,868	-36	-0.5%
880	NB	e/o High	7,885	7,830	-55	-0.7%	9,985	9,995	10	0.1%
880	SB	e/o High	9,365	9,245	-120	-1.3%	8,750	8,670	-80	-0.9%
880	NB	w/o 23rd	10,568	10,556	-12	-0.1%	10,916	11,012	96	0.9%
880	SB	w/o 23rd	10,016	10,052	36	0.4%	8,964	9,000	36	0.4%
980	EB	s/o 580	8,810	8,810	0	0.0%	5,590	5,575	-15	-0.3%
980	WB	s/o 580	4,200	4,300	100	2.4%	7,285	7,405	120	1.6%

Table 4: Total Volume Change Due to Project in Ramp Merge/Diverge Areas, 2035 Cumulative Condition

FWY	DIR	RAMP	AM	PM
880	SB	5th St. off (to Broadway)	-3	-65
880	NB	Broadway off	24	35
880	NB	Jackson St. on	4	60
880	NB	High St. off	6	-68
880	SB	High St. on	-82	28
880	SB	Jackson St. off	-3	-47
880	SB	Oak St. on	6	-1
980	EB	12th St. off	3	1
980	EB	12th St. on	-10	-11
980	WB	18th St. off	-30	-20

SIGNIFICANCE CRITERIA

Caltrans Measures of Effectiveness

Caltrans bases its LOS for operating State highway facilities upon certain measures of effectiveness (MOEs). For basic freeway segments and ramps operating at a free-flow speed of 65 MPH, the MOE is density with thresholds that mirror those of the HCM. (See Table 5.) LOS C or better is desirable on State highway facilities; however, Caltrans acknowledges that LOS C may not be feasible in some cases. In those instances, Caltrans expects local agencies to work with Caltrans to identify an appropriate LOS standard for those facilities. The Caltrans traffic impact study guidelines state that "if an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained."[1]

ACTC CMP LOS Standards for Monitoring

The Alameda County Transportation Commission (ACTC) Congestion Management Program (CMP) establishes LOS E as the standard for facilities under LOS monitoring in the CMP network.[2]

Grandfathered Segments

Certain segments are identified in the CMP as "grandfathered segments," which were operating at LOS F during the PM peak in 1991 when existing LOSs were established for the CMP network. The following segments are included in the CMP Table 6—LOS F Freeways for Alameda County CMP-Designated Roadway System:

- Southbound I-580 during PM peak between I-80/580 and I-980/SR 24: This captures our one I-580 analysis segment for the southbound direction during the PM peak.
- Southbound I-880 during PM peak between Washington Street and Hegenberger Road: This captures all but one of our I-880 analysis segments for the southbound direction during the PM peak. I-880 west of Adeline Street is not within the grandfathered segment.
- Eastbound I-980 during the PM peak between I-880 and I-580: This captures our one I-980 analysis segment for the eastbound direction during the PM peak.

Local Agency Thresholds

Since the CMP does not define the threshold of significance for those locations that already exceed the LOS standard, local agencies can define the criteria. The City of Alameda has significance criteria for local roads and intersections but not for freeway facilities. The freeway facilities under analysis are located within Oakland, and the City of Oakland has analyzed traffic impacts on those facilities for

[1] Guide for the Preparation of Traffic Impact Studies, California Department of Transportation, December 2002.
[2] ACTC CMP, Table 4—Approach to LOS Monitoring

several recent EIRs. The City of Oakland's CEQA Thresholds of Significance Guidelines[3] could be applied for analyzing the freeway mainline segments and ramp merge/diverge areas identified for the Alameda Point EIR analysis. The relevant criterion is:

7. For a roadway segment of the Congestion Management Program (CMP) Network, the project would cause (a) the LOS to degrade from LOS E or better to LOS F or (b) the V/C ratio to increase 0.03 or more for a roadway segment that would operate at LOS F without the project.[4]

As was applied for the Boatworks EIR, the roadway impacts of the project could be considered significant if the addition of project-related traffic would result in a service level worse than LOS E, except where the roadway link was already at LOS F under no project conditions. For those locations where this no-project condition is LOS F, the impacts of the project were considered significant if the contribution of project-related traffic is three percent or more of the total traffic. This criterion has been included to address impacts along roadway segments currently operating under unacceptable levels and was developed based on professional judgment using a "reasonableness test" of daily fluctuations of traffic. Also a change of volume-to-capacity (V/C) ratio of 0.03 has been found to be the threshold for which a perceived change in congestion is observed. The V/C ratio is calculated by comparing the peak-hour link volume to the peak-hour capacity of the road link. That change is equivalent to about one-half of the change from one level of service to the next.

METHODOLOGY

Freeway Mainline Segments

The 2000 *Highway Capacity Manual* (HCM) procedures, as applied by Highway Capacity Software (HCS+), were used to calculate average peak hour capacities for each freeway mainline segment. The LOS was determined using density, or passenger cars per mile per lane (pc/mi/ln), given an estimated free-flow speed. The estimated free-flow speed of 70 MPH was used for those freeway segments with posted speed limits of 65 MPH. Seventy miles per hour (70 MPH) is the base free-flow speed for urban areas from the HCM. An estimated free-flow speed of 60 MPH was used for two segments of I-880 (segment west of Adeline and segment west of 23rd Street) where the posted speed limit is 55 MPH. Table 5 contains the density thresholds for both free-flow conditions.

[3] Adopted August 24, 2011

[4] Refer to the Alameda County Transportation Commission's (ACTC) (formerly the Alameda County Congestion Management Agency) Congestion Management Program for a description of the CMP Network. In Oakland, the CMP Network includes all state highways plus the following streets: portions of Martin Luther King, Jr., Way, Webster/Posey Tubes, 23rd Ave., 29th Ave., and Hegenberger Rd.

Table 5: LOS and Density for Free-Flow Speed @ 60 MPH and 70 MPH

Level of Service	Maximum Density (pc/mi/ln)
A	11
B	18
C	26
D	35
E	45

Source: *Highway Capacity Manual*, Transportation Research Board, Washington D.C, 2000, 23-4.

Ramp Merge/Diverge Areas

Highway Capacity Software (HCS+) was used to analyze the ramp merge/diverge areas. Freeway ramp area operating conditions are dependent upon traffic volumes and the ramp characteristics. These characteristics include the length and type of acceleration/deceleration lanes, free-flow speed of the ramps, number of freeway and acceleration/deceleration lanes, grade along the facility, and types of facilities a ramp connects. Table 6 Table 5contains the density thresholds from A to F for ramp merge/diverge areas.

Table 6: LOS and Density for Freeway Ramp Merge/Diverge Areas

Level of Service	Maximum Density (pc/mi/ln)
A	10
B	20
C	28
D	35
E	>35
F	Demand exceeds capacity

Source: *Highway Capacity Manual*, Transportation Research Board, Washington D.C, 2000, 25-5.

The 2000 *Highway Capacity Manual* requires that several criteria be considered in addition to density so that LOS F is automatically attained for a ramp if:

At an on-ramp, volume exceeds capacity (V>C) in:

- The segment of a freeway downstream, or
- The merge-area defined by the on-ramp and the two adjacent freeway lanes,

Or at an off-ramp volume exceeds capacity (V>C) in:

- The segment of a freeway upstream OR downstream,
- The off-ramp itself, or
- The diverge-area defined by the two adjacent freeway lanes approaching the ramp.

Data Sources

The California Department of Transportation (Caltrans) provided freeway mainline and ramp counts for I-580 from the westbound on-ramp from High Street to the westbound off-ramp to I-80E (2011), for I-880 from the northbound off-ramp to Coliseum Way/66th Avenue to the southbound on-ramp to 7th Street (2008 and 2011), and for I-980 from the westbound off-ramp to Jackson Street to the westbound off-ramp to 27th Street (2012), and 2010 truck counts for these same freeway sections.

Assumptions

- PHF: 0.92 (default in HCS+)
- BFFS: 5 MPH above posted speed limit (70 MPH for most segments; 60 MPH for I-880 west of Adeline and I-880 west of 23rd Street)
- Ramp free-flow speed (S_{FR}): 35 MPH for non-circuitous ramps
- Percent trucks/buses on ramp (E_T): 2%
- Driver population factor (f_p): 1
- Grade on freeways and ramps: 0%

Limitations of Analysis

The HCM 2000 methodology has certain limits for valid applications. It does not apply when the traffic along a segment is influenced by downstream blockages or queuing, nor does it apply when free-flow speeds are below 55 MPH.[5] The ACTC CMP originally identified most of our segments as deficient (LOS F) in certain directions during the PM peak and grandfathered those segments into the CMP as deficient in 1991. The 2012 CMP Report identified I-580 west of I-980 as LOS F (average speeds less than 20 MPH) during the PM peak for both directions of travel as well as during the AM peak for the northbound direction. For some study segments, the traffic counts used in the analysis of those segments may represent saturated flows resulting from downstream queuing and not reflect the demand during the study periods. Collectively, these limitations need to be considered when reviewing the results of the HCS+ analysis.

FREEWAYS RESULTS

The results on the analysis for the freeway mainline are shown in Tables 7 and 8 for the existing and cumulative (2035) conditions, respectively. As shown, the change in traffic due to the project has minimal effect on the freeway operations with no change in LOS and minimal, if any, change in density under existing and cumulative conditions, with the exception of I-980 south of I-580 in the westbound direction during the AM peak hour.

[5] *Highway Capacity Manual*, Transportation Research Board, Washington, D.C., 2000, 23-1.

Table 7: Existing Conditions – AM(PM)

FWY section	Direction	Without Project Volume (pc/h/ln)	Without Project Density (pc/mi/ln)	Without Project LOS	With Project Volume (pc/h/ln)	With Project Density (pc/mi/ln)	With Project LOS
880 w/o Adeline	NB	1840(1967)	32.9(35.6)	D(E)	1846(1977)	33.0(35.8)	D(E)
	SB	1269(1337)	22.7(23.9)	C(C)	1290(1340)	23.0(23.9)	C(C)
880 w/o 23rd	NB	2512(2303)	N/A*	F(F)	2520(2302)	N/A*	F(F)
	SB	2099(1992)	N/A*	F(F)	2094(2001)	N/A*	F(F)
880 e/o High	NB	1517(1603)	22.5(23.9)	C(C)	1517(1596)	22.5(23.7)	C(C)
	SB	1495(1556)	22.2(23.1)	C(C)	1493(1549)	22.1(23.0)	C(C)
980 s/o 580	WB	1610(945)	25.8(15.1)	C(B)	1658(953)	26.6(15.2)	D(B)
	EB	731(1326)	11.7(21.2)	B(C)	735(1370)	11.8(21.9)	B(C)
880 e/o 980	NB	1521(1594)	23.2(24.4)	C(C)	1513(1588)	23.1(24.3)	C(C)
	SB	903(966)	13.8(14.7)	B(B)	898(968)	13.7(14.8)	B(B)
580 w/o 980	WB	2369(1360)	44.7(20.1)	E(C)	2368(1374)	44.6(20.4)	E(C)
	EB	1118(1679)	16.6(25.1)	B(C)	1130(1676)	16.7(25.1)	B(C)

* Volume exceeds capacity, so HCM methodology does not apply, and density is not calculated; automatic LOS F.

Table 8: 2035 Cumulative Conditions – AM(PM)

FWY section	Direction	Without Project Volume (pc/h/ln)	Without Project Density (pc/mi/ln)	Without Project LOS	With Project Volume (pc/h/ln)	With Project Density (pc/mi/ln)	With Project LOS
880 w/o Adeline	NB	2131(2246)	40.1(44.4)	E(E)	2115(2246)	39.6(44.4)	E(E)
	SB	1554(1726)	27.8(30.8)	D(D)	1569(1717)	28.0(30.7)	D(D)
880 w/o 23rd	NB	2642(2729)	N/A*	F(F)	2639(2753)	N/A*	F(F)
	SB	2504(2241)	N/A*(N/A**)	F(F)	2513(2250)	N/A*(N/A**)	F(F)
880 e/o High	NB	1577(1997)	23.4(31.6)	C(D)	1566(1999)	23.3(31.6)	C(D)
	SB	1873(1750)	28.8(26.4)	D(D)	1849(1734)	28.3(26.1)	D(D)
980 s/o 580	WB	1762(1118)	28.4(17.9)	D(B)	1762(1115)	28.4(17.8)	D(B)
	EB	840(1457)	13.4(23.3)	B(C)	860(1481)	13.8(23.7)	B(C)
880 e/o 980	NB	1604(1840)	24.5(28.7)	C(D)	1607(1842)	24.6(28.8)	C(D)
	SB	1198(1172)	18.3(17.9)	C(B)	1219(1176)	18.6(17.9)	C(B)
580 w/o 980	WB	2597(1648)	N/A*(24.6)	F(C)	2595(1646)	N/A*(24.6)	F(C)
	EB	1374(1878)	20.4(28.9)	C(D)	1383(1856)	20.5(28.4)	C(D)

* Volume exceeds capacity, so HCM methodology does not apply, and density is not calculated; automatic LOS F.
** Adjusted free-flow speed is beyond extents of HCM methodology, so density is not calculated.

RAMPS RESULTS

The results on the analysis for the ramps are shown in Tables 9 and 10 for the existing and cumulative (2035) conditions, respectively. As shown, the change in traffic due to the project has minimal effect on the ramp operations with no change in LOS and minimal, if any, change in density under existing conditions.

Table 9: Existing Conditions – AM(PM)

		Without Project		**With Project**	
Ramp	FWY	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Jackson St. on	880 NB	38.8(39.0)	F(F)	38.9(39.2)	F(F)
Broadway off	880 NB	32.7(29.8)	D(D)	33.0(29.9)	D(D)
18th St. off	980 WB	36.6(13.6)	F(B)	38.6(13.7)	F(B)
5th St. off (to Broadway)	880 SB	14.0(15.3)	B(B)	14.4(15.4)	B(B)
High St. on	880 SB	33.4(33.6)	D(D)	33.4(33.5)	D(D)
High St. off	880 NB	27.2(27.4)	C(C)	27.4(27.3)	C(C)
Jackson St. off	980 WB	19.8(16.3)	B(B)	20.0(16.5)	C(B)
Oak St. on	880 SB	24.1(26.4)	C(C)	24.1(26.5)	C(C)
12th St. on	980 EB	29.1(62.0)	D(F)	29.3(62.8)	D(F)
12th St. off	980 EB	19.1(26.3)	B(C)	18.8(26.3)	B(C)

Table 10: 2035 Cumulative Conditions – AM(PM)

		Without Project		**With Project**	
Ramp	FWY	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Jackson St. on	880 NB	47.4(48.5)	F(F)	47.5(49.0)	F(F)
Broadway off	880 NB	34.5(35.5)	D(E)	34.8(35.9)	D(F)
18th St. off	980 WB	43.1(17.8)	F(B)	43.1(17.7)	F(B)
5th St. off (to Broadway)	880 SB	19.7(23.2)	B(F)	20.0(23.0)	C(F)
High St. on	880 SB	38.7(36.4)	F(F)	37.9(36.3)	F(E)
High St. off	880 NB	28.4(35.0)	D(F)	28.2(34.7)	D(F)
Jackson St. off	980 WB	29.9(27.8)	D(C)	30.5(26.8)	D(C)
Oak St. on	880 SB	30.2(32.0)	D(D)	30.6(32.1)	D(D)
12th St. on	980 EB	29.1(64.0)	D(F)	29.7(64.3)	D(F)
12th St. off	980 EB	18.2(27.9)	B(C)	18.2(28.3)	B(D)

Under cumulative conditions, the project would result in a change in LOS at the following ramps:

- Broadway off-ramp from I-880 northbound during the PM peak hour. The project-related traffic volumes increase by 35 vehicles on this ramp and by 46 vehicles along the contiguous portion of the mainline, which results in a change in LOS from E to F during the PM peak hour and a corresponding change in density of 0.4 passenger cars per mile per lane (pc/mi/ln) within the diverge area.
- High Street on-ramp from I-880 southbound during the PM peak hour. The project-related traffic volumes increase by 28 vehicles on the ramp, but the density at the merge actually decreases from 36.4 to 36.3 since the mainline freeway volume decreases by 102 vehicles. This decrease in mainline volumes drops below the capacity resulting in a change in LOS from F to E with the project-related traffic.
- 12th Street off-ramp from I-980 eastbound during the PM peak hour. The project-related traffic volumes increase by 1 vehicle on this ramp and by 44 vehicles along the contiguous portion of the mainline, affecting the density at the diverge area and resulting in a change in LOS from C to D during the PM peak hour.

While this discussion focuses on the change in LOS based on the significance thresholds, the change in project-related traffic is minimal compared to the total volume on the mainline as well as the total volume on the ramps and any resulting change in mainline and ramp operations would likely be imperceptible to the motorist.

APPENDIX B

MMLOS Output Data

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BICYCLE LOS for Existing and Plus Project Conditions

Segment	Peak Hour	Scenario	NB / WB Bike Score	NB / WB LOS	NB / WB % Change in Bike Score	SB / EB Bike Score	SB / EB LOS	SB / EB % Change in Bike Score
Webster St. (Buena Vista Ave./ Atlantic Ave.)	AM	Existing	4.2	D	-1%	3.9	D	-1%
		Existing Plus Project	4.1	D		3.9	D	
	PM	Existing	4.0	D	-1%	4.2	D	-1%
		Existing Plus Project	4.0	D		4.1	D	
Park St. (Alameda Ave./ Central Ave.)	AM	Existing	3.9	D	1%	3.7	D	1%
		Existing Plus Project	4.0	D		3.8	D	
	PM	Existing	3.9	D	0%	4.0	D	1%
		Existing Plus Project	4.0	D		4.1	D	
Otis Dr. (Broadway/ High St.)	AM	Existing	4.1	D	1%	4.0	D	0%
		Existing Plus Project	4.1	D		4.0	D	
	PM	Existing	4.0	D	1%	4.1	D	1%
		Existing Plus Project	4.0	D		4.1	D	
Willie Stargell Ave. (Main St./ Webster St.)	AM	Existing	2.3	B	56%	2.8	C	19%
		Existing Plus Project	3.6	D		3.3	C	
	PM	Existing	2.6	C	35%	2.7	C	33%
		Existing Plus Project	3.4	C		3.7	D	
Main St. (RAMP/ Pacific Ave.)	AM	Existing	3.6	D	15%	3.1	C	32%
		Existing Plus Project*	4.2	D		4.0	D	
	PM	Existing	2.9	C	42%	3.3	C	26%
		Existing Plus Project*	4.1	D		4.2	D	
Central Ave. (Main St./ 4th St.)	AM	Existing	2.9	C	33%	2.8	C	33%
		Existing Plus Project	3.9	D		3.8	D	
	PM	Existing	2.2	B	76%	2.4	B	63%
		Existing Plus Project	3.8	D		3.9	D	
Pacific Ave. (Main St./ 3rd St.)	AM	Existing	2.2	B	11%	1.1	A	8%
		Existing Plus Project	2.4	B		1.2	A	
	PM	Existing	0.9	A	22%	1.5	B	16%
		Existing Plus Project	1.1	A		1.8	B	
RAMP (W. Campus Dr./ Webster St.)	AM	Existing	4.0	D	6%	4.0	D	0%
		Existing Plus Project	4.3	D		4.0	D	
	PM	Existing	4.0	D	5%	3.9	D	8%
		Existing Plus Project	4.2	D		4.2	D	
Clement Ave. (Park St./ Broadway)	AM	Existing	3.8	D	0%	-	-	-
		Existing Plus Project	3.8	D		-	-	
	PM	Existing	2.4	B	1%	-	-	-
		Existing Plus Project	2.4	B		-	-	
Oak St. (Santa Clara Ave./ Central Ave.)	AM	Existing	2.5	B	0%	1.9	B	0%
		Existing Plus Project	2.5	B		1.9	B	
	PM	Existing	2.8	C	0%	3.0	C	0%
		Existing Plus Project	2.8	C		3.0	C	
Constitution Way (Marina Village Pkwy./ Atlantic Ave.)	AM	Existing	4.0	D	0%	3.5	D	0%
		Existing Plus Project	4.0	D		3.5	D	
	PM	Existing	3.7	D	4%	4.1	D	-1%
		Existing Plus Project	3.8	D		4.0	D	

Table 2 – 1
Bicycle and Pedestrian LOS Categories

LOS	Score
A	≤ 1.5
B	> 1.5 and ≤ 2.5
C	> 2.5 and ≤ 3.5
D	> 3.5 and ≤ 4.5
E	> 4.5 and ≤ 5.5
F	> 5.5

Bicycle LOS Thresholds

LOS	Score
A	≤ 1.5
B	> 1.5 and ≤ 2.5
C	> 2.5 and ≤ 3.5
D	> 3.5 and ≤ 4.5
E	> 4.5 and ≤ 5.5
F	> 5.5

* LOS reflects Class II bicycle lane. Separated Class I bicycle path cannot be evaluated within the given methodology but would be expected to yield a better LOS than a Class II bicycle lane.

BICYCLE LOS for Cumulative NO Project and Plus Project Conditions

Segment	Peak Hour	Scenario	NB / WB Bike Score	NB / WB LOS	NB / WB % Change in Bike Score	SB / EB Bike Score	SB / EB LOS	SB / EB % Change in Bike Score
Webster St. (Buena Vista Ave./ Atlantic Ave.)	AM	Cumulative	4.2	D	0%	4.0	D	-1%
		Cumulative Plus Project	4.2	D		4.0	D	
	PM	Cumulative	4.1	D	-1%	4.2	D	-1%
		Cumulative Plus Project	4.1	D		4.2	D	
Park St. (Alameda Ave./ Central Ave.)	AM	Cumulative	4.2	D	0%	4.0	D	1%
		Cumulative Plus Project	4.1	D		4.1	D	
	PM	Cumulative	4.2	D	0%	4.2	D	0%
		Cumulative Plus Project	4.2	D		4.2	D	
Otis Dr. (Broadway/ High St.)	AM	Cumulative	4.1	D	1%	4.2	D	0%
		Cumulative Plus Project	4.2	D		4.2	D	
	PM	Cumulative	4.2	D	0%	4.1	D	0%
		Cumulative Plus Project	4.1	D		4.1	D	
Willie Stargell Ave. (Main St./ Webster St.)	AM	Cumulative	2.7	C	36%	3.6	D	1%
		Cumulative Plus Project	3.6	D		3.7	D	
	PM	Cumulative	3.6	D	4%	3.1	C	18%
		Cumulative Plus Project	3.7	D		3.7	D	
Main St. (RAMP/ Pacific Ave.)	AM	Cumulative	3.7	D	13%	3.7	D	14%
		Cumulative Plus Project	4.1	D		4.2	D	
	PM	Cumulative	3.6	D	16%	3.5	D	18%
		Cumulative Plus Project	4.2	D		4.2	D	
Central Ave. (Main St./ 4th St.)	AM	Cumulative	2.9	C	32%	3.5	C	14%
		Cumulative Plus Project	3.8	D		3.9	D	
	PM	Cumulative	3.0	C	31%	2.5	B	54%
		Cumulative Plus Project	3.9	D		3.8	D	
Pacific Ave. (Main St./ 3rd St.)	AM	Cumulative	2.3	B	7%	1.2	A	3%
		Cumulative Plus Project	2.5	B		1.2	A	
	PM	Cumulative	1.1	A	7%	1.7	B	8%
		Cumulative Plus Project	1.2	A		1.8	B	
RAMP (W. Campus Dr./ Webster St.)	AM	Cumulative	4.2	D	5%	4.1	D	2%
		Cumulative Plus Project	4.4	D		4.2	D	
	PM	Cumulative	4.1	D	4%	4.1	D	6%
		Cumulative Plus Project	4.3	D		4.3	D	
Clement Ave. (Park St./ Broadway)	AM	Cumulative	3.8	D	0%	-	-	-
		Cumulative Plus Project	3.8	D		-	-	
	PM	Cumulative	2.5	B	3%	-	-	-
		Cumulative Plus Project	2.5	B		-	-	
Oak St. (Santa Clara Ave./ Central Ave.)	AM	Cumulative	2.5	C	2%	2.3	B	18%
		Cumulative Plus Project	2.6	C		2.8	C	
	PM	Cumulative	3.0	C	5%	3.5	C	3%
		Cumulative Plus Project	3.1	C		3.6	D	
Constitution Way (Marina Village Pkwy./ Atlantic Ave.)	AM	Cumulative	3.8	D	1%	3.7	D	-4%
		Cumulative Plus Project	3.9	D		3.5	D	
	PM	Cumulative	3.8	D	1%	4.0	D	-1%
		Cumulative Plus Project	3.8	D		4.0	D	

Table 2 – 1
Bicycle and Pedestrian LOS Categories

LOS	Score
A	≤ 1.5
B	> 1.5 and ≤ 2.5
C	> 2.5 and ≤ 3.5
D	> 3.5 and ≤ 4.5
E	> 4.5 and ≤ 5.5
F	> 5.5

PEDESTRIAN LOS for Existing and Plus Project Conditions

			Crosswalk									
			South Leg		North Leg		East Leg		West Leg		5th Leg	
Intersection	Peak Hour	Scenario	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Main St. & Navy Way	AM	Existing	20.1	D	-	-	21.6	D	21.6	D	-	-
		Existing Plus Project	20.1	D	-	-	21.6	D	21.6	D	-	-
	PM	Existing	20.1	D	-	-	21.6	D	21.6	D	-	-
		Existing Plus Project	20.1	D	-	-	21.6	D	21.6	D	-	-
Main St. & Ferry Terminal Way	AM	Existing	-	-	24.6	C	1.1	A	1.1	A	-	-
		Existing Plus Project	-	-	25.0	C	1.1	A	1.1	A	-	-
	PM	Existing	-	-	17.9	B	2.6	A	2.6	A	-	-
		Existing Plus Project	-	-	17.9	B	2.6	A	2.6	A	-	-
Main St. & Singleton Ave.	AM	Existing	21.7	C	21.7	C	1.9	A	-	-	-	-
		Existing Plus Project	21.6	C	21.6	C	1.9	A	-	-	-	-
	PM	Existing	21.7	C	21.7	C	1.9	A	-	-	-	-
		Existing Plus Project	21.8	C	21.8	C	1.9	A	-	-	-	-
Main St. & W. Midway Ave.	AM	Existing	13.7	B	13.7	B	5.9	A	5.9	A	-	-
		Existing Plus Project	13.7	B	13.7	B	5.9	A	5.9	A	-	-
	PM	Existing	13.6	B	13.6	B	6.0	A	6.0	A	-	-
		Existing Plus Project	13.6	B	13.6	B	6.0	A	6.0	A	-	-
Main St. & Atlantic Ave.	AM	Existing	9.4	A	9.4	A	9.3	A	9.1	A	-	-
		Existing Plus Project	11.0	B	11.0	B	14.1	B	12.7	B	-	-
	PM	Existing	7.9	A	7.9	A	12.3	B	9.5	A	-	-
		Existing Plus Project	11.4	B	11.4	B	15.3	B	8.6	A	-	-
Main St. & Pacific Ave.	AM	Existing	21.7	C	17.4	B	13.0	B	14.6	B	-	-
		Existing Plus Project	29.3	C	27.6	C	19.7	B	15.6	B	-	-
	PM	Existing	18.2	B	17.7	B	12.5	B	10.3	B	-	-
		Existing Plus Project	28.6	C	31.7	D	23.1	C	14.1	B	-	-
Webster St. & Atlantic Ave.	AM	Existing	20.9	C	29.2	C	21.8	C	24.4	C	-	-
		Existing Plus Project	20.6	C	29.5	C	23.0	C	25.7	C	-	-
	PM	Existing	23.7	C	27.9	C	22.9	C	20.6	C	-	-
		Existing Plus Project	22.8	C	30.5	D	23.3	C	25.0	C	-	-

Constitution Way & Lincoln Ave.	AM	Existing	19.5	B	19.5	B	16.1	B	17.8	B	-	-
		Existing Plus Project	18.7	B	18.7	B	17.0	B	18.7	B	-	-
	PM	Existing	24.1	C	24.1	C	23.1	C	14.3	B	-	-
		Existing Plus Project	22.8	C	22.8	C	22.3	C	14.7	B	-	-
8th St. & Central Ave.	AM	Existing	25.8	C	25.8	C	22.1	C	18.7	B	-	-
		Existing Plus Project	25.8	C	25.8	C	22.1	C	18.7	B	-	-
	PM	Existing	25.8	C	25.8	C	22.1	C	18.7	B	-	-
		Existing Plus Project	25.8	C	25.8	C	22.1	C	18.7	B	-	-
Oak St. & Lincoln Ave.	AM	Existing	5.9	A	5.9	A	13.7	B	13.7	B	-	-
		Existing Plus Project	5.9	A	5.9	A	13.7	B	13.7	B	-	-
	PM	Existing	7.3	A	7.3	A	11.7	B	11.7	B	-	-
		Existing Plus Project	7.3	A	7.3	A	11.7	B	11.7	B	-	-
Oak St. & Santa Clara Ave.	AM	Existing	6.3	A	6.3	A	13.0	B	13.0	B	-	-
		Existing Plus Project	6.3	A	6.3	A	13.0	B	13.0	B	-	-
	PM	Existing	10.5	B	10.5	B	8.3	A	8.3	A	-	-
		Existing Plus Project	10.5	B	10.5	B	8.3	A	8.3	A	-	-
Park St. & Clement Ave.	AM	Existing	14.4	B	14.4	B	11.7	B	5.4	A	-	-
		Existing Plus Project	14.4	B	14.4	B	11.7	B	5.4	A	-	-
	PM	Existing	14.4	B	14.4	B	11.7	B	5.4	A	-	-
		Existing Plus Project	14.4	B	14.4	B	11.7	B	5.4	A	-	-
Park St. & Central Ave.	AM	Existing	11.4	B	11.4	B	8.0	A	8.0	A	-	-
		Existing Plus Project	11.4	B	11.4	B	8.0	A	8.0	A	-	-
	PM	Existing	11.4	B	11.4	B	8.0	A	8.0	A	-	-
		Existing Plus Project	11.4	B	11.4	B	8.0	A	8.0	A	-	-
Park St. & Encinal Ave.	AM	Existing	14.8	B	15.6	B	17.0	B	16.8	B	-	-
		Existing Plus Project	12.9	B	15.8	B	18.3	B	17.9	B	-	-
	PM	Existing	16.8	B	17.3	B	16.6	B	14.4	B	-	-
		Existing Plus Project	16.4	B	17.0	B	16.7	B	14.6	B	-	-
Park St. & Otis Dr.	AM	Existing	17.0	B	17.4	B	19.9	B	14.6	B	-	-
		Existing Plus Project	16.2	B	16.6	B	21.5	C	16.1	B	-	-
	PM	Existing	23.2	C	24.1	C	24.4	C	19.7	B	-	-
		Existing Plus Project	22.3	C	23.2	C	24.3	C	20.3	C	-	-

Broadway & Tilden Way	AM	Existing	23.5	C	21.9	C	12.2	B	12.2	B	-	-
		Existing Plus Project	29.5	C	22.3	C	16.0	B	16.0	B	-	-
	PM	Existing	21.9	C	17.5	B	14.4	B	14.4	B	-	-
		Existing Plus Project	26.7	C	21.1	C	23.7	C	23.7	C	-	-
Broadway & Encinal Ave.	AM	Existing	13.0	B	13.0	B	6.3	A	6.3	A	-	-
		Existing Plus Project	13.0	B	13.0	B	6.3	A	6.3	A	-	-
	PM	Existing	13.0	B	13.0	B	6.3	A	6.3	A	-	-
		Existing Plus Project	13.0	B	13.0	B	6.3	A	6.3	A	-	-
Broadway & Otis Dr.	AM	Existing	11.9	B	10.6	B	19.5	B	19.5	B	-	-
		Existing Plus Project	11.8	B	10.5	B	19.6	B	19.6	B	-	-
	PM	Existing	15.2	B	15.4	B	20.2	C	20.2	C	-	-
		Existing Plus Project	16.0	B	16.1	B	19.3	B	19.3	B	-	-
Tilden Way & Blanding Ave.	AM	Existing	9.2	A	9.2	A	14.1	B	9.9	A	-	-
		Existing Plus Project	11.3	B	11.3	B	13.8	B	9.1	A	-	-
	PM	Existing	13.7	B	13.7	B	17.3	B	9.1	A	-	-
		Existing Plus Project	16.2	B	16.2	B	14.2	B	8.5	A	-	-
High St. & Fernside Blvd.	AM	Existing	40.0	E	25.6	C	24.9	C	12.9	B	25.6	C
		Existing Plus Project	41.3	E	26.8	C	26.5	C	12.7	B	26.8	C
	PM	Existing	36.2	D	19.4	B	24.7	C	13.4	B	19.4	B
		Existing Plus Project	42.4	E	25.1	C	28.8	C	12.0	B	25.1	C
High St. & Otis Dr.	AM	Existing	8.4	A	9.3	A	21.3	C	21.3	C	-	-
		Existing Plus Project	9.3	A	9.3	A	21.3	C	21.3	C	-	-
	PM	Existing	9.2	A	11.0	B	24.5	C	24.5	C	-	-
		Existing Plus Project	9.4	A	10.4	B	25.4	C	25.4	C	-	-
Island Dr. & Otis Dr.	AM	Existing	26.7	C	20.4	C	14.8	B	-	-	-	-
		Existing Plus Project	26.7	C	20.4	C	14.8	B	-	-	-	-
	PM	Existing	18.1	B	8.9	A	16.9	B	-	-	-	-
		Existing Plus Project	17.4	B	8.6	A	18.5	B	-	-	-	-
Constitution Way & Marina Village Pkwy.	AM	Existing	-	-	7.2	A	7.2	A	-	-	-	-
		Existing Plus Project	-	-	7.2	A	7.2	A	-	-	-	-
	PM	Existing	-	-	25.1	C	19.2	B	-	-	-	-
		Existing Plus Project	-	-	26.4	C	18.8	B	-	-	-	-

Constitution Way & Atlantic Ave.	AM	Existing	25.5	C	27.6	C	18.2	B	17.5	B	-	-
		Existing Plus Project	26.0	C	29.4	C	19.9	B	21.6	C	-	-
	PM	Existing	25.6	C	27.2	C	20.9	C	17.6	B	-	-
		Existing Plus Project	28.9	C	32.8	D	25.2	C	21.2	C	-	-
Fernside Blvd. & Otis Dr.	AM	Existing	4.3	A	9.2	A	-	-	38.4	D	-	-
		Existing Plus Project	4.3	A	9.2	A	-	-	38.4	D	-	-
	PM	Existing	5.6	A	9.5	A	-	-	16.0	B	-	-
		Existing Plus Project	5.6	A	9.5	A	-	-	16.0	B	-	-
Park St. & Blanding Ave.	AM	Existing	15.8	B	15.8	B	8.3	A	8.3	A	25.7	C
		Existing Plus Project	15.8	B	15.8	B	8.3	A	8.3	A	25.7	C
	PM	Existing	15.8	B	15.8	B	8.3	A	8.3	A	25.7	C
		Existing Plus Project	15.8	B	15.8	B	8.3	A	8.3	A	25.7	C
Challenger Dr. & Atlantic Ave.	AM	Existing	2.2	A	4.3	A	19.4	B	19.4	B	-	-
		Existing Plus Project	2.1	A	4.2	A	20.0	B	20.0	B	-	-
	PM	Existing	5.1	A	9.0	A	12.7	B	12.7	B	-	-
		Existing Plus Project	5.1	A	8.9	A	12.9	B	12.9	B	-	-
Challenger Dr. & Marina Village Pkwy.	AM	Existing	17.4	B	17.4	B	9.1	A	23.0	C	-	-
		Existing Plus Project	17.2	B	18.0	B	9.8	A	24.3	C	-	-
	PM	Existing	19.0	B	19.0	B	10.4	B	17.1	B	-	-
		Existing Plus Project	19.0	B	19.0	B	10.5	B	17.1	B	-	-
Webster St. & Willie Stargell Ave.	AM	Existing	15.8	B	-	-	4.7	A	7.5	A	-	-
		Existing Plus Project	15.8	B	-	-	4.7	A	7.5	A	-	-
	PM	Existing	15.4	B	-	-	5.6	A	8.4	A	-	-
		Existing Plus Project	15.4	B	-	-	5.6	A	8.4	A	-	-
5th St. & Willie Stargell Ave.	AM	Existing	20.1	D	-	-	14.4	C	14.4	C	-	-
		Existing Plus Project	20.1	D	-	-	14.4	C	14.4	C	-	-
	PM	Existing	20.1	D	-	-	14.4	C	14.4	C	-	-
		Existing Plus Project	20.1	D	-	-	14.4	C	14.4	C	-	-

Constitution Way & Mariner Square Dr.	AM	Existing	-	-	-	-	2.3	A	12.9	B	-	-
		Existing Plus Project	-	-	-	-	2.3	A	12.9	B	-	-
	PM	Existing	-	-	-	-	6.6	A	9.2	A	-	-
		Existing Plus Project	-	-	-	-	6.6	A	9.2	A	-	-
Park St. & Lincoln Ave.	AM	Existing	8.7	A	8.7	A	13.8	B	13.8	B	-	-
		Existing Plus Project	8.7	A	8.7	A	13.8	B	13.8	B	-	-
	PM	Existing	8.7	A	8.7	A	13.8	B	13.8	B	-	-
		Existing Plus Project	8.7	A	8.7	A	13.8	B	13.8	B	-	-

PEDESTRIAN LOS for Cumulative NO Project and Plus Project Conditions

			Crosswalk									
			South Leg		North Leg		East Leg		West Leg		5th Leg	
Intersection	Peak Hour	Scenario	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Main St. & Navy Way	AM	Cumulative	20.1	D	-	-	21.6	D	21.6	D	-	-
		Cumulative Plus Project	20.1	D	-	-	21.6	D	21.6	D	-	-
	PM	Cumulative	20.1	D	-	-	21.6	D	21.6	D	-	-
		Cumulative Plus Project	20.1	D	-	-	21.6	D	21.6	D	-	-
Main St. & Ferry Terminal Way	AM	Cumulative	-	-	26.2	C	1.0	A	1.0	A	-	-
		Cumulative Plus Project	-	-	26.2	C	1.0	A	1.0	A	-	-
	PM	Cumulative	-	-	21.0	C	1.9	A	1.9	A	-	-
		Cumulative Plus Project	-	-	21.0	C	1.9	A	1.9	A	-	-
Main St. & Singleton Ave.	AM	Cumulative	14.0	B	14.0	B	6.1	A	-	-	-	-
		Cumulative Plus Project	14.0	B	14.0	B	6.1	A	-	-	-	-
	PM	Cumulative	18.2	B	18.2	B	2.8	A	-	-	-	-
		Cumulative Plus Project	18.2	B	18.2	B	2.8	A	-	-	-	-
Main St. & W. Midway Ave.	AM	Cumulative	13.7	B	13.7	B	5.9	A	5.9	A	-	-
		Cumulative Plus Project	13.7	B	13.7	B	5.9	A	5.9	A	-	-
	PM	Cumulative	13.6	B	13.6	B	6.0	A	6.0	A	-	-
		Cumulative Plus Project	13.6	B	13.6	B	6.0	A	6.0	A	-	-
Main St. & Atlantic Ave.	AM	Cumulative	12.7	B	12.7	B	11.6	B	4.7	A	-	-
		Cumulative Plus Project	13.0	B	13.0	B	17.5	B	8.2	A	-	-
	PM	Cumulative	11.3	B	11.3	B	10.7	B	5.7	A	-	-
		Cumulative Plus Project	13.6	B	13.6	B	16.8	B	6.6	A	-	-
Main St. & Pacific Ave.	AM	Cumulative	27.3	C	23.9	C	17.3	B	15.1	B	-	-
		Cumulative Plus Project	31.9	D	28.5	C	23.7	C	15.4	B	-	-
	PM	Cumulative	20.5	C	22.2	C	13.6	B	14.8	B	-	-
		Cumulative Plus Project	28.5	C	31.5	D	21.3	C	15.4	B	-	-
Webster St. & Atlantic Ave.	AM	Cumulative	21.6	C	29.5	C	24.4	C	24.6	C	-	-
		Cumulative Plus Project	20.6	C	28.3	C	24.4	C	27.3	C	-	-
	PM	Cumulative	24.5	C	27.3	C	24.0	C	23.4	C	-	-

	PM	Cumulative Plus Project	23.3	C	27.9	C	26.0	C	25.8	C	-	-

Constitution Way & Lincoln Ave.	AM	Cumulative	22.4	C	22.4	C	21.6	C	17.3	B	-	-
		Cumulative Plus Project	19.6	B	19.6	B	19.4	B	18.5	B	-	-
	PM	Cumulative	22.6	C	22.6	C	22.3	C	15.5	B	-	-
		Cumulative Plus Project	21.2	C	21.2	C	22.3	C	15.2	B	-	-
8th St. & Central Ave.	AM	Cumulative	25.8	C	25.8	C	22.1	C	18.7	B	-	-
		Cumulative Plus Project	25.8	C	25.8	C	22.1	C	18.7	B	-	-
	PM	Cumulative	25.8	C	25.8	C	22.1	C	18.7	B	-	-
		Cumulative Plus Project	25.8	C	25.8	C	22.1	C	18.7	B	-	-
Oak St. & Lincoln Ave.	AM	Cumulative	5.9	A	5.9	A	13.7	B	13.7	B	-	-
		Cumulative Plus Project	5.9	A	5.9	A	13.7	B	13.7	B	-	-
	PM	Cumulative	7.3	A	7.3	A	11.7	B	11.7	B	-	-
		Cumulative Plus Project	7.3	A	7.3	A	11.7	B	11.7	B	-	-
Oak St. & Santa Clara Ave.	AM	Cumulative	6.3	A	6.3	A	13.0	B	13.0	B	-	-
		Cumulative Plus Project	6.3	A	6.3	A	13.0	B	13.0	B	-	-
	PM	Cumulative	10.5	B	10.5	B	8.3	A	8.3	A	-	-
		Cumulative Plus Project	10.5	B	10.5	B	8.3	A	8.3	A	-	-
Park St. & Clement Ave.	AM	Cumulative	14.4	B	14.4	B	11.7	B	5.4	A	-	-
		Cumulative Plus Project	14.4	B	14.4	B	11.7	B	5.4	A	-	-
	PM	Cumulative	14.4	B	14.4	B	11.7	B	5.4	A	-	-
		Cumulative Plus Project	14.4	B	14.4	B	11.7	B	5.4	A	-	-
Park St. & Central Ave.	AM	Cumulative	11.4	B	11.4	B	8.0	A	8.0	A	-	-
		Cumulative Plus Project	11.4	B	11.4	B	8.0	A	8.0	A	-	-
	PM	Cumulative	11.4	B	11.4	B	8.0	A	8.0	A	-	-
		Cumulative Plus Project	11.4	B	11.4	B	8.0	A	8.0	A	-	-
Park St. & Encinal Ave.	AM	Cumulative	14.0	B	15.9	B	17.1	B	16.7	B	-	-
		Cumulative Plus Project	13.9	B	15.7	B	17.1	B	16.9	B	-	-
	PM	Cumulative	16.7	B	22.2	C	37.4	D	32.3	D	-	-
		Cumulative Plus Project	15.4	B	15.4	B	15.6	B	14.1	B	-	-
Park St. & Otis Dr.	AM	Cumulative	19.1	B	20.3	C	27.0	C	17.0	B	-	-
		Cumulative Plus Project	19.4	B	21.0	C	27.9	C	17.0	B	-	-
	PM	Cumulative	24.0	C	25.8	C	25.5	C	20.2	C	-	-
		Cumulative Plus Project	22.0	C	23.7	C	23.5	C	20.9	C	-	-

Broadway & Tilden Way	AM	Cumulative	24.2	C	30.2	D	22.8	C	22.8	C	-	-
		Cumulative Plus Project	25.7	C	28.8	C	23.1	C	23.1	C	-	-
	PM	Cumulative	31.1	D	25.1	C	29.8	C	29.8	C	-	-
		Cumulative Plus Project	31.9	D	26.1	C	31.2	D	31.2	D	-	-
Broadway & Encinal Ave.	AM	Cumulative	13.0	B	13.0	B	6.3	A	6.3	A	-	-
		Cumulative Plus Project	13.0	B	13.0	B	6.3	A	6.3	A	-	-
	PM	Cumulative	13.0	B	13.0	B	6.3	A	6.3	A	-	-
		Cumulative Plus Project	13.0	B	13.0	B	6.3	A	6.3	A	-	-
Broadway & Otis Dr.	AM	Cumulative	12.9	B	11.6	B	18.2	B	18.2	B	-	-
		Cumulative Plus Project	12.9	B	11.6	B	18.2	B	18.2	B	-	-
	PM	Cumulative	16.0	B	16.2	B	19.3	B	19.3	B	-	-
		Cumulative Plus Project	16.0	B	16.2	B	19.3	B	19.3	B	-	-
Tilden Way & Blanding Ave.	AM	Cumulative	25.2	C	25.2	C	12.6	B	6.0	A	-	-
		Cumulative Plus Project	24.4	C	24.4	C	12.8	B	6.1	A	-	-
	PM	Cumulative	21.6	C	21.6	C	11.7	B	7.3	A	-	-
		Cumulative Plus Project	23.5	C	23.5	C	11.3	B	6.9	A	-	-
High St. & Fernside Blvd.	AM	Cumulative	38.9	D	24.8	C	20.4	C	13.4	B	24.8	C
		Cumulative Plus Project	41.2	E	27.4	C	19.3	B	12.5	B	27.4	C
	PM	Cumulative	46.6	E	33.2	D	24.7	C	11.5	B	33.2	D
		Cumulative Plus Project	46.4	E	33.8	D	25.3	C	11.7	B	33.8	D
High St. & Otis Dr.	AM	Cumulative	11.4	B	12.9	B	18.2	B	18.2	B	-	-
		Cumulative Plus Project	13.0	B	12.3	B	18.2	B	18.2	B	-	-
	PM	Cumulative	15.8	B	12.6	B	22.3	C	22.3	C	-	-
		Cumulative Plus Project	18.0	B	13.7	B	20.9	C	20.9	C	-	-
Island Dr. & Otis Dr.	AM	Cumulative	26.7	C	20.4	C	14.8	B	-	-	-	-
		Cumulative Plus Project	26.7	C	20.4	C	14.8	B	-	-	-	-
	PM	Cumulative	22.2	C	10.1	B	18.1	B	-	-	-	-
		Cumulative Plus Project	22.1	C	10.0	A	19.5	B	-	-	-	-
Constitution Way & Marina Village Pkwy.	AM	Cumulative	-	-	6.7	A	6.1	A	-	-	-	-
		Cumulative Plus Project	-	-	7.1	A	5.7	A	-	-	-	-
	PM	Cumulative	-	-	6.7	A	5.6	A	-	-	-	-
		Cumulative Plus Project	-	-	6.8	A	5.6	A	-	-	-	-

Constitution Way & RAMP	AM	Cumulative	25.3	C	26.1	C	20.2	C	19.4	B	-	-
		Cumulative Plus Project	26.8	C	25.1	C	24.7	C	25.8	C	-	-
	PM	Cumulative	29.7	C	34.0	D	29.5	C	26.0	C	-	-
		Cumulative Plus Project	27.8	C	35.6	D	35.6	D	30.1	D	-	-
Fernside Blvd. & Otis Dr.	AM	Cumulative	4.3	A	9.2	A	-	-	38.4	D	-	-
		Cumulative Plus Project	4.3	A	9.2	A	-	-	38.4	D	-	-
	PM	Cumulative	4.2	A	7.7	A	-	-	17.1	B	-	-
		Cumulative Plus Project	3.9	A	7.4	A	-	-	17.3	B	-	-
Park St. & Blanding Ave.	AM	Cumulative	15.8	B	15.8	B	8.3	A	8.3	A	25.7	C
		Cumulative Plus Project	15.8	B	15.8	B	8.3	A	8.3	A	25.7	C
	PM	Cumulative	15.8	B	15.8	B	8.3	A	8.3	A	25.7	C
		Cumulative Plus Project	15.8	B	15.8	B	8.3	A	8.3	A	25.7	C
Challenger Dr. & Atlantic Ave.	AM	Cumulative	4.5	A	7.7	A	21.9	C	21.9	C	-	-
		Cumulative Plus Project	4.0	A	7.0	A	22.7	C	22.7	C	-	-
	PM	Cumulative	5.8	A	9.4	A	20.3	C	20.3	C	-	-
		Cumulative Plus Project	5.8	A	9.4	A	20.3	C	20.3	C	-	-
Challenger Dr. & Marina Village Pkwy.	AM	Cumulative	20.7	C	23.4	C	10.8	B	28.4	C	-	-
		Cumulative Plus Project	20.5	C	21.7	C	9.8	A	28.0	C	-	-
	PM	Cumulative	25.9	C	25.1	C	10.2	B	22.2	C	-	-
		Cumulative Plus Project	24.9	C	24.1	C	10.4	B	21.1	C	-	-
Webster St. & Willie Stargell Ave.	AM	Cumulative	16.3	B	-	-	4.7	A	8.1	A	-	-
		Cumulative Plus Project	16.3	B	-	-	4.7	A	8.1	A	-	-
	PM	Cumulative	15.8	B	-	-	5.5	A	9.0	A	-	-
		Cumulative Plus Project	15.8	B	-	-	5.5	A	9.0	A	-	-
5th St. & Willie Stargell Ave.	AM	Cumulative	20.1	D	-	-	14.4	C	14.4	C	-	-
		Cumulative Plus Project	20.1	D	-	-	14.4	C	14.4	C	-	-
	PM	Cumulative	20.1	D	-	-	14.4	C	14.4	C	-	-
		Cumulative Plus Project	20.1	D	-	-	14.4	C	14.4	C	-	-

Constitution Way & Mariner Square Dr.	AM	Cumulative	-	-	-	-	2.3	A	12.9	B	-	-
		Cumulative Plus Project	-	-	-	-	2.3	A	12.9	B	-	-
	PM	Cumulative	-	-	-	-	6.6	A	9.2	A	-	-
		Cumulative Plus Project	-	-	-	-	6.6	A	9.2	A	-	-
Park St. & Lincoln Ave.	AM	Cumulative	8.7	A	8.7	A	13.8	B	13.8	B	-	-
		Cumulative Plus Project	8.7	A	8.7	A	13.8	B	13.8	B	-	-
	PM	Cumulative	8.7	A	8.7	A	13.8	B	13.8	B	-	-
		Cumulative Plus Project	8.7	A	8.7	A	13.8	B	13.8	B	-	-

TRANSIT LOS for Existing and Plus Project Conditions

Segment	Peak Hour	Scenario	NB / WB Travel Speed (MPH)	NB / WB LOS	NB / WB % Change in Travel Speed	SB / EB Travel Speed (MPH)	SB / EB LOS	SB / EB % Change in Travel Speed
Main St. at Willie Stargell Ave. to Pacific Ave. at Webster St.	AM	Existing	19.0	B	-4%	17.8	C	-3%
		Existing Plus Project	18.2	C		17.2	C	
	PM	Existing	18.8	C	-1%	17.9	C	-3%
		Existing Plus Project	18.6	C		17.3	C	
Webster St. (Webster Tube to Central Ave.)	AM	Existing	9.8	D	1%	14.4	C	-1%
		Existing Plus Project	9.9	D		14.3	C	
	PM	Existing	10.2	D	0%	14.0	C	-1%
		Existing Plus Project	10.2	D		13.8	C	
Park St. (Blanding Ave. to Otis Dr.)	AM	Existing	10.7	D	-7%	12.6	D	-2%
		Existing Plus Project	10.0	D		12.3	D	
	PM	Existing	11.3	D	-1%	11.4	D	-7%
		Existing Plus Project	11.2	D		10.6	D	
Otis St. (Willow Dr. to Roberty Davey, Jr. Dr.)	AM	Existing	13.2	C	-8%	16.7	C	0%
		Existing Plus Project	12.2	D		16.7	C	
	PM	Existing	12.8	D	-6%	15.5	C	-3%
		Existing Plus Project	12.0	D		15.0	C	

• Transit – If travel speed degrades by 10 percent or more along a street segment, a segment would be defined as the impacted bus stop location, plus the two previous stops and the two subsequent stops. A segment that crosses a City boundary shall also include five bus stops, but the last stop shall be the first bus stop outside the City of Alameda (Transit LOS for an arterial segment would be calculated using the Highway Capacity Manual's methodology for Urban Street (arterial) Level of Service, or LOS).

EXHIBIT 15-2. URBAN STREET LOS BY CLASS

Urban Street Class	I	II	III	IV
Range of free-flow speeds (FFS)	55 to 45 mi/h	45 to 35 mi/h	35 to 30 mi/h	35 to 25 mi/h
Typical FFS	50 mi/h	40 mi/h	35 mi/h	30 mi/h
LOS	Average Travel Speed (mi/h)			
A	> 42	> 35	> 30	> 25
B	> 34–42	> 28–35	> 24–30	> 19–25
C	> 27–34	> 22–28	> 18–24	> 13–19
D	> 21–27	> 17–22	> 14–18	> 9–13
E	> 16–21	> 13–17	> 10–14	> 7–9
F	≤ 16	≤ 13	≤ 10	≤ 7

TRANSIT LOS for Cumulative No Project and Plus Project Conditions

Segment	Peak Hour	Scenario	NB / WB Travel Speed (MPH)	NB / WB LOS	NB / WB % Change in Travel Speed	SB / EB Travel Speed (MPH)	SB / EB LOS	SB / EB % Change in Travel Speed
Main St. at Willie Stargell Ave. to Pacific Ave. at Webster St.	AM	Cumulative	18.3	C	-7%	16.9	C	-10%
		Cumulative Plus Project	17.1	C		15.2	C	
	PM	Cumulative	18.0	C	-2%	16.5	C	-6%
		Cumulative Plus Project	17.7	C		15.5	C	
Webster St. (Webster Tube to Central Ave.)	AM	Cumulative	9.8	D	0%	13.9	C	-2%
		Cumulative Plus Project	9.8	D		13.6	C	
	PM	Cumulative	9.6	D	1%	13.4	C	-1%
		Cumulative Plus Project	9.7	D		13.3	C	
Park St. (Blanding Ave. to Otis Dr.)	AM	Cumulative	8.5	E	2%	8.4	E	-13%
		Cumulative Plus Project	8.7	E		7.3	E	
	PM	Cumulative	7.6	E	21%	8.5	E	-4%
		Cumulative Plus Project	9.2	D		8.2	E	
RAMP (Main St. to Webster St.)	AM	Cumulative	11.0	D	-7%	11.0	D	-1%
		Cumulative Plus Project	10.2	D		10.9	D	
	PM	Cumulative	11.0	D	-4%	10.9	D	-3%
		Cumulative Plus Project	10.6	D		10.6	D	
Willie Stargell Ave. (Main St. to Webster St.)	AM	Cumulative	22.4	B	-4%	19.7	B	2%
		Cumulative Plus Project	21.6	B		20.0	B	
	PM	Cumulative	22.7	B	-4%	19.8	B	-2%
		Cumulative Plus Project	21.8	B		19.5	B	
Lincoln Ave. (Webster St. to Park St.)	AM	Cumulative	18.0	C	-2%	18.9	C	0%
		Cumulative Plus Project	17.6	C		18.9	C	
	PM	Cumulative	18.5	C	1%	18.8	C	-4%
		Cumulative Plus Project	18.6	C		18.0	C	
Otis St. (Willow Dr. to Roberty Davey, Jr. Dr.)	AM	Cumulative	6.5	F	-6%	10.5	D	-9%
		Cumulative Plus Project	6.1	F		9.6	D	
	PM	Cumulative	8.7	E	0%	15.0	C	-3%
		Cumulative Plus Project	8.7	E		14.5	C	

• Transit – If travel speed degrades by 10 percent or more along a street segment, a segment would be defined as the impacted bus stop location, plus the two previous stops and the two subsequent stops. A segment that crosses a City boundary shall also include five bus stops, but the last stop shall be the first bus stop outside the City of Alameda (Transit LOS for an arterial segment would be calculated using the Highway Capacity Manual's methodology for Urban Street (arterial) Level of Service, or LOS).

EXHIBIT 15-2. URBAN STREET LOS BY CLASS

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Typical FFS	50 mi/h	40 mi/h	35 mi/h	30 mi/h
LOS	Average Travel Speed (mi/h)			
A	> 42	> 35	> 30	> 25
B	> 34–42	> 28–35	> 24–30	> 19–25
C	> 27–34	> 22–28	> 18–24	> 13–19
D	> 21–27	> 17–22	> 14–18	> 9–13
E	> 16–21	> 13–17	> 10–14	> 7–9
F	≤ 16	≤ 13	≤ 10	≤ 7