

APPENDIX M

Transportation Discipline Report

APPENDIX M: NEW WHATCOM REDEVELOPMENT SUPPLEMENTAL TRANSPORTATION DISCIPLINE REPORT

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Prepared for:

Port of Bellingham and City of Bellingham

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Chapter 1: Introduction

This Supplemental Transportation Discipline Report builds on the work completed as part of the *New Whatcom Redevelopment Project Draft Environmental Impact Statement (DEIS)* published January 2008. It presents transportation analyses of the Preferred Alternative which was developed as part of the ongoing master planning process. In addition, it presents transportation analyses for the City of Bellingham's Straight Street Grid Option at key locations where impacts may be different from those highlighted in the DEIS. It identifies transportation impacts associated with these Alternatives and outlines suggested mitigation strategies to meet City of Bellingham operational standards and accommodate the projected growth in travel demand.

Report Organization

The methodology and affected environment are presented in the January 2008 *Appendix N: New Whatcom Redevelopment Transportation Discipline Report*. Existing conditions have not changed and are, therefore, not discussed further in this report. The remainder of this document comprises the following chapters:

- **Chapter 2: Impacts and Alternatives Comparison** describes the future impacts of the Preferred Alternative on different components of the transportation system, and then compares them to the impacts reported in the DEIS.
- **Chapter 3: Mitigation Measures** presents the required mitigation measures and suggested strategies (also in comparison to the mitigation measures in the DEIS) to help address the identified impacts, while also highlighting the significant and unavoidable adverse impacts.

Preferred Alternative Evaluated

The Preferred Alternative would develop the site with 6 million square feet of mixed-use development; similar to Alternatives 2 and 2A in the DEIS. The Straight Street Grid Option is assumed to have the same land use characteristics as the Preferred Alternative. Approximately 3.4 million square feet of development would be institutional, office, light industrial, and marina uses; about 2.3 million square feet would be multi-family residential development; and about 375,000 square feet of development would be retail or restaurant uses. The Puget Sound Energy Encogen facility would operate until 2016.

This Alternative would provide approximately 33 acres of public parks, trails, and open space. Major pedestrian connections would be provided along Commercial Street, which would be a "Green Street" including open space and a pedestrian-oriented environment, and Central Avenue between Holly Street and Roeder Avenue which would be converted to a pedestrian corridor. Bicycle facilities would be provided along all roadways within the development as well as along Roeder Avenue along the project frontage. A parks and trails system would be developed along Bellingham Bay and a short trail would be constructed along C Street to Roeder Avenue.

On-site circulation would be provided via extensions of Chestnut Street and Maple Street within the Marine Trades Area and extensions of Central Avenue, Bay Street, and Commercial Street within the other redevelopment areas. The site would be accessed via Hilton Avenue, F Street and C Street, and Central Avenue as well as new bridges at Bay Street, Commercial Street, and Cornwall Avenue.

The Preferred Alternative also assumes relocation of the BNSF railroad corridor by 2016.

Chapter 2: Impacts and Alternatives Comparison

This chapter describes future 2016 and 2026 conditions for the transportation systems within the study area under the Preferred Alternative. The future transportation system conditions were established based on forecasts consistent with regional planning including the Whatcom Council of Governments and the City of Bellingham. The No-Action Alternative, discussed in the DEIS, establishes the baseline information for system performance against which the Preferred Alternative is compared. A set of new off-site transportation facilities and services were assumed to be in place by 2016 and 2026 and accounted for in the development of the travel forecasts for the Preferred Alternative. The Preferred Alternative was evaluated based on a set of performance measures for each of the main modal components, consistent with those used in the DEIS.

Alternative Overview

Table 1 provides a summary of the land use assumptions under the Preferred Alternative (and Straight Street Grid) by land use type. For comparison purposes, the table also provides the No-Action and Alternative 2/2A land uses from the DEIS. The DEIS Alternative 2/2A is most similar to the Preferred Alternative in that 6 million square feet of development is assumed by 2026. Detailed information on the land use assumptions for the Preferred Alternative is provided in Appendix M-1. As shown in the table as compared to DEIS Alternative 2/2A, the Preferred Alternative would develop approximately 460 less residential dwelling units and approximately 550,000 square feet more commercial use.

Table 1. Land Use Summary by Alternative

Land Use	DEIS No-Action Alternative ¹	DEIS Alternative 2/2A (Medium Density)	Preferred Alternative
<i>2016 Horizon Year</i>			
Office	-	488,500 sf	663,500 sf
Institutional	-	285,000 sf	335,000 sf
Industrial ²	1,097,529 sf	310,000 sf	535,000 sf
Boat Launch	600 boat slips	460 boat slips	460 boat slips
Low-Rise Residential	-	488 du	184 du
Mid-Rise Residential	-	746 du	675 du
High-Rise Residential	-	-	-
Retail	-	86,000 sf	88,000 sf
Restaurant	-	39,500 sf	37,500 sf
<i>Total</i>			
Commercial³	1,097,529 sf	1,209,000 sf	1,659,000 sf
Marina	600 boat slips	460 boat slips	460 boat slips
Residential	-	1,234 du	859 du
<i>2026 Horizon Year</i>			
Office	-	1,785,000 sf	2,000,000 sf
Institutional	-	570,000 sf	670,000 sf
Industrial ²	2,195,058 sf	450,000 sf	685,000 sf
Boat Launch	600 boat slips	460 boat slips	460 boat slips
Low-Rise Residential	-	500 du	334 du
Mid-Rise Residential	-	1,392 du	1100 du
High-Rise Residential	-	458 du	458 du
Retail	-	310,000 sf	310,000 sf
Restaurant	-	65,000 sf	65,000 sf
<i>Total</i>			
Commercial³	2,195,058 sf	3,180,000 sf	3,730,000 sf
Marina	600 boat slips	460 boat slips	460 boat slips
Residential	-	2,350 du	1,892 du

Source: Collins Woerman (August 2007 and August 2008)

sf = square feet and du = dwelling units

1. The No-Action Alternative land use includes existing support office uses.

2. Includes warehouse, light industrial, marine industrial, and support office uses.

3. Commercial includes office, industrial, retail, and restaurant uses.

Programmed and Planned Transportation Improvements

This evaluation includes transportation improvements assumed to be in place in both the on-site and off-site study area. The off-site improvements for both the Preferred Alternative and the Straight Street Grid are the same as those described in the DEIS, and are based on the City of Bellingham's 2005 *Comprehensive Plan* and 2008 – 2013 *Transportation Improvement Plan* (TIP).

The Preferred Alternative on-site infrastructure improvements are based on the Port of Bellingham's project description entitled *The Proposal* dated June 10, 2008 and supplemental information provided by CollinsWoerman in August 2008. The street systems proposed with the Preferred Alternative would improve connections to the off-site transportation system as well as access and circulation to and through the site. As an

option to the Preferred Alternative, the Straight Street Grid is evaluated. As discussed previously, the Straight Street Grid would have a similar on-site land use and density as well as off-site street system as the Preferred Alternative; however, the on-site street network would be different.

For both grid systems, roadway upgrades would occur to the existing Hilton Avenue, F Street, and C Street, and new Chestnut and Maple connector streets would be provided within the Marine Trades area to serve traffic. In addition, Central Avenue and Bay Street would be extended within the other redevelopment areas to serve traffic and connect to the off-site road system. Table 2 shows the project access and roadway system for both the Preferred Alternative and the Straight Street Grid Option. Figures 1 and 2 illustrate the street system for the two on-site roadway systems. The numbers in the table and the descriptions below correspond to the figure. The following provides a general description of the assumed roadway infrastructure for both grid systems:

Marine Trades

- **Hilton Avenue (1)** – For the Preferred Alternative and the Straight Street Grid by 2016, this roadway would be classified as an industrial street with 6-foot sidewalks on one side of the street and no on-street parking. Two 13-foot travel lanes would be provided in each direction which would accommodate both vehicular and bicycle travel. The total right-of-way for these roadways would be 40 feet.
- **F Street and C Street (2, 3)** – For the Preferred Alternative and the Straight Street Grid by 2016, this roadway would be classified as an industrial/transitional residential street. This roadway type would support industrial uses and create a pedestrian/bicycle environment for this portion of the Marine Trades area which would provide mixed-uses including industrial, commercial and residential. The cross-section includes 10-foot sidewalks/landscaping areas and 7-foot parking lanes on both sides of the street. Two 13-foot travel lanes would be provided in each direction which would accommodate both vehicular and bicycle travel. The total right-of-way for these roadways would be 60 feet.
- **Maple Street and Chestnut Street (4)** – For the Preferred Alternative and the Straight Street Grid by 2016, these roadways would be classified as an industrial/transitional residential street with 8.5-foot sidewalks/landscaping areas on both sides of the street and 7-foot parking lanes on one side of the street. Two 13-foot travel lanes would be provided in each direction which would accommodate both vehicular and bicycle travel. The total right-of-way for these roadways would be 50 feet.
- **C Street/W Holly Street and C Street/Roeder Avenue (5)** – For the Preferred Alternative and the Straight Street Grid by 2016, traffic signals would be installed at these two intersections and C Street would be reconstructed to provide a three lane section with associated sidewalks between Roeder Avenue and Holly Street. A railroad crossing with a gate would be incorporated into the traffic signal at the C Street/Roeder Avenue intersection.

Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach Redevelopment Areas

- **Central Avenue/Bloedel Avenue (6, 7)** – For the Preferred Alternative and the Straight Street Grid by 2016, the existing Central Avenue would be upgraded and extended into the site. This roadway would be classified retail street with 14-foot sidewalks/landscaping areas and 7-foot parking lanes on both sides of the street. Two 16.5-foot travel lanes would be provided in each direction which would accommodate vehicular travel as well as bicycle lanes. In addition, a 10-foot two-way left-turn lane would be provided throughout Bloedel Avenue. The total right-of-way for this roadway would be 85 feet. The Central Avenue/Roeder Avenue intersection would be signalized. In addition, with both the Preferred Alternative and the Straight Street Grid Option, Central Avenue between Holly Street and Roeder Avenue would be converted into a pedestrian corridor. The closure of Central Avenue (between Holly Street and Roeder Avenue) as a vehicular access would eliminate the safety and operational issues that would occur due to the offset intersections. With offset intersections, a higher cycle length would be needed to accommodate the longer vehicular crossing on Roeder Avenue and a separate pedestrian signal phase would be needed to provide safe crossing. Therefore, without the closure of Central Avenue, the offset intersection would reduce the efficiency of overall intersection operations especially along Roeder Avenue.
- **Commercial Street (8, 9)** – For the Preferred Alternative by 2016, this roadway would be extended beyond the new Paper Avenue connector street. Commercial Street would be classified as a Green Street which would include an open space component flanked by streets on each side of the open space with the streets on one side focused on movement of vehicular traffic as well as pedestrians and bicycles and the other side oriented towards slower traffic and pedestrians. This roadway would be built in phases with the portion oriented towards movement of vehicles and other modes completed by 2016 to support vehicular traffic generated by the development and the pedestrian environment completed by 2026 to support the increase in pedestrians and bicyclists as density increases. The vehicular connection would provide 5-foot sidewalks adjacent to the open space, 13-foot sidewalks/landscaping area on the other side, and 7-foot parking lanes on both sides of the street. Two 16.5-foot travel lanes would be provided in each direction which would accommodate vehicular travel as well as bicycle lanes. In addition, the Commercial Street/Chestnut Street intersection would be signalized. By 2026, the roadway would be expanded to provide the pedestrian environment with one-way traffic flow and inclusion of a 12-foot sidewalk/landscaping area, one 7-foot parking lane, and one 12-foot shared vehicular/bicycle lane. The one-way street and open space northwest of Paper Avenue will have a right-of-way of 220 feet while the one-way street and open space southeast of Paper Avenue will be private for public use. The Straight Street Grid would not construct the Commercial Street bridge connection but would provide a Commercial Street connection between Maple Street and Oak Street.

- **Paper Avenue (10)** – The internal connections for the two Alternatives would be different. The Preferred Alternative would remove the existing Laurel Street and construct Paper Avenue which would extend from Bay Street to Oak Street by 2016 and all the way to Pine Street by 2026. This roadway would be classified as a residential street with 13.5-foot sidewalks/landscaping areas and 7-foot parking lanes on both sides of the street. Two 12-foot travel lanes would be provided in each direction which would accommodate both vehicular and bicycle travel. The total right-of-way for this roadway would be 65 feet.
- **Laurel Street (10)** – Instead of Paper Avenue, the Straight Street Grid would upgrade the existing Laurel Street from Central Avenue to Cornwall Avenue as described in the DEIS. This roadway would be classified retail street with 14-foot sidewalks/landscaping areas and 7-foot parking lanes on both sides of the street. Two 16.5-foot travel lanes would be provided in each direction which would accommodate vehicular travel as well as bicycle lanes. In addition, a 10-foot two-way left-turn lane would be provided throughout Laurel Street. The total right-of-way for this roadway would be 85 feet.
- **Cornwall Avenue/Cornwall Bridge (11, 12)** – The Preferred Alternative would close the Cornwall Bridge while the Straight Street Grid would reconstruct the bridge by 2016. Both Alternatives would extend Cornwall Avenue south of Oak Street into the Cornwall Beach Area by 2016. Within the Cornwall Beach Area, this roadway would be classified as a residential park street which would provide one 6-foot sidewalk, one 7-foot parking lane, and two 12-foot shared vehicular/bicycle lanes. The total right-of-way for this roadway would be 45 feet. North of Wharf Street, Cornwall Avenue would be classified as an arterial street which would accommodate bicycle lanes and on-street parking on both sides of the street as well as two travel lanes.
- **Railroad Relocation (13)** – By 2016, both the Preferred Alternative and the Straight Street Grid Option would relocate the railroad to the northeast edge of the property. The relocation of the railroad would decrease the number of at grade crossings on-site.
- **Wharf Street/State Street (14)** – Both the Preferred Alternative and the Straight Street Grid would reconfigure the Wharf Street/State Street intersection. The intersection currently operates as two intersections; this improvement would create one intersection controlled by a roundabout.
- **Oak Street (15)** – For the Preferred Alternative, this new connector street would be constructed from Paper Avenue to Cornwall Avenue by 2016 and from Paper Avenue to Log Pond Drive by 2026. For the Straight Street Grid, this roadway would be constructed from Bay Street to Cornwall Avenue by 2016. This roadway would be classified as a residential street, and would have the same configuration as Paper Avenue.
- **Bay Street (16)** – Both Alternatives would reconstruct the Bay Street Bridge and extend this roadway into the site by 2026. This roadway would be

classified as a residential street, and would have the same configuration as Paper Avenue.

- **Log Pond Drive (17)** – For the Preferred Alternative by 2026, this roadway would extend from Cornwall Avenue to Pine Street with a bridge between Bloedel Avenue and Cornwall Avenue. From Cornwall Avenue to Paper Avenue this roadway would be classified as a retail street, and would have the same configuration as Bloedel Avenue. From Paper Avenue to Pine Street, this roadway would be classified as a residential street and would have the same configuration as Paper Avenue. Log Pond Drive would not be included in Straight Street Grid.

In comparison to the DEIS Alternatives, both the Preferred Alternative and Straight Street Grid would improve traffic control at site access locations by providing channelization and traffic control improvements at C Street, Central Avenue, Bay Street, Commercial Street, and Log Pond Drive/Cornwall Avenue.

Table 2. 2016 and 2026 Roadway Infrastructure Improvements by Alternative

Map ID ¹	Preferred Alternative	Straight Street Grid Option
2016 Improvements by Alternative		
1	Hilton Avenue – Upgrade	
2	F Street – Upgrade	
3	C Street Upgrade	
4	Maple Street / Chestnut Street – Build connector in Marine Trades Area ²	
5	C Street with Roeder Avenue and Holly Street – Install traffic signal, upgrade C Street and provide rail crossing	
6	Central Avenue/Bloedel Avenue – Upgrade roadway and extend to Bloedel Avenue, extend Bloedel Avenue to Log Pond Drive, pedestrian corridor between Roeder Avenue and Holly Street	Central Avenue – Upgrade roadway and extend to Laurel Street
7	Central Avenue/Roeder Avenue – Install traffic signal	
8	Commercial Street Bridge - Extend street beyond Paper Avenue	Commercial Street – No bridge connection
9	Commercial Street/Chestnut Street – Upgrade traffic signal	Commercial Street/Chestnut Street – Same as existing
10	Paper Avenue – Build connector from Bay Street to Oak Street	Laurel Street – Upgrade for Cornwall Avenue to Central Avenue
11	Cornwall Avenue Bridge – Close roadway at railroad between Maple Street and Bloedel Avenue	Cornwall Avenue Bridge – Re-construct Bridge
12	Cornwall Avenue South of Oak Road –extend to Cornwall Beach Area	
13	Relocate railroad	
14	Wharf Street/State Street – Install roundabout	
15	Oak Street – Construct from Paper Avenue to Cornwall Avenue	Oak Street – Construct from Cornwall Avenue to Bay Street
2026 Improvements by Alternative		
10	Paper Avenue – Build connector from Oak Street to Pine Street	Laurel Street – Same as 2016
15	Oak Street – Construct from Paper Avenue to Log Pond Drive	Same as 2016
16	Bay Street – Reconstruct bridge	
17	Log Pond Drive – Construct bridge to Cornwall Avenue extend to Oak Street	Log Pond Drive – Not part of Alternative
18	Maple Street/Cornwall Avenue – Upgrade Maple Street including intersection traffic control at Cornwall Avenue, State Street, and Forest Street	Maple Street/Cornwall Avenue – Upgrade Maple Street including intersection traffic control at Cornwall Avenue, State Street, and Forest Street

Source: Collins Woerman (August 2008)

1. Numbers correspond to Figures 1 and 2.
2. Roads do not connect to Maple Street and Chestnut Street off-site.

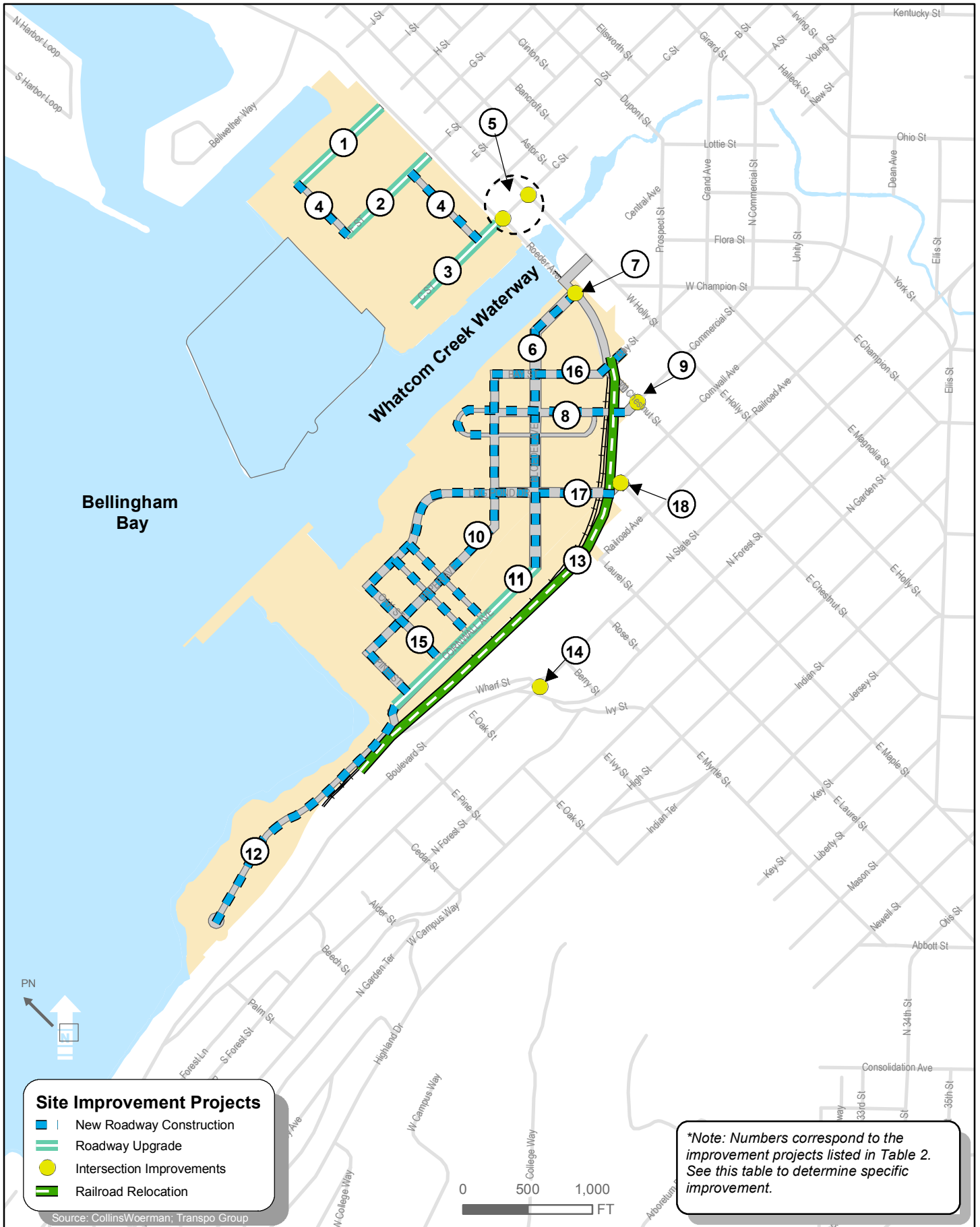


Figure 1
Preferred Alternative
On-Site Infrastructure Improvements

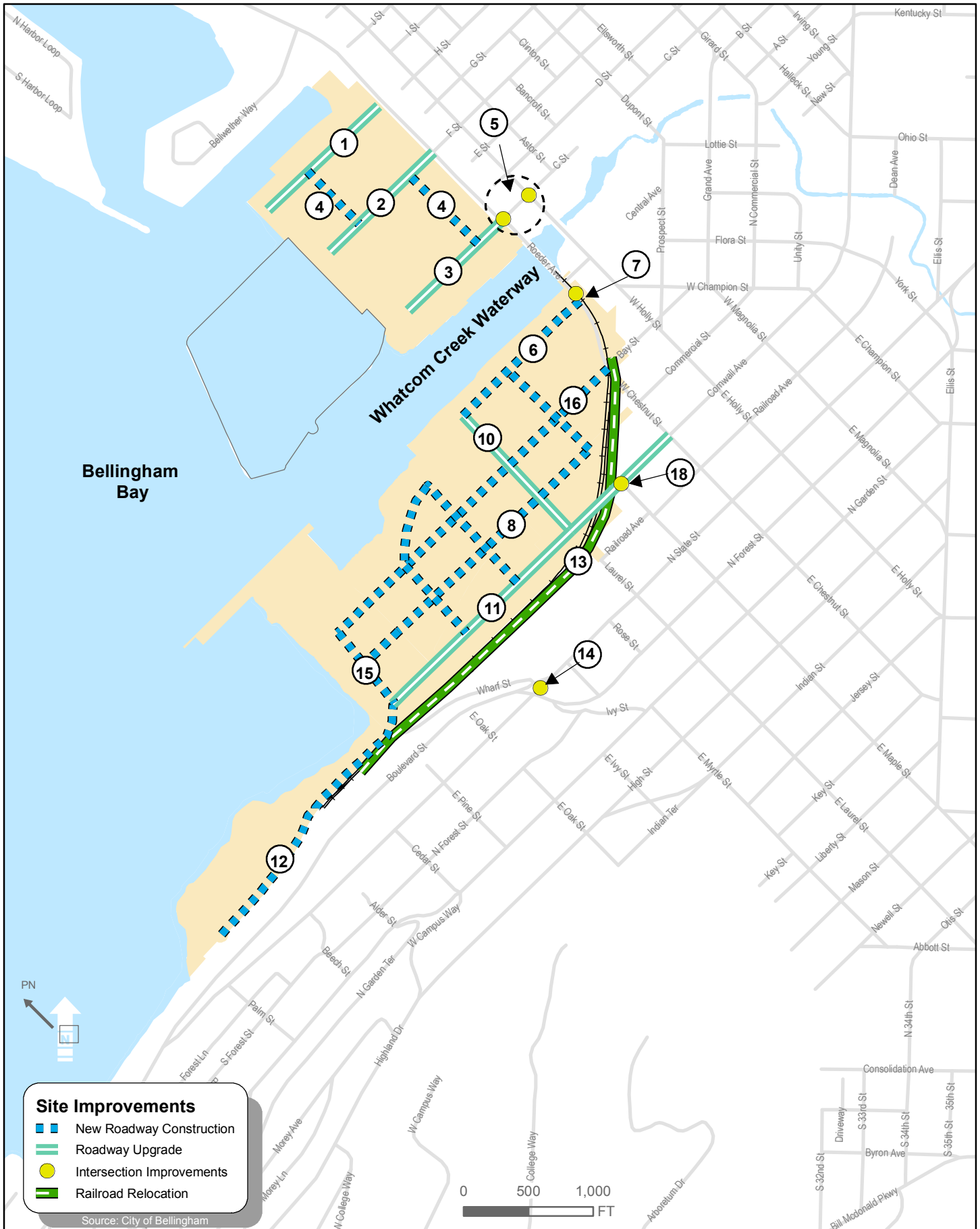


Figure 2
 Straight Street Grid Option
 On-Site Infrastructure Improvements

Travel Forecasts

The Preferred Alternative was evaluated for 2016 and 2026 travel conditions. The background travel forecasts were estimated using the same method and assumptions described in the DEIS. The City of Bellingham travel demand model was utilized with refinements to the New Whatcom Redevelopment Project area based on the preferred land use and roadway network. The traffic volume forecasts were assumed to be the same for both the Preferred Alternative and Straight Street Grid, given the similarity in land uses and density.

Trip Generation

Trip generation was calculated for both the weekday AM and PM peak hours for the Preferred Alternative. Traffic generated by this alternative was distributed and assigned to the study area using the City's travel demand model. The process for estimating trip generation uses the same method as described in the DEIS (see Appendix N of the DEIS). Appendix M-1 provides detailed trip generation calculations. A summary of estimated AM and PM peak hour vehicle trip generation for the Preferred Alternative is provided in Table 3. DEIS Alternative 2/2A is shown for comparison purposes.

Table 3. Estimated Vehicle Trip Generation Summary

Scenario	AM Peak Hour Net New Vehicle Trips ¹			PM Peak Hour Net New Vehicle Trips ¹		
	Total	In	Out	Total	In	Out
<i>Preferred Alternative</i>						
Net New Trips 2016 ²	1,791	1,272	519	1,975	641	1,334
Net New Trips 2026 ²	4,229	3,144	1,085	4,806	1,465	3,341
<i>DEIS Alternative 2/2A - Medium Density</i>						
Net New Trips 2016 ²	1,551	946	604	1,746	704	1,042
Net New Trips 2026 ²	3,940	2,751	1,188	4,538	1,541	2,997

Source: The Transpo Group (July 2007 and September 2008)

1. Vehicle trips were estimated based on person trips for each land use.
2. The net new trips account for the existing trips on-site including the Georgia Pacific (GP) Tissue Mill which was closed in 2007. With the GP closure, the existing site trip generation likely decreased.

As shown in the table, the Preferred Alternative would generate approximately 1,791 AM and 1,975 PM peak hour net new vehicles trips at the 2016 horizon year and approximately 4,229 AM and 4,806 PM peak hour net new vehicles trips at the 2026 horizon year. The 2016 horizon year would generate about 40 percent of the net new peak-hour vehicle trips projected for 2026. As compared to DEIS Alternative 2/2A the net new peak hour trips for the Preferred Alternative would be slightly higher. The higher trip generation is because the Preferred Alternative would have less residential and more commercial/employment uses which generate more trips per square foot. However, due to the changes in the mix of land uses (less residential, more commercial/employment uses), the Preferred Alternative (as compared to Alternative 2/2A) would have less outbound traffic during the AM peak hour and less inbound traffic during the PM peak hour.

Trip Distribution and Assignment

Distribution and assignment of the Preferred Alternative and Straight Street Grid uses the same methodology described in the DEIS (see Appendix N of the DEIS).

Construction Impacts

Similar to the DEIS Alternatives, the Preferred Alternative would be constructed over a 20 year period with an interim phase in 2016 and full build-out by 2026. As discussed in the DEIS, fill and other materials as well as equipment would be brought to the site via barge and/or truck with a majority likely via barges. As a conservative estimate, the analysis of construction impacts assumes construction traffic would use the street system and consist of trucks bringing and removing equipment and materials as well as construction employees coming to and from the site. Construction impacts of the Preferred Alternative would be the same as those disclosed in the DEIS.

Construction traffic may be intermittently heavy during construction but overall would be less than traffic generated by build-out of the site. As disclosed in the DEIS, up to 700,000 cubic yards of material would be hauled to and from the site over the 20-year period which would generate about 34 daily truck trips with about 3 truck trips during the PM peak hour. The number of construction workers is unknown at this time; however, the workers would generate substantially less traffic than the projected 1,975 to 4,800 net new PM peak hour trips anticipated with completion of the 2016 and 2026 phases of the Preferred Alternative. Therefore, impacts of construction traffic are expected to be the less than the impacts of the Preferred Alternative. In addition, the Straight Street Grid is anticipated to have similar impacts.

Operations Impacts

This section discusses the operations for the Preferred Alternative for both 2016 and 2026 conditions. Both on-site and off-site operations are discussed relative to the transportation system including the street system, non-motorized facilities, transit, rail, and parking. These impacts are evaluated using the methodologies described in the DEIS. For most parts of the transportation system, the Straight Street Grid would be similar to the Preferred Alternative. Therefore, an evaluation of the Straight Street Grid is presented for only those aspects that would be different.

This discussion is consistent with the DEIS and focuses on the key roadway segments and intersections identified in the DEIS as potentially impacted. Appendices M-2 and M-3 provide a summary of the evaluation for all of the study locations consistent with those evaluated in the DEIS. Figure 3 presents traffic volumes for the street system on-site and in the vicinity of the site for the Preferred Alternative under both the 2016 and 2026 conditions. Figure 4 provides traffic volumes for the street system on-site (i.e., where traffic volumes would differ from the Preferred Alternative) for the Straight Street Grid under both the 2016 and 2026 conditions.

2016

The evaluation of the Preferred Alternative for 2016 operations and comparison to the DEIS No-Action illustrates the expected transportation environment with the Preferred Alternative as well as how the transportation system would operate relative to No-Action conditions.

Street System

The Preferred Alternative 2016 PM peak hour travel forecasts were used to evaluate roadways and intersections to gain an understanding of how the street system would operate (see Figures 3 and 4). Impacts to the street system are measured by determining roadway and intersection LOS. Table 4 provides a comparison of DEIS No-Action and the Preferred Alternative 2016 on-site roadway and intersection operations¹. Table 5 provides a comparison of No-Action and the Preferred Alternative 2016 off-site roadway and intersection operations. DEIS Alternative 2 2016 operational analysis is provided for reference. With the roadway improvements provided for the Preferred Alternative in 2016, there would be additional intersections on-site which would not be constructed under the No-Action 2016 Alternative.

¹ Appendix M-3 provides detailed intersection LOS worksheets for Preferred Alternative 2016 PM peak hour conditions. Appendix M-2 provides the entire roadway segment analysis.

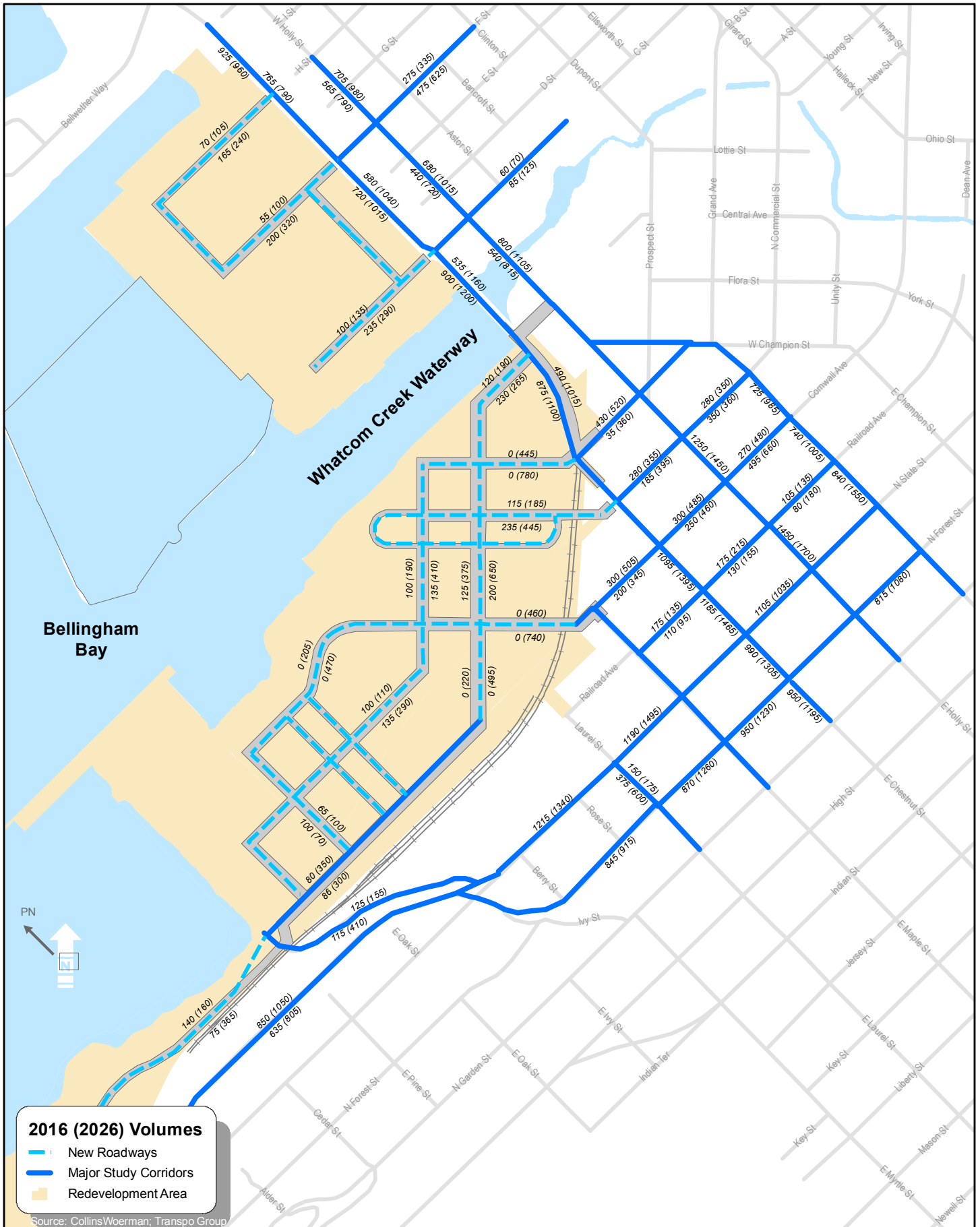


Figure 3
Preferred Alternative
PM Peak Hour Traffic Volumes

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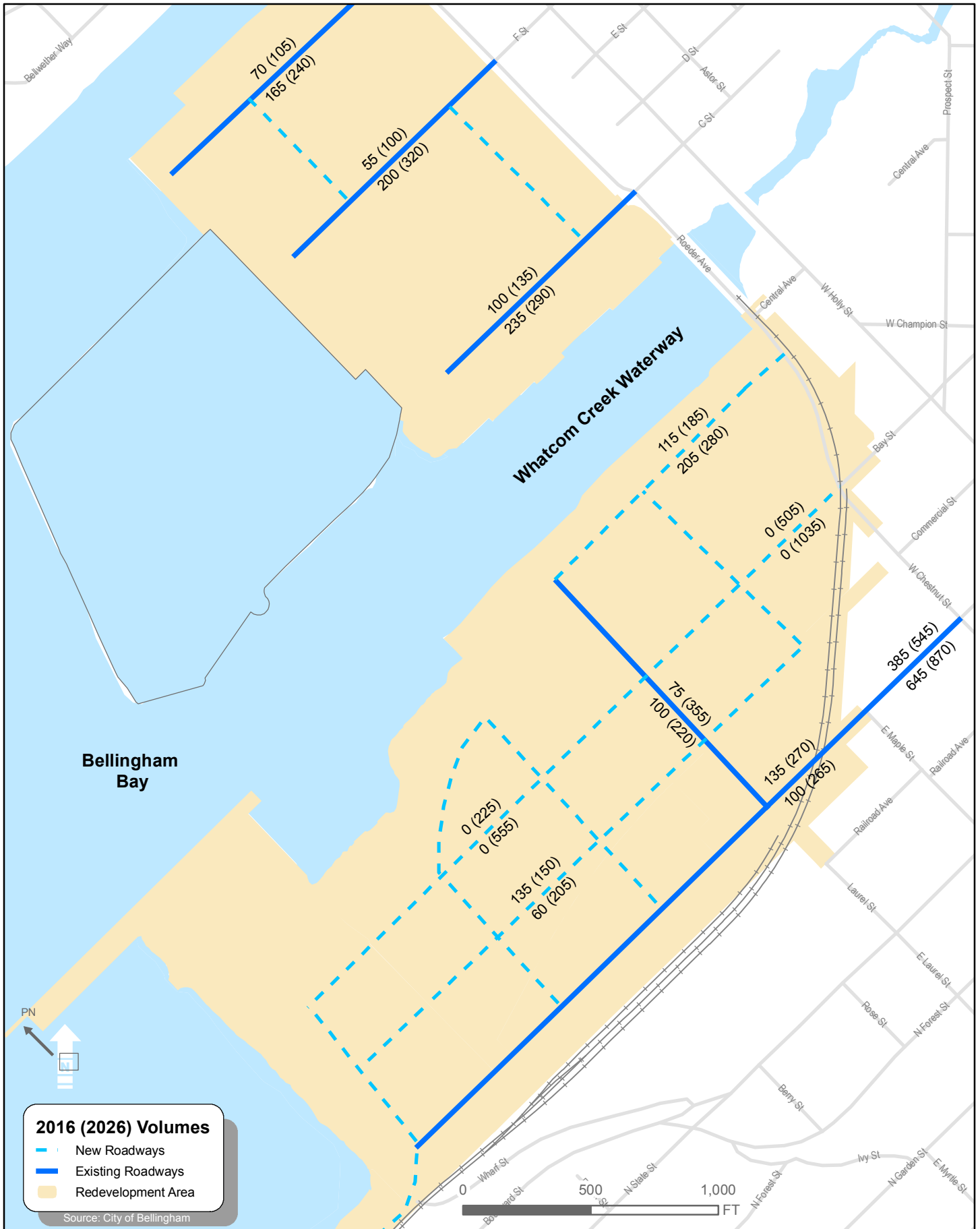


Figure 4
Straight Street Grid Option
PM Peak Hour Traffic Volumes

New Whatcom
Redevelopment SEIS

Table 4. 2016 DEIS No-Action, DEIS Alternative 2 and Preferred Alternative—PM Peak Hour On-Site Roadway and Intersection Operations

Roadways ¹	DEIS No-Action			DEIS Alternative 2			Preferred Alternative		
	LOS ²	Volume	V/C ³	LOS ²	Volume	V/C ³	LOS ²	Volume	V/C ³
Roeder Ave – Broadway St to F St (SEB)	D	765	0.82	D	800	0.85	D	815	0.87
Roeder Ave – Broadway St to F St (NWB)	D	780	0.83	D	750	0.80	D	770	0.82
Roeder Ave – F St to C St (SEB)	C	680	0.72	C	695	0.74	D	775	0.83
Roeder Ave – F St to C St (NWB)	B	615	0.66	B	585	0.62	A	540	0.58
Roeder Ave – C St to Central Ave (SEB)	C	675	0.72	D	815	0.87	E	900	0.96
Roeder Ave – C Street to Central Ave (NWB)	C	665	0.71	B	580	0.62	A	535	0.57
Roeder Ave – Central Ave to Bay St (SEB)	D	800	0.85	D	815	0.87	D	825	0.88
Roeder Ave – Central Ave to Bay St (NWB)	A	460	0.49	A	355	0.38	A	360	0.38
Cornwall Ave – Wharf St to Maple St (NEB)	D	710	0.87	A	75	0.09	A	75	0.09
Cornwall Ave – Maple St to Chestnut St (NEB)	D	710	0.87	B	500	0.62	B	555	0.68

Intersections ^{1,7}	LOS ²	Delay ⁴	V/C ⁵ or WM ⁶		LOS ²	Delay ⁴	V/C ⁵ or WM ⁶		LOS ²	Delay ⁴	V/C ⁵ or WM ⁶	
			V/C ⁵	WM ⁶			V/C ⁵	WM ⁶			V/C ⁵	WM ⁶
1. Roeder Ave/Hilton Ave	F	84	NB		F	>200	NB		F	>200	NB	
2. Roeder Ave/F St	D	48	0.69		D	49	0.74		D	49	0.76	
3. Roeder Ave/C St ⁸	F	114	NB/SB		F	>200	SB		C	24	0.62	
4. Roeder Ave/Central Ave ⁹	F	>200	NB/SB		F	>200	NB		B	16	0.80	
5. West Chestnut St/Bay St/Roeder Ave	F	>200	SBL		F	>200	SBL		F	>200	SBL	
6. West Chestnut St/Commercial St	B	15	0.55		B	14	0.56		B	16	0.71	
7. East Chestnut St/Cornwall Ave	E	57	1.09		C	21	0.82		D	39	0.98	

Source: The Transpo Group (August 2007 and September 2008)

Notes: SEB = south-eastbound; NWB = north-westbound; NEB = north-eastbound

- Operations are shown for those locations presented in the DEIS. A summary of all study location operations is provided in Appendix M-2 and M-3.
- Level of service, based on 2000 *Highway Capacity Manual* methodology.
- Volume-to-capacity ratio reported for roadway segments where is capacity based on City of Bellingham Concurrency Model.
- Average delay in seconds per vehicle.
- Volume-to-capacity ratio reported for signalized intersections.
- Worst movement for unsignalized intersections.
- The intersection operations for locations 1, 2, and 3 would be the same for the Preferred Alternative and Straight Street Grid Option.
- The Preferred Alternative includes installation of a traffic signal at this location as well as turn lanes on C Street.
- The Preferred Alternative includes installation of a traffic signal as well as closure of Central Avenue between Roeder Avenue and Holly Street.

As shown in the table, with the addition of the Preferred Alternative 2016 traffic, all of the on-site roadways would continue to meet the City's LOS E standard. Roadway operations for the Preferred Alternative would be similar to the DEIS Alternative 2. As compared to the DEIS No-Action Alternative, roadway operations for the Preferred Alternative would improve at some locations due to the on-site roadway improvements proposed as part of the redevelopment. These improvements include provision of additional site access locations which would shift traffic.

The following two site access locations along Chestnut Street and Roeder Avenue would continue to operate at LOS F with the addition of Preferred Alternative 2016 traffic:

- Roeder Avenue/Hilton Avenue (1)
- West Chestnut Street/Bay Street/Roeder Avenue (5)

As compared to DEIS Alternative 2, the Preferred Alternative would improve operations at the C Street and Central Avenue intersections with Roeder Avenue due to the assumed installation of traffic signals. These improvements are part of the Preferred Alternative development proposal.

Table 5. 2016 DEIS No-Action, DEIS Alternative 2, and Preferred Alternative—PM Peak Hour Off-Site Roadway and Intersection Operations

Roadways ¹	DEIS No-Action		DEIS Alternative 2		Preferred Alternative	
	LOS ²	Volume V/C ³	LOS ²	Volume V/C ³	LOS ²	Volume V/C ³
Holly St - Broadway St to F St (SEB)	B	560 0.69	C	585 0.72	B	570 0.70
Holly St - Broadway St to F St (NWB)	D	675 0.83	D	710 0.87	D	705 0.87
Holly St - F St to Central Ave (SEB)	A	475 0.58	A	475 0.58	A	440 0.54
Holly St - F St to Central Ave (NWB)	D	715 0.88	E	740 0.91	E	800 0.98
Holly St - Central Ave to Champion St (SEB)	B	535 0.66	B	570 0.70	D	710 0.87
Holly St - Central Ave to Champion St (NWB)	E	775 0.95	E	810 1.00	E	778 0.96
Cornwall Ave - Chestnut St to Holly St (NEB)	A	290 0.36	A	215 0.26	A	230 0.28

Intersections ^{1,7}	DEIS No-Action		DEIS Alternative 2		Preferred Alternative	
	LOS ²	Delay ⁴ V/C ⁵ or WM ⁶	LOS ²	Delay ⁴ V/C ⁵ or WM ⁶	LOS ²	Delay ⁴ V/C ⁵ or WM ⁶
1. Meridian St/Birchwood Ave	E	65 0.87	E	63 0.87	E	64 0.88
2. Meridian St/Squalicum Way	D	42 0.63	D	40 0.63	D	45 0.64
6. West Holly St/F St	C	25 0.67	C	27 0.74	C	32 0.78
7. West Holly St/ C St ⁷	F	127 SB	F	>200 SB	C	27 0.54
8. Cornwall Ave/Flora St/York St	C	21 0.75	B	20 0.73	C	22 0.76
11. East Chestnut St/Railroad Ave	F	168 SB	F	98 SB	F	>200 SB
15. Lakeway Dr/Ellis St/Jersey St/E Holly St	D	37 0.85	D	37 0.85	D	38 0.86
16. Lakeway Dr/I-5 Southbound Ramps	D	38 0.93	D	43 0.96	E	56 1.03
17. Lakeway Dr/King St	D	47 0.78	D	46 0.77	D	47 0.78
18. Lakeway Dr/Lincoln St	D	47 0.90	D	46 0.89	D	47 0.90
19. Iowa St/Moore St/I-5 Northbound Ramps	D	47 0.99	D	46 0.98	D	46 0.99
21. N State St/James St/Iowa St	F	>200 2.59	F	>200 2.79	F	>200 2.80
22. N State St/Ohio St	D	37 0.85	D	40 0.91	D	40 0.87
24. N State St/East Laurel St	D	27 EB	F	>200 WB	B	14 WB
25. N Forest St/ N State St/Boulevard St/Wharf St ⁸	Operates as two intersections see below.				B	13 N/A
a. N Forest St/N State St/Boulevard St	D	28 SBL	D	34 SBL	Roundabout - see operations above.	
b. N State St/Wharf St	C	21 EB	E	36 EB		
26. N Forest St/E Laurel St	C	20 EB	F	>200 EB	E	37 EB
28. S Samish Way/Elwood Ave/Lincoln St	C	34 0.85	D	38 0.88	D	39 0.89

Source: The Transpo Group (August 2007 and September 2008)

Notes: SEB = south-eastbound; NWB = north-westbound; NEB = north-eastbound

- Operations are shown for those locations presented in the DEIS. A summary of all study location operations is provided in Appendix M-2 and M-3.
- Level of service, based on 2000 *Highway Capacity Manual* methodology.
- Volume-to-capacity ratio reported for roadway segments where is capacity based on City of Bellingham Concurrency Model.
- Average delay in seconds per vehicle.
- Volume-to-capacity ratio reported for signalized intersections.
- Worst movement for unsignalized intersections. Not applicable (N/A) for roundabout control intersections.
- The Preferred Alternative includes installation of a traffic signal and turn lanes.
- This intersection operates as two separate intersections in the field; therefore, the analysis was conducted as such. Roundabout control was assumed for the Preferred Alternative.

As shown in the table, all of the off-site roadways would continue to meet the City's LOS E standard. Table 5 shows the Preferred Alternative 2016 traffic would worsen LOS F operations at the following intersections:

- Chestnut Street/Railroad Avenue (11)
- State Street/James Street/Iowa Street (21)

These two intersections would also have LOS F operations with the DEIS No-Action Alternative and Alternative 2. Some intersections operations would improve slightly with the Preferred Alternative 2016, as compared to the DEIS No-Action Alternative and Alternative 2, due to the assumed intersection improvements. As discussed previously, these improvements include installation of a traffic signal at the Holly Street/C Street intersection and roundabout control at the Forest Street/State Street/Boulevard Street/Wharf Street intersection.

Straight Street Grid

The Straight Street Grid Option would be anticipated to have similar operations as the Preferred Alternative off-site. On-site operations are anticipated to be similar to the Preferred Alternative except at a few key site access locations. The differences in operations would occur within the Downtown Waterfront, Log Pond, Cornwall Beach, and Shipping Terminal redevelopment areas since the on-site roadway system and site access locations would be different from the Preferred Alternative.

Detailed phasing of the internal roadway system for the Straight Street Grid has not been formulated to date; therefore, an evaluation was conducted for the site access intersections only. However, it is anticipated that internal intersection and roadway operations would be sufficient with the Straight Street Grid Option since it is similar to the Preferred Alternative in that it provides two main roadways (i.e., Bay Street and Cornwall Avenue) which run the length of the site beginning in the Downtown Waterfront area and running to the southwest. These main roadways distribute traffic to five collectors which run perpendicular from Whatcom Creek Waterway to the southeast.

The main difference between the Straight Street Grid and the Preferred Alternative in 2016 is that from Chestnut Street the Straight Street Grid would provide site access via Central Avenue and Cornwall Avenue while the Preferred Alternative would provide access via Central Avenue and Commercial Street. Table 6 provides a comparison of the Preferred Alternative and Straight Street Grid intersection operations at the four locations where the difference in site access may result in operational changes. Detailed LOS worksheets are provided in Appendix M-2. Roadway operations along Roeder Avenue/Chestnut Street for the Straight Street Grid are anticipated to be similar to the Preferred Alternative and would meet the City's LOS E standard since the land use would be the same.

Table 6. 2016 Preferred Alternative and Straight Street Grid—PM Peak Hour On-Site Intersection Operations

Intersections ¹	Preferred Alternative			Straight Street Grid		
	LOS ²	Delay ³	V/C ⁴ or WM ⁵	LOS ²	Delay ³	V/C ⁴ or WM ⁵
4. Roeder Avenue/Central Avenue ⁶	B	16	0.80	C	21	0.69
5. West Chestnut Street/Bay Street/Roeder Avenue	F	>200	SB	F	>200	SBL
6. West Chestnut Street/Commercial Street	B	16	0.71	B	13	0.61
7. East Chestnut Street/Cornwall Avenue	D	39	0.98	D	36	0.98

Source: The Transpo Group (September 2008)

Notes: SEB = south-eastbound; NWB = north-westbound; NEB = north-eastbound

- Operations are shown for the site access locations along Roeder Avenue/Chestnut Street which would be affected by the difference in roadway systems.
- Level of service, based on 2000 *Highway Capacity Manual* methodology.
- Average delay in seconds per vehicle.
- Volume-to-capacity ratio reported for signalized intersections.
- Worst movement for unsignalized intersections.
- The Preferred Alternative and Straight Street Grid assume a traffic signal at this location.

As shown in the table, the Preferred Alternative and Straight Street Grid would have similar intersection operations. For both roadway systems, the West Chestnut Street/Bay Street/Roeder Avenue intersection would operate at LOS F due to both background growth as well as project traffic. The Preferred Alternative would provide access via Bay Street in 2026 and would improve this intersection with installation of a traffic signal.

Non-Motorized

The Preferred Alternative would provide an extensive pedestrian and bicycle system with sidewalks and bicycle facilities along all roadways within the redevelopment area as well as a trail system that connects to the existing trails. Commercial Street would be designed as a “Green Street” which includes an open space component flanked by streets on each side of the open space. One side of the “Green Street” would focus primarily on the movement of vehicular traffic with sidewalks and bikes lanes for non-motorized. The other side of the “Green Street” would serve as a slower speed environment oriented towards pedestrians. Throughout the redevelopment there would be a focus on creating a pedestrian environment through the use of techniques such as street narrowing, textured paving and sidewalks, landscaping and street trees, and street furniture.

Although the redevelopment would provide connections to off-site non-motorized facilities, enhancements to off-site facilities would facilitate walking and biking between the site and downtown. Specifically, in 2016, improvements are recommended along Wharf Street (from Cornwall Avenue to State Street) to provide wider shoulders or bicycle lanes and sidewalks would improve bicycle and pedestrian accessibility from this access.

The Preferred Alternative is projected to generate about 5,800 daily pedestrian/bicycle trips which is similar to Alternative 2 evaluated in the DEIS. Non-motorized impacts would be similar to those disclosed for Alternative 2 in the DEIS. Future development and the consequent increase in vehicular volumes are expected to proportionally increase observed conflicts with pedestrians and bicyclists that exist today. However, as discussed, the Preferred Alternative would enhance pedestrian and bicycle usage on and around the site as part of its

overall development plan through provision of sidewalks, trails, and bicycle facilities. The Preferred Alternative 2016 non-motorized impacts are expected to be minimal.

The Straight Street Grid is anticipated to provide a similar pedestrian environment and bicycle network as the Preferred Alternative. In addition, it would generate the same level of daily pedestrian/bicycle trips as the Preferred Alternative. Therefore, the Straight Street Grid 2016 non-motorized impacts are expected to be minimal.

Transit

The Preferred Alternative proposal anticipates an extension of the existing and planned future transit service on-site via Hilton Avenue and F Street within the Marine Trades Area and Commercial Street and Log Pond Drive/Cornwall Avenue within the other redevelopment areas. This Alternative would generate the same amount of transit ridership as Alternative 2 in 2016 (i.e., 1,600 daily riders) and as disclosed in the DEIS the passenger loading ratio would be about 1.23. This is less than the Whatcom Transportation Authority's (WTA)'s 1.25 standard for seating capacity². However, the transit system would need to be modified to incorporate stops and service on-site to support the future development. These transit impacts would be similar to those disclosed in the DEIS.

The Straight Street Grid is anticipated to have similar impacts as the Preferred Alternative.

Rail

Relocation of the railroad is included as part of the Preferred Alternative and the Straight Street Grid in 2016. Four at-grade crossings would remain including Wharf Street/Pine Street, and at the site accesses—F Street, C Street, and Central Avenue where the railway runs parallel to Roeder Avenue. Both the Preferred Alternative and the Straight Street Grid would signalize the C Street crossing which would improve safety at this location.

The Preferred Alternative would generate more vehicular and non-motorized trips than the No-Action 2016 conditions; therefore, the chances of conflicts and potential safety issues with trains at at-grade rail crossings are greater. At-grade crossings also increase delays to vehicular traffic that must stop as trains pass through intersections. The elimination of the BNSF railway on-site creates safer rail conditions and is an improvement over the No-Action Alternative. Construction of the Commercial Street Bridge over the railroad would provide emergency access to the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach areas, as this new intersection would not be blocked by rail operations. Within the Marine Trades Area, all at-grade crossings would remain, potentially delaying emergency access when trains cross through the site access locations since they would need to access Roeder Avenue at Commercial Street or another location without an at-grade railroad crossing. These rail impacts would be similar to those disclosed in the DEIS.

The Straight Street Grid is anticipated to have rail impacts similar to the Preferred Alternative except Cornwall Avenue at Maple Street would be the only crossing over the railroad.

² Passenger loading ratio is calculated in the same manner as noted in the DEIS.

Parking

The majority of parking for the proposed project would be located on-site. The Preferred Alternative would provide 5,455 parking spaces in 2016. Table 7 summarizes the parking demand and supply for the Preferred Alternative 2016 conditions. As discussed in the DEIS, parking was analyzed in parking sub-areas to take into account shared parking that might occur between different redevelopment areas and acknowledge that shared parking opportunities would not likely occur between redevelopment areas that are not easily accessible by walking (i.e., persons might drive to another area of the site and park again). Detailed parking calculations are provided in Appendix M-4.

Table 7. Preferred Alternative 2016 Parking Demand and Supply

Parking Sub-Area	Hourly Parking Demand ¹	Proposed Parking	Recommended Supply Range ²	Parking Surplus/Deficiency Range
Marine Trades	2,210	2,918	2,431 - 2,542	487 - 377
Downtown/Log Pond (1)	849	932	934 - 976	-2 - -44
Downtown/Log Pond (2)	742	762	816 - 853	-54 - -91
Shipping Terminal	188	252	207 - 216	45 - 35
Cornwall Beach	<u>455</u>	<u>591</u>	<u>501</u> - <u>523</u>	<u>90</u> - <u>68</u>
Total	4,444	5,455	4,888 - 5,111	567 - 344

Source: Collins Woerman and The Transpo Group (September 2008)

1. Hourly parking demand represents the maximum hourly demand within the parking sub-area.

2. Recommended supply is 10 to 15 percent more than the parking demand to reduce vehicles re-circulating through the parking areas.

As shown in the table, the hourly parking demand for Preferred Alternative in 2016 is about 4,400 vehicles, which would be accommodated by the overall proposed parking supply. In addition, each redevelopment area would provide sufficient parking except the Downtown/Log Pond area where there would be a parking deficiency of approximately 56 to 135 parking spaces. However, there is a surplus in all other parking areas so this deficiency could be accommodated on-site. This is not considered an impact because as the master plan for the New Whatcom site is developed, it is assumed that parking supply and adopted standards will require that each future redevelopment project will accommodate that project's parking demand. Therefore, no parking impact is anticipated for the 2016 conditions.

It is likely that some users of the site would park off-site when visiting multiple destinations in the area. Based on the parking utilization survey conducted for the DEIS, there are currently about 570 available off-site parking spaces within ¼-mile of the site. Since a majority of the vehicles would park on-site there would be minimal impacts to off-site parking.

The Straight Street Grid is anticipated to have parking impacts similar to the Preferred Alternative.

2026

The evaluation of the Preferred Alternative 2026 operations and comparison to DEIS No-Action 2026 conditions provides an understanding of the expected transportation environment with the Preferred Alternative as well as how the transportation system would operate relative to No-Action conditions.

Street System

The Preferred Alternative 2026 PM peak hour travel forecasts were used to evaluate roadways and intersections to gain an understanding of how the street system would operate. Impacts to the street system are measured by determining roadway and intersection LOS. Table 8 provides a comparison of DEIS No-Action and the Preferred Alternative 2026 on-site roadway and intersection operations³. Table 9 provides a comparison of DEIS No-Action and the Preferred Alternative 2026 off-site roadway and intersection operations. DEIS Alternative 2 2026 operational analysis is provided for reference. With the roadway improvements provided for the Preferred Alternative in 2026, there would be additional intersections on-site which would not be constructed under the No-Action 2026 Alternative.

³ Appendix M-3 provides detailed intersection LOS worksheets for Preferred Alternative 2016 PM peak hour conditions. Appendix M-2 provides the entire roadway segment analysis.

Table 8. 2026 DEIS No-Action, DEIS Alternative 2 and Preferred Alternative—PM Peak Hour On-Site Roadway and Intersection Operations

Roadways ¹	DEIS No-Action			DEIS Alternative 2			Preferred Alternative		
	LOS ²	Volume	V/C ³	LOS ²	Volume	V/C ³	LOS ²	Volume	V/C ³
Roeder Ave – Broadway St to F St (SEB)	E	895	0.95	E	940	1.00	F	960	1.02
Roeder Ave – Broadway St to F St (NWB)	F	1,400	1.49	F	1,045	1.11	F	1,230	1.31
Roeder Ave – F St to C St (SEB)	E	855	0.91	E	905	0.96	F	1,020	1.09
Roeder Ave – F St to C St (NWB)	E	865	0.92	E	920	0.98	F	1,040	1.11
Roeder Ave – C St to Central Ave (SEB)	F	990	1.06	F	1,070	1.14	F	1,200	1.28
Roeder Ave – C St to Central Ave (NWB)	E	870	0.93	F	1,005	1.07	F	1,160	1.24
Roeder Ave –Central Ave to Bay St (SEB)	E	910	0.97	D	810	0.86	F	1,285	1.37
Roeder Ave – Central Ave to Bay St (NWB)	C	665	0.71	C	690	0.74	F	1,015	1.08
Central Ave – Laurel St to Roeder Ave (NEB)	-	-	-	C	630	0.77	-	-	-
Commercial St – Laurel St to Maple St (NEB)	-	-	-	C	585	0.72	-	-	-
Cornwall Ave – Wharf St to Maple St (NEB)	F	1,035	1.27	A	130	0.16	A	190	0.23
Cornwall Ave –Maple St to Chestnut St (NEB)	F	1,035	1.27	D	680	0.84	E	785	0.97

Intersections ^{1,7}	DEIS No-Action			DEIS Alternative 2			Preferred Alternative		
	LOS ²	Delay ⁴	V/C ⁵ or WM ⁶	LOS ²	Delay ⁴	V/C ⁵ or WM ⁶	LOS ²	Delay ⁴	V/C ⁵ or WM ⁶
1. Roeder Ave/Hilton Ave	F	>200	NB	F	>200	NB	F	>200	NB
2. Roeder Ave/F St	F	100	0.90	F	100	1.01	F	166	1.21
3. Roeder Ave/C St ⁸	F	>200	NB/SB	F	>200	NB/SB	C	26	0.87
4. Roeder Ave/Central Ave ⁹	F	>200	NB/SB	F	>200	NB/SB	C	21	0.95
5. West Chestnut St/Bay St/Roeder Ave ¹⁰	F	>200	SBL	F	>200	NB/SB	D	39	0.90
6. West Chestnut St/Commercial St ¹¹	F	>200	1.47	E	68	1.10	C	30	0.91
7. East Chestnut St/Cornwall Ave	F	>200	NB	F	>200	NB	E	80	1.13

Source: The Transpo Group (August 2007 and September 2008)

Notes: **Bold:** Indicates locations operating below existing LOS standards. SEB = south-eastbound; NWB = north-westbound; NEB = north-eastbound

1. Operations are shown for those locations presented in the DEIS. A summary of all study location operations is provided in Appendix M-2 and M-3.
2. Level of service, based on 2000 *Highway Capacity Manual* methodology.
3. Volume-to-capacity ratio reported for roadway segments.
4. Average delay in seconds per vehicle.
5. Volume-to-capacity ratio reported for signalized intersections.
6. Worst movement for unsignalized intersections.
7. The intersection operations for locations 1, 2, and 3 would be the same for the Preferred Alternative and Straight Street Grid Option.
8. The Preferred Alternative includes installation of a traffic signal at this location as well as turn lanes on C Street.
9. The Preferred Alternative includes installation of a traffic signal as well as closure of Central Avenue between Roeder Avenue and Holly Street.
10. The Preferred Alternative includes installation of a traffic signal at this location and provision of turn lanes.
11. The Preferred Alternative includes upgrading the existing traffic signal and provision of turn lanes on-site.

Table 8 shows, as compared to the DEIS No-Action, that the Preferred Alternative 2026 would worsen LOS F conditions at the following on-site locations:

- Roeder Avenue between Broadway Street and F Street in the north-westbound direction
- Roeder Avenue between C Street and Central Avenue in the south-eastbound direction
- Roeder Avenue/Hilton Avenue
- Roeder Avenue/F Street

In addition, as compared to the DEIS No-Action, operations would degrade from acceptable operations (i.e., LOS E or better) to LOS F along the following roadways:

- Roeder Avenue between Broadway Street and F Street in the south-eastbound direction
- Roeder Avenue between F Street and C Street in the both the south-eastbound and north-westbound directions
- Roeder Avenue between C Street and Central Avenue in the north-westbound direction
- Roeder Avenue between Central Avenue to Bay Street in the south-eastbound and north-westbound directions

The poor operations along Roeder Avenue are due to increases in both background traffic as well as the traffic generated by the Preferred Alternative. As compared to the DEIS No-Action Alternative and Alternative 2, roadway operations along Roeder Avenue would be worse with the addition of Preferred Alternative traffic due to additional development proposed within the Marine Trades Area (i.e., the Preferred Alternative would shift some land use from the other redevelopment areas to the Marine Trades Area). Intersection operations would improve at several locations due to proposed traffic control and channelization improvements as part of the Preferred Alternative. These improvements include traffic signals at C Street, Central Avenue, and Bay Street as well as site access improvements at Cornwall Avenue and Commercial Street (see Table 2 and associated discussion).

Table 9. 2026 DEIS No-Action, DEIS Alternative 2 and Preferred Alternative—PM Peak Hour Off-Site Roadway and Intersection Operations

Roadways ¹	DEIS No-Action			DEIS Alternative 2			Preferred Alternative		
	LOS ²	Volume	V/C ³	LOS ²	Volume	V/C ³	LOS ²	Volume	V/C ³
Holly St – Broadway St to F St (SEB)	E	775	0.95	F	900	1.11	E	800	0.98
Holly St – Broadway St to F St (NWB)	F	895	1.10	E	780	0.96	F	980	1.21
Holly St – F St to Central Ave (SEB)	D	680	0.84	D	690	0.85	D	720	0.89
Holly St – F St to Central Ave (NWB)	F	980	1.21	F	945	1.16	F	1,105	1.36
Holly St – Central Ave to Champion St (SEB)	E	775	0.95	E	800	0.98	F	890	1.09
Holly St – Central Ave to Champion St (NWB)	F	1,100	1.35	F	1,115	1.37	F	990	1.22
Cornwall Ave – Chestnut St to Holly St (NEB)	F	1,015	1.25	A	335	0.41	A	395	0.49

Intersections ¹	V/C ⁵			V/C ⁵			V/C ⁵		
	LOS ²	Delay ⁴	or WM ⁶	LOS ²	Delay ⁴	or WM ⁶	LOS ²	Delay ⁴	or WM ⁶
1. Meridian St/Birchwood Ave	F	128	1.01	F	109	1.02	F	126	1.04
2. Meridian St/Squalicum Way	D	53	0.73	E	75	0.79	E	68	0.79
6. West Holly St/F St	C	33	0.89	D	54	0.96	F	89	1.14
7. West Holly St/ C St ⁷	F	>200	NB/SB	F	>200	NB/SB	C	32	0.83
8. Cornwall Ave/Flora St/York St	D	41	0.93	D	46	1.01	D	53	1.00
11. East Chestnut St/Railroad Ave	F	>200	SB	F	>200	SB	F	>200	SB
15. Lakeway Dr/Ellis St/Jersey St/East Holly St	D	55	0.96	E	64	0.98	E	62	1.00
16. Lakeway Dr/I-5 Southbound Ramps	F	98	1.16	F	88	1.17	F	104	1.17
17. Lakeway Dr/King Street	E	69	0.84	E	66	0.87	E	69	0.83
18. Lakeway Dr/Lincoln Street	E	68	1.07	E	65	1.04	E	69	1.02
19. Iowa St/Moore St/I-5 Northbound Ramps	E	74	1.11	E	79	1.10	E	66	1.08
21. N State St/James St/Iowa St	F	>200	2.98	F	>200	3.12	F	>200	3.04
22. N State St/Ohio St	E	67	1.03	F	110	1.13	F	145	1.27
24. N State St/East Laurel St	F	81	WB	F	>200	WB	C	24	WB
25. N Forest St/ N State St/Boulevard St/Wharf St ⁸	Operates as two intersections see below.						E	58	N/A
a. N Forest St/N State St/Boulevard St	F	51	SBL	F	54	SBL	Roundabout – see operations above.		
b. N State St/Wharf St	E	39	EB	F	>200	EB			
26. N Forest St/East Laurel St	F	95	EB	F	>200	EB	F	>200	EB
28. South Samish Way/Elwood Ave/Lincoln St	E	64	1.07	E	68	1.10	E	70	1.11

Source: The Transpo Group (August 2007 and September 2008)

Notes: **Bold:** Indicates locations operating below existing LOS standards. SEB = south-eastbound; NWB = north-westbound; NEB = north-eastbound

- Operations are shown for those locations presented in the DEIS. A summary of all study location operations is provided in Appendix M-2 and M-3.
- Level of service, based on 2000 *Highway Capacity Manual* methodology.
- Volume-to-capacity ratio reported for roadway segments.
- Average delay in seconds per vehicle.
- Volume-to-capacity ratio reported for signalized intersections.
- Worst movement for unsignalized intersections. Not applicable (N/A) for roundabout control intersections.
- The Preferred Alternative includes installation of a traffic signal and turn lanes.
- This intersection operates as two separate intersections in the field; therefore, the analysis was conducted as such. Roundabout control was assumed for the Preferred Alternative.

As shown in Table 9, as compared to the DEIS No-Action Alternative, the Preferred Alternative in 2026 would impact the following off-site locations by degrading acceptable operations (i.e., LOS E or better) to LOS F:

- Holly Street between Central Avenue and Champion Street in the south-eastbound direction
- West Holly Street/F Street
- North State Street/Ohio Street

In addition to the location discussed above, as compared to the DEIS No-Action Alternative, the Preferred Alternative traffic would worsen to LOS F operations at the following locations:

- Holly Street between Broadway Street and F Street in the north-westbound direction
- Holly Street between F Street and Champion street in the north-westbound direction
- Holly Street between F Street and Central Avenue in the north-westbound direction
- Holly Street Between Central Avenue and Champion Street in the north-westbound direction
- East Chestnut Street/Railroad Avenue
- Lakeway Drive/I-5 Southbound Ramps
- North State Street/James Street/Iowa Street
- North Forest Street/East Laurel Street

As compared to the DEIS No-Action Alternative and Alternative 2, roadway operations along Holly Street would worsen with the addition of Preferred Alternative traffic due to additional development proposed within the Marine Trades Area. Intersection operations would improve at several locations due to proposed traffic control improvements and site access as part of the Preferred Alternative. It is noted that the elimination of the Laurel Street bridge as part of the site access, would improve operations at the State Street/Laurel Street intersection.

Straight Street Grid

The Straight Street Grid Option would be anticipated to have similar operations as the Preferred Alternative off-site. On-site operations are anticipated to be similar to the Preferred Alternative except at a few key site access locations. The differences in operations would occur within the Downtown Waterfront, Log Pond, Cornwall Beach, and Shipping Terminal redevelopment areas since the on-site roadway system and site access locations would be different from the Preferred Alternative.

It is anticipated that internal intersection and roadway operations would be sufficient with the Straight Street Grid Option since it is similar to the Preferred Alternative in that it provides two main roadways (i.e., Bay Street and Cornwall Avenue) which run the length of the site beginning in the Downtown Waterfront area and running to the southwest. These main roadways distribute traffic to five collectors which run perpendicular from Whatcom Creek Waterway to the southeast.

The main difference between the Straight Street Grid and the Preferred Alternative in 2026 is that from Chestnut Street the Straight Street Grid would provide site access via three locations: Central Avenue, Bay Street, and Cornwall Avenue while the Preferred Alternative would provide access via four locations: Central Avenue, Bay Street, Commercial Street, and Log Pond Drive/Cornwall Avenue. Table 10 provides a comparison of the Preferred Alternative and Straight Street Grid intersection operations at the four intersections where the difference in site access may result in operational changes. Detailed LOS worksheets are provided in Appendix M-2. Since the Straight Street Grid land use assumptions would be the same as the Preferred Alternative, roadway operations along Roeder Avenue/Chestnut Street for this option are anticipated to be similar to the Preferred Alternative. Therefore, the Straight Street Grid would not meet the City’s LOS E standard along portions of Roeder Avenue as noted for the Preferred Alternative analysis.

Table 10. 2026 Preferred Alternative and Straight Street Grid—PM Peak Hour On-Site Intersection Operations

Intersections ¹	Preferred Alternative			Straight Street Grid		
	LOS ²	Delay ³	V/C ⁴ or WM ⁵	LOS ²	Delay ³	V/C ⁴ or WM ⁵
4. Roeder Avenue/Central Avenue ⁶	C	21	0.95	C	27	0.90
5. West Chestnut Street/Bay Street/Roeder Avenue ⁶	D	39	0.90	F	98	1.23
6. West Chestnut Street/Commercial Street	C	30	0.91	B	14	0.67
7. East Chestnut Street/Cornwall Avenue	E	80	1.13	F	139	1.30

Source: The Transpo Group (September 2008)

Notes: SEB = south-eastbound; NWB = north-westbound; NEB = north-eastbound

1. Operations are shown for the site access locations along Roeder Avenue/Chestnut Street which would be affected by the difference in roadway systems.
2. Level of service, based on 2000 *Highway Capacity Manual* methodology.
3. Average delay in seconds per vehicle.
4. Volume-to-capacity ratio reported for signalized intersections.
5. Worst movement for unsignalized intersections.
6. The Preferred Alternative and Straight Street Grid assume a traffic signal at this location.

As shown in the table, the Preferred Alternative would have better operations at both the West Chestnut Street/Bay Street/Roeder Avenue and East Chestnut/Cornwall Avenue intersections. The poor operations with the Straight Street Grid would result because additional site access locations would be needed to accommodate this level of development (i.e., up to 6 million square feet). An analysis of phasing is presented at the end of this chapter and provides additional detail on how much redevelopment density can be accommodated with the Straight Street Grid.

Non-Motorized

As discussed previously, the Preferred Alternative would provide sidewalks and bicycle facilities along all roadways as well as on-site trails which would connect to the existing trail system. The Alternative would provide a pedestrian and bicycle friendly environment including elements such as narrow streets, street trees, textured pavements, and street furniture. These facilities would enhance the on-site non-motorized facilities; however, enhancements to off-site facilities would facilitate walking and biking between the site and downtown. Specifically, pedestrian and bicycle facility improvements along Wharf Street (as discussed previously) and Bay Street (from Chestnut Street to Champion Street) would improve accessibility to and from the site.

The Preferred Alternative is projected to generate about 14,000 daily pedestrian/bicycle trips which is similar to Alternative 2 evaluated in the DEIS. Non-motorized impacts would be similar to those disclosed for Alternative 2 in the DEIS. Future development and the consequent increase in vehicular volumes are expected to proportionally increase observed conflicts with pedestrians and bicyclists that exist today. However, as noted above, the Preferred Alternative would enhance pedestrian and bicycle usage on and around the site as part of its overall development plan through provision of sidewalks, trails, and bicycle facilities. Therefore, non-motorized impacts are expected to be minimal similar to those disclosed in the DEIS.

The Straight Street Grid is anticipated to provide a similar pedestrian environment and bicycle network as the Preferred Alternative. In addition, it would generate the same level of daily pedestrian/bicycle trips as the Preferred Alternative. Therefore, the Straight Street Grid 2026 non-motorized impacts are expected to be minimal.

Transit

As discussed previously, the Preferred Alternative proposal anticipates an extension of the existing and planned future transit service on-site via Hilton Avenue and F Street within the Marine Trades Area and Commercial Street and Log Pond Drive/Cornwall Avenue within the other redevelopment areas. In addition, the Preferred Alternative would generate the same amount of transit ridership as Alternative 2 in 2026 (i.e., 4,200 daily riders). Therefore, the passenger loading ratio would be about 1.55 for the Preferred Alternative which exceeds WTA's 1.25 standard for seating capacity⁴. In addition, the Preferred Alternative passenger loading ratio of 1.55 is greater than the DEIS No-Action passenger loading ratio of 1.36. Because the Preferred Alternative would exceed WTA's standard and the anticipated passenger loading ratio would be greater than the DEIS No-Action 2026 conditions, it would impact the transit system. An increase in transit service in the vicinity of the site as well as service and stops on-site would be required to support future growth and transit demand. These transit impacts would be similar to those disclosed in the DEIS.

The Straight Street Grid is anticipated to have similar impacts as the Preferred Alternative.

Rail

The location of rail crossings for the Preferred Alternative 2026 would be the same as 2016 conditions. The Preferred Alternative would generate more vehicular and non-motorized trips than the DEIS No-Action 2026 conditions; therefore, the chances of conflicts and potential safety issues with trains at at-grade rail crossings are greater. At-grade crossings also increase delays to vehicular traffic that must stop as trains pass through intersections. The elimination of the BNSF railway on-site creates safer rail conditions and is an improvement over the DEIS No-Action Alternative. Construction of the Bay Street, Log Pond Drive, and Commercial Street bridges over the railroad would provide three emergency accesses to the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach areas. As discussed previously, within the Marine Trades area, all at-grade crossings would remain, potentially delaying entry of emergency vehicles during the passage of trains since they would need to access Roeder Avenue at Bay

⁴ Passenger loading ratio is calculated in the same manner as the DEIS.

Street or another location without an at-grade railroad crossing. These rail impacts would be similar to those disclosed in the DEIS.

The Straight Street Grid is anticipated to have rail impacts similar to the Preferred Alternative except there would be only two crossings over the railroad. These crossings include the Bay Street and Cornwall Avenue bridges at Chestnut Street.

Parking

The majority of parking for the proposed project would be located on-site. The Preferred Alternative would provide 12,892 parking spaces in 2026. Detailed parking calculations are provided in Appendix M-4. Table 9 summarizes the parking demand and supply for Preferred Alternative 2026 conditions.

Table 11. Preferred Alternative 2026 Parking Demand and Supply

Parking Sub-Area	Hourly Parking Demand ¹	Proposed Parking	Recommended Supply Range ²		Parking Surplus/Deficiency Range	
Marine Trades	2,701	3,532	2,971	3,106	561	426
Downtown/Log Pond (1)	3,197	3,943	3,517	3,677	426	266
Downtown/Log Pond (2)	2,925	3,226	3,218	3,364	8	-138
Shipping Terminal	1,163	1,601	1,279	1,337	322	263
Cornwall Beach	455	591	501	523	90	68
Total	10,441	12,892	11,485	12,007	1,407	885

Source: Collins Woerman and The Transpo Group (August 2007)

1. Hourly parking demand represents the maximum hourly demand within the redevelopment area.
2. Recommended supply is 10 to 15 percent more than the parking demand to reduce vehicles re-circulating through the parking areas.

As shown in the table, the hourly parking demand for the Preferred Alternative in 2026 is approximately 10,400 vehicles, which would be accommodated by the overall proposed parking supply. In addition, each redevelopment area would provide sufficient parking except the Downtown/Log Pond area where there would be a parking deficiency of approximately 140 parking spaces. However, there is a surplus in all other parking areas so this deficiency could be accommodated on-site. This is not considered an impact because as the master plan for the New Whatcom site is developed it is assumed that parking supply and adopted standards will require that each future redevelopment project will accommodate that project’s parking demand. Therefore, no parking impact is anticipated for the 2026 conditions.

It is likely that some users of the site would park off-site when visiting multiple destinations in the area. Based on the parking utilization survey in the DEIS, there are currently about 570 available off-site parking spaces within ¼-mile of the site. Since a majority of the vehicles would park on-site there would be minimal impacts to off-site parking.

The Straight Street Grid is anticipated to have parking impacts similar to the Preferred Alternative.

Phasing and Roadway Network Capacity Analysis

As the New Whatcom site is developed, infrastructure improvements would be needed to accommodate the traffic generated by the project. Tables 13 and 14 provide a summary of the Preferred Alternative and Straight Street Grid Option's assumed transportation infrastructure phasing as well as the capacity of that system (defined by vehicle trips and density of development). The phasing examines the Marine Trades area separate from the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas.

The capacity of the roadway network is based on the total outbound PM peak hour vehicular capacity (i.e., existing on-site vehicle trips plus net new project-related vehicle trips). The outbound direction generates the highest demand during the PM peak hour for the assumed set of land uses. This capacity represents the maximum number of outbound weekday PM peak hour trips that could be accommodated with the assumed infrastructure improvements. This is different from the estimated trip generation provided in Table 3 which provides net new peak hour vehicular trips. The phasing and capacity analysis considers total trip generation since existing trips would use some of the available capacity on the roadway network. Table 12 provides a summary of the estimated total outbound PM peak hour vehicle trips for the Preferred Alternative. These trips would also apply to the Straight Street Grid Option since the land use density is assumed to be the same.

Table 12. Preferred Alternative Estimated Total Outbound PM Peak Hour Vehicle Trips¹

Redevelopment Area	2016	2026
Marine Trades	900	1,070
Downtown Waterfront, Log Pond, Shipping Terminal Cornwall Beach	760	2,490
Total	1,460	3,560

Source: The Transpo Group (July 2007 and September 2008)

1. Vehicle trips were estimated based on person trips for each land use.

Preferred Alternative

Table 13 provides a summary of the Preferred Alternative phasing and associated development capacity. First, phasing and capacity of the Marine Trades redevelopment area is described and then the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas are shown.

Marine Trades

As shown in Table 13, the Marine Trade Area existing street network could accommodate some level of development; however, it would not accommodate the 2016 or 2026 land use densities. The Preferred Alternative proposed infrastructure improvements would accommodate the 2016 land use densities and associated traffic generation of approximately 900 total outbound PM peak hour vehicle trips. However, additional improvements would be necessary to accommodate the 2026 land use densities and associated traffic generation (i.e., 1,070 total outbound PM peak hour vehicle trips). Chapter 5 discusses the necessary mitigation measures to accommodate this level of development. These measures include improvements to Roeder Avenue and its intersections with Hilton Avenue and F Street.

Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach

As shown in Table 13, the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach existing street network could accommodate the Preferred Alternative 2016 land use densities without additional off-site or site access improvements. Although the existing street network could accommodate the proposed 2016 redevelopment, an internal roadway network would be needed to support these land use densities (see On-site Roadway System discussion following this section). In addition, to reduce non-motorized, transit, and rail impacts, improvements would be necessary such as pedestrian and bicycle enhancements, extension of the transit system, and upgrading of unsignalized and at-grade rail crossings.

Street sequences 1 through 6 represent the core street network which would have a capacity of approximately 1,200 PM peak hour outbound vehicle trips. This would accommodate approximately 2.2 million square-feet of development; however, the actual level of development depends on the land use mix and trip generation properties. This core street network would address the existing deficiencies to the non-motorized, transit, and rail facilities. It should be noted that the on-site street system capacity would decrease between street sequences 5 and 6 due to closure of Cornwall Avenue and the Cornwall Avenue Bridge demolition to relocate the railroad.

Construction of street sequences 7 and 8 would accommodate up to 2,100 PM peak hour outbound vehicle trips. This would accommodate approximately 3.8 million square-feet of development. The Preferred Alternative 2026 would generate approximately 2,490 PM peak hour outbound vehicle trips; and therefore, construction of street sequence 9 would be necessary to support this density. With the additional improvements for street sequence 9, the on-site infrastructure would have a capacity of approximately 2,600 outbound vehicle trips.

Table 13. Preferred Alternative Phasing of Transportation Infrastructure Improvements and Associated Development Capacity¹

Street Sequence	On-Site Improvements	Off-Site Improvements ²	PM Peak Hour Outbound Vehicle Capacity ³	Approximate Development in Millions of sf ⁴
Marine Trades Area				
Existing Street Network⁵			520	0.8
1	Upgrade Hilton Avenue and C Street. Build Maple Street between Hilton Avenue and F Street.	Signalize C Street intersections with Roeder Avenue and Holly Street. Provide turn lanes along C Street.	550	0.9
2 ^{6,7}	Upgrade F Street and build Chestnut Street from F Street to C Street.		900	1.4
Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach Areas				
Existing Street Network⁵			950	1.7
1	Build Bloedel Avenue and convert Central Avenue between Holly Street and Roeder Avenue to pedestrian access only	Signalize intersection at Central Avenue / Roeder Avenue	1,225	2.2
2		Build Roundabout at Wharf/State /Boulevard intersection	1,575	2.8
3	Build Paper Avenue connect from Bay Street to Log Pond Drive		1,575	2.8
4	Extend Paper Avenue from Log Pond Drive to Cornwall Avenue		1,575	2.8
5	Construct Commercial Street Bridge extend to Paper Avenue		1,950	3.5
6 ^{6,7}	Demolish Cornwall Bridge and relocate BNSF Railroad. Rebuild temporary Bloedel Avenue and Log Pond Drive connections.		1,200	2.2
7	Build Log Pond Drive bridge connection to existing Cornwall Avenue	Upgrade the Maple Street corridor, including intersection traffic control improvements at Cornwall Avenue, State Street and Forest Street	2,100	3.8
8	Build Log Pond Drive between Paper Avenue and Oak Street / Ivy Street		2,100	3.8
9 ⁷	Rebuild Bay Street Bridge Extend Bloedel Avenue to Cornwall	Signalize intersection at Bay Street /Chestnut Street	2,600	4.7

Source: Collins Woerman and The Transpo Group (September 2008)

1. The infrastructure phasing outlined addresses the Marin Trades Area separate from the Downtown Waterfront, Log Pong, Shipping Terminal, and Cornwall Beach Areas.
2. The off-site improvements represent those improvements needed to support the redevelopment.
3. Outbound vehicle trips represent peak direction of travel during the PM peak hour. This capacity represents the maximum number of weekday PM peak hour trips that could be accommodated without additional infrastructure.
4. Approximate square-footage is provided for reference and is based on the outbound vehicle trips. This square-footage is related to the specific redevelopment area(s) noted and not for the total New Whatcom site.
5. Existing street network assumes roadway and intersections as they are today with no improvements or upgrades.
6. Street Sequences 1 through 6 represent the core street network of the Preferred Alternative.
7. Shading indicates street sequence which would complete 2016 and 2026 roadway network.

On-Site Roadway System

Traffic control and channelization were assumed along roadways and intersections internal to the site. The intent of these improvements is to provide adequate access and circulation throughout the development. The evaluation of internal on-site intersections focuses on major

locations within the redevelopment areas since detailed information on land uses and driveways is unknown. The internal intersections within the Marine Trades Area were not included in the analysis. Internal traffic volumes within this redevelopment area are low; therefore, intersections are assumed to be stop-controlled and traffic signals would not be required. As specific development is identified for the parcels within the Marine Trades Area, internal intersections should be evaluated to ensure safe and acceptable operations.

The following describes the internal intersection improvements that would be necessary to support the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas. These improvements expand on the preliminary roadway improvements assumed as part of the Preferred Alternative and described in Table 2.

- **Bloedel Avenue/Bay Street** – As discussed previously, Bloedel Avenue is classified as a retail street which would accommodate a three-lane section. At this intersection, side-street stop control along Bloedel Avenue with the associated turn lanes should be provided. With additional density and the construction of the Bay Street Bridge by 2026, traffic signal control and left-turn lanes on all approaches should be provided.
- **Bloedel Avenue/Commercial Street** – As discussed previously, Bloedel Avenue is classified as a retail street which would accommodate a three-lane section. At this intersection, side-street stop control along Bloedel Avenue with the associated turn lanes should be provided. With additional density by 2026, traffic signal control and left-turn lanes on all approaches should be provided.
- **Cornwall Avenue/Wharf Street** – At this intersection, side-street stop control along Cornwall Avenue should be provided. No additional improvements would be necessary in 2026.
- **Paper Avenue/Log Pond Drive** – A traffic signal should be installed at this intersection. It is assumed that this intersection would not be constructed by 2016, but would be in place by 2026.
- **Bloedel Avenue/Log Pond Drive** – As discussed previously, Bloedel Avenue is classified as a retail street which would accommodate a three-lane section. A traffic signal and turn lanes along Bloedel Avenue should be provided at this intersection. It is assumed that this intersection would not be constructed by 2016, but would be in place by 2026.
- **Paper Avenue/Oak Street** – All-way stop control should be provided at this intersection. It is assumed that this intersection would not be constructed by 2016, but would be in place by 2026.
- **Cornwall Avenue/Oak Street** – Side-street stop control along Oak Street should be provided at this intersection. It is assumed that this intersection would not be constructed by 2016, but would be in place by 2026.

These improvements are intended as a guide for traffic control and channelization within the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment

areas. As parcels within these areas are redeveloped, traffic control and channelization should be confirmed to ensure safe and acceptable operations are provided.

Straight Street Grid Option

Phasing of the Straight Street Grid Option was also evaluated. Table 14 provides a summary of the assumed street phasing and its capacity. Detailed phasing for the Straight Street Grid has not been formulated to date; therefore, this evaluation is presented in two parts with Phase 1 occurring by 2016 and Phase 2 occurring by 2026.

Marine Trades

Within the Marine Trades Area, the Straight Street Grid has the same assumptions for phasing and land use densities as the Preferred Alternative. As mentioned previously, the 2016 redevelopment could be accommodated with the proposed street network; however, additional improvements would be necessary to accommodate the 2026 land use densities. Chapter 5 discusses the necessary mitigation measures to accommodate this level of development. These measures include improvements to Roeder Avenue and its intersections with Hilton Avenue and F Street.

Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach

As discussed, the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach existing street network could accommodate the Preferred Alternative 2016 land use densities without additional off-site or site access improvements. However, improvements would be necessary to reduce non-motorized, transit, and rail impacts including pedestrian and bicycle enhancements, extension of the transit system, and upgrading of unsignalized and at-grade rail crossings.

Phase 1, which would be completed by 2016, would accommodate the 2016 land use densities as well as additional densities up to approximately 2.8 million square feet; however, the actual level of development depends on the land use mix and trip generation properties. Phase 2 would not accommodate the 2026 land use densities which generate approximately 2,490 outbound PM peak hour trips. To accommodate the full development, additional on-site improvements would be necessary, such as construction of the Commercial Street or Laurel Street Bridges, and/or transportation demand management strategies which would reduce the outbound PM peak hour vehicle trips by approximately 20 percent or 415 vehicle trips.

Table 14. Straight Street Grid Phasing of Transportation Infrastructure Improvements and Associated Development Capacity¹

Phase ^{1,2}	On-Site Improvement	Off-Site Improvements ²	PM Peak Hour Outbound Vehicle Capacity ³	Approximate Development in Millions of sf ⁴
Marine Trades Area				
Existing Street Network⁵			520	0.8
1 ⁷	Upgrade Hilton Avenue and C Street. Build Maple Street between Hilton Avenue and F Street.	Signalize C Street intersections with Roeder Avenue and Holly Street. Provide turn lanes along C Street.	900	1.4
	Upgrade F Street and build Chestnut Street from F Street to C Street.			
Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach Areas				
Existing Street Network⁵			950	1.7
1 ⁷	Extend Central to Laurel and convert Central Avenue between Holly Street and Roeder Avenue to pedestrian access only	Signalize intersection at Central Avenue / Roeder Avenue	1,575	2.8
		Build Roundabout at Wharf/State/Boulevard intersection		
2 ⁷	Rebuild Cornwall Bridge and relocate BNSF Railroad			
	Rebuild Bay Street Bridge Extend to Laurel Street	Signalize intersection at Bay Street/ Chestnut Street	2,075	3.7

Source: City of Bellingham and The Transpo Group (September 2008)

1. The infrastructure phasing outlined pertains only to the Downtown Waterfront, Log Pong, Shipping Terminal, and Cornwall Beach Areas.
2. The off-site improvements represent those improvements needed to support the redevelopment.
3. Outbound vehicle trips represent peak direction of travel during the PM peak hour. This capacity represents the maximum number of weekday PM peak hour trips that could be accommodated without additional infrastructure.
4. Approximate square-footage is provided for reference and is based on the outbound vehicle trips. This square-footage is related to the specific redevelopment area(s) noted and not for the total New Whatcom site.
5. Existing street network assumes roadway and intersections as they are today with no improvements or upgrades.
6. Phase 1 completed by 2016 and phase 2 completed by 2026.
7. On-site connector roads would be constructed as part of these phases; however, detailed phasing of the internal roadway system for the Straight Street Grid has not been formulated to date.

On-Site Roadway System

Similar to the Preferred Alternative, traffic control and channelization were assumed along roadways and intersections internal to the site. The intent of these improvements is to provide adequate access and circulation throughout the development. The evaluation of internal on-site intersections focuses on major locations within the redevelopment areas since detailed information on land uses and driveways is unknown. The internal intersections within the Marine Trades Area were not included in the analysis. Internal traffic volumes within this redevelopment area are low; therefore, intersections are assumed to be stop-controlled and traffic signals would not be required. As specific development is identified for the parcels within the Marine Trades Area, internal intersections should be evaluated to ensure safe and acceptable operations.

As discussed previously, it is anticipated that internal (on-site) intersection and roadway operations would be adequate with the Straight Street Grid Option since it is similar to the

Preferred Alternative. The following describes the internal intersection improvements that would be necessary to support the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas. These improvements expand on the preliminary roadway improvements assumed as part of the Straight Street Grid Option and described in Table 2.

- **Laurel Street/Bay Street** – As discussed previously, Laurel Street is classified as a retail street which would accommodate a three-lane section. At this intersection, by 2016, side-street stop control along Laurel Street with the associated turn lanes should be provided. With additional density and the construction of the Bay Street Bridge by 2026, traffic signal control and left-turn lanes on all approaches should be provided.
- **Commercial Street/Laurel Street** - At this intersection, by 2016, side-street stop control along Commercial Street with turn lanes along Laurel Street should be provided. With additional density by 2026, traffic signal control and left-turn lanes on all approaches should be provided.
- **Cornwall Avenue/Laurel Street** - At this intersection, side-street stop control along Laurel Street should be provided. No additional improvements would be necessary in 2026.
- **Cornwall Avenue/Wharf Street** – At this intersection, side-street stop control along Cornwall Avenue should be provided. No additional improvements would be necessary in 2026.
- **Bay Street/Oak Street** – All-way stop control should be provided at this intersection. No additional improvements would be necessary in 2026.
- **Cornwall Avenue/Oak Street** – Side-street stop control along Oak Street should be provided at this intersection. No additional improvements would be necessary in 2026.

This is intended as a guide for traffic control and channelization within the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas. As parcels within these areas are redeveloped, traffic control and channelization should be confirmed to ensure safe and acceptable operations are provided.

Chapter 3: Mitigation Measures

The DEIS provides a discussion on mitigation measures to eliminate or reduce the impacts of New Whatcom Redevelopment, as well as mitigation strategies the City could implement to better accommodate anticipated growth throughout the Downtown area with or without the New Whatcom Redevelopment. The operational and management strategies described in the DEIS for each transportation mode would also apply to the Preferred Alternative (see Table 3.12-16 in the DEIS). This chapter builds on the DEIS by addressing specific measures as they relate to the Preferred Alternative and providing a comparison to the DEIS Alternatives. Table 15 provides a summary of the mitigation measures and comparison the DEIS Alternatives. Detailed descriptions of the mitigation measures are discussed in the DEIS.

As shown in the table, the Preferred Alternative would have less on-site and off-site impacts both in 2016 and 2026 as compared to the DEIS Alternatives. This is due to the infrastructure improvements proposed as part of the Preferred Alternative. It is noted that financial responsibility for these mitigation measures would be determined as part of the development agreement.

Phasing of Mitigation Measures

As discussed previously, based on the City's existing LOS methodology and standards for roadway segments, additional improvements are needed to accommodate the proposed land use densities. The following discusses the timing of on-site and off-site mitigation measures.

On-Site

The on-site operational analysis showed poor operations at the Roeder Avenue/Hilton Avenue and Chestnut Street/Bay Street intersections in 2016 for both the Preferred Alternative and Straight Street Grid. It is recommended that improvements be made to these locations by 2016 to ensure safe and efficient traffic operations. Roeder Avenue/Hilton Avenue improvements may include installation of a traffic signal and turn lanes, provision of a refuge/merge lane for left-turns from Hilton Avenue onto Roeder Avenue, or restriction of left-turns from Hilton Avenue. Chestnut Street/Bay Street intersection improvements would include installation of a traffic signal and turn lanes. Improvements at this intersection may require rebuilding the existing elevated structure.

For the Straight Street Grid Option in 2026, the Chestnut Street/Bay Street and Chestnut Street/Cornwall Avenue intersections would have poor operations. The Chestnut Street/Bay Street intersection includes intersection improvements as part of the Straight Street Grid Option; therefore, additional site access locations would be needed to improve intersection operations and accommodate the 2026 land use densities. To improve operations at the Chestnut Street/Cornwall Avenue intersection, an additional northbound turn lane would be needed.

For the Marine Trade Area, the Preferred Alternative and Straight Street Grid roadway system would accommodate the 2016 development only. To develop beyond the 2016 land use densities, Roeder Avenue improvements would be necessary. Roeder Avenue/Chestnut Street from Hilton Avenue to Cornwall Avenue would require widening to provide two lanes per

direction and turn lanes at major intersections. This improvement would also include provision of sidewalks and bicycle facilities. In addition, a southbound left-turn lane would be needed along F Street at its intersection with Roeder Avenue. There may be other options to widening Roeder Avenue to provide additional capacity and/or allow additional development. The City is currently evaluating options to improve Roeder Avenue as well as updating their LOS methodology and standards. The City's evaluation of Roeder Avenue takes into consideration Holly Street and is exploring additional options beyond widening Roeder Avenue including provision of a one-way street system.

Off-Site

In addition to on-site improvements, some off-site improvements would be necessary to support the Preferred Alternative and Straight Street Grid Option. The following improvements would be necessary by 2016:

- Chestnut Street/Railroad Avenue – Provide a traffic signal. This improvement would be needed under the DEIS No-Action Alternative where land use densities are less than with the Preferred Alternative; therefore, it is recommended that this improvement be constructed during the early phases of development.
- Wharf Street – It is recommended that this roadway be improved to provide wide shoulders or bicycle lanes and sidewalks enhance pedestrian and bicycle use.

The following improvements would be necessary by 2026:

- Forest Street/Laurel Street – Provide a traffic signal and turn lanes. The City is planning to implement a road-diet along Forest Street to enhance multi-modal access and increase safety for pedestrians. Implementation of these improvements may eliminate the need for this mitigation measure and/or change what improvements should be made. It is recommended that the necessary improvements at this intersection be re-evaluated as the City plans and implements the road-diet.
- Holly Street – Widen to provide additional capacity in the northbound direction from Broadway Street to Champion Street. As discussed previously, the City is exploring improvements along this corridor as well as Roeder Avenue.
- Holly Street/F Street – Provide a northbound left-turn lane on F Street.
- Bay Street – Improve pedestrian and bicycle facilities along this roadway from Champion Street to Chestnut Street to enhance non-motorized access to and from the site.

As discussed in the DEIS, improvements are needed along the Lakeway Drive, State Street and Forest Street corridors to accommodate the future traffic volumes as part of the DEIS Alternatives and the Preferred Alternative. In addition, intersections with James Street, Ohio Street, and Iowa Street all need additional turn lanes to provide acceptable intersection operations. However these locations are constrained by adjoining properties and alternative concepts should be further explored. WSDOT is currently evaluating future improvements to the I-5 corridor and interchanges within the City of Bellingham. Lakeway Drive and Iowa Street are two of the interchanges currently being evaluated. The Port/City should contribute their

pro-rata share to any future interchange project that will improve overall operations at either of the ramp intersections by 2026. Financial contributions would be determined as part of the development agreement.

Significant Unavoidable Adverse Impacts

As described in the DEIS, the Preferred Alternative would accommodate additional amounts of future development within the site which would contribute to travel demands and congestion along the on-site and off-site street system. The additional development would also increase traffic access and circulation in the area. This added congestion would contribute to measurably poorer performance of the transportation network, in terms of increased delays along several of the corridors and at some specific intersections. The increase in traffic and higher volumes of pedestrian and bicycles would result in more conflict points and increased hazards to safety.

Table 15. Transportation Impacts and Mitigation Measures

Map ID¹	Location	Impact	Mitigation Measure²	No Action		Alternative 1		Alternative 2		Alternative 2A		Alternative 3		Preferred / Straight Grid		Mitigation Challenges	Notes	
				2016	2026	2016	2026	2016	2026	2016	2026	2016	2026	2016	2026			
On-Site Access and Circulation^{2,3,4}																		
1	Roeder Avenue/ Chestnut Street	Street System	Widen and improve roadway to 4/5 lanes to provide additional capacity.	X	X	X	X	X	X	X	X	X	X	-	X	The railroad tracks and the Whatcom Waterway make widening Roeder Avenue very difficult and potentially financially challenging.	Provide two-lanes per direction from Hilton Avenue to Cornwall Avenue with turn lanes at major intersections, including sidewalks and bicycle lanes. This improvement is based on the results of the existing City LOS methodology and standards for roadway segment v/c ratios.	
2	Roeder Avenue/ Hilton Avenue	Intersection	Intersection improvements to include traffic signal and turn lanes.	X	X	X	X	X	X	X	X	-	-	X	X			
3	Roeder Avenue/ F Street	Intersection	Provide an exclusive southbound left-turn lane on the F Street approach.	-	X	-	X	-	X	-	X	-	X	-	X	This would likely require additional right-of-way.		
4	Roeder Avenue/ C Street	Intersection	Intersection improvements to include traffic signal and turn lanes on both C Street approaches.	X	X	X	X	X	X	X	X	X	X	- ⁶	- ⁶		Preferred Alternative and Straight Street Grid assume completion of this improvement.	
5	Roeder Avenue/ Central Avenue	Intersection	Intersection improvements to include traffic signal and an exclusive left-turn lane on both Central Street approaches.	X	X	X	X	X	X	X	X	X	X	- ⁶	- ⁶		The Preferred Alternative and Straight Street Grid assume improvements at this intersection including a traffic signal and closure of Central Avenue between Holly Street and Roeder Avenue.	
6	Chestnut Street/ Bay Street	Intersection	Intersection improvements to include traffic signal and an exclusive left-turn lane on both Bay Street approaches.	X	X	X	X	X	X	X	X	-	X	X	X ^{6,7}	This may require rebuilding the existing elevated structure.	Preferred Alternative and Straight Street Grid assume completion of this improvement. Additional access is needed with the Straight Street Grid to improve intersection operations.	
7	Chestnut Street/ Cornwall Avenue	Intersection	Provide an additional northbound left-turn lane on Cornwall Avenue from the site.	-	X	-	X	-	X	-	X	-	X	-	X ⁷	The existing right-of-way does not allow for an additional lane and obtaining additional right-of-way would require building demolition.	This mitigation measure is dependent on widening of Roeder Avenue/Chestnut Street since two receiving lanes would be needed for the left-turn lanes. The Straight Street Grid would impact this location.	
8	C Street	Rail	Provide railroad crossing gates on C Street between Holly Street and Roeder Avenue.	X	X	X	X	X	X	X	X	X	X	- ⁶	- ⁶		Preferred Alternative and Straight Street Grid assume completion of this improvement.	
9	Laurel Street On-site Street Grid and Laurel Street/ Commercial Street/ Log Pond Road Intersection	Street System	Reconfigure the street system to create a four-leg intersection and consider an alternate internal street system to reduce the amount of traffic through the Laurel Street/ Commercial Street intersection (e.g., extending Bay Street to Oak Street).	-	-	-	X	-	X	-	X	-	-	- ⁶	- ⁶	The 5-leg intersection would be above grade creating construction issues that may make the location of the intersection both physically and financially challenging.	Although the overall LOS of the roundabout for the DEIS scenarios would be LOS D or better, vehicle queues would impact adjacent intersections. The Preferred Alternative and the Straight Street Grid reconfigure the street system to eliminate this five-leg intersection.	
10	Cornwall Avenue	Non-motorized	Provide a bike path that allows continued access along the Cornwall Avenue corridor or provide an alternative route.	-	-	-	-	X	X	-	-	-	-	- ⁶	- ⁶		Cornwall Avenue would be closed with Alternative 2. This closure would sever an unmarked bicycle route. Preferred Alternative and Straight Street Grid assume completion of this improvement.	
11	Cornwall Avenue	Street System	Widen and improve roadway to 4 lanes to provide additional capacity.	-	X	-	-	-	-	-	-	-	X	-	-	Would likely require additional right-of-way and/or removal of on-street parking.	Provide two-lanes per direction from Wharf Street to Chestnut Street. This improvement is based on the results of the existing City LOS methodology and standards for roadway segment v/c ratios.	

Map ID¹	Location	Impact	Mitigation Measure²	No Action		Alternative 1		Alternative 2		Alternative 2A		Alternative 3		Preferred / Straight Grid		Mitigation Challenges	Notes
				2016	2026	2016	2026	2016	2026	2016	2026	2016	2026	2016	2026		
Off-Site Capital Improvements^{2,4,5}																	
12	Holly Street	Street System	Widen roadway by an additional lane to provide additional capacity in the northbound direction from Broadway Street to Champion Street.	-	X	-	X	X	X	X	X	-	X	-	X	This would require removal of on-street parking.	This improvement is based on the results of the existing City LOS methodology and standards for roadway segment v/c ratios.
13	Holly Street/ F Street	Intersection	Provide a northbound left-turn lane on F Street.	X	X	X	X	X	X	X	X	X	X	-	X	This would likely require additional right-of-way.	This is an impact because queues spillback into Roeder Avenue/F Street. Alternatively, C Street could be upgraded to a collector arterial to divert some of the traffic from F Street to C Street and improve operations.
14	Holly Street/ C Street	Intersection	Intersection improvements to include traffic signal and turn lanes.	X	X	X	X	X	X	X	X	X	X	-.6	-.6	The existing right-of-way does not allow for an additional lane and obtaining additional right-of-way would require building demolition.	Preferred Alternative and Straight Street Grid assume completion of this improvement.
15	Holly Street/ Central Avenue	Intersection	Intersection improvements to include traffic signal and turn lanes.	X	X	X	X	X	X	X	X	X	X	-.6	-.6	The existing right-of-way does not allow for an additional lane and obtaining additional right-of-way would require building demolition.	Preferred Alternative and Straight Street Grid assume closure of Central Avenue between Holly Street and Roeder Avenue.
16	Chestnut Street/ Railroad Avenue	Intersection/ Non-motorized	Intersection improvements to include traffic signal.	X	X	X	X	X	X	X	X	X	X	X	X		
	State Street/ Forest Street																
17	State Street/ Laurel Street	Intersection	Intersection improvements to include traffic signal and turn lanes	-	-	X	X	X	X	X	X	-	X	-	-	This would likely require additional right-of-way.	
18	State Street/ Wharf Street/ Forest Street/ Boulevard Street	Intersection	Realign intersection. Intersection improvements to include traffic signal or roundabout control.	-	X	X	X	-	X	-	X	-	X	-.6	-.6		Alternative 1, Preferred Alternative, and Straight Street Grid assume completion of this improvement in the analysis.
19	Forest Street/Laurel Street	Intersection	Intersection improvements to include traffic signal and turn lanes.	-	-	X	X	X	X	X	X	-	X	-	X	This would likely require additional right-of-way.	
20	Bay Street between Champion Street and Chestnut Street	Non-motorized	Provide bicycle lanes as well as enhance the pedestrian facilities to facilitate walking and biking between the site and downtown.	-	-	X	X	X	X	X	X	X	X	-	X		Bicycle and pedestrian facilities would be provided within the redevelopment area along this roadway as part of the redevelopment Alternatives.
21	Central Avenue between Chestnut Street and Holly Street	Non-motorized	Upgrade bicycle route to provide bicycle lanes to accommodate bicycle travel between the site and downtown.	-	-	X	X	X	X	X	X	X	X	-.6	-.6		Bicycle and pedestrian facilities would be provided within the redevelopment area along this roadway as part of the redevelopment Alternatives.
22	Wharf Street between Cornwall Avenue and State Street	Non-motorized / Street System	Improve Wharf Street to provide wide shoulders or bicycle lanes and sidewalks.	-	-	X	-	X	X	X	X	X	X	X	X		
23	Laurel Street between Cornwall Avenue and Garden Street	Non-motorized / Street System	Provide bicycle lanes as well as enhance the pedestrian facilities to facilitate walking and biking between the site and WWU.	-	-	X	X	X	X	-	X	-	-	-	-		Bicycle and pedestrian facilities would be provided within the redevelopment area along this roadway as part of the redevelopment Alternatives. Preferred Alternative and Straight Street Grid would not provide off-site access via this street.

Map ID ¹	Location	Impact	Mitigation Measure ²	No Action		Alternative 1		Alternative 2		Alternative 2A		Alternative 3		Preferred / Straight Grid		Mitigation Challenges	Notes
				2016	2026	2016	2026	2016	2026	2016	2026	2016	2026	2016	2026		
24	Maple Street between Cornwall Avenue and Forest Street	Non-motorized / Street System	Provide bicycle lanes or shoulders as well as enhance the pedestrian facilities to facilitate walking and biking between the site and WWU. Provide turn lanes at intersections.	-	-	-	-	-	-	X	-	X	X	- ⁶	- ⁶		Preferred Alternative and Straight Street Grid assumes completion of these improvements.
NA	Off-Site Street System	Street system / Construction	Provide designated truck routes to be used by all construction traffic to minimize impacts to the street system.	X	X	X	X	X	X	X	X	X	X	X	X		This is a temporary impact during the physical construction of the development.

Source: The Transpo Group (November 2007 and September 2008)

Note: NA = Not applicable, location not identified on map.

- Numbers correspond to Figure 23 in the DEIS.
- Mitigation measures will be phased over the 20-year build-out period of the redevelopment project. Implementation of the mitigation measures would be determined in the development agreement between the Port and the City.
- X indicates that the Alternative creates an on-site impact. On-site access and circulation mitigation measures provide physical improvements to the transportation infrastructure.
- indicates that the Alternative does not impact the location.
- X indicates that the Alternative creates an off-site impact. The New Whatcom Redevelopment Project would contribute to the cost of these improvements.
- The Preferred Alternative and Straight Street Grid Option assume completion of this improvement.
- X indicates that the Straight Street Grid creates an impact. The Preferred Alternative would not impact this location.

Appendix M-1: Project Land Use
and Trip Generation

Mode Split and Occupancy									
Mode	Census	Office/							
		Comp Plan 2015	Average	Institutional	Light Ind	Residential	Retail	Restaurant	Marina
Auto	84%	75%	81%	82%	82%	77%	77%	77%	92%
Transit	4%	6%	4%	4%	4%	5%	5%	5%	2%
Walk/Bike/Other	12%	19%	13%	14%	14%	15%	15%	15%	6%
AVO	1.08	1.30	1.30	1.1	1.3	1.2	1.2	1.52	1.5

Calculation of Daily Person Trip Rates			
Land Use	Vehicle	AVO	Person
Office	11.01	1.10	12.11
Institutional	8.11	1.10	8.92
Light Industrial	6.97	1.30	8.36
Low-Rise	6.72	1.20	8.06
Mid-Rise	6.72	1.20	8.06
High-Rise	6.72	1.20	8.06
Retail	42.94	1.20	51.53
Restaurant	127.15	1.52	193.27
Boat Launch	2.96	1.5	4.44

Percent of Daily Trips During Peak Hours		
Land Use	PM	AM
Office	14%	14%
Institutional	13%	15%
Light Industrial	14%	13%
Low-Rise	9%	8%
Mid-Rise	9%	8%
High-Rise	9%	8%
Retail	9%	2%
Restaurant	9%	9%
Marina	6%	3%

ITE Vehicle Trip Rates		
Land Use	PM	AM
Office	1.49	1.55
R&D	1.08	1.24
Light Industrial	0.98	0.92
Low-Rise	0.62	0.51
Mid-Rise	0.62	0.51
High-Rise	0.62	0.51
Retail	3.75	1.03
Restaurant	10.92	11.52
Marina	0.19	0.08

Note: Based on ratio of ITE daily trip rate to peak hour trip rate.

TAZ / Area	Land Use	Size	Units	Daily Person Trips By Mode				PM Peak Hour Person Trips By Mode				PM Peak Hour Vehicle Trips Based on Person Trips			PM Peak Hour Vehicle Trips Based on ITE			AM Peak Hour Person Trips By Mode				AM Peak Hour Vehicle Trips Based on Person Trips			AM Peak Hour Vehicle Trips Based on ITE		
				Auto	Transit	Walk/Bike/Other	Total	Auto	Transit	Walk/Bike/Other	Total	In	Out	Total	In	Out	Total	Auto	Transit	Walk/Bike/Other	Total	In	Out	Total	In	Out	Total
				1	Office	430,000 sf		4,270	208	729	5,207	598	29	102	729	92	452	544	109	532	641	598	29	102	729	479	65
	Institutional	50,000 sf		366	18	62	446	48	2	8	58	7	37	44	8	46	54	55	3	9	67	42	8	50	51	11	62
	Light Industrial	450,000 sf		3,085	150	527	3,762	432	21	74	527	40	292	332	53	388	441	401	20	68	489	271	37	308	364	50	414
	Low-Rise	125 du		776	50	182	1,008	70	5	16	91	38	20	58	51	27	78	62	4	15	81	10	42	52	13	51	64
	Mid-Rise	167 du		1,036	67	243	1,346	93	6	22	121	51	27	78	68	36	104	83	5	20	108	14	55	69	17	68	85
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	52,000 sf		2,064	134	482	2,680	186	12	43	241	74	81	155	94	101	195	42	3	9	54	21	14	35	33	21	54
	Restaurant	20,000 sf		2,976	193	696	3,865	268	17	63	348	107	69	176	133	85	218	268	17	63	348	92	84	176	120	110	230
	Boat Launch	460 berths		1,879	41	122	2,042	113	2	8	123	45	30	75	52	35	87	56	1	4	61	12	25	37	12	25	37
	Existing Area Trips	353 emp		1,480	0	0	0	148	0	0	0	31	117	148	31	117	148	155	0	0	0	129	26	155	129	26	155
	Internal Trips			2,315	133	472	2,920	243	14	49	306	104	103	207	63	63	126	172	10	34	216	74	74	148	49	49	98
	Net New Trips Subtotal			12,657	728	2,571	17,436	1,417	80	287	1,932	319	788	1,107	474	1,070	1,544	1,238	72	256	1,721	738	230	968	1,019	341	1,360
2	Office	76,963 sf		764	37	131	932	107	5	18	130	16	81	97	20	95	115	107	5	18	130	85	12	97	105	14	119
	Institutional	153,387 sf		1,122	55	191	1,368	146	7	25	178	20	113	133	25	141	166	168	8	29	205	127	26	153	158	32	190
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mid-Rise	112 du		695	45	163	903	62	4	15	81	34	18	52	45	24	69	55	4	13	72	9	37	46	11	46	57
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	8,477 sf		336	22	79	437	30	2	7	39	12	13	25	15	17	32	7	0	2	9	4	2	6	5	4	9
	Restaurant	4,306 sf		641	42	149	832	58	4	13	75	23	15	38	29	18	47	58	4	13	75	20	18	38	26	24	50
	Existing Area Trips	230 emp		970	0	0	0	97	0	0	0	20	77	97	20	77	97	101	0	0	0	84	17	101	84	17	101
	Internal Trips			501	31	111	643	54	3	11	68	24	25	49	15	15	30	43	2	9	54	20	20	40	13	13	26
	Net New Trips Subtotal			2,087	170	602	3,829	252	19	67	435	61	138	199	99	203	302	251	19	66	437	141	58	199	208	90	298
3	Office	5,734 sf		57	3	9	69	8	0	2	10	1	6	7	2	7	9	8	0	2	10	6	1	7	8	1	9
	Institutional	11,429 sf		84	4	14	102	11	1	1	13	2	8	10	2	10	12	12	1	2	15	9	2	11	12	2	14
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mid-Rise	8 du		49	3	12	64	5	0	1	6	3	1	4	3	2	5	4	0	1	5	1	2	3	1	3	4
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	632 sf		25	2	6	33	2	0	1	3	1	1	2	1	1	2	1	0	0	1	1	0	1	1	0	1
	Restaurant	321 sf		48	3	11	62	5	0	1	6	2	1	3	2	2	4	5	0	1	6	2	1	3	2	2	4
	Existing Area Trips	0 emp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Internal Trips			37	2	8	47	4	0	1	5	2	2	4	1	1	2	3	0	1	4	2	2	3	1	1	2
	Net New Trips Subtotal			226	13	44	283	27	1	5	33	7	15	22	9	21	30	27	1	5	33	17	4	22	23	7	30
4	Office	58,115 sf		577	28	99	704	81	4	14	99	13	61	74	15	72	87	81	4	14	99	65	9	74	79	11	90
	Institutional	115,824 sf		847	41	145	1,033	110	5	19	134	15	85	100	19	106	125	127	6	22	155	95	20	115	120	24	144
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mid-Rise	85 du		527	34	124	685	48	3	11	62	26	14	40	34	19	53	42	3	10	55	7	28	35	9	34	43
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	6,401 sf		254	17	59	330	23	2	5	30	9	10	19	12	12	24	5	0	2	7	2	2	4	4	3	7
	Restaurant	3,251 sf		484	31	113	628	44	3	10	57	18	11	29	22	14	36	44	3	10	57	15	14	29	19	18	37
	Existing Area Trips	0 emp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Internal Trips			378	23	84	485	41	2	9	52	18	19	37	11	12	23	33	2	7	42	15	15	30	10	9	19
	Net New Trips Subtotal			2,311	128	456	2,895	265	15	50	330	63	162	225	91	211	302	266	14	51	331	169	58				

TAZ / Area	Land Use	Size	Units	Daily Person Trips By Mode				PM Peak Hour Person Trips By Mode				PM Peak Hour Vehicle Trips Based on Person Trips			PM Peak Hour Vehicle Trips Based on ITE			AM Peak Hour Person Trips By Mode				AM Peak Hour Vehicle Trips Based on Person Trips			AM Peak Hour Vehicle Trips Based on ITE		
				Auto	Transit	Walk/ Bike/Other	Total	Auto	Transit	Walk/ Bike/Other	Total	In	Out	Total	In	Out	Total	Auto	Transit	Walk/ Bike/Other	Total	In	Out	Total	In	Out	Total
<i>Sub-Total Project Trips</i>																											
	Office	663,495 sf		6,588	320	1,126	8,034	924	44	158	1,126	143	698	841	170	819	989	924	44	158	1,126	739	102	841	906	123	1,029
	Institutional	335,000 sf		2,451	120	417	2,988	319	15	54	388	45	246	291	55	307	362	367	18	63	448	277	57	334	345	70	415
	Light Industrial	535,000 sf		3,668	178	627	4,473	513	25	88	626	47	348	395	63	462	525	476	24	81	581	322	44	366	434	59	493
	Low-Rise	184 du		1,139	74	266	1,479	103	7	24	134	56	30	86	74	39	113	91	6	22	119	15	62	77	18	76	94
	Mid-Rise	675 du		4,187	271	982	5,440	378	24	88	490	206	110	316	272	147	419	335	22	78	435	56	223	279	69	275	344
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	87,999 sf		3,490	228	817	4,535	314	20	73	407	125	137	262	159	171	330	72	3	17	92	37	24	61	55	37	92
	Restaurant	40,368 sf		6,007	389	1,404	7,800	543	35	126	704	218	139	357	271	171	442	543	35	126	704	188	169	357	241	223	464
	Boat Launch	460 berths		1,879	41	122	2,042	113	2	8	123	45	30	75	52	35	87	56	1	4	61	12	25	37	12	25	37
	Total Project Trips			29,409	1,621	5,761	36,791	3,207	172	619	3,998	885	1,738	2,623	1,116	2,151	3,267	2,864	153	549	3,566	1,646	706	2,352	2,080	888	2,968
<i>Sub-Total Trip Reductions</i>																											
	Existing Area Trips	645 emp		2,760	0	0	0	276	0	0	0	59	217	276	59	217	276	286	0	0	0	236	50	286	236	50	286
	Internal Trips			4,138	250	893	5,281	431	25	91	547	185	187	372	113	114	227	315	18	64	397	138	137	274	91	90	181
	Net New Project Trips			22,511	1,371	4,868	31,510	2,500	147	528	3,451	641	1,334	1,975	944	1,820	2,764	2,263	135	485	3,169	1,272	519	1,792	1,753	748	2,501

Mode Split and Occupancy									
Mode	Census	Comp Plan 2022		Office/					
		Average		Institutional	Light Ind	Residential	Retail	Restaurant	Marina
Auto	84%	75%	79%	80%	80%	75%	75%	75%	90%
Transit	4%	6%	5%	5%	5%	6%	5%	5%	5%
Walk/Bike/Other	12%	19%	16%	15%	15%	19%	20%	20%	5%
AVO	1.08	1.30		1.1	1.3	1.2	1.2	1.52	1.5

Calculation of Daily Person Trip Rates			
Land Use	Vehicle	AVO	Person
Office	11.01	1.10	12.11
Institutional	8.11	1.10	8.92
Light Industrial	6.97	1.30	8.36
Low-Rise	6.72	1.20	8.06
Mid-Rise	6.72	1.20	8.06
High-Rise	6.72	1.20	8.06
Retail	42.94	1.20	51.53
Restaurant	127.15	1.52	193.27
Boat Launch	2.96	1.5	4.44

Percent of Daily Trips During Peak Hours		
Land Use	PM	AM
Office	14%	14%
Institutional	13%	15%
Light Industrial	14%	13%
Low-Rise	9%	8%
Mid-Rise	9%	8%
High-Rise	9%	8%
Retail	9%	2%
Restaurant	9%	9%
Marina	6%	3%

ITE Vehicle Trip Rates		
Land Use	PM	AM
Office	1.49	1.55
R&D Light Industrial	1.08	1.24
Low-Rise	0.98	0.92
Low-Rise	0.62	0.51
Mid-Rise	0.62	0.51
High-Rise	0.62	0.51
Retail	3.75	1.03
Restaurant	10.92	11.52
Marina	0.19	0.08

Note: Based on ratio of ITE daily trip rate to peak hour trip rate.

TAZ / Area	Land Use	Size	Units	Daily Person Trips By Mode				PM Peak Hour Person Trips By Mode				PM Peak Hour Vehicle Trips Based on Person Trips			PM Peak Hour Vehicle Trips Based on ITE			AM Peak Hour Person Trips By Mode				AM Peak Hour Vehicle Trips Based on Person Trips			AM Peak Hour Vehicle Trips Based on ITE		
				Auto	Transit	Walk/Bike/Other	Total	Auto	Transit	Walk/Bike/Other	Total	In	Out	Total	In	Out	Total	Auto	Transit	Walk/Bike/Other	Total	In	Out	Total	In	Out	Total
				Marina Trade	Office	500,000 sf		4,844	303	908	6,055	678	42	128	848	105	511	616	127	618	745	678	42	128	848	542	74
	Institutional	100,000 sf		714	45	133	892	93	6	17	116	13	72	85	16	92	108	107	7	20	134	81	16	97	103	21	124
	Light Industrial	550,000 sf		3,678	230	690	4,598	515	32	97	644	48	348	396	65	474	539	478	30	90	598	324	44	368	445	61	506
	Low-Rise	167 du		1,010	81	255	1,346	91	7	23	121	49	27	76	68	36	104	81	6	21	108	14	54	68	17	85	
	Mid-Rise	208 du		1,257	101	318	1,676	113	9	29	151	61	33	94	84	45	129	101	8	25	134	17	67	84	21	106	
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	70,000 sf		2,705	180	722	3,607	244	16	65	325	97	106	203	126	137	263	54	4	14	72	27	18	45	44	28	72
	Restaurant	20,000 sf		2,899	193	773	3,865	261	17	70	348	105	67	172	133	85	218	261	17	70	348	89	83	172	120	110	230
	Boat Launch	460 berths		1,838	102	102	2,042	111	6	6	123	44	30	74	52	35	87	55	3	3	61	12	25	37	12	25	37
	<i>Existing Area Trips</i>	353 emp		1,480	0	0	0	148	0	0	0	31	117	148	31	117	148	155	0	0	0	129	26	155	129	26	155
	<i>Internal Trips</i>			2,789	192	618	3,599	291	19	65	375	122	121	243	85	84	169	213	14	46	273	90	90	180	59	58	117
	Net New Trips Subtotal			14,676	1,043	3,283	20,482	1,667	116	370	2,301	369	956	1,325	555	1,321	1,876	1,447	103	325	2,030	887	265	1,152	1,256	407	1,663
Waterfront	Office	357,714 sf		3,466	217	649	4,332	485	30	91	606	75	366	441	91	442	533	485	30	91	606	388	53	441	488	66	554
	Institutional	323,646 sf		2,310	144	433	2,887	300	19	56	375	41	232	273	53	297	350	346	22	65	433	261	54	315	333	68	401
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mid-Rise	180 du		1,088	87	276	1,451	98	8	25	131	53	29	82	73	39	112	87	7	22	116	15	58	73	18	74	92
	High-Rise	260 du		1,572	126	398	2,096	142	11	36	189	77	41	118	105	56	161	126	10	32	168	21	84	105	27	106	133
	Retail	44,005 sf		1,701	113	454	2,268	153	10	41	204	61	67	128	79	86	165	34	2	9	45	17	11	28	27	18	45
	Restaurant	5,678 sf		823	55	219	1,097	74	5	20	99	30	19	49	38	24	62	74	5	20	99	25	24	49	34	31	65
	<i>Existing Area Trips</i>	230 emp		970	0	0	0	97	0	0	0	20	77	97	20	77	97	101	0	0	0	84	17	101	84	17	101
	<i>Internal Trips</i>			1,613	115	385	2,113	173	12	40	225	77	78	155	54	53	107	135	9	30	174	62	61	123	39	39	78
	Net New Trips Subtotal			8,377	627	2,044	12,018	982	71	229	1,379	240	599	839	365	814	1,179	916	67	209	1,293	581	206	787	804	307	1,111
Downtown Waterfront	Office	79,821 sf		774	48	145	967	108	7	20	135	17	81	98	20	99	119	108	7	20	135	86	12	98	109	15	124
	Institutional	72,219 sf		515	32	97	644	67	4	13	84	9	52	61	12	66	78	78	5	14	97	59	12	71	75	15	90
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mid-Rise	40 du		242	19	61	322	22	2	5	29	12	6	18	16	9	25	20	2	4	26	3	14	17	4	16	20
	High-Rise	58 du		350	28	89	467	32	3	7	42	18	9	27	23	13	36	28	2	7	37	5	18	23	6	24	30
	Retail	9,819 sf		380	25	101	506	35	2	9	46	14	15	29	18	19	37	8	1	10	4	3	7	6	4	10	
	Restaurant	1,267 sf		184	12	49	245	17	1	4	22	7	4	11	9	5	14	17	1	4	22	6	5	11	8	7	15
	<i>Existing Area Trips</i>	0 emp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Internal Trips</i>			360	25	86	471	39	3	9	51	17	18	35	12	12	24	30	2	6	38	14	14	28	9	8	17
	Net New Trips Subtotal			2,085	139	456	2,680	242	16	49	307	60	149	209	86	199	285	229	16	44	289	149	50	199	199	73	272
	Office	161,910 sf		1,569	98	294	1,961	220	14	41	275	34	166	200	41	200	241	220	14	41	275	176	24	200	221	30	251
	Institutional	146,490 sf		1,046	65	196	1,307	136	9	25	170	19	105	124	24	134	158	157	10	29	196	119	24	143	151	31	182
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mid-Rise	81 du		490	39	124	653	44	4	11	59	24	13	37	33	17	50	39	3	10	52	7	26	33	8	33	41
	High-Rise	118 du		713	57	181	951	65	5	16	86	35	19	54	47	26	73	57	5	14	76	10	38	48	12	48	60
	Retail	19,918 sf		770	51	205	1,026	69	5	18	92	28	30	58	36	39	75	16	1	4	21	8	5	13	13	8	21
	Restaurant	2,570 sf		373	25	99	497	34	2	9	45	13	9	22	17	11	28	34	2	9							

TAZ / Area	Land Use	Size	Units	Daily Person Trips By Mode				PM Peak Hour Person Trips By Mode				PM Peak Hour Vehicle Trips Based on Person Trips			PM Peak Hour Vehicle Trips Based on ITE			AM Peak Hour Person Trips By Mode				AM Peak Hour Vehicle Trips Based on Person Trips			AM Peak Hour Vehicle Trips Based on ITE			
				Auto	Transit	Walk/ Bike/Other	Total	Auto	Transit	Walk/ Bike/Other	Total	In	Out	Total	In	Out	Total	Auto	Transit	Walk/ Bike/Other	Total	In	Out	Total	In	Out	Total	
5	Office	79,008 sf		766	48	143	957	107	7	20	134	16	81	97	20	98	118	107	7	20	134	85	12	97	107	15	122	
	Institutional	27,645 sf		198	12	37	247	26	2	4	32	4	20	24	5	25	30	30	2	5	37	22	5	27	28	6	34	
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Low-Rise	7 du		42	3	11	56	4	0	1	5	2	1	3	3	1	4	3	0	1	4	1	2	3	1	3	4	
	Mid-Rise	44 du		266	21	68	355	24	2	6	32	13	7	20	18	9	27	21	2	5	28	4	14	18	4	18	22	
	High-Rise	22 du		133	11	33	177	12	1	3	16	7	3	10	9	5	14	11	1	2	14	2	7	9	2	9	11	
	Retail	17,711 sf		685	46	182	913	62	4	16	82	25	27	52	32	34	66	14	1	3	18	7	5	12	11	7	18	
	Restaurant	2,882 sf		418	28	111	557	38	3	9	50	15	10	25	19	12	31	38	3	9	50	13	12	25	17	16	33	
	Existing Area Trips	0 emp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Internal Trips			369	26	93	488	38	3	9	50	17	16	33	11	11	22	26	2	6	34	12	11	23	8	7	15	
Net New Trips Subtotal				2,139	143	492	2,774	235	16	50	301	65	133	198	95	173	268	198	14	39	251	122	46	168	162	67	229	
Log Pond	Office	69,843 sf		677	42	127	846	94	6	18	118	14	71	85	18	86	104	94	6	18	118	75	10	85	95	13	108	
	Institutional	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Low-Rise	10 du		61	5	15	81	5	0	2	7	3	1	4	4	2	6	5	0	1	6	1	3	4	1	4	5	
	Mid-Rise	42 du		254	20	65	339	23	2	6	31	12	7	19	17	9	26	20	2	5	27	3	14	17	4	17	21	
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Retail	20,112 sf		777	52	207	1,036	70	5	18	93	28	30	58	36	39	75	16	1	4	21	8	5	13	13	8	21	
	Restaurant	3,455 sf		501	33	134	668	45	3	12	60	18	12	30	23	15	38	45	3	12	60	16	14	30	21	19	40	
	Existing Area Trips	20 emp		80	0	0	0	8	0	0	0	2	6	8	2	6	8	9	0	0	0	7	2	9	7	2	9	
	Internal Trips			334	24	87	445	33	2	8	43	14	14	28	10	9	19	21	1	5	27	9	9	18	6	6	12	
Net New Trips Subtotal				1,856	128	461	2,525	196	14	48	266	59	101	160	86	136	222	150	11	35	205	87	35	122	121	53	174	
7	Office	127,161 sf		1,232	77	231	1,540	173	11	32	216	27	130	157	32	157	189	173	11	32	216	138	19	157	173	24	197	
	Institutional	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Light Industrial	10,436 sf		70	4	13	87	10	1	1	12	1	7	8	1	9	10	9	1	1	11	6	1	7	9	1	10	
	Low-Rise	22 du		133	11	33	177	12	1	3	16	7	3	10	9	5	14	11	1	2	14	2	7	9	2	9	11	
	Mid-Rise	57 du		344	28	87	459	31	2	8	41	17	9	26	23	12	35	28	2	7	37	5	18	23	6	23	29	
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Retail	29,881 sf		1,155	77	308	1,540	104	7	28	139	42	45	87	54	58	112	23	2	6	31	12	7	19	19	12	31	
	Restaurant	5,321 sf		771	51	206	1,028	70	5	18	93	28	18	46	35	23	58	70	5	18	93	24	22	46	32	29	61	
	Existing Area Trips	0 emp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Internal Trips			545	39	139	723	55	4	13	72	23	24	47	16	16	32	37	3	8	48	16	16	32	11	10	21	
Net New Trips Subtotal				3,160	209	739	4,108	345	23	77	445	99	188	287	138	248	386	277	19	58	354	171	58	229	230	88	318	
Log Pond	Office	250,077 sf		2,422	151	455	3,028	339	21	64	424	52	256	308	63	310	373	339	21	64	424	271	37	308	341	47	388	
	Institutional	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Low-Rise	36 du		218	17	55	290	20	2	4	26	11	6	17	14	8	22	17	1	5	23	3	11	14	4	14	18	
	Mid-Rise	148 du		895	72	226	1,193	80	6	21	107	44	23	67	60	32	92	71	6	18	95	12	47	59	15	60	75	
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Retail	72,011 sf		2,783	186	742	3,711	251	17	66	334	100	109	209	130	140	270	56	4	14	74	29	18	47	45	29	74	
	Restaurant	12,369 sf		1,793	120	478	2,391	161	11	43	215	65	41	106	82	53	135	161	11	43	215	55	51	106	74	68	142	
	Existing Area Trips	0 emp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Internal Trips			1,194	85	310	1,589	117	8	29	154	50	50	100	35	34	69	76	5	18	99	33	32	65	21	21	42	
Net New Trips Subtotal				6,917	461	1,646	9,024	734	49	169	952	222	385	607	314	509	823	568	38	126	732	337	132	469	458	197	655	
Shipping Terminal	Office	364,467 sf		3,531	221	662	4,414	494	31	93	618	76	373	449	92	451	543	494	31	93	618	395	54	449	497	68	565	
	Institutional	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Light Industrial	124,565 sf		833	52	156	1,041	117	7	22	146	11	79	90	15	107	122	108	7	20	135	73	10	83	101	14	115	
	Low-Rise	92 du		557	45	140	742	50	4	13	67	27	15	42	37	20	57	44	4	11	59	7	30	37	9	38	47	
	Mid-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Retail	24,544 sf		949	63	253	1,265	86	6	22	114	35	37	72	44	48	92	19	1	5	25	10	6	16	15	10	25	
	Restaurant	6,459 sf		936	62	250	1,248	84	6	22	112	34	21	55	43	28	71	84	6	22	112	29	26	55	38	36	74	
	Existing Area Trips	42 emp		230	0																							

TAZ / Area	Land Use	Size	Units	Daily Person Trips By Mode				PM Peak Hour Person Trips By Mode				PM Peak Hour Vehicle Trips Based on Person Trips			PM Peak Hour Vehicle Trips Based on ITE			AM Peak Hour Person Trips By Mode				AM Peak Hour Vehicle Trips Based on Person Trips			AM Peak Hour Vehicle Trips Based on ITE		
				Auto	Transit	Walk/ Bike/Other	Total	Auto	Transit	Walk/ Bike/Other	Total	In	Out	Total	In	Out	Total	Auto	Transit	Walk/ Bike/Other	Total	In	Out	Total	In	Out	Total
				Sub-Total Project Trips																							
	Office	2,000,000 sf		19,378	1,211	3,632	24,221	2,712	170	509	3,391	418	2,046	2,464	507	2,473	2,980	2,712	170	509	3,391	2,167	297	2,464	2,727	373	3,100
	Institutional	670,000 sf		4,783	298	896	5,977	622	40	115	777	86	481	567	110	614	724	718	46	133	897	542	111	653	690	141	831
	Light Industrial	685,000 sf		4,581	286	859	5,726	642	40	120	802	60	434	494	81	590	671	595	38	111	744	403	55	458	555	76	631
	Low-Rise	334 du		2,021	162	509	2,692	182	14	46	242	99	53	152	135	72	207	161	12	41	214	28	107	135	34	136	170
	Mid-Rise	1,100 du		6,650	532	1,684	8,866	599	48	152	799	325	175	500	445	237	682	532	44	132	708	90	355	445	111	448	559
	High-Rise	458 du		2,768	222	701	3,691	251	20	62	333	137	72	209	184	100	284	222	18	55	295	38	147	185	47	187	234
	Retail	310,000 sf		11,982	798	3,195	15,975	1,081	72	285	1,438	433	469	902	559	604	1,163	242	17	60	319	123	79	202	194	125	319
	Restaurant	65,000 sf		9,423	627	2,512	12,562	849	57	225	1,131	341	218	559	433	277	710	849	57	225	1,131	290	269	559	390	358	748
	Boat Launch	460 berths		1,838	102	102	2,042	111	6	6	123	44	30	74	52	35	87	55	3	3	61	12	25	37	12	25	37
	Total Project Trips			63,424	4,238	14,090	81,752	7,049	467	1,520	9,036	1,943	3,978	5,921	2,506	5,002	7,508	6,086	405	1,269	7,760	3,693	1,445	5,138	4,760	1,869	6,629
Sub-Total Trip Reductions																											
	Existing Area Trips	645 emp		2,760	0	0	0	276	0	0	0	59	217	276	59	217	276	286	0	0	0	236	50	286	236	50	286
	Internal Trips			9,337	658	2,233	12,228	973	67	226	1,266	419	420	839	292	288	580	714	49	157	920	313	310	623	203	198	401
	Net New Project Trips			51,327	3,580	11,857	69,524	5,800	400	1,294	7,770	1,465	3,341	4,806	2,155	4,497	6,652	5,086	356	1,112	6,840	3,144	1,085	4,229	4,321	1,621	5,942

Appendix M-2: Roadway and Intersection Operations

Intersection Operations

Study Intersection	Existing			No Action			Alternative 1			Alternative 2			Alternative 2A ⁵			Alternative 3			Preferred Alternative								
	2007			2016			2026			2016			2026			2016			2026			2016			2026		
	LOS ¹	Delay ²	V/C or WM ³	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM
On-Site																											
1. Roeder Avenue/Hilton Avenue	C	16	NB	E	<u>84</u>	NB	E	<u>>200</u>	NB	E	<u>>200</u>	NB	E	<u>>200</u>	NB	E	<u>>200</u>	NB	E	<u>86</u>	NB	E	<u>>200</u>	NB	E	<u>>200</u>	NB
2. Roeder Avenue/F Street	B	17	0.32	D	48	0.69	E	<u>100</u>	<u>0.90</u>	D	50	0.79	E	<u>105</u>	<u>1.09</u>	D	49	0.74	E	<u>100</u>	<u>1.01</u>	-	-	-	D	44	0.66
3. Roeder Avenue/C Street	C	16	SB	E	<u>114</u>	NB/SB	E	<u>>200</u>	NB/SB	E	<u>>200</u>	SB	E	<u>>200</u>	NB/SB	E	<u>>200</u>	SB	E	<u>>200</u>	NB/SB	-	-	-	E	<u>174</u>	SB
4. Roeder Avenue/Central Avenue	C	16	NB	E	<u>>200</u>	NB/SB	E	<u>>200</u>	NB/SB	E	<u>>200</u>	NB	E	<u>>200</u>	NB/SB	E	<u>>200</u>	NB	E	<u>>200</u>	NB/SB	E	<u>>200</u>	NB	E	<u>>200</u>	SB
5. West Chestnut Street/Bay Street/Roeder Avenue	E	40	SBL	E	<u>>200</u>	SBL	E	<u>>200</u>	SBL	E	<u>>200</u>	NB/SBL	E	<u>>200</u>	SBL	E	<u>>200</u>	NB/SBL	E	<u>>200</u>	SBL	E	<u>>200</u>	SBL	E	<u>>200</u>	SBL
6. West Chestnut Street/Commercial Street	B	11	0.39	B	15	0.55	B	16	0.70	B	14	0.49	D	45	0.81	B	14	0.56	D	52	1.08	B	15	0.56	D	39	0.85
7. East Chestnut Street/Cornwall Avenue	B	14	0.57	E	57	1.09	E	<u>>200</u>	<u>1.47</u>	C	28	0.93	E	<u>94</u>	<u>1.17</u>	C	21	0.82	E	68	1.10	C	31	0.96	E	<u>92</u>	<u>1.21</u>
8. Maple Street/Central Avenue	-	-	-	-	-	-	-	-	-	-	-	-	C	20	WB	-	-	-	B	13	WB	-	-	-	E	<u>154</u>	<u>1.34</u>
9. Maple Street (Bloedel Avenue)/Bay Street	-	-	-	-	-	-	-	-	-	-	-	-	C	26	0.75	-	-	-	B	12	0.54	-	-	-	B	11	WB
10. Maple Street (Bloedel Avenue)/Commercial Street	-	-	-	-	-	-	-	-	-	-	-	-	A	9	0.45	-	-	-	C	19	EB	-	-	-	B	15	EB
11. Laurel Street/Bay Street	-	-	-	-	-	-	-	-	-	-	-	-	A	9	0.45	-	-	-	C	19	EB	-	-	-	B	12	SB
12. Laurel Street/Commercial Street/Log Pond Road	-	-	-	-	-	-	-	-	-	B	11	NA	B	14	NA	B	10	NA	C	24	NA	A	8	NA	B	14	NA
13. Cornwall Avenue/Oak Street/Wharf Street	-	-	-	-	-	-	-	-	-	D	51	1.05	-	-	-	D	37	NA	-	-	-	B	17	NA	-	-	-
14. Cornwall Avenue/Wharf Street	-	-	-	-	-	-	-	-	-	B	11	EB	-	-	-	A	9	NA	-	-	-	A	9	NA	-	-	-
15. Paper Avenue/Log Pond Drive	-	-	-	-	-	-	-	-	-	A	9	NA	D	34	NB	B	13	SB	D	35	SB	B	14	SB	D	26	SB
16. Bloedel Avenue/Log Pond Drive	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17. Paper Avenue/Oak Street	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18. Cornwall Avenue/Oak Street	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Off-Site																											
1. Meridian Street/Birchwood Avenue	D	40	0.72	E	65	0.87	E	<u>128</u>	<u>1.01</u>	E	66	0.87	E	<u>132</u>	<u>1.03</u>	E	63	0.87	E	<u>109</u>	<u>1.02</u>	-	-	-	E	63	0.86
2. Meridian Street/Squalicum Way	C	28	0.49	D	42	0.63	D	53	0.73	D	44	0.65	E	63	0.77	D	40	0.63	E	75	0.79	-	-	-	D	40	0.63
3. Broadway/Meridian Street/Girard Street	B	18	0.50	C	24	0.61	C	28	0.70	C	24	0.60	C	29	0.68	B	20	0.55	C	28	0.62	-	-	-	C	23	0.51
4. Broadway/Elm Street/Dupont Street	A	8	0.50	B	16	0.59	C	22	0.67	B	18	0.68	C	25	0.72	B	17	0.59	C	21	0.66	-	-	-	B	17	0.60
5. Broadway/Eldridge Avenue/West Holly Street	A	8	0.58	A	9	0.64	B	14	0.80	A	9	0.65	B	15	0.82	A	9	0.66	B	14	0.81	-	-	-	A	9	0.65
6. West Holly Street/F Street	B	13	0.50	C	25	0.67	C	33	0.89	C	52	0.84	E	73	1.09	C	27	0.74	D	54	0.96	-	-	-	C	24	0.69
7. West Holly Street/ C Street	C	18	SB	E	<u>127</u>	SB	E	<u>>200</u>	NB/SB	E	<u>198</u>	SB	E	<u>>200</u>	NB/SB	E	<u>>200</u>	SB	E	<u>>200</u>	NB/SB	-	-	-	E	<u>166</u>	SB
8. Cornwall Avenue/Flora Street/York Street	B	13	0.68	C	21	0.75	D	41	0.93	C	22	0.78	E	68	1.02	B	20	0.73	D	46	1.01	-	-	-	C	20	0.74
9. Cornwall Avenue/East Magnolia Street	B	12	0.52	B	17	0.58	C	30	0.84	B	18	0.63	C	28	0.83	B	16	0.56	C	25	0.82	-	-	-	B	17	0.60
10. East Holly Street/Cornwall Avenue	B	16	0.53	B	17	0.73	D	52	1.05	B	16	0.67	C	32	0.88	B	19	0.80	B	19	0.80	-	-	-	B	17	0.73
11. East Chestnut Street/Railroad Avenue	E	44	SB	E	<u>168</u>	SB	E	<u>>200</u>	SB	E	<u>70</u>	SB	E	<u>>200</u>	SB	E	<u>98</u>	SB	E	<u>>200</u>	SB	-	-	-	E	<u>87</u>	SB
12. East Chestnut Street/North State Street	B	13	0.53	B	17	0.59	C	27	0.53	B	16	0.58	C	27	0.57	B	16	0.56	B	17	0.59	-	-	-	B	16	0.55
13. East Chestnut Street/North Forest Street	A	7	0.39	B	11	0.51	B	17	0.59	B	11	0.50	B	19	0.65	B	12	0.51	B	16	0.68	-	-	-	B	12	0.52
14. East Chestnut Street/Ellis Street	A	10	0.42	B	11	0.47	B	15	0.71	B	11	0.49	C	21	0.82	B	11	0.47	B	18	0.78	-	-	-	B	10	0.46
15. Lakeway Drive/Ellis Street/Jersey Street/East Holly Street	C	24	0.68	D	37	0.85	D	55	0.96	D	37	0.85	E	64	0.99	D	37	0.85	E	64	0.98	-	-	-	D	37	0.85
16. Lakeway Drive/I-5 Southbound Ramps	C	23	0.82	D	38	0.93	E	<u>98</u>	<u>1.16</u>	C	35	0.91	E	<u>108</u>	<u>1.20</u>	D	43	0.96	E	<u>88</u>	<u>1.17</u>	-	-	-	D	46	0.99
17. Lakeway Drive/King Street	D	39	0.73	D	47	0.78	E	69	0.84	D	49	0.77	E	<u>85</u>	<u>0.84</u>	D	46	0.77	E	66	0.87	-	-	-	D	46	0.78
18. Lakeway Drive/Lincoln Street	D	38	0.91	D	47	0.90	E	68	1.07	D	47	0.91	E	67	1.02	D	46	0.89	E	65	1.04	-	-	-	D	45	0.89
19. Iowa Street/Moore Street/I-5 Northbound Ramps	C	33	0.89	D	47	0.99	E	74	1.11	D	46	0.98	E	78	1.11	D	46	0.98	E	79	1.10	-	-	-	D	43	0.96
20. Iowa Street/King Street	B	17	0.62	C	22	0.80	C	33	0.89	B	20	0.74	D	38	0.92	B	19	0.68	C	34	0.86	-	-	-	B	18	0.66
21. North State Street/James Street/Iowa Street	E	<u>114</u>	<u>1.63</u>	E	<u>>200</u>	<u>2.59</u>	E	<u>>200</u>	<u>2.98</u>	E	<u>>200</u>	<u>2.78</u>	E	<u>>200</u>	<u>3.21</u>	E	<u>>200</u>	<u>2.79</u>	E	<u>>200</u>	<u>3.12</u>	-	-	-	E	<u>>200</u>	<u>2.81</u>
22. North State Street/Ohio Street	C	20	0.65	D	37	0.85	E	67	1.03	D	38	0.89	E	<u>94</u>	<u>1.13</u>	D	40	0.91	E	<u>110</u>	<u>1.13</u>	-	-	-	D	37	0.89
23. North State Street/York Street	B	15	0.51	C	22	0.71	D	38	0.88	C	23	0.73	D	55	0.98	C	23	0.67	D	51	0.96	-	-	-	C	21	0.69
24. North State Street/East Laurel Street	B	11	WBL	D	27	EB	E	<u>81</u>	WB	E	<u>>200</u>	WB	E	<u>>200</u>	WB	E	<u>>200</u>	WB	E	<u>>200</u>	WB	-	-	-	D	27	EB
25. North Forest Street/ North State Street/Boulevard Street/Wharf Street ⁵										B	13	NA										-	-	-	B	13	NA
a. North Forest Street/North State Street/Boulevard Street	C	17	SBL	D	28	SBL	E	<u>51</u>	SBL	D	28	SBL				D	34	SBL	E	<u>54</u>	SBL	-	-	-	D	28	SBL
b. North State Street/Wharf Street	B	14	EB	C	21	EB	E	39	EB	C	22	EB				E	36	EB	E	<u>>200</u>	EB	-	-	-	C	19	EB
26. North Forest Street/East Laurel Street	B	14	EB	C	20	EB	E	<u>95</u>	EB	E	<u>>200</u>	EB	E	<u>>200</u>	EB	E	<u>>200</u>	EB	E	<u>>200</u>	EB	-	-	-	C	22	EB
27. North Forest Street/Ellis Street/York Street	B	18	0.54	C	22	0.66	C	28	0.77	C	22	0.67	C	30	0.81	D	41	0.79	C	34	0.84	-	-	-	C	23	0.69
28. South Samish Way/Elwood Avenue/Lincoln Street	B	18	0.64	C	34	0.85	E	64	1.07	D	38	0.89	E	57	1.05	D	38	0.88	E	68	1.10	-	-	-	D	38	0.88
29. South Samish Way/I-5 Southbound Off-Ramp/36th Street	C	26	0.66	C	30	0.72	D	35	0.86	C	30	0.72	D	36	0.88	C	31	0.75	D	36	0.85	-	-	-	C	30	0.72
30. North Samish Way/Bill McDonald Parkway	B	15	0.52	C	21	0.67	C	32	0.86	C	21	0.67	C	31	0.85	C	21	0.66	C	32	0.82	-	-	-	B	20	0.64
31. 12 th Street/Old Fairhaven Parkway	B	19	0.59	C	21	0.61	C	24	0.72	C	21	0.62	C	24	0.69	C	21	0.62	C	24	0.69	-	-</				

Appendix M-3: Intersection Level
of Service Worksheets

The Intersection Level of Service worksheets are available on file at the Port of Bellingham.

Appendix M-4: Parking Calculations

Parking Demand based on Rates from ITE and Shared Parking																							
ITE #	Land Use	ITE Rate	Units	% Reduction	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	12 AM
701	Office	2.40	ksf		3%	20%	68%	90%	96%	95%	94%	96%	100%	99%	92%	62%	25%	10%	7%	3%	1%	0%	0%
701	Research / Institutional	2.40	ksf		3%	20%	68%	90%	96%	95%	94%	96%	100%	99%	92%	62%	25%	10%	7%	3%	1%	0%	0%
110/130	Industrial / Warehouse	0.75	ksf		55%	55%	82%	88%	89%	90%	92%	97%	100%	95%	77%	62%	25%	10%	7%	3%	1%	0%	0%
230/221	Residential - Assigned	1.00	du		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Residential - Unassigned	0.46	du		92%	74%	64%	55%	50%	45%	40%	45%	45%	44%	59%	69%	66%	75%	77%	92%	94%	100%	100%
820	Retail	2.65	ksf	10%	1%	5%	16%	34%	48%	77%	90%	88%	82%	77%	73%	51%	62%	74%	63%	38%	9%	12%	0%
931/932	Restaurant	10.48	ksf	10%	24%	42%	54%	73%	81%	100%	100%	100%	51%	40%	40%	79%	81%	62%	63%	60%	46%	42%	35%
420	Marina	0.27	slips		9%	16%	31%	38%	34%	38%	78%	94%	94%	78%	75%	100%	94%	78%	47%	47%	6%	6%	6%

					Shared Parking Demand																							
Area	Land Use	Size	Units	Demand	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM					
Marine Trade	Office	430,000 sf		1,032	31	206	702	929	991	980	970	991	1,032	1,022	949	640	258	103	72	31	10	0	0					
	Institutional	50,000 sf		120	4	24	82	108	115	114	113	115	120	119	110	74	30	12	8	4	1	0	0					
	Light Industrial	450,000 sf		338	10	68	230	304	324	321	318	324	338	335	311	210	85	34	24	10	3	0	0					
	Low-Rise	125 du		183	178	168	162	157	154	151	148	151	151	151	150	159	165	163	168	169	178	179	183					
	Mid-Rise	167 du		244	238	224	216	209	205	202	198	202	202	202	201	212	220	218	225	226	238	239	244					
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	52,000 sf		138	1	7	22	47	66	106	124	121	113	106	101	70	86	102	87	52	12	17	0					
	Restaurant	20,000 sf		210	46	80	103	139	153	189	189	189	97	76	76	149	153	118	120	113	86	80	67					
	Marina	460 slips		124	11	20	38	47	42	47	97	117	117	97	93	124	117	97	58	58	7	7	7					
	Total			2,389	519	797	1,555	1,940	2,050	2,110	2,157	2,210	2,170	2,108	1,991	1,638	1,114	847	762	663	535	522	501					
Downtown Waterfront/Log Pond (1)	Office	89,702 sf		216	6	43	147	194	207	205	203	207	216	214	199	134	54	22	15	6	2	0	0					
	Institutional	169,176 sf		405	12	81	275	365	389	385	381	389	405	401	373	251	101	41	28	12	4	0	0					
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Low-Rise	4 du		6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6					
	Mid-Rise	123 du		180	175	165	159	154	151	148	146	148	148	148	148	156	162	160	165	167	175	176	180					
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	10,701 sf		28	0	1	4	10	13	22	25	25	23	22	20	14	17	21	18	11	3	3	0					
	Restaurant	7,949 sf		83	18	32	41	55	61	75	75	75	38	30	30	59	61	46	47	45	34	32	27					
	Total			953	217	327	631	783	826	840	835	849	835	820	775	619	400	295	278	246	224	217	213					
Downtown Waterfront/Log Pond (2)	Office	100,922 sf		241	7	48	164	217	231	229	227	231	241	239	222	149	60	24	17	7	2	0	0					
	Institutional	115,824 sf		278	8	56	189	250	267	264	261	267	278	275	256	172	70	28	19	8	3	0	0					
	Light Industrial	2,822 sf		2	0	0	1	2	2	2	2	2	2	2	2	1	1	0	0	0	0	0	0					
	Low-Rise	30 du		44	43	41	39	38	37	37	36	37	37	37	39	40	40	41	41	41	43	44	44					
	Mid-Rise	85 du		124	121	114	110	107	105	103	101	103	103	103	102	108	112	111	114	115	121	122	124					
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	18,270 sf		49	0	2	8	17	24	38	44	43	40	38	36	25	30	36	31	19	4	6	0					
	Restaurant	6,163 sf		65	14	25	32	43	47	59	59	59	30	23	23	46	47	36	37	35	27	25	21					
	Total			803	193	286	543	674	713	732	730	742	731	717	678	540	360	275	259	225	200	197	189					
Shipping Terminal	Office	32,871 sf		79	2	16	54	71	76	75	74	76	79	78	73	49	20	8	6	2	1	0	0					
	Institutional	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Light Industrial	82,178 sf		62	2	12	42	56	60	59	58	60	62	61	57	38	16	6	4	2	1	0	0					
	Low-Rise	24 du		35	34	32	31	30	30	29	29	29	29	29	29	31	32	32	33	33	34	35	35					
	Mid-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	5,027 sf		13	0	1	2	4	6	10	12	11	11	10	9	7	8	10	8	5	1	2	0					
	Restaurant	1,257 sf		13	3	5	6	9	9	12	12	12	6	5	5	9	9	7	7	7	5	5	4					
	Total			202	41	66	135	170	181	185	185	188	187	183	173	134	85	63	58	49	42	42	39					
Cornwall Beach	Office	10,000 sf		24	1	5	16	22	23	23	23	23	24	24	22	15	6	2	2	1	0	0	0					
	Institutional	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Low-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Mid-Rise	300 du		438	427	402	388	376	369	362	355	362	362	362	361	381	395	391	404	406	427	430	438					
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	2,000 sf		5	0	0	1	2	2	4	5	4	4	4	4	3	3	4	3	2	0	1	0					
	Restaurant	5,000 sf		52	11	20	25	34	38	47	47	47	24	19	19	37	38	29	30	28	21	20	17					
	Total			519	439	427	430	434	432	436	430	436	414	409	406	436	442	426	439	437	448	451	455					
Grand Total					4,866	1,409	1,903	3,294	4,001	4,202	4,303	4,337	4,425	4,337	4,237	4,023	3,367	2,401	1,906	1,796	1,620	1,449	1,429	1,397				

Parking Area	Demand		Supply					Surplus / Deficiency Range		Surplus / Deficiency Range		
	ITE Maximum	Shared Parking Maximum Hourly	Proposed Parking	Available On-Street	Total Supply	Proposed Practical Supply	Recommended Supply Range	(with Proposed Parking Only)		(with On-Street Parking)		
								Surplus	Deficiency	Surplus	Deficiency	
Marine Trade	2,389	2,210	2,918	316	3,234	1.46	2,431	2,542	487	377	803	693
Downtown/Log Pond	953	849	932	159	1,091	1.28	934	976	-2	-44	157	115

Parking Demand based on Rates from ITE and Shared Parking

ITE #	Land Use	ITE Rate	Units	% Reduction	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	12 AM
701	Office	2.40	ksf		3%	20%	68%	90%	96%	95%	94%	96%	100%	99%	92%	62%	25%	10%	7%	3%	1%	0%	0%
701	Research / Institutional	2.40	ksf		3%	20%	68%	90%	96%	95%	94%	96%	100%	99%	92%	62%	25%	10%	7%	3%	1%	0%	0%
110/130	Industrial / Warehouse	0.75	ksf		55%	55%	82%	88%	89%	90%	92%	97%	100%	95%	77%	62%	25%	10%	7%	3%	1%	0%	0%
230/221	Residential - Assigned	1.00	du		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
230/221	Residential - Unassigned	0.46	du		92%	74%	64%	55%	50%	45%	40%	45%	45%	44%	59%	69%	66%	75%	77%	92%	94%	100%	100%
820	Retail	2.65	ksf	10%	1%	5%	16%	34%	48%	77%	90%	88%	82%	77%	73%	51%	62%	74%	63%	38%	9%	12%	0%
931/932	Restaurant	10.48	ksf	10%	24%	42%	54%	73%	81%	100%	100%	100%	51%	40%	40%	79%	81%	62%	63%	60%	46%	42%	35%
420	Marina	0.27	slips		9%	16%	31%	38%	34%	38%	78%	94%	94%	78%	75%	100%	94%	78%	47%	47%	6%	6%	6%

Area	Land Use	Size	Units	Demand	Shared Parking Demand																			
					6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	
Marine Trade	Office	500,000 sf		1,200	36	240	816	1,080	1,152	1,140	1,128	1,152	1,200	1,188	1,104	744	300	120	84	36	12	0	0	
	Institutional	100,000 sf		240	7	48	163	216	230	228	226	230	240	238	221	149	60	24	17	7	2	0	0	
	Light Industrial	550,000 sf		413	12	83	281	372	396	392	388	396	413	409	380	256	103	41	29	12	4	0	0	
	Low-Rise	167 du		244	238	224	216	209	205	202	198	202	202	202	201	212	220	218	225	226	238	239	244	
	Mid-Rise	208 du		304	296	279	269	261	256	251	246	251	251	251	250	264	274	271	280	282	296	298	304	
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Retail	70,000 sf		186	2	9	30	63	89	143	167	164	153	143	136	95	115	138	117	71	17	22	0	
	Restaurant	20,000 sf		210	46	80	103	139	153	189	189	189	97	76	76	149	153	118	120	113	86	80	67	
	Marina	460 slips		124	11	20	38	47	42	47	97	117	117	97	93	124	117	97	58	58	7	7	7	
	Total			2,921	648	983	1,916	2,387	2,523	2,592	2,639	2,701	2,673	2,604	2,461	1,993	1,342	1,027	930	805	662	646	622	
Downtown Waterfront/Log Pond (1)	Office	516,543 sf		1,241	37	248	844	1,117	1,191	1,179	1,167	1,191	1,241	1,229	1,142	769	310	124	87	37	12	0	0	
	Institutional	423,510 sf		1,016	30	203	691	914	975	965	955	975	1,016	1,006	935	630	254	102	71	30	10	0	0	
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Low-Rise	7 du		10	10	9	9	9	9	8	8	8	8	8	8	9	9	9	9	9	10	10	10	
	Mid-Rise	264 du		385	376	354	342	331	325	319	313	319	319	319	317	336	348	344	355	358	376	378	385	
	High-Rise	340 du		496	484	456	440	426	418	410	403	410	410	410	409	432	448	443	457	460	484	487	496	
	Retail	71,535 sf		190	2	10	30	65	91	146	171	167	156	146	139	97	118	141	120	72	17	23	0	
Restaurant	9,827 sf		103	23	39	50	68	75	93	93	93	47	37	37	73	75	58	59	56	42	39	33		
	Total			3,471	962	1,319	2,406	2,930	3,084	3,120	3,110	3,163	3,197	3,155	2,987	2,346	1,562	1,221	1,158	1,022	951	937	924	
Downtown Waterfront/Log Pond (2)	Office	608,991 sf		1,462	44	292	994	1,316	1,404	1,389	1,374	1,404	1,462	1,447	1,345	906	366	146	102	44	15	0	0	
	Institutional	146,490 sf		352	11	70	239	317	338	334	331	338	352	348	324	218	88	35	25	11	4	0	0	
	Light Industrial	10,436 sf		8	0	2	5	7	8	8	8	8	8	8	7	5	2	1	1	0	0	0	0	
	Low-Rise	68 du		99	97	91	88	85	84	82	81	82	82	82	82	86	90	89	91	92	97	97	99	
	Mid-Rise	328 du		479	467	440	425	411	403	396	388	396	396	396	394	417	432	428	441	444	467	470	479	
	High-Rise	118 du		172	168	158	153	148	145	142	140	142	142	142	150	155	154	159	160	168	169	172	172	
	Retail	141,921 sf		376	4	19	60	128	180	290	338	331	308	290	274	192	233	278	237	143	34	45	0	
Restaurant	23,715 sf		249	55	95	122	164	182	224	224	224	115	90	90	177	182	139	142	134	102	95	80		
	Total			3,197	846	1,167	2,086	2,576	2,744	2,865	2,884	2,925	2,865	2,803	2,658	2,151	1,548	1,270	1,198	1,028	887	876	830	
Shipping Terminal	Office	364,467 sf		875	26	175	595	788	840	831	823	840	875	866	805	543	219	88	61	26	9	0	0	
	Institutional	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Light Industrial	124,565 sf		93	3	19	63	84	89	88	87	89	93	92	86	58	23	9	7	3	1	0	0	
	Low-Rise	92 du		134	131	123	119	115	113	111	109	111	111	111	111	117	121	120	124	125	131	132	134	
	Mid-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Retail	24,544 sf		65	1	3	10	22	31	50	59	57	53	50	47	33	40	48	41	25	6	8	0	
Restaurant	6,459 sf		68	15	26	33	45	50	61	61	61	31	24	24	48	50	38	39	37	28	26	22		
	Total			1,235	176	346	820	1,054	1,123	1,141	1,139	1,158	1,163	1,143	1,073	799	453	303	272	216	175	166	156	
Cornwall Beach	Office	10,000 sf		24	1	5	16	22	23	23	23	23	24	24	22	15	6	2	2	1	0	0	0	
	Institutional	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Light Industrial	0 sf		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Low-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Mid-Rise	300 du		438	427	402	388	376	369	362	355	362	362	362	361	381	395	391	404	406	427	430	438	
	High-Rise	0 du		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Retail	2,000 sf		5	0	0	1	2	2	4	5	4	4	4	4	3	3	4	3	2	0	1	0	
Restaurant	5,000 sf		52	11	20	25	34	38	47	47	47	24	19	19	37	38	29	30	28	21	20	17		
	Total			519	439	427	430	434	432	436	430	436	414	409	406	436	442	426	439	437	448	451	455	
Grand Total					11,343	3,071	4,242	7,658	9,381	9,906	10,154	10,202	10,383	10,312	10,114	9,585	7,725	5,347	4,247	3,997	3,508	3,123	3,076	2,987

Parking Area	Demand		Supply					Surplus / Deficiency Range (with Proposed Parking Only)		Surplus / Deficiency Range (with On-Street Parking)	
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