

Transportation Impact Analysis

SHORELINE III – 147TH & 1ST

Permit No.: PIN 23-2383BLDG
Address: 104-158 NE 147th St Shoreline, WA



Prepared for:
Evergreen Point Five, LLC

March 2024

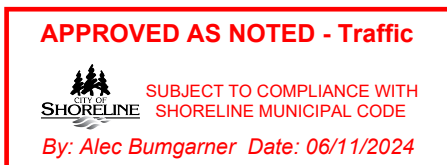
Prepared by:



12131 113th Avenue NE, Suite 203
Kirkland, WA 98034-7120
Phone: 425-821-3665
Fax: 425-825-8434
www.transpogroup.com

1.22228.00

© 2024 Transpo Group



MXU23-3073

Table of Contents

Introduction	1
Project Description	1
Study Scope	1
Existing & Future Without-Project Conditions	4
Land Use	4
Street Network	4
Transit	6
Non-Motorized Facilities	6
Traffic Volumes	7
Vehicular Traffic Operations	8
Traffic Safety	13
Project Impacts	14
Land Use	14
Trip Generation	14
Trip Distribution & Assignment	15
Traffic Operations Impact	18
Site Access	19
Parking Analysis	21
Transportation Impact Fees	23
Other Mitigation Measures	25
Findings and Conclusions	26

Appendix

- Appendix A: Traffic Counts
- Appendix B: LOS Definitions
- Appendix C: LOS Worksheets
- Appendix D: Trip Generation
- Appendix E: SEPA Mitigation Fee Calculation

Figures

Figure 1.	Site Vicinity and Study Intersections	2
Figure 2.	Preliminary Site Plan	3
Figure 3.	Existing Weekday PM Peak Hour Traffic Volumes	11
Figure 4.	Future (2028) Without-Project Weekday PM Peak Hour Traffic Volumes	12
Figure 5.	Project Trip Distribution and Assignment	16
Figure 6.	Future (2028) With-Project Weekday PM Peak Hour Traffic Volumes	17
Figure 7.	Future Non-Motorized Connections Near the Project Site	20
Figure 8.	King County Right Size Parking Demand Rate Estimate	22

Tables

Table 1.	Existing Transit Routes	6
Table 2.	List of Pipeline Projects	8
Table 3.	Existing and Future (2028) Without-Project PM Peak Hour LOS Summary	9
Table 4.	Existing and Future (2028) Without-Project PM Peak Hour Queuing Summary	10
Table 5.	Three-Year Collision Summary – 2020 to 2022	13
Table 6.	Estimated Weekday Vehicle Trip Generation ¹	15
Table 7.	Future (2028) Without- and With-Project PM Peak Hour LOS Summary	18
Table 8.	Future (2028) PM Peak Hour Queuing Summary	19
Table 9.	Code Required Parking Supply	21
Table 10.	Transportation Impact Fee Calculation based on ITE 11th Edition ¹	24

Introduction

The purpose of this transportation impact analysis (TIA) is to identify potential transportation-related impacts to the surrounding street network associated with the proposed development of Shoreline III, located in Shoreline, WA.

Project Description

The proposed project includes a seven-story residential development located in the Parkwood neighborhood of Shoreline and is shown on Figure 1. The project is bounded by NE 147th Street to the south, 1st Avenue NE to the west, Interstate 5 to the east, and adjacent parcels to the north. The proposed project would construct up to 360 multifamily mid-rise housing units, as well as 2,947 square feet of retail space. A total of 10 existing single-family detached homes would be removed with development of the proposed project. Access to the 249-space parking garage would be provided via NE 147th Street and 1st Avenue NE.

A preliminary site plan for the development is shown on Figure 2. The proposed project is anticipated to be constructed by 2028.

Study Scope

The scope of the analysis was coordinated with City of Shoreline staff. Based on the anticipated travel patterns for project-generated vehicle traffic, the following study intersections were selected and are illustrated on Figure 1:

- 1st Avenue NE/N 145th Street
- 1st Avenue NE/N 147th Street/NE 147th Street
- 1st Avenue NE/N 155th Street

The study focuses on the weekday PM peak hour when traffic volumes for the proposed project and on the surrounding roadway network are anticipated to be highest. The future 2028 horizon year is evaluated consistent with when the proposed project is anticipated to be constructed and occupied. The analysis includes a review of the land use, street network, non-motorized facilities, transit service, existing and future peak hour traffic volumes, traffic operations, and traffic safety. Future with-project conditions are evaluated by adding site-generated traffic to future without-project volumes. Future without-project and with-project conditions were compared to identify the relative impacts the proposed project would have on the surrounding transportation system.

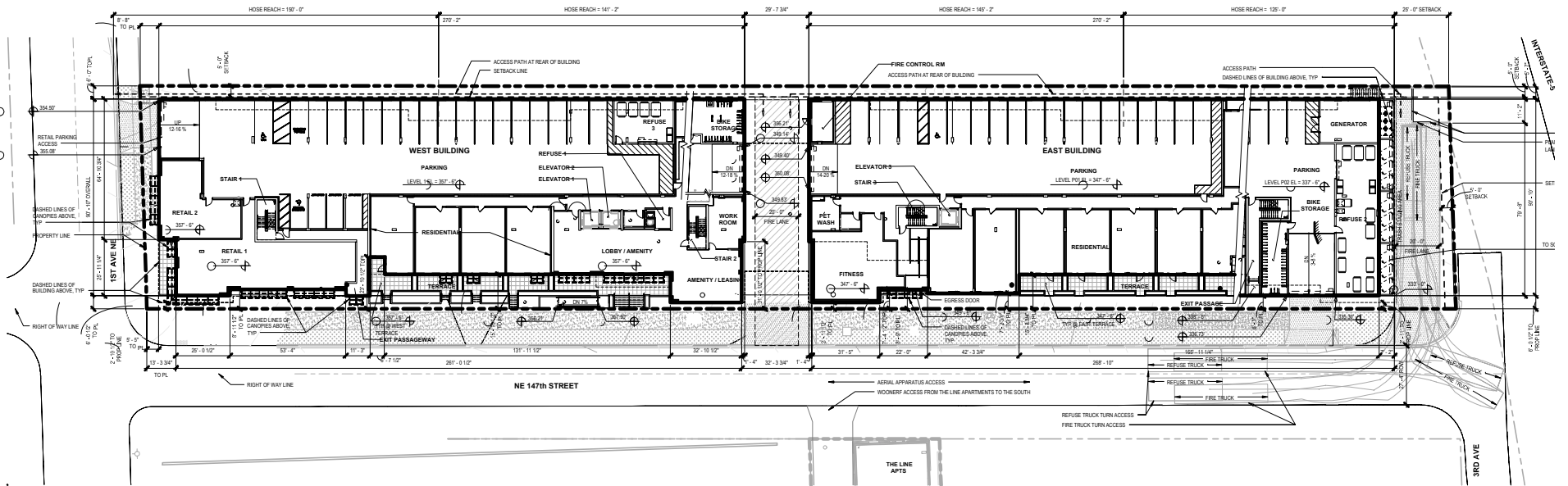


Site Vicinity and Study Intersections

Shoreline III

FIGURE

1



Preliminary Site Plan

Shoreline III

MXU23-3073

FIGURE

2



Existing & Future Without-Project Conditions

This section describes both existing and future (2028) without-project conditions within the identified study area. Study area characteristics are provided for the land use, street network, planned improvements, transit service, non-motorized facilities, existing and future forecasted without-project traffic volumes, traffic operations, and traffic safety.

Land Use

The existing land use within the proposed project site vicinity is primarily single-family residential with some religious, school and park facilities nearby. Shoreline has adopted the 145th Street Station Subarea Plan and Comprehensive Plan amendment, which updates the land use and zoning plan north of NE 145th Street in the vicinity of the project site to “Station Area 1”. The Station Area 1 designation is intended to support high density residential, a mix of uses, reduced parking standards, public amenities, commercial and office uses that support the stations and residents of the light rail station areas, changing the land use context surrounding the project site. With mixed use residential, it is anticipated that there will be more commercial uses within walking distance for residents to live, work and play closer to home. The overarching vision for the 145th Street Station Subarea is to have a livable community where walking, biking and transit are the primary mode for most trips¹.

Street Network

The following sections describe the street network in the vicinity of the proposed project and anticipated changes resulting from planned improvements by 2028.

Existing

The site is served by arterials and local streets including:

N 145th Street is defined by the City of Shoreline as a four-lane principal arterial. It has a posted speed of 35 miles per hour (mph) near the project site. It also has a 20-mph speed limit zone when there are children present for a section of the street west of 1st Ave NE. There are sidewalks along both sides of the roadway and no on-street parking.

N 147th Street/NE 147th Street is defined by the City of Shoreline as a two-lane local secondary street near the project site. There is a posted speed of 25 mph. There are no sidewalks along either side of the roadway, but a striped shoulder is provided on the north side of N 147th Street west of 1st Avenue NE. On-street parking is allowed on both sides of N 147th Street and NE 147th Street.

N 155th Street is defined by the City of Shoreline as a two-lane minor arterial near the project site with a center two-way left-turn lane. There is a posted speed limit of 30 mph. The roadway has two bike lanes, one on the north side going westbound and one on the south going eastbound. Sidewalks are provided along both sides of the roadway and on-street parking is not available on either side of the street.

1st Avenue NE is defined by the City of Shoreline as a two-lane collector arterial near the project site. The roadway has a posted speed limit of 30 mph. There is a striped shoulder sidewalk zone on the east side between N 145th Street and N 147th Street, which turns into a separated concrete sidewalk approximately 100 feet north of NE 147th Street. The concrete sidewalk transitions into an unmarked paved shoulder between N 148th Street and N 149th Street for

¹ 145th Street Station Subarea Plan October 2016

about 300 feet but transitions back to a concrete sidewalk again for the rest of the corridor. ~~There is no sidewalk available on the west side of the street, with intermittent unpaved shoulders present for most of the roadway.~~ On-street parking is provided intermittently along the roadway primarily on the west side north of N 147th Street and on the east side between N 145th Street and N 147th Street.

Sidewalk along the west side of the street between NE 145th and NE 155th was built through development frontage improvements, and the 1st Ave NE sidewalk project.

Future

A review of the *City of Shoreline 2023-2028 Transportation Improvement Plan (TIP)* shows there are four planned improvements that would be completed by 2028 in the vicinity of the proposed project.

- **Project #6, 145th Street (SR 523) Corridor Improvements, Aurora Avenue N to I-5** – This improvement is part of the implementation of the 145th Street Multimodal Corridor Study. Improvements will be made to the signalized intersections between I-5 and Aurora Avenue N to improve transit service, general purpose traffic, and pedestrian crossings. As it relates to the study area, the improvements include exclusive turn lanes at 1st Avenue NE/N 145th Street intersection. Pedestrian facilities will also be improved along 145th Street on the north side. Bike facilities will be provided through construction of an Off-Corridor Bike Network between the Interurban Trail to the west and 1st Avenue N to the east with connections to City of Seattle’s planned Off-Corridor south of 145th. These improvements are partially funded and phase 1 of construction (improvements from I-5 to Corliss Avenue N) is anticipated to be complete by 2024.
- **Project #7, SR 523 (N/NE 145th Street) & I-5 Interchange Improvements** – This project includes two multi-lane roundabouts to replace the two existing signalized interchange intersections. The design phase was completed in 2022 and advertising for construction bids begins in early 2023. This project is fully funded and anticipated to be completed by 2024.
- **Project #8, 148th Street Non-Motorized Bridge** – This project will provide a new non-motorized bridge crossing over I-5 from the neighborhood in the vicinity of N 148th Street on the west side of I-5 into the Sound Transit Lynnwood Link Shoreline South/145th Station to be located on the east side of I-5. This project has been split into 2 phases to complete construction of the east landing before 2024, when light rail is expected to increase construction costs significantly. Phase 1 will consist of constructing the east landing, while phase 2 will construct the west landing, bridge span, and a shared use path connection to 1st Avenue NE. Funding for phase 2 has not been fully secured yet.
- **Project #14, Light Rail Access Improvements 1st Avenue NE (145th to 155th)** – This project enhances pedestrian access to the Shoreline South/148th Station (Sound Transit light rail) by constructing sections of sidewalk on 1st Avenue NE between NE 145th and NE 155th Streets. The improvement includes design and construction of cement concrete sidewalk, amenity zone, and placement of curb and gutter to be forward-compatible with future bicycle facilities. Where possible, the project will retain any existing sidewalks. This project is fully funded and anticipated to be completed by 2024.
- In addition, the city has a SEPA mitigation for the **1st Avenue NE/NE 155th Street intersection**, which is applicable to all projects within the 145th Subarea. The SEPA mitigation will shift the 1st Avenue NE vehicle lanes west to add a northbound turn lane and shared use sidewalk at the 1st Avenue NE/NE 155th Street. Construction of the improvements are anticipated to occur as part of the 1st Avenue NE sidewalk improvements and will be completed prior to 2028.

All the planned improvements described above are anticipated to be constructed before the 2028 future horizon year; therefore, it is assumed that these projects are in place prior to completion of the proposed project.

Transit

The following describes existing and future planned transit conditions within the project vicinity.

Existing

Transit service in the study area is provided by King County Metro. The nearest bus stops to the proposed project are located just south (approximately 2-minute walk) of the project site at the 1st Ave NE/N 145th Street intersection. In addition, there are bus stops at Meridian Avenue N/N 145th Street and 5th Avenue NE/NE145th Street intersections located approximately 1,500 feet (6-minute walk) west and 1,300 feet (5-minute walk) east of the project site, respectively. There is a park and ride located at the Shoreline Unitarian Universalist Church along 1st Avenue NE, about 400 feet north of the site. Local transit routes serving stops within the vicinity of the project site, hours of operation, and scheduled headways are summarized in Table 1.

Table 1. Existing Transit Routes

Route	Days of Operation	Hours of Operation ¹		Weekday Peak Hour Headway ²
		Weekdays	Weekends	
304 – Shoreline P&R to Northgate	Mon-Fri	6:15 a.m.-8:30 a.m. & 4:00 p.m.-6:30 p.m.	-	30
346 – Aurora Village to Northgate	Mon- Sun	5:15 a.m.-11:30 p.m.	Sat: 6:00 a.m.-12:00 a.m. Sun: 6:00 a.m.-12:00 a.m.	20
347 – Richmond Beach to Mountlake Terrace TC to Northgate Station	Mon- Sun	5:15 a.m.-12:00 a.m.	Sat: 6:30 a.m.-11:30 a.m. Sun: 6:30 a.m.-11:30 a.m.	20

Source: King County Metro

1. Rounded to the closest 15 minutes. The span of hours of operations includes the start time for service at the first stop to the last service time at the last stop on the route.
2. Headways in minutes during weekday AM and PM peak periods.

Future

Future planned transit improvements include the Sound Transit Link Light Rail Lynnwood Link Extension. Sound Transit is extending light rail from the Northgate station to Lynnwood and adding four stations. Two stations, Shoreline South/148th and Shoreline North/185th, are in Shoreline. Shoreline South/148th would be approximately 0.5 to 0.6 miles northeast of the project site or a 7 to 9-minute walk from the site (see discussion of pedestrian bridge below). The Lynnwood Link Extension is due to open in 2024. The Shoreline South/148th Station will also connect to the new Sound Transit SR 522/NE 145th Street Bus Rapid Transit service. The light rail extension would provide opportunities for increased transit use within the study area.

Non-Motorized Facilities

The following describes existing and future planned pedestrian and bicycle conditions within the project vicinity.

Pedestrians

Pedestrian facilities are provided along both sides of major roadways, such as NE 145th Street and NE 155th Street. However, many surrounding residential streets, including 1st Avenue NE currently include intermittent sidewalks or shoulders only. Crosswalks and curb ramps are provided at major intersections where sidewalks exist, most notably at NE 145th Street/1st Avenue NE.

The city plans to connect the light rail station to 1st Avenue NE on the west of I-5 via a non-motorized bridge at N 148th Street. The walking distance between the site and the station would

decrease to approximately 0.3 miles with the non-motorized bridge, and overall access for residents would be improved by limiting conflicts between pedestrians and vehicles and potential delay incurred at intersections. Furthermore, the TIP outlines planned pedestrian improvements, such as new or widened sidewalks and enhanced crossings, along 1st Avenue NE and along the north side of NE 145th Street. Additionally, as the 145th Street Station Subarea Plan is implemented and the area redevelops, construction of sidewalks will be part of required frontage improvements to provide a more comprehensive pedestrian network in concert with the increased residential density and improved transit access. Overall, the pedestrian network will be improved from existing conditions by completion of the proposed Shoreline III project.

Bicycles

Bicycle facilities within the vicinity of the project include bicycle lanes on both sides of NE 155th Street and the Interurban Trail that runs along Aurora Avenue N and Midvale Avenue N. The Interurban Trail is 24-miles long and goes through both King and Snohomish Counties between Everett and Seattle. While these facilities are not located directly adjacent to the site, they can both be accessed from lower-volume residential streets.

Additionally, as noted previously, the proposed non-motorized bridge at N 148th Street will improve bike access to the new light rail station. Bike facilities will be provided through construction of an Off-Corridor Bike Network between the Interurban Trail to the west and 1st Avenue N to the east with connections to City of Seattle's planned Off-Corridor network south of 145th, improving access to existing facilities.

Traffic Volumes

The following documents the development of the traffic volumes used in the existing and future without-project operations analyses.

Existing

Existing traffic volumes are based on weekday PM peak period (4 to 6 p.m.) traffic counts conducted at the study intersections in April 2022 (1st Ave NE/NE 155th St) and August 2023 (1st Ave NE/NE 145th St and 1st Ave NE/NE 147th St). The existing weekday PM peak period traffic counts are included in Appendix A. The traffic counts were adjusted for seasonable variation based on Washington State Department of Transportation (WSDOT) 2020 Ramp & Roadway Northwest Region Seasonal Factors per direction from city staff. The adjusted existing traffic volumes were rounded to the nearest five vehicles to account for daily fluctuations and are shown on Figure 3.

Future

Future (2028) without-project traffic volumes are comprised of the existing traffic volumes, background traffic growth, and traffic generated from planned "pipeline" developments. Based on coordination with city staff and consistent with other approved studies in the area, an annual growth rate of 2 percent was applied to existing traffic volumes to estimate 2028 horizon year traffic volumes, accounting for inherent growth on the roadway network, including additional traffic associated with the opening of the new light rail station and development within the study area. In addition, the following pipeline projects were also included in the future without-project traffic volume projections.

- **Shoreline Townhomes.** 81 townhomes located along the west side of 1st Avenue NE between N 145th Street and N 147th Street and along the south side of N 147th Street between Corliss Avenue N and 1st Avenue N.

- **N 145th Street Apartments (The Line).** Mixed-use building with 241 new apartment units and up to 1,700 square-feet of retail space located in the parcels immediately south of the Shoreline III project’s east building.
- **147th Apartments.** 299-unit apartment building located on the west side of 1st Avenue NE between N 148th Street and N 147th Street.
- **Shea Properties.** 550-unit mid-rise apartment building located to the south of 147th Avenue and east of 1st Avenue NE, immediately south of the Shoreline III project’s west building.

Table 2 provides a list of the pipeline projects, the associated weekday PM peak hour trips, and the source for the trip data.

Table 2. List of Pipeline Projects

Pipeline Project	PM Peak Hour Trips	Source of Trip Data
Shoreline Townhomes	30	Shoreline Townhomes Transportation Consistency/Traffic Impact Analysis, TENW, January 31, 2019
N 145th Street Apartments	69	Shoreline N 145th Apartments Transportation Consistency/Traffic Impact Analysis Update, TENW, April 1, 2022
147th Apartments	114	Shoreline 147th Apartments Transportation Consistency/ Traffic Impact Analysis, TENW, June 4, 2021
Shea Properties	161	145th St/1st Ave NE Shoreline TOD Transportation Impact Analysis, Transpo Group, October 2022

Forecast future (2028) without-project traffic volumes are shown on Figure 4.

Vehicular Traffic Operations

The following summarizes traffic operations for existing and future conditions for the study area intersections.

The operational characteristics of an intersection are determined by calculating the intersection level of service (LOS). At unsignalized side-street, stop-controlled intersections, LOS is measured by the average delay on the worst-movement of the intersection. Traffic operations and average vehicle delay for an intersection can be described qualitatively with a range of levels of service (LOS A through LOS F), with LOS A indicating free-flowing traffic and LOS F indicating extreme congestion and long vehicle delays. Appendix B contains a detailed explanation of LOS criteria and definitions.

Weekday PM peak hour traffic operations for existing and future without-project conditions were evaluated at the study intersections based on the procedures identified in the *Highway Capacity Manual 6th Edition* (2016) and were evaluated using *Synchro 11*. *Synchro 11* is a software program that uses *HCM* methodology to evaluate intersection LOS and average vehicle delays. *Synchro* was also used to evaluate vehicle queuing at the study intersections.

All intersection parameters such as channelization and intersection control were consistent between existing and future without-project conditions except for the channelization at 1st Avenue NE/N 145th Street and 1st Avenue NE/N 155th Street intersections, which include the planned improvements. At the 1st Avenue NE/NE 145th Street intersection, exclusive eastbound, westbound, and southbound left-turn lanes and an exclusive northbound right-turn lane were assumed, consistent with the planned 145th Street Corridor Improvements. Under existing conditions, the eastbound left-turn movement at the 1st Avenue NE/NE 145th Street intersection is restricted. Pipeline project vehicle trips were routed through the study area assuming the availability of the eastbound movement at the 1st Avenue NE/N 145th Street under future conditions. In addition, the 1st Avenue NE/N 155th Street intersection assumes the SEPA

mitigation that includes construction of a right-turn lane by 2024 with the city’s sidewalk project. Separate left and right turn lanes have been assumed along 1st Avenue NE at NE 155th Street as part of the future conditions analysis.

Results for the existing and future without-project LOS analyses are summarized in Table 3. Table 4 summarizes the existing and future without-project vehicle queues during the weekday PM peak hour. Detailed LOS and queuing worksheets for each study intersection are included in Appendix C.

Table 3. Existing and Future (2028) Without-Project PM Peak Hour LOS Summary

Intersection	Existing			2028 Without-Project		
	LOS ¹	Delay ²	WM ³	LOS	Delay	WM
1. 1st Ave NE / N 145th St	B	17 ⁴	-	C	21 ⁵	-
2. 1st Ave NE / N 147th St / NE 147th St	B	12	WB	C	22	WB
3. 1st Ave NE / N 155th St	C	19	NB	C	19	NB

1. Level of Service (A – F) as defined by the *Highway Capacity Manual* 6th Edition (TRB, 2016)
2. Average delay per vehicle in seconds
3. Worst movement or approach reported for side-street stop-controlled intersections including WB = westbound and NB = northbound
4. Intersection evaluated using HCM 2000 Methodology in Existing 2023 conditions because the current signal timing and configuration is non-NEMA-standard.
5. 2028 Without-Project conditions assume completion of the 145th Street Corridor Improvements, which include exclusive westbound and southbound left-turn lanes.

The City of Shoreline has adopted a LOS D standard. As shown in Table 3, during the existing weekday PM peak hour, all intersections currently meet the adopted LOS standard operating at LOS C or better. In addition, with the planned improvements, the study intersections would continue to meet the city’s LOS D standard under the future without-project conditions during the weekday PM peak hour.

Table 4. Existing and Future (2028) Without-Project PM Peak Hour Queuing Summary

Intersection & Movement	Storage ² (ft)	Existing		2028 Without-Project	
		50th Percentile (ft)	95th Percentile (ft)	50th Percentile (ft)	95th Percentile (ft)
1. 1st Avenue NE/N 145th Street					
Eastbound Left-Turn	325	N/A	N/A	5	10
Eastbound Through/Right	325	75	105	145	205
Westbound Left-Turn	150	N/A	N/A	35	115 ³
Westbound Through/Right	725	205	370 ³	155	365 ³
Northbound Left/Through	675	85	155	105	185
Northbound Right-Turn	50	5	45	15	55
Southbound Left-Turn	150	N/A	N/A	40	110 ³
Southbound Through/Right	500	30	65	30	65 ³
2. 1st Avenue NE/N 147th Street/NE 147th Street¹					
Eastbound Left/Through/Right	670	15	40	25	50
Westbound Left/Through/Right	325	20	45	50	80
Northbound Left/Through/Right	500	5	20	15	50
Southbound Left/Through/Right	75	5	10	10	35
3. 1st Avenue NE/N 155th Street¹					
Eastbound Through/Right	1,150	5	30	10	50
Westbound Left-Turn	80	10	35	25	50
Westbound Through	380	5	30	5	30
Northbound Left-Turn	4,080	80	160	75	185
Northbound Right-Turn	100	N/A	N/A	60	115

Note: **Bold** indicates queue exceeds storage. Vehicle queues are rounded to the nearest 5-feet. N/A = Lane does not exist for the condition.

1. Queues for stop-controlled intersection based on SimTraffic report. SimTraffic outputs both average and 95th percentile queues for stop-controlled intersections, whereas the default Synchro output only displays 95th percentile queues for stop-controlled intersections. Queuing for signalized scenarios based on the Synchro report.
2. Storage length for through and through/right-turn lanes is estimated as the distance between the stop bar and the next adjacent intersection. Future storage for locations where there are improvements determined based on design plans provided by the city.
3. Analysis indicates 95th percentile volume exceeds capacity and queue may be longer.

As shown in Table 4, existing average and 95th-percentile vehicle queues are accommodated within the available storage at study intersection. Under future (2028) without-project conditions, the 95th-percentile queue for the northbound right-turn at the 1st Avenue NE/N 145th Street and 1st Avenue NE/NE 155th Street intersections are anticipated to exceed storage by 5 to 15-feet, which is less than the average length of a vehicle. The 95th-percentile queue represents a maximum vehicle queue length, and the analysis shows that on average vehicle queues are within the available storage.



Existing (2023) Weekday PM Peak Hour Traffic Volumes **FIGURE**

Shoreline III



Future (2028) Without-Project PM Peak Hour Volumes

FIGURE

Shoreline III

transpogroup

4

MXU23-3073

Traffic Safety

Recent collision records were reviewed within the study area to identify existing traffic safety issues. The most recent three-year summary of accident data from WSDOT is for the period between January 1, 2020 and December 31, 2022. A summary of the total and average annual number of reported accidents at each study intersection is provided in Table 5.

Table 5. Three-Year Collision Summary – 2020 to 2022

Intersection	Number of Collisions			Total	Annual Average	Collisions per MEV ¹
	2020	2021	2022			
1. 1st Ave NE / N 145th St	11	6	12	29	9.7	1.01
2. 1st Ave NE / N 147th St / NE 147th St	0	0	0	0	0.0	0.00
3. 1st Ave NE / N 155th St	0	0	0	0	0.0	0.00

Source: WSDOT, 2020.

Under 23 U.S. Code § 409 and 23 U.S. Code § 148, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

1. Million entering vehicles.

As shown in Table 5, the study intersections experience an average of 10 reported collisions or less, with the 1st Avenue NE/N 145th Street intersection experiencing the most collisions. No fatalities occurred at the study intersections during this period, and most collisions are property damage only. At the 1st Avenue NE/N 145th Street intersection, the most common collision type was angle collisions, followed by approach turn and rear end collisions. Collisions at this intersection may be elevated due to the high number of turning vehicles that share a lane with vehicles traveling through the intersection. Additionally, rear end collisions can be more prevalent at signalized intersections.

The City of Shoreline annually reviews collisions within the city to identify collision reduction strategies. The most recent *City of Shoreline Annual Traffic Report (2020 Report)* was reviewed to determine if there are any strategies identified in the study area. There are no specific strategies for intersections identified in the study area. As described previously, improvements have been identified at the 1st Avenue NE/N 145th Street intersection including left-turn lanes, revised signal phasing, and improved non-auto facilities as identified in the 2023-2028 TIP.

Project Impacts

This section documents the proposed project's impact on the surrounding transportation network. First, estimated traffic generated by the proposed site is distributed and assigned to adjacent streets and intersections within the study area for the weekday PM peak hour study period. Next, 2028 future with-project traffic volumes are projected and potential impact to traffic operations are identified.

Land Use

The adopted 145th Street Station Subarea Plan evaluated 2035 and buildout conditions for the area. The subarea is growing faster than anticipated and planned and permitted housing units already exceed 2035 projections. The Subarea Plan projected a net increase of 10,019 housing units at buildout. The proposed Shoreline III project includes a net increase of 350 residential units (i.e., 360 apartments proposed minus 10 single-family units demolished). Additionally, the pipeline projects included as part of this analysis assume a total of 1,882 net new residential units. In total, the proposed Shoreline III project and the pipeline projects account for 2,232 net new residential units (i.e., 1,882 new units + 350 new project units), or approximately 22 percent² of the total housing growth planned within the 145th Street Station Subarea Plan at buildout. Overall, the proposed project and pipeline projects remain consistent with the Subarea Plan.

Trip Generation

The proposed project includes 360 apartment units and 2,947 square feet of retail space. In coordination with City staff, trip generation estimates were prepared for the proposed residential development based on trip rates identified using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition (2021). Trip rates consistent with ITE Multifamily Housing (Mid Rise) (LU #221) Close to Rail were utilized for the proposed use. The 11th Edition contains two data categories based on proximity to transit for the multifamily mid-rise land use that are: close to rail transit and not close to rail transit. Based on the project's proximity to the future Shoreline light rail station, trip rates were based on the close to rail transit option. Sites are considered close to rail transit if they are within ½-mile of the transit station. Trip rates for the retail land use were based on Strip Retail Plaza with under 40ksf (LU #822). In addition, pass-by trips, or trips already on the roadway network that may stop at the retail, were assumed. Based on coordination with city staff, the ITE Trip Generation Manual LU# 821 Strip Retail Plaza 40 percent pass-by rate was assumed for the retail use during the weekday PM peak hour. There is no pass-by rate for daily trips; therefore, a 20 percent pass-by rate was assumed. Lastly, the proposed retail use will be local serving and the trip generation assumed that there would be internal trips between the proposed residential and retail use. The NCHRP Report 684 was utilized to determine the number of internal trips between the uses.

In addition to trip generation for the proposed use, credit was taken for the existing single-family detached housing units (LU #210) that would be removed with the construction of the proposed project. This approach to trip generation was coordinated with and approved by City staff.

Table 6 summarizes the resulting net new weekday daily, AM, and PM peak hour vehicle trip generation for the proposed and existing land uses. Detailed calculations are included in Appendix D.

² Represents 2,232 new residential units divided by 10,019 housing units projected at buildout of the 145th Street Station Subarea Plan.

Table 6. Estimated Weekday Vehicle Trip Generation¹

Land Use	Size	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			In	Out	Total	In	Out	Total
<u>Proposed Use</u>								
Multifamily Mid-Rise Close to Rail Transit (LU #221)	360 DU	1,710	41	74	115	68	36	104
Strip Retail Plaza <40k (LU 822)	2,947 sf	160	4	3	7	17	16	33
Less Internal Capture ²	-	-82	-1	-1	-2	-6	-6	-12
Less Pass-by Trips ³	-	-26	-	-	-	-5	-5	-10
Subtotal	-	1,762	44	76	120	74	41	115
<u>Existing Use</u>								
Single-Family Detached Housing (LU #210)	10 DU	94	2	5	7	6	3	9
Net New Vehicle Trips		1,668	42	71	113	68	38	106

Notes: DU= dwelling unit, sf = square-feet

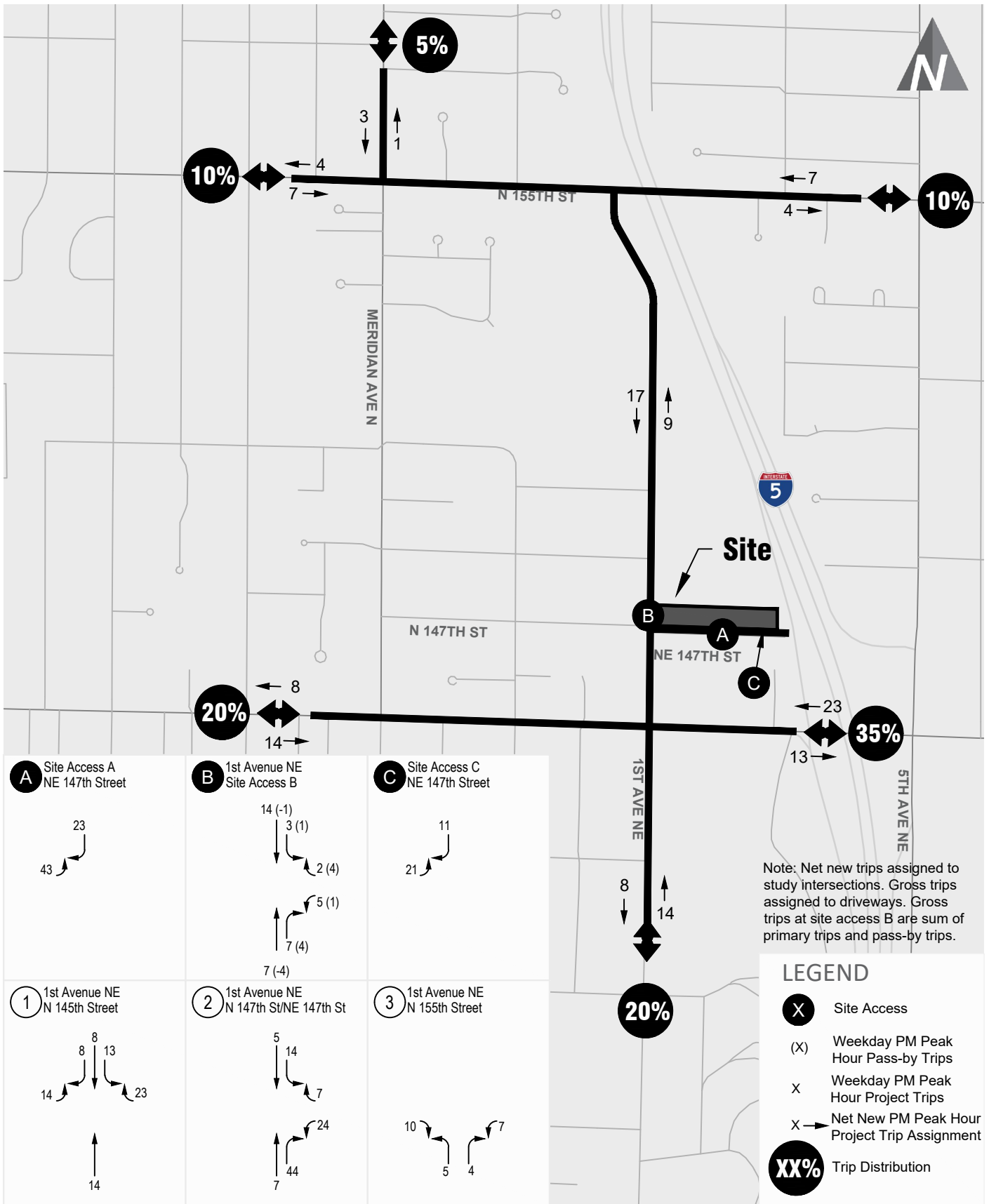
1. Trip generation based on Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition (2021)
2. Based on NCHRP Report 684 procedures and data.
3. Based on ITE *Trip Generation Manual* pass-by for Strip Retail Plaza (LU 821).

As shown in Table 6, the development is estimated to generate approximately 1,668 net new weekday daily trips, with 113 trips occurring during the weekday AM peak hour and 106 occurring during the weekday PM peak hour.

Trip Distribution & Assignment

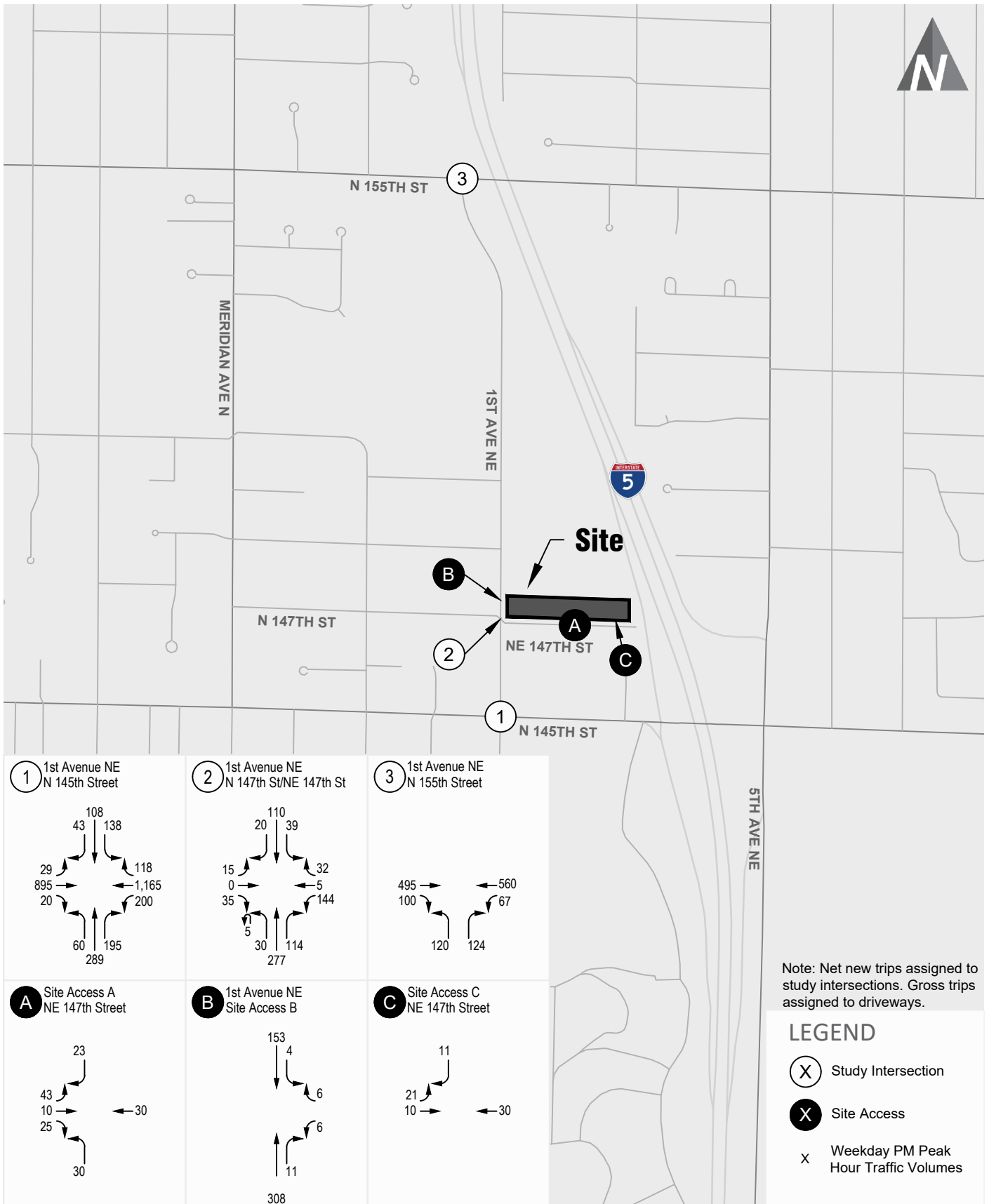
Trip distribution patterns for trips to and from the project site were based on existing vehicle travel patterns, and the U.S. Census Bureau’s *OnTheMap* tool. *OnTheMap* is a web-based mapping and reporting application, which shows where workers are employed and where they live based on census data. The *OnTheMap* census data were translated to the number of people that live within a quarter-mile radius of the proposed project and where they work. The zip codes where people work were evaluated to determine if a person would be more likely to travel to the zip code via vehicle or by other means. Trips to zip codes closer to the proposed project site or in more transit-oriented locations are more likely to use transit, walk, bike, or other non-SOV modes, while zip codes further from the site are more likely to drive. The project trip distribution and assignment are shown on Figure 5. Figure 5 shows 35 percent of the trips are distributed east along N 145th Street accessing I-5 and Northeast Seattle, 20 percent west along N 145th Street, 25 percent to and from north of the site traveling along N 155th Street via 1st Avenue NE and 20 percent to/from the south of the site via 1st Avenue NE.

Project generated traffic was added to future without-project weekday PM peak hour traffic volumes to form the basis of the with-project analysis. The resulting 2028 with-project traffic volumes are shown on Figure 6.



Project Trip Distribution and Assignment

FIGURE



Future (2028) With-Project Weekday PM Peak Hour Traffic Volumes FIGURE

Traffic Operations Impact

The following section summarizes the traffic operations at the study intersections under future conditions.

A future with-project LOS analysis was conducted for the weekday PM peak hour to analyze traffic impacts of the proposed project. The same methodologies were applied as used for existing and future without-project conditions. All intersection parameters such as channelization and intersection control were consistent with those used in the evaluation of future without-project conditions. A comparison of horizon year 2028 future without- and with-project weekday PM peak hour traffic operations are summarized in Table 7. Table 8 summarizes the existing and future without-project vehicle queues during the weekday PM peak hour. Detailed LOS and queuing worksheets for each study intersection are included in Appendix C.

Table 7. Future (2028) Without- and With-Project PM Peak Hour LOS Summary

Intersection	2028 Without-Project			2028 With-Project		
	LOS ¹	Delay ²	WM ³	LOS	Delay	WM
1. 1st Ave NE / N 145th St	C	21	-	C	22	-
2. 1st Ave NE / N 147th St / NE 147th St	C	22	WB	D	32	WB
3. 1st Ave NE / N 155th St	C	19	NB	C	20	NB

1. Level of Service (A – F) as defined by the *Highway Capacity Manual* (TRB, 6th Edition)
 2. Average delay per vehicle in seconds
 3. Worst movement or approach reported for side-street stop-controlled intersections.

As shown in Table 7, all study intersections will continue to meet the city’s LOS D standard during the weekday PM peak hour under future with-project conditions.

As described previously, a SEPA mitigation has been identified at the 1st Avenue NE/N 155th Street intersection. An improvement has been identified to provide a northbound right-turn lane, which is assumed as part of the analysis. Developments within the 145th Subarea Plan would contribute a proportional share of the improvement cost. A mitigation calculation spreadsheet has been developed by the city and is further explained under the Other Mitigation Measures section of this TIA.

Table 8. Future (2028) PM Peak Hour Queuing Summary

Intersection & Movement	Storage ² (ft)	Without-Project		With-Project	
		50th Percentile (ft)	95th Percentile (ft)	50th Percentile (ft)	95th Percentile (ft)
1. 1st Avenue NE/N 145th Street¹					
Eastbound Left-Turn	325	5	10	5	15
Eastbound Through/Right	325	145	205	145	205
Westbound Left-Turn	150	35	115 ³	35	115 ³
Westbound Through/Right	725	155	365 ³	160	375 ³
Northbound Left/Through	675	105	185	110	205 ³
Northbound Right-Turn	50	15	55	15	55
Southbound Left-Turn	150	40	110 ³	45	130 ³
Southbound Through/Right	500	30	65	30	75
2. 1st Avenue NE/N 147th Street/NE 147th Street¹					
Eastbound Left/Through/Right	670	25	50	25	50
Westbound Left/Through/Right	325	50	80	60	110
Northbound Left/Through/Right	500	15	50	15	55
Southbound Left/Through/Right	75	10	35	15	40
3. 1st Avenue NE/N 155th Street¹					
Eastbound Through/Right	1,150	10	50	10	40
Westbound Left-Turn	80	25	50	25	55
Westbound Through	380	5	30	5	40
Northbound Left-Turn	4,080	75	185	80	235
Northbound Right-Turn	100	60	115	60	115

Note: **Bold** indicates queue exceeds storage. Vehicle queues are rounded to the nearest 5-feet. N/A = Lane does not exist for the condition.

1. Queues for stop-controlled intersection based on SimTraffic report. SimTraffic outputs both average and 95th percentile queues for stop-controlled intersections, whereas the default Synchro output only displays 95th percentile queues for stop-controlled intersections. Queuing for signalized scenarios based on the Synchro report.
2. Storage length for through and through/right-turn lanes is estimated as the distance between the stop bar and the next adjacent intersection. Future storage for locations where there are improvements determined based on design plans provided by the city.
3. Analysis indicates 95th percentile volume exceeds capacity and queue may be longer.

As shown in Table 8, average and 95th-percentile queue lengths are anticipated to increase minimally with most queues increasing less than 10 feet. In addition, the proposed project is not anticipated to have a significant impact on the northbound right-turn 95th-percentile queues at the 1st Avenue NE intersections with N 145th and 155th Streets, which are shown to exceed capacity by less than 15-feet, or less than a vehicle length. At the 1st Avenue NE/N 147th Street/NE 147th Street intersection, queuing results for the westbound and southbound movements show that the queue lengths along the project frontage are forecast to not reach the proposed driveways.

Site Access

Vehicle Access

Vehicle access to the site is proposed via NE 147th Street and 1st Avenue NE. There would be 3 driveways along NE 147th Street and one driveway along 1st Avenue NE. Along NE 147th Street, there would be a central driveway at the breezeway/pass through providing access to the parking garages for the east and west buildings, a secondary driveway providing access to the east building, and driveway along the eastside of the building with a fire lane and access to the trash area. In addition, a driveway would be provided along 1st Avenue NE with access to the retail parking. Full movement is proposed at the driveways.

Traffic operations were evaluated for the general vehicle access points including the NE 147th Street central and east garage driveways and the 1st Avenue NE driveway. The driveway along the eastside of the building at NE 147th Street would have limited trips for fire and trash; thus, the analysis is conservative by assigning all residential trips to the central and east garage driveways. The analysis shows the NE 147th St central garage driveway is anticipated to operate at LOS A with 10 seconds of delay under future (2028) with-project conditions, while the east garage driveway is anticipated to operate at LOS A with 9 seconds of delay. The 1st Avenue NE site access is anticipated to operate at LOS B with 11 second of delay. The driveways would meet the city's LOS D standard. Queues at the driveways are anticipated to be minimal with 1 vehicle at most. Queues at the southbound approach of 1st Avenue NE/N 147th Street/NE 147th Street are anticipated to be one vehicle at most and do not extend to the project site access along 1st Avenue NE, which is located approximately 75 feet from NE 147th Street. Detailed LOS worksheets are provided in Appendix C.

Non-Motorized Access

The proposed project will provide sidewalks with landscaping and lighting along both the 1st Avenue NE and NE 147th Street frontages. The Line Apartments project, to the south of NE 147th, will construct a woonerf (pedestrian street) running north-south connecting NE 145th Street and NE 147th Street allowing for midblock pedestrian connectivity within the neighborhood. The proposed project includes construction of a midblock crossing between the woonerf and the central breezeway of the project building. Provision of the midblock crossing will enhance the neighborhood connectivity including access to the future NE 148th Street pedestrian bridge that will provide access over I-5 to the Link light rail station. Figure 7 illustrates the future non-motorized connections surrounding the project site.

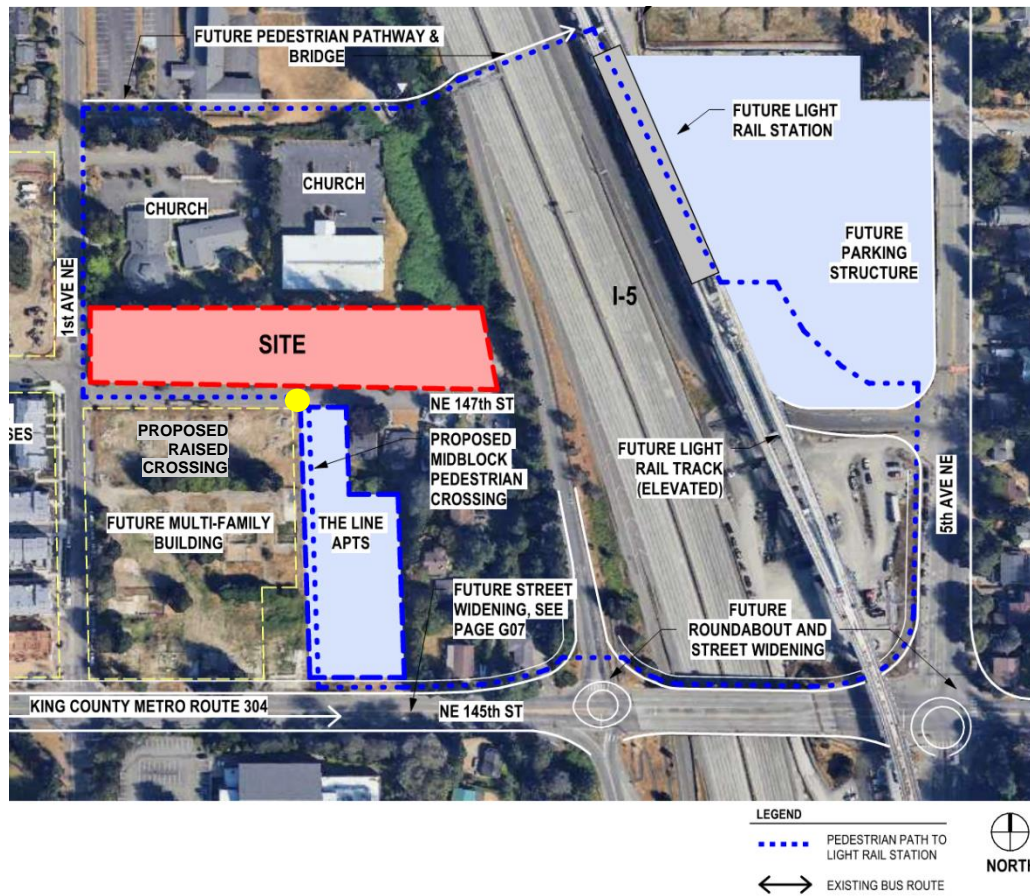


Figure 7. Future Non-Motorized Connections Near the Project Site

Parking Analysis

The following sections describe the proposed parking supply, code requirements, and estimated peak parking demand of the proposed project.

Supply

The proposed project would include a parking structure with a total of 249 vehicle parking stalls with approximately 239 residential stalls and 10 retail stalls. Per Shoreline Municipal Code (SMC) Table 20.50.390E, 20 percent of the required residential parking stalls and 10 percent of the required non-residential parking stalls would need electric vehicle (EV) infrastructure. As shown in Table 9, the SMC required parking is 239 residential stalls and 8 retail stalls. The proposed project would be required to supply a minimum of 49 EV-ready stalls (i.e., 239 SMC required parking stalls x 20 percent) for residential use and 1 EV-ready space for non-residential use. The project will supply 50 EV-ready stalls with 48 stalls for residential use and 2 stalls for retail use.

Code Requirements

Table 9 summarizes the parking code requirements for the proposed project. The proposed project includes 89 studios, 208 one-bedroom units, 63 two-bedroom units, and 2,947 square feet of retail space. SMC also allows a reduction in parking requirements for proximity to the Link light rail station. SMC section 20.50.400 notes that a reduction of up to 25 percent may be approved by the Director when subsection (A)(1) or two or more of subsections (A)(2) through (A)(9) of the code are met. Because the project is located less than ¼-mile from a high-capacity transit service stop (the 145th Link light rail station) subsection (A)(1) is met.

Table 9. Code Required Parking Supply

Proposed Land Use	Unit Type	Size ¹	Required Parking Stalls ²		
			Rate	Base Requirement	Reduced Requirement ³
Multifamily	Studio	89 du	0.75 per du	67	50
	One-Bedroom	208 du	0.75 per du	157	118
	Two-Bedroom+	63 du	1.50 per du	95	71
Subtotal		360 du		319	239
Non-residential	General Services⁴	2,947 sf	1 per 300 sf	10	8
Total Parking				329	247

1. du = dwelling units, sf = square feet.
2. Shoreline Municipal Code (SMC) 20.50.390.
3. 25 percent reduction assumed per SMC 20.50.400 and proximity to the 145th Link light rail station.
4. The parking rate will depend on actual use of core and shell retail area. General Services LU gives the maximum number of potential parking spaces required based on potential LU.

As shown in Table 9, 247 parking stalls would be required based on City Municipal Code. The project would meet code requirements with the proposed 249 stalls.

Demand

The following sections summarize the anticipated parking demand for residential and retail uses. The residential peak parking demand was estimated utilizing the King County Right Size Parking Calculator. Peak parking demand for retail use was estimated utilizing the *ITE Parking Generation Manual*, January 2019.

Residential

Parking demand for the residential was based on the King County Right Size Parking Calculator. The King County Right Size Parking calculator is an online tool developed by King County that estimates parking/unit ratios for multi-family developments throughout urban areas of King County. The Right Size Parking calculator relies on the unit mix of the proposed development and location to estimate a parking demand ratio, as well as the price of parking and the number of stalls provided. The assumptions utilized in the parking demand calculations are summarized on Figure 8 for the 360-unit development.

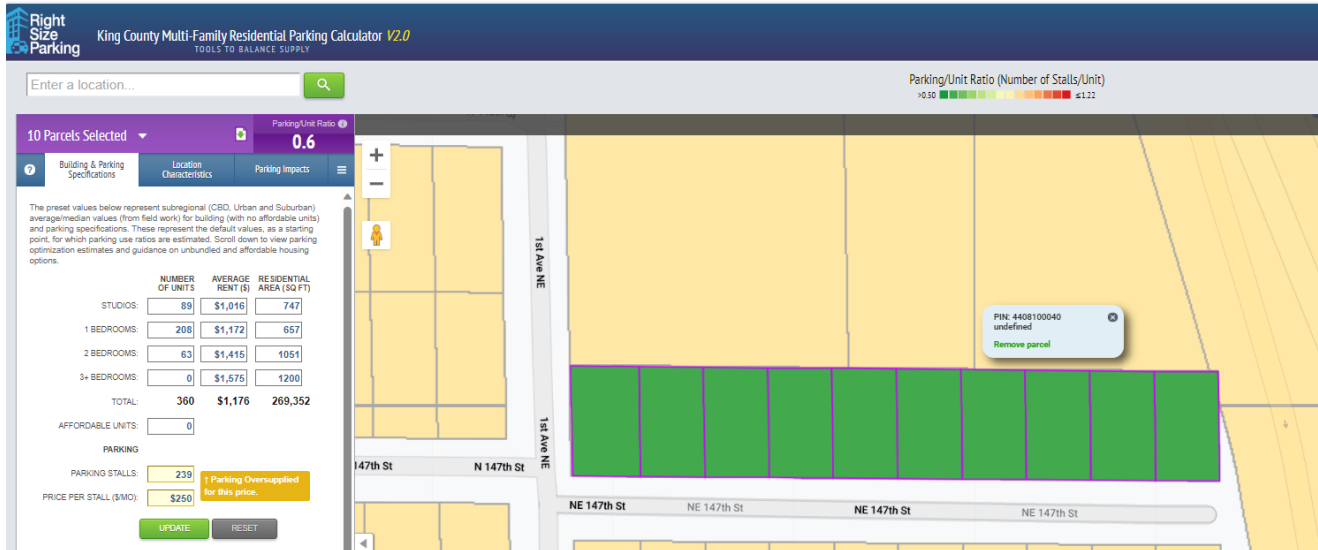


Figure 8. King County Right Size Parking Demand Rate Estimate

Based on the unit mix and the residential supply of 239 stalls, a peak parking demand of 0.60 stalls per unit was determined. The parking rate of 0.60 vehicles per unit equates to a peak parking demand of approximately 216 vehicles for the proposed 360 units. The proposed parking supply of 239 would accommodate the demand from both buildings with a surplus of 23 stalls during the peak period.

Retail

The parking rate used to estimate the peak parking demand for the retail is based on the ITE *Parking Generation* 6th Edition suburban rates for strip retail plaza (< 40,000 sf), which notes an average peak parking demand rate of 2.79 vehicles/1,000 square feet. The vehicle trips were reduced by the anticipated internalization between the retail and residential use during the PM peak period from 4 PM to 6 PM. The internal capture resulted in an 18 percent reduction in the number of vehicle trips. A parking rate of 2.29 vehicles per 1,000 square feet (2.79 stalls/1,000 sf x 82% non-internal trips) was used for retail use. A rate of 2.29 vehicles per 1,000 square feet results in a parking demand of 7 vehicles for the 2,947 square feet of retail space and could be accommodated on-site. The proposal includes 10 retail stalls, which would accommodate the estimated retail parking demand.

Transportation Impact Fees

City of Shoreline transportation impact fees (TIFs) would be paid by the applicant per Shoreline Municipal Code 3.80.010. Fees collected are used to construct transportation projects on the City's Transportation Improvement Plan identified to accommodate future traffic growth in the city. The applicant is requesting an independent fee calculation (SMC 3.80.060) that reflects the updated multi-family rates published in the ITE *Trip Generation*, 11th Edition and potential reductions to the TIF based on participation in the City of Shoreline Deep Green Incentive Program (DGIP). The current rates utilized by the city reflect the ITE 9th Edition trip generation rates. In addition, based on Shoreline Municipal Code (SMC) 3.80.070.I.1, the retail business portion of the proposed project is exempt from the TIF and is not included in the calculations.

The vehicle trip generation estimates used in the transportation impact analysis described in the previous sections of this study are based on ITE *Trip Generation*, 11th Edition. The trip generation accounts for proximity to transit and the mixed-use walkable and bikeable land use context. However, the trip generation estimates are conservative because they do not consider a reduction in vehicle trips due to implementation of transportation demand management measures. The applicant has strategically located the proposed development near transit, bicycle facilities and uses within walking distance and is striving to reduce vehicular travel to and from the site by providing on-site amenities. The following attributes of the proposed project would help to reduce vehicular travel:

- **Commuter/Transportation Information.** Residents would be provided with information on commuting and transportation options in the area. In addition, a lobby kiosk/screen would include information on nearby transportation options and alternatives to driving alone.
- **Bike Share or Other Rental Options.** The applicant will implement a bike loaner program or other rental options such as electric scooter where bikes (or scooters) would be available through the property management. Property management will supply at least two (2) bikes, which will be available to tenants on a first come, first served basis. Check-in/check-out will be through the leasing office during normal business hours (approximately 9 or 10 a.m. to 5 or 6 p.m.). Tenants will be able to make reservations in advance and keep bikes overnight or return them to a secured location outside of business hours, if needed. The property manager will evaluate bike share usage and purchase additional bikes if there is site demand.
- **Carpool/Vanpool Parking.** Preferred parking would be provided within the garage for carpools or vanpools.
- **Unbundled Parking.** Parking would be charged separately with monthly rates and not included in the resident rent (if allowed by the city).
- **On-site Amenities/Work from Home.** The building includes public areas for use by residents including fitness facilities and a conference room. There would also be an area where residents can work including workstations (individual and collaboration space), conference room and printer.
- **On-site Food Services.** The applicant will partner with a food service company to provide on-site food vending machines stocked with fresh on-the-go meals.
- **Raised Pedestrian Crossing.** The applicant will provide a raised midblock crossing between the proposed project central breezeway/pedestrian pathway and the woonerf south of NE 147th Street adjacent to The Line Apartments. The raised crossing will facilitate access to and from the north and south including the future NE 148th Street pedestrian bridge located north of the site that will provide access over I-5 to the Link light rail station.

The project features and location would all contribute to reduced vehicle use to and from the project site. The ITE trip rate accounts for the project's proximity to transit and internal trips between uses; however, the city does not have specific guidelines on the level of vehicle or fee reduction that should be taken on Transit-Oriented Developments (TODs) and projects that provide transportation demand management. Bellingham has developed traffic impact fee reductions based on Fehr & Peers' *MXD+* tool, which uses research to predict vehicle trip generation by identifying the relationship between travel modes and the built environment. Bellingham has established reductions ranging from 2 to 15 percent with opportunities for application of multiple reductions based on a project's location in an urban village and demand management measures such as bicycle parking and carshare programs. Applying Bellingham's reductions against the proposed project shows up to an 18 percent fee reduction. The Bellingham data presented does not consider the additional TDM measures related to amenities included in the project that would reduce vehicle trips especially during the peak periods. The project includes space for residents to work from home not only within their units but also in the shared conference room area. The proposed project also has a fitness facility. The applicant is also proposing to construct a raised crossing along NE 147th Street to facilitate pedestrian and bicycle movements in the neighborhood. Based on coordination with Shoreline City staff, a TIF reduction of 8.5 percent is proposed.

Based on rates and methods found in the City's Impact Fee Rate Table and Transportation Impact Fee Rate Study, the proposed transportation impact fee calculations are summarized in Table 10. The TIF calculated in Table 10 also reflects a reduction related to the DGIP/TDM measures, credit for the existing use and the retail use fee exemption. The trip credit was estimated based on existing trip generation and the cost per trip impact fee outlined in the City of Shoreline *Transportation Impact Fee Rate Table*, updated January 2023.

Table 10. Transportation Impact Fee Calculation based on ITE 11th Edition¹

Land Use	PM Peak Hour Average Trip Rate ²	% New Trips	Trip Length Factor	Net New Trips Per Unit of Measure	Impact Fee per Unit at \$9,271.05 per Trip	Size	DGIP/TDM Reduction	Impact Fee
Proposed Use								
221- Multifamily Housing Mid-Rise Close to Rail Transit	0.272 trips per du	100%	0.95	0.26 trips per du	\$2,410.47 per du	360 du	8.5%	\$794,008.82
822 – Strip Retail Plaza <40k ³	5.769 trips per 1,000 sf	66%	0.54	2.056 trips per 1,000 sf	\$19.06 per sf	2,947 sf	8.5%	\$56,169.82
Retail Exempt from Fee ³								-\$56,169.82
Existing Use								
210 – Single Family	0.94 trips per du	100%	0.90	0.85 trips per du	\$7,880.39 per du	10 du	-	-\$78,803.90
Administrative Fee								\$193.00
Total Impact Fee								\$715,204.92

du = dwelling unit; sf = square-feet

Note: DGIP = Deep Green Incentive Program; TDM = Transportation Demand Management

1. Based on the City of Shoreline Transportation Impact Fee Rate Table (Shoreline Municipal Code (SMC) 3.01.015) and the City of Shoreline Transportation Impact Fee Rate Study.

2. Trip rate is based on the Institute of Transportation Engineers (ITE) 11th Edition (2021) and accounts for internal trip reduction consistent with the trip generation estimates for the proposed project. Pass-by trip reduction for the retail accounted for with the % new trips reduction.

3. Based on SMC 3.80.070.I.1, the retail business portion is exempt from the transportation impact fee.

As shown in Table 10, the transportation impact fee estimate is \$715,397.92 based on use of ITE 11th Edition, the estimated existing trip credits and a proposed reduction of 8.5 percent for site amenities and proposed transportation demand management measures.

17 external trips per appendix D

Other Mitigation Measures

The city has identified a SEPA mitigation project for the 1st Avenue NE and N 155th Street intersection. All projects in the 145th Subarea are required to pay a mitigation fee, dependent on their location (east or west of I-5) and based on the net new PM Peak trips generated by the project. This development is located within the subarea and is required to pay the SEPA mitigation fee.

As noted previously, the city has identified the provision of a northbound right-turn lane to improve intersection operations. The city has a sidewalk improvement at the 1st Avenue NE/N 155th Street intersection and construction of the right-turn lane will be incorporated into the City's sidewalk project that is anticipated to be completed by 2024.

The city has developed a calculation spreadsheet for the SEPA mitigation fee. Based on the project's location (west of I-5) and net new trip generation, the project is required to contribute \$60,089 toward mitigation for the intersection. The fee calculations are provided in Appendix E.

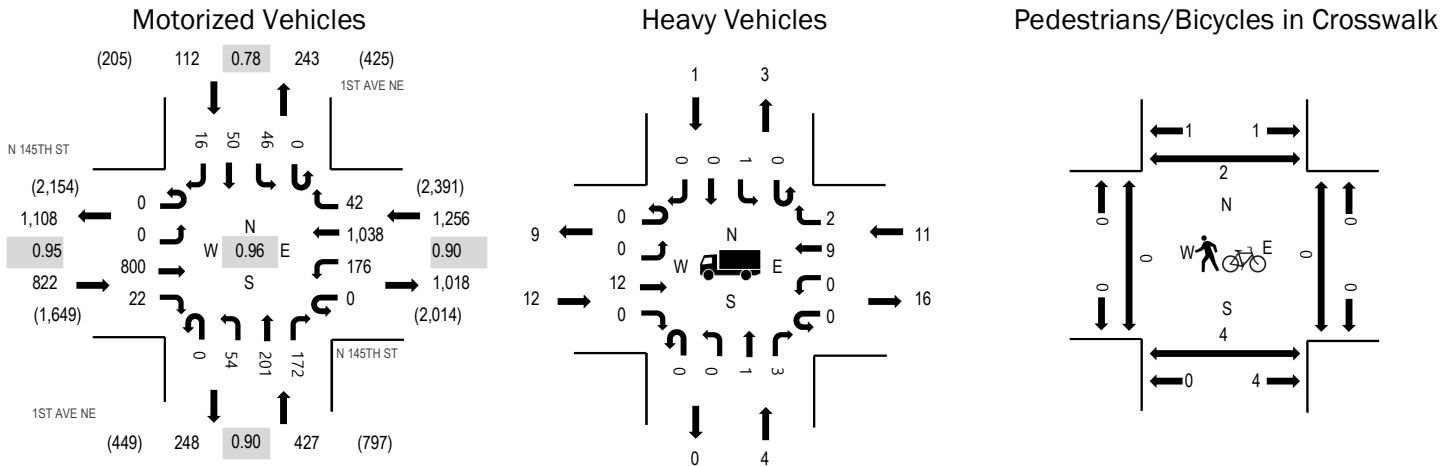
Findings and Conclusions

This analysis summarizes the project traffic impacts of the proposed Shoreline III residential development in Shoreline. General findings and recommendations include:

- The development is estimated to generate 1,668 net new weekday daily trips with 113 trips occurring during the weekday AM peak hour and 106 occurring during the weekday PM peak hour.
- With the addition of project trips and planned improvements, all study intersections are forecast to continue to meet the city's LOS D standard.
- The site access points are anticipated to operate at LOS B or better during the weekday PM peak hour meeting city LOS standards.
- Vehicle queues at the site access under future with-project conditions are anticipated to be equivalent to 1 vehicle at most during the weekday PM peak hour. Vehicles queues at 1st Avenue NE / N 147th Street do not impact the proposed site access points.
- The anticipated peak residential and retail parking demand would be accommodated by the proposed parking supply of 254 spaces.
- The proposed project is required to pay the city identified SEPA mitigation for the 1st Avenue NE/N 155th Street intersection. Using the calculation spreadsheet that the city has developed, the project is required to contribute \$60,085.
- An independent TIF calculation is proposed with an estimate of \$715,397.92 based on ITE *Trip Generation*, 11th Edition, consideration of existing trip credits, participation in the DGIP, and transportation demand management strategies.

Appendix A: Traffic Counts

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.5%	0.95
WB	0.9%	0.90
NB	0.9%	0.90
SB	0.9%	0.78
All	1.1%	0.96

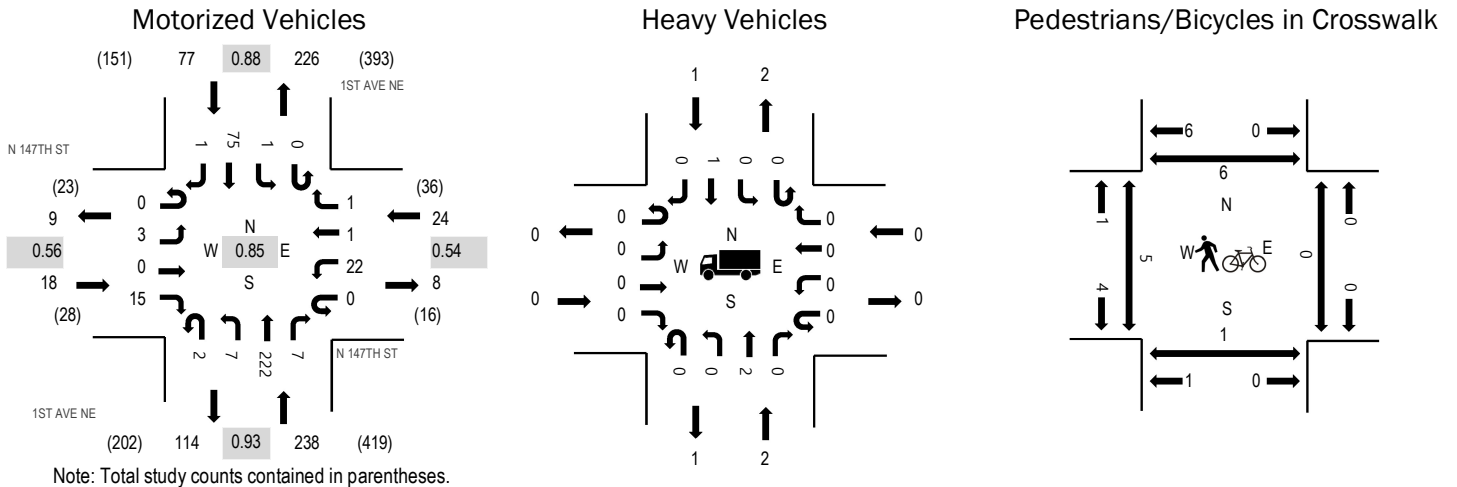
Traffic Counts - Motorized Vehicles

Interval Start Time	N 145TH ST Eastbound				N 145TH ST Westbound				1ST AVE NE Northbound			1ST AVE NE Southbound				Total	Rolling Hour	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru			Right
4:00 PM	0	0	206	1	0	23	214	6	0	16	27	38	0	14	9	4	558	2,522
4:15 PM	0	0	222	2	0	25	244	8	0	19	36	46	0	6	8	3	619	2,602
4:30 PM	0	0	201	5	0	32	265	9	0	15	56	47	0	15	13	4	662	2,617
4:45 PM	0	0	193	8	0	52	288	11	0	10	56	29	0	13	15	8	683	2,576
5:00 PM	0	0	216	8	0	41	238	12	0	12	41	47	0	11	11	1	638	2,520
5:15 PM	0	0	190	1	0	51	247	10	0	17	48	49	0	7	11	3	634	
5:30 PM	0	0	183	5	0	38	266	7	0	14	46	36	0	3	19	4	621	
5:45 PM	0	0	198	10	0	49	250	5	0	12	47	33	0	11	12	0	627	
Count Total	0	0	1,609	40	0	311	2,012	68	0	115	357	325	0	80	98	27	5,042	
Peak Hour	0	0	800	22	0	176	1,038	42	0	54	201	172	0	46	50	16	2,617	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	6	0	6	4:00 PM	0	0	0	0	0	4:00 PM	2	0	0	1	3
4:15 PM	2	0	3	0	5	4:15 PM	0	0	0	0	0	4:15 PM	0	1	0	0	1
4:30 PM	8	0	3	0	11	4:30 PM	0	0	0	0	0	4:30 PM	0	1	0	1	2
4:45 PM	0	0	4	0	4	4:45 PM	0	0	1	0	1	4:45 PM	0	1	0	1	2
5:00 PM	2	3	3	1	9	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	2	1	1	0	4	5:15 PM	0	0	0	1	1	5:15 PM	0	2	0	0	2
5:30 PM	4	2	1	0	7	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	2	0	1	0	3	5:45 PM	0	1	0	0	1	5:45 PM	0	0	1	0	1
Count Total	20	6	22	1	49	Count Total	0	1	1	1	3	Count Total	2	5	1	3	11
Peak Hour	12	4	11	1	28	Peak Hour	0	0	1	1	2	Peak Hour	0	4	0	2	6

Peak Hour



	HV%	PHF
EB	0.0%	0.56
WB	0.0%	0.54
NB	0.8%	0.93
SB	1.3%	0.88
All	0.8%	0.85

Traffic Counts - Motorized Vehicles

Interval Start Time	N 147TH ST Eastbound				N 147TH ST Westbound				1ST AVE NE Northbound			1ST AVE NE Southbound				Total	Rolling Hour	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru			Right
4:00 PM	0	0	0	2	0	4	0	2	0	4	29	1	0	0	19	0	61	322
4:15 PM	0	0	0	1	0	1	0	1	0	2	39	2	0	0	17	0	63	342
4:30 PM	0	2	0	6	0	13	0	0	0	2	61	1	0	1	19	0	105	357
4:45 PM	0	0	0	5	0	7	0	0	2	1	59	1	0	0	17	1	93	332
5:00 PM	0	0	0	4	0	0	0	0	0	2	52	2	0	0	21	0	81	312
5:15 PM	0	1	0	0	0	2	1	1	0	2	50	3	0	0	18	0	78	
5:30 PM	0	1	1	4	0	1	0	1	0	3	50	3	0	0	15	1	80	
5:45 PM	0	0	0	1	0	1	1	0	0	3	44	1	0	0	22	0	73	
Count Total	0	4	1	23	0	29	2	5	2	19	384	14	0	1	148	2	634	
Peak Hour	0	3	0	15	0	22	1	1	2	7	222	7	0	1	75	1	357	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

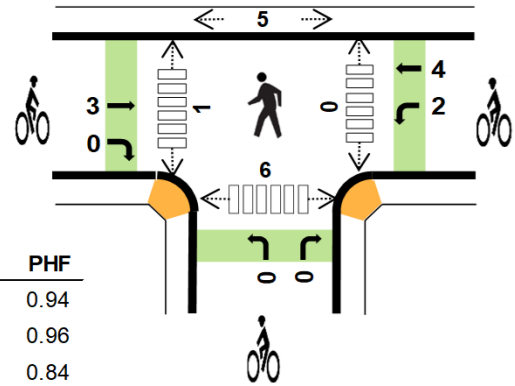
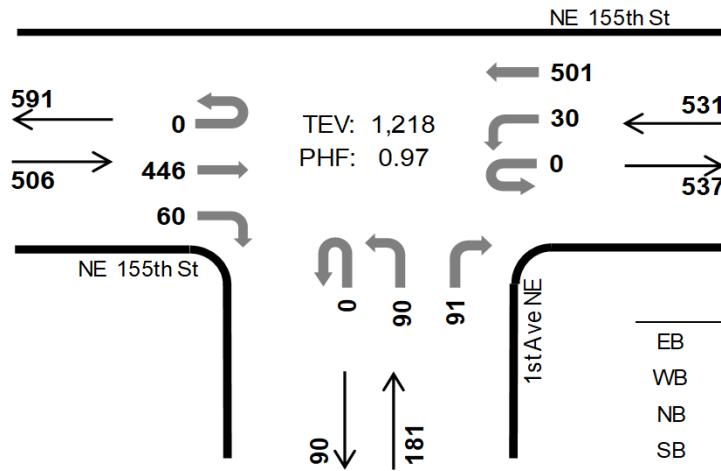
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	2	2	2	4	10
4:15 PM	0	1	0	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	0	1	0	0	1	4:30 PM	0	0	0	0	0	4:30 PM	3	0	0	4	7
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	1	1	4:45 PM	2	1	0	2	5
5:00 PM	0	0	0	1	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	5:15 PM	1	0	0	0	1	5:15 PM	0	0	0	0	0
5:30 PM	0	2	0	0	2	5:30 PM	0	0	0	0	0	5:30 PM	1	0	0	2	3
5:45 PM	0	0	0	0	0	5:45 PM	1	1	0	0	2	5:45 PM	3	0	0	2	5
Count Total	0	5	0	1	6	Count Total	2	1	0	1	4	Count Total	11	3	2	14	30
Peak Hour	0	2	0	1	3	Peak Hour	1	0	0	1	2	Peak Hour	5	1	0	6	12

1st Ave NE NE 155th St



Peak Hour

Date: 04/05/2022
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM



Two-Hour Count Summaries

Interval Start	NE 155th St				NE 155th St				1st Ave NE				0				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	0	114	14	0	4	109	0	0	20	0	22	0	0	0	0	283	0	
4:15 PM	0	0	77	10	0	10	112	0	0	18	0	17	0	0	0	0	244	0	
4:30 PM	0	0	102	8	0	10	126	0	0	15	0	27	0	0	0	0	288	0	
4:45 PM	0	0	113	21	0	11	127	0	0	22	0	21	0	0	0	0	315	1,130	
5:00 PM	0	0	126	9	0	6	111	0	0	25	0	22	0	0	0	0	299	1,146	
5:15 PM	0	0	103	12	0	6	132	0	0	26	0	28	0	0	0	0	307	1,209	
5:30 PM	0	0	104	18	0	7	131	0	0	17	0	20	0	0	0	0	297	1,218	
5:45 PM	0	0	107	20	0	15	126	0	0	24	0	19	0	0	0	0	311	1,214	
Count Total	0	0	846	112	0	69	974	0	0	167	0	176	0	0	0	0	2,344	0	
Peak Hour	All	0	0	446	60	0	30	501	0	0	90	0	91	0	0	0	0	1,218	0
	HV	0	0	9	0	0	0	7	0	0	1	0	0	0	0	0	0	17	0
	HV%	-	-	2%	0%	-	0%	1%	-	-	1%	-	0%	-	-	-	-	1%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	4	2	1	0	7	1	0	0	0	1	0	0	0	0	0
4:15 PM	4	4	0	0	8	0	0	0	0	0	0	0	0	0	0
4:30 PM	1	1	1	0	3	1	1	0	0	2	0	1	2	0	3
4:45 PM	3	1	0	0	4	0	1	0	0	1	0	0	1	1	2
5:00 PM	2	1	0	0	3	1	0	0	0	1	0	1	2	1	4
5:15 PM	4	3	1	0	8	1	4	0	0	5	0	0	0	2	2
5:30 PM	0	2	0	0	2	1	1	0	0	2	0	0	2	2	4
5:45 PM	3	3	0	0	6	0	1	0	0	1	0	0	2	1	3
Count Total	21	17	3	0	41	5	8	0	0	13	0	2	9	7	18
Peak Hr	9	7	1	0	17	3	6	0	0	9	0	1	5	6	12

MXU23-3073

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 155th St				NE 155th St				1st Ave NE				0				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	4	0	0	0	2	0	0	0	0	1	0	0	0	0	7	0
4:15 PM	0	0	2	2	0	0	4	0	0	0	0	0	0	0	0	0	8	0
4:30 PM	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0
4:45 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	4	22	
5:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3	18
5:15 PM	0	0	4	0	0	0	3	0	0	1	0	0	0	0	0	0	8	18
5:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	17
5:45 PM	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	6	19
Count Total	0	0	19	2	0	0	17	0	0	2	0	1	0	0	0	0	41	0
Peak Hour	0	0	9	0	0	0	7	0	0	1	0	0	0	0	0	0	17	0

Two-Hour Count Summaries - Bikes

Interval Start	NE 155th St			NE 155th St			1st Ave NE			0			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	2	0
4:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	4
5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	4
5:15 PM	0	1	0	2	2	0	0	0	0	0	0	0	5	9
5:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	2	9
5:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	9
Count Total	0	5	0	2	6	0	0	0	0	0	0	0	13	0
Peak Hour	0	3	0	2	4	0	0	0	0	0	0	0	9	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Appendix B: LOS Definitions

Highway Capacity Manual 2010/6th Edition

Signalized intersection level of service (LOS) is defined in terms of a weighted average control delay for the entire intersection. Control delay quantifies the increase in travel time that a vehicle experiences due to the traffic signal control as well as provides a surrogate measure for driver discomfort and fuel consumption. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour). Control delay is a complex measure based on many variables, including signal phasing and coordination (i.e., progression of movements through the intersection and along the corridor), signal cycle length, and traffic volumes with respect to intersection capacity and resulting queues. Table 1 summarizes the LOS criteria for signalized intersections, as described in the *Highway Capacity Manual 2010* and 6th Edition (Transportation Research Board, 2010 and 2016, respectively).

Table 1. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F ¹	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010 and 6th Edition*, Transportation Research Board, 2010 and 2016, respectively.

1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop and two-way stop control. All-way stop control intersection LOS is expressed in terms of the weighted average control delay of the overall intersection or by approach. Two-way stop-controlled intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is because major-street through vehicles are assumed to experience zero delay, a weighted average of all movements results in very low overall average delay, and this calculated low delay could mask deficiencies of minor movements. Table 2 shows LOS criteria for unsignalized intersections.

Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F ¹	>50













Source: *Highway Capacity Manual 2010 and 6th Edition*, Transportation Research Board, 2010 and 2016, respectively.

1. If the volume-to-capacity (v/c) ratio exceeds 1.0, LOS F is assigned an individual lane group for all unsignalized intersections, or minor street approach at two-way stop-controlled intersections. Overall intersection LOS is determined solely by control delay.

Appendix C: LOS Worksheets

HCM Signalized Intersection Capacity Analysis
1: 1st Ave NE & N 145th St

Shoreline 3 - 147th & 1st
Existing PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑			↑↑			↑	↑		↑↓		
Traffic Volume (vph)	0	810	20	180	1050	40	55	205	175	45	50	15	
Future Volume (vph)	0	810	20	180	1050	40	55	205	175	45	50	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0		
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00		
Frbp, ped/bikes		1.00			1.00			1.00	0.98		1.00		
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00		
Frt		1.00			1.00			1.00	0.85		0.98		
Flt Protected		1.00			0.99			0.99	1.00		0.98		
Satd. Flow (prot)		3524			3528			1860	1573		1804		
Flt Permitted		1.00			0.67			0.91	1.00		0.80		
Satd. Flow (perm)		3524			2373			1720	1573		1472		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	844	21	188	1094	42	57	214	182	47	52	16	
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	121	0	10	0	
Lane Group Flow (vph)	0	863	0	0	1320	0	0	271	61	0	105	0	
Confl. Peds. (#/hr)	2		4	4		2	4		4	2		2	
Confl. Bikes (#/hr)						1						1	
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	
Turn Type		NA		pm+pt	NA		Perm	NA	Perm	Perm	NA		
Protected Phases		4		3	8			2			6		
Permitted Phases				8			2		2	6			
Actuated Green, G (s)		35.9			35.9			16.0	16.0		16.0		
Effective Green, g (s)		35.9			35.9			16.0	16.0		16.0		
Actuated g/C Ratio		0.60			0.60			0.27	0.27		0.27		
Clearance Time (s)		4.0			4.0			4.0	4.0		4.0		
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0		
Lane Grp Cap (vph)		2112			1422			459	420		393		
v/s Ratio Prot		0.24											
v/s Ratio Perm					c0.56			c0.16	0.04		0.07		
v/c Ratio		0.41			0.93			0.59	0.15		0.27		
Uniform Delay, d1		6.4			10.8			19.1	16.7		17.3		
Progression Factor		1.00			1.00			1.00	1.00		1.04		
Incremental Delay, d2		0.1			10.7			5.5	0.7		1.7		
Delay (s)		6.5			21.6			24.6	17.5		19.7		
Level of Service		A			C			C	B		B		
Approach Delay (s)		6.5			21.6			21.7			19.7		
Approach LOS		A			C			C			B		
Intersection Summary													
HCM 2000 Control Delay			16.8									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.89										
Actuated Cycle Length (s)			59.9									Sum of lost time (s)	12.0
Intersection Capacity Utilization			99.1%									ICU Level of Service	F
Analysis Period (min)			15										
c	Critical Lane Group												

Intersection													
Int Delay, s/veh	1.6												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕				↕			↕	
Traffic Vol, veh/h	5	0	15	20	5	5	5	5	225	5	5	75	5
Future Vol, veh/h	5	0	15	20	5	5	5	5	225	5	5	75	5
Conflicting Peds, #/hr	11	0	6	1	0	6	0	6	0	1	6	0	11
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	1	1	1	1
Mvmt Flow	6	0	18	24	6	6	6	6	265	6	6	88	6

Major/Minor	Minor2		Minor1		Major1			Major2					
Conflicting Flow All	411	415	108	404	415	285	-	105	0	0	277	0	0
Stage 1	114	114	-	286	298	-	-	-	-	-	-	-	-
Stage 2	297	301	-	118	117	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	-	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	-	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	555	531	951	561	531	759	-	1493	-	-	1292	-	-
Stage 1	896	805	-	726	671	-	-	-	-	-	-	-	-
Stage 2	716	669	-	891	803	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-	-	-	-
Mov Cap-1 Maneuver	532	520	936	542	520	747	~	~	-	-	1285	-	-
Mov Cap-2 Maneuver	532	520	-	542	520	-	-	-	-	-	-	-	-
Stage 1	896	793	-	726	667	-	-	-	-	-	-	-	-
Stage 2	697	665	-	865	791	-	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	9.7		11.8					0.5		
HCM LOS	A		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	~	-	-	787	564	1285	-	-
HCM Lane V/C Ratio	~	-	-	0.03	0.063	0.005	-	-
HCM Control Delay (s)	-	-	-	9.7	11.8	7.8	0	-
HCM Lane LOS	-	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	~	-	-	0.1	0.2	0	-	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	450	60	30	505	90	90
Future Vol, veh/h	450	60	30	505	90	90
Conflicting Peds, #/hr	0	7	6	0	7	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	80	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	1	1	1	1
Mvmt Flow	464	62	31	521	93	93

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	533	0	1092 508
Stage 1	-	-	-	-	502 -
Stage 2	-	-	-	-	590 -
Critical Hdwy	-	-	4.11	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	-	-	2.209	-	3.509 3.309
Pot Cap-1 Maneuver	-	-	1040	-	239 567
Stage 1	-	-	-	-	610 -
Stage 2	-	-	-	-	556 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1033	-	228 560
Mov Cap-2 Maneuver	-	-	-	-	363 -
Stage 1	-	-	-	-	606 -
Stage 2	-	-	-	-	536 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	19
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	440	-	-	1033	-
HCM Lane V/C Ratio	0.422	-	-	0.03	-
HCM Control Delay (s)	19	-	-	8.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.1	-	-	0.1	-

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕					↕
Traffic Vol, veh/h	0	10	0	0	25	0	0	0	0	0	0	0
Future Vol, veh/h	0	10	0	0	25	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	10	0	0	26	0	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	26	0	0	10	0	0	36	-	-	-	-	26
Stage 1	-	-	-	-	-	-	10	-	-	-	-	-
Stage 2	-	-	-	-	-	-	26	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	-	-	-	3.318
Pot Cap-1 Maneuver	1588	-	-	1610	-	-	970	0	0	0	0	1050
Stage 1	-	-	-	-	-	-	1011	0	0	0	0	-
Stage 2	-	-	-	-	-	-	992	0	0	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1588	-	-	1610	-	-	970	-	-	-	-	1050
Mov Cap-2 Maneuver	-	-	-	-	-	-	970	-	-	-	-	-
Stage 1	-	-	-	-	-	-	1011	-	-	-	-	-
Stage 2	-	-	-	-	-	-	992	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			0		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1588	-	-	1610	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	0	230	0	0	80
Future Vol, veh/h	0	0	230	0	0	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	237	0	0	82

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	319	237	0	0	237	0
Stage 1	237	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	674	802	-	-	1330	-
Stage 1	802	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	674	802	-	-	1330	-
Mov Cap-2 Maneuver	674	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1330	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues
1: 1st Ave NE & N 145th St

Shoreline 3 - 147th & 1st
Existing PM Peak Hour



Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	865	1324	271	182	115
v/c Ratio	0.41	0.93	0.59	0.34	0.29
Control Delay	7.0	24.8	25.4	6.3	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	24.8	25.4	6.3	18.6
Queue Length 50th (ft)	74	195	85	5	29
Queue Length 95th (ft)	106	#368	153	45	m67
Internal Link Dist (ft)	633	640	297		376
Turn Bay Length (ft)				50	
Base Capacity (vph)	2113	1429	459	540	402
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.93	0.59	0.34	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 2: 1st Ave NE & N 147th St/NE 147th St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	ULTR	LTR
Maximum Queue (ft)	36	43	37	26
Average Queue (ft)	14	20	2	2
95th Queue (ft)	40	45	19	12
Link Distance (ft)	360	277	387	15
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: 1st Ave NE & N 155th St






















Movement	EB	WB	WB	NB	B11
Directions Served	TR	L	T	LR	T
Maximum Queue (ft)	62	35	59	165	27
Average Queue (ft)	5	12	4	77	2
95th Queue (ft)	32	37	28	141	20
Link Distance (ft)			509	144	293
Upstream Blk Time (%)				2	
Queuing Penalty (veh)				5	
Storage Bay Dist (ft)		80			
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

Zone Summary

Zone wide Queuing Penalty: 5

Lanes, Volumes, Timings
1: 1st Ave NE & N 145th St

Shoreline 3 - 147th & 1st
Future (2028) Without-Project PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	895	20	200	1165	95	60	275	195	125	100	35
Future Volume (vph)	15	895	20	200	1165	95	60	275	195	125	100	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	150		0	0		50	150		0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00			1.00	0.98	1.00	1.00	
Frt		0.997			0.989				0.850		0.961	
Flt Protected	0.950			0.950				0.991		0.950		
Satd. Flow (prot)	1770	3526	0	1787	3528	0	0	1864	1599	1787	1801	0
Flt Permitted	0.167			0.148				0.922		0.371		
Satd. Flow (perm)	311	3526	0	278	3528	0	0	1733	1573	697	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			17				151			30
Link Speed (mph)		30			30			30				30
Link Distance (ft)		713			720			377				456
Travel Time (s)		16.2			16.4			8.6				10.4
Confl. Peds. (#/hr)	2		4	4		2	4		4	2		2
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	16	932	21	208	1214	99	63	286	203	130	104	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	953	0	208	1313	0	0	349	203	130	140	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template	Left			Left			Left		Right	Left		
Leading Detector (ft)	20	50		20	50		20	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2				6
Permitted Phases	4			8			2		2	6		
Detector Phase	7	4		3	8		2	2	2	6		6
Switch Phase												

Lanes, Volumes, Timings
1: 1st Ave NE & N 145th St

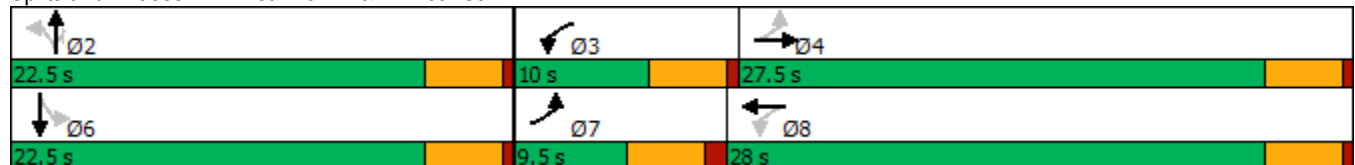
Shoreline 3 - 147th & 1st
Future (2028) Without-Project PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	20.0		8.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	9.5	27.5		10.0	28.0		22.5	22.5	22.5	22.5	22.5	
Total Split (%)	15.8%	45.8%		16.7%	46.7%		37.5%	37.5%	37.5%	37.5%	37.5%	
Maximum Green (s)	5.0	23.5		6.0	24.0		18.5	18.5	18.5	18.5	18.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	
Walk Time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	24.8	20.3		29.7	28.5			18.6	18.6	18.6	18.6	
Actuated g/C Ratio	0.44	0.36		0.52	0.50			0.33	0.33	0.33	0.33	
v/c Ratio	0.06	0.76		0.68	0.74			0.62	0.33	0.57	0.23	
Control Delay	6.9	20.4		23.1	16.0			22.8	7.1	30.6	13.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	6.9	20.4		23.1	16.0			22.8	7.1	30.6	13.6	
LOS	A	C		C	B			C	A	C	B	
Approach Delay		20.1			17.0			17.0			21.8	
Approach LOS		C			B			B			C	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 56.9
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 18.3
 Intersection Capacity Utilization 84.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service E

Splits and Phases: 1: 1st Ave NE & N 145th St



HCM 6th Signalized Intersection Summary
 1: 1st Ave NE & N 145th St

Shoreline 3 - 147th & 1st
 Future (2028) Without-Project PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	895	20	200	1165	95	60	275	195	125	100	35
Future Volume (veh/h)	15	895	20	200	1165	95	60	275	195	125	100	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	16	932	21	208	1214	99	62	286	203	130	104	36
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	199	1208	27	376	1379	112	149	533	540	301	452	156
Arrive On Green	0.02	0.34	0.34	0.10	0.41	0.41	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1781	3552	80	1795	3346	272	209	1572	1592	913	1333	461
Grp Volume(v), veh/h	16	466	487	208	649	664	348	0	203	130	0	140
Grp Sat Flow(s),veh/h/ln	1781	1777	1855	1795	1791	1828	1781	0	1592	913	0	1794
Q Serve(g_s), s	0.3	12.8	12.8	3.7	18.2	18.3	2.5	0.0	5.3	7.4	0.0	3.1
Cycle Q Clear(g_c), s	0.3	12.8	12.8	3.7	18.2	18.3	8.4	0.0	5.3	15.8	0.0	3.1
Prop In Lane	1.00		0.04	1.00		0.15	0.18		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	199	604	631	376	738	753	681	0	540	301	0	608
V/C Ratio(X)	0.08	0.77	0.77	0.55	0.88	0.88	0.51	0.00	0.38	0.43	0.00	0.23
Avail Cap(c_a), veh/h	327	765	799	392	788	804	681	0	540	301	0	608
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.3	16.1	16.1	11.4	14.8	14.8	14.6	0.0	13.7	21.1	0.0	12.9
Incr Delay (d2), s/veh	0.2	3.8	3.6	1.6	10.7	10.8	2.7	0.0	2.0	4.5	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	5.1	5.3	1.3	8.3	8.5	3.6	0.0	2.0	1.8	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.4	19.9	19.7	13.0	25.5	25.6	17.4	0.0	15.7	25.6	0.0	13.8
LnGrp LOS	B	B	B	B	C	C	B	A	B	C	A	B
Approach Vol, veh/h		969			1521			551				270
Approach Delay, s/veh		19.7			23.8			16.7				19.5
Approach LOS		B			C			B				B
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		22.5	9.5	22.6		22.5	5.6	26.5				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.5	4.0				
Max Green Setting (Gmax), s		18.5	6.0	23.5		18.5	5.0	24.0				
Max Q Clear Time (g_c+I1), s		10.4	5.7	14.8		17.8	2.3	20.3				
Green Ext Time (p_c), s		1.6	0.0	2.9		0.1	0.0	2.2				
Intersection Summary												
HCM 6th Ctrl Delay				21.1								
HCM 6th LOS				C								

HCM 6th TWSC
2: 1st Ave NE & N 147th St/NE 147th St

Shoreline 3 - 147th & 1st
Future (2028) Without-Project PM Peak Hour

Intersection													
Int Delay, s/veh	5.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕				↕			↕	
Traffic Vol, veh/h	15	0	35	120	5	25	5	30	270	70	25	105	20
Future Vol, veh/h	15	0	35	120	5	25	5	30	270	70	25	105	20
Conflicting Peds, #/hr	11	0	6	1	0	6	0	6	0	1	6	0	11
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	1	1	1	1
Mvmt Flow	18	0	41	141	6	29	6	35	318	82	29	124	24

Major/Minor	Minor2		Minor1			Major1			Major2				
Conflicting Flow All	663	693	153	656	664	376	-	159	0	0	406	0	0
Stage 1	205	205	-	435	447	-	-	-	-	-	-	-	-
Stage 2	458	488	-	221	217	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	-	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	-	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	377	369	898	382	384	675	-	1427	-	-	1158	-	-
Stage 1	802	736	-	604	577	-	-	-	-	-	-	-	-
Stage 2	587	553	-	786	727	-	-	-	-	-	-	-	-
Platoon blocked, %													
Mov Cap-1 Maneuver	341	353	884	352	367	664	~-7	~-7	-	-	1151	-	-
Mov Cap-2 Maneuver	341	353	-	352	367	-	-	-	-	-	-	-	-
Stage 1	802	708	-	604	574	-	-	-	-	-	-	-	-
Stage 2	549	550	-	724	699	-	-	-	-	-	-	-	-

Approach	EB		WB			NB			SB		
HCM Control Delay, s	11.7		22.3						1.4		
HCM LOS	B		C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	+	-	-	598	382	1151	-	-
HCM Lane V/C Ratio	-	-	-	0.098	0.462	0.026	-	-
HCM Control Delay (s)	-	-	-	11.7	22.3	8.2	0	-
HCM Lane LOS	-	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0.3	2.4	0.1	-	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	3.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	495	90	60	560	115	120
Future Vol, veh/h	495	90	60	560	115	120
Conflicting Peds, #/hr	0	7	6	0	7	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	80	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	1	1	1	1
Mvmt Flow	510	93	62	577	119	124

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	610	0	1272 570
Stage 1	-	-	-	-	564 -
Stage 2	-	-	-	-	708 -
Critical Hdwy	-	-	4.11	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	-	-	2.209	-	3.509 3.309
Pot Cap-1 Maneuver	-	-	974	-	186 523
Stage 1	-	-	-	-	571 -
Stage 2	-	-	-	-	490 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	968	-	172 517
Mov Cap-2 Maneuver	-	-	-	-	308 -
Stage 1	-	-	-	-	567 -
Stage 2	-	-	-	-	456 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	18.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	308	517	-	-	968	-
HCM Lane V/C Ratio	0.385	0.239	-	-	0.064	-
HCM Control Delay (s)	23.8	14.1	-	-	9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.7	0.9	-	-	0.2	-

HCM 6th TWSC
4: Site Access A & NE 147th St

Shoreline 3 - 147th & 1st
Future (2028) Without-Project PM Peak Hour

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔					↔
Traffic Vol, veh/h	0	10	25	0	30	0	30	0	0	0	0	0
Future Vol, veh/h	0	10	25	0	30	0	30	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	10	26	0	31	0	31	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	31	0	0	36	0	0	54	-	-	-	-	31
Stage 1	-	-	-	-	-	-	23	-	-	-	-	-
Stage 2	-	-	-	-	-	-	31	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	-	-	-	3.318
Pot Cap-1 Maneuver	1582	-	-	1575	-	0	944	0	0	0	0	1043
Stage 1	-	-	-	-	-	0	995	0	0	0	0	-
Stage 2	-	-	-	-	-	0	986	0	0	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1582	-	-	1575	-	-	944	-	-	-	-	1043
Mov Cap-2 Maneuver	-	-	-	-	-	-	944	-	-	-	-	-
Stage 1	-	-	-	-	-	-	995	-	-	-	-	-
Stage 2	-	-	-	-	-	-	986	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			8.9			0		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	944	1582	-	-	1575	-	-
HCM Lane V/C Ratio	0.033	-	-	-	-	-	-
HCM Control Delay (s)	8.9	0	-	-	0	-	0
HCM Lane LOS	A	A	-	-	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	0	305	0	0	140
Future Vol, veh/h	0	0	305	0	0	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	314	0	0	144

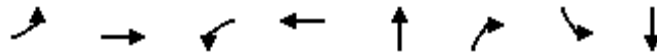
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	458	314	0	0	314	0
Stage 1	314	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	561	726	-	-	1246	-
Stage 1	741	-	-	-	-	-
Stage 2	883	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	561	726	-	-	1246	-
Mov Cap-2 Maneuver	561	-	-	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1246	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues
1: 1st Ave NE & N 145th St

Shoreline 3 - 147th & 1st
Future (2028) Without-Project PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	953	208	1313	349	203	130	140
v/c Ratio	0.06	0.76	0.68	0.74	0.62	0.33	0.57	0.23
Control Delay	6.9	20.4	23.1	16.0	22.8	7.1	30.6	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	20.4	23.1	16.0	22.8	7.1	30.6	13.6
Queue Length 50th (ft)	2	144	33	154	103	13	38	28
Queue Length 95th (ft)	9	205	#117	#363	187	55	m#110	m66
Internal Link Dist (ft)		633		640	297			376
Turn Bay Length (ft)			150			50	150	
Base Capacity (vph)	264	1462	304	1777	565	614	227	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.65	0.68	0.74	0.62	0.33	0.57	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Intersection: 2: 1st Ave NE & N 147th St/NE 147th St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	ULTR	LTR
Maximum Queue (ft)	54	97	85	38
Average Queue (ft)	26	48	13	10
95th Queue (ft)	50	81	52	33
Link Distance (ft)	355	272	381	13
Upstream Blk Time (%)				1
Queuing Penalty (veh)				2
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: 1st Ave NE & N 155th St

Movement	EB	WB	WB	NB	NB	B11
Directions Served	TR	L	T	L	R	T
Maximum Queue (ft)	98	60	62	172	124	55
Average Queue (ft)	10	24	5	74	59	3
95th Queue (ft)	49	52	31	154	116	29
Link Distance (ft)			497	144		293
Upstream Blk Time (%)				4	0	
Queuing Penalty (veh)				13	0	
Storage Bay Dist (ft)		80			100	
Storage Blk Time (%)		0	0	10	1	
Queuing Penalty (veh)		0	0	12	1	

Intersection: 4: Site Access A & NE 147th St

Movement	NB
Directions Served	L
Maximum Queue (ft)	47
Average Queue (ft)	18
95th Queue (ft)	44
Link Distance (ft)	150
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: 1st Ave NE & Site Access B

Movement	NB	SB
Directions Served	TR	LT
Maximum Queue (ft)	12	24
Average Queue (ft)	0	2
95th Queue (ft)	7	13
Link Distance (ft)	13	1608
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 27

Lanes, Volumes, Timings
1: 1st Ave NE & N 145th St

Shoreline 3 - 147th & 1st
Future (2028) With-Project PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	895	20	200	1165	118	60	289	195	138	108	43
Future Volume (vph)	29	895	20	200	1165	118	60	289	195	138	108	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	150		0	0		50	150		0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.99	0.99			0.99	0.98	0.99	0.99	
Frt		0.997			0.986				0.850		0.957	
Flt Protected	0.950			0.950				0.991		0.950		
Satd. Flow (prot)	1770	3526	0	1787	3516	0	0	1864	1599	1787	1793	0
Flt Permitted	0.173			0.150				0.922		0.356		
Satd. Flow (perm)	322	3526	0	282	3516	0	0	1733	1573	669	1793	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			21				145		35	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		713			720			377			456	
Travel Time (s)		16.2			16.4			8.6			10.4	
Confl. Peds. (#/hr)	2		4	4		2	4		4	2		2
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	30	932	21	208	1214	123	63	301	203	144	113	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	953	0	208	1337	0	0	364	203	144	158	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template	Left			Left			Left		Right	Left		
Leading Detector (ft)	20	50		20	50		20	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	7	4		3	8		2	2	2	6	6	
Switch Phase												

Lanes, Volumes, Timings
1: 1st Ave NE & N 145th St

Shoreline 3 - 147th & 1st
Future (2028) With-Project PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	20.0		8.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	9.5	27.5		10.0	28.0		22.5	22.5	22.5	22.5	22.5	
Total Split (%)	15.8%	45.8%		16.7%	46.7%		37.5%	37.5%	37.5%	37.5%	37.5%	
Maximum Green (s)	5.0	23.5		6.0	24.0		18.5	18.5	18.5	18.5	18.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	
Walk Time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	24.8	20.3		29.0	26.7			18.6	18.6	18.6	18.6	
Actuated g/C Ratio	0.44	0.36		0.51	0.47			0.33	0.33	0.33	0.33	
v/c Ratio	0.11	0.75		0.68	0.80			0.64	0.33	0.66	0.25	
Control Delay (s/veh)	7.4	20.3		23.8	19.8			23.8	7.4	36.8	13.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay (s/veh)	7.4	20.3		23.8	19.8			23.8	7.4	36.8	13.5	
LOS	A	C		C	B			C	A	D	B	
Approach Delay (s/veh)		20.0			20.4			18.0			24.7	
Approach LOS		B			C			B			C	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 56.9
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay (s/veh): 20.2 Intersection LOS: C
 Intersection Capacity Utilization 85.8% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: 1st Ave NE & N 145th St



HCM 6th Signalized Intersection Summary
 1: 1st Ave NE & N 145th St

Shoreline 3 - 147th & 1st
 Future (2028) With-Project PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	895	20	200	1165	118	60	289	195	138	108	43
Future Volume (veh/h)	29	895	20	200	1165	118	60	289	195	138	108	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	30	932	21	208	1214	123	62	301	203	144	112	45
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	215	1258	28	383	1350	136	142	522	527	278	421	169
Arrive On Green	0.03	0.35	0.35	0.10	0.41	0.41	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1781	3552	80	1795	3275	331	202	1577	1592	901	1273	511
Grp Volume(v), veh/h	30	466	487	208	662	675	363	0	203	144	0	157
Grp Sat Flow(s),veh/h/ln	1781	1777	1855	1795	1791	1815	1779	0	1592	901	0	1784
Q Serve(g_s), s	0.6	12.8	12.8	3.8	19.3	19.4	3.4	0.0	5.5	8.9	0.0	3.6
Cycle Q Clear(g_c), s	0.6	12.8	12.8	3.8	19.3	19.4	9.3	0.0	5.5	18.2	0.0	3.6
Prop In Lane	1.00		0.04	1.00		0.18	0.17		1.00	1.00		0.29
Lane Grp Cap(c), veh/h	215	629	657	383	738	748	664	0	527	278	0	590
V/C Ratio(X)	0.14	0.74	0.74	0.54	0.90	0.90	0.55	0.00	0.39	0.52	0.00	0.27
Avail Cap(c_a), veh/h	314	747	780	395	769	779	664	0	527	278	0	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.2	15.8	15.8	11.4	15.3	15.4	15.5	0.0	14.3	23.2	0.0	13.7
Incr Delay (d2), s/veh	0.3	3.3	3.1	1.4	13.0	13.4	3.2	0.0	2.1	6.8	0.0	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	5.1	5.3	1.4	9.2	9.5	4.0	0.0	2.1	2.3	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	13.5	19.1	18.9	12.8	28.3	28.7	18.8	0.0	16.5	30.0	0.0	14.8
LnGrp LOS	B	B	B	B	C	C	B		B	C		B
Approach Vol, veh/h		983			1545			566				301
Approach Delay, s/veh		18.8			26.4			17.9				22.1
Approach LOS		B			C			B				C
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		22.5	9.6	23.8		22.5	6.4	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.5	4.0				
Max Green Setting (Gmax), s		18.5	6.0	23.5		18.5	5.0	24.0				
Max Q Clear Time (g_c+I1), s		11.3	5.8	14.8		20.2	2.6	21.4				
Green Ext Time (p_c), s		1.5	0.0	2.9		0.0	0.0	1.6				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh				22.4								
HCM 6th LOS				C								

HCM 6th TWSC
2: 1st Ave NE & N 147th St/NE 147th St

Shoreline 3 - 147th & 1st
Future (2028) With-Project PM Peak Hour

Intersection													
Int Delay, s/veh	8.1												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕				↕			↕	
Traffic Vol, veh/h	15	0	35	144	5	32	5	30	277	114	39	110	20
Future Vol, veh/h	15	0	35	144	5	32	5	30	277	114	39	110	20
Conflicting Peds, #/hr	11	0	6	1	0	6	0	6	0	1	6	0	11
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	1	1	1	1
Mvmt Flow	18	0	41	169	6	38	6	35	326	134	46	129	24

Major/Minor	Minor2		Minor1		Major1			Major2					
Conflicting Flow All	740	792	158	729	737	410	-	164	0	0	466	0	0
Stage 1	244	244	-	469	481	-	-	-	-	-	-	-	-
Stage 2	496	548	-	260	256	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	-	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	-	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	335	324	893	341	348	646	-	1421	-	-	1101	-	-
Stage 1	764	708	-	579	557	-	-	-	-	-	-	-	-
Stage 2	559	520	-	749	699	-	-	-	-	-	-	-	-
Platoon blocked, %													
Mov Cap-1 Maneuver	294	304	879	310	327	636	~-7	~-7	-	-	1095	-	-
Mov Cap-2 Maneuver	294	304	-	310	327	-	-	-	-	-	-	-	-
Stage 1	764	668	-	579	554	-	-	-	-	-	-	-	-
Stage 2	515	517	-	677	660	-	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s/v	12.3		31.6					1.9		
HCM LOS	B		D							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	+	-	-	550	341	1095	-	-
HCM Lane V/C Ratio	-	-	-	0.107	0.624	0.042	-	-
HCM Control Delay (s/veh)	-	-	-	12.3	31.6	8.4	0	-
HCM Lane LOS	-	-	-	B	D	A	A	-
HCM 95th %tile Q (veh)	-	-	-	0.4	4	0.1	-	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	3.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	495	100	67	560	120	124
Future Vol, veh/h	495	100	67	560	120	124
Conflicting Peds, #/hr	0	7	6	0	7	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	80	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	1	1	1	1
Mvmt Flow	510	103	69	577	124	128

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	620	0	1291 575
Stage 1	-	-	-	-	569 -
Stage 2	-	-	-	-	722 -
Critical Hdwy	-	-	4.11	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	-	-	2.209	-	3.509 3.309
Pot Cap-1 Maneuver	-	-	965	-	181 519
Stage 1	-	-	-	-	568 -
Stage 2	-	-	-	-	483 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	959	-	166 513
Mov Cap-2 Maneuver	-	-	-	-	301 -
Stage 1	-	-	-	-	564 -
Stage 2	-	-	-	-	445 -

Approach	EB	WB	NB
HCM Control Delay, s/v	0	1	19.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	301	513	-	-	959	-
HCM Lane V/C Ratio	0.411	0.249	-	-	0.072	-
HCM Control Delay (s/veh)	25.1	14.3	-	-	9	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q (veh)	1.9	1	-	-	0.2	-

HCM 6th TWSC
4: Site Access A & NE 147th St

Shoreline 3 - 147th & 1st
Future (2028) With-Project PM Peak Hour

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕					↕
Traffic Vol, veh/h	43	10	25	0	30	0	30	0	0	0	0	23
Future Vol, veh/h	43	10	25	0	30	0	30	0	0	0	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	44	10	26	0	31	0	31	0	0	0	0	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	31	0	0	36	0	0	154	-	-	-	-	31
Stage 1	-	-	-	-	-	-	111	-	-	-	-	-
Stage 2	-	-	-	-	-	-	43	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	-	-	-	3.318
Pot Cap-1 Maneuver	1582	-	-	1575	-	0	813	0	0	0	0	1043
Stage 1	-	-	-	-	-	0	894	0	0	0	0	-
Stage 2	-	-	-	-	-	0	971	0	0	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1582	-	-	1575	-	-	777	-	-	-	-	1043
Mov Cap-2 Maneuver	-	-	-	-	-	-	777	-	-	-	-	-
Stage 1	-	-	-	-	-	-	869	-	-	-	-	-
Stage 2	-	-	-	-	-	-	949	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	4			0			9.8			8.5		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	777	1582	-	-	1575	-	1043
HCM Lane V/C Ratio	0.04	0.028	-	-	-	-	0.023
HCM Control Delay (s/veh)	9.8	7.3	0	-	0	-	8.5
HCM Lane LOS	A	A	A	-	A	-	A
HCM 95th %tile Q (veh)	0.1	0.1	-	-	0	-	0.1

HCM 6th TWSC
5: 1st Ave NE & Site Access B

Shoreline 3 - 147th & 1st
Future (2028) With-Project PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	TT		T			T
Traffic Vol, veh/h	6	6	308	11	4	153
Future Vol, veh/h	6	6	308	11	4	153
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	6	318	11	4	158

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	490	324	0	0	329	0
Stage 1	324	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	537	717	-	-	1231	-
Stage 1	733	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	535	717	-	-	1231	-
Mov Cap-2 Maneuver	535	-	-	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	860	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	11	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	613	1231
HCM Lane V/C Ratio	-	-	0.02	0.003
HCM Control Delay (s/veh)	-	-	11	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q (veh)	-	-	0.1	0

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔			↔
Traffic Vol, veh/h	21	10	30	0	0	11
Future Vol, veh/h	21	10	30	0	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	10	31	0	0	11

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	31	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1582	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1582	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s/v	4.9	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1582	-	-	-	1043
HCM Lane V/C Ratio	0.014	-	-	-	0.011
HCM Control Delay (s/veh)	7.3	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q (veh)	0	-	-	-	0

Appendix D: Trip Generation

Attachment 1: Current Proposal Trip Generation

Shoreline III

<u>Proposed Use</u>																									
Land Use	Setting	Size	Units	Model	Equation	Rate	Units	Inbound %	Gross Trips			Internal Trips				External trips			Pass-By			Total Net New			
									Inbound	Outbound	Subtotal	In	Out	Total	%	In	Out	Total	%	In	Out	Total	Inbound	Outbound	Total
Multifamily (Mid-Rise) (Close to Transit) (LU 221)																									
Daily	General Urban/Suburban	360	360 du						855	855	1,710	28	28	56	3%	827	827	1654	-	-	-	827	827	1,654	
AM Peak Hour	General Urban/Suburban			Rate	-	4.75	per du	50%	41	74	115	0	1	1	1%	41	73	114	-	-	-	41	73	114	
PM Peak Hour	General Urban/Suburban			Rate	-	0.32	per du	36%	68	36	104	4	2	6	6%	64	34	98	-	-	-	64	34	98	
				Rate	-	0.29	per du	65%																	
Strip Retail Plaza <40k (LU 822)																									
Daily	General Urban/Suburban	2,947	2,947 sf						80	80	160	13	13	26	16%	67	67	134	20%	13	13	26	54	54	108
AM Peak Hour	General Urban/Suburban			Rate	-	54.45	per ksf	50%	4	3	7	1	0	1	14%	3	3	6	-	-	-	3	3	6	
PM Peak Hour	General Urban/Suburban			Rate	-	2.36	per ksf	60%	17	16	33	2	4	6	18%	15	12	27	40%	5	5	10	10	7	17
				Equation (log)	-			50%																	
				Equation (log)	-			50%																	
				Equation (log)	-			50%																	
				Equation (log)	-			50%																	
Subtotal																									
Daily									935	935	1,870	41	41	82	-	894	894	1,788				881	881	1,762	
AM Peak Hour									45	77	122	1	1	2	-	44	76	120				44	76	120	
PM Peak Hour									85	52	137	6	6	12	-	79	46	125				74	41	115	

<u>Existing Use</u>																								
Land Use	Size	Units	Model	Equation	Rate	Units	Inbound %	Gross Trips			Internal Trips				External trips			Pass-By			Total Net New			
								Inbound	Outbound	Subtotal	In	Out	Total	%	In	Out	Total	%	In	Out	Total	Inbound	Outbound	Total
Single-Family Detached Housing (LU 210)																								
Daily	10	10,000 du							47	47	94											47	47	94
AM Peak Hour				Rate	-	9.43	per du	50%	2	5	7											2	5	7
PM Peak Hour				Rate	-	0.70	per du	25%	6	3	9											6	3	9
				Rate	-	0.94	per du	63%																
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			
				Rate	-																			

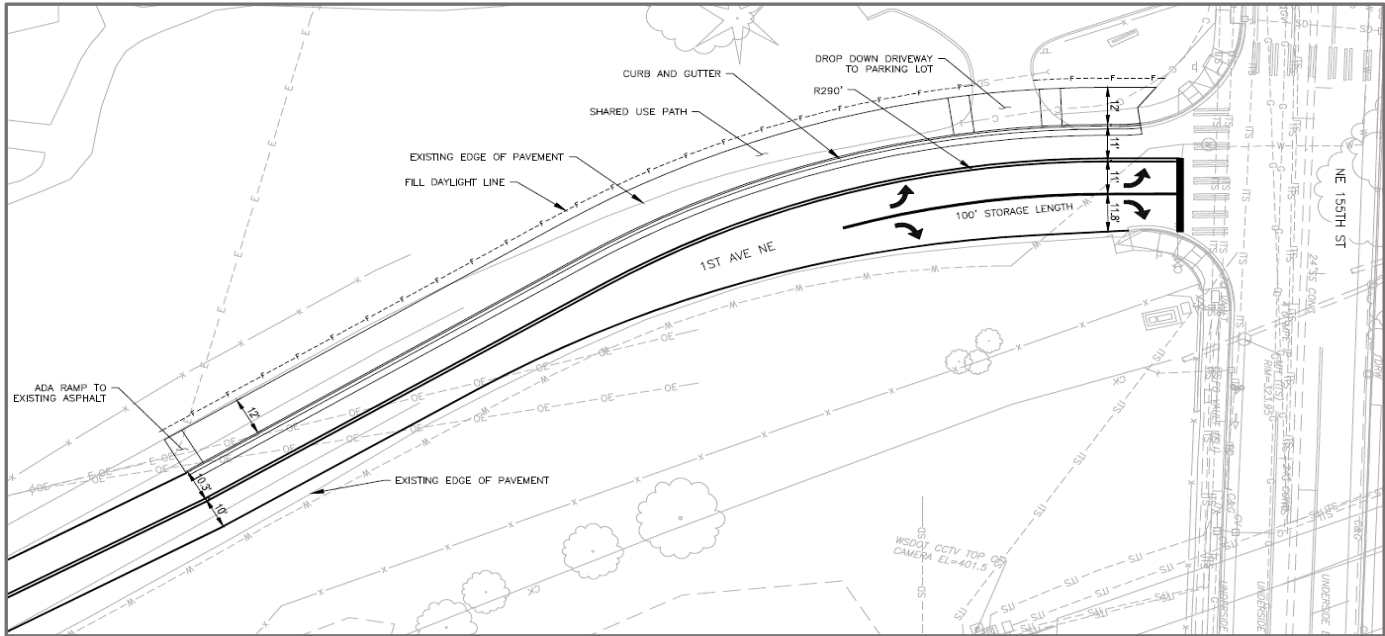
Appendix E: SEPA Mitigation Fee Calculation

1st Ave NE and NE 155th Street SEPA Mitigation

Applicable to all projects within the 145th Subarea

Mitigation project description: Add northbound turn lane to address vehicle delay exceeding LOS D standard

Shift vehicle lanes west to add a northbound turn lane and shared use sidewalk improvements



Total mitigation project cost:	\$	438,531
Growth share of mitigation project cost:	\$	314,600

Proportional Share Determination

PM peak trips to failure (baseline condition):	141	
Net new PM peak redevelopment project trips:	106	<i>Enter net new PM peak trips in blue box</i>
Redevelopment project on east or west side of I-5?	West	<i>Select East or West</i>
Redevelopment project trip impact	27	
Redevelopment project share of mitigation cost	19.1%	

Mitigation Fee	\$	60,089
-----------------------	----	---------------