

3.3 Multimodal Transportation

This section describes the affected environment, analyzes potential impacts, and provides recommendations for mitigation measures for multimodal transportation, including motor vehicle traffic, transit, bicycle, and pedestrian modes. Parking conditions also are analyzed.

The purpose of analyzing multimodal transportation for the 145th Street Station Subarea Plan FEIS is to understand how the transportation system operates with changes to zoning alternatives. While the recommendations for transportation improvements in this FEIS are representative of the type of investment needed, proposed development in the subarea would undergo the standard project review process in order to determine the transportation projects needed before development could proceed.

3.3.1 Affected Environment

Introduction

Existing conditions of the multimodal transportation network are described and illustrated on the following pages, along with planned conditions for the future as outlined in adopted transportation plans. They include an assessment of the current infrastructure and operating conditions for all transportation modes. Additionally, in this section impacts to transportation facilities and services resulting from the proposed action alternatives are assessed to determine appropriate mitigation measures needed to accommodate the changes. In order to provide relevant details and constructive analysis, the project

team conducted field visits, utilized existing data (such as traffic counts and transit timetables) and reviewed relevant plans for the area, including:

- 2015 Sound Transit Final Environmental Impact Statement (FEIS) for the Lynnwood Link Extension
- City response letter to the 2013 Sound Transit Draft Environmental Impact Statement (DEIS) for the Lynnwood Link Extension
- 2011 Shoreline Transportation Master Plan (TMP) and amendments
- 2012 Shoreline Comprehensive Plan (CP)
- City of Shoreline Vision 2029 Plan
- 2013 PSRC Growing Transit Communities Report (GTC)
- 2016 King County Metro Connects Draft Long Range Plan
- 2011 Community Transit Long Range Plan
- 2014 Sound Transit Long Range Plan Update
- 2016-2021 Capital Improvement Plan (CIP)
- 2016-2021 Transportation Improvement Plan (TIP)
- 2016 145th Street Multimodal Corridor Study
- 2016 185th Street Station Subarea Plan, DEIS, and FEIS

Existing Street Network

Regional Access

Interstate 5 (I-5) is a limited access freeway classified as a highway of statewide significance. It provides access from the mobility study area (see **Figure 3.3-1**) south to Northgate, the University District, Capitol Hill and Downtown Seattle and beyond, as well as to Mountlake Terrace, Lynnwood, and points north. I-5 also connects with State Routes 522 and 523, providing access to Lake Forest Park and Bothell. Additionally, I-5 serves as

the key corridor for express regional bus service in the area. The nearest access point to I-5 from the mobility study area is the NE 145th Street interchange, centrally located at the southern edge of the study area.

Subarea Street Network

SR 99/Aurora Avenue N is a managed access highway and is also classified as a highway of statewide significance. It serves as a principal arterial in Shoreline. It lies directly west of the study area, providing north-south mobility and business access along the corridor.

The principal arterials in the study area are N/NE 145th Street and 15th Avenue NE, which form the southern and eastern edges. NE 145th Street is a state highway (SR 523) from I-5 to SR 522. N/NE 145th Street is not located within the City of Shoreline. The northern half of the right-of-way is located in unincorporated King County and the southern half of the right-of-way is located in the City of Seattle. Minor arterials within the study area include Meridian Ave N, N/NE 155th Street and 5th Avenue NE. **Figure 3.3-1** highlights the street classifications of the roadways within the study area. The proposed light rail station location is identified on the map immediately east of I-5 and north of NE 145th Street. The area is composed of a mostly gridded network. The non-arterial street grid is broken in many places by the presence of parks. Crossings of I-5 are limited, with the only east-west connections located along N/NE 145th Street and N/NE 155th Street.

Existing Roadway Operations

Concurrency Management System

The Washington State Growth Management Act (GMA) includes a transportation concurrency requirement. This means that jurisdictions must provide adequate public facilities and services to keep pace with a community's growth over time to maintain the Level of Service (LOS) goals stated in a community's comprehensive plan. The improvements can include capital improvements, such as intersection modifications, or other strategies such as transit service expansion or transportation demand management. As part of the process, a jurisdiction evaluates the operations of roadway segments or intersections in order to determine the relative impact from new development on the transportation network. The City of Shoreline has an adopted concurrency methodology to balance growth, congestion, and capital investment.

Level of Service Criteria for Intersections

A common metric to evaluate intersection operations is average seconds of delay per vehicle, which can be translated into a grade for Level of Service (LOS) as shown in **Table 3.3-1**. An additional metric is the evaluation of a roadway segment via the volume-to-capacity (V/C) ratio, which compares a roadway's vehicle demand against the theoretical capacity of that segment. These V/C ratios can also be translated into LOS grades as shown in the table. The LOS concept is used to describe traffic operations by assigning a letter grade of A through F, where A represents free-flow conditions and F represents highly congested conditions. As shown in **Table 3.3-2**, the City has adopted LOS D for signalized intersections on arterials, unsignalized intersecting arterials and

roadway segments on Principal and Minor Arterials¹. WSDOT has a separate set of standards, which can also be referenced in **Table 3.3-2**. N/NE 145th Street is not subject to the City of Shoreline's LOS standards because it is not located within the City of Shoreline and is also a state highway between I-5 and SR 522.

Traffic Volumes

The existing conditions analysis uses data from the 2011 TMP update to describe current traffic operations and supplements it with more recent vehicle counts. Traffic counts were obtained from the City of Seattle, WSDOT, and the City of Shoreline and were also collected by the project team in July 2014. **Figure 3.3-2** and **Table 3.3-3** show existing traffic volumes and LOS values within the study area. N/NE 145th Street corridor has the highest east-west volume and carries over 30,000 vehicles per day. 15th Avenue NE is the busiest north-south corridor, with over 16,000 average daily trips (ADT). All segments in the study area in the City of Shoreline currently operate within City LOS standards.

Evaluation of Intersections

During the PM peak hour, all intersections within the study area and under the City's jurisdiction currently operate within the Shoreline LOS standards as shown in **Figure 3.3-3**. The most congested intersection is located at NE 145th Street and 15th Avenue NE, which operates at LOS E. While most intersections along N/NE 145th Street operate at LOS D or better, some individual movements experience higher levels of delay than an

¹ Average delay at signalized intersections is based on all vehicles that approach the intersection. Average delay for unsignalized intersections is based on the delay experienced by vehicles at the stop-controlled approaches.

overall intersection LOS D would suggest. This includes the northbound left and westbound through movements at the NE 145th Street / 5th Avenue NE intersection.

Collision History

As shown in **Figure 3.3-4**, some intersections in the study area have a relatively high number of vehicle collisions; experiencing a crash rate above 1.0 per million entering vehicles (MEV)². The intersection of N 145th Street and Meridian Avenue N averaged 12 collisions per year, or 1.39 collisions per MEV (col/MEV), with a high number of rear-end, left-turn, right-angle, and sideswipe collisions. NE 145th Street and 5th Avenue NE experienced 16 collisions per year, a rate of 1.18 col/MEV. NE 145th Street and 15th Avenue NE had 12 collisions per year, a rate of .90 col/MEV. With a high number of rear-end and right-angle collisions. Additionally, the unsignalized intersection of 5th Avenue NE and the I-5 Northbound on-ramp averaged 7 collisions per year, a collision rate of 1.37 col/MEV. All other intersections in the study area averaged fewer than 10 collisions per year. The collision rate for the entirety of the 145th Street corridor is 6.03 per million vehicle miles of travel, more than two and a half times higher than the 2010 Northwest Region average collision rate of 2.27 for Urban Principal Arterials.

Between 2011 and 2013, there were 15 pedestrian and bicycle collisions within the study area, with five of the collisions located along N/NE 145th Street. Five collisions occurred along N 155th Street while three were located along 15th Avenue NE.

² Information provided by Lynnwood Link FEIS using collision data from 2008 to 2011

Table 3.3-1 Level of Service Criteria For Intersection And Roadway Analysis

Level of Service (LOS)	Signalized Intersection Delay per Vehicle (seconds)	Unsignalized Intersection Delay per Vehicle (seconds)	Roadway Segment Volume-to-Capacity ratio (V/C)
A	< 10	< 10	<.60
B	> 10 to 20	> 10 to 15	.60 - .70
C	> 20 to 35	> 15 to 25	.70-.80
D	> 35 to 55	> 25 to 35	.80 - .90
E	> 55 to 80	> 35 to 50	.90 – 1.0
F	> 80	> 50	> 1.0

Source: 2010 Highway Capacity Manual and the 2011 City of Shoreline Transportation Master Plan

Table 3.3-2 Level of Service Standards by Agency

Agency	LOS Standard
City of Shoreline	LOS D for signalized intersections LOS D for unsignalized intersecting arterials V/C ratio of .90 (LOS D) for principal and minor arterials ³
City of Seattle	LOS D (goal)
WSDOT	LOS D for highways of statewide significance (HSS) LOS E/mitigated for regionally significant state highways (non-HSS)

³ The City allows a V/C ratio of 1.10 for 15th Avenue NE, between NE 150th Street and NE 175th Street due to rechannelization for operational safety.



Table 3.3-3 Average Daily Traffic and PM Peak Hour Congestion For Existing Conditions

Street	Segment	Average Daily Traffic	PM Peak Hour Volume ⁴	PM Peak hour Volume-to-Capacity Ratio
East-West Corridors				
N/NE 145th Street*	West of I-5	25,240	1,331	0.81
NE 145th Street*	East of I-5	31,790	1,431	0.87
N 155th Street	West of I-5	11,640	538	0.60
NE 155th Street	East of I-5	9,900	486	0.61
North-South Corridors				
5th Avenue NE*	I-5 NB on-ramp to NE 155th Street	7,170	530	0.76
15th Avenue NE	NE 145th to NE 150th Street	16,130	1,038	0.52
15th Avenue NE**	NE 150th to NE 155th Street	14,240	881	0.73
Meridian Avenue N	145th to 155th Street	6,220	392	0.56

Source: 2011 City of Shoreline Transportation Master Plan and updated traffic counts from 2014

- * Note that 145th Street and the portion of 5th Avenue NE between NE 145th Street and the I-5 northbound on-ramp is exempt from the City of Shoreline's concurrency standard due to being within WSDOT jurisdiction.
- ** The City allows a V/C ratio of 1.10 for 15th Avenue NE, between NE 150th Street and NE 175th Street due to rechannelization for operational safety.

⁴ One-directional volume only, signifying the direction with the highest volume

Figure 3.3-1 Street Classifications in the Study Area

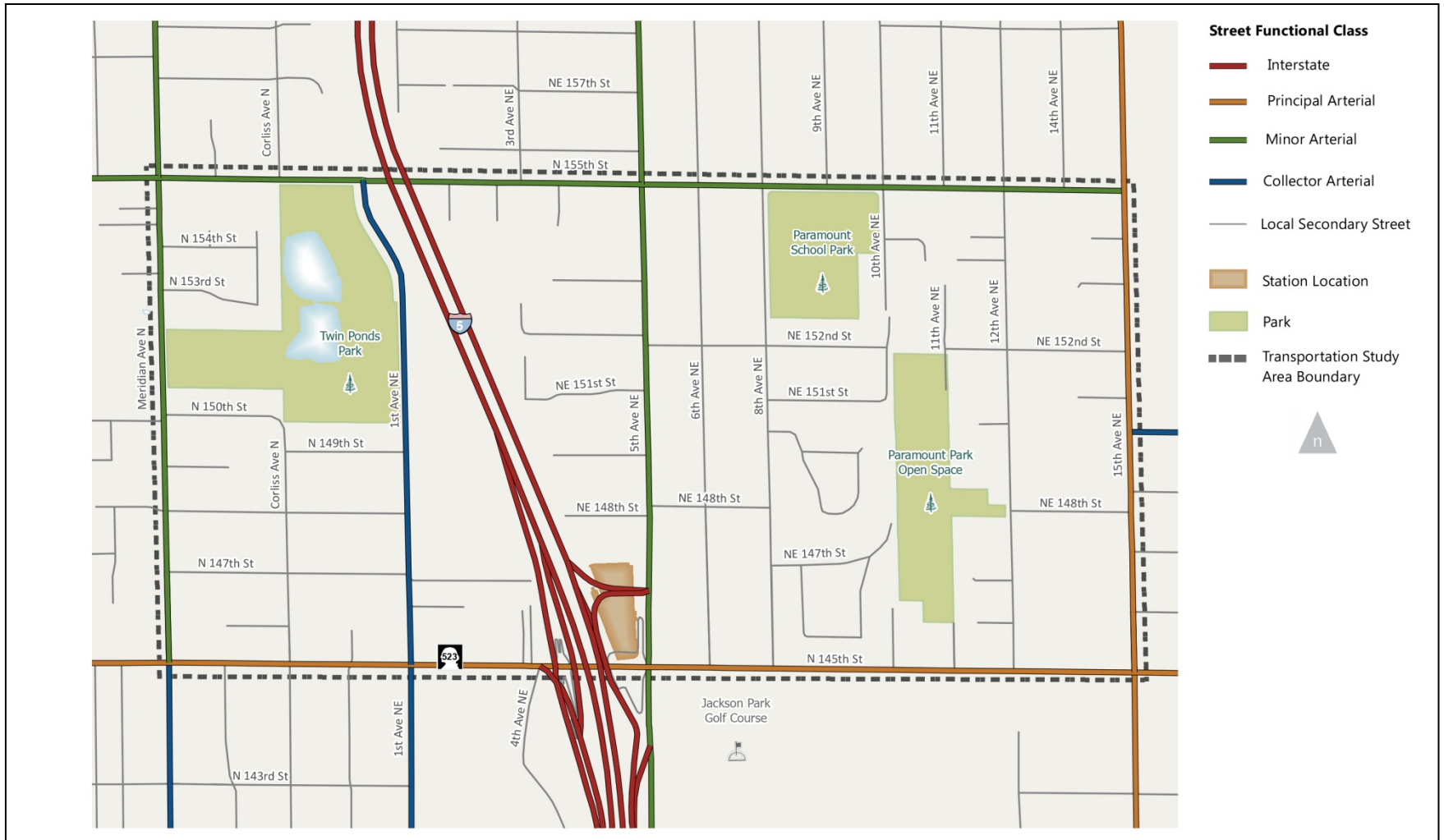
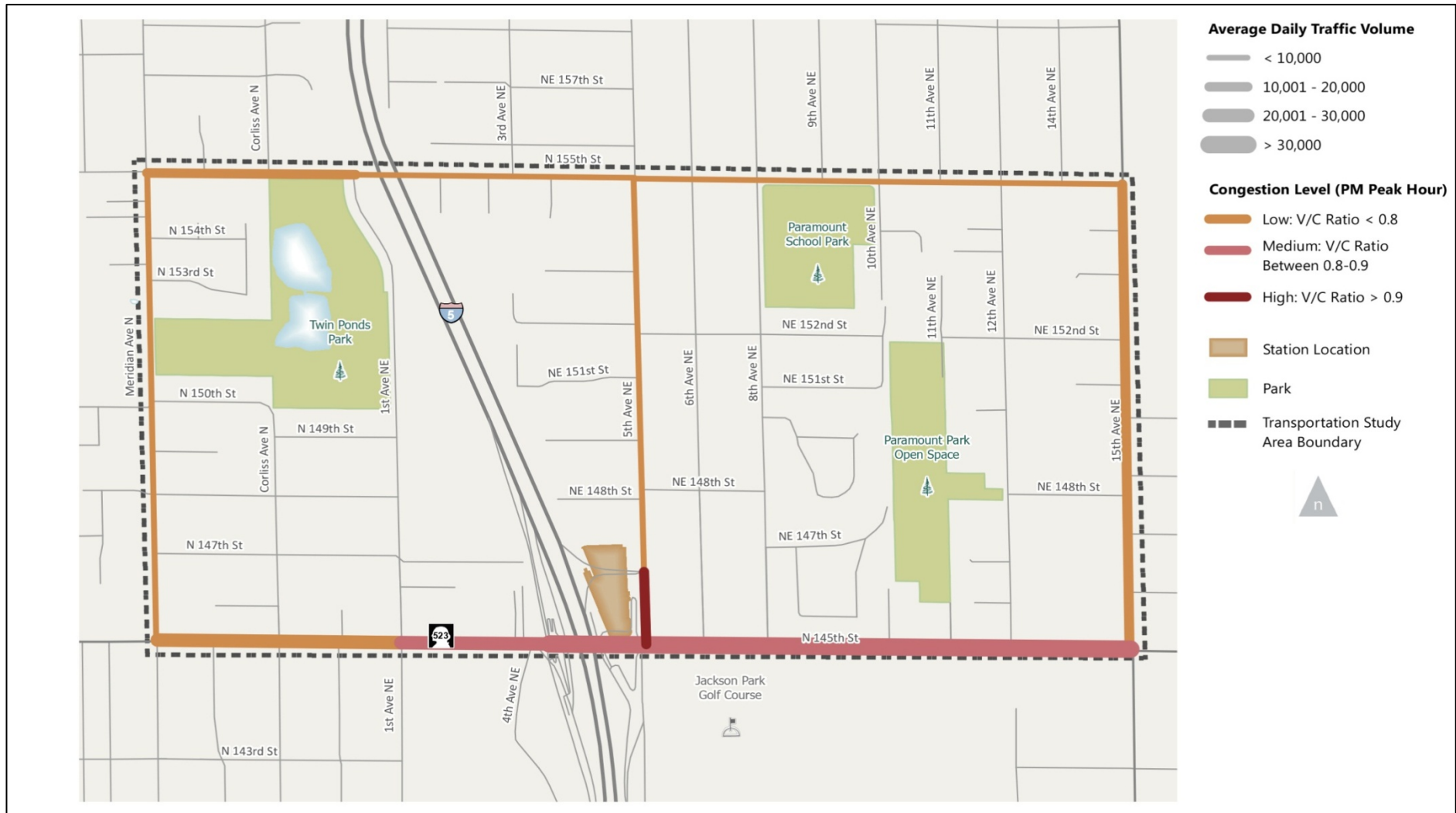


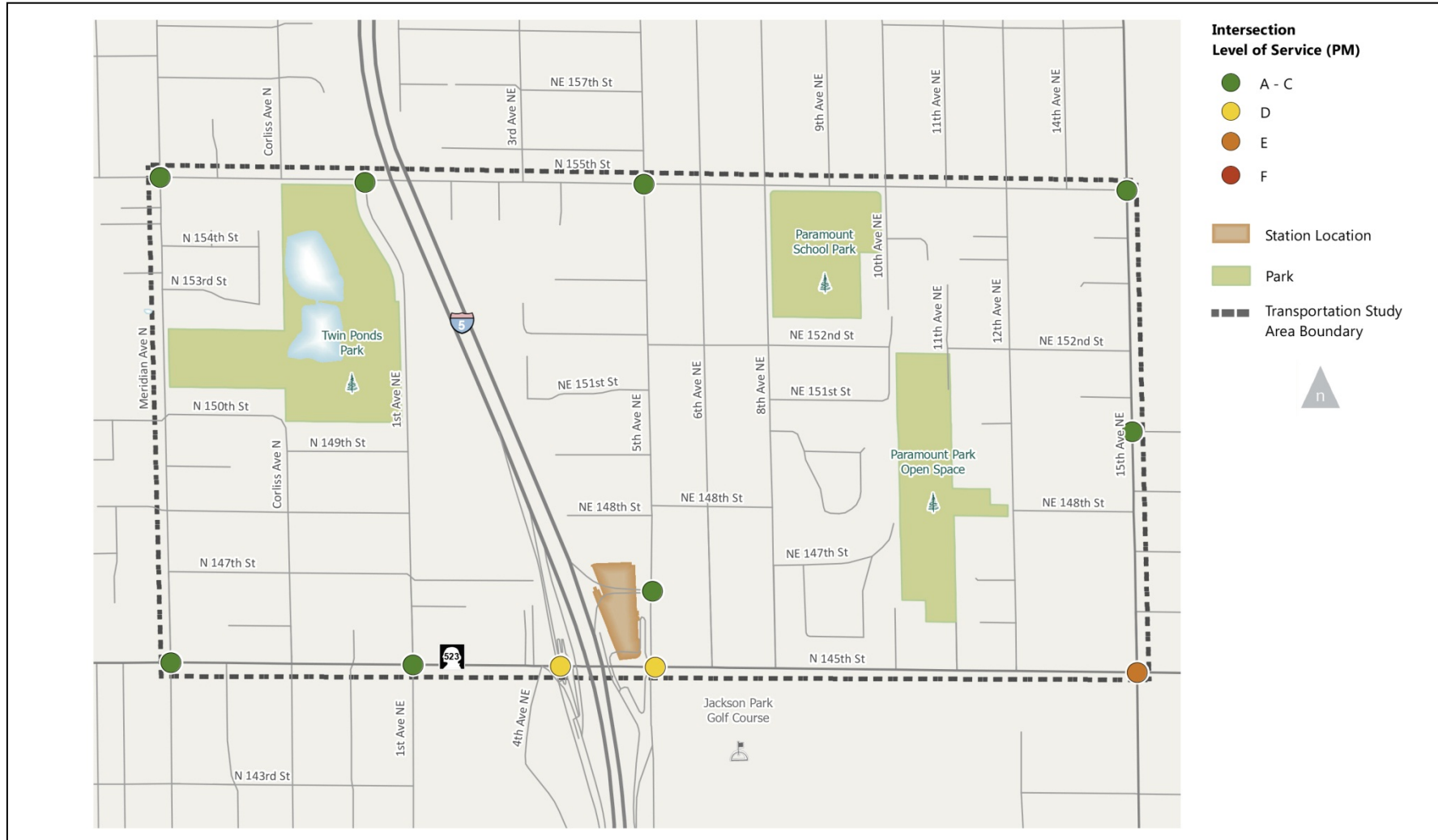
Figure 3.3-2 Average Daily Traffic and PM Peak Congestion (Existing Conditions)



Sources: City of Shoreline, WSDOT, City of Seattle and updated traffic counts from 2014

Note: N/NE 145th Street is not subject to city LOS standards

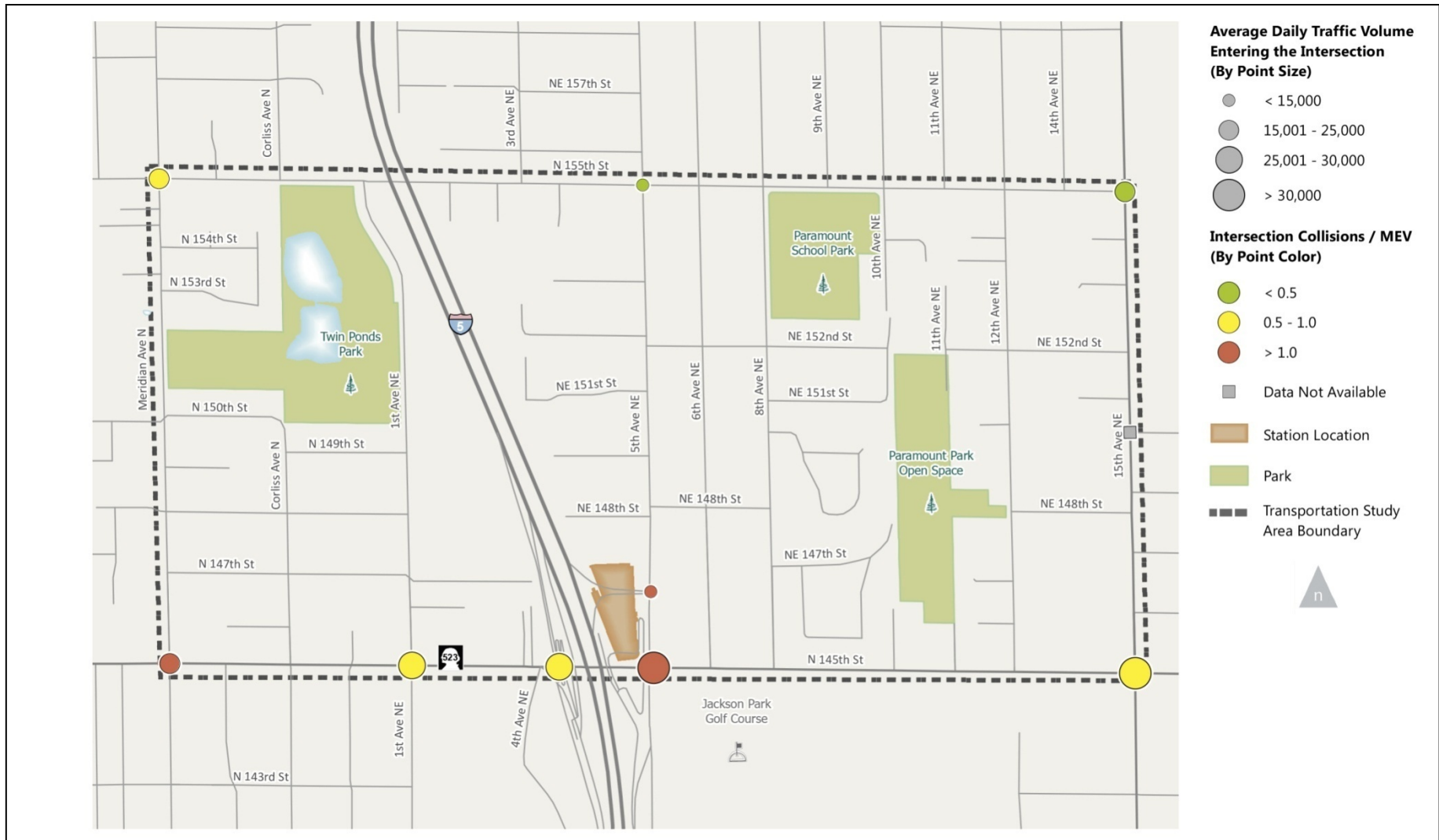
Figure 3.3-3 Intersection Level of Service (Existing Conditions)



Sources: City of Shoreline, WSDOT, City of Seattle and updated traffic counts from 2014.

Note: N/NE 145th Street is not subject to city LOS standards

Figure 3.3-4 Accident/Collision Rates (Existing Conditions)



Sources: Sound Transit Lynnwood Link Extension FEIS, WSDOT



Transit Service Provision

Existing Conditions

The transit coverage within the study area is provided by King County Metro and Sound Transit. **Table 3.3-4** details the current headways and destinations serviced by routes that traverse the area while **Figure 3.3-5** highlights the location of the routes. There are many transit routes with service within and in the vicinity of the study area, both in the peak and off-peak time periods. Peak-period routes connect the study area with regional growth centers such as Downtown Seattle, the University of Washington, Northgate, Bellevue, and Redmond. All-day service is primarily provided along the north-south corridors within the study area. Sound Transit provides all-day service from downtown Seattle to Lynnwood and Everett, with a stop at the NE 145th Street freeway station. However, this route does not serve the freeway station in the peak travel direction during the peak periods (i.e. there is no service at the southbound stop during the a.m. peak and there is no service at the northbound stop during the p.m. peak). There is no all-day east-west route that travels the entire length of the 145th Street corridor between Aurora Avenue and Lake City. The only east-west all day service in the study area is along N/NE 155th Street. While Sound Transit routes 510, 511, and 513 and a number of Community Transit routes pass by the study area along I-5, they do not stop at the 145th Street freeway bus station.

Planned Transit Service

While the City of Shoreline does not have direct control over the transit service within its borders, a number of conceptual modifications with light rail deployment are identified in the TMP

and King County Metro's Connect Long Range Plan. The TMP specifies that bus service be redirected to better connect to the station once service begins, especially along N/NE 145th Street. The City will be engaged with King County Metro and Sound Transit over the next two years as part of the development of a Transit Service Integration Plan. The Metro Connects Long Range Plan assumes that three high frequent routes and one Sound Transit Bus Rapid Transit route will serve the NE 145th Street Station by 2040. Additionally, the Lynnwood Link FEIS forecast 2,600-6,000 daily light rail station boardings at the NE 145th Street Station. The Lynnwood Link FEIS noted that long-distance/commuter bus routes near the 145th Street Station could be rerouted to connect with the light rail station as a transfer point in order to provide a faster and more frequent trip.

While not directly within the subarea, Sound Transit route 522 operates during weekdays and weekends, providing service east of the subarea along State Route 522, with connections to Downtown Seattle, Lake City, Lake Forest Park, Kenmore, Bothell, and Woodinville.

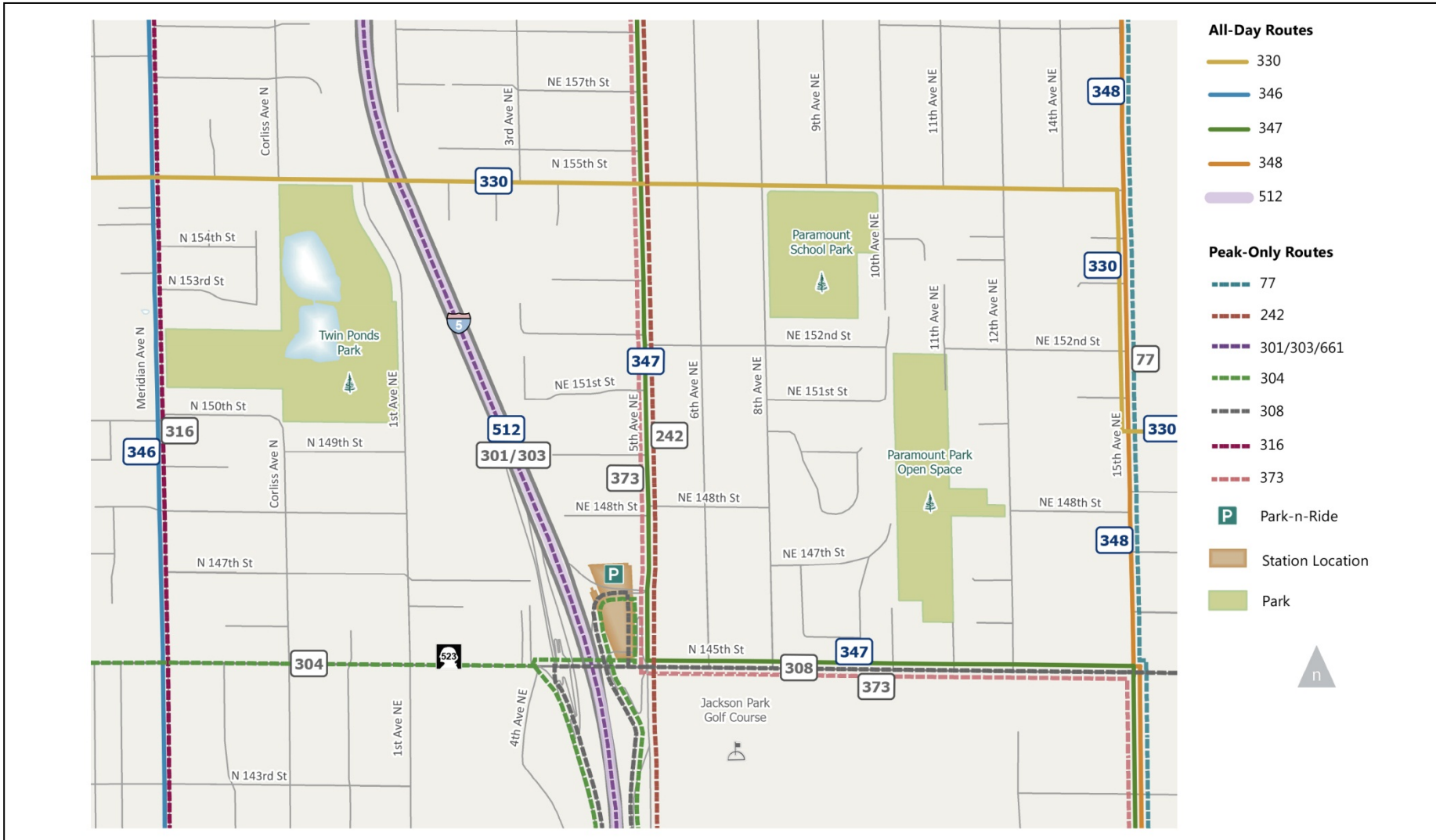
Table 3.3-4 Existing Transit Service

Route	Weekday Headways (in minutes)				Destinations Served
	AM Peak (6-9am)	Midday	PM Peak (3-6pm)	Evening	
All-day Routes					
KCM 330	60	60	60	-	Shoreline Community College, Lake City
KCM 346	30	30	30	60	Aurora Village, Meridian Park, Northgate
KCM 347	30	30	30	60	Northgate, Ridgecrest, North City, Mountlake Terrace
KCM 348	30	30	30	60	Richmond Beach, North City, Northgate
ST 512	15	15	15	15-30	Everett, Lynnwood, Mountlake Terrace, University District, Downtown Seattle
ST 522***	10	30	10	30-60	Woodinville, Bothell, Kenmore, Lake Forest Park, Lake City, Downtown Seattle
Peak Period Routes					
KCM 77	15-25	-	15-30	-	North City, Maple Leaf, Downtown Seattle
KCM 242	30	-	30	-	Northgate, Ravenna, Montlake, Bellevue, Overlake
KCM 301*	15**	-	15**	-	NW Shoreline, Aurora Village, Shoreline Park and Ride, Downtown Seattle
KCM 303	15	-	15	60**	Shoreline Park and Ride, Aurora Village Transit Center, Meridian Park, Northgate, Downtown Seattle, First Hill
KCM 304	20-30	-	20-30	-	Richmond Beach, Downtown Seattle
KCM 308	30	-	30	-	Lake Forest Park, Lake City, Downtown Seattle
KCM 316	15-20	-	15-25	-	Meridian Park, Bitter Lake, Green Lake, Downtown Seattle
KCM 373	15	-	15	60**	Aurora Village Transit Center, Shoreline Park and Ride, Meridian Park, University District

Source: King County Metro, 2015

- * This route provides bi-directional service during the a.m. and p.m. peak periods. Currently 5 out of 18 trips stop at the 145th Street freeway station during the peak periods.
- ** One outbound trip to Shoreline after 6 pm.
- *** Route ST522 does not serve the subarea directly but provides service directly east of the subarea

Figure 3.3-5 Existing Transit Service



Existing Parking Conditions

Existing On-Street Parking Conditions

A substantial portion of the mobility study area is residential in character and does not have on-street parking restrictions. Streets within the study area where parking is restricted include the main corridor of N/NE 145th Street, portions of 1st Avenue NE between N 145th Street and N 155th Street, 5th Avenue NE south of the I-5 northbound on-ramp, and 15th Avenue NE between NE 145th Street and NE 155th Street. The Lynnwood Link FEIS evaluated parking supply and utilization for an area within a quarter-mile of the proposed station⁵. The study determined that there were 450 unrestricted on-street spaces and 350 off-street spaces in total with a utilization rate of 27 percent for the on-street spaces and 71 percent for the off-street locations. A later section on planned improvements provides a summary of the parking mitigation identified in the Lynnwood Link FEIS.

Due to the limitations of the midday evaluation and the geographic area covered, a qualitative assessment was conducted for the Shoreline 145th Street Station Subarea Plan FEIS during the periods in which residential on-street parking utilization is typically higher, such as evenings and weekends⁶. Within the study area, there are approximately 1,950 on-street spaces available. Utilization was observed to be between approximately 10 percent and 20 percent for a majority of the non-arterial streets, with higher utilization of 20 and 30 percent observed along 6th Avenue NE.

⁵ Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

⁶ Observations were conducted December 2014 on a Sunday between 7 am and 8 am.

Park-and-Ride Facilities

King County Metro owns and operates the 68 space North Jackson Park park-and-ride lot at 14711 5th Avenue NE. This lot generally is 100% utilized.⁷ As part of the Lynnwood Link Extension Preferred Alternative, a 500 space parking garage will be located on the eastern edge of I-5 just north of NE 145th Street in the WSDOT right-of-way and the existing park-and-ride area. The Lynnwood Link FEIS assumed that the garage would be fully utilized during the daytime hours. During the PM peak hour, it was estimated that 180 vehicles would exit the garage and 45 would enter. During the AM peak hour, it was estimated that 200 vehicles would enter the garage and 50 would exit.⁸

⁷ King County Metro Park and Ride utilization report Second Quarter 2014

⁸ Vehicle volume estimates provided from the Lynnwood Link DEIS

Existing Pedestrian and Bicycle Facilities

Existing Conditions

Bicycle and pedestrian facilities are located sporadically throughout the mobility study area. **Figure 3.3-6** details the current sidewalk and bicycle infrastructure. Sidewalks exist on both sides of most arterial streets including Meridian Avenue N, 5th Avenue NE, 15th Avenue NE, N/NE 145th Street, and N/NE 155th Street. The quality and condition of these sidewalks varies throughout the subarea. The sidewalks along N/NE 145th Street are typically less than five feet wide, provide little buffer from heavy vehicle traffic, are in various states of repair, and are constricted by utility poles. The only existing bicycle facilities within the study area are on N/NE 155th Street between Meridian Avenue N and 5th Avenue NE, and on 15th Avenue NE between NE 150th Street and NE 155th Street (these facilities continue beyond the study area boundary). Currently there is not a direct bicycle connection to the proposed station site.

The neighborhoods within the subarea were primarily developed from the 1940s through the 1970s when the area was part of unincorporated King County. The street standards at that time did not require sidewalks, and as such, most of the non-arterial streets today do not have them. This is also true of bicycle lanes, which are not provided on non-arterial streets.

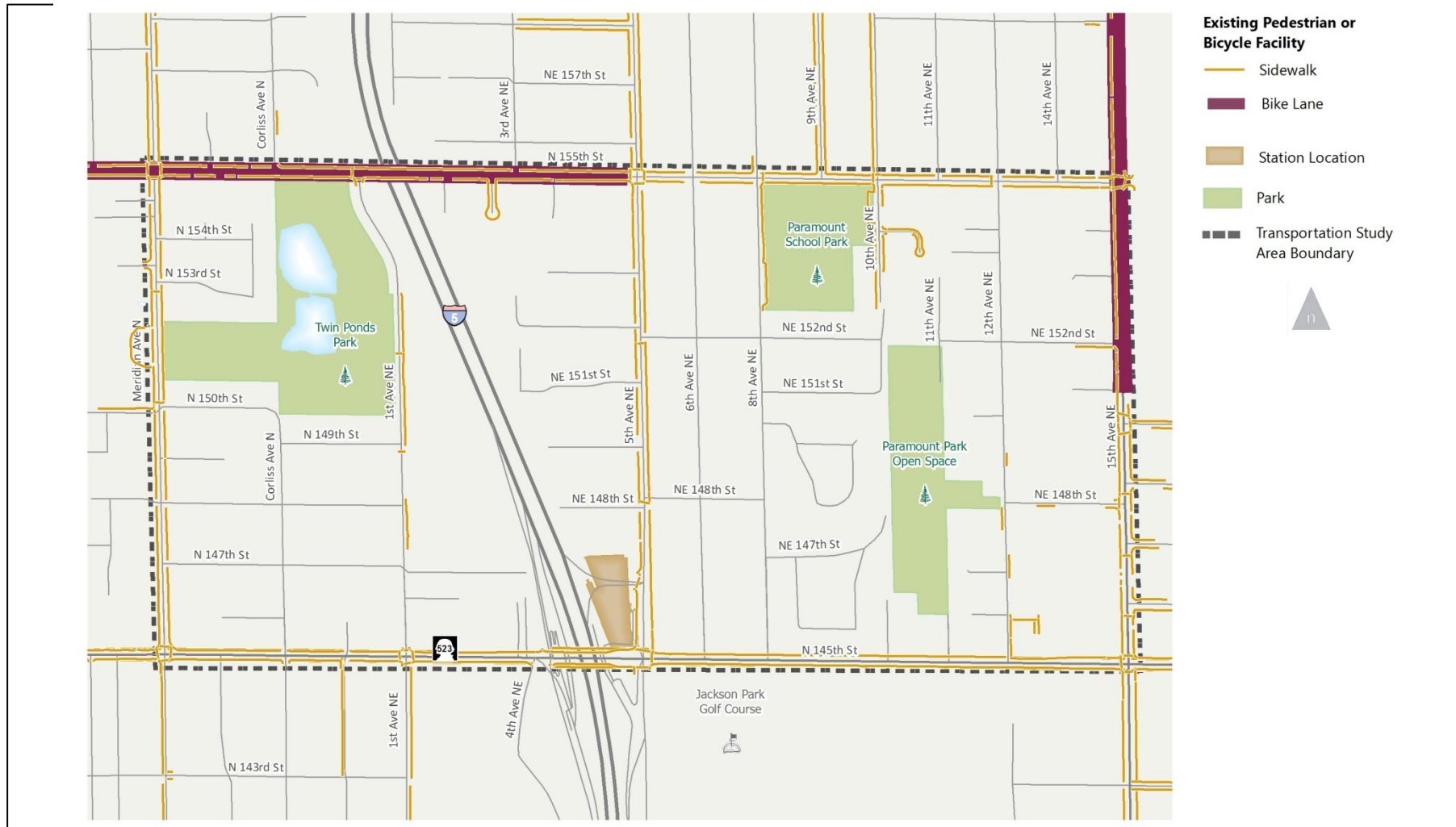
When the City of Shoreline incorporated in 1995, it assumed jurisdiction of the study area. The City works with the community to identify and prioritize capital transportation and infrastructure improvements throughout the city through development of the TMP, Transportation Improvement Plan, and Capital Improvement Plan.

I-5 presents a barrier for east-west bicycle and pedestrian travel, as there are only two crossings within the study area and they are approximately one-half mile apart. Bicycle lanes and sidewalks are present at N 155th Street. At the NE 145th Street interchange, the existing bridge has narrow, curbside sidewalks and no bicycle facilities. These minimal facilities, combined with heavy traffic volumes, the need for pedestrians to cross freeway on- and off-ramps, and limited north-south crossings, create an uncomfortable environment for pedestrians and bicyclists.



Narrow and non-ADA compliant sidewalk facilities along NE 145th Street near 10th Avenue NE

Figure 3.3-6 Existing Pedestrian and Bicycle Facilities



*Bike lanes on NE 155th Street between 5th Avenue NE and 15th Avenue NE will be completed within the 2016/2017 timeframe

Planned Multimodal Transportation Improvements

Pedestrian and Bicycle Improvements

The 2011 TMP identified a number of improvements to address the pedestrian and bicycle connectivity challenges described in the previous subsection. **Figure 3.3-7** highlights the planned bicycle improvements. **Figure 3.3-8** details the Pedestrian System Plan, as identified in the TMP. Within the study area, the Bicycle System Plan recommends adding bicycle lanes along 5th Avenue NE, Meridian Avenue NE, and an extension of the current bicycle lanes along NE 155th Street to 15th Avenue NE. The extension of the bicycle lanes on NE 155th Street east of 5th Avenue NE, as well as bicycle lanes on NE 150th Street between 15th Avenue NE and 25th Avenue NE are part of the Interurban / Burke-Gilman Trail Connectors project that is specified in the 2016-2021 Capital Improvement Program and scheduled for completion in 2016. Bicycle lanes along Meridian Avenue NE and 5th Avenue NE are scheduled for completion at a later date.

The Pedestrian System Plan specifies sidewalk facilities for the minor and collector arterials in the study area, including 1st Avenue NE, 5th Avenue NE, 15th Avenue NE, Meridian Avenue NE, and NE 155th Street. While several of these streets already have sidewalks, many do not comply with the City's existing standards for materials, width and/or amenity zones. The 145th Street Multimodal Corridor study addressed sidewalk standards along N/NE 145th Street in addition to bicycle connections in the area. Details of this study are provided in a later section.

Vehicle Traffic Improvements

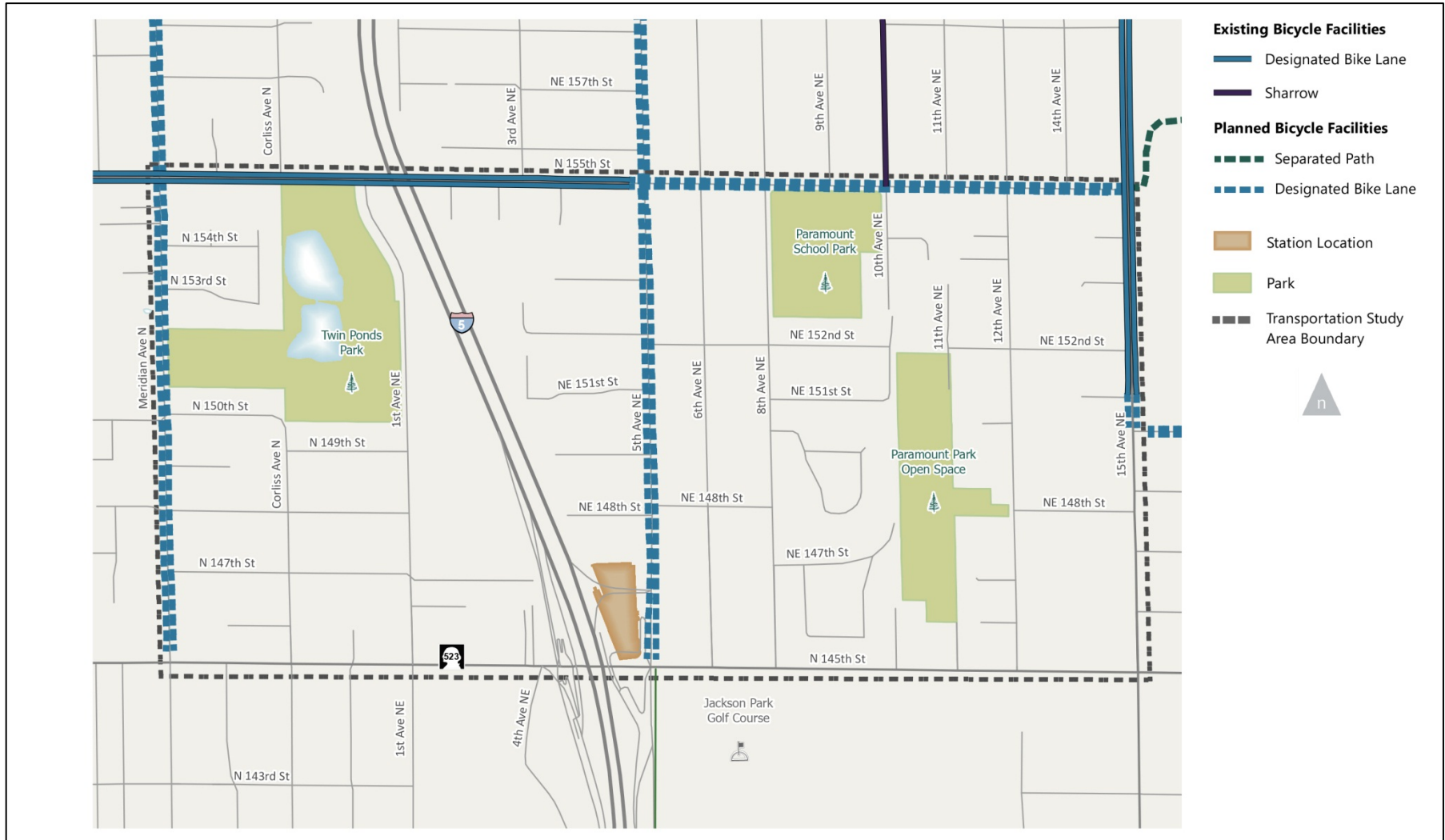
Figure 3.3-9 highlights projects identified in the TMP as well as in the Lynnwood Link FEIS that are needed to accommodate future

planned growth and maintain the City's adopted transportation level of service standard. The TMP calls for the reconfiguration of Meridian Avenue N to allow for a two-way left turn lane from N 145th Street to N 205th Street. NE 155th Street would have a similar treatment, extending the current 3-lane profile from 5th Avenue NE to 15th Avenue NE. Potential traffic improvements listed in Sound Transit's Lynnwood Link FEIS related to a 145th Street station alternative are summarized below. It should be noted that the City of Shoreline has not agreed that these improvements are adequate mitigation for the proposed station.

- 5th Avenue NE: Two-way left-turn lane between NE 145th Street and the park-and-ride entrance along 5th Avenue NE
- 5th Avenue NE / I-5 northbound on-ramp: Relocate the on-ramp and intersection to the north of the proposed station parking garage and signalize the intersection
- NE 145th Street / 5th Avenue NE: Add a protected northbound right-turn phase. Add a protected westbound to northbound right-turn lane
- NE 145th Street / 12th Avenue NE: Add a short refuge area on NE 145th Street for eastbound approach

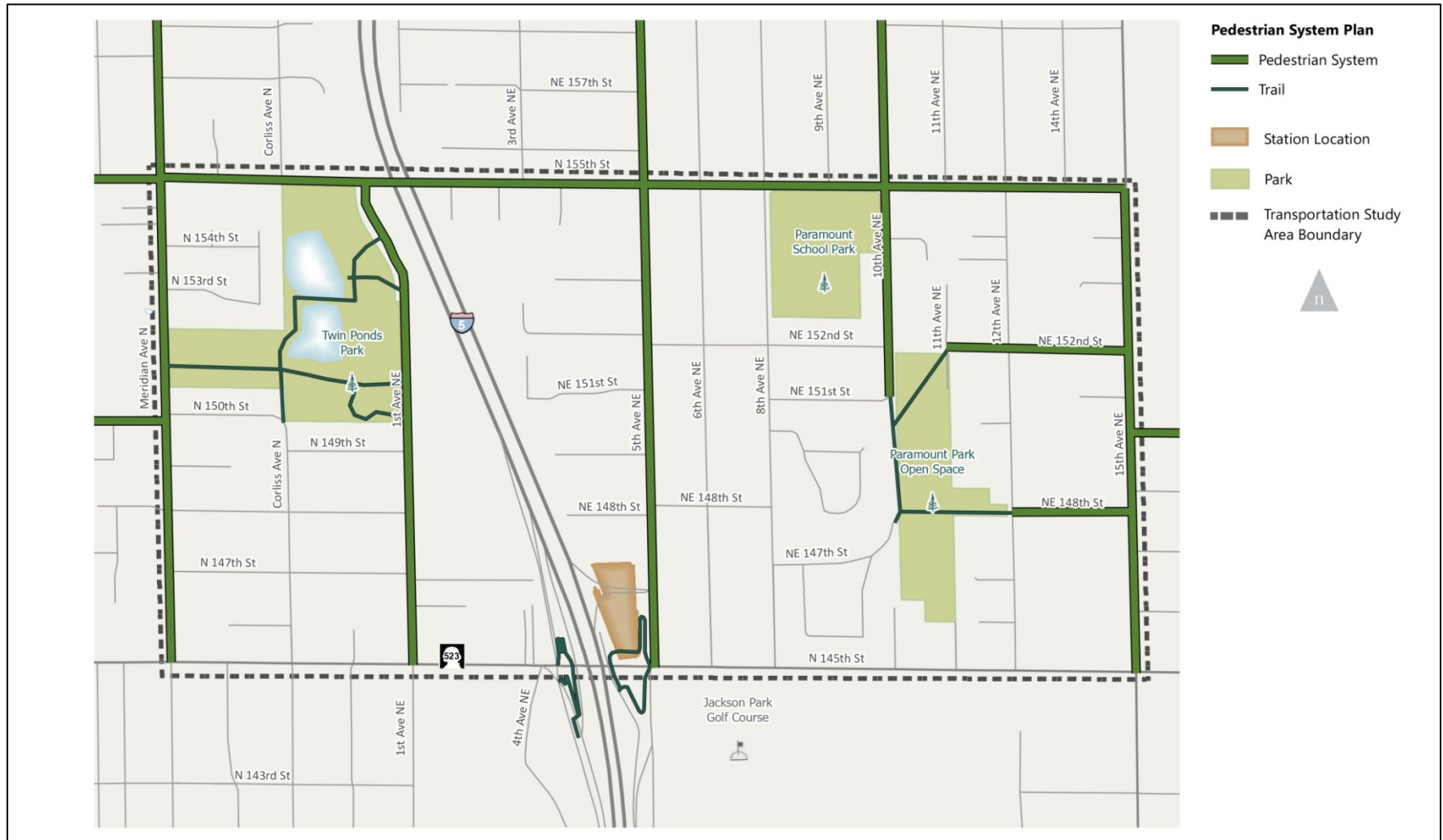
Additional improvements along N/NE 145th Street were identified in the 145th Street Multimodal Corridor Study and were incorporated into the transportation mitigation measures. Details of these improvements are included in a later section.

Figure 3.3-7 Bicycle System Plan from the Transportation Master Plan



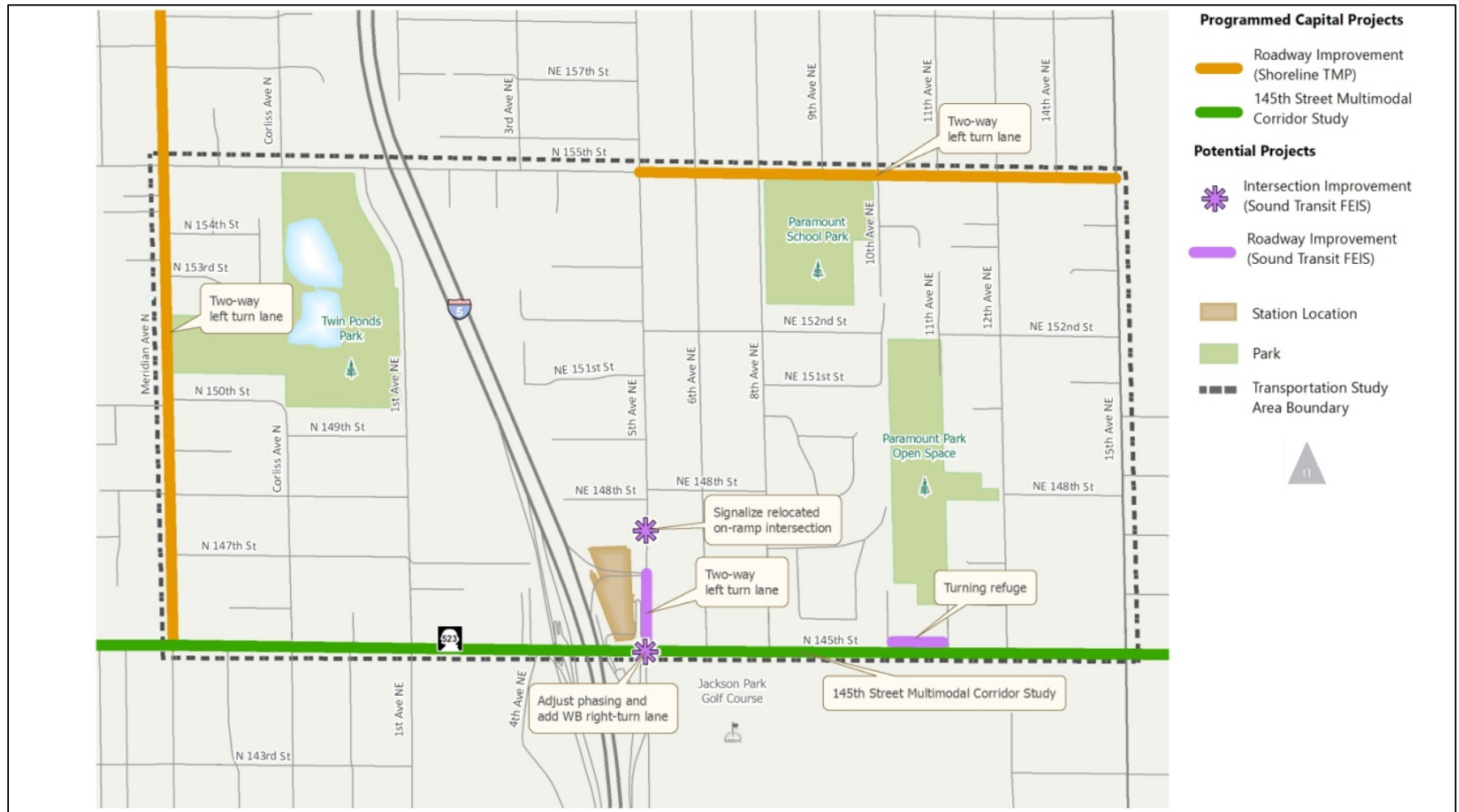
Note: Improvements identified in the 145th Multimodal Corridor Study are detailed in a later section

Figure 3.3-8 Pedestrian System Plan from the Transportation Master Plan



Note: Improvements identified in the 145th Multimodal Corridor Study are detailed in a later section

Figure 3.3-9 Roadway Improvements to Accommodate Growth Identified in the Transportation Master Plan, Sound Transit Lynnwood Link Extension Final Environmental Impact Statement



*Note that the City of Shoreline has not agreed that the improvements identified in the ST FEIS are adequate mitigation for the proposed station.

3.3.2 Analysis of Potential Impacts

Introduction

A key function of the FEIS process is to understand the effects of changes in land use on the transportation environment at the macro or cumulative level. However, it is worth noting that information regarding specific impacts and mitigations will also be generated at the project level. This FEIS analysis evaluates the overall transportation system as impacted by potential zoning changes in order to understand the relative need for transportation investment in the subarea. Some of this investment will be in the form of City-sponsored capital projects; some will come from project proponents, including Sound Transit and developers. This FEIS analysis is the first step in a detailed process that allows for development to be proposed under new zoning. Proposed development in the subarea that triggers certain thresholds would require additional traffic modeling in order to identify the appropriate mitigations to support a new development. With each step in the process, the City would monitor the state of the transportation system, including vehicle, bicycle, pedestrian, and transit operations along with parking demand and supply.

It is important to understand that full build-out under the action alternatives may take at least 55 years with forecast levels of yearly growth in housing and employment. This section describes potential impacts at this full level of growth in order to understand the relative change to the transportation environment.

The section includes a description of the forecast methodology as well as a detailed account of the results of the transportation

impact analysis. A later section details a shorter 20-year timeframe for each action alternative that evaluates a phased approach to zoning to understand the near-term level of transportation investment expected.

The four alternatives evaluated during this process included:

- **Alternative 1—No Action**, which assumes that there would be minimal growth within the subarea based upon existing zoning designations with the total forecast of 4,600 households and 2,325 jobs.
- **Alternative 2—Connecting Corridors**, which envisions an additional 9,835 households and 9,422 jobs in the subarea above Alternative 1, building out over a 60 to 94 year horizon.
- **Alternative 3—Compact Community**, which envisions an additional 10,670 households and 7,314 jobs in the subarea above Alternative 1, building out over a 63 to 98 year horizon.
- **Alternative 4—Compact Community Hybrid**, which envisions an additional 8,886 households and 8,685 jobs in the subarea above Alternative 1, building out over a 55 to 87 year horizon.

Forecasts

Baseline Forecasts

In order to determine the transportation-related impacts of the various action alternatives, traffic volumes were forecasted based on changes in development intensity within the subarea. The 2011 TMP update included forecasts of year 2030 traffic volumes.

However, these forecasts were based on a transit-oriented land use scenario in which much of the city's future housing and employment growth was directed to multiple transit nodes within the city, including the 145th Street Station subarea.

Because current zoning is geared toward less transit-oriented uses (such as single family and other lower intensity development), the travel model developed for the 145th Street Station Subarea Plan FEIS was re-run utilizing a "Dispersed" land use scenario, which directed future growth more evenly throughout the city based on existing zoning and observed development patterns. The travel model provided forecast traffic volumes for year 2030 and traffic volumes were then increased by 0.5 percent to reflect estimated 2035 volumes in order to be consistent with the land use horizon year. These revisions to the travel model allow for a true "no action" alternative as a baseline for analyzing the potential impacts of the proposed land use changes in the subarea.

To analyze how the three action alternatives (Alternatives 2, 3, and 4) would result in different travel patterns due to their mix of land uses and connectivity, the project team used an innovative trip generation analysis technique known as the mixed-use development (MXD) model. The MXD model is based on a growing body of research that focuses on the relationship between travel and the built environment. This method supplements conventional trip generation methods to capture effects related to built environment variables (known as the Ds) including **density**, **diversity** of land uses, **destinations** (accessibility), **development scale**, pedestrian and bicycle **design**, **distance** to transit services, and **demographics**. The proposed height and density alternatives in the 145th Street Station Subarea incorporate changes in a number of these variables that, in turn,

would influence the neighborhood's travel characteristics. In short, places with higher densities, a rich variety of land uses close to one another, and high quality pedestrian, bicycle, and transit environments have lower vehicle trip generation rates. People have more choices in terms of both the travel mode as well as how far they must travel to reach various destinations. The MXD method provides a more reasonable picture of how travel characteristics change over time by avoiding overestimates of the number of vehicle trips that infill projects generate.

The MXD method was applied to the station subarea to calculate the number of walking, biking, transit and automobile trips generated from new development. **Table 3.3-5** highlights the mode split of the PM peak hour trips generated by full development within the subarea. As the table shows, the proposal to increase land use intensity for the Connecting Corridors, Compact Community, and Compact Community Hybrid Alternatives results in a higher proportion of short distance trips that could be made via walking, biking, and transit. Due to the more compact nature of the Compact Community and Compact Community Hybrid Alternatives, a higher percentage of trips would be internal, and would remain within the subarea as compared to the Connecting Corridors Alternative.

To evaluate how streets and intersections in the study area would operate under each of the alternatives, traffic volume estimates were developed with the following methodology. For the No Action Alternative, traffic

The MXD analysis is a method for vehicle trip forecasting that more accurately reflects the number of trips that can be completed within a given subarea due to complementary land uses such as residential and retail.

volumes were generated from the “Dispersed” land-use model. Because the action alternatives include housing and job totals that are greater than the No Action alternative, the analysis for each of the action alternatives utilized the No Action traffic volumes plus the additional auto trips related to the land use changes for that alternative. The growth in trips was calculated using the MXD model recognizing a much higher portion of trips would be made by non-auto modes. Note that distribution of trips for all alternatives was based on existing travel patterns and expected shifts as a result of regional traffic growth.

The MXD method was also applied to the alternatives to evaluate transportation-related greenhouse gas (GHG) emissions associated with each. This GHG calculation considers emissions from motor vehicles only and does not include other emissions related to the built environment. While the three action alternatives result in more GHG emissions than the No Action Alternative, it should be noted that the No Action Alternative assumed substantially less overall housing and employment. On a per capita basis (per 100 households), all three action alternatives have lower transportation-related GHG emissions than the No Action Alternative.

These estimates are confirmed by outside studies that have concluded on average, denser mixed-use development generates 20 to 60 percent less greenhouse gas emissions per unit when compared to less dense development. To provide a more even comparison amongst the alternatives, a version of the “Dispersed” land-use model was run with housing and employment growth equivalent to the Compact Community Alternative. Under this scenario, the built environment would be similar to the No Action Alternative, which is less conducive to biking, walking, and transit and results in more overall vehicle

travel. Similarly, this scenario would generate much higher levels of transportation-related GHG-emissions, as shown in **Table 3.3-5**. The forecast mode splits, trips generated and GHG emissions also are identified in **Table 3.3-5**.

Roadway Improvement Assumptions

The TMP planned transportation projects and the projects from the Lynnwood Link FEIS outlined in the previous section were considered in all of the future year alternatives (no action and action). These improvements included:

- Meridian Ave N: Two-way left-turn lane from N 145th Street to N 205th Street
- NE 155th Street: Two-way left-turn lane extended from 5th Avenue NE to 15th Avenue NE
- 5th Avenue NE / I-5 northbound on-ramp: Relocation of the on-ramp and intersection to the north and signalize the intersection
- NE 145th Street / 5th Avenue NE: Add a protected westbound to northbound right-turn lane

Table 3.3-5 Percentage of Trips by Mode and GHG Emissions

Alternative	External ⁹ Walk/Bike Trips	External Transit Trips	Internal Trips	External Auto Trips	Total PM Peak Trips Generated	External PM Auto Trips Generated	Per Capita GHG (metric tons / 100 households)
Alternative 1 - No Action	4%	5%	15%	76%	6,261	4,756	3.6
Alternative 2 - Connecting Corridors	14%	10%	21%	55%	20,700	11,408	2.4
Alternative 3 - Compact Community	12%	10%	23%	55%	17,894	9,978	2.0
Alternative 4 – Compact Community Hybrid	12%	10%	23%	55%	18,061	10,160	2.6
Dispersed Land-Use Model with Alternative 3 Population/Job totals	4%	5%	15%	76%	17,894	13,599	7.1

⁹ External trips are assumed to start or end outside of the study area. By contrast, internal trips both start and end within the study area.

Alternative 1—No Action

Street Access and Circulation

With no change in land use zoning, the current street access and circulation network would remain for Alternative 1—No Action.

Traffic Impact Analysis

Under Alternative 1—No Action, most signalized intersections would meet the WSDOT, City of Seattle, and City of Shoreline LOS standards even with an increase in their average delay. These intersections are shown in **Figure 3.3-10** and **Table 3.3-6**. While some intersections along the 145th corridor would operate at LOS E, the intersection at N 145th Street and 15th Avenue NE would operate at LOS F under this alternative due to added delay for the eastbound approach, the northbound approach, and the left turning movement of the westbound approach.

Average Daily Traffic Volumes on Major Corridors

As shown in **Table 3.3-7**, average daily traffic volumes and congestion under Alternative 1—No Action are expected to grow along major roadway segments compared to today. **Figure 3.3-11** shows expected traffic volumes on roadways and the projected V/C ratios on principal and minor arterials within the subarea. 5th Avenue would operate at a V/C ratio of .96, while N/NE 155th Street and Meridian Avenue N would remain within the City's adopted threshold of .90. Note that 15th Avenue between 150th Street and 155th Street has a concurrency threshold of 1.10 as specified in the Transportation Master Plan.

Vehicle-Miles-Traveled and Greenhouse Gas Emissions

Based on the land use forecasts, the total vehicle-miles-traveled (VMT) generated from existing and future development within the subarea would amount to roughly 227,000 miles per day. This is based on a continuation of existing land-use patterns and current zoning. The suburban nature of development constrains the amount of trips that can be completed via non-auto modes such as walking, bicycling, or transit because of the long distances between origins and destinations. In total, future land uses within the subarea would generate roughly 165 metric tons of carbon dioxide (CO₂) per day from additional transportation demand. In comparison, a similar amount of housing and retail with a density proposed in the Connecting Corridors Alternative would generate approximately 22,000 fewer daily VMT and 25 fewer metric tons of CO₂ per day.

Transit Service and Mobility

Under the Alternative 1—No Action, planned enhancements to bus service would likely be incremental, as the existing land uses and densities would not support major increases in transit service frequency. While the future light rail station would provide regional mobility, local bus service would primarily function to transport passengers to and from outside of the station subarea. The increased traffic along N/NE 145th Street may have an impact on overall transit reliability without any mitigating measures, such as transit signal priority, queue jumps, or other intersection treatment

Parking Conditions

Based on current supply and the expected limited growth in demand in the mobility study area, peak parking demand generated by land uses in the study area is forecast to be approximately 5,400 spaces.

The parking minimums articulated in City Code specify that any new development of single-family residential uses would be built with two spaces per unit. The Code also requires that any new development in retail or other commercial-related land use must provide one space per 300 to 400 feet of leasable space and this would be accommodated on-site. With little opportunity for development of complementary uses, the amount of parking that could be shared would be limited.

With the addition of light rail service and the 500-space parking garage in 2023, the Lynnwood Link FEIS stated that Sound Transit would work with local jurisdictions to evaluate and, if necessary, implement hide-and-ride mitigation (hide-and-ride parking occurs when transit user park in neighborhoods surrounding transit stations). Sound Transit would inventory on-street parking around the station before and after the start of light rail revenue service, and would then work with the local jurisdictions to determine where mitigation measures would be needed. Potential parking control measures include parking meters, restricted parking signage, passenger and truck load zones, and residential parking zone programs.

Pedestrian and Bicycle Mobility

Under the Alternative 1—No Action, the pedestrian and bicycle environment would improve with the planned improvements

specified in the TMP. However, the dispersed land use would limit the amount of trips that could be completed via bicycling or walking.

Bicyclists could utilize N/NE 155th Street and 5th Avenue NE in order to connect to the station from the east and west. In a later section, the 145th Street Multimodal Corridor Study recommendations address the east-west gap on 145th across I-5 due to the lack of facilities along 145th Street and the barrier created by I-5.

**Table 3.3-6 PM Peak Period Intersection Level of Service
for Alternative 1—No Action**

Signal Type	Intersection	Existing LOS	Existing Delay (sec. / veh.)	No Action LOS	No Action Delay (sec. / veh.)
Signalized	145th St / Meridian Ave	B	16	D	55
Signalized	145th St / 1st Ave	B	18	E	57
Signalized	145th St / SB I-5	D	46	E	66
Signalized	145th St / 5 th Ave	D	42	F	81
Signalized	5th Ave / I-5 NB On-ramp	A	<10	A	<10
Signalized	145th St / 15th Ave	E	60	F	94
Signalized	150th St / 15th Ave	B	16	C	21
Signalized	155th St / 15th Ave	C	30	D	37
Signalized	155th St / 5th Ave	B	10	B	17
Unsignalized	155th St / 1st Ave	C	21	E	49
Signalized	155th / Meridian Ave	B	14	C	27

Note: Level of Service results do not incorporate improvements identified in the 145th Street Multimodal Corridor Study

Figure 3.3-10 Intersection Level of Service (Alternative 1—No Action)



Table 3.3-7 Average Daily Traffic Volumes and PM Peak Period Congestion for Alternative 1—No Action

Street	Segment	Existing ADT	No Action ADT	Existing PM Peak Hour Volume ¹⁰	No Action PM Peak Hour Volume ¹⁰	No Action V/C Ratio
East-West Corridors						
N/NE 145th Street*	West of I-5	25,240	30,430	1,331	1,650	1.00
NE 145th Street*	East of I-5	31,790	37,650	1,431	1,630	0.99
N 155th Street	West of I-5	11,640	14,920	538	700	0.73
NE 155th Street	East of I-5	9,900	12,380	486	610	0.64
North-South Corridors						
5th Avenue NE*	I-5 NB on-ramp to 155th Street	7,170	9,230	530	670	0.96
15th Avenue NE	145th to 150th Street	16,130	20,060	1,038	1,290	0.65
15th Avenue NE**	150th to 155th Street	14,240	18,640	881	1,150	0.96
Meridian Avenue N	145th to 155th Street	6,220	9,310	392	650	0.78

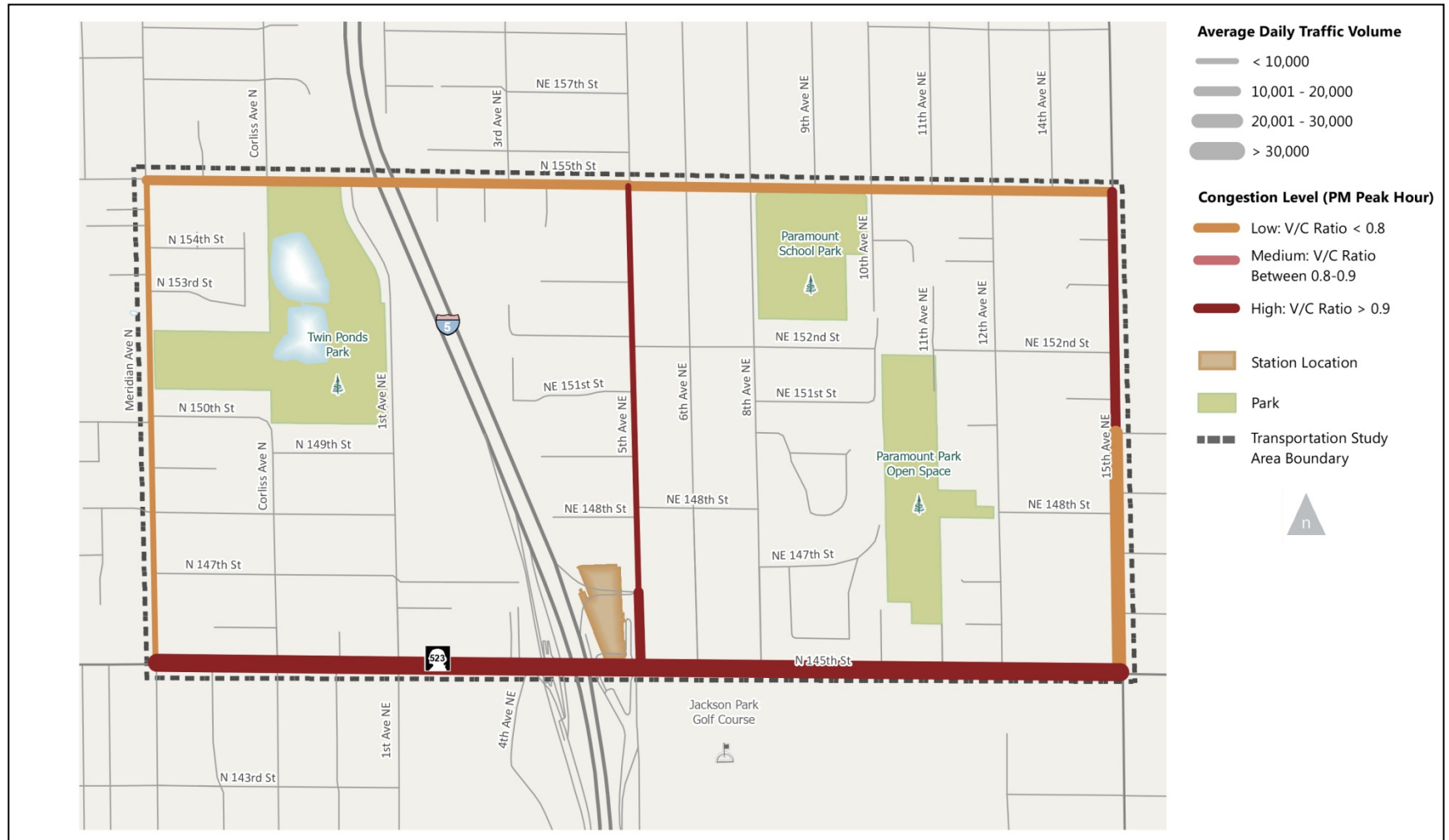
* N/NE 145th Street and the portion of 5th Avenue NE between NE 145th Street and the I-5 northbound on-ramp is exempt from the City of Shoreline's concurrency standard due to being within WSDOT jurisdiction.

** The City allows a V/C ratio of 1.10 for 15th Avenue NE, between NE 150th Street and NE 175th Street due to rechannelization for operational safety.

Note: Traffic volumes and congestion level results do not incorporate improvements identified in the 145th Street Multimodal Corridor Study

¹⁰ One-directional volume only, signifying the direction with the highest volume

Figure 3.3-11 Average Daily Traffic and PM Peak Congestion (Alternative 1—No Action Full Build-out)



Note – N/NE 145th Street and the portion of 5th Avenue NE between N 145th Street and the I-5 on-ramp are not currently subject to City V/C standards

Alternative 4—Compact Community Hybrid

Street Access and Circulation

Similar to Alternative 2 and Alternative 3, changes in land use zoning, parcel consolidation and redevelopment would allow for the creation of new streets and paths along with the consolidation of access points along 5th Avenue NE, N/NE 155th Street and N/NE 145th Street. The area would still be constrained by I-5, with east-west connections limited to N/NE 145th Street and N/NE 155th Street.

Traffic Volumes

Under Alternative 3—Compact Community, with full build-out of the proposed zoning, most intersections would fail to meet City and WSDOT standards for LOS, operating at LOS E or F as shown in **Figure 3.3-16** and **Table 3.3-12**. Intersections along N/NE 145th and N/NE 155th Street would experience a large increase in average vehicle delay due to additional vehicle trips generated by development proposed under Alternative 4—Compact Community Hybrid. Provision of internal circulation routes, which consolidate access, would potentially lessen intersection and roadway impacts. The improvements needed to mitigate these impacts are described later in this document.

Average Daily Traffic Volumes on Major Corridors

Similarly, the increase in

Collector Arterials and local secondary streets (such as 1st Avenue NE, 8th Avenue NE, and 10th Avenue NE) were not explicitly analyzed since they are not subject to the City’s concurrency standard for V/C ratios. As future travel patterns change, some of these streets may be candidates for potential traffic calming measures or for reclassification.

trips generated within the study area would result in substantial growth in ADT volumes along roadway corridors as shown in **Table 3.3-13** and **Figure 3.3-17**. N/NE 145th Street, N/NE 155th Street, Meridian Avenue N, 5th Avenue NE, and 15th Avenue NE would all experience a large increase, with growth between 50 and 170 percent as compared to the No Action Alternative. V/C ratios for all of the major corridors would exceed .90 during the PM peak period.

Vehicle-Miles-Traveled and Greenhouse Gas Emissions

Based on the land use forecasts, the total VMT generated from land uses within the subarea under Alternative 4—Compact Community Hybrid would amount to roughly 551,000 miles per day. In total, future land use and transportation would generate roughly 2.6 metric tons of CO₂ per 100 households per day under Alternative 3—Compact Community. In comparison, a similar amount of housing and retail with a density similar to Alternative 1—No Action would generate approximately 718,000 daily VMT and 3.6 metric tons of CO₂ per 100 households per day based on existing land use patterns and the anticipated amount of driving.

Transit Service and Mobility

The higher density provided under Alternative 4—Compact Community Hybrid would support more robust public transit service within the subarea. The TMP recommends that frequency of service could be improved to enable more frequent connections to the proposed light rail station, including service on existing routes and newly directed feeder service to the station. The Metro Connects Long Range Plan identifies two frequent service routes and one Bus Rapid Transit route that would connect to the station by 2025, with three frequent routes planned for 2040. The substantial growth in vehicle traffic would

impact overall transit speed and reliability along N/NE 145th Street, N/NE 155th Street, Meridian Avenue N, 5th Avenue NE, and 15th Avenue NE. King County Metro, Sound Transit, and the work from the 145th Street Multimodal Corridor Study identified recommendations to ensure that transit operates efficiently to connect the area to the light rail station.

Parking Conditions

Within the subarea, peak parking demand generated by new development is expected to be approximately 26,300 spaces more than the Alternative 1—No Action quantity of 5,400 (a total of 31,700), with a higher concentration near retail-uses. Based on current parking minimums, the total supply expected in the subarea would be 32,200. Estimated parking supply values are based on forecasted housing units and jobs and the current parking minimums in the Code associated with development.

The City would continue to monitor parking demand and supply with changes in development. If demand for parking exceeds supply, the City may look to mitigation measures such as residential parking zones and priced parking for retail uses. If excess parking is available, they City may allow for reductions in parking supply if opportunities exist to share excess parking and to capitalize on high capacity transit.

With the addition of light rail service and the 500-space parking garage in 2023, the Lynnwood Link FEIS stated that Sound Transit would work with local jurisdictions to evaluate and, if necessary, implement hide-and-ride mitigation (hide-and-ride parking occurs when transit user park in neighborhoods surrounding transit stations). Sound Transit would inventory on-street parking around the station before and after the start of light rail revenue service, and would then work with the local jurisdictions to

determine where mitigation measures would be needed. Potential parking control measures include parking meters, restricted parking signage, passenger and truck load zones, and residential parking zone programs.

Pedestrian and Bicycle Mobility

Pedestrian and bicycle mobility should improve as new sidewalk and bicycle facilities are installed with new development. Consolidation of parcels may allow for nonmotorized paths to close current gaps in the roadway network. Alternative 4—Compact Community Hybrid is more conducive to walk and bike trips compared to Alternative 2—Connecting Corridors due to a higher density of land use in a smaller area. However, a substantial increase in traffic volumes in the subarea may increase overall bicycle stress for a number of roadway segments including along N/NE 145th Street, N/NE 155th Street, Meridian Avenue NE, 5th Avenue NE, and 15th Avenue NE. This may require more separated facilities, such as off-street trails or cycle tracks to make cycling a more comfortable experience for most riders. Detailed in a later section, the 145th Street Multimodal Corridor Study recommendations provide an off-street bicycle network that serves to connect riders through the area via alternative streets and paths.

**Table 3.3-8 PM Peak Period Intersection Level of Service
for Alternative 4—Compact Community Hybrid (Full Build-Out)**

Signal Type	Intersection	Existing LOS	Existing Delay (sec. / veh.)	No Action LOS	No Action Delay (sec. / veh.)	Compact Community Hybrid LOS	Compact Community Hybrid Delay (sec. / veh.)
Signalized	145th St / Meridian Ave	B	16	D	55	F	940
Signalized	145th St / 1st Ave	B	18	E	57	F	>1000
Signalized	145th St / SB I-5	D	46	E	66	F	223
Signalized	145th St / 5 th Ave	D	42	F	81	F	570
Signalized	5th Ave / I-5 NB On-ramp	A	<10	A	<10	D	39
Signalized	145th St / 15th Ave	E	60	F	94	F	310
Signalized	150th St / 15th Ave	B	16	C	21	E	69
Signalized	155th St / 15th Ave	C	30	D	37	F	940
Signalized	155th St / 5th Ave	B	10	B	17	F	>1000
Unsignalized	155th St / 1st Ave	C	21	E	49	F	223
Signalized	155th / Meridian	B	14	C	27	F	570

Notes: Large delay values (over 240 seconds) rounded to the nearest ten; Level of Service results do not incorporate improvements identified in the 145th Street Multimodal Corridor Study

Figure 3.3-12. Intersection Level of Service for Alternative 4—Compact Community Hybrid (Full Build-out)



**Table 3.3-9 Average Daily Traffic Volumes and PM Peak Period Congestion
for Alternative 4—Compact Community Hybrid (Full Build-Out)**

Street	Segment	Existing ADT	No Action ADT	Compact Community Hybrid ADT	No Action PM Peak Hour Volume ¹²	Compact Community Hybrid PM Peak Hour Volume ¹¹	Compact Community Hybrid V/C Ratio
East-West Corridors							
N/NE 145th Street*	West of I-5	25,240	30,430	55,250	1,650	2,920	1.77
NE 145th Street*	East of I-5	31,790	37,650	65,670	1,630	2,760	1.67
N 155th Street	West of I-5	11,640	14,920	40,000	700	1,860	1.95
NE 155th Street	East of I-5	9,900	12,380	20,030	610	940	0.98
North-South Corridors							
5th Avenue NE*	I-5 NB on-ramp to 155th Street	7,170	9,230	15,700	670	1,280	1.83
15th Avenue NE	145th to 150th Street	16,130	20,060	36,760	1,290	2,150	1.07
15th Avenue NE**	150th to 155th Street	14,240	18,640	26,340	1,150	1,540	1.28
Meridian Avenue N	145th to 155th Street	6,220	9,310	23,070	650	1,320	1.58

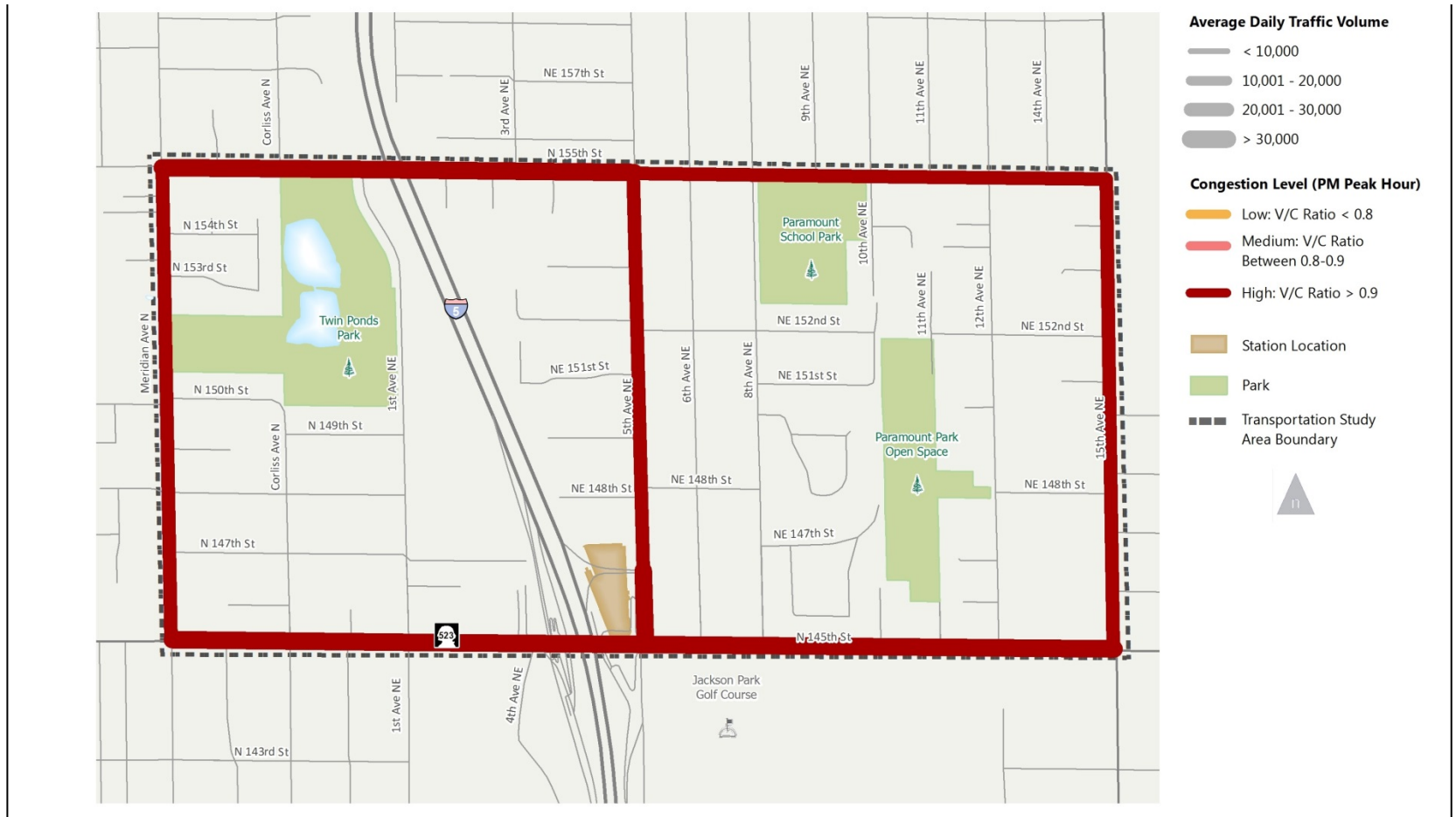
* N/NE 145th Street and the portion of 5th Avenue NE between NE 145th Street and the I-5 northbound on-ramp is exempt from the City of Shoreline's concurrency standard due to being within WSDOT jurisdiction.

** The City allows a V/C ratio of 1.10 for 15th Avenue NE, between NE 150th Street and NE 175th Street due to rechannelization for operational safety.

Note: Traffic volumes and congestion level results do not incorporate improvements identified in the 145th Street Multimodal Corridor Study.

¹¹ One-directional volume only, signifying the direction with the highest volume

Figure 3.3-13. Average Daily Traffic and PM Peak Congestion Alternative 4—Compact Community Hybrid (Full Build-out)



Note: Results for traffic volume and congestion do not incorporate the improvements identified in the 145th Street Multimodal Corridor Study

Alternative 3—Compact Community

Street Access and Circulation

Similar to Alternative 2—Connecting Corridors, changes in land use zoning, parcel consolidation and redevelopment would allow for the creation of new streets, alleys and paths along with the consolidation of access points along 5th Avenue NE, N/NE 155th Street, and N/NE 145th Street. The area would still be constrained by I-5, with east-west connections limited to N/NE 145th Street and N/NE 155th Street.

Traffic Volumes

Under Alternative 3—Compact Community, with full build-out of the proposed zoning, most intersections would fail to meet City and WSDOT standards for LOS, operating at LOS E or F as shown in **Figure 3.3-14** and **Table 3.3-10**. Intersections along N/NE 145th and N/NE 155th Street would experience a large increase in average vehicle delay due to additional vehicle trips generated by development proposed under Alternative 3—Compact Community. Provision of internal circulation routes, which consolidate access, would potentially lessen intersection and roadway impacts. The improvements needed to mitigate these impacts are described later in this document.

Average Daily Traffic Volumes on Major Corridors

Similarly, the increase in

Collector Arterials and local secondary streets (such as 1st Avenue NE, 8th Avenue NE, and 10th Avenue NE) were not explicitly analyzed since they are not subject to the City’s concurrency standard for V/C ratios. As future travel patterns change, some of these streets may be candidates for potential traffic calming measures or for reclassification.

trips generated within the study area would result in substantial growth in ADT volumes along roadway corridors as shown in **Table 3.3-11** and **Figure 3.3-15**. N/NE 145th Street, N/NE 155th Street, Meridian Avenue N, 5th Avenue NE, and 15th Avenue NE would all experience a large increase, with growth between 40 and 140 percent as compared to the No Action Alternative. V/C ratios for all of the major corridors would exceed .90 during the PM peak period.

Vehicle-Miles-Traveled and Greenhouse Gas Emissions

Based on the land use forecasts, the total VMT generated from land uses within the subarea under Alternative 3—Compact Community would amount to roughly 542,000 miles per day. Per capita, future land use and transportation would generate roughly 2.0 metric tons of CO₂ per 100 households per day under Alternative 3—Compact Community. In comparison, a similar amount of housing and retail with a density similar to Alternative 1—No Action would generate approximately 725,000 daily VMT and 3.0 metric tons of CO₂ per 100 households per day based on existing land use patterns and the anticipated amount of driving.

Transit Service and Mobility

The higher density provided under Alternative 3—Compact Community would support more robust public transit service within the subarea. The TMP recommends that frequency of service could be improved to enable more frequent connections to the proposed light rail station, including service on existing routes and newly directed feeder service to the station. The Metro Connects Long Range Plan identifies two frequent service routes and one Bus Rapid Transit route that would connect to the station by 2025 and three frequent routes by 2040. The substantial growth in vehicle traffic would impact overall transit

speed and reliability along N/NE 145th Street, N/NE 155th Street, Meridian Avenue N, 5th Avenue NE, and 15th Avenue NE. King County Metro, Sound Transit, and the work from the 145th Street Multimodal Corridor Study identified recommendations to ensure that transit operates efficiently to connect the area to the light rail station.

Parking Conditions

Within the subarea, peak parking demand generated by new development is expected to be approximately 28,100 spaces more than the Alternative 1—No Action quantity of 5,400 (a total of 33,500), with a higher concentration near retail-uses. Based on current parking minimums, the total supply expected in the subarea would be 34,000. The City would continue to monitor parking demand and supply with changes in development. If demand for parking exceeds supply, the City may look to mitigation measures such as residential parking zones and priced parking for retail uses. If excess parking is available, they City may allow for reductions in parking supply if opportunities exist to share excess parking and to capitalize on high capacity transit.

With the addition of light rail service and the 500-space parking garage in 2023, the Lynnwood Link FEIS stated that Sound Transit would work with local jurisdictions to evaluate and, if necessary, implement hide-and-ride mitigation (hide-and-ride parking occurs when transit user park in neighborhoods surrounding transit stations). Sound Transit would inventory on-street parking around the station before and after the start of light rail revenue service, and would then work with the local jurisdictions to determine where mitigation measures would be needed. Potential parking control measures include parking meters, restricted parking signage, passenger and truck load zones, and residential parking zone programs.

Pedestrian and Bicycle Mobility

Pedestrian and bicycle mobility should improve as new sidewalk and bicycle facilities are installed with new development. Consolidation of parcels may allow for nonmotorized paths to close current gaps in the roadway network. Alternative 3—Compact Community is more conducive to walk and bike trips compared to Alternative 2—Connecting Corridors due to a higher density of land use in a smaller area. However, a substantial increase in traffic volumes in the subarea may increase overall bicycle stress for a number of roadway segments including along N/NE 145th Street, N/NE 155th Street, Meridian Avenue NE, 5th Avenue NE, and 15th Avenue NE. This may require more separated facilities, such as off-street trails or cycle tracks to make cycling a more comfortable experience for most riders. Detailed in a later section, the 145th Street Multimodal Corridor Study recommendations provide an off-street bicycle network that serves to connect riders through the area via alternative streets and paths.

**Table 3.3-10 PM Peak Period Intersection Level of Service
for Alternative 3—Compact Community (Full Build-Out)**

Signal Type	Intersection	Existing LOS	Existing Delay (sec. / veh.)	No Action LOS	No Action Delay (sec. / veh.)	Compact Community LOS	Compact Community Delay (sec. / veh.)
Signalized	145th St / Meridian Ave	B	16	D	55	F	660
Signalized	145th St / 1st Ave	B	18	E	57	F	820
Signalized	145th St / SB I-5	D	46	E	66	F	250
Signalized	145th St / 5 th Ave	D	42	F	81	F	390
Signalized	5th Ave / I-5 NB On-ramp	A	<10	A	<10	D	38
Signalized	145th St / 15th Ave	E	60	F	94	F	330
Signalized	150th St / 15th Ave	B	16	C	21	E	70
Signalized	155th St / 15th Ave	C	30	D	37	F	226
Signalized	155th St / 5th Ave	B	10	B	17	F	420
Unsignalized	155th St / 1st Ave	C	21	E	49	F	>1000
Signalized	155th / Meridian	B	14	C	27	F	390

Notes: Large delay values (over 240 seconds) rounded to the nearest ten; Level of Service results do not incorporate improvements identified in the 145th Street Multimodal Corridor Study

Figure 3.3-14. Intersection Level of Service for Alternative 3—Compact Community (Full Build-out)



**Table 3.3-11 Average Daily Traffic Volumes and PM Peak Period Congestion
for Alternative 3—Compact Community (Full Build-Out)**

Street	Segment	Existing ADT	No Action ADT	Compact Community ADT	No Action PM Peak Hour Volume ¹²	Compact Community PM Peak Hour Volume ¹²	Compact Community V/C Ratio
East-West Corridors							
N/NE 145th Street*	West of I-5	25,240	30,430	54,940	1,650	2,900	1.76
NE 145th Street*	East of I-5	31,790	37,650	64,060	1,630	2,720	1.65
N 155th Street	West of I-5	11,640	14,920	34,550	700	1,650	1.74
NE 155th Street	East of I-5	9,900	12,380	22,770	610	1,140	1.20
North-South Corridors							
5th Avenue NE*	I-5 NB on-ramp to 155th Street	7,170	9,230	21,980	670	1,210	1.73
15th Avenue NE	145th to 150th Street	16,130	20,060	33,670	1,290	1,970	0.98
15th Avenue NE**	150th to 155th Street	14,240	18,640	26,220	1,150	1,530	1.27
Meridian Avenue N	145th to 155th Street	6,220	9,310	22,020	650	1,250	1.49

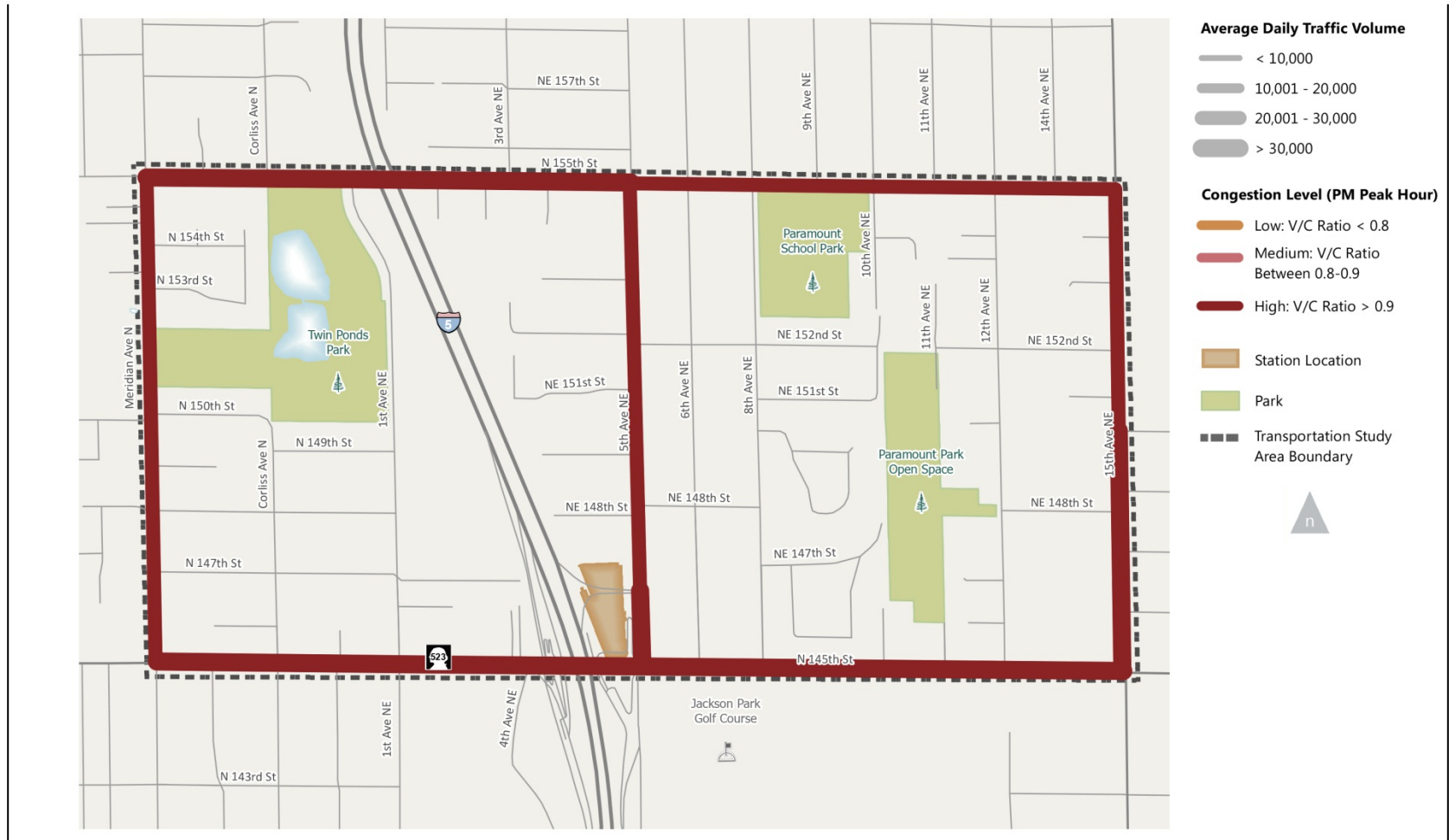
* N/NE 145th Street and the portion of 5th Avenue NE between NE 145th Street and the I-5 northbound on-ramp is exempt from the City of Shoreline's concurrency standard due being within WSDOT jurisdiction.

** The City allows a V/C ratio of 1.10 for 15th Avenue NE, between NE 150th Street and NE 175th Street due to rechannelization for operational safety.

Note: Traffic volumes and congestion level results do not incorporate improvements identified in the 145th Street Multimodal Corridor Study.

¹² One-directional volume only, signifying the direction with the highest volume

**Figure 3.3-15. Average Daily Traffic and PM Peak Congestion
Alternative 3—Compact Community (Full Build-out)**



Note: Results for traffic volume and congestion do not incorporate the improvements identified in the 145th Street Multimodal Corridor Study

Alternative 2 – Connecting Corridors

Street Access and Circulation

Changes in land use zoning, parcel consolidation, and redevelopment would allow for the creation of new streets, alleys and paths along with the consolidation of access points along 5th Avenue NE, N/NE 155th Street, and N/NE 145th Street.

Transportation options would still be constrained by I-5, with east-west connections limited to N/NE 145th Street and N/NE 155th Street.

Traffic Volumes

Under Alternative 2—Connecting Corridors, with full build-out of the proposed zoning, most intersections would fail to meet City and WSDOT standards for LOS, operating at LOS E or F as shown in **Figure 3.3-12** and **Table 3.3-8**. Intersections along N/NE 145th and N/NE 155th Street would experience a large increase in average vehicle delay due to additional vehicle trips generated by development proposed under Alternative 2—Connecting

Corridors. Provision of internal circulation routes including consolidated access points, would potentially lessen intersection and roadway impacts. The improvements needed to mitigate these impacts are described later in this document.

Collector Arterials and local secondary streets (such as 1st Avenue NE, 10th Avenue NE, and 8th Avenue NE) were not explicitly analyzed since they are not subject to the City's concurrency standard for V/C ratios. As future travel patterns change, some of these streets may be candidates for potential traffic calming measures or for reclassification.

Average Daily Traffic Volumes on Major Corridors

Similarly, the increase in trips generated within the study area would result in substantial growth in ADT volumes along roadway corridors as shown in **Table 3.3-9** and **Figure 3.3-13**. N/NE 145th Street, N/NE 155th Street, Meridian Avenue N, 5th Avenue NE, and 15th Avenue NE would all experience a large increase, with growth between 40 and 150 percent as compared to the No Action Alternative. V/C ratios for all of the major corridors would exceed .90 during the PM peak period.

Vehicle-Miles-Traveled and Greenhouse Gas Emissions

Based on the forecasts, the total VMT generated from land uses within the subarea under Alternative 2—Connecting Corridors would amount to roughly 626,000 miles per day. Per capita, future land use would generate roughly 2.4 metric tons of CO₂ per 100 households per day. By comparison, an equivalent amount of housing and retail with a density similar to Alternative 1—No Action would generate approximately 740,000 daily VMT and 3.0 metric tons of CO₂ per 100 households per day.

Transit Service and Mobility

The higher density provided under Alternative 2—Connecting Corridors would support more robust public transit service within the subarea. The TMP recommends that frequency of service could be improved to enable more frequent connections to the proposed light rail station, including service on existing routes and newly directed feeder service to the station. The Metro Connects Long Range Plan identifies two frequent service routes and one Bus Rapid Transit route that would connect to the station by 2025 and three frequent routes by 2040. The substantial growth in vehicle traffic would impact overall transit speed and reliability along N/NE 145th Street, N/NE 155th Street, Meridian Avenue N, 5th Avenue NE, and 15th Avenue NE. King

County Metro, Sound Transit, and the work from the 145th Street Multimodal Corridor Study identified recommendations to ensure that transit operates efficiently to connect the area to the light rail station.

Parking Conditions

For Alternative 2—Connecting Corridors, peak parking demand generated by new development is expected to be approximately 29,200 spaces more than the Alternative 1—No Action quantity of 5,400 (a total of 34,600) in the subarea with a higher concentration near retail-uses. Based on current parking minimums required for development, the total supply expected in the subarea would be 38,000.

The City would continue to monitor parking demand and supply with changes in development. If demand for parking exceeds supply, the City may look to mitigation measures such as residential parking zones and priced parking for retail uses. If excess parking is available, the City may allow for reductions in parking supply if opportunities exist to share excess parking and to capitalize on high capacity transit.

With the addition of light rail service and the 500-space parking garage in 2023, the Lynnwood Link FEIS stated that Sound Transit would work with local jurisdictions to evaluate and, if necessary, implement hide-and-ride mitigation (hide-and-ride parking occurs when transit user park in neighborhoods surrounding transit stations). Sound Transit would inventory on-street parking around the station before and after the start of light rail revenue service, and would then work with the local jurisdictions to determine where mitigation measures would be needed. Potential parking control measures include parking meters,

restricted parking signage, passenger and truck load zones, and residential parking zone programs.

Pedestrian and Bicycle Mobility

Pedestrian and bicycle mobility should improve as new sidewalk and bicycle facilities are installed with new development. City Code stipulates that any multifamily residential uses must have a minimum of one short-term bicycle parking space per 10 dwelling units and one long-term bicycle parking space per studio or 1-bedroom unit and two per unit having two or more bedrooms. Commercial development must have one short-term bicycle stall per 12 vehicle parking spaces and one long-term space per 25,000 square feet of commercial floor area. Additionally, conditions for development could be structured to allow for the creation of non-motorized paths within larger parcels to connect with other on- and off-street pedestrian and bicycle facilities. The increase in density surrounding the light rail station would lend itself to more bike and walk trips within the area due to compatible land uses such as residential and retail. Additionally, the substantial increase in vehicle traffic along N/NE 145th Street, N/NE 155th Street, Meridian Avenue N, 5th Avenue NE, and 15th Avenue NE over time will impact bicycle stress along these streets. This may require more separated facilities, such as off-street trails or cycle tracks to make cycling a more comfortable experience for most riders. Detailed in a later section, the 145th Street Multimodal Corridor Study recommendations provide an off-street bicycle network that serves to connect riders through the area.

**Table 3.3-12 PM Peak Period Intersection Level of Service
for Alternative 2—Connecting Corridors (Full Build-Out)**

Signal Type	Intersection	Existing LOS	Existing Delay (sec. / veh.)	No Action LOS	No Action Delay (sec. / veh.)	Connecting Corridors LOS	Connecting Corridors Delay (sec. / veh.)
Signalized	145th St / Meridian Ave	B	16	D	55	F	730
Signalized	145th St / 1st Ave	B	18	E	57	F	920
Signalized	145th St / SB I-5	D	46	E	66	F	240
Signalized	145th St / 5 th Ave	D	42	F	81	F	390
Signalized	5th Ave / I-5 NB On-ramp	A	<10	A	<10	D	52
Signalized	145th St / 15th Ave	E	60	F	94	F	290
Signalized	150th St / 15th Ave	B	16	C	21	E	59
Signalized	155th St / 15th Ave	C	30	D	37	F	460
Signalized	155th St / 5th Ave	B	10	B	17	F	670
Unsignalized	155th St / 1st Ave	C	21	E	49	F	>1000
Signalized	155th / Meridian	B	14	C	27	F	410

Note: Large delay values (over 240 seconds) rounded to the nearest ten

Level of Service results do not incorporate improvements identified in the 145th Street Multimodal Corridor Study

Figure 3.3-16 Intersection Level of Service (Alternative 2—Connecting Corridors Full Build-Out)



**Table 3.3-13 Average Daily Traffic Volumes and PM Peak Period Congestion
for Alternative 2—Connecting Corridors (Full Build-Out)**

Street	Segment	Existing ADT	No Action ADT	Connecting Corridors ADT	No Action PM Peak Hour Volume ¹¹	Connecting Corridors PM Peak Hour Volume ¹³	Connecting Corridors V/C Ratio
East-West Corridors							
N/NE 145th Street*	West of I-5	25,240	30,430	55,340	1,650	2,900	1.75
NE 145th Street*	East of I-5	31,790	37,650	60,810	1,630	2,600	1.57
N 155th Street	West of I-5	11,640	14,920	36,470	700	1,780	1.87
NE 155th Street	East of I-5	9,900	12,380	25,100	610	1,210	1.27
North-South Corridors							
5th Avenue NE*	I-5 NB on-ramp to 155th Street	7,170	9,230	22,620	670	1,270	1.81
15th Avenue NE	145th to 150th Street	16,130	20,060	31,950	1,290	1,890	0.94
15th Avenue NE**	150th to 155th Street	14,240	18,640	25,770	1,150	1,510	1.26
Meridian Avenue N	145th to 155th Street	6,220	9,310	23,450	650	1,380	1.64

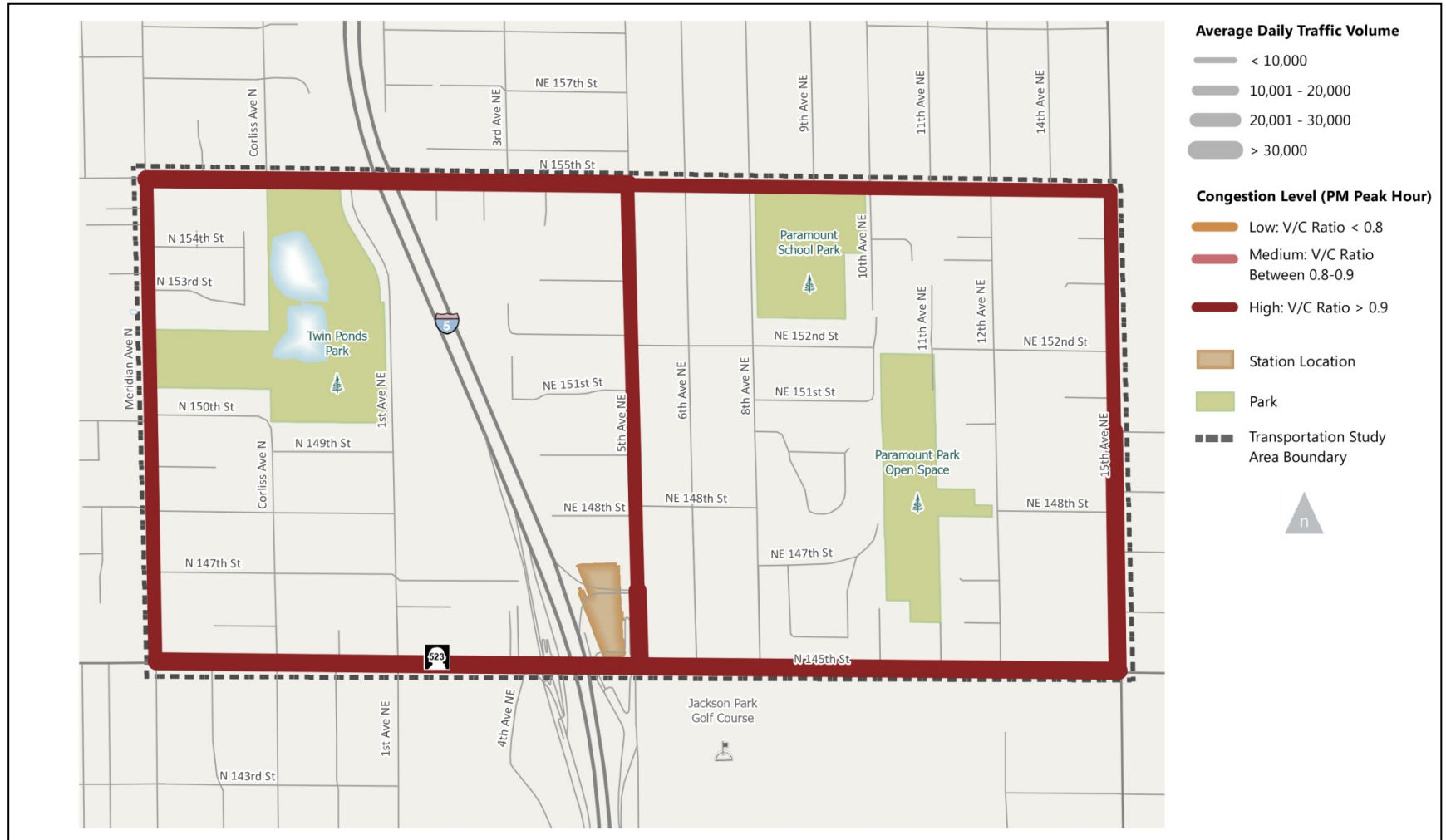
* N/NE 145th Street and the portion of 5th Avenue NE between NE 145th Street and the I-5 northbound on-ramp is exempt from the City of Shoreline's concurrency standard due being within WSDOT jurisdiction.

** The City allows a V/C ratio of 1.10 for 15th Avenue NE, between NE 150th Street and NE 175th Street due to rechannelization for operational safety.

Note: Traffic volumes and congestion level results do not incorporate improvements identified in the 145th Street Multimodal Corridor Study.

¹³ One-directional volume only, signifying the direction with the highest volume

Figure 3.3-17 Average Daily Traffic and PM Peak Congestion for Alternative 2—Connecting Corridors (Full Build-Out)



Note: Results for traffic volume and congestion do not incorporate the improvements identified in the 145th Street Multimodal Corridor Study

3.3.3 Mitigation Measures

Introduction

This section describes the mitigation measures that would be needed to address impacts under each of the action alternatives. It is important to note that the land use changes proposed and the traffic impacts identified in the previous section are based upon development scenarios that are anticipated to be very long term, particularly for Alternatives 2, 3, and 4 (at least 55 years). Despite this long-term road to implementation, the mitigation measures proposed below identify the full scale of actions needed. In reality, these measures would gradually be incorporated as development occurs and would be continually monitored to address the most current conditions. All proposed development would go through the standard review process and would only be approved with necessary and appropriate infrastructure investments provided by the development.

Applicable Regulations and Commitments

The Shoreline Municipal Code (SMC) contains a number of regulations and stipulations that would apply to all alternatives. Under Chapter 14.10, the City of Shoreline currently manages a Commute Trip Reduction program that assists employers of a certain size to reduce their overall VMT and automobile trips. This program should continue with new employers in the area to leverage the availability of high capacity transit and reduce the net increase in automobile trips. Additionally, Chapter 20.50 in the Shoreline Municipal Code contains a number of stipulations for new development that aim to improve pedestrian and bicycle facilities while ensuring efficient provision and use of parking.

WSDOT Limited Access Control Standards

WSDOT has full control of access to roadways within 300 feet of a ramp terminal. In the case of the 145th Street Station Subarea Plan, this is relevant for 5th Avenue NE and the I-5 Northbound on-ramp. WSDOT policy states that any change to existing land use within this 300-foot boundary would need to be re-evaluated to determine if access can remain if their land use changed. Deviations from that policy would require the Federal Highway Administration, WSDOT, Sound Transit, and the City of Shoreline to determine a course of action.

Limited Access Control Standards

WSDOT has full control of access to roadways within 300 feet of a freeway ramp terminal. In the case of the 145th Street Station, this is pertinent for 5th Avenue NE and the I-5 Northbound on-ramp. WSDOT policy states that any change to existing land use within this 300-foot boundary would need to be re-evaluated to determine if access can remain if the land use is changed.

Deviations from the policy would require the Federal Highway Administration, WSDOT, Sound Transit, and the City of Shoreline to determine an appropriate course of action. This may be a constraint to the development and access allowed directly adjacent to the station location. Access for parcels within this constrained area may need to reconfigure site access to 6th Avenue NE.

145th Street Multimodal Corridor Study

Background

N/NE 145th Street is a major conveyor today and is not working well for vehicles, bicyclists, pedestrians, and transit, yet it will be the key connection to the light rail station. Currently this corridor is not within the City of Shoreline, but is managed and owned by a number of agencies, including WSDOT, King County, and the City of Seattle. In partnership with the City of Seattle, WSDOT, Sound Transit, King County Metro, and other local agencies, the City of Shoreline led a study of the 145th Street corridor to understand the current and future challenges within the corridor and to identify improvements to address all modes of transportation. As part of the process, the City solicited input from partner agencies, adjacent jurisdictions, residents, property owners, business owners, community groups, and human service organizations. The corridor study is a key element that provides guidance on the primary transportation improvements needed for N/NE 145th Street. The 145th Street Subarea Plan was put on hold during 2015 to allow for the corridor study to proceed and to identify necessary improvements.

Study Process and Segment Improvements

The study separated the corridor into segments, three of which are relevant to the subarea plan: Aurora Avenue to I-5, the I-5 Interchange and from I-5 to 15th Avenue NE.

The land use estimates for the 20-year phasing of the action alternatives were used in the analysis to identify the needed transportation investment to accommodate the change in land use and transportation operations. The following section details the transportation improvements identified within each segment

in the study. All graphics are from the 145th Street Multimodal Corridor Study draft concept.

Segment: Aurora Avenue to I-5

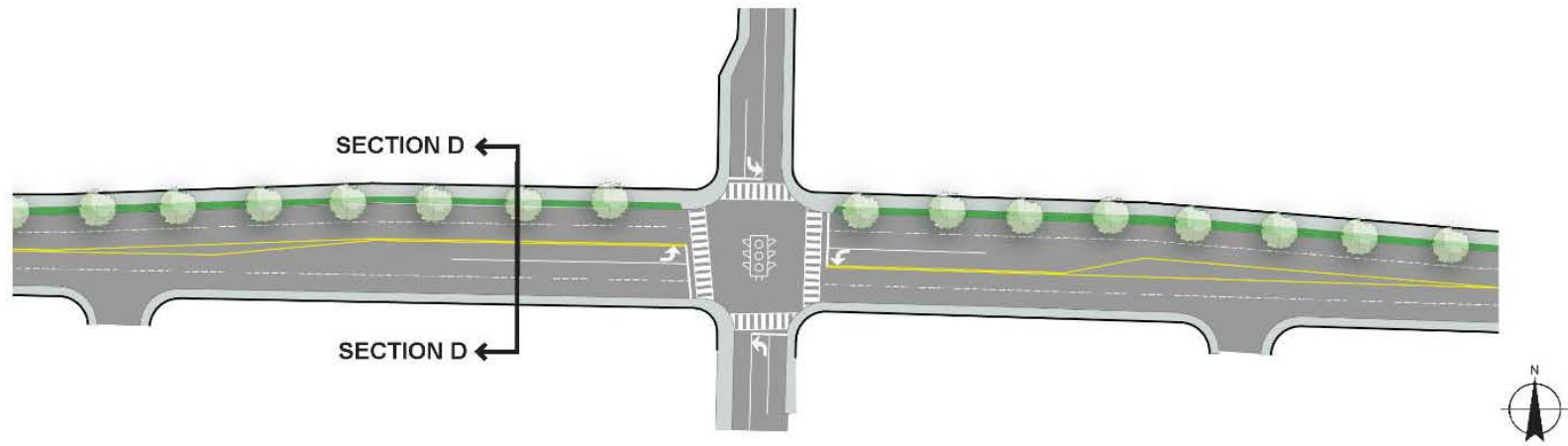
This segment would include improved signalized intersections, with new left turn lanes from 145th Street, lengthened storage for turn lanes, right turn lanes, and signal timing changes. Sidewalks would be upgraded to meet City Standards and new wheelchair accessible bus stops would be constructed. Additionally, transit signal priority would be provided to improve bus travel time through this portion of the corridor.

Segment: I-5 Interchange

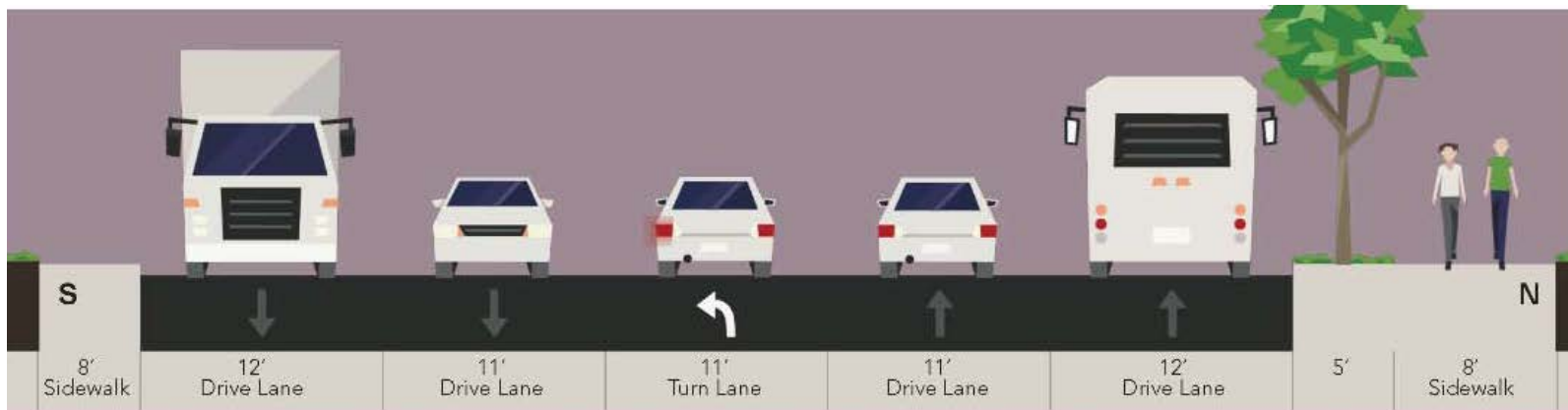
The study recommends a series of reconfigurations to the interchange at I-5 in order to accommodate all modes of travel and improve access with the future light rail station. This includes a rebuilt bridge over I-5 that incorporates a 14' shared-use path on the north side and an improved sidewalk on the south side with six total vehicle lanes for through and turning movements. It incorporates a reconfigured northbound on-ramp to I-5 from 5th Avenue NE and a grade separated non-motorized crossing over the southbound I-5 off-ramp



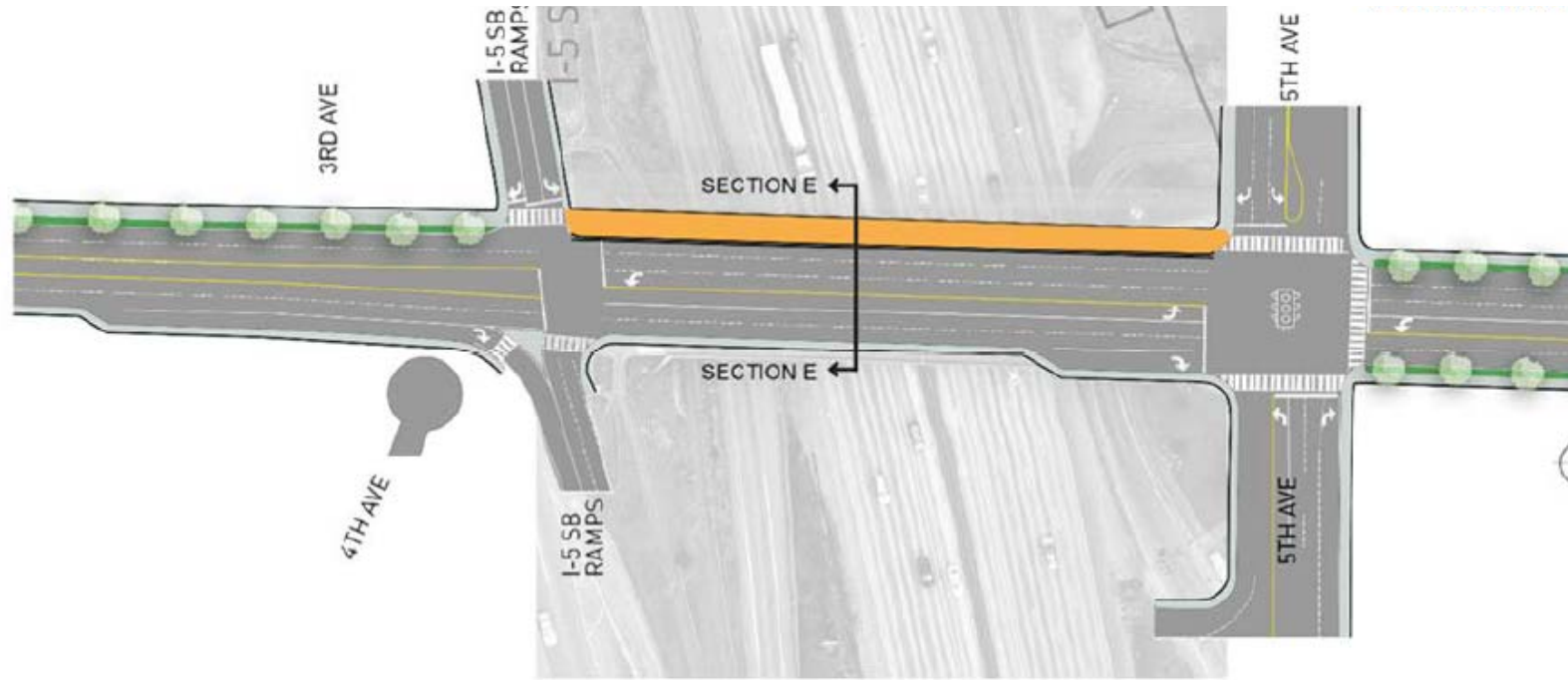
Sample roadway configuration from the 145th Street Multimodal Corridor Study



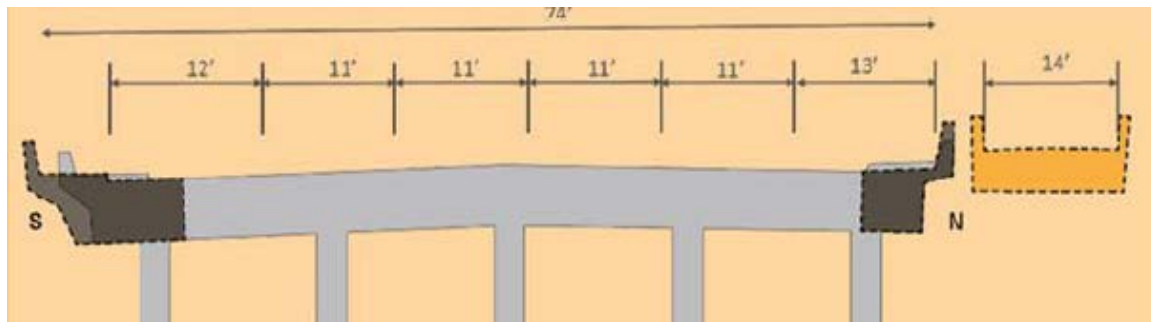
Typical intersection between Aurora Avenue and I-5 from the 145th Street Multimodal Corridor Study



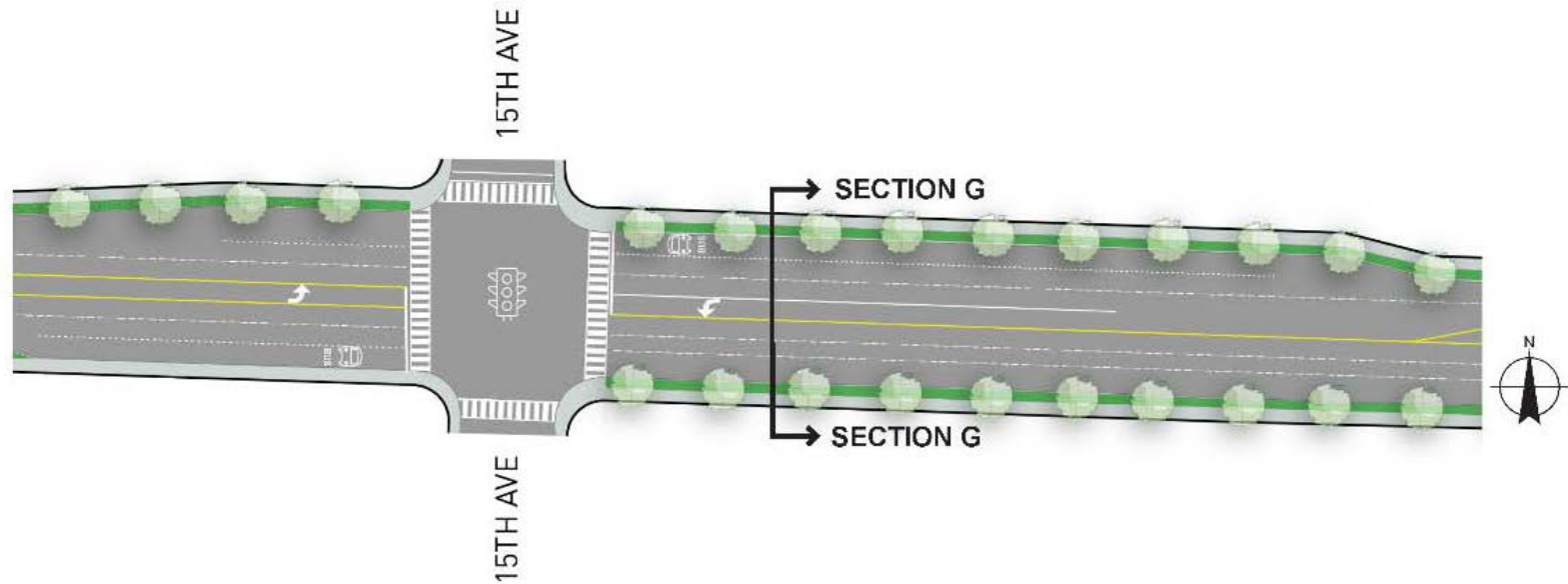
Roadway configuration at I-5 from the 145th Street Multimodal Corridor Study



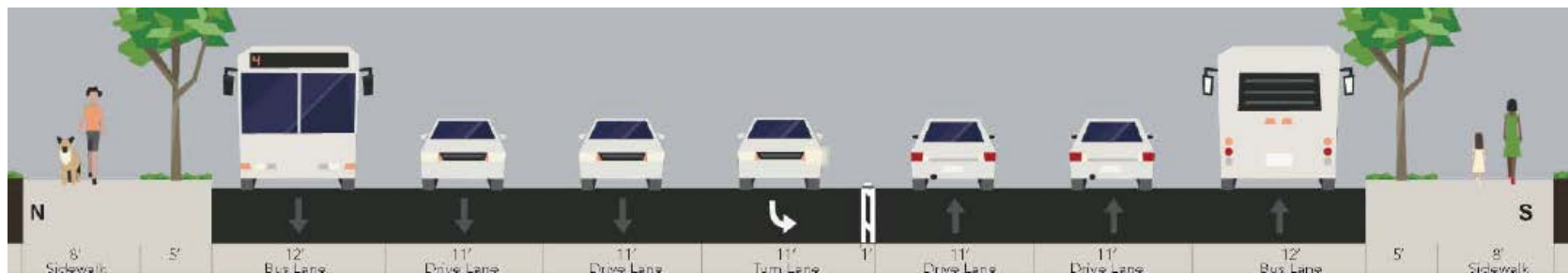
Cross-section of the 145th Street bridge over I-5 from the 145th Street Multimodal Corridor Study



Sample roadway configuration from the 145th Street Multimodal Corridor Study



Cross-section of the intersection at 15th Avenue NE from the 145th Street Multimodal Corridor Study



Segment: I-5 to 15th Avenue NE

This segment would include improved signalized intersections, with new left turn lanes from 145th Street, lengthened storage for turn lanes, right turn lanes, and signal timing changes. Sidewalks would be upgraded to meet City Standards and new wheelchair accessible bus stops would be constructed. Business Access and Transit (BAT) lanes and transit signal priority would be provided in both directions in this segment to improve bus travel time and reliability. Left-turns would be restricted mid-block to improve traffic safety.

Off-Corridor Bicycle Network

Complementing the specific segment improvements on 145th Street is an off-corridor bicycle network. With a constrained right-of-way along 145th Street, this off-corridor bicycle network would ensure safe east-west and north-south connections along the corridor by leveraging existing and future paths, bike lanes and additional non-motorized connections. As shown on **Figure 3.3-18**, key elements within the subarea are the connections across I-5, the facilities along 5th Avenue NE, Meridian Avenue N, and N/NE 155th Street, in addition to the connections through Jackson Park Golf Course and on N 147th Street.

Other Mitigation Measures for Street and Intersection Impacts

With full build-out, the level of development planned in Alternative 2, Alternative 3, and Alternative 4 would be extensive and would require substantial multimodal transportation investments to mitigate the impacts.

As noted in previous sections, it is estimated that Alternative 2, Alternative 3, and Alternative 4 would take 55 years or more to

build-out to the proposed zoning capacity. A later section of the FEIS provides a near-term growth scenario to compare conditions forecasted for a 20-year time horizon for each alternative.

Multimodal transportation improvements required to support the growth of either of these alternatives could be funded incrementally through a variety of sources, including mitigation associated with new development, federal and state grants, and cycles of capital improvement plans. The length of time to full build-out would enable the City to monitor growth and proactively plan for needed improvements over time. Any new development would still undergo a review process that would identify the transportation investments needed to approve the development.

The City also intends to pursue a variety of transportation demand management strategies to mitigate and minimize traffic congestion and reduce vehicle miles traveled, consistent with the Climate Action Plan and other City plans and policies. Measures can be taken to reduce the impact of additional vehicle traffic generated from an increase in density. For example, new development sites along the 5th Avenue NE and 155th Street corridors likely would be required to have access from the side streets and/or rear alleyways. This would reduce the amount of traffic that directly impacts these corridors.

Access management strategies (reduced curb cuts/driveways), as well as a new system of well-connected blocks, road connections, non-motorized facilities, and alleyways would serve corridor development, taking pressure off N/NE 155th Street and 5th Avenue NE. This would improve overall travel flow for all modes and enhance pedestrian and bicyclist safety.

Figure 3.3-18. Off-Corridor Bike Network from the 145th Street Multimodal Corridor Study



Many of the projects identified as mitigation for the alternatives would require roadway widening near the intersection locations, and additional easements or right-of-way would need to be obtained. Again, the full build-out of the action alternatives is not expected for 55 years or more.

As a means to reduce the amount of infrastructure necessary to accommodate future growth, the City may look to revise its concurrency standards to include measures that consider pedestrian, bicycle, and transit measures of effectiveness.

In addition to the roadway improvements called out in the TMP¹⁴ and the Sound Transit Lynnwood Link Extension FEIS, the following potential measures are highlighted to mitigate street and intersection impacts under the full build-out of each alternative assuming the City of Shoreline maintains the current intersection and roadway LOS standards.

Alternative 1—No Action

- Implement segment and off-corridor bicycle network recommendations from the 145th Street Multimodal Corridor Study noted in the previous section
- Provide a right-turn pocket for the northbound approach at 155th Street and 1st Avenue NE
- Extend the two-way left turn lane profile along 5th Avenue NE from the I-5 NB on-ramp to NE 155th Street

Alternative 2, Alternative 3, or Alternative 4

- Implement segment and off-corridor bicycle network recommendations from the 145th Street Multimodal Corridor Study noted in the previous section
- Transportation demand management strategies and actions to minimize traffic congestion on N/NE 155th Street, Meridian Avenue N, 5th Avenue NE, and other key corridors in the subarea
- Additional through-lanes in the eastbound and westbound direction along N/NE 155th Street to create a 5-lane profile from Aurora Avenue N to 15th Avenue NE
- Intersection improvements at N 155th Street and Meridian Avenue N including channelized right-turn lane for eastbound and westbound approaches and dual left-turn lanes for northbound and southbound approaches
- Right-turn lane for northbound approach to N 155th Street and 1st Avenue N or treatment of the intersection, such as signalization or a roundabout
- Additional through-lanes in the northbound and southbound direction along 5th Avenue NE to create a 5-lane profile between 145th Street and 155th Street
- Dual left-turn lanes for eastbound approach at NE 155th Street and 5th Avenue NE
- Intersection improvements at NE 155th Street and 15th Avenue NE including a channelized right-turn lane for

¹⁴ For example, where the TMP recommends a center-turn lane along Meridian Avenue, that profile is assumed in addition to the recommended improvements stated in this section.

southbound approach and dual left-turn lanes for the eastbound approach¹⁵

- Channelized right-turn lane for northbound approach at NE 150th Street and 15th Avenue NE

In addition to the improvements listed above, the City should engage as needed in traffic calming measures along non-arterial streets. The City of Shoreline has a Neighborhood Traffic Safety Program to help address the safety concerns on non-arterial streets stemming from higher speed and/or cut-through traffic. This program includes enhanced enforcement and education along with engineering solutions such as traffic circles, speed humps and narrowed lanes. Neighborhood impacts should be evaluated as development occurs; keeping in mind the impacts of transitioning to denser land uses within existing single family neighborhoods. Solutions to address traffic issues are discussed and implemented as part of a public process to ensure they appropriately address a given circumstance.

Transit Service Mitigation Measures

In the Lynnwood Link Extension FEIS, Sound Transit assumed at least 24 buses will serve the future light rail station during the PM peak hour. Depending on final design of the station, ample bus facilities will be needed. The design of these facilities, which is the responsibility of Sound Transit, will need to consider impacts to both traffic and transit.

King County Metro Transit's Metro Connects Long Range Plan identifies two frequent¹⁶ transit routes and one Bus Rapid Transit

¹⁵ Note that the southbound approach right-turn channelization is not needed for Alternative 3 – Compact Community

connection to the light rail station by 2025 and three frequent routes by 2040, providing frequent transfer opportunities to and from the station. The City of Shoreline should coordinate with area transit agencies in the development of a transit service integration plan for the light rail station subarea. This coordination should coincide with traffic analysis to ensure transit service speed and reliability along the major corridors in the area. Transit reliability can be improved via a number of transit priority treatments including signal priority, bus bulbs, and bus queue jump lanes. Additionally, on-demand transport such as the King County Metro Access and the Hyde Shuttles¹⁷ should have direct service to the light rail station bus access point in order to improve service for those with mobility limitations.

Additional modes that could operate in coordination with transit include bike sharing or car sharing programs such as Zipcar, Car2Go, or Puget Sound Bike Share ("Pronto"), or ridesourcing services such as Lyft or Uber. An analysis of potential demand for these services will be needed to determine their relative feasibility.

Parking Mitigation Measures

While any new development is required by City Code to provide ample off-street parking for the demand generated by its respective use, there are additional measures the City may take in order to manage the changes in parking demand and supply. In coordination with Sound Transit, any on-street parking spillover generated from the light rail station or new commercial development may be mitigated via a Residential Parking Zone

¹⁶ The Metro Connects Long Range Plan designates frequent service with 5 to 15 minute headways all-day.

¹⁷ Access and Hyde Shuttles provide transport for seniors and people with disabilities

(RPZ) designation. An RPZ provides on-street parking permits to residents located within the zone to help discourage long-term parking by non-residents on non-arterial streets. An evaluation of parking demand in the area as it redevelops following implementation of light rail service should be conducted regularly to assess the need of an RPZ designation. The Lynnwood Link FEIS calls for this monitoring to occur. Additional measures that may be taken to address parking impacts include:

- Install signage and driver information to direct commercial and light rail users towards available off-street parking garage locations near commercial development that is adjacent to frequent transit or to other park-and-ride locations
- Implement variable parking time limits and paid parking with variable prices to moderate parking demand and ensure sufficient supply during peak parking periods

As new development occurs, if the amount of parking supplied is greater than the demand for parking, there may be opportunities to reduce the overall amount of parking supply created. While the three action alternatives have more development and higher trip generation than the No Action, they also provide greater opportunity for shared-use parking. Alternative 1—No Action by contrast lends itself to more auto-oriented development that is not as conducive to measures like shared parking.

City Code stipulates that development may reduce its parking supply according to the following criteria:

20.50.400 Reductions to minimum parking requirements.

- A. Reductions of up to 25 percent may be approved by the Director using a combination of the following criteria:

1. On-street parking along the parcel's street frontage.
2. Shared parking agreement with nearby parcels within reasonable proximity where land uses do not have conflicting parking demands. The number of on-site parking stalls requested to be reduced must match the number provided in the agreement. A record on title with King County is required.
3. Parking management plan according to criteria established by the Director.
4. A City approved residential parking zone (RPZ) for the surrounding neighborhood within one-quarter mile radius of the subject development. The RPZ must be paid by the developer on an annual basis.
5. A high-capacity transit service stop within one-quarter mile of the development property line with complete City approved curbs, sidewalks, and street crossings.
6. A pedestrian public access easement that is eight feet wide, safely lit and connects through a parcel between minimally two different rights-of-way. This easement may include other pedestrian facilities such as walkways and plazas.
7. City approved traffic calming or traffic diverting facilities to protect the surrounding single-family neighborhoods within one-quarter mile of the development.

- B. In the event that the Director approves reductions in the parking requirement, the basis for the determination shall be articulated in writing.
- C. The Director may impose performance standards and conditions of approval on a project including a financial guarantee.
- D. Reductions of up to 50 percent may be approved by Director for the portion of housing providing low income housing units that are 60 percent of AMI or less as defined by the U.S. Department of Housing and Urban Development.
- E. A parking reduction of 25 percent may be approved by the Director for multifamily development within one-quarter mile of the light rail station. These parking reductions may not be combined with parking reductions identified in subsections A and D of this section.

Note that this reduction will not be granted until the light rail station exists.

- F. Parking reductions for affordable housing may not be combined with parking reductions identified in subsection A of this section. (Ord. 731 § 1 (Exh. A), 2015; Ord. 706 § 1 (Exh. A), 2015; Ord. 669 § 1 (Exh. A), 2013; Ord. 654 § 1 (Exh. 1), 2013; Ord. 238 Ch. V § 6(B-2), 2000).

Pedestrian and Bicycle Facilities Mitigation Measures

Additional traffic along all of the principal and minor arterials along with increased bus service will create a higher potential for

conflicts between bicyclists, pedestrians, transit vehicles, and automobiles. Besides off-corridor bicycle network recommendations along 145th Street from the Multimodal Corridor Study, separated bicycle facilities along key corridors such as N/NE 155th and 5th Avenue NE may be necessary to reduce the number of conflicts. N/NE 155th Street is a part of the Interurban – Burke-Gilman trail connection and it would serve as a primary gateway for trail users to access the station.

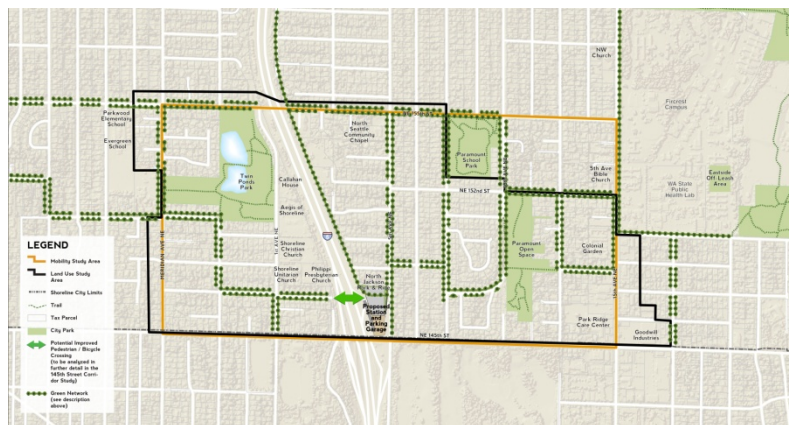
The “greenway” shown on the Alternatives map (shown in Section 3.1 and 3.5) provides an east-west bicycle route along non-residential streets. The alternatives could improve overall pedestrian and bicycle connectivity by allowing for more dedicated pathways with parcel consolidation and expanded development. Any new development in the area under the proposed zoning should consider pedestrian and bicycle paths through the sites to allow for connections to the station and subarea amenities without the need to travel along busy arterials. All streets in the subarea, whether arterial or not should include sidewalks. Sidewalks will be required with any redevelopment activity in MUR zones. For a list of other instances where frontage improvements (sidewalks and landscaping) are required, see Development Code section 20.70.320.

The major barrier of I-5 restricting non-motorized connections requires improved bicycle and pedestrian access. The 145th Street Multimodal Corridor Study examined alternatives to improve the bicycle and pedestrian crossing of I-5 near the light rail station. Detail of this crossing improvement is shown in **Figure 3.3-18**. Additionally, the large number of parks in the study area creates an opportunity to provide dedicated pathways between the parks and the light rail station. The City is interested in exploring

opportunities for bicycle sharing and bicycle storage facilities near the station to encourage and enhance bike access to transit.

The Green Network Concept

Separate from the Off-Corridor Bicycle Network identified in the 145th Street Multimodal Corridor Study, a concept proposed during the development of the three action alternatives calls for creation of a “Green Network” of sidewalks, trails, bicycle lanes, parks, stream corridors, wetlands, and natural areas throughout the subarea, implemented over time with redevelopment. Green infrastructure and low impact development stormwater management and water quality treatment facilities also would be a part of this network. For an enlarged illustration of the Green Network concept and more discussion, refer to Sections 3.1 and 3.5 of this FEIS.



The Green Network Concept—interconnecting trails, pedestrian, and bicycle facilities in green streets and parks throughout the subarea. This concept would greatly enhance pedestrian and bicycle access to and from the light rail station and within the subarea.

3.3.4 Phased Improvements

Introduction

While the impacts and mitigation measures specified for Alternative 2 – Connecting Corridors, Alternative 3 – Compact Communities, and Alternative 4 – Compact Community Hybrid would occur over the projected 55 to 98-year timespan, this section describes the mitigation measures that would be needed to address impacts in the near-term, specifically over a 20-year horizon for each of the action alternatives. These measures would gradually be incorporated as development occurs and would be continually monitored to address the most current conditions. All proposed development would go through the standard review process and would only be approved with necessary and appropriate infrastructure investments provided by the development.

Growth Forecasts

The land use patterns for each alternative were tested using the phased zoning patterns described in previous chapters. An assumed average growth rate of approximately 2 percent was based on historical trends in the region, however this may fluctuate between 1.5 and 2.5 percent depending on actual market conditions. Based on a growth rate of 1.5 to 2.5 percent, within 20 years there would be 4,670 to 5,681 households and 2,180 to 2,678 jobs. Additionally, while the analysis assumed a growth rate of development for the areas identified for zoning changes within 20 years, particular parcels may redevelop at a higher or lower rate than the average. Actual distribution of development would impact where and when specific roadways and areas would experience a change in travel patterns.

**Table 3.3-14 PM Peak Period Intersection Level of Service
for the 20-year Build-Out of the Four Alternatives**

Signal Type	Intersection	Existing LOS / Delay (sec)	No Action LOS / Delay (sec)	20-year Alt2 LOS / Delay (sec)	20-year Alt3 LOS / Delay (sec)	20-year Alt4 LOS / Delay (sec)
Signalized	145th St / Meridian Ave	B / 16	D / 55	F/270	F/250	F/240
Signalized	145th St / 1st Ave	B / 18	E / 57	F/123	F/100	F/95
Signalized	145th St / SB I-5	D / 46	E / 66	E/70	E/70	E/74
Signalized	145th St / 5 th Ave	D / 42	F / 81	F/100	F/100	F/110
Signalized	5th Ave / I-5 NB On-ramp	A / <10	A / <10	A / <10	A / <10	A / <10
Signalized	145th St / 15th Ave	E / 60	F / 94	F/106	F/102	F/102
Signalized	150th St / 15th Ave	B / 16	C / 21	B/13	A/9	B/17
Signalized	155th St / 15th Ave	C / 30	D / 37	D/48	D/47	D/46
Signalized	155th St / 5th Ave	B / 10	B / 17	B/17	B/16	B/17
Unsignalized	155th St / 1st Ave	C / 21	E / 49	F/105	F/93	F/113
Signalized	155th / Meridian	B / 14	C / 27	D/42	D/47	D/51

Notes: Large delay values (over 240 seconds) rounded to the nearest ten; Level of Service results do not incorporate improvements identified in the 145th Street Multimodal Corridor Study

**Table 3.3-15 Average Daily Traffic Volumes and PM Peak Period Congestion
for the 20-year Build-Out of the Four Alternatives**

Street	Segment	Existing PM Peak Hour Volume / VC Ratio ¹⁸	No Action PM Peak Hour Volume / VC Ratio	20-year Alt2 Volume/ VC Ratio	20-year Alt3 Volume/ VC Ratio	20-year Alt4 Volume/ VC Ratio
East-West Corridors						
N/NE 145th Street*	West of I-5	1,330 / 0.81	1,650 / 1.00	1820 / 1.10	1790 / 1.08	1800 / 1.09
NE 145th Street*	East of I-5	1,430 / 0.87	1,630 / 0.99	1710 / 1.03	1700 / 1.03	1730 / 1.05
N 155th Street	West of I-5	540 / 0.60	700 / 0.73	750 / 0.79	740 / 0.78	780 / 0.82
NE 155th Street	East of I-5	490 / 0.61	610 / 0.64	620 / 0.65	620 / 0.65	630 / 0.66
North-South Corridors						
5th Avenue NE*	I-5 NB on-ramp to 155th Street	530 / 0.76	670 / 0.96	700 / 1.00	700 / 1.00	730 / 1.04
15th Avenue NE	145th to 150th Street	1,040 / 0.52	1,290 / 0.65	1310 / 0.66	1320 / 0.66	1340 / 0.67
15th Avenue NE**	150th to 155th Street	880 / 0.73	1,150 / 0.96	1160 / 0.97	1170 / 0.97	1180 / 0.98
Meridian Avenue N	145th to 155th Street	390 / 0.56	650 / 0.78	740 / 0.88	720 / 0.86	730 / 0.87

*N/NE 145th Street and the portion of 5th Avenue NE between NE 145th Street and the I-5 northbound on-ramp is exempt from the City of Shoreline's concurrency standard due to being within WSDOT jurisdiction.

** The City allows a V/C ratio of 1.10 for 15th Avenue NE, between NE 150th Street and NE 175th Street due to rechannelization for operational safety.

Note: Traffic volumes and congestion level results do not incorporate improvements identified in the 145th Street Multimodal Corridor Study.

¹⁸ One-directional volume only, signifying the direction with the highest volume

The differences in traffic operations for the alternatives, while minimal, are primarily due to distribution of the forecasted growth for 20 years based upon the specific zoning changes of each alternative.

Average Daily Traffic and Intersection Level of Service

As shown in **Table 3.3-14** and **Table 3.3-15** on the two previous pages, additional trips resulting from redevelopment as part of the 20-year growth scenarios for the alternatives would increase average vehicle delay at intersections and along roadways, particularly along N/NE 145th Street. However, many intersections would still operate at or better than LOS D during the PM peak period.

Congestion along N/NE 145th Street and other streets would be influenced by actual development patterns and how this new development is accessed. While impacts from light rail implementation are addressed in the Lynnwood Link Extension FEIS, the following section identifies specific steps the City may take to address any potential impacts related to land use development within the subarea over the next 20 years.

Additional Recommended Mitigation Measures

As stated in previous sections, the length of time until full build-out for any of the three action alternatives would enable the City to monitor growth and proactively plan for needed improvements. This would occur as development proceeds in order to provide a sustainable and efficient transportation system within the subarea. All new development would undergo a thorough review process to identify the specific transportation projects necessary to allow the development to proceed.

This section details specific actions the City may take to address growth that is forecast for 20-year phased scenarios of the three action alternatives and unless otherwise specified, each mitigation is appropriate under all three scenarios.

N/NE 145th Street

Implement recommendations from the 145th Street Multimodal Corridor Study including:

- Traffic signal improvements at the intersections at Meridian Avenue and 1st Avenue
- Improved signalized intersections which will include new left turn lanes, right turn lanes, and signal timing changes for the portion between Aurora Avenue and NE 15th Avenue NE
- Transit signal priority along the corridor
- Revised interchange at I-5 with a button-hook on-ramp to allow eastbound 145th to northbound I-5 traffic to turn right onto 5th Avenue and loop under the bridge
- Additional left-turn storage on existing bridge over I-5
- New eastbound right-turn lane to southbound I-5
- New southbound off-ramp right turn lane
- New westbound right turn lane at 5th Avenue
- Grade-separated crossing for non-motorized traffic over the SB I-5 off-ramp
- New bridge deck for 145th Street over I-5 that includes a multi-use trail on the north side
- Sidewalks upgraded to meet City Standards
- Westbound BAT lane/queue jump lane east of 5th Avenue
- Eastbound BAT lane/queue jumps east of 15th Avenue NE
- Wheelchair accessible bus stops
- Off-corridor bike network
- Restricted left-turn access mid-block east of 5th Avenue

N/NE 155th Street

- Consistent with the TMP, extend the two-way left turn lane from 5th Avenue NE to 15th Avenue NE with bicycle lanes
- Construct a northbound right-turn pocket at the intersection of N/NE 155th Street and 1st Avenue NE
- Consider signalization or a roundabout at the intersection of N/NE 155th Street and 1st Avenue NE

5th Avenue NE

- Construct a two-way left turn lane from the I-5 NB on-ramp to N/NE 155th Street

Meridian Avenue N

- Consistent with the TMP, convert Meridian Avenue N to a three-lane profile with a two-way left-turn lane and bicycle lanes

Bicycle Facilities

- Implement recommendations for the off-corridor bike network from the 145th Street Multimodal Corridor Study referenced in the previous section

3.3.5 Significant Unavoidable Adverse Impacts

Under all alternatives, the subarea would be anticipated to experience growth in traffic levels. Given that growth is expected to occur incrementally over many decades, the City and other agencies responsible for transportation services would be able to proactively monitor changes, update plans, and implement needed improvements to address the increased transportation demand. Behavioral changes in the way people travel (such as reduced vehicle household trips in a more walkable neighborhood, use of bike share and car share programs, and increased use of the high-capacity transit system) also would help to offset some of the demand over time. Given these considerations and with implementation of mitigation measures, no significant unavoidable adverse impacts would be anticipated.

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