Appendix A

Transportation Technical Analysis Methodology

Appendix A
Transportation Technical Analysis Methodology and Assumptions and Updates

1.0 Introduction

The *Transportation Technical Analysis Methodology Report* (Sound Transit, 2013) was prepared for Sound Transit's Federal Way Link Extension (FWLE) Draft Environmental Impact Statement (Draft EIS) (see Attachment B). This report is an addendum to the *Transportation Technical Analysis Methodology Report* and describes only modifications and updates to the transportation methods and assumptions for the Final Environmental Impact Statement (Final EIS). The transportation analysis will be updated based on project information obtained since the Draft EIS analysis was conducted. This report follows the same organization as the Draft EIS *Transportation Technical Analysis Methodology Report*. Unless otherwise noted, the methodologies described in the Draft EIS *Transportation Technical Analysis Methodology Report* will remain unchanged and include the following sections:

- Affected Environment
- Regional Transportation System
- Corridor and Sub-Area System
- Property Access and Local Circulation
- Parking
- Non-motorized Facilities and Modes
- Freight

2.0 Methodology Refinements

2.1 Transportation Analysis Years and Period

The transportation analysis will focus on the same two future years identified in the Draft EIS methodology report. Analysis years are listed below:

- Existing year 2013 (revised to 2015, as needed)
- Construction year 2021
- Design year 2035

Existing transit service will be revised to reflect year 2015 conditions, as a major transit service change occurred in 2014. Other existing data used in the Draft EIS analysis will continue to be considered valid.

The Preferred Alternative's construction impacts will be quantitatively analyzed for the worst construction staging condition for the FWLE. Based on the project schedule, construction is expected to occur in the early 2020s, with the FWLE opening by 2023; therefore, for the transportation analysis the peak construction year is assumed to occur in 2021. In general, the peak construction activity is during heavy civil construction, which would occur during the first two to three years of the overall construction period.

A design year of 2035 remains unchanged from the Draft EIS. This design year is reflective of the latest 2035 Land Use Targets forecasts released by the Puget Sound Regional Council (PSRC). This product is widely used by PSRC and the regional and local jurisdictions to use in their long-range planning efforts and is consistent with *Vision 2040*. In addition, Sound Transit has adopted the year 2035 for use in several ST2 projects, including the Lynnwood Link and Tacoma Link extensions. As part of this effort, the Sound Transit ridership model has been constructed to provide transit ridership information based on year 2035 projects, and is appropriate to continue using for the FWLE Final EIS.

2.2 EIS Alternatives

The EIS Alternatives section will be revised to include the Preferred Alternative, including new or modified station locations.

2.3 Background Project Identification

The background project identification lists have been revised based on the latest state, regional, and surrounding local agencies' transportation plans. Since the development of the Draft EIS *Transportation Technical Analysis Methodology Report*, some local and regional agencies have updated their transportation plans and Washington State has passed a statewide transportation package. The projects included in the statewide transportation package are assumed to be constructed by 2035, and therefore are included in the No Build and Build conditions. An updated background project list is included in Attachment A. Highlighted projects in the package included the following:

- Washington State Department of Transportation's (WSDOT) State Route (SR) 509 Corridor Completion and Freight Improvement Project (SR 509 Extension) as defined in the Federal Highway Administration's (FHWA) 2003 Record of Decision (ROD)
- WSDOT's SR 167 Tacoma to Edgewood New Freeway Construction Project as defined in FHWA's 2007 ROD
- WSDOT's Interstate 5 (I-5)/SR 161/SR 18: Federal Way Triangle Vicinity Improvements
- Local jurisdiction/agency intersection and roadway projects as part of transportation improvement programs (TIPs) and capital improvement programs (CIPs)

The SR 509 Extension has the most direct influence in the area. The SR 509 Extension, as defined in the 2003 ROD, would connect to -5 via a new system interchange in the vicinity of S 216th Street. A new interchange at Kent-Des Moines Road (SR 516) would be provided, including a connection to S 231st Way, and the S 272nd interchange would have additional ramp capacity. Two additional lanes would be

provided on both northbound and southbound I-5 between the S Kent-Des Moines Road and S 272nd Street, and one additional lane on southbound I-5 would be provided from S 272nd Street to S 320th Street.

Until recently, the SR 509 Extension had remained mostly unfunded and, consequently, it was included in the FWLE Draft EIS Cumulative Impacts section. However, new funding was programmed for this project in Washington State's transportation package adopted in 2015. As a result, WSDOT is currently reevaluating the SR 509 Extension. For the purpose of the FWLE project, the SR 509 Extension will be assumed as a background project as defined in the 2003 ROD for the 2035 No Build and Build conditions. This provides the most conservative traffic-related assumptions for the FWLE Final EIS as the SR 509 Extension assumed in the 2003 ROD likely creates the most amount of vehicle demand within the FWLE study area and specifically near the station areas located along the arterial and local street system.

In addition to the SR 509 Extension, other background projects (including the SR 167 Tacoma to Edgewood New Freeway Construction Project, I-5/SR 161/SR 18: Federal Way Triangle Vicinity Improvements, and new local/agency TIP/CIP projects) have also been added to the background project list included in Attachment A.

The assumptions for high-occupancy vehicle (HOV) lane designations on state facilities (such as SR 99 and I-5) will not be modified from the current (2015) status, except where there are known proposed policy changes (e.g., I-405 between Bellevue and Lynnwood). Therefore, the HOV facilities within the FWLE study area will be assumed to continue to operate as 2+ occupancy as there has not been a published WSDOT document or legislation proposed by the Washington Transportation Commission modifying this designation. Furthermore, it is likely that maintaining the current HOV designations on state highways will provide the most conservative traffic-related assumptions for the FWLE Final EIS because any change to the State's lane management would be intended to reduce the amount of vehicle demand.

2.4 Study Area and Area of Effect

The intersections analyzed in the Draft EIS traffic analysis will be included in the Final EIS analysis. However, the study area and area of effect will be reevaluated based on preliminary engineering plans and new station locations, as well as any anticipated changes in construction impacts. If changes to the list of study intersections are needed, the transportation analysis team will coordinate with Sound Transit and affected agencies.

2.5 Analysis Tools

The analysis tools and software used for the transportation modeling in the Draft EIS will be used for the Final EIS. The models used for travel demand forecasting will be updated based on the latest versions publically available from the PSRC.

2.6 Assessment Methods and Analysis Thresholds

The Assessment Methods and Analysis Thresholds will be updated for the freeway safety and construction period analysis. The latest versions of guidance documents will be used for analysis as appropriate. Sub-elements for the arterial and local street system presented in the Draft EIS

methodology report are shown in the following subsections, and any methodology changes are described in more detail.

2.6.1 Transit

The transit integration plan will be updated in collaboration with Sound Transit, King County Metro, and Pierce Transit. Transit level of service, station access, and circulation will be evaluated as described in the Draft EIS methodology report

2.6.2 Intersection Operations

The most recent adopted standards will be assumed in the Final EIS. The level of service (LOS) standards for each agency are summarized in Table 1 and will be used to describe transportation conditions for the Final EIS. At intersections where multiple agencies' standards could be applied (i.e., on state facilities such as SR 99, where local and state LOS standards vary), the most conservative LOS standard will continue to be assumed similar to the Draft EIS.

TABLE 1
Agency LOS Standards within the FWLE Study Area

Agency	LOS Standard Used for Project Evaluation
Washington State Department of Transportation	LOS D for highways of statewide significance (HSS) LOS E/mitigated for regionally significant state highways (non-HSS)
City of SeaTac	LOS E for principal and minor arterials LOS D for collector and lower classification streets
City of Des Moines	LOS D for signalized intersections or Xc less than 1.0 with the following exceptions (with their LOS threshold) along Pacific Highway South (SR 99): • S 216th Street (LOS F) (Xc < 1.0 standard) • Kent Des Moines Road (LOS F) (Xc < 1.2 standard) • S 220th Street (LOS E) (Xc < 1.0 standard) • S 224th Street (LOS E Xc < 1.0 standard)
City of Kent	LOS E for non-SR 99 intersections LOS F for all SR 99 intersections
City of Federal Way	v/c of 1.2 for signalized intersections v/c of 1.0 for unsignalized intersections Maintain an average v/c of 1.1 for signalized intersections within City Center
King County	LOS E for signalized and unsignalized intersections

Sources: City of Des Moines, 2015; City of Federal Way, 2015; City of Kent, 2008; King County, 2001; WSDOT, 2010.

Note: For intersections that have approaches with multiple roadway classifications, the LOS threshold for the highest classified roadway will apply (e.g., for an intersection between a principal arterial and a collector arterial, the LOS threshold for the principal arterial will apply).

< = less than; Xc = critical volume to capacity ratio

The City of Federal Way has updated its LOS standards since the Draft EIS was published. It changed from a LOS-based standard to a volume-to-capacity (v/c) ratio standard. Intersections must operate with a v/c ratio of 1.2 or better at signalized intersections while maintaining a v/c ratio of 1.0 at unsignalized intersections outside of the City Center limits (between 13th Avenue S, S 312th Street,

S 324th Street, and I-5). For all signalized intersections located in the City Center, an average v/c ratio of 1.1 must be maintained.

Queuing at I-5 ramp terminals will be analyzed using Synchro. Upon completion of the Synchro analysis for all interchanges in the study area, Sound Transit will coordinate with WSDOT and FHWA to review the results of the Synchro analysis. Based on this review, Sound Transit may perform additional analysis at specific intersections surrounding I-5 ramp terminals using an alternative analysis tool (e.g., SimTraffic, VISSIM, or other methods) to supplement the Synchro results for potential queuing impacts. A comparison of effective storage (i.e., storage length available to safely contain vehicles) will be determined using the WSDOT Design Manual (WSDOT, 2014), and expected 95th percentile queue lengths will be documented and compared for off-ramp intersection approaches. If queues with the project exceed effective storage, mitigation may be proposed depending on the No Build condition and discussions with the affected agencies.

2.6.3 Safety

A quantitative safety analysis was conducted for I-5 as a part of the Draft EIS. It identified clear zone impacts using *Highway Safety Manual* (HSM) methodologies (American Association of State Highway and Transportation Officials, 2014). This methodology will continue to be used for the Final EIS to understand the potential changes in safety conditions for locations where the alignment is within the I-5 clear zone. As stated in Section 2.3, the SR 509 Extension and its preliminary design will be assumed to be in place along I-5 as part of both the No Build and Build conditions. Further documentation of the safety conditions on the interchange ramps will compare forecasted queue lengths to the calculated storage lengths based on the WSDOT Design Manual criteria. Furthermore, HSM safety performance functions will be used at ramp terminals to determine potential safety impacts. Refer to Section 2.6.1.2 for the operational analysis methods and software tools.

Other potential safety effects of the project will be evaluated as previously described in the Draft EIS methodology report.

2.6.4 Construction

Construction impacts were previously analyzed qualitatively for each Draft EIS alternative; however, construction impacts associated with the Preferred Alternative will be assessed quantitatively and qualitatively for the Final EIS. The analysis will primarily focus on local roadways and I-5 ramps during the period when construction impacts are likely to be greatest. Based on the current project schedule, construction would begin in 2019, with peak FWLE heavy civil construction activities likely occurring in 2021.

The highest-impact construction condition will be determined by a combination of factors, including the following:

- Impacts of construction-related traffic on traffic operations, including additional construction-related truck trips, construction site access, and construction staging areas

- Impacts on traffic operations, property access, and parking related to potential road, sidewalk, bicycle, park-and-ride, or other transportation facility closures or detours during construction

Transit services and facilities, and roadways adjacent to or intersecting potential construction activities and/or that could be used as a detour route, will be assessed for their ability to accommodate the construction impact and/or additional traffic volumes as a detour route. This includes analysis of interchange areas, construction site access locations, major haul routes, transit stop closures or relocation, and park and ride closures.

Depending on the time of day when the construction impact could occur, roadway v/c ratios and a limited intersection analysis at key construction areas will be performed. For the construction period analysis, the worst peak hour (either AM or PM peak hour) operating condition will be identified based on the information developed for the Final EIS and will be used to assess construction impacts. Construction impacts analyzed during other periods of the day, including nights and/or weekends, will be based on roadway v/c ratios or other appropriate measures as listed in Table 2.

TABLE 2
Construction Transportation Information and Analysis Measures

Construction Description and Transportation-related Information	• Type and duration of construction • Conceptual haul routes and staging areas • Roadway, sidewalk, bike lane closures (identify if all day or off-peak only) • Property access modifications/impacts • Construction truck trip estimates
Type of Analysis by Period:	
Off-Peak Period (i.e., evening/weekends)	• Roadway/lane closure impacts (if relevant) • Roadway volume and potential congestion levels (and v/c ratio) • Transit service (route path, reliability and bus stop/park & ride impacts)
Peak Period	• Roadway/lane closure impacts (if relevant) • AM/PM Intersection LOS analysis (including delay and queue lengths) • Roadway volume and potential congestion levels (and v/c ratio) • Transit service (route path, reliability and bus stop/P&R impacts)

Based on the engineering information known at the time of this report, quantitative construction analysis will include, but not be limited to, the following roadways:

- SR 99 near the alignment and/or station areas
- South 216th Street
- 30th Avenue S
- Kent-Des Moines Road
- Military Road
- S 272nd Street
- S 317th Street
- 23rd Avenue S
- S 320th Street
- I-5 ramp terminals within study area

Depending on the type of impact as listed above, intersection analysis will be conducted at key construction locations along these roadways, primarily intersections that would have lane closures, high FWLE truck volumes, or increased traffic volumes due to park-and-ride closures. These locations will be finalized when the Preferred Alternative alignment, footprint, and construction impacts are identified. The analysis may include intersections in addition to those analyzed for design year operations, i.e., those that could have impacts during the construction period only. While some construction activities for both the FWLE and WSDOT's SR 509 Extension may occur simultaneously, it is assumed the peak FWLE construction would occur prior to SR 509 construction (see Exhibit 1).

The I-5 Landfill Median Alignment Option analyzed in the Draft EIS also identified impacts to the I-5 mainline. As this option is still being analyzed in the Final EIS, any associated I-5 mainline and ramp impacts will continue to be documented.

2.6.5 Cumulative and Indirect Effects

The Cumulative Effects section previously included the SR 167, SR 509 Extension, and I-5 Puget Sound Gateway projects. These projects are now included in the No Build condition background projects list and therefore the cumulative operation of the SR 509 Extension with the FWLE will be included in the direct impacts analysis.

Construction of the SR 509 Extension could occur during a portion of the FWLE construction period. Joint construction impacts will be addressed qualitatively within the Cumulative Impacts section because WSDOT will not likely have construction plans or quantitative construction data available before the FWLE Final EIS is published. The construction effects from the FWLE, assuming the SR 509 Extension is already built and operating, will not be analyzed as a direct impact because the programmed funding of the two projects make this condition unlikely. Exhibit 1 shows the assumed FWLE and SR 509 construction schedule. Additionally, other funded transportation projects near the FWLE study area, such as I-5/SR 161/SR 18 Triangle and SR 167 Extension projects, could have overlapping construction schedules. These projects' specific construction schedules and impacts are not known at this time, and therefore the potential for overlapping construction impacts will be addressed qualitatively within this section.

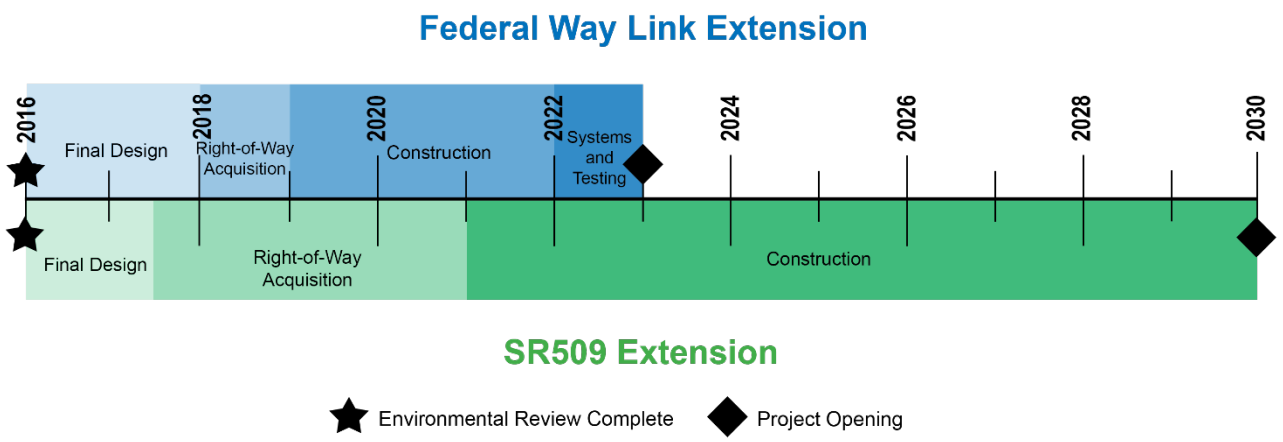

EXHIBIT 1
FWLE and SR 509 Construction Schedule

Transit-oriented development (TOD) was previously described as an indirect effect in the Draft EIS. TOD will continue to be qualitatively and, where appropriate, quantitatively described in the Indirect Impacts sections of the Final EIS.

2.6.6 Mitigation

Mitigation required by the FWLE will be updated and documented as described in the Draft EIS methodology report.

3.0 References

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Attachment A

Future Transportation Project List

Attachment A
Future Transportation Project List

This attachment presents the highway, transit, and local roadway and intersection projects that will be included in the Federal Way Link Extension (FWLE) future year (2035) conditions analysis. This list is comprehensive and includes both Draft EIS and Final EIS projects. Projects added to or updated on the list from the Draft EIS are denoted by an asterisk (*).

A.1 Highway and Transit

The following highway and transit projects will be included in the FWLE future year (2035) conditions (Puget Sound Regional Council [PSRC], 2014 Sound Transit, 2012; Washington State Department of Transportation [WSDOT], 2015). These projects will be incorporated, where appropriate, in the travel demand models and analysis for the 2035 No Build and Build conditions. Because FWLE may be submitted to the Federal Transit Administration (FTA), among other agencies, for potential funding, the project's future year conditions assume that projects with substantial funding already identified would be constructed prior to the FWLE, and therefore they are included in both the Year 2035 No Build and Build conditions analyses.

Highway Network:

- SR 520: Floating Bridge Replacement and Improvements Project and associated Eastside transit and high-occupancy vehicle (HOV) project improvements
- I-90: R8A Phase 3
- SR 99: Alaskan Way Viaduct and Seawall Replacement Program
- I-405: Renton to Bellevue Project SR 169 to I-90*
- I-405: SR 167 Interchange Direct Connector Project*
- I-405: NE 6th Street to I-5 Widening and Express Toll Lanes Project
- SR 518: SeaTac Airport to I-5/I-405 Interchange – third eastbound lane
- I-5: Tacoma HOV Extension
- I-5/SR 161/SR 18: Federal Way Triangle Vicinity Improvements*
- SR 167: HOV Lane Extension from 8th to Pierce County Line
- SR 16: HOV Lane Extension from Olympic View Drive to I-5
- SR 161: Additional Lanes from 36th Street to Jovita Boulevard
- SR 509 Corridor Completion and Freight Improvement Project (as defined in 2003 Record of Decision)*

- SR 167 Tacoma to Edgewood New Freeway Construction Project (as defined in 2007 Record of Decision)*
- HOV 2+ occupancy designation on WSDOT freeway facilities in the Puget Sound Region, except where current or proposed designations differ*
- SR 99: Intersection Improvements at S 200th Street to construct dual northbound left turn lane and eastbound right turn lane as part of the Angle Lake Station mitigation improvements*

Transit Network:

- The Downtown Seattle Transit Tunnel will be used exclusively by light rail, and buses will be relocated to surface roads.
- Transit-only operations on Third Avenue in downtown Seattle will include mid-day operations in addition to the existing AM and PM peak period operations.
- RapidRide bus service will operate along six bus rapid transit corridors.
- Light rail will be extended as part of the U Link, Northgate Link, East Link, and Lynnwood Link Extension projects to the north and east. Light rail will be extended to S 200th Street in SeaTac. Light rail will have two operating lines: north to south (Lynnwood Transit Center to Angle Lake Station) and north to east (Lynnwood Transit Center to Overlake Transit Center). For the Build condition, light rail would extend to the Federal Way Transit Center.*
- Tacoma Link Extension will be expanded from its current terminus to MLK Jr Way and 18th Street.
- The First Hill Streetcar will operate along Broadway.
- Sound Transit's Sounder commuter rail will operate from Everett to Lakewood.
- Sounder will operate with expanded service (two new Southline runs planned by 2017).

A.2 Local Street Network

The following local jurisdiction street and intersection improvements are included for the 2035 No Build and Build alternatives for the transportation analysis. Each of these projects is identified in each city's respective transportation improvement program (TIP) and capital improvement program (CIP) project lists, or identified by the city for inclusion in the future year networks (City of Des Moines, 2015; City of Federal Way, 2014; City of Kent, 2015; City of SeaTac, 2015; King County, 2012; PSRC, 2014).

A.2.1 City of SeaTac

New / Expanded Facilities:

- Military Road S: Reconstruct roadway to include bicycle lanes and traffic signal at S 170th Street with channelization enhancements.
- 28th/24th Avenues S: Construct a five-lane roadway including bicycle lanes.
- Military Road S: Widen existing roadway with access and circulation improvements. Construct right turn lane on S 152nd Street from Military Road S to International Boulevard.

- Military Road S: Widen I-5 southbound off-ramp to provide for a left-turn lane. Reconstruct west leg to provide left-, through-, and right-turn lanes. Modify signal to facilitate lane changes (to be completed by WSDOT).
- S 152nd Street: Widen existing roadway. Provide access and circulation improvements for vehicle and pedestrian movements in support of redevelopment from 30th Avenue S to Military Road S.

Intersection Improvements:

- Military Road S at S 200th Street/I-5 Southbound Ramps: Provide a southbound left-turn lane. Reconstruct west leg to provide left-, through-, and right-turn lanes. Modify signal phasing.
- Military Road S at S 170th Street: Provide traffic signal.
- S 152nd Street at International Blvd: Construct right-turn lane.
- 24th Avenue S at S 208th Street: Install new traffic signal at new intersection (in conjunction with City of Des Moines).*

A.2.2 City of Des Moines

New/Expanded Facilities:

- S 212th Street and SR 99: Provide traffic signal.
- S 216th Street: Widen to provide center turn lane, bike lanes, curb gutter, and sidewalk between 11th Avenue S and 18th Avenue S.*
- 24th Avenue S from S 208th Street to S 216th Street: Widen to provide additional travel lanes and bicycle lanes. Rebuild signal at 24th Avenue S and S 216th Street.
- 216th Street from SR 99 to 24th Avenue S: Widen to provide additional travel lanes and bicycle lanes. Rebuild signal at S 216th Street and SR 99 S.*
- S 224th Street from SR 99 to 30th Avenue S: Reconstruct roadway. Enhance traffic signal operations at intersection.
- S 240th Street from East City Limits to 16th Ave S: Reconstruct roadway to provide two travel lanes and bicycle lanes.*
- 16th Avenue S from S 272nd Street to S 276th Street: Widen to provide additional travel lanes with bicycle lanes.*
- Kent Des Moines Road from 24th Avenue S to SR 99: Widen to provide additional turn lanes and pedestrian facilities.*
- S 240th Street from 16th Avenue S to Marine View Drive: Reconstruct roadway to include two travel lanes and bicycle lanes.*
- S 268th Street Improvement Project from 16th Avenue S to SR 99 S: Reconstruct to Neighborhood Collector Standard with 2 travel lanes, curb and gutter*

- Kent Des Moines Road from 16th Avenue S to 24th Avenue S: Widen roadway to provide pedestrian facilities and center two-way left turn lane where warranted. *
- 16th Avenue S Improvement Project from Kent Des Moines Road to S 240th Street: Widen to provide center left turn lane at apartment driveways south of Kent Des Moines Road.*
- 16th Avenue S/18th Avenue S Road Improvement: Construct new neighborhood collector alignment along 16th/18th Avenues S corridor including curb gutter, bicycle facilities, and multi-use path.*

Intersection Improvements:

- S 216th Street at 24th Avenue S: Widen to provide additional travel lanes and bicycle lanes. Rebuild signal.
- S 216th Street at SR 99: Widen to provide additional travel lanes and bicycle lanes. Rebuild traffic signal.
- S 236th Street at SR 99: Highline Place Mixed-Use Development, Construction of mixed-use development at S 236th Street on SR 99. Includes installation of new traffic signal at S 236th Street and SR 99.

A.2.3 City of Kent

No City of Kent TIP/CIP projects are expected in the FWLE study area.*

A.2.4 City of Federal Way

New/Expanded Facilities:

- S 320th Street: I-5 bridge widening. Add HOV lanes, realign ramps in the southeast quadrant.

Intersection Improvements:

- S 320th Street at Pete von Reichbauer Way S: Add second left-turn lanes on the eastbound and southbound approaches.
- SR 99 at S 312th Street: Add second left-turn lane on northbound approach.
- S 304th Street at 28th Avenue S: Add northbound right-turn lane and a signal.
- SW 320th Street at 21st Avenue SW: Add second westbound left-turn lane and interconnect to 26th Avenue SW.
- S 312th Street at 28th Avenue S: Add southbound right-turn lane.
- SR 99 at S 324th Street: Make intersection improvements including flashing yellow arrow (FYA) signal indications and other signal head improvements.
- S 320th Street at 25th Avenue S: Install FYA indication on all legs of the intersection and reflective backplates on all signal heads.
- S 316th Street at Pete von Reichbauer Way S: Install FYA indication on all legs of the intersection.*
- S 317th Street at 23rd Avenue S: Install FYA indication on north and south legs of the intersection.*
- S 322nd Street at 23rd Avenue S: Install FYA indication on all legs of the intersection.*

A.2.5 King County

New / Expanded Facilities:

- Military Road S: From S 272nd Street to S 304th Street, widen to 4 or 5 lanes.
- S Star Lake Road: Construct asphalt/concrete shoulder between Military Road S and 42nd Avenue S.

A.3 References

City of Des Moines. 2015. *Transportation Improvement Plan from 2016-2035*. City of Des Moines, Washington. June.

City of Federal Way. 2014. *City of Federal Way Transportation Improvement Plan 2015 to 2020*. City of Federal Way, Washington. June.

City of Kent. 2015. *Transportation Improvement Plan 2016 to 2021*. City of Kent, Washington. July.

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Attachment B

Draft EIS Methodology Report

B.1 Introduction

This Draft Transportation Methodology Report is provided for review and comment by participating and cooperating agencies for the Federal Way Link Extension (FWLE) Environmental Impact Statement (EIS). The review of methods at the start of the EIS process is consistent with the National Environmental Policy Act (NEPA) environmental review procedures. Sound Transit and the Federal Transit Administration (FTA) initiated the EIS process for the project in fall 2012 and invited potential cooperating and participating agencies to take part in the EIS process. This technical analysis methodology report describes the methods that will be used to analyze the effects on the transportation system for the Federal Way Link Extension EIS. The transportation section of the EIS will identify and evaluate the project alternatives' impacts for the following topics:

- Regional transit system, including ridership and mode share
- Regional traffic, including vehicle miles of travel, vehicle hours of travel, and vehicle hours of delay
- Project corridor traffic
- Transit service
- Intersection level of service
- Property access and local traffic circulation
- Parking near stations and at park-and-ride lots
- Bicycle and pedestrian circulation surrounding stations
- Freight movement
- Safety
- Construction impacts

In addition to the impacts analysis related to the topics listed above, the report also describes the transportation analysis that will be conducted to accomplish the following:

- Describe cumulative transportation effects
- Develop data for use by other disciplines, including air quality, noise, energy, and environmental justice

B.2 Project Background

Sound Move, the first phase of regional transit investments, was approved and funded by voters in 1996. Sound Transit is now completing its implementation. It includes light rail, commuter rail, and regional express bus infrastructure and service, including the Central Link light rail system. In 2009, Sound Transit began light rail operations between downtown Seattle and Seattle-Tacoma (Sea-Tac) International Airport, and an extension to the University of Washington is under construction and scheduled to open in 2016.

In 2004, Sound Transit began planning for the next phase of investment to follow Sound Move. This work included updating Sound Transit's Regional Transit Long-Range Plan and associated environmental review. Following several years of system planning work to detail, evaluate, and prioritize the next round of regional transit system expansion, voters in 2008 authorized funding to extend the regional light rail system south to Federal Way as part of the Sound Transit 2 (ST2) Plan. Link light rail south from Sea-Tac Airport to S 200th Street is now under construction and is scheduled to open in 2016. The ST2 Plan also extends light rail from downtown Seattle to Bellevue and Redmond to the east, and to Northgate and Lynnwood to the north.

B.3 Federal Way Link Extension Project Area

The FWLE corridor includes portions of the cities of SeaTac, Des Moines, Kent, and Federal Way in south King County. The approximately 7.6-mile-long corridor extends from the future Angle Lake Station at S 200th Street in SeaTac to the Federal Way Transit Center (FWTC) in Federal Way. The project corridor parallels State Route 99 (SR 99) and Interstate 5 (I-5), and generally follows a topographic ridge between Puget Sound and the Green River Valley where the city limits of SeaTac, Des Moines, Kent, and Federal Way meet (Exhibit B-1). Major east-west arterials connecting I-5 and SR 99 include Kent-Des Moines Road (SR 516), S 272nd Street, and S 320th Street, which also correspond with major transit stops, including Kent-Des Moines Park-and-Ride (SR 516), Redondo Heights and Star Lake Park-and-Ride (S 272nd Street), and the FWTC (S 317th Street) or Federal Way Park-and-Ride (S 324th Street).

B.4 Guiding Regulations, Plans, and/or Policies

The transportation analysis will be guided by the following laws and regulations:

- NEPA
- State Environmental Policy Act (SEPA)
- Moving Ahead for Progress in the 21st Century (MAP-21)
- Code of Federal Regulations (CFR) 23 Part 450 (implementing USC 23 Section 111, which requires the U.S. Secretary of Transportation to approve access revisions to the Interstate System)
- CFR 23 Part 771 (Environmental Impact and Related Procedures)
- CFR 23 Part 710 (Right-of-Way Regulations for Federally Assisted Transportation Programs)
- Washington State Growth Management Act (Revised Code of Washington [RCW] 36,70A.070)

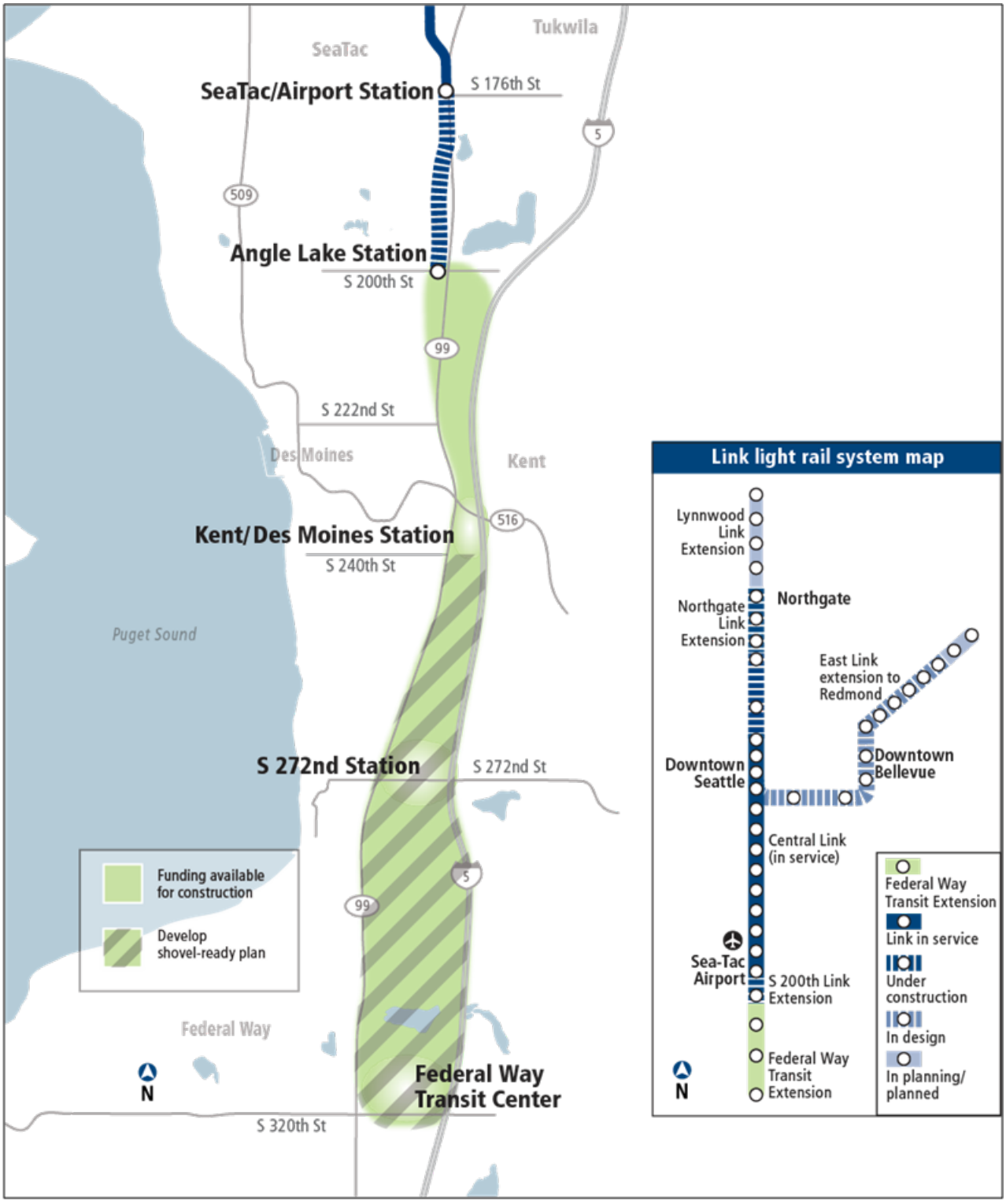

EXHIBIT B-1
FWLE Study Area

In addition to the laws and regulations identified above, analysis of local transportation impacts will be guided by the policy direction established in the numerous plans or policy documents adopted within the project corridor. These include, but are not limited to, the following:

- ST2
- Strategic Plan for Public Transportation 2007–2016 (King County Department of Transportation Metro Transit Division)
- Washington Transportation Plan 2007–2026 (Washington State Department of Transportation [WSDOT])
- WSDOT Design Manual
- WSDOT Development Service Manual (M.3007.00)
- Puget Sound Regional Council (PSRC) Transportation 2040: Toward a Sustainable Transportation System (PSRC, 2014)
- Comprehensive Plans (and/or Transportation Plans) and Capital Improvement Programs for the Cities of SeaTac, Des Moines, Kent, and Federal Way, as well as King County (City of Des Moines, 2009; City of Federal Way, 2012; City of Kent, 2008; City of SeaTac, 2012)

B.5 Agency Coordination

The transportation planning and analysis process will involve local jurisdictions, state agencies, federal agencies, transit agencies, PSRC, and other interested parties.

B.5.1. NEPA Lead Agency

FTA will be the lead agency for development of the EIS in accordance with NEPA regulations.

B.5.2. Cooperating and Participating Agencies

For the development of the transportation technical report, Sound Transit will meet with and provide opportunity for coordination with the cooperating and participating agencies for this project:

- WSDOT
- Federal Highway Administration (FHWA)
- PSRC
- King County
- Pierce Transit
- City of SeaTac
- City of Des Moines
- City of Kent
- City of Federal Way

B.6 Environmental Impacts Analysis

This section provides an overview of the transportation analysis framework that will be documented in the EIS. This includes describing the analysis years and period, affected environment, alternatives and/or conditions and future background project assumptions.

B.6.1. Transportation Analysis Years and Period

Based on the project's schedule and available traffic forecasting data, the transportation analysis will focus on three distinct years:

- Existing Year—2013.
- Future Design Year—2035. This is the proposed design analysis year based on an approximate 20-year period from the project's environmental process. This design year will be confirmed based on further coordination with local agencies, FTA, WSDOT, FHWA, and others.
- Construction Period—if construction impacts are determined to need more than a qualitative assessment for any particular location.

In all three analysis years, the PM peak period will be evaluated – in some instances the analysis will focus on the peak hour within that period. The PM peak period, which will be confirmed through existing data sources, is typically between 3:00 p.m. and 6:00 p.m. This period is considered the timeframe when traffic impacts are the highest; therefore, the analysis will be of the worst-case traffic conditions.

A limited AM peak period analysis will be conducted for the Existing Year and Future Design Year if there is the potential for traffic impacts during this period. The AM analysis will focus on traffic impacts at and adjacent to stations and at I-5 ramp terminal intersections. The AM peak period will be identified through existing data sources, but would likely be between 6:00 a.m. and 9:00 a.m.

B.6.2. Affected Environment

The affected environment for transportation includes all components of the transportation system within the study area. These components include traffic-related operations and performance on all roadway facilities; transit (road-based and rail); freight; bicycles; and pedestrians. Particular focus for these modes will be on transportation facilities in the vicinity of proposed transit stations and park-and-ride lots because these will be the primary site-specific traffic generators. Assessments of the safety conditions on the roadways in the study area will be provided in addition to the effects on the parking facilities in the project area. Effects on the regional transportation system will also be documented.

Measures for assessing these transportation elements, discussed in the following sections, will be both quantitative and qualitative and will be displayed both graphically and in a tabular format as appropriate.

B.6.3. EIS Alternatives

The EIS analysis will be developed for the conditions listed in Table B-1. Existing and future year 2035 No-Build conditions will provide a point of comparison against the Build (project alternatives) conditions. This comparison determines project benefits and impacts based on the measures described in Section 11 of this report.

TABLE B-1
EIS Evaluated Conditions

Condition	Existing Year (Year 2013)	Future Year		Notes
		Construction Period[a]	Design Year 2035	
Existing	X			
No-Build		X	X	Based on travel demand forecasts and an assumed list of constructed background projects. A No-Build condition during the construction period may be evaluated if determined necessary.
Build (Project Alternatives)			X	This assumes the full-length project is constructed and operating between Angle Lake Station and Federal Way Transit Center (FWTC)
Build (Interim Terminus)			X	Project alternatives that are not full-length, but instead are assumed to be constructed to interim terminus locations, will be assessed.
Construction		X		A qualitative construction analysis will be conducted based on an estimate of when construction would occur in the future.

[a] The construction period has yet to be determined. This will be determined during the preliminary engineering and environmental documentation phase of this project.

As part of the Build condition, the transportation analysis will be conducted for the full-length project alternatives (to FWTC), as well as an analysis of the project alternatives at each potential interim terminus station in the study area.

B.6.4. Background Project Identification

The future year 2035 conditions include a variety of projects from the state, regional, and surrounding local agencies' transportation plans. These projects are assumed to be built and in-place before the FWLE project is completed. This list of background projects provides valuable insight into how the transportation system within, and surrounding, the project's study area will change from existing conditions. These projects may directly affect transportation conditions, such as by altering travel patterns, affecting roadway operations and safety, and influencing non-motorized access and connections.

This project may be submitted to the FTA and other agencies for potential funding. To be consistent with analysis criteria established by these agencies, the future year conditions will include projects through environmental documentation (if required) and with substantial design and/or construction funding already identified. The assumed background project list is included in Attachment A of this report.

B.7 Data Needs and Sources

A variety of data will be collected and assembled to analyze the transportation-related effects of project alternatives. These data sets will include the following:

- Existing peak-hour turning-movement counts at the intersections identified below under "Intersections to be Studied." These counts will be collected from the local and state agencies (Cities of SeaTac, Des Moines, Kent, and Federal Way; King County; and WSDOT) for the PM peak hour. New counts will be taken for 2 hours during the PM peak period, if year 2010 or more recent turning-movement counts are not available from the agencies listed above. The new counts will include automobiles, trucks, buses, pedestrians and bicyclists. All peak-hour turning-movement counts will be factored to a common base analysis year (2013) based on available historical data trends. At non-intersection areas, such as SR 99 mid-block U-turn locations, a short duration vehicle count ("short-count"), which is typically 30-minutes or less, will be collected during the PM peak period to understand the impacts of any proposed traffic circulation changes with the project alternatives.
- Existing AM peak-hour turning movement counts will be collected at ramp terminal intersections and surrounding potential station area intersections. These counts will be collected from the same state and local agencies identified for the PM peak period. New counts may be taken for up to 3 hours (6:00 a.m. to 9:00 a.m.) during the AM peak period, if year 2010 or more recent counts are unavailable. The new counts will include the same transportation modes as the PM peak period and will also be factored to a common base year (2013).
- Daily traffic counts in the study area, as available from local jurisdictions. These counts will be factored to a common base analysis year (2013).
- Physical characteristics of the existing street system, including functional use, lane geometry, traffic signal timing and phasing patterns, and other parameters necessary to conduct traffic operations analysis (such as the proximity of bus stops, speed limits, transit signal priority, presence of public and restricted on-street parking, etc.). Where available, these data will be obtained from local agencies and will be field-verified as appropriate.
- On- and off-street public parking supply and weekday parking utilization survey data will be collected within a 0.25-mile walking distance of each station and at locations where the alignment may have direct impacts to parking. Data will be obtained from the cities of SeaTac, Des Moines, Kent, and Federal Way, and augmented by field visits where appropriate. Future parking demand will be estimated from Sound Transit's Ridership model.
- Park-and-ride supply and demand data will be collected at either proposed stations or locations within a 0.25-mile walking distance of each station. Existing park-and-ride supply and demand information will be collected from King County Metro, Pierce Transit, and WSDOT, and supplemented by field visits as appropriate.

- Pedestrian volumes will be collected in areas with high pedestrian activity (including station areas, activity centers, and major non-motorized facilities), and where existing counts have been conducted by local jurisdictions. The data collection effort will be limited to the intersections identified below under "Intersections to be Studied." Pedestrian and bicycle volume data will also be collected for major non-motorized facilities near proposed station areas.
- Existing and planned pedestrian and bicycle facilities within an approximate 0.5-mile of each station area (1.0 mile for bicycle facilities) will be inventoried by either field visits or available information from agencies (such as geographic information system [GIS] data). The pedestrian and bicycle facility assessment will be based on the surrounding road system rather than a radius buffer. This inventory will include identification of school walk routes and any barriers to pedestrian or bicycle travel within each station area. The general sidewalk condition immediately surrounding station areas will be qualitatively assessed.
- Existing transit route information in the study area will be obtained from the local and regional transit agencies and compiled. This task will include information on selected routes that serve the project corridor. The bus route information will include service areas, hours of service (including schedule/frequency), reliability and passenger load. Passenger load information will be collected at selected screenline locations. Transit reliability information will be collected for selected routes at key destinations (i.e., FWTC) that serve the project corridor.
- Accident data for the most recent 3-year period will be obtained for the study area intersections (signalized and unsignalized). Accident data for roadway segments (between intersections) will be collected where at-grade or elevated light rail alternatives are running within or immediately adjacent to a roadway. These data will be collected from the local agencies and WSDOT.
- Existing truck routes and any truck restrictions will be identified; truck volume data for the SR 99 and I-5 corridors will also be collected, where available.
- Local, regional, and state agency Transportation Improvement Plans/Capital Improvement Programs or Transportation Facilities Plans, and other planned improvements in proximity to a light rail alignment or station area will be reviewed and summarized. This effort will include identification of all "committed" improvements assumed for a No-Build Alternative.

B.8 Study Area and Area of Effect

B.8.1. Geographic Coverage

The transportation analysis will include evaluation measures that consider systemwide as well as more localized impacts, which are described in more detail in the Assessment Methods and Analysis Thresholds section. Analysis of systemwide traffic impacts will address the regional effects of project alternatives on travel movements within the study area. Exhibit B-1 shows the study area within the context of the Puget Sound region. The arterial and local street analysis will focus on locations assumed to be most likely affected by the light rail alternatives. The intersections that will be analyzed are those directly affected, such as by a change in channelization or signal control, and those indirectly

affected by changes in volume as a result of trips accessing the system. These latter locations will include intersections surrounding transit stations and passenger pick-up and drop-off activity.

B.8.2. Intersections to be Studied

A list of intersection locations has been identified for analysis based on the project alternatives identified in the Alternatives Analysis phase of the project. This list, provided below by jurisdiction, is preliminary and based upon expected direct and indirect impacts of the various project alternatives. The list will be reviewed and modified as necessary with Sound Transit and local jurisdiction staff, as appropriate. A level of service (LOS) analysis will be conducted at each of the study intersections. At non-intersection locations, such as SR 99 mid-block U-turn areas, changes in traffic volumes related to traffic circulation will be evaluated to understand the magnitude of possible volume change. Sixty-two study intersections are proposed for LOS analysis, and an additional 16 short counts would be conducted. The following list illustrates the number of study intersections located within the various jurisdictions:

- City of SeaTac (4)
- City of Des Moines (12)
- City of Kent (19)
- City of Federal Way (26)
- King County (1)

A reduced number of intersections will also be analyzed in the AM peak period. The specific intersections have yet to be identified, but they would be limited to the station access locations and I-5 ramp terminal intersections.

Final confirmation of intersections to be studied will be documented in updates to this report. Exhibit B-2 shows the locations of these intersections and Table B-2 shows the jurisdiction, control type, and the proposed count period (PM peak or short).

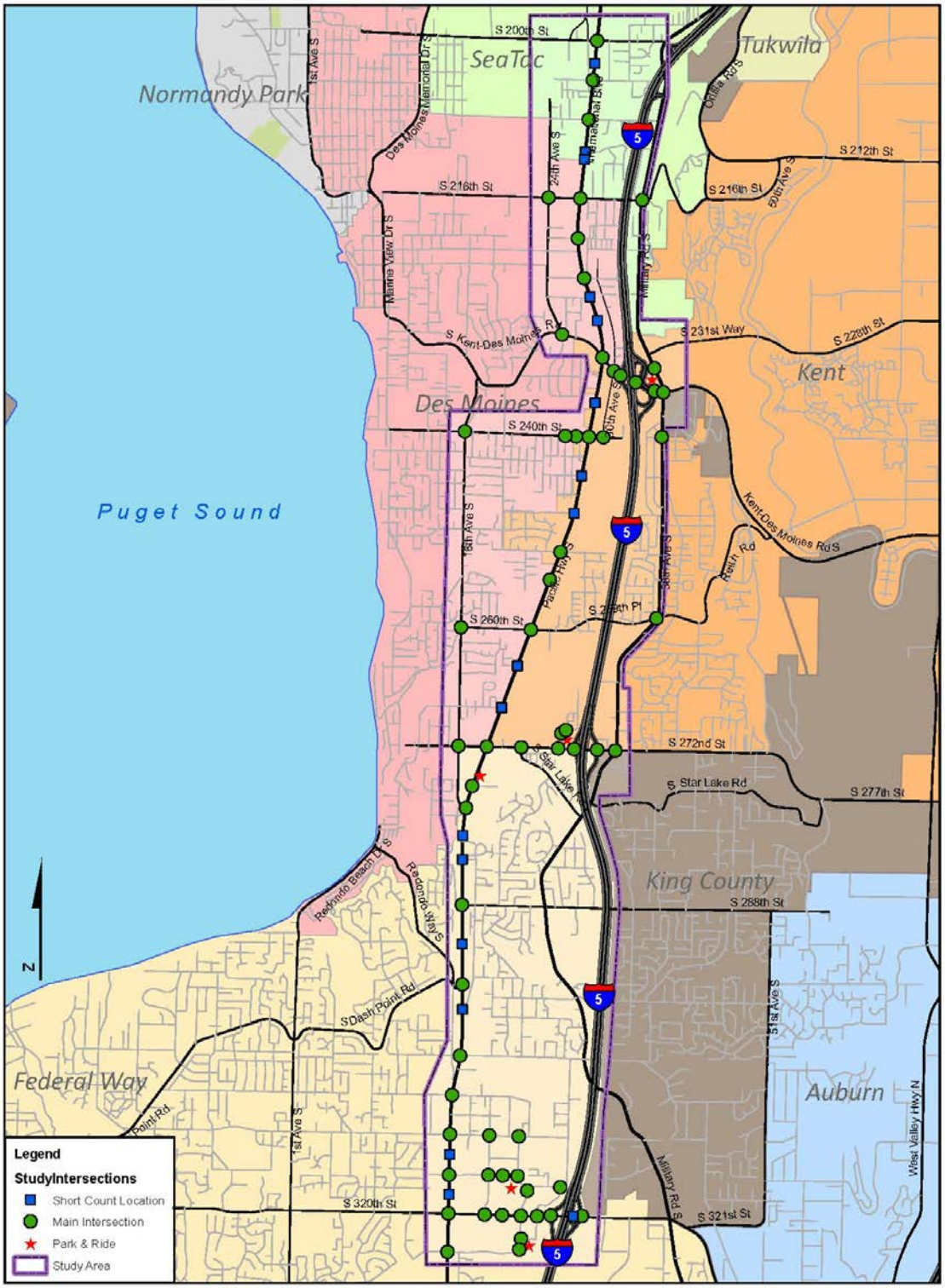

EXHIBIT B-2
FWLE Study Area Intersections

TABLE B-2

Proposed Study Intersections

ID #	North/South Street	East/West Street	Control Type	PM LOS Analysis	Short Count
City of Sea Tac					
S1	Pacific Highway S	S 200th Street	Signal	✓	
S2	Pacific Highway S	S 202nd Street	Unsignalized		✓
S3	Pacific Highway S	S 204th Street	Signal	✓	
S4	Pacific Highway S	S 208th Street	Signal	✓	
S5	Pacific Highway S	S 211th Street	Unsignalized		✓
S6	Military Road S	S 216th Street	Signal	✓	
City of Des Moines					
D1	Pacific Highway S	Business Access s/o S 211th Street	Unsignalized		✓
D2	24th Avenue S	S 216th Street	Signal	✓	
D3	Pacific Highway S	S 216th Street	Signal	✓	
D4	Pacific Highway S	S 220th Street	Signal	✓	
D5	Pacific Highway S	S 224th Street	Signal	✓	
D6	Pacific Highway S	S 226th Street	Unsignalized		✓
D7	Pacific Highway S	Business Access s/o S 226th Street	Signal		✓
D8	24th Avenue S	S Kent Des Moines Rd	Signal	✓	
D9	Pacific Highway S	S Kent Des Moines Rd	Signal	✓	
D10	30th Avenue S	S Kent Des Moines Rd	Unsignalized	✓	
D11	16th Avenue S	S 240th Street	Signal	✓	
D12	28th Avenue S/Highline College Parking Entrance	S 240th Street	Unsignalized	✓	
D13	Highline College Drop-off loop/26th Place S	240th Street	Signal	✓	
D14	16th Avenue S	S 260th Street	Signal	✓	
D15	16th Avenue S	S 272nd Street	Signal	✓	
City of Kent					
K1	Military Road S	Kent Des Moines Park-and-Ride	Unsignalized	✓	
K2	Southbound I-5 Ramps	S Kent Des Moines Rd	Signal	✓	
K3	Northbound I-5 Loop Ramp	S Kent Des Moines Rd	Unsignalized	✓	
K4	Northbound I-5 Slip Ramp	S Kent Des Moines Rd	Signal	✓	
K5	Military Road S	S Kent Des Moines Rd	Signal	✓	
K6	Pacific Highway S	S 236th Lane	Unsignalized		✓
K7	Pacific Highway S	S 240th Street	Signal	✓	
K8	30th Avenue S	S 240th Street	Unsignalized	✓	
K9	Military Road S	S 240th Street	Unsignalized	✓	
K10	Pacific Highway S	S 244th Street	Unsignalized		✓
K11	Pacific Highway S	S 248th Street	Unsignalized		✓
K12	Pacific Highway S	S 252nd Street	Signal	✓	
K13	Pacific Highway S	Fred Meyer Dwy	Signal	✓	
K14	Pacific Highway S	S 260th Street	Signal	✓	
K15	Military Road S	S 259th Street	Signal	✓	
K16	Pacific Highway S	S 264th Street	Unsignalized		✓
K17	Pacific Highway S	S 268th Street	Unsignalized		✓
K18	Pacific Highway S	S 272nd Street	Signal	✓	

TABLE B-2
Proposed Study Intersections

ID #	North/South Street	East/West Street	Control Type	PM LOS Analysis	Short Count
K19	S Star Lake Road	S 272nd Street	Signal	✓	
K20	26th Avenue S	North Star Lake Park-and-Ride Entrance	Unsignalized	✓	
K21	26th Avenue S	South Star Lake Park-and-Ride Entrance	Unsignalized	✓	
K22	26th Avenue S	S 272nd Street	Signal	✓	
K23	Southbound I-5 Ramps	S 272nd Street	Signal	✓	
K24	Northbound I-5 Ramps	S 272nd Street	Signal	✓	
City of Federal Way					
F1	Pacific Highway S	S 276th Street	Signal	✓	
F2	Pacific Highway S	S Crestview Driveway	Unsignalized		✓
F3	Pacific Highway S	16th Ave S	Unsignalized	✓	
F4	Pacific Highway S	S 283rd Street	Unsignalized		✓
F5	Pacific Highway S	S 288th Street	Signal	✓	
F6	Pacific Highway S	29300 block U-turn	Unsignalized		✓
F7	Pacific Highway S	S Dash Point Road	Signal	✓	
F8	Pacific Highway S	18th Ave S	Unsignalized		✓
F9	Pacific Highway S	S 304th Street	Signal	✓	
F10	Pacific Highway S	S 308th Street	Signal	✓	
F11	Pacific Highway S	S 312th Street	Signal	✓	
F12	20th Avenue S	S 312th Street	Signal	✓	
F13	23th Avenue S	S 312th Street	Signal	✓	
F14	Pacific Highway S	Pavilions Centre	Unsignalized		✓
F15	Pacific Highway S	S 316th Street	Signal	✓	
F16	20th Avenue S	S 316th Street	Signal	✓	
F17	21st Avenue S	S 316th Street	Unsignalized	✓	
F18	23rd Avenue S	S 316th Street	Signal	✓	
F19	23rd Avenue S	S 317th Street	Signal	✓	
F20	28th Avenue S	S 317th Street	Roundabout	✓	
F21	Pacific Highway S	S 318th Place	Unsignalized		✓
F22	Pacific Highway S	S 320th Street	Signal	✓	
F23	20th Avenue S	S 320th Street	Signal	✓	
F24	21st Avenue S	S 320th Street	Unsignalized	✓	
F25	23rd Avenue S	S 320th Street	Unsignalized	✓	
F26	25th Ave S/Gateway Center Blvd	S 320th Street	Signal	✓	
F27	Southbound I-5 Ramp	S 320th Street	Signal	✓	
F28	Northbound I-5 Loop Ramp	S 320th Street	Unsignalized	✓	
F29	Northbound I-5 Ramps	S 320th Street	Signal	✓	
F30	23rd Avenue S	S 322nd Street	Signal	✓	
F31	Pacific Highway S	S 324th Street	Signal	✓	
F32	23rd Avenue S	S 324th Street/FW 320th Park-and-Ride	Unsignalized	✓	
King County					
KC1	Military Road S	S 272nd Street	Signal	✓	

B.8.3. Screening Intersections to be Studied

All the study area intersections will be evaluated using the traffic data collected for the existing (2013) and future year (2035) No-Build conditions PM peak hour analysis. For the project alternatives (i.e., Build conditions), a screening process will be applied to each of the study area intersections, using threshold values, to identify conditions that could result in a change in the LOS at the intersection. Any intersection that has a direct (physical) geometry impact by the Build alternatives or could be indirectly impacted by the project (i.e., traffic generated at stations) will be analyzed.

No further analysis beyond the No-Build conditions will be conducted at intersections where changes in traffic volumes or other conditions in the Build alternatives are expected to be below all of the threshold values identified in Table B-3.

TABLE B-3
Intersection Analysis Screening Process

Parameter	Threshold Value	Description
Critical Volumes	5%	Forecasts indicate that the total volume for any movement between the Build alternative and the No-Build condition would exceed the threshold value.
Change in Intersection Geometry	Changes in the number of lanes (and/or designation)	Changes in intersection geometry resulting in the addition or deletion of a lane in any approach would change the capacity of the intersection and could affect LOS.
Change in Intersection Control	Traffic signal installation/modification	The addition of a traffic control device, such as a signal, or signal phasing that would affect the capacity for some traffic movements, and could change the overall LOS.
Crosswalk Lengths	Increased crossing distance	Green traffic signal time would be extended and pedestrian clearances would be longer.
Intersection LOS	Intersection operates with a delay within 10% of the agency's LOS threshold	Locations meeting the threshold criterion with the No-Build Alternative would be analyzed in the Build condition. For example, if an intersection operates at LOS E (75 seconds) in the No-Build condition and the LOS threshold is LOS E (80 seconds), the intersection is then included in the Build analysis.

B.9 Analysis Tools

This section describes the tools that will be used to conduct the transportation analysis for the EIS.

B.9.1. Travel Demand Forecasting

The transportation analysis will use two regional travel demand models to support the assessment of future conditions, which includes developing transit ridership forecasts and future roadway traffic volumes. The Sound Transit Ridership Model will be used to produce ridership forecasts, and the PSRC Regional Model will be used to calculate growth in vehicular traffic volumes to support traffic operations analysis, as well as data required for a variety of environmental analyses. Exhibit B-3 illustrates the relationship between the demand models.

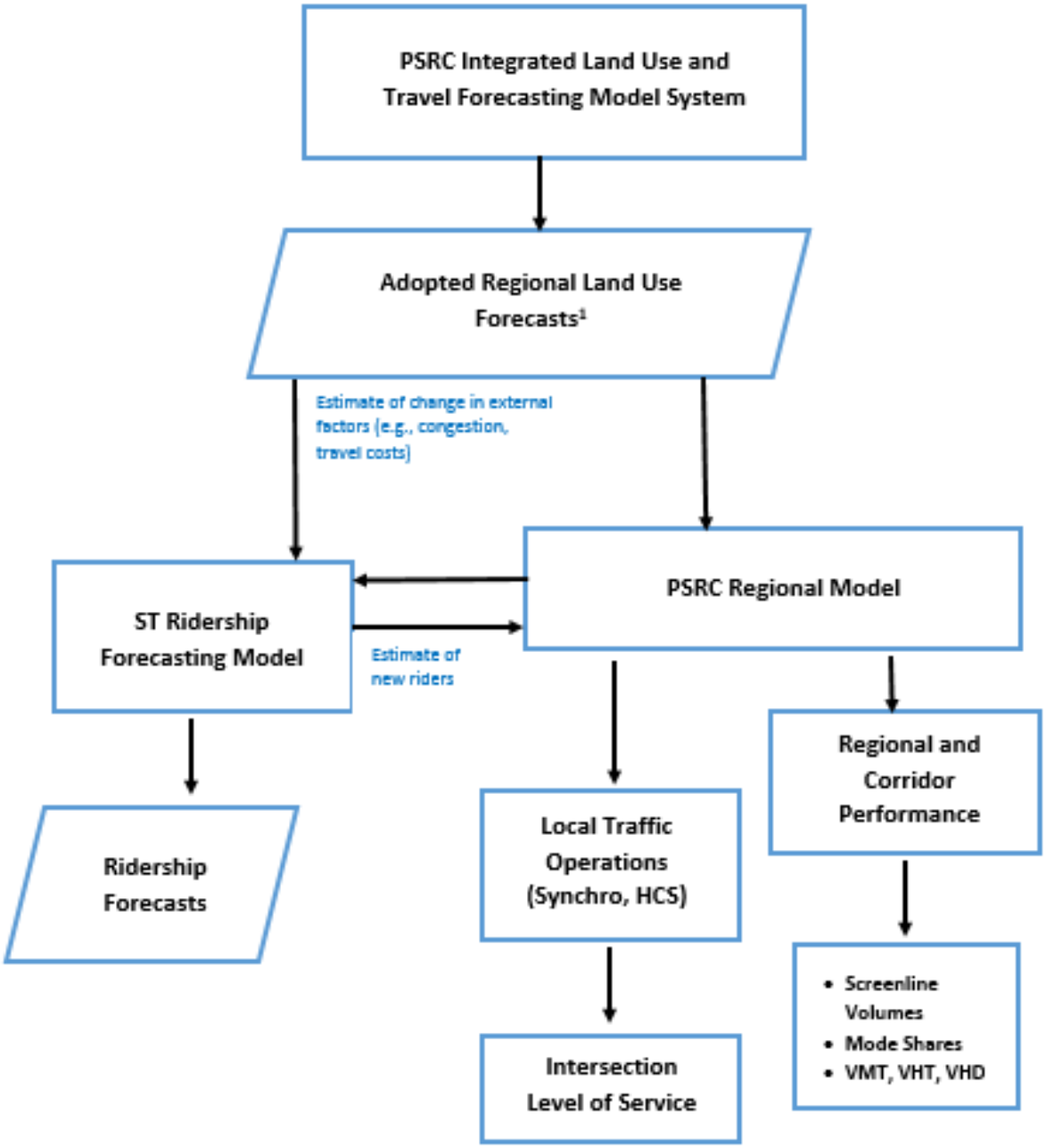

EXHIBIT B-3
FWLE Travel Demand Model Relationship

B.9.1.1. Sound Transit Incremental Ridership Model

The current version of the Sound Transit Incremental Ridership Model was developed using analytical ridership forecasting procedures developed over two decades of incremental methods applications. During this period, the methods have been subjected to substantial external review, including two independent Expert Review Panels, and two cycles of review by the FTA over the course of New Starts grant applications for Link light rail projects (FTA, 2013). The Sound Transit and PSRC modeling procedures are closely inter-related and highly complementary. The Sound Transit ridership model uses data from the PSRC modeling process to establish measures of change in external factors including population and economic growth, and highway congestion. For more detailed information about the Sound Transit Incremental Ridership Model, see the *North Corridor Transit Project Transit Ridership Forecasting Technical Report* (Sound Transit, 2010).

This current model version is 2013-based, using new land use data from PSRC, and surveys and counts data within the general incremental modeling framework. The Sound Transit model will be used to produce rail and bus ridership forecasts for use in the EIS and, if applicable, in support of an FTA New Starts application.

B.9.1.2. Puget Sound Regional Council Regional Model

The version of the PSRC model that will be used for this project is the WSDOT - Project Version model that has been developed for other major EIS documents, such as the SR 520 EIS, in the Puget Sound area. This version of the PSRC model will be updated to incorporate the most recent PSRC land use projections described as the “local target” forecasts released in summer 2013.

The PSRC model will be refined to reflect necessary network modification specific to the project corridor, such as the background projects listed in Attachment A. Additionally, the transportation network from the City of Federal Way’s travel demand model will be incorporated into the PSRC model, where appropriate. These supplemented data into the model will provide a more detailed representation of the roadway network and travel patterns in the study area.

In addition, to provide travel pattern and volume information, the model will also be used to provide input for other environmental disciplines including air quality modeling, noise analysis, greenhouse gas assessment, environmental justice analysis, and community equity evaluation. This is described in further detail in the Assessment Methods and Analysis Thresholds section of this report.

B.9.2. Traffic Operations Analysis

B.9.2.1. Synchro/SimTraffic

The study area intersections listed in Section 8 will be assessed using Synchro software (version 8.0 or later). Synchro is a traffic modeling program designed for analyzing intersection traffic operations and optimizing traffic signal timings. Synchro reports average vehicle delay, allowing calculation of LOS consistent with the *Highway Capacity Manual* (HCM) (Transportation Research Board, 2010) definitions. Synchro also estimates average and 95th percentile queue lengths.

B.9.2.2. Other Tools

Other tools that may be used include SIDRA Intersection 5.1 to analyze roundabouts within the study area. SIDRA was chosen as the preferred tool because various roundabout analysis procedures (HCM2010 or SIDRA standard capacity model) are included with the software. Additionally, mode of access tools including GIS-based determination of 15-minute walk, bicycle, and automobile "access sheds" will be used to refine the mode of access estimates.

B.10 Travel Demand Forecasting

In many instances, the methodology for analyzing a particular measure is the same across all analysis years, periods, and alternatives. However, when developing traffic forecasts, some differences exist in how the volumes are developed. This section describes the differences in methodology that will be employed depending on the condition being analyzed.

B.10.1. Ridership Forecasting

The Sound Transit Incremental Ridership Model that has been recently refined through other Sound Transit projects will be used to perform the transit ridership (bus and rail) forecasts for the future horizon year of 2035. The model will be updated to reflect the latest adopted PSRC land use projections as available.

The transit system, which includes the light rail alternatives along with adjustments to the bus service, as documented through the King County Metro and Sound Transit FWLE Project Transit Integration Plan, will be coded for the No-Build and Build alternatives. This model will produce, summarize, and display transit ridership forecasts for the No-Build and Build alternatives.

B.10.2. Existing Highway Conditions

Peak hour roadway and intersection-turning movement volumes will be compiled from traffic volume counts. These will form the basis upon which traffic volumes for the future analyses will be developed.

B.10.3. Future No-Build (Baseline) Highway Conditions

For the future No-Build conditions, growth rates derived from the PSRC Regional Model will be applied to observed traffic volume counts to develop estimated future PM peak hour and daily traffic forecasts.

B.10.4. Future Build Highway Condition(s)

The PSRC Regional Model will be used to generate traffic volumes for the Build condition based on the transit ridership forecasts developed for the project alternatives from the Sound Transit Incremental Ridership Model. The projected changes to transit demand associated with the project alternatives will be incorporated into the PSRC model to reflect travel pattern and volume effects from changes in transit ridership. This process is illustrated in Exhibit B-3. This process will be used to produce traffic volumes for the Build condition at the regional and corridor and sub-area system levels (e.g., vehicle miles of travel [VMT], vehicle hours of travel [VHT], vehicle hours of delay [VHD] and screenlines data).

For traffic volumes used in the analysis at the arterial and local level (i.e., intersection analysis near park-and-ride lots), the traffic volumes for the No-Build condition will be used as a base, with additional volumes added to reflect traffic anticipated to be generated by the given facility. This is explained further in the Assessment Methods and Analysis Thresholds section.

B.10.4.1. Station Area Trip Generation

Information on trip generation for the light rail transit stations will be developed from the Sound Transit Incremental Ridership Model and will be assigned to various modes of travel (auto [park-and-ride or drop-off/pick-up], bus transfer, or walk/bike) based on a combination of sources: Sound Transit's ridership model, data from the 2008 BART [Bay Area Rapid Transit] Station Profile Study (BART, 2008), and data collected from existing Sound Transit rail stations, such as the Tukwila park-and-ride station, (Sound Transit, 2012).

The BART study is a comprehensive mode of access and egress survey of BART rail users in the San Francisco Bay area. This survey characterized the different modes people choose to access and depart from the stations such as walking, bicycling, driving alone, driving with others, being dropped off, using a transit transfer, or other modes. This information is presented by each station type, which is based on the type of station facilities provided and the surrounding land uses. By Year 2035, Sound Transit's light rail system will have been in operation for decades and had substantial expansion reflecting characteristics similar to BART. Therefore, BART data for similar station types to the FWLE stations will be used in the mode of access assignment. Information on bus service for each station will be developed by Sound Transit and King County service planners as part of the planning-level transit service integration plan. This plan includes changes in local transit circulation to and from the station area, which will be incorporated into the overall trip generation.

The vehicle and pedestrian trips associated with the light rail station ridership forecasts for the alternative with the highest ridership at that station will be used for evaluating the station area effects. Exceptions may be made at locations where there are substantial differences between alternatives (e.g., one has a park-and-ride, and one does not); in these cases, two different scenarios may be evaluated at affected locations. For stations with a park-and-ride facility, the trip generation that is used for the traffic analysis will assume that the park-and-ride lot is full. This provides a conservatively high estimate of automobile trips at each station. The automobile traffic volumes will be added to the future No-Build Alternative traffic volumes as the basis to analyze the build alternatives. This yields a conservatively high forecast of automobile trips for the Build alternatives because it does not reflect a shift to transit as people replace their vehicle trip and use light rail. Trips will be assigned to the pedestrian and vehicular networks around the station locations based on existing and anticipated future circulation patterns.

B.10.5. Construction Condition

The effect of construction on traffic operations will be mainly evaluated in a qualitative manner, although some analysis at spot locations may be conducted where appropriate. Traffic volumes in this

instance would be estimated by extrapolating the existing year volumes to the year that best reflects the construction period conditions.

B.11 Assessment Methods and Analysis Thresholds

This section discusses the methodology used to understand the transportation effects of the No-Build Alternative and the Build alternatives (including all alignment options and station locations). It also describes the methodology used to determine direct and indirect (long term/operational and construction), as well as cumulative impacts on transportation.

The transportation analysis that will be presented in the Transportation Chapter and Transportation Technical Report of the EIS will be divided into three levels – Regional, Corridor and Sub-Area, and Arterials and Local Streets. Within these three levels a variety of criteria will be analyzed and documented. Table B-4 provides a summary list of the transportation analysis criteria by assessment level.

TABLE B-4
Transportation Criteria by Assessment Level

Assessment Level	Type of Analysis	Criteria
Regional	Transit	System-wide annual and daily transit trips and boardings, total annual and daily light rail boardings.
	Traffic	Growth rate, VMT, VHT, VHD.
Corridor & Sub-Area	Transit	Project-wide daily transit trips, project-wide daily transit trips by transit-dependent population, station area boardings, travel times.
	Traffic	Screenline volume, volume-to-capacity ratio, mode share.
Arterials and Local Streets	Transit	Effects on local transit patterns and circulation, reliability, and access to proposed station locations.
	Property Access/Circulation	Traffic patterns, street closures, property access modifications.
	Intersection	Intersection LOS, delay and queue lengths.
	Safety	Historical intersection and roadway accident type and frequency. Safety assessment of effects on auto, freight, transit, and non-motorized modes.
	Parking	Station areas and spillover potential, on-street public parking supply and utilization, parking impacts.
	Non-Motorized	Pedestrian and bicycle access, circulation and gaps surrounding stations, barriers, Americans with Disabilities Act accessibility, school walk route impacts.
	Freight	Identify freight routes and impacts, impacts to business loading zones and access.
	Construction	Mainly qualitative impacts to traffic, property access, non-motorized and parking. Estimation of construction-related traffic, truck routes and staging areas.

B.11.1. Regional Transportation System

B.11.1.1. Regional Transit

Evaluation Criteria

The following criteria will be considered for assessing effects of the project on regional transit for the design year 2035:

- Annual and daily transit trips for each Build alternative, compared to the No-Build alternative (the currently-assumed 2024 ST2 transit system, see Attachment A for transit project list).
- Annual transit boardings for each Build alternative compared to the No-Build alternative.
- Annual and daily system-wide Link boardings associated with each corridor alternative.
- Annual total system-wide Link transit rider with each FWLE Build alternative ('Guideway Riders' in the FTA cost-effective measure under the 2013 FTA Policy Guidance for New Starts and Small Starts).

Evaluation Approach

As described earlier, the Sound Transit Ridership Model will be used to produce data related to regional transit forecasts associated with the Build alternatives. The model will be coded to reflect the project alternatives and then run to produce summary data tables. Ridership data will be provided as direct outputs from the ridership model. Annual ridership estimates will be produced using a consistent annualization factor established from current Link ridership consistent with other ongoing Sound Transit ridership evaluations.

B.11.1.2. Regional Traffic

Evaluation Criteria

Information from the project's PSRC model will be the key data source for this analysis. The following types of data will be produced for design year 2035 to gauge the effect of the project alternatives on regional or system-wide traffic characteristics:

- Traffic growth rate – the annual growth rate for vehicle traffic in the FWLE study area.
- VMT—Total average daily vehicle miles traveled on the regional highway system.
- VHT—Total average daily vehicle hours traveled on the regional highway system.
- VHD—Total average daily vehicle hours of delay on the regional highway system, which indicates the total level of congestion on the highway system.

Evaluation Approach

Information from the PSRC Regional Model will be used to generate the No-Build Alternative and Build alternative(s) VMT, VHT, and VHD data. This model will be run in an iterative process with the Sound Transit Incremental Ridership Model, with highway traffic volumes reflecting changes in transit ridership and the ridership model reflecting changes in highway travel times. Matrices of vehicle trips

and travel time per trip will be used to quantify estimated VHT, and matrices of vehicle trips and hours of delay per trip will be used to quantify the impact of project alternatives on VHD.

B.11.2. Corridor and Sub-Area System

The methodology proposed for the corridor and sub-areas are intended to be applied as consistently as possible throughout the study area.

B.11.2.1. Traffic

Evaluation Criteria

Criteria used to evaluate effects within a corridor and/or sub-area of the study area will be based on a screenline-level analysis. Screenlines are imaginary lines drawn across one or more roadways to compare aggregate changes in traffic conditions. Data that will be included for each screenline are as follows:

- PM peak hour and daily vehicle volumes;
- Vehicle volume to capacity (v/c) ratios (possibly converted to a generalized LOS); and
- Mode share—person mode split between transit and automobile.

Evaluation Approach

The analysis of traffic impacts in various segments of the corridor will involve comparing traffic conditions on the highway and local street system at selected screenlines for each alternative. The screenline comparisons will provide a snapshot of traffic operations along each corridor. A map and table will be used to present data at three identified screenline locations. The three screenlines, shown in Exhibit B-4, are as follows:

- Screenline 1—Between S 200th Street and SR 516
- Screenline 2—Between SR 516 and S 272nd Street
- Screenline 3—between S 272nd Street and S 317th Street

Information for each screenline will be generated from the project's PSRC model and Sound Transit's ridership model and include PM peak hour and daily values.

B.11.2.2. Transit

This section describes the corridor and sub-area analyses that will evaluate projected changes to transit services by the Build alternatives.

Evaluation Criteria

The following evaluation criteria will be considered to understand the corridor and sub-area affects in transit service for design year 2035:

- Daily project-wide transit ridership—Daily project-wide (in-bound boardings and out-bound alightings) ridership by Build alternative. For the No-Build Alternative, corridor daily bus ridership will be estimated. The number of new riders will also be estimated based on the number of system-

wide transit riders between the No-Build and Build conditions. Project-wide ridership forecasts may also be produced by transit-dependent population.

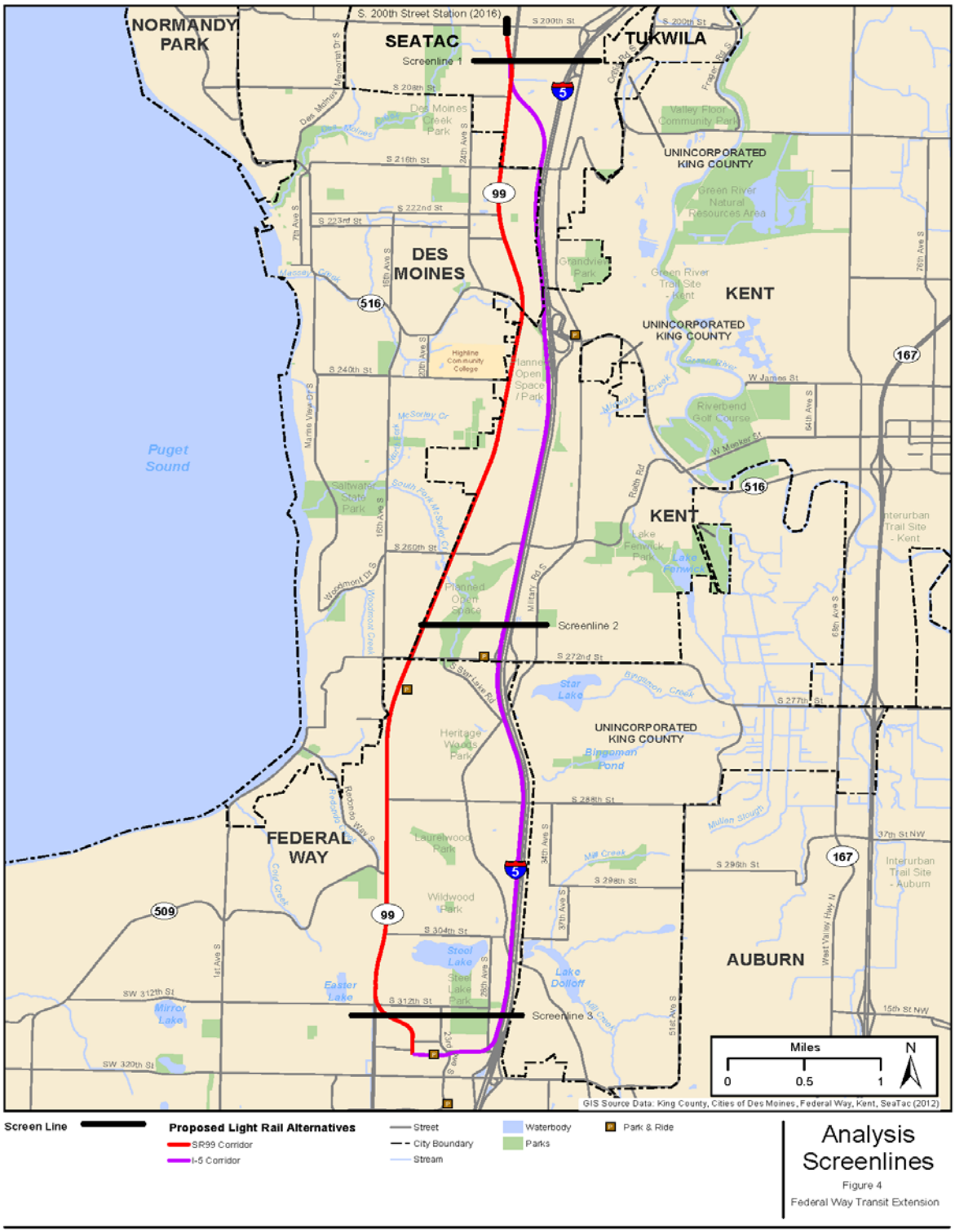

EXHIBIT B-4
FWLE Screenline Locations

- Station Area Boardings — Daily and PM peak period station boardings by alternative will be produced from the Sound Transit Incremental Ridership model. Each alternative will have a specific transit integration plan and parking capacity developed. Transit travel times (light rail and bus) within the FWLE corridor and other key areas.

Evaluation Approach

As described earlier, the Sound Transit Incremental Ridership Model will be used to produce ridership data related to the FWLE corridor and sub-area transit forecasts with the Build alternatives. Ridership will be estimated for both the PM peak and daily periods.

B.11.3. Arterial and Local Street System

The methodology proposed for the assessment on the surface streets is intended to be applied as consistently as possible throughout the FWLE study area. The surface street system focuses on transit and intersection operations and safety, but also includes impacts on property access/circulation, parking, non-motorized facilities, freight movement, and construction.

B.11.3.1. Transit

The transit quality of service assessment will analyze the expected project effects on the existing and future bus and light rail services within the FWLE study area using both qualitative and quantitative information. The approach will follow the methodology and guidelines presented in the *Transit Capacity and Quality of Service Manual* (TRB, 2003). Transit quality of service information will either be reported at the screenlines, or at station areas within the FWLE study area.

Evaluation Criteria

The evaluation will document the transit service effects for existing conditions and No-Build and Build alternatives. This will include:

- Service coverage and circulation
- Transit level of service for:
  - Service frequency by transit line, at station areas, PM peak hour
  - Hours of service by transit line and station area pairs, daily, for entire study area
  - Passenger load by transit line, PM peak hour, at screenlines identified in Exhibit B-4
  - Reliability by transit line, at station areas, PM peak hour

Evaluation Approach

Expected changes in transit service and routing under the Build alternatives will be identified and compared to the transit service and routing under No-Build conditions. These changes will be developed in conjunction with King County and Sound Transit service planners as part of the project's transit integration plan. The comparison will focus on changes in coverage area and potential effects on speed and reliability (based on existing reliability information from the transit agencies, traffic operations results, and/or other traffic analysis data). Passenger load data will be provided from the Sound Transit Incremental Ridership Model.

B.11.3.2. Property Access and Local Circulation

This evaluation will assess local area traffic circulation impacts including access to properties affected by the Build alternatives. The focus will be on impacts during both project construction and operations.

Evaluation Criteria

The evaluation will document any physical change to the traffic patterns and movements along with changes in property access.

Evaluation Approach

This assessment will include such factors as:

- Effect of potential street closures on localized traffic movement;
- Loss of access (such as left turns) to and from driveways for below-grade and elevated light rail alternatives; and
- Changes in property access.

B.11.3.3. Intersection Operations (including Station Area Traffic Analysis)

Evaluation Criteria

Effects on intersection operations will be evaluated based on the design year 2035 PM peak hour intersection LOS. LOS measures the quality of traffic operations at an intersection. As described in Table B-5, LOS ratings range from "A" to "F." LOS A represents the best operation and LOS F the poorest operation. Queue lengths will be reported at intersections that operate at or below (failing) the agency's LOS threshold.

TABLE B-5
Level of Service Definitions for Signalized and Unsignalized Intersections

LOS	Average Control Delay (seconds per vehicle)		Traffic Flow Characteristics
	Signalized Intersections	Unsignalized Intersections	
A	≤ 10	≤ 10	Virtually free flow; completely unimpeded.
B	> 10 and ≤ 20	> 10 and ≤ 15	Stable flow with slight delays; less freedom to maneuver.
C	> 20 and ≤ 35	> 15 and ≤ 25	Stable flow with delays; less freedom to maneuver.
D	> 35 and ≤ 55	> 25 and ≤ 35	High density but stable flow.
E	> 55 and ≤ 80	> 35 and ≤ 50	Operating conditions at or near capacity; unstable flow.
F	> 80	> 50	Forced flow; breakdown conditions.

Source: TRB, 2010.

Agency Thresholds

As part of each agency's comprehensive planning efforts, agency transportation goals and LOS standards are developed. Although each agency accepts different levels of congestion, a delay-based intersection LOS analysis is typically conducted and is proposed for this project. Delay is expressed in

terms of average delay (in seconds), per vehicle, experienced as a result of the intersection operations. Overall, if an intersection's operations are equal to or better than the agency's LOS standard with the Build alternative, then that intersection is considered to meet the agency's standard and does not require mitigation. In situations where the intersection already operates worse (e.g., LOS F) than the agency's LOS standard in the No-Build alternative, then mitigation is only required if the intersection delay and/or LOS noticeably degrades further with the Build alternative. This is further described in the Mitigation Measures section of this report. The LOS standard(s) for each agency is summarized in Table B-6 and described in the following sub-sections.

TABLE B-6
Agency LOS Standards within the FWLE Study Area

Agency	LOS Standard Used for Project Evaluation
Washington State Department of Transportation	LOS D for highways of statewide significance (HSS) LOS E/mitigated for regionally significant state highways (non-HSS)
City of SeaTac	LOS E for principal and minor arterials LOS D for collector and lower classification streets.
City of Des Moines	LOS D for signalized intersections or Xc less than 1.0 with the following exceptions (with their LOS threshold) along Pacific Highway South (SR 99): • S 216th Street (LOS F) (Xc<1.0 standard) • Kent Des Moines Road (LOS F) (Xc<1.2 standard) • S 220th Street (LOS E) (Xc<1.0 standard) • S 224th Street (LOS E Xc<1.0 standard)
City of Kent	LOS E for non-SR 99 intersections. LOS F for all SR 99 intersections
City of Federal Way	LOS E for signalized intersections and a volume to capacity (v/c) ratio less than 1.0 for major arterials At unsignalized intersections, a volume to capacity ratio less than 1.0 for unsignalized intersection lane groups is required.
King County	LOS E for signalized and unsignalized intersections

Sources: City of Des Moines, 2009; City of Kent, 2008; King County, 2001; WSDOT, 2010.

Note: For intersections that have approaches with multiple roadway classifications, the LOS threshold for the higher classified roadway will apply (i.e., for an intersection between a principal arterial and a collector arterial, the LOS threshold for the principal arterial will apply).

Washington State Department of Transportation

For state Highways of Statewide Significance (HSS), such as I-5 and portions of SR 99, the operating threshold in urban areas is LOS D. For regionally significant state highways (non-HSS), such as SR 99 (north of SR 509 extension) and SR 516 (Kent Des Moines Road), the operating threshold is LOS E, meaning that congestion should be mitigated when the PM peak hour LOS falls below LOS E (i.e., LOS F).

For corridors such as SR 99, where it is a state facility but local agencies also established LOS standards, the LOS standards for both agencies will be documented.

City of SeaTac

The City of SeaTac maintains a LOS E threshold for signalized intersections on principal or minor arterials, and LOS D on collector and lower classification streets. Within the study area, a LOS policy

exception, where the City of SeaTac allows LOS F operations, is at the S 200th Street and International Boulevard intersection.

City of Des Moines

Signalized intersection operations within the City of Des Moines are expected to operate at LOS D or an Xc<1.0[1], with exceptions for selected intersections along major arterials and in the Marina District. These intersections may operate at LOS E or LOS F. The following locations within the study area are allowed to operate at LOS F or LOS E:

- S 216th Street and Pacific Highway S (LOS F, Xc<1.0)
- Kent Des Moines Road and Pacific Highway S (LOS F, Xc<1.2)
- S 220th Street/Pacific Highway S (LOS E, Xc<1.0)
- S 224th Street/Pacific Highway S (LOS E, Xc<1.0)

City of Kent

The City of Kent uses roadway corridors to evaluate LOS and then develops a corridor-wide average based on a weighting of the corridor intersection volumes. The City has a total of 16 analysis corridors, of which the following three are in the Federal Way Link Extension study area:

- Pacific Highway South – S 240th Street to S 272nd Street
- Military Road – S 231st Street to S 272nd Street
- S 272nd Street – SR 99 to Military Road

The City has set their LOS standard so that corridors operate at LOS E or better. However, the City provides an exception along Pacific Highway, which is allowed to operate at LOS F. These LOS thresholds along the corridor will be applied to individual intersection operations as part of the project's evaluation.

City of Federal Way

The City of Federal Way goal is to maintain LOS E or better at intersection operations and arterials operating at a v/c ratio better than 1.0. For unsignalized intersections, the City requires a v/c ratio of less than 1.0 for all approaching lane groups.

King County

The King County goal is to maintain LOS E or better at signalized and unsignalized intersections in urbanized areas within the FWLE study area.

Evaluation Approach

Level of Service Analysis

Synchro (version 8.0) software will be used to determine the projected 2035 PM peak hour LOS at signalized and unsignalized intersections identified in Table B-1, under "Intersections to be Studied."

The HCM report from the Synchro software will be used to summarize average intersection delay, LOS, and v/c ratios. The signalized intersections LOS will be defined in terms of average intersection delay. The LOS at an unsignalized intersection is also defined in terms of delay, but only for the worst operating movement, which is typically on the minor street (i.e., stop) approaches. For unsignalized intersections that are stop-controlled on each approach, the average intersection delay is reported. Vehicle queue lengths will be reported from Synchro for intersections that operate at or below (failing) the agency's LOS threshold to understand if the project alternatives extend vehicle queues beyond the turn movement storage length.

Default assumption values for the analysis will be developed for intersections where actual values are not available. These will include assumptions with respect to saturation flow rates, geometry, traffic, and signalization conditions. Table B-7 provides assumptions for existing and future year (No-Build and Build alternatives) input values and assumptions when data are not available.

TABLE B-7
Default Synchro Parameters and Assumptions

Arterial Intersection Parameters	Analysis Year	
	Existing Year 2013	Design Year 2035
Peak Hour Factor	From count and for entire intersection, otherwise: If Total Entering Vehicles ≥ 1000, 0.92 If Total Entering Vehicles<1000, 0.90	Use 0.95 for all intersections except where existing Peak Hour Factor (PHF) is greater than 0.95 or less than 0.70. Use existing PHF in cases where the PHF is greater than 0.95. If existing PHF is less than 0.70, then increase factor by 0.20.
Conflicting Cyclists and Pedestrians per Hour	From traffic count, otherwise assume 10 pedestrians/cyclists in both AM and PM periods	For the No-Build Alternative, apply growth rate from adjacent street to existing volumes. For the Build condition, add the number of pedestrians based on the station ridership and mode of access forecasts.
Area Type	"Other" for all areas	Same as existing
Ideal Saturation Flow (for all movements)	1,900 vehicles per hour	Same as existing
Lane Utilization	Default software assumptions unless data/ engineering judgment suggests otherwise	Same as existing
Lane Width	Existing lane widths. Assume 12 feet if no information available.	Same as existing, unless improvements proposed; then use agency standards/plans.
Percent Heavy Vehicles	From count, otherwise 3%	Same as existing
Percent Grade[a]	Flat approach = 0% Moderate Grade on approach = 3% Steep grade on approach = 6%; Or from field/elevation data	Same as existing
Parking Maneuvers per Hour	Based on parking regulations. For less than 15-minute parking, assume 4 maneuvers per hour; otherwise, assume 1 maneuver per hour, unless data/information gathered or provided from agencies suggest otherwise.	Same as existing. For new parking, assume existing assumptions for maneuvers based on parking durations.
Bus Blockages	Headway information provided by transit agencies	Use future service assumptions developed by King County Metro, Pierce Transit, and Sound Transit as part of the Transit Service Integration Plan.
Intersection Signal Phasing and Coordination	From agency signal phasing sheets or their existing analysis files	Same as existing. For timing adjustments: Left turns, if permitted in existing, will be examined for a protected phase

TABLE B-7
Default Synchro Parameters and Assumptions

Arterial Intersection Parameters	Analysis Year	
	Existing Year 2013	Design Year 2035
		based on LOS, access/geometry, safety and agency guidance. For Build: Any left-turn conflict with at-grade light rail will include a separate lane and have protected phasing. Left turns will be restricted (or protected with a gate or similar treatment) at unsignalized intersections. For elevated light rail, mid-block left turns will be restricted.
Intersection Signal Timing Optimization Limits	Not applicable	Between 60 to maximum of 150 seconds
Minimum Green Time	Not applicable	Based on pedestrian times (minimum of 7 seconds walk time and 3.5 feet per second for flashing don't walk [FDW] clearance). If no crosswalk: 10 seconds
Yellow and All Red Time	Not applicable	New signals: (Y) = 4 seconds and (R) = 1 second
High-occupancy Vehicle (HOV) Lanes	Lane Utilization Method[b]	Same as existing
Right Turn on Red	Allow	Same as existing
Right Turn Overlaps	Signal timing plans	Identify if used
Vehicle Queue Lengths	Based on 25 feet per vehicle	Same as existing

Note: Delay-based LOS results will be reported from Synchro's HCM 2000 Reports.

[a] Percent grade assumed for at-grade intersections only.

[b] This methodology assumes intersection lane designations will be coded exactly as shown in the field. Shared through (HOV) and right turn lanes will be coded as a general purpose traffic lane because Synchro does not have a special method for HOV lane analysis. To account for lower HOV lane volumes, the lane utilization factors will be adjusted accordingly to reflect this condition.

B.11.3.4. Safety

Potential effects of the project on safety will be assessed quantitatively and qualitatively for all modes within the study area including general traffic, transit, freight, bicycle, and pedestrian modes.

Evaluation Criteria

Evaluation criteria could include the following:

- Intersection and roadway accident histories (type, severity, and frequency); and
- Qualitative effects on general purpose traffic, transit, freight, and non-motorized safety.

Evaluation Approach

A quantitative safety analysis will be used to assess accidents/crashes currently occurring within the project limits in terms of type, severity, and frequency.

Accident data from the latest 3 years will be compiled and summarized to identify any current safety deficiencies. Unique accident patterns (e.g., high frequency of a specific pattern) will be noted. The accident data will be collected for any directly affected local intersections and roadways. An intersection and roadway safety analysis will be conducted only where the Build alternatives are proposed to be either at-grade in semi-exclusive right-of-way, elevated within or immediately adjacent to the road right-of-way, or results in a physical change to a roadway. Along these streets, a qualitative

discussion of how the project may affect the existing accident type and frequency will be developed and documented.

Within the roadway right-of-way, safety effects on road-based and freight travel will be assessed based on projected changes in traffic volumes and critical queue lengths, modal conflicts, and roadway design guidance. Safety effects on bicycle and pedestrian travel will also be assessed based on change in the number of conflicts with motorized modes, as well as change in facilities provided for their travel. This assessment will include consideration of school walk routes and school bus zones.

No accident analysis or safety assessment for alternatives proposed to operate outside the roadway right-of-way (exclusive right-of-way) will be conducted.

B.11.3.5. Parking

Demand for parking will likely vary depending on location throughout the study area, with relatively high demand at park-and-ride facilities along the I-5 corridor including Kent/Des Moines, Star Lake, and Federal Way Transit Center, and Highline College; moderate demand along SR 99, including Redondo Park-and-Ride; and some on-street demand in the residential neighborhoods within the study area. The Angle Lake station (opening in 2016) would also provide a parking garage with up to 700 parking spaces and ancillary, temporary parking with up to 400 spaces. As part of the Draft EIS alternatives, station parking capacities and locations will be defined.

Evaluation Criteria

Analysis of the impacts of light rail on existing on-street and off-street public parking will focus on the light rail station areas that provide parking and the effects of the light rail alignments on existing on-street and off-street parking supply.

Evaluation Approach

The evaluation of parking impacts will include an inventory of parking supply and utilization in locations where parking is anticipated to be affected by the project and then assessed compared to the changes the alignments may have on the parking supply and forecasted demand at the stations.

Inventory of Parking Supply and Utilization

The analysis of light rail effects on existing patterns of on-street parking supply and demand will generally be limited to one block on either side of the proposed light rail alignments. A parking inventory and utilization survey will be conducted for all potential rail alignments that are within the road right-of-way. At station areas, parking inventory and utilization surveys will be conducted within 0.25 mile (walking distance) of each station area. Within this area, an inventory of existing on-street and off-street public parking spaces will be developed.

Inventory data will be stratified by type of parking (i.e., time-limited parking, free parking, loading zone, private, etc.) and location (i.e., block face). Where available, data from local agencies will be used to initiate the inventories near the light rail alignments and station locations. Where data are not available from local agencies, data will be collected through field surveys. Data will include a space

occupancy count by block face or lot taken once during weekday mid-morning or mid-afternoon hours. This time period represents typical conditions for parking demand.

Assessment of Parking Impacts

The assessment of parking loss will be based on review of the inventory of parking supply and demand coupled with an evaluation of the conceptual drawings for each Build alternative. Comparison between existing demand and the supply remaining after construction of each Build alternative will form the basis for identifying parking loss associated with each alternative. This comparison will also address the potential significance of that loss in relation to parking utilization, and will facilitate the identification of possible mitigation strategies. The loss of existing parking spaces will be stratified by both location and type.

At stations with a park-and-ride lot, demand in year 2035 will be estimated at an aggregate level for the project corridor area based on the Sound Transit Ridership Model and then allocated to individual stations based on an assessment of the GIS-based calculated 15-minute automobile "access shed" (an access shed of 25 minutes will be used for Federal Way Transit Center Station because it will be the terminus of the line). This estimate will be combined with an assessment of the physical and policy-related potential for parking at a given location. The estimated park-and-ride demand will then be compared to the proposed supply to determine the potential for spillover parking impacts on the surrounding area.

B.11.3.6. Non-motorized Facilities and Modes

The alternatives will be qualitatively assessed regarding existing and future non-motorized (pedestrian and bicycle) facilities. Specific issues to be assessed include the following:

- Pedestrian access and circulation in the vicinity of the proposed station in relation to the forecasted ridership.
- Direct (physical) effects on pedestrian and bicycle facilities along the alignment of each alternative. This would include identifying any barriers the Build alternative may create to non-motorized movements.
- Identification of existing physical barriers for non-motorized (pedestrian and bicycle) movements accessing proposed stations.
- Identification of missing existing and funded sidewalk sections for city arterials within 0.5 mile (walking distance) of proposed station locations.
- Impacts on recommended school walk routes.
- Identification of deficiencies in the existing and funded regional bicycle paths and routes within 1.0 mile of proposed station locations, and a general quantification of how major multi-use trails/paths are used (i.e., by commuters or recreational users).

A pedestrian LOS analysis will also be conducted for sidewalks at intersections within one block (approximately 300 feet) of each proposed station entrance (the study area may exceed one block or

300 feet from the station depending on the location of transfer points or nearby pedestrian generators). The Transit Capacity and Quality of Service Manual and HCM methodology for determining sidewalk LOS will be used for this analysis. This methodology produces a score that indicates the pedestrian's perception of the travel experience, and is based on the average pedestrian space and average flow rate.

B.11.3.7. Freight

Evaluation Criteria

Evaluation criteria may include the following:

- Change in congestion levels and/or travel speeds along identified freight facilities/routes; and
- Physical impacts on truck loading zones or access to local businesses.

Evaluation Approach

Impacts of the Build alternatives on freight movements will be qualitatively assessed. This assessment will focus on truck movement and truck routing impacts because freight rail corridors do not exist in the study area. The assessment of truck issues will focus along major truck routes (including I-5 and SR 99) and truck service areas, access to these facilities and areas, and loss of on-street loading zones and/or modifications of truck access to local businesses.

B.11.3.8. Construction

Evaluation Criteria

Two primary sources of construction impacts on traffic will be considered:

- Assess potential impacts on traffic operations, property access, non-motorized travel, and parking supply related to potential road, sidewalk, bicycle, or other transportation facility closures during construction; and
- Assess potential impacts of construction-related traffic on traffic operations.

Evaluation Approach

The assessment of construction-related traffic impacts will focus primarily along I-5, SR 99, principal and minor arterials, or on streets that could be significantly affected by construction with any of the Build alternatives. For the purposes of impact assessment, the construction stage considered to be most disruptive to traffic operations in the corridor will be the one evaluated in the most detail. This stage will be identified in coordination with Sound Transit staff and staff from local jurisdictions, as appropriate.

Construction analysis will consider the following:

- Changes in roadway capacity including potential lane closures, parking restrictions, pedestrian or bicycle facility impacts, alignment shifts, areas of construction activity adjacent to travel lanes, or other reductions to capacity as a result of project construction activity
- Impacts on transit and emergency services

- Impacts on school transportation services during construction
- Impacts on- and off-street public parking supply
- Identification of potential construction staging areas, including access and impact on roadway operations
- Identification of potential construction access and truck routes and the impact of construction-related traffic on these routes
- Assessment of potential for neighborhood traffic intrusion related to road closure and options for traffic detour
- Estimation of construction truck traffic
- Development of mitigation measures

The analysis will be summarized in a tabular format to identify the following:

- Impact location(s).
- Street characteristics.
- Type of construction activity, including likely duration of impact (short-term versus long-term).
- Level of construction traffic (characterized as high, moderate, or low). High truck traffic is generally associated with major fill, excavation, and concrete work.
- Full or partial road closures.
- Availability of detour routes.
- Potential for detoured traffic to affect a residential neighborhood. (This is characterized as high, medium, or low and is related to both potential for road closure and options for traffic detour.)
- Loss of on-street and off-street public parking. (This may be characterized as “yes” for parking loss and “no” for no parking loss. Additionally, there may be some temporary loss of off-street parking as a result of the location and operation of construction staging, as well as construction worker parking.)

B.11.4. Indirect Effects

Indirect effects are those project effects that occur later in time or some distance from the project. Typical indirect effects are those associated with changes in land use development patterns, typically consistent with adopted plans and zoning, and associated with changes in transportation accessibility over time. These effects are described in the land use and specific resource reports, but the potential changes in transportation access that could lead to these effects will be discussed qualitatively in the Transportation Technical Report.

B.11.5. Cumulative Effects

The analysis of future traffic and transit impacts of the project will be cumulatively assessed based on the results of traffic modeling and ridership modeling that incorporates past and future approved and substantially funded actions, as well as projected growth that would result from development in the region.

The assessment of additional cumulative transportation effects will include a qualitative evaluation and discussion of reasonably foreseeable future actions that could interact with the project alternatives, and that were not included in the traffic modeling. These may include, but are not limited to, consideration of effects from actions such as the following:

- Highway/lane management, such as from the implementation of tolls on state and/or local facilities, that could further alter travel behavior in the corridor, such as with the "SR 167, SR 509, and I-5 Puget Sound Gateway Project."

  The Puget Sound Gateway Project, which includes portions of the previous SR 509 and SR 167 Extension projects along with tolling of I-5, is currently undergoing a feasibility analysis by WSDOT and will require its own NEPA process before the program can advance into preliminary and final design. Because of its lack of environmental documentation and funding, the Puget Sound Gateway Project is being considered a part of the cumulative effects for this project.
- Construction activities from other transportation projects that could affect or be influenced by the project construction activities.
- Local developments and public infrastructure projects that could contribute to cumulative traffic delays on local arterial streets over the construction period.

B.11.6. Transportation Data Developed for Use by Other Disciplines

B.11.6.1. Air Quality Effect Analysis Data

To support the air quality effect analysis, the following types of data will be produced for the documented conditions listed in Section 5:

- PM peak hour traffic volumes and vehicular class data (i.e., heavy vehicle percentage) for all roadway intersections that will be affected by changes in travel and traffic patterns caused by project alternatives.
- Daily VMT estimates by speeds for two areas: Federal Way Link Extension study area, and the regional system. These estimates will be provided in a tabular format for greenhouse gas analyses.
- LOS at affected intersections.
- The above information will be provided for existing conditions and the design year (2035), and the design year information will be extrapolated to 2040 for air quality conformity analyses.

B.11.6.2. Noise Effect Analysis Data

To support the noise effect analysis, the following types of data will be produced:

- Existing and design year (2035) PM peak hour Synchro model files and general system-wide vehicle classification information (i.e., heavy vehicle percentage).

B.11.6.3. Energy Effect Analysis Data

Energy effects will be calculated for operational and construction phases of the project. To determine operational energy effects, the following types of data for year 2035 will be produced:

- Daily regional VMT and VHT; and
- Daily light rail transit VMT.

B.11.6.4. Environmental Justice and Social Impact Analysis Data

To support the environmental justice and social impact analysis, a variety of data will be produced, including the following:

- Estimated travel sheds as determined by using the travel demand model to identify transportation analysis zones relevant to environmental justice and social impact analysis.
- Estimated travel times to selected destinations (e.g., Sea-Tac Airport, Seattle central business district, University of Washington, Northgate, Lynnwood and Bellevue) for use in the analysis of access to employment centers, education, and medical services for environmental justice populations.
- Analysis of temporary or permanent impacts on Americans with Disabilities Act parking or designated parking at social services, as well as percentage of parking spaces temporarily or permanently lost in designated commercial shopping districts.
- Change in LOS on corridor roadways.

B.12 Mitigation Measures

B.12.1. Project Design Measures and Best Management Practices

As long-term impacts are identified and mitigation options developed, these options will be discussed between Sound Transit and the project team for engineering design/refinement and development of approximate cost estimates. The analysis of mitigation options will be coordinated with the relevant local/state jurisdictions to identify strategies that may already be under consideration but that could benefit the project.

B.12.2. Mitigation

B.12.2.1. Direct Impacts

Potential mitigation measures will be described to address potential transportation impacts associated with the Build alternatives.

- Local Traffic Impacts: Based on the 2035 traffic analysis, mitigation of long-term impacts will be identified for the intersections that do not meet the established LOS standards discussed under the Assessment Methods and Analysis Thresholds section. Determining if an intersection meets the agency LOS standards will be based on the conditions at each intersection. Potential mitigation

might include operational changes to signal phasing, physical modification such as restriping, or added turn lanes. For intersections that do not meet the established LOS standards in the No-Build condition, the project alternatives are only obligated to bring the operating conditions back to the No-Build condition overall delay levels.

- Parking: Areas for potential parking mitigation will be identified by considering the potential for hide-and-ride parking activity in neighborhoods surrounding the stations. Areas with a high potential for hide-and-ride activity will be identified with potential mitigation strategies to reduce the likelihood of this activity.
- Construction: Mitigation measures aimed at addressing the construction traffic impacts identified above will be developed and reviewed. As appropriate, this will include a review of measures proposed and/or used for Initial Segment, Airport and University Link light rail construction. Mitigation measures identified to address local construction traffic impacts will also be reviewed for their relevancy in addressing regional and/or corridor-level construction traffic issues.
- Potential improvements will also be identified to mitigate acknowledged impacts from the Build alternatives on transit, non-motorized facilities, freight, and property access.

B.13 Summary of Technical Activity by Analysis Year

Table B-8 shows the technical activities to be undertaken for each of the project's analysis years.

TABLE B-8
Summary of Technical Activities by Analysis Year

Activity	Existing (2013)	Design Year (2035)	Construction Period[a]
Regional Transportation System			
Transit (includes ridership)	✓	✓	N/A
Traffic	N/A	✓	N/A
Corridor and Sub-Area Transportation System			
Screenline	✓	✓	N/A
Local and regional transit	✓	✓	N/A
Arterials and Local Streets System			
Intersection operations	✓	✓	✓
Property access and circulation	✓	✓	✓
Parking demand	✓	✓	✓
Non-motorized modes	✓	✓	✓
Freight	✓	✓	✓
Construction impacts	N/A	N/A	✓
Indirect effects	N/A	✓	N/A
Cumulative effects	N/A	✓	N/A
Transportation Data for Other Disciplines			
Air quality	✓	✓[b]	N/A
Noise	✓	✓	N/A

TABLE B-8
Summary of Technical Activities by Analysis Year

Activity	Existing (2013)	Design Year (2035)	Construction Period[a]
Energy	✓	✓	N/A
Environmental justice and social impact	✓	✓	N/A

[a] Construction period analysis will be mainly qualitative.

[b] Year 2035 forecasts will be extrapolated to year 2040 for conformity analyses.
N/A = not applicable

B.14 Documentation

For the FWLE EIS, the transportation discipline will develop the following documentation:

- EIS section
- Transportation Technical Report

B.15 References

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Attachment A - Future Transportation Project List

The following highway and transit projects are included in the FWLE future year (2035) conditions (PSRC, 2012; Sound Transit 2012; WSDOT, 2013). These projects will be incorporated, where appropriate, in the travel demand models and analysis for the 2035 No Build and Build conditions. Because this project may be submitted to the Federal Transit Administration (FTA), among other agencies, for potential funding, the project's future year conditions involve assuming that projects with substantial funding already identified would be constructed prior to the FWLE and included in both the Year 2035 No Build and Build conditions analysis.

Highway Network

- SR 520: Floating Bridge Replacement and associated Eastside Transit and high-occupancy vehicle (HOV) project improvements
- I-90: R8A Phase 3
- SR 99: Alaskan Way Viaduct and Seawall Replacement Program
- I-405: South Bellevue Widening Project
- I-405: NE 6th Street to I-5 Widening and Express Toll Lanes Project
- SR 518: SeaTac Airport to I-5/I-405 Interchange – third eastbound lane
- I-5: Tacoma HOV Extension
- SR 167: HOV Lane Extension from 8th to Pierce County Line
- SR 16: HOV Lane Extension from Olympic View Drive to I-5
- SR 161: Additional Lanes from 36th Street to Jovita Boulevard

Transit Network

- The Downtown Seattle Transit Tunnel will be used exclusively by light rail, and buses will be relocated to surface roads.
- Transit-only operations on Third Avenue in downtown Seattle will include mid-day operations in addition to the existing AM and PM peak period operations.
- RapidRide bus service will operate along six bus rapid transit corridors.
- Light rail will be extended as part of the U Link, Northgate Link, East Link, and Lynnwood Link Extension projects to the north and east. Light rail will also be extended to S 200th Street under the

No Build condition. For the Build condition, light rail would extend to the Federal Way Transit Center.

- East Link light rail will operate between Lynnwood Transit Center and Overlake Transit Center. It is assumed East Link will include a tunnel profile through downtown Bellevue.
- Tacoma Link Extension in accordance with the Sound Transit 2 (ST2) plan
- First Hill Streetcar along Broadway
- ST Commuter Rail (Sounder) will operate from Everett to Lakewood.
- ST Commuter Rail (Sounder) will operate with expanded service.

Local Street Network

The following local jurisdiction street and intersection improvements are included for the 2035 No Build and Build alternatives for the transportation analysis. Each of these projects is identified in each city's respective transportation improvement program/capital improvement program (TIP/CIP) project lists, or identified by the city for their inclusion in the future year networks (City of Des Moines, 2012; City of Federal Way, no date; City of Kent, 2012; City of SeaTac, 2012; King County, 2102; PSRC, 2012).

City of SeaTac

New/Expanded Facilities

- Military Road S: Reconstruct roadway to include bicycle lanes, traffic signal at S 170th Street with channelization enhancements.
- 28th/24th Ave S: Construct a five-lane roadway including bicycle lanes.
- Military Road S: Widen existing roadway with access and circulation improvements. Construct right turn lane on S 152nd Street from Military Road S to International Boulevard.
- Military Road S: Widen I-5 southbound off ramp to provide for a left-turn lane. Reconstruct west leg to provide left-, through-, and right-turn lanes. Modify signal to facilitate lane changes.
- S 152nd Street: Widen existing roadway. Provide access and circulation improvements for vehicle and pedestrian movements in support of redevelopment between 30th Avenue S to Military Road S.
- International Boulevard: Construct interchange improvement consistent with WSDOT's Route Development Plan. Elements may include modification to S 154th Street exit ramp and new eastbound exit ramp to northbound International Boulevard.

Intersection Improvements

- Military Road S at S 200th Street/I-5 Southbound Ramps: Provide a southbound left-turn lane. Reconstruct west leg to provide left-, through-, and right-turn lanes. Modify signal phasing.
- Military Road S at S 170th Street: Provide traffic signal.
- S 152nd Street at International Blvd: Construct right-turn lane.

City of Des Moines

New/Expanded Facilities

- S 212th Street and SR 99: Provide traffic signal.
- S 216th Street: Widen to provide additional travel lanes between 24th Avenue S to 18th Avenue S. Signal rebuild at 24th Avenue S and S 216th Street.
- 24th Avenue S from S 208th Street to S 216th Street: Widen to provide additional travel lanes and bicycle lanes. Rebuild signal rebuild at 24th Avenue S and S 216th Street.
- S 216th Street from 29th Avenue S to 24th Avenue S: Widen to provide additional travel lanes and bicycle lanes. Signal rebuild at S 216th Street and Pacific Highway S.
- S 224th Street from Pacific Highway S to 30th Avenue S: Reconstruct roadway. Enhance traffic signal operations at intersection.

Intersection Improvements

- S 216th Street at 24th Avenue S: Widen to provide additional travel lanes and bicycle lanes. Rebuild signal.
- S 216th Street at Pacific Highway: Widen to provide additional travel lanes and bicycle lanes. Rebuild traffic signal.

City of Kent

New/Expanded Facilities

- Military Road S: Widen Military Road from S 272nd Street to Kent-Des Moines Road with center left-turn and bicycle lanes.

Intersection Improvements

- Military Road S at Reith Road: Provide exclusive left-turn lanes for all approaches and right-turn lanes for the northbound, southbound, and westbound approaches. Project will provide future bicycle lanes.
- S 272nd Street at Military Road: Add a southbound through-lane and modify signal phasing.

City of Federal Way

New/Expanded Facilities

- S 320th Street: I-5 bridge widening. Add HOV lanes, realign ramps in the southeast quadrant.

Intersection Improvements

- S 320th Street at 20th Avenue S: Add second left-turn lanes on the eastbound and southbound approaches.
- SR 99 at S 312th Street: Add second left-turn lane on northbound approach.
- S 304th Street at 28th Avenue S: Add northbound right-turn lane and a signal.

- SW 320th Street at 21st Avenue SW: Add second westbound left-turn lane and interconnect to 26th Avenue SW.
- S 312th Street at 28th Avenue S: Add southbound right-turn lane.
- SR 99 at S 324th Street: Intersection improvements including flashing yellow arrow (FYA) signal indications and other signal head improvements.
- S 320th Street at 25th Avenue S: Install FYA indication on all legs of the intersection and reflective backplates on all signal heads.

King County

New/Expanded Facilities

- Military Road S: From S 272nd Street to S 304th Street widen to 4/5 lanes.
- S Star Lake Road: Construct asphalt/concrete shoulder between Military Road S and 42nd Avenue S.

Appendix B

Level of Service Definitions Used for Federal Way Link Extension Analysis

TABLE B-1

LOS Definitions for Service Frequency (Urban Schedule Transit Service)

LOS	Headway (min.)	Comments
A	<10	Passengers do not need schedules
B	10-14	Frequent service, passengers consult schedules
C	15-20	Maximum desirable time to wait if bus/train missed
D	21-30	Service unattractive to choice riders
E	31-60	Transit service is available
F	>60	Service unattractive to all riders

Source: Transportation Research Board, *Transit Capacity and Quality Service Manual*, Second Edition, 2003.

TABLE B-2

LOS Definitions for Hours of Service

LOS	Hours of Service	Comments
A	19-24	Night or owl service provided
B	17-18	Late evening service provided
C	14-16	Early evening service provided
D	12-13	Daytime service provided
E	4-11	Peak hour service/limited midday service
F	0-3	Very limited or no service

Source: Transportation Research Board, *Transit Capacity and Quality Service Manual*, Second Edition, 2003.

TABLE B-3

LOS Definition for Bus Passenger Load

LOS	Passenger/Seat	Comments
A	0.00-0.50	No passengers need sit next to another
B	0.51-0.75	Passengers can choose where to sit
C	0.76-1.00	All passengers can sit
D	1.01-1.25	Comfortable standee load for design
E	1.26-1.50	Maximum schedule load
F	>1.5	Crush load

Source: Transportation Research Board, *Transit Capacity and Quality Service Manual*, Second Edition, 2003.

TABLE B-4

LOS Definition for Light Rail Passenger Load

LOS	ft²/Passenger	Comments
A	>10.8[a]	At most some passengers must stand
B	8.2-10.8	No Passengers need to stand next to another
C	5.5-8.1	Passengers can choose where to stand
D	3.9-5.4	Comfortable standee load for design
E	2.2-3.8	Maximum schedule load
F	<2.2	Crush load

Source: Adapted from Transportation Research Board, *Transit Capacity and Quality Service Manual*, Second Edition, 2003.
[a]This includes the potential for some cars to not have any standing passengers.

TABLE B-5

LOS Definitions for Reliability (On-Time Performance)

LOS	On-Time Percentage[a]	Description
A	95.0% - 100%	1 late transit vehicle every 2 weeks (no transfer)
B	90.0% - 94.9%	1 late transit vehicle every week (no transfer)
C	85.0% - 89.9%	3 late transit vehicles every 2 weeks (no transfer)
D	80.0% - 84.9%	2 late transit vehicles every week (no transfer)
E	75.0% - 79.9%	1 late transit vehicle every day (with a transfer)
F	<75.0%	1 late transit vehicle at least daily (with a transfer)

Source: Transportation Research Board, *Transit Capacity and Quality Service Manual*, Second Edition, 2003.
[a] "On time" is a departure 1 minute early to 5 minutes late.
Note: On-time definition is based on Transit Capacity and Quality of Service Manual, Third Edition, 2013.

TABLE B-6

LOS Definitions for Reliability (Headway Adherence)

LOS	Coefficient of Variation	Description
A	0.00-0.21	Service provided like clockwork
B	0.22-0.30	Vehicles slightly off headway
C	0.31-0.39	Vehicles often off headway
D	0.40-0.52	Irregular headways, with some bunching
E	0.53-0.74	Frequent bunching
F	>0.75	Most vehicles bunched

Source: Transportation Research Board, *Transit Capacity and Quality Service Manual*, Second Edition, 2003.
Note: Headway Adherence LOS applies only to transit routes with headways of 10 minutes or less.
[a] Coefficient of variation is the deviation in actual departing headways over the scheduled headway. A high coefficient of variation signifies a large difference between the actual and scheduled departure time, resulting in a poor reliability LOS.

TABLE B-7

LOS Definitions for Intersections

Level of Service	Average Delay (seconds per vehicle)	Traffic Flow Characteristics
Signalized Intersections		
A	< 10	Most vehicles arrive during the green phase and do not stop at all.
B	> 10 - < 20	More vehicles stop, causing higher delay.
C	> 20 - < 35	Vehicles stopping is significant, but many still pass through the intersection without stopping.
D	> 35 - < 55	Many vehicles stop, and the influence of congestion becomes more noticeable.
E	> 55 - < 80	Very few vehicles pass through without stopping.
F	> 80	Considered unacceptable to most drivers. Intersection is not necessarily over capacity, even though arrivals exceed capacity of lane groups.
Unsignalized Intersections		
A	≤ 10	Little or no traffic delays
B	> 10 - ≤ 15	Short traffic delays
C	> 15 - ≤ 25	Average traffic delays
D	> 25 - ≤ 35	Long traffic delays
E	> 35 - ≤ 50	Very long traffic delays
F	> 50	Queuing on minor approaches and not enough gaps of suitable size to allow safe crossing of major streets. Signalization should be investigated at this point, but warrants must be satisfied before implementation.

Source: Transportation Research Board, *Highway Capacity Manual*, 2010.

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Appendix C

Existing and Future Transit Routes and Level of Service

TABLE C-1

Existing Average Weekday PM Peak Hour Route Passenger Load

Route	Direction	Average Load	Average Capacity	Load Factor (passenger/seat)	LOS
Screenline: South of S 200th Street					
Metro RapidRide A	Northbound	18	48	0.37	A
Metro 156	Northbound	5	35	0.15	A
Metro 166	Northbound	9	35	0.24	A
Metro 180	Northbound	15	35	0.42	A
Metro 183	Northbound	6	35	0.18	A
ST 574	Northbound	10	36	0.28	A
ST 578	Northbound	22	35	0.62	B
ST 590	Northbound	19	36	0.52	B
ST 594	Northbound	21	39	0.56	B
Metro RapidRide A	Southbound	30	48	0.63	B
Metro 121	Southbound	7	57	0.12	A
Metro 122	Southbound	6	50	0.12	A
Metro 156	Southbound	7	35	0.21	A
Metro 158	Southbound	39	44	0.88	C
Metro 159	Southbound	26	58	0.44	A
Metro 177	Southbound	30	47	0.63	B
Metro 178	Southbound	39	61	0.64	B
Metro 179	Southbound	34	50	0.69	B
Metro 180	Southbound	22	35	0.62	B
Metro 183	Southbound	18	35	0.52	B
Metro 190	Southbound	30	46	0.66	B
Metro 192	Southbound	25	35	0.72	B
Metro 193	Southbound	18	64	0.29	A
Metro 197	Southbound	30	58	0.52	B
ST 574	Southbound	31	36	0.86	C
ST 577	Southbound	48	41	1.16	D
ST 586	Southbound	40	35	1.14	D
ST 590	Southbound	29	39	0.73	B
ST 595	Southbound	28	35	0.79	C
Total Screenline*	Northbound	15	39	0.39	A
Total Screenline*	Southbound	28	45	0.62	B
Screenline: South of S 312th Street					
Metro RapidRide A	Northbound	13	48	0.28	A
Metro 181	Northbound	13	35	0.38	A

TABLE C-1
Existing Average Weekday PM Peak Hour Route Passenger Load

Route	Direction	Average Load	Average Capacity	Load Factor (passenger/seat)	LOS
Metro 182	Northbound	1	35	0.02	A
Metro 183	Northbound	13.1	32.5	0.40	A
Metro 187	Northbound	9	35	0.27	A
PT 402	Northbound	1	38	0.02	A
PT 500	Northbound	1	39	0.03	A
PT 501	Northbound	3	38	0.07	A
Metro RapidRide A	Southbound	10	48	0.21	A
Metro 158	Southbound	1	44	0.03	A
Metro 159	Southbound	6	58	0.11	A
Metro 177	Southbound	28	47	0.60	B
Metro 179	Southbound	33	50	0.66	B
Metro 181	Southbound	20	35	0.56	B
Metro 182	Southbound	8	35	0.23	A
Metro 183	Southbound	16	35	0.45	A
Metro 187	Southbound	10	35	0.28	A
Metro 192	Southbound	3	35	0.08	A
Metro 193	Southbound	15.1	56.0	0.27	A
Metro 197	Southbound	24	58	0.42	A
PT 402	Southbound	9	38	0.25	A
PT 500	Southbound	16	39	0.40	A
PT 501	Southbound	13	38	0.34	A
ST 574	Southbound	28	35	0.79	C
ST 577	Southbound	48	41	1.16	D
ST 586	Southbound	40	35	1.14	D
ST 590	Southbound	29	39	0.73	B
ST 592	Southbound	17	38	0.46	A
ST 595	Southbound	28	35	0.79	C
Total Screenline[a]	Northbound	17	49	0.43	A
Total Screenline[a]	Southbound	22	43	0.53	B

Source: King County Metro Transit, Automatic Passenger Counter Data, 2012.

Notes:
Gray shading indicates the route service is assumed to be peak period currently. PM peak hour was assumed to be 4:30 pm to 5:30 pm.
[a] Screenline average load and average capacity is weighted based on the total number of peak hour vehicles per route.

Metro = King County Metro Transit; PT = Pierce Transit; ST = Sound Transit

TABLE C-2

Existing PM Peak-Hour Transit On-Time Performance and Reliability at Transit Hubs

Station Location	Route Number	Direction	Headway (minutes)	Frequency LOS	On-Time Performance Percentage	Coefficient of Variation	Reliability LOS
International District/Chinatown Station	Metro 158	S	13	B	37%	-	F
	Metro 159	S	15	C	41%	-	F
	Metro 177	S	30	D	11%	-	F
	Metro 178	Southbound	15	C	17%	-	F
	Metro 179	S	30	D	3%	-	F
	Metro 190	S	30	D	40%	-	F
	Metro 192	S	30	D	39%	-	F
	ST 577	S	15	C	11%	-	F
	ST 590	Northbound	30	D	40%	-	F
	ST 594	Northbound	30	D	40%	-	F
				Station Average[a]	28%	-	F
Kent-Des Moines Park-and-Ride/Kent-Des Moines I-5 Freeway Stop	Metro 158	S	13	B	32%	-	F
	Metro 159	S	15	C	32%	-	F
	Metro 166	N	30	D	32%	-	F
	Metro 166	S	30	D	51%	-	F
	Metro 192	S	30	D	40%	-	F
	Metro 193	S	30	D	23%	-	F
	Metro 197	S	30	D	41%	-	F
	ST 574	S	30	D	28%	-	F
				Station Average[a]	37%	-	F
Highline College	Metro 121	S	12	B	95%	-	B
	Metro 122	S	25	D	85%	-	D
	Metro 156	E	30	D	86%	-	C
	Metro 156	W	30	D	32%	-	F
	Metro 166	N	30	D	27%	-	F
	Metro 166	S	30	D	68%	-	F
	Metro RapidRide A	N	10	A	71%	0.40	F
	Metro RapidRide A	S	10	A	28%	0.28	F
				Station Average[a]	65%	-	F
Star Lake Park-and-Ride	Metro 183	N	30	D	86%	-	C
	Metro 183	S	30	D	14%	-	F
	Metro 190	S	30	D	36%	-	F
	Metro 193	S	30	D	23%	-	F
	Metro 197	S	30	D	41%	-	F

TABLE C-2

Existing PM Peak-Hour Transit On-Time Performance and Reliability at Transit Hubs

Station Location	Route Number	Direction	Headway (minutes)	Frequency LOS	On-Time Performance Percentage	Coefficient of Variation	Reliability LOS
	ST 574	N	30	D	53%	-	F
	ST 574	S	30	D	33%	-	F
				Station Average[a]	40%	-	F
Federal Way Transit Center	Metro 177	S	30	D	22%	-	F
	Metro 178	S	15	C	15%	-	F
	Metro 179	S	30	D	24%	-	F
	Metro 181	E	30	D	62%	-	F
	Metro 181	W	30	D	58%	-	F
	Metro 182	N	30	D	72%	-	F
	Metro 182	S	30	D	78%	-	E
	Metro 183	N	30	D	92%	-	B
	Metro 183	S	30	D	50%	-	F
	Metro 187	N	30	D	54%	-	F
	Metro 187	S	30	D	97%	-	A
	Metro 193	S	30	D	18%	-	F
	Metro 197	S	30	D	39%	-	F
	ST 402	N	30	D	60%	-	F
	ST 402	S	60	E	97%	-	A
	ST 500	N	30	D	46%	-	F
	ST 500	S	30	D	97%	-	A
	ST 501	N	60	E	29%	-	F
	ST 501	S	60	E	96%	-	A
	ST 574	N	30	D	33%	-	F
	ST 574	S	30	D	24%	-	F
	ST 577	S	15	C	10%	-	F
	ST 578	N	30	D	54%	-	F
	Metro RapidRide A	N	10	A	88%	0.40	C
	Metro RapidRide A	S	10	A	27%	0.28	F
				Station Average[a]	53%		F

Sources: King County Metro Transit Historical Vehicle Arrival Data, 2015. Sound Transit Historical Arrival Data, 2015.

[a] Station average LOS = X/Y, where X= LOS for percent on-time performance station average, Y= LOS for coefficient of variation station average.
Metro = King County Metro Transit; ST = Sound Transit.

TABLE C-3
2035 FWLE Alternatives Station Area Mode of Access

Station Area	Alternative	Daily Transit Boardings	PM Peak Period Person Trips[a]	Percent Mode of Access		
				Car	Non-Motorized	Transit
Kent/Des Moines Station	Preferred	3,500	1,900	30%	24%	45%
	SR 99	3,500	2,000	31%	25%	44%
	SR 99 to I-5	3,000	1,800	32%	24%	44%
	I-5 to SR 99	3,000	1,800	31%	26%	43%
S 272nd Star Lake Station	Preferred	3,000	1,900	35%	23%	42%
	SR 99 to I-5	3,000	1,900	35%	23%	42%
S 272nd Redondo Station	SR 99	3,500	2,100	45%	20%	36%
	I-5 to SR 99	3,500	2,000	45%	20%	36%
Federal Way Transit Center Station	Preferred	12,500	8,300	28%	4%	68%
	SR 99	12,500	7,900	26%	4%	70%
	SR 99 to I-5	12,000	8,100	28%	4%	68%
	I-5 to SR 99	12,000	7,800	26%	4%	70%

Source: Sound Transit Ridership Model, 2014.

Notes:
Percentages may not add to 100% due to rounding.
Daily transit boardings and PM peak period person trips rounded to nearest 100 trips.

[a] Values shown are for a 3-hour PM peak period.

TABLE C-4
2035 FWLE Alternatives Station Options Station Area Mode of Access

Station Area	Alternative	Design Option(s)	Daily Transit Boardings	PM Peak Period Person Trips[a]	Percent Mode of Access		
					Car	Non-Motorized	Transit
S 216th Street	SR 99, SR 99 to I-5	S 216th West Station S 216th East Station	2,000	900	4%	78%	18%
Kent/Des Moines Station	SR 99	HC Campus Station SR 99 East Station SR 99 Median Station	3,500	2,000	31%	25%	44%
	Preferred	I-5 Station	2,500	1,600	36%	24%	40%
		At-Grade Station	2,500	1,600	34%	24%	42%
S 260th Street	SR 99, I-5 to SR 99	S 260th West Station S 260th East Station	1,500	600	5%	87%	9%
Federal Way Transit Center Station	SR 99, I-5 to SR 99	SR 99 Station	10,500	6,900	24%	7%	69%
	Preferred, SR 99 to I-5	I-5 Station	10,500	7,100	28%	4%	68%
		S 320th Park-and-Ride Station	11,000	2,000	18%	9%	73%

Source: Sound Transit Ridership Model, 2014.

Notes:
Percentages may not add to 100% due to rounding.
Daily transit boardings and PM peak period person trips rounded to nearest 100 trips.

[a] Values shown are for a 3-hour PM peak period.

TABLE C-5

2035 FWLE Alternatives Station Area Mode of Access – Kent/Des Moines Interim Terminus Conditions

Station Area	Alternative	Design Option(s)	Daily Transit Boardings	PM Peak Period Person Trips[a]	Percent Mode of Access		
					Car	Non-Motorized	Transit
Kent/Des Moines Station	Preferred	Preferred (baseline) I-5 Station At-Grade Station	6,000	3,900	31%	11%	58%
	SR 99	SR 99 West Station (Baseline) HC Campus Station SR 99 East Station SR 99 Median Station	6,500	4,100	31%	11%	58%
	SR 99 to I-5	30th Avenue East Station	6,000	3,600	35%	11%	54%
	I-5 to SR 99	30th Avenue West Station	5,000	3,500	34%	12%	54%

Source: Sound Transit Ridership Model, 2014.
Notes:
Percentages may not add to 100% due to rounding.
Daily transit boardings and PM peak period person trips rounded to nearest 100 trips.
[a] Values shown are for a 3-hour PM peak period.

TABLE C-6

2035 FWLE Alternatives Station Area Mode of Access – S 272nd Interim Terminus Conditions

Station Area	Alternative	Design Option(s)	Daily Transit Boardings	PM Peak Period Person Trips[a]	Percent Mode of Access		
					Car	Non-Motorized	Transit
Kent/Des Moines Station	Preferred	Preferred (baseline) I-5 Station At-Grade Station	2,500	2,200	26%	21%	53%
	SR 99	SR 99 West Station (Baseline) HC Campus Station SR 99 East Station SR 99 Median Station	4,500	2,600	23%	17%	60%
	SR 99 to I-5	30th Avenue East Station	2,500	1,900	30%	24%	46%
	I-5 to SR 99	30th Avenue West Station	3,500	2,300	24%	19%	57%
S 272nd Redondo Station	SR 99, I-5 to SR 99	N/A	6,000	3,500	49%	10%	41%
S 272nd Star Lake Station	Preferred, SR 99 to I-5	N/A	6,500	4,000	38%	9%	52%

Source: Sound Transit Ridership Model, 2014.
Notes:
Percentages may not add to 100% due to rounding.
Daily transit boardings and PM peak period person trips rounded to nearest 100 trips.
[a] Values shown are for a 3-hour PM peak period.

TABLE C-7
2035 No Build Average Weekday PM Peak Hour Transit Route Passenger Load

Route	Direction	Average Load	Average Capacity	Load Factor (passenger/seat)	LOS
Screenline : South of S 200th Street					
		25	48	0.51	B
Metro 180	Northbound	9	35	0.27	A
ST 574	Northbound	48	36	1.35	E
ST 578	Northbound	18	35	0.50	A
ST 594	Northbound	38	39	0.97	C
Metro RapidRide A	Southbound	40	48	0.84	C
Metro 121	Southbound	8	57	0.14	A
Metro 122	Southbound	13	50	0.26	A
Metro 177	Southbound	52	47	1.10	D
Metro 178	Southbound	54	61	0.89	C
Metro 179	Southbound	54	50	1.10	D
Metro 180	Southbound	33	35	0.93	C
Metro 190	Southbound	24	46	0.53	B
ST 574	Southbound	86	35	2.44	F
ST 577	Southbound	46	41	1.10	D
ST 590	Southbound	35	39	0.90	C
ST 592	Southbound	35	38	0.92	C
ST 595	Southbound	60	35	1.70	F
Total Screenline[a]	Northbound	29	41	0.70	B
Total Screenline[a]	Southbound	41	45	0.91	C
Screenline : North of S 272nd Street					
Metro RapidRide A	Northbound	16	48	0.34	A
Metro 180	Northbound	53	35	1.52	F
Metro DMFW[b]	Northbound	7	35	0.19	A
ST 574	Northbound	7	35	0.20	A
ST 594	Northbound	47	36	1.32	E
ST 578	Northbound	18	35	0.50	A
Metro 594	Northbound	38	39	0.97	C
Metro RapidRide A	Southbound	68	48	1.42	E
Metro 177	Southbound	52	47	1.10	D
Metro 178	Southbound	54	61	0.89	C
Metro 179	Southbound	41	50	0.82	C
Metro 183	Southbound	13	35	0.36	A
Metro DMFW[b]	Southbound	14	35	0.40	A
18.2	45.5	0.40	A	18.2	45.5

TABLE C-7

2035 No Build Average Weekday PM Peak Hour Transit Route Passenger Load

Route	Direction	Average Load	Average Capacity	Load Factor (passenger/seat)	LOS
ST 574	Southbound	88	35	2.50	F
ST 577	Southbound	68	41	1.65	F
ST 578	Southbound	23	35	0.64	B
ST 590	Southbound	53	39	1.35	E
ST 592	Southbound	17	38	0.46	A
ST 594	Southbound	26	39	0.67	B
ST 595	Southbound	30	35	0.85	C
Total Screenline[a]	Northbound	24	40	0.61	B
Total Screenline[a]	Southbound	48	43	1.12	D
Screenline : South of S 312th Street					
Metro RapidRide A	Northbound	16	48	0.33	A
Metro 183	Northbound	7	35	0.20	A
Metro FWTC[c]	Northbound	24	35	0.69	B
Metro DMFW[b]	Northbound	45	35	1.29	E
Metro 901	Northbound	14	18	0.75	B
ST 574	Northbound	47	36	1.31	E
ST 578	Northbound	18	35	0.50	A
ST 594	Northbound	38	39	0.97	C
Metro RapidRide A	Southbound	30	48	0.63	B
Metro 177	Southbound	52	47	1.10	D
Metro 178	Southbound	54	61	0.89	C
Metro 179	Southbound	54	50	1.10	D
Metro 183	Southbound	5	35	0.14	A
Metro FWTC[c]	Southbound	21	35	0.60	B
Metro DMFW[b]	Southbound	44	35	1.26	D
Metro 901	Southbound	6	18	0.35	A
ST 574	Southbound	85	35	2.43	F
ST 577	Southbound	46	41	1.10	D
ST 578	Southbound	46	35	1.29	E
ST 590	Southbound	35	39	0.90	C
ST 592	Southbound	35	38	0.92	C
ST 594	Southbound	52	39	1.34	E
ST 595	Southbound	60	35	1.70	F
Total Screenline[a]	Northbound	24	38	0.63	B
Total Screenline[a]	Southbound	42	41	1.01	C

Source: Sound Transit Ridership Model, 2014.
Note: PM peak hour was assumed to be 4:45 – 5:45 p.m.

[a] Screenline average load and average capacity is weighted based on the total number of peak hour vehicles.

[b] Metro DMFW = Des Moines to Federal Way. New route serving Federal Way Transit Center and Kent-Des Moines Park-and-Ride.

[c] Metro FWTC = Federal Way Transit Center to Milton. New route serving Federal Way Transit Center and Milton.

TABLE C-8
2035 Build SR 99 Average Weekday PM Peak Hour Transit Route Passenger Load

Route	Direction	Average Load	Average Capacity	Load Factor (passenger/seat)	LOS
Screenline : South of S 200th Street					
Metro RapidRide A	Northbound	7	48	0.14	A
Metro 180	Northbound	9	35	0.25	A
ST 578	Northbound	1	57	0.02	A
ST 594	Northbound	25	55	0.46	A
Metro RapidRide A	Southbound	9	48	0.18	A
Metro 121	Southbound	8	58	0.13	A
Metro 122	Southbound	0	35	0.00	A
Metro 178	Southbound	16	51	0.31	A
Metro 179	Southbound	21	35	0.59	B
Metro 180	Southbound	24	35	0.69	B
ST 577	Southbound	7	57	0.13	A
ST 590	Southbound	35	49	0.71	B
ST 592	Southbound	34	45	0.77	C
ST 595	Southbound	60	57	1.04	D
Total Screenline[a]	Northbound	9	48	0.19	A
Total Screenline[a]	Southbound	18	48	0.36	A
LINK	Northbound	83	-	0.28	A
	Southbound	312	-	1.04	D
Screenline : North of S 272nd Street					
Metro RapidRide A	Northbound	8	48	0.16	A
Metro 183	Northbound	6	49	0.11	A
Metro DMFW[b]	Northbound	6	49	0.11	A
ST 578	Northbound	1	57	0.02	A
ST 594	Northbound	25	55	0.46	A
Metro RapidRide A	Southbound	10	48	0.22	A
Metro 178	Southbound	16	51	0.31	A
Metro 179	Southbound	21	35	0.59	B
Metro 183	Southbound	11	33	0.34	A
ST 577	Southbound	7	57	0.13	A
ST 577	Southbound	7	57	0.13	A
ST 578	Southbound	7	57	0.13	A
ST 590	Southbound	35	49	0.71	B
ST 592	Southbound	34	45	0.77	C
ST 594	Southbound	51	55	0.93	C
ST 595	Southbound	60	57	1.04	D

TABLE C-8
2035 Build SR 99 Average Weekday PM Peak Hour Transit Route Passenger Load

Route	Direction	Average Load	Average Capacity	Load Factor (passenger/seat)	LOS
Total Screenline[a]	Northbound	9	48	0.19	A
Total Screenline[a]	Southbound	21	48	0.44	A
LINK	Northbound	70		0.23	A
	Southbound	281		0.94	C
Screenline : South of S 312th Street					
Metro RapidRide A	Northbound	6	48	0.14	A
Metro 183	Northbound	2	33	0.07	A
Metro FWTC[c]	Northbound	27	35	0.78	C
Metro DMFW[b]	Northbound	12	35	0.34	A
Metro 901	Northbound	20	35	0.58	B
Metro 578	Northbound	1	57	0.02	A
Metro 594	Northbound	25	55	0.46	A
Metro RapidRide A	Southbound	11	48	0.22	A
Metro 178	Southbound	16	51	0.31	A
Metro 179	Southbound	21	35	0.59	B
Metro 183	Southbound	4	33	0.12	A
Metro FWTC[c]	Southbound	34	35	0.96	C
Metro DMFW[b]	Southbound	11	35	0.32	A
Metro 901	Southbound	8	35	0.23	A
ST 577	Southbound	7	57	0.13	A
ST 578	Southbound	7	57	0.13	A
ST 590	Southbound	35	49	0.71	B
ST 592	Southbound	34	45	0.77	C
ST 594	Southbound	51	55	0.93	C
ST 595	Southbound	60	57	1.04	D
Total Screenline[a]	Northbound	11	43	0.25	A
Total Screenline[a]	Southbound	20	46	0.43	A
LINK	Northbound	69.7		0.23	A
	Southbound	223.9		0.75	B

Source: Sound Transit Ridership Model, 2014.
Note: PM peak hour was assumed to be 4:45-5:45 PM.
[a] Screenline average load and average capacity is weighted based on the total number of peak hour vehicles.
[b] New route serving Federal Way Transit Center and Kent Des-Moines Park-and-Ride.
[c] New route serving Federal Way Transit Center and Milton.

TABLE C-9

2035 Build I-5 Average Weekday PM Peak Hour Transit Route Passenger Load

Route	Direction	Average Load	Average Capacity	Load Factor (passenger/seat)	LOS
Screenline : South of S 200th Street					
Metro RapidRide A	Northbound	9	48	0.18	A
Metro 180	Northbound	9	35	0.26	A
ST 578	Northbound	1	35	0.03	A
ST 594	Northbound	25	39	0.65	B
Metro RapidRide A	Southbound	9	48	0.19	A
Metro 121	Southbound	8	57	0.14	A
Metro 122	Southbound	4	50	0.08	A
Metro 178	Southbound	15	61	0.24	A
Metro 179	Southbound	20	50	0.40	A
Metro 180	Southbound	22	35	0.63	B
ST 577	Southbound	6	41	0.15	A
ST 590	Southbound	35	39	0.88	C
ST 592	Southbound	34	38	0.91	C
ST 595	Southbound	60	35	1.70	F
Total Screenline[a]	Northbound	10	43	0.24	A
Total Screenline[a]	Southbound	18	41	0.42	A
LINK	Northbound	82	-	0.27	A
	Southbound	322	-	1.07	A
Screenline : North of S 272nd Street					
Metro RapidRide A	Northbound	7	48	0.14	A
Metro 183	Northbound	5	36	0.15	A
Metro DMFW[b]	Northbound	5	36	0.15	A
ST 578	Northbound	1	35	0.03	A
ST 594	Northbound	25	39	0.65	B
Metro RapidRide A	Southbound	10	48	0.21	A
Metro 178	Southbound	15	61	0.24	A
Metro 179	Southbound	20	50	0.40	A
Metro 183	Southbound	12	35	0.34	A
Metro DMFW[b]	Southbound	11	35	0.30	A
ST 577	Southbound	6	41	0.15	A
ST 578	Southbound	6	35	0.17	A
ST 590	Southbound	35	39	0.88	C
ST 592	Southbound	34	38	0.91	C
ST 594	Southbound	50	39	1.31	E
ST 595	Southbound	60	35	1.70	F

TABLE C-9

2035 Build I-5 Average Weekday PM Peak Hour Transit Route Passenger Load

Route	Direction	Average Load	Average Capacity	Load Factor (passenger/seat)	LOS
Total Screenline[a]	Northbound	7	41	0.17	A
Total Screenline[a]	Southbound	20	43	0.49	A
LINK	Northbound	70	-	0.23	A
	Southbound	294	-	0.98	A
Screenline : South of S 312th Street					
Metro RapidRide A	Northbound	14	48	0.30	A
Metro 183	Northbound	1	35	0.04	A
Metro FWTC[c]	Northbound	26	35	0.74	B
Metro DMFW[b]	Northbound	5	35	0.15	A
Metro 901	Northbound	22	18	1.22	D
Metro 578	Northbound	1	35	0.03	A
Metro 594	Northbound	25	39	0.65	B
Metro RapidRide A	Southbound	13	48	0.27	A
Metro 178	Southbound	15	61	0.24	A
Metro 179	Southbound	20	50	0.40	A
Metro 183	Southbound	4	35	0.12	A
Metro FWTC[c]	Southbound	27	35	0.76	C
Metro DMFW[b]	Southbound	9	35	0.24	A
Metro 901	Southbound	8	18	0.46	A
ST 577	Southbound	6	41	0.15	A
ST 578	Southbound	6	35	0.17	A
ST 590	Southbound	35	39	0.88	C
ST 592	Southbound	34	38	0.91	C
ST 594	Southbound	50	39	1.31	E
ST 595	Southbound	60	35	1.70	F
Total Screenline[a]	Northbound	13	38	0.37	A
Total Screenline[a]	Southbound	19	41	0.49	A
LINK	Northbound	58	-	0.19	A
	Southbound	247	-	0.82	C

Source: Sound Transit Ridership Model, 2014.
Note: PM peak hour was assumed to be 4:45-5:45 PM.
[a]Screenline average load and average capacity is weighted based on the total number of peak hour vehicles.
[b] New route serving Federal Way Transit Center and Kent Des-Moines Park and Ride.
[c]New route serving Federal Way Transit Center and Milton.

Appendix D

Existing and Future Intersection Level of Service Results

TABLE D-1

Existing AM Peak-Hour and PM Peak-Hour Intersection Level of Service

Intersection ID	Control Type	LOS Standard[a]	AM Peak-Hour			PM Peak-Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Kent/Des Moines Station Area								
SR 99 and S 200th St	Signalized	E	--	--	--	D	48.3	0.81
SR 99 and S 204th St	Signalized	E	--	--	--	B	13.2	0.47
SR 99 and S 208th St	Signalized	E	--	--	--	B	13.7	0.56
Military Rd S and S 216th St	Signalized	E	--	--	--	C	33.9	0.76
24th Ave. S and S 216th St	Signalized	E	--	--	--	B	12.3	0.62
SR 99 and S 216th St	Signalized	D	--	--	--	D	43.7	0.81
S 220th St and SR 99	Signalized	D	--	--	--	A	9.3	0.61
SR 99 and S 224th St	Signalized	D	--	--	--	B	14.2	0.56
25th Ave. S/24th Ave S and Kent-Des Moines Rd	Signalized	D	--	--	--	A	9.4	0.67
SR 99 and Kent-Des Moines Rd	Signalized	D	E	72.6	0.99	E	66.5	1.50
30th Ave. S and Kent-Des Moines Rd	TWSC	D	--	--	--	B	12.9	0.58
16th Ave. S and S 240th St	Signalized	D	--	--	--	A	9.1	0.53
28th Ave. S/Highline College Driveway and S 240th St	TWSC	D	--	--	--	C	16.5	0.27
S 240th St and Highline College Drop-Off Loop	OWSC	D	--	--	--	B	12.1	0.26
Military Rd S and Kent-Des Moines P&R	OWSC	E	--	--	--	C	24.1	0.26
I-5 Southbound Ramps and Kent-Des Moines Rd	Signalized	D	C	21.3	0.62	E	59.9	0.92
I-5 Northbound Ramps and Kent-Des Moines Rd	TWSC	D	B	12.6	0.62	B	12.1	0.70
Military Rd S and Kent-Des Moines Rd	Signalized	E	--	--	--	E	56.4	0.86
SR 99 and S 236th Lane	OWSC/ Signalized[b]	D	A	8.6	0.05	C	18.8	0.08
SR 99 and S 240th St	Signalized	D	C	32.7	0.68	D	42.6	0.78
S 240th St and 30th Ave. S	OWSC	E	A	8.9	0.07	A	8.9	0.09
Military Rd S and S 240th St	OWSC	E	--	--	--	C	21.5	0.11
SR 99 and S 252nd St	Signalized	D	--	--	--	B	15.3	0.58
SR 99 and Fred Meyer	Signalized	D	--	--	--	C	23.5	0.67
SR 99 and S 260th St	Signalized	D	--	--	--	D	38.6	0.70
Military Rd S and 259th Pl/S Reith Rd	Signalized	E	--	--	--	E	55.8	0.89
16th Ave. S and S 260th St	Signalized	D	--	--	--	C	20.3	0.74
I-5 Northbound Ramps and Veterans Dr	Signalized	D	-	-	-	-	-	-
I-5 Southbound Ramps and Veterans Dr	Signalized	D	-	-	-	-	-	-

TABLE D-1

Existing AM Peak-Hour and PM Peak-Hour Intersection Level of Service

Intersection ID	Control Type	LOS Standard[a]	AM Peak-Hour			PM Peak-Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
S 272nd Station Area								
16th Ave. S and S 272nd St	Signalized	D	--	--	--	D	43.7	0.40
SR 99 and S 272nd St	Signalized	D	C	32.4	0.67	D	38.1	0.77
S Star Lake Rd and S 272nd St	Signalized	E	--	--	--	B	16.3	0.74
26th Ave. S and Star Lake P&R North Driveway	OWSC	E	--	--	--	A	8.8	0.03
26th Ave. S and Star Lake P&R South Driveway	OWSC	E	--	--	--	A	9.7	0.14
S 272nd St and 26th Ave. S	Signalized	E	A	5.9	0.35	A	8	0.5
I-5 Southbound Ramps and S 272nd St	Signalized	D	C	24.1	0.53	D	36.9	0.8
I-5 Northbound Ramps and S 272nd St	Signalized	D	C	34.2	0.71	C	31.1	0.67
Military Rd S and S 272nd St	Signalized	E	--	--	--	D	46.2	0.76
SR 99 and S 276th St	Signalized	D	B	10.5	0.5	A	6.6	0.53
SR 99 and 16th Ave S	OWSC	D	--	--	--	C	17.4	0.36
SR 99 and S 288th St	Signalized	D	--	--	--	D	37.4	0.63
SR 99 and Dash Point Rd	Signalized	D	--	--	--	B	17.9	0.64
Federal Way Station Area								
SR 99 and S 304th St	Signalized	D	--	--	--	C	24.2	0.53
SR 99 and S 308th St	Signalized	D	--	--	--	B	15.7	0.51
SR 99 and S 312th St	Signalized	D	--	--	--	D	47.1	0.66
Pete von Reichbauer Way and S 312th St	Signalized	E	--	--	--	B	13.4	0.32
23rd Ave. S and S 312th St	Signalized	E	--	--	--	C	21.8	0.43
SR 99 and S 316th St	Signalized	D	B	13.1	0.3	D	35.2	0.69
Pete von Reichbauer Way and S 316th St	Signalized	E	--	--	--	B	19.7	0.36
21st Ave. S and S 316th St	OWSC	E	A	9.6	0.05	B	11.2	0.23
23rd Ave. S and S 316th St	Signalized	E	--	--	--	B	12.5	0.23
23rd Ave. S and S 317th St	Signalized	E	A	9.4	0.34	B	13.9	0.51
S 317th St and 28th Ave. S	Roundabout	E	A	6.5	0.314	A	7.7	0.422
SR 99 and S 320th St	Signalized	D	D	42.6	0.59	D	39.1	0.68
Pete von Reichbauer Way and S 320th St	Signalized	E	--	--	--	C	21.6	0.69
21st Ave. S and S 320th St	TWSC	E	--	--	--	B	11.6	0.11
23rd Ave. S and S 320th St	Signalized	E	C	30.2	0.51	D	41.4	0.74
25th Ave. S and S 320th St	Signalized	E	B	13.2	0.48	B	11.2	0.6
I-5 Southbound Ramps and S 320th St	Signalized	D	B	13.7	0.77	C	31.2	0.89

TABLE D-1

Existing AM Peak-Hour and PM Peak-Hour Intersection Level of Service

Intersection ID	Control Type	LOS Standard[a]	AM Peak-Hour			PM Peak-Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
I-5 Northbound Ramps and S 320th St	Signalized	D	B	16.5	0.59	C	25.4	0.67
23rd Ave. S and S 322nd St	Signalized	E	A	4.2	0.12	A	8.7	0.25
SR 99 and S 324th St	Signalized	D	--	--	--	C	32.6	0.62
S 320th P&R and 23rd Ave. S/S 324th St	OWSC	E	A	9.9	0.02	B	11.8	0.06

Notes:
Improvements described include changes in intersection control, pedestrian phasing, and channelization improvements that could be included as part of the project.
Des Moines v/c are reported for the worst lane group per the City of Des Moines concurrency standards.
Results are reported using HCM 2000 methodology.
Roundabout results are reported from Sidra 5.1.
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Assumed signalized as part of the base project definition for all build alternatives except the Kent/Des Moines At-Grade Station Option.

HCM = Highway Capacity Manual; HSS = Highway of Statewide Significance; LOS = level of service; OWSC = one-way stop control; P&R = park-and-ride; TWSC = two-way stop control; v/c = volume to capacity; WSDOT = Washington State Department of Transportation; -- = not analyzed

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Future 2035 Intersection LOS Results

TABLE D-2

No Build and SR 99 Alternative Intersection Level of Service: Kent/Des Moines Station Area Options

Intersection	LOS Standard[a]	Alternative/Station Options														
		No Build Alternative			SR 99 West			HC Campus			SR 99 Median			SR 99 East		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 200th St	E	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (D)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)
SR 99 and S 204th St	E	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (C)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)
SR 99 and S 208th St	E	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (C)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)
Military Rd S and S 216th St	E	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (D)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)
24th Ave. S and S 216th St	E	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (D)	-- (0.27)	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (39.5)	-- (0.27)
SR 99 and S 216th St	D	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (E)	-- (1.32)	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (63.5)	-- (1.32)
S 220th St and SR 99	D	-- (B)	-- (13.1)	-- (0.78)	-- (B)	-- (B)	-- (0.8)	-- (B)	-- (13.3)	-- (0.8)	-- (B)	-- (13.3)	-- (0.8)	-- (B)	-- (13.3)	-- (0.8)
SR 99 and S 224th St	D	-- (B)	-- (18.2)	-- (0.67)	-- (B)	-- (B)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)
25th Ave. S/24th Ave S and Kent-Des Moines Rd	D	-- (B)	-- (11.7)	-- (0.67)	-- (B)	-- (B)	-- (0.66)	-- (B)	-- (12.5)	-- (0.66)	-- (B)	-- (12.5)	-- (0.66)	-- (B)	-- (12.5)	-- (0.66)
SR 99 and Kent-Des Moines Rd	D	E (F)	58.5 (98.1)	0.95 (1.57)	E (F)	70.5 (F)	1.56 (1.56)	E (F)	70.1 (104.7)	1.26 (1.51)	E (F)	69.8 (105.5)	0.99 (1.49)	E (F)	69.7 (104.7)	0.99 (1.49)
30th Ave. S and Kent-Des Moines Rd	D	-- (B)	-- (12.8)	-- (0.56)	-- (B)	-- (B)	-- (0.58)	-- (B)	-- (13.1)	-- (0.58)	-- (B)	-- (13.1)	-- (0.58)	-- (B)	-- (13.1)	-- (0.58)
16th Ave. S and S 240th St	D	-- (B)	-- (10.5)	-- (0.61)	-- (B)	-- (B)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)

TABLE D-2

No Build and SR 99 Alternative Intersection Level of Service: Kent/Des Moines Station Area Options

Intersection	LOS Standard[a]	Alternative/Station Options														
		No Build Alternative			SR 99 West			HC Campus			SR 99 Median			SR 99 East		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
28th Ave. S/Highline College Driveway and S 240th St	D	-- (B)	-- (14.3)	-- (0.26)	-- (B)	-- (B)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)
S 240th St and Highline College Drop-Off Loop	D	-- (B)	-- (12.2)	-- (0.25)	-- (B)	-- (B)	-- (0.26)	-- (B)	-- (12.7)	-- (0.26)	-- (B)	-- (12.7)	-- (0.26)	-- (B)	-- (12.7)	-- (0.26)
Military Rd S and Kent-Des Moines P&R	E	-- (D)	-- (31)	-- (0.32)	-- (D)	-- (D)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)
I-5 Southbound Ramps and Kent-Des Moines Rd	D	C (D)	23 (46.6)	0.63 (0.93)	C (D)	24.9 (D)	0.7 (0.97)	C (D)	24.9 (49.9)	0.7 (0.97)	C (D)	24.8 (50)	0.7 (0.97)	C (D)	24.9 (49.9)	0.7 (0.97)
I-5 Northbound Ramps and Kent-Des Moines Rd	D	C (B)	30.4 (19.5)	0.6 (0.7)	C (C)	30.4 (C)	0.64 (0.75)	C (C)	30.5 (20.1)	0.64 (0.75)	C (C)	30.5 (20.1)	0.64 (0.75)	C (C)	30.3 (20.1)	0.64 (0.75)
Military Rd S and Kent-Des Moines Rd	E	-- (E)	-- (58.5)	-- (0.99)	-- (E)	-- (E)	-- (1)	-- (E)	-- (59.1)	-- (1)	-- (E)	-- (62.2)	-- (1.01)	-- (E)	-- (62.2)	-- (1.01)
SR 99 and S 236th Lane	D	A (B)	5.9 (15.7)	0.6 (0.73)	C (D)	28.6 (D)	0.69 (0.98)	C (C)	32.8 (30.7)	0.73 (0.9)	C (D)	26.5 (38.8)	0.7 (0.87)	D (D)	43.3 (46)	0.77 (0.92)
SR 99 and S 240th St	D	E (D)	57.2 (49.4)	0.91 (0.93)	E (E)	70 (E)	0.93 (1)	E (E)	74.1 (76.5)	0.93 (1)	E (E)	73.1 (67.7)	0.93 (1)	E (E)	71.4 (65.8)	0.94 (0.99)
S 240th St and 30th Ave. S	E	B (B)	12.9 (13.3)	0.15 (0.29)	B (B)	11.2 (B)	0.13 (0.21)	B (B)	11.2 (11)	0.14 (0.23)	B (B)	11.2 (11)	0.13 (0.23)	B (B)	11.1 (10.9)	0.14 (0.21)
Military Rd S and S 240th St	E	-- (E)	-- (38.2)	-- (0.25)	-- (E)	-- (E)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)

TABLE D-2

No Build and SR 99 Alternative Intersection Level of Service: Kent/Des Moines Station Area Options

Intersection	LOS Standard[a]	Alternative/Station Options														
		No Build Alternative			SR 99 West			HC Campus			SR 99 Median			SR 99 East		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 252nd St	D	-- (B)	-- (13.8)	-- (0.74)	-- (B)	-- (B)	-- (0.75)	-- (B)	-- (16)	-- (0.75)	-- (B)	-- (15.7)	-- (0.75)	-- (B)	-- (13.9)	-- (0.75)
SR 99 and Fred Meyer	D	-- (C)	-- (30.2)	-- (0.84)	-- (C)	-- (C)	-- (0.85)	-- (C)	-- (31.5)	-- (0.85)	-- (C)	-- (31.7)	-- (0.85)	-- (C)	-- (31.6)	-- (0.85)
SR 99 and S 260th St	D	-- (D)	-- (40.6)	-- (0.9)	-- (D)	-- (D)	-- (0.93)	-- (D)	-- (45.4)	-- (0.93)	-- (D)	-- (45.6)	-- (0.93)	-- (D)	-- (45.6)	-- (0.93)
Military Rd S and 259th Pl/S Reith Rd	E	-- (F)	-- (112.5)	-- (1.16)	-- (F)	-- (F)	-- (1.18)	-- (F)	-- (119.1)	-- (1.18)	-- (F)	-- (119.1)	-- (1.18)	-- (F)	-- (119.1)	-- (1.18)
16th Ave. S and S 260th St	D	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (C)	-- (0.79)	-- (C)	-- (23.9)	-- (0.8)	-- (C)	-- (23.9)	-- (0.8)	-- (C)	-- (23.9)	-- (0.8)
I-5 Northbound Ramps and Veterans Dr	D	C (C)	23.7 (27.6)	0.83 (0.67)	-- (--)	23.8 (C)	0.84 (0.68)	-- (--)	23.9 (28.4)	0.84 (0.68)	-- (--)	23.8 (28.4)	0.84 (0.68)	C (C)	23.8 (28.4)	0.84 (0.68)
I-5 Southbound Ramps and Veterans Dr	D	B (C)	16.3 (26.9)	0.24 (0.86)	-- (--)	17.3 (C)	0.25 (0.86)	-- (--)	17.3 (27)	0.25 (0.86)	-- (--)	17.3 (27)	0.25 (0.86)	B (C)	17.3 (27)	0.25 (0.86)

Notes:
AM Peak Hour (PM Peak Hour)
Improvements described include changes in intersection control, pedestrian phasing, and channelization improvements that could be included as part of the project.
Des Moines v/c are reported for the worst lane group per the City of Des Moines concurrency standards.
Results are reported using HCM 2000 methodology.
Roundabout results are reported from Sidra 5.1.
Gray shading indicates intersection does not meet LOS standard.

[a] LOS Designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Assumed signalized as part of the base project definition for all build alternatives except the Kent/Des Moines At-Grade Option.

HCM = Highway Capacity Manual; HSS = Highway of Statewide Significance; OWSC = one-way stop control; P&R = park-and-ride; TWSC = two-way stop control; v/c = volume to capacity; WSDOT = Washington State Department of Transportation; -- = not analyzed

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TABLE D-3

No Build and SR 99 Alternative Intersection Level of Service: S 272nd Station Area

Intersection	LOS Standard[a]	Alternative					
		No Build			S 272nd Redondo		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave. S and S 272nd St	D	-- (D)	-- (40.4)	-- (0.88)	-- (D)	-- (40.7)	-- (0.88)
SR 99 and S 272nd St	D	F (D)	126.3 (38.6)	1.23 (0.92)	F (E)	135.7 (59.3)	1.3 (1.01)
S Star Lake Rd and S 272nd St	E	-- (E)	-- (67.2)	-- (1.06)	-- (F)	-- (91.6)	-- (1.16)
26th Ave. S and Star Lake P&R North Driveway	E	-- (A)	-- (8.7)	-- (0.03)	-- (A)	-- (8.8)	-- (0.04)
26th Ave. S and Star Lake P&R South Driveway	E	-- (A)	-- (9.9)	-- (0.15)	-- (A)	-- (9.9)	-- (0.15)
S 272nd St and 26th Ave. S	E	A (B)	6 (10.7)	0.48 (0.69)	A (B)	6.1 (10.6)	0.49 (0.71)
I-5 Southbound Ramps and S 272nd St	D	C (E)	23.4 (72.7)	0.59 (0.94)	C (E)	22.7 (75.2)	0.61 (0.97)
I-5 Northbound Ramps and S 272nd St	D	E (E)	69.6 (60.7)	0.98 (0.65)	F (F)	85.9 (84.9)	1.03 (0.69)
Military Rd S and S 272nd St	E	-- (F)	-- (120)	-- (1.33)	-- (F)	-- (128.8)	-- (1.37)
SR 99 and S 276th St	D	B (B)	11.8 (19.9)	0.6 (0.72)	D (B)	52.7 (17.7)	0.89 (0.9)
SR 99 and 16th Ave S	D	-- (C)	-- (21.3)	-- (0.59)	-- (D)	-- (26)	-- (0.67)
SR 99 and S 288th St	D	-- (D)	-- (53.8)	-- (0.81)	-- (D)	-- (54.5)	-- (0.83)
SR 99 and Dash Point Rd	D	-- (C)	-- (27.8)	-- (0.85)	-- (D)	-- (35.7)	-- (0.91)

Notes:
AM Peak Hour (PM Peak Hour)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity (v/c) was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HCM = Highway Capacity Manual; HSS = Highway of Statewide Significance; P&R = park-and-ride; -- = not analyzed

TABLE D-4

No Build and SR 99 Alternative Intersection Level of Service: Federal Way City Center Station Area Options

Intersection	LOS Standard[a]	Alternative/Station Options								
		No Build			Federal Way Transit Center			Federal Way SR 99		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 304th St	D	-- (C)	-- (31.1)	-- (0.7)	-- (C)	-- (31.5)	-- (0.7)	-- (C)	-- (31.6)	-- (0.7)
SR 99 and S 308th St	D	-- (C)	-- (23.2)	-- (0.78)	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (23.5)	-- (0.79)
SR 99 and S 312th St	D	-- (D)	-- (40.9)	-- (0.8)	-- (D)	-- (41)	-- (0.8)	-- (D)	-- (41.2)	-- (0.8)
20th Ave. S and S 312th St	F[c]	-- (B)	-- (18.3)	-- (0.41)	-- (B)	-- (18.3)	-- (0.41)	-- (B)	-- (18.4)	-- (0.41)
23rd Ave. S and S 312th St	F[c]	-- (C)	-- (33.8)	-- (0.65)	-- (C)	-- (33.1)	-- (0.65)	-- (C)	-- (31)	-- (0.65)
SR 99 and S 316th St	D	B (D)	17.3 (41.9)	0.43 (0.94)	B (D)	18.8 (45.6)	0.45 (0.93)	B (D)	17.8 (45.8)	0.44 (0.93)
Pete von Reichbauer Way and S 316th St	F[c]	-- (C)	-- (22.2)	-- (0.56)	-- (C)	-- (20.7)	-- (0.56)	-- (C)	-- (20.7)	-- (0.54)
21st Ave. S and S 316th St	F[c]	A (B)	9.8 (12.8)	0.07 (0.37)	B (B)	10.2 (13)	0.1 (0.37)	A (B)	9.9 (13)	0.08 (0.38)
23rd Ave. S and S 316th St	F[c]	-- (A)	-- (9.4)	-- (0.4)	-- (B)	-- (10.2)	-- (0.4)	-- (A)	-- (9.5)	-- (0.4)
23rd Ave. S and S 317th St	F[c]	A (C)	9.6 (28.6)	0.39 (0.85)	B (C)	10 (27.6)	0.09 (0.82)	B (C)	12.1 (29.9)	0.43 (0.79)
S 317th St and 28th Ave. S	F[c]	A (B)	2.5 (14.1)	0.582 (0.754)	A (B)	7.9 (10.8)	0.543 (0.675)	A (B)	7.9 (10.8)	0.543 (0.675)
SR 99 and S 320th St	D	D (D)	51.1 (50.3)	0.91 (0.95)	E (D)	58.6 (47.9)	0.97 (0.97)	E (D)	58.4 (50.7)	0.97 (0.99)
Pete von Reichbauer Way and S 320th St	F[c]	-- (C)	-- (26.9)	-- (0.91)	-- (C)	-- (20.4)	-- (0.93)	-- (C)	-- (20)	-- (0.94)
21st Ave. S and S 320th St	F[c]	-- (B)	-- (14.8)	-- (0.25)	-- (C)	-- (18.4)	-- (0.31)	-- (C)	-- (18.5)	-- (0.38)
23rd Ave. S and S 320th St	F[c]	C (E)	30.2 (61.2)	0.68 (1.06)	D (E)	37.4 (79.2)	0.74 (1.12)	D (F)	44 (86.9)	0.82 (1.12)
25th Ave. S and S 320th St	F[c]	B (C)	13.7 (22.9)	0.65 (1.26)	B (D)	13.3 (52.8)	0.68 (1.62)	B (C)	14.1 (23.2)	0.68 (1.26)
I-5 Southbound Ramps and S 320th St	D	B (D)	14.9 (43.8)	0.63 (0.97)	B (D)	15.1 (42.6)	0.64 (0.98)	B (D)	15.2 (45.6)	0.65 (0.99)
I-5 Northbound Ramps and S 320th St	D	B (C)	14.2 (23.3)	0.65 (0.76)	B (C)	14.9 (24)	0.66 (0.78)	B (C)	15.2 (24.4)	0.67 (0.79)
23rd Ave. S and S 322nd St	F[c]	A (B)	8 (11.3)	0.23 (0.41)	A (B)	8.2 (11.2)	0.26 (0.43)	B (B)	16.8 (16.1)	0.66 (0.53)

TABLE D-4

No Build and SR 99 Alternative Intersection Level of Service: Federal Way City Center Station Area Options

Intersection	LOS Standard[a]	Alternative/Station Options								
		No Build			Federal Way Transit Center			Federal Way SR 99		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 324th St	D	-- (D)	-- (40.3)	-- (0.96)	-- (D)	-- (48.1)	-- (0.97)	-- (D)	-- (52.6)	-- (0.99)
S 320th P&R and 23rd Ave. S/S 324th St	F[c]	B (B)	13.3 (13)	0.05 (0.13)	B (B)	14.2 (13.3)	0.05 (0.13)	C (C)	15.8 (17.3)	0.19 (0.39)

Note:

AM Peak Hour (PM Peak Hour)

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

[c] City of Federal Way LOS standard is based on v/c ratio, as described in Table 3-11 in Chapter 3 of this document. For purposes of this table a LOS F standard represents an average V/C ratio of 1.1 for the City Center area. Detailed v/c ratio calculations are provided in Appendix D.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; WSDOT = Washington State Department of Transportation; -- = not analyzed

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TABLE D-5

No Build and SR 99 Alternative Intersection Level of Service: S 216th and S 260th Station Area Options

Intersection	LOS Standard[a]	Alternative/Station Options																	
		No Build			SR 99Baseline			S 216th St West			S 216th St East			S 260th St West			S 260th St East		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 200th St	E	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.1)	-- (0.63)	-- (D)	-- (36.1)	-- (0.63)	-- (D)	-- (36.1)	-- (0.63)	-- (D)	-- (36.1)	-- (0.63)
SR 99 and S 204th St	E	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.7)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.7)	-- (0.62)
SR 99 and S 208th St	E	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.6)	-- (0.79)	-- (C)	-- (29.3)	-- (0.79)	-- (C)	-- (28.6)	-- (0.79)	-- (C)	-- (29.3)	-- (0.79)
Military Rd S and S 216th St	E	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (54.9)	-- (1.03)	-- (E)	-- (56)	-- (1.04)	-- (D)	-- (54.9)	-- (1.03)	-- (E)	-- (56)	-- (1.04)
24th Ave. S and S 216th St	E	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (37.7)	-- (0.27)	-- (D)	-- (37.7)	-- (0.27)	-- (D)	-- (37.7)	-- (0.27)	-- (D)	-- (37.7)	-- (0.27)
SR 99 and S 216th St	D	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (63.2)	-- (1.32)	-- (E)	-- (65.5)	-- (1.37)	-- (E)	-- (65.7)	-- (1.32)	-- (E)	-- (65.5)	-- (1.37)	-- (E)	-- (65.7)	-- (1.32)
S 220th St and SR 99	D	-- (B)	-- (13.1)	-- (0.78)	-- (B)	-- (13.3)	-- (0.8)	-- (B)	-- (13.7)	-- (0.8)	-- (B)	-- (14.4)	-- (0.8)	-- (B)	-- (13.7)	-- (0.8)	-- (B)	-- (14.4)	-- (0.8)
SR 99 and S 224th St	D	-- (B)	-- (18.2)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)	-- (B)	-- (18.6)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)	-- (B)	-- (18.6)	-- (0.67)
25th Ave. S/24th Ave S and Kent-Des Moines Rd	D	-- (B)	-- (11.7)	-- (0.67)	-- (B)	-- (12.5)	-- (0.66)	-- (B)	-- (12.5)	-- (0.66)	-- (B)	-- (12.7)	-- (0.66)	-- (B)	-- (12.5)	-- (0.66)	-- (B)	-- (12.7)	-- (0.66)
SR 99 and Kent-Des Moines Rd	D	E (F)	58.5 (98.1)	0.95 (1.57)	E (F)	70.5 (105.7)	1.56 (1.56)	E (F)	70 (104.5)	0.79 (1.61)	E (F)	70 (106)	0.79 (1.61)	E (F)	70 (104.5)	0.79 (1.61)	E (F)	70 (106)	0.79 (1.61)
30th Ave. S and Kent-Des Moines Rd	D	-- (B)	-- (12.8)	-- (0.56)	-- (B)	-- (13.1)	-- (0.58)	-- (B)	-- (12.9)	-- (0.58)	-- (B)	-- (12.9)	-- (0.58)	-- (B)	-- (12.9)	-- (0.58)	-- (B)	-- (12.9)	-- (0.58)
16th Ave. S and S 240th St	D	-- (B)	-- (10.5)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)	-- (B)	-- (10.9)	-- (0.62)	-- (B)	-- (10.7)	-- (0.61)	-- (B)	-- (10.9)	-- (0.62)
28th Ave. S/Highline College Driveway and S 240th St	D	-- (B)	-- (14.3)	-- (0.26)	-- (B)	-- (14.6)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)
S 240th St and Highline College Drop-Off Loop	D	-- (B)	-- (12.2)	-- (0.25)	-- (B)	-- (12.7)	-- (0.26)	-- (B)	-- (12.7)	-- (0.26)	-- (B)	-- (12.8)	-- (0.26)	-- (B)	-- (12.7)	-- (0.26)	-- (B)	-- (12.8)	-- (0.26)
Military Rd S and Kent-Des Moines P&R	E	-- (D)	-- (31)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.5)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.5)	-- (0.32)
I-5 Southbound Ramps and Kent-Des Moines Rd	D	C (D)	23 (46.6)	0.63 (0.93)	C (D)	24.9 (49.9)	0.7 (0.97)	C (D)	25.9 (51.8)	0.71 (0.98)	C (D)	25.9 (52.2)	0.71 (0.98)	C (D)	25.9 (51.8)	0.71 (0.98)	C (D)	25.9 (52.2)	0.71 (0.98)
I-5 Northbound Ramps and Kent-Des Moines Rd	D	C (B)	30.4 (19.5)	0.6 (0.7)	C (C)	30.4 (20.1)	0.64 (0.75)	C (C)	30.7 (20.3)	0.64 (0.75)	C (C)	30.7 (20.5)	0.64 (0.75)	C (C)	30.7 (20.3)	0.64 (0.75)	C (C)	30.7 (20.5)	0.64 (0.75)
Military Rd S and Kent-Des Moines Rd	E	-- (E)	-- (58.5)	-- (0.99)	-- (E)	-- (59.1)	-- (1)	-- (E)	-- (62.8)	-- (1.01)	-- (E)	-- (60.6)	-- (1)	-- (E)	-- (62.8)	-- (1.01)	-- (E)	-- (60.6)	-- (1)
SR 99 and S 236th Lane	E	A (B)	5.9 (15.7)	0.6 (0.73)	C (D)	28.6 (39.3)	0.69 (0.98)	C (D)	28.2 (44.4)	0.68 (0.93)	C (D)	28.2 (40.2)	0.68 (0.98)	C (D)	28.2 (44.4)	0.68 (0.93)	C (D)	28.2 (40.2)	0.68 (0.98)
SR 99 and S 240th St	E	E (D)	57.2 (49.4)	0.91 (0.93)	E (E)	70 (75.4)	0.93 (1)	E (F)	74.7 (83.4)	0.94 (1)	E (E)	74.7 (77)	0.94 (1.01)	E (F)	74.7 (83.4)	0.94 (1)	E (E)	74.7 (77)	0.94 (1.01)
S 240th St and 30th Ave. S	E	B (B)	12.9 (13.3)	0.15 (0.29)	B (B)	11.2 (10.9)	0.13 (0.21)	B (B)	11.6 (10.9)	0.14 (0.21)	B (B)	11.6 (10.9)	0.14 (0.21)	B (B)	11.6 (10.9)	0.14 (0.21)	B (B)	11.6 (10.9)	0.14 (0.21)
Military Rd S and S 240th St	E	-- (E)	-- (38.2)	-- (0.25)	-- (E)	-- (39.2)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)
SR 99 and S 252nd St	E	-- (B)	-- (13.8)	-- (0.74)	-- (B)	-- (15.6)	-- (0.75)	-- (B)	-- (16.4)	-- (0.75)	-- (B)	-- (16.7)	-- (0.76)	-- (B)	-- (16.4)	-- (0.75)	-- (B)	-- (16.7)	-- (0.76)
SR 99 and Fred Meyer	E	-- (C)	-- (30.2)	-- (0.84)	-- (C)	-- (31.8)	-- (0.85)	-- (C)	-- (32)	-- (0.85)	-- (C)	-- (30.9)	-- (0.85)	-- (C)	-- (32)	-- (0.85)	-- (C)	-- (30.9)	-- (0.85)
SR 99 and S 260th St	E	-- (D)	-- (40.6)	-- (0.9)	-- (D)	-- (45.6)	-- (0.93)	-- (D)	-- (54.5)	-- (0.91)	-- (D)	-- (50.6)	-- (0.91)	-- (D)	-- (54.5)	-- (0.91)	-- (D)	-- (50.6)	-- (0.91)
Military Rd S and 259th Pl/S Reith Rd	E	-- (F)	-- (112.5)	-- (1.16)	-- (F)	-- (119.1)	-- (1.18)	-- (F)	-- (120)	-- (1.18)	-- (F)	-- (120)	-- (1.19)	-- (F)	-- (120)	-- (1.18)	-- (F)	-- (120)	-- (1.19)
16th Ave. S and S 260th St	E	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (23.9)	-- (0.79)	-- (C)	-- (23.9)	-- (0.8)	-- (C)	-- (23.9)	-- (0.77)	-- (C)	-- (23.9)	-- (0.8)	-- (C)	-- (23.9)	-- (0.77)
16th Ave S and S 272nd St	E	-- (D)	-- (40.4)	-- (0.88)	-- (D)	-- (40.7)	-- (0.88)	-- (D)	-- (40.7)	-- (0.88)	-- (D)	-- (40.7)	-- (0.88)	-- (D)	-- (40.7)	-- (0.88)	-- (D)	-- (40.7)	-- (0.88)

TABLE D-5

No Build and SR 99 Alternative Intersection Level of Service: S 216th and S 260th Station Area Options

Intersection	LOS Standard[a]	Alternative/Station Options																	
		No Build			SR 99Baseline			S 216th St West			S 216th St East			S 260th St West			S 260th St East		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 272nd St	E	F (D)	126.3 (38.6)	1.23 (0.92)	F (E)	135.7 (59.3)	1.3 (1.01)	F (E)	135.8 (60)	1.3 (1.01)	F (E)	135.8 (59.9)	1.3 (1.01)	F (E)	135.8 (60)	1.3 (1.01)	F (E)	135.8 (59.9)	1.3 (1.01)
S Star Lake Rd and S 272nd St	E	-- (E)	-- (67.2)	-- (1.06)	-- (F)	-- (91.6)	-- (1.16)	-- (F)	-- (397.9)	-- (1.88)	-- (F)	-- (91.9)	-- (1.16)	-- (F)	-- (397.9)	-- (1.88)	-- (F)	-- (91.9)	-- (1.16)
26th Ave S and Star Lake P&R North Driveway	E	-- (A)	-- (8.7)	-- (0.03)	-- (A)	-- (8.8)	-- (0.04)	-- (A)	-- (8.8)	-- (0.04)	-- (A)	-- (8.8)	-- (0.04)	-- (A)	-- (8.8)	-- (0.04)	-- (A)	-- (8.8)	-- (0.04)
26th Ave S and Star Lake P&R South Driveway	E	-- (A)	-- (9.9)	-- (0.15)	-- (A)	-- (9.9)	-- (0.15)	-- (A)	-- (9.9)	-- (0.15)	-- (A)	-- (9.9)	-- (0.15)	-- (A)	-- (9.9)	-- (0.15)	-- (A)	-- (9.9)	-- (0.15)
S 272nd St and 26th Ave S	E	A (B)	6 (10.7)	0.48 (0.69)	A (B)	6.1 (10.6)	0.49 (0.71)	A (B)	6.1 (10.6)	0.5 (0.7)	A (B)	6.1 (10.6)	0.5 (0.71)	A (B)	6.1 (10.6)	0.5 (0.7)	A (B)	6.1 (10.6)	0.5 (0.71)
I-5 Southbound Ramps and S 272nd St	E	C (E)	23.4 (72.7)	0.59 (0.94)	C (E)	22.7 (75.2)	0.61 (0.97)	C (E)	22.9 (75.1)	0.61 (0.97)	C (E)	22.9 (76.1)	0.61 (0.97)	C (E)	22.9 (75.1)	0.61 (0.97)	C (E)	22.9 (76.1)	0.61 (0.97)
I-5 Northbound Ramps and S 272nd St	E	E (E)	69.6 (60.7)	0.98 (0.65)	F (F)	85.9 (84.9)	1.03 (0.69)	F (F)	86.5 (83.9)	1.03 (0.69)	F (F)	86.5 (85.7)	1.03 (0.69)	F (F)	86.5 (83.9)	1.03 (0.69)	F (F)	86.5 (85.7)	1.03 (0.69)
Military Rd S and S 272nd St	E	-- (F)	-- (120)	-- (1.33)	-- (F)	-- (128.8)	-- (1.37)	-- (F)	-- (128.7)	-- (1.37)	-- (F)	-- (129.1)	-- (1.37)	-- (F)	-- (128.7)	-- (1.37)	-- (F)	-- (129.1)	-- (1.37)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; WSDOT = Washington State Department of Transportation; -- = not analyzed

TABLE D-6
No Build and Preferred Alternative Intersection Level of Service: Kent/Des Moines Station Area Options

Intersection	LOS Standard[a]	No Build			Station Options								
					Preferred			I-5			At-Grade		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 200th St	E	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)
SR 99 and S 204th St	E	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)
SR 99 and S 208th St	E	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)
Military Rd S and S 216th St	E	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)
24th Ave. S and S 216th St	E	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (37.6)	-- (0.91)	-- (D)	-- (39.5)	-- (0.27)	-- (D)	-- (37.6)	-- (0.91)
SR 99 and S 216th St	D	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (63.2)	-- (1.32)	-- (E)	-- (63.5)	-- (1.32)	-- (E)	-- (63.2)	-- (1.32)
S 220th St and SR 99	D	-- (B)	-- (13.1)	-- (0.78)	-- (B)	-- (13.3)	-- (0.8)	-- (B)	-- (13.3)	-- (0.8)	-- (B)	-- (13.3)	-- (0.8)
SR 99 and S 224th St	D	-- (B)	-- (18.2)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)
25th Ave. S/24th Ave S and Kent-Des Moines Rd	D	-- (B)	-- (11.7)	-- (0.67)	-- (B)	-- (12.4)	-- (0.66)	-- (B)	-- (12.5)	-- (0.66)	-- (B)	-- (12.5)	-- (0.66)
SR 99 and Kent-Des Moines Rd	D	E (F)	58.5 (98.1)	0.95 (1.57)	E (F)	69.4 (104.4)	1.26 (1.44)	E (F)	69.7 (104.7)	0.99 (1.49)	E (F)	68.3 (110)	1.04 (1.8)
30th Ave. S and Kent-Des Moines Rd	D	-- (B)	-- (12.8)	-- (0.56)	-- (B)	-- (12.9)	-- (0.58)	-- (B)	-- (13.1)	-- (0.58)	-- (B)	-- (12.9)	-- (0.58)
16th Ave. S and S 240th St	D	-- (B)	-- (10.5)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)
28th Ave. S/Highline College Driveway and S 240th St	D	-- (B)	-- (14.3)	-- (0.26)	-- (B)	-- (14.6)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)
S 240th St and Highline College Drop-Off Loop	D	-- (B)	-- (12.2)	-- (0.25)	-- (B)	-- (12.7)	-- (0.26)	-- (B)	-- (12.7)	-- (0.26)	-- (B)	-- (12.7)	-- (0.26)
Military Rd S and Kent-Des Moines P&R	E	-- (D)	-- (31)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)
I-5 Southbound Ramps and Kent-Des Moines Rd	D	C (D)	23 (46.6)	0.63 (0.93)	C (D)	24.9 (51.1)	0.7 (0.98)	C (D)	24.9 (49.9)	0.7 (0.97)	C (D)	24.8 (51)	0.69 (0.97)
I-5 Northbound Ramps and Kent-Des Moines Rd	D	C (B)	30.4 (19.5)	0.6 (0.7)	C (B)	30.3 (19.3)	0.62 (0.72)	C (C)	30.3 (20.1)	0.64 (0.75)	C (B)	30.2 (18.9)	0.62 (0.72)
Military Rd S and Kent-Des Moines Rd	E	-- (E)	-- (58.5)	-- (0.99)	-- (E)	-- (59.6)	-- (1)	-- (E)	-- (62.2)	-- (1.01)	-- (E)	-- (59.5)	-- (1)
SR 99 and S 236th Lane	D	A (B)	5.9 (15.7)	0.6 (0.73)	D (D)	45.6 (54.6)	0.69 (0.8)	D (D)	43.3 (46)	0.77 (0.92)	A (B)	7.1 (14.9)	0.56 (0.75)
SR 99 and S 240th St	D	E (D)	57.2 (49.4)	0.91 (0.93)	E (D)	67.9 (51.5)	0.94 (1)	E (E)	71.4 (65.8)	0.94 (0.99)	F (E)	123.3 (66.2)	1.08 (1.03)
S 240th St and 30th Ave S	E	B (B)	12.9 (13.3)	0.15 (0.29)	B (B)	11.2 (11.6)	0.17 (0.3)	B (B)	11.1 (10.9)	0.14 (0.21)	C (C)	19.2 (21)	0.24 (0.45)
Military Rd S and S 240th St	E	-- (E)	-- (38.2)	-- (0.25)	-- (E)	-- (39.2)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)
SR 99 and S 252nd St	D	-- (B)	-- (13.8)	-- (0.74)	-- (B)	-- (15.6)	-- (0.75)	-- (B)	-- (13.9)	-- (0.75)	-- (B)	-- (15.7)	-- (0.75)
SR 99 and Fred Meyer	D	-- (C)	-- (30.2)	-- (0.84)	-- (C)	-- (30.8)	-- (0.85)	-- (C)	-- (31.6)	-- (0.85)	-- (C)	-- (30.8)	-- (0.85)
SR 99 and S 260th St	D	-- (D)	-- (40.6)	-- (0.9)	-- (D)	-- (45)	-- (0.93)	-- (D)	-- (45.6)	-- (0.93)	-- (D)	-- (44.8)	-- (0.93)
Military Rd S and 259th Pl/S Reith Rd	E	-- (F)	-- (112.5)	-- (1.16)	-- (F)	-- (120)	-- (1.18)	-- (F)	-- (119.1)	-- (1.18)	-- (F)	-- (119.6)	-- (1.18)
16th Ave. S and S 260th St	D	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (23.9)	-- (0.79)	-- (C)	-- (23.9)	-- (0.8)	-- (C)	-- (23.9)	-- (0.79)
I-5 Northbound Ramps and Veterans Dr	D	C (C)	23.7 (27.6)	0.83 (0.67)	C (C)	24 (27.1)	0.84 (0.68)	C (C)	23.8 (28.4)	0.84 (0.68)	C (C)	24.1 (27.3)	0.84 (0.68)
I-5 Southbound Ramps and Veterans Dr	D	B (C)	16.3 (26.9)	0.24 (0.86)	B (C)	17.3 (27)	0.25 (0.86)	B (C)	17.3 (27)	0.25 (0.86)	B (C)	17.3 (27)	0.25 (0.86)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity (v/c) was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; v/c = volume to capacity; WSDOT = Washington State Department of Transportation; -- = not analyzed

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TABLE D-7

No Build and Preferred Alternative Intersection Level of Service: S 272nd Star Lake Station Area Options

Intersection	LOS Standard[a]	Alternative					
		No Build			S 272nd Star Lake		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave. S and S 272nd St	D	-- (D)	-- (40.4)	-- (0.88)	-- (D)	-- (40.5)	-- (0.88)
SR 99 and S 272nd St	D	F (D)	126.3 (38.6)	1.23 (0.92)	F (D)	143.7 (47.2)	1.29 (1)
S Star Lake Rd and S 272nd St	E	-- (E)	-- (67.2)	-- (1.06)	-- (F)	-- (127.5)	-- (1.25)
26th Ave. S and Star Lake P&R North Driveway	E	-- (A)	-- (8.7)	-- (0.03)	-- (A)	-- (9.2)	-- (0.04)
26th Ave. S and Star Lake P&R South Driveway	E	-- (A)	-- (9.9)	-- (0.15)	-- (C)	-- (18.5)	-- (0.64)
S 272nd St and 26th Ave. S	E	A (B)	6 (10.7)	0.48 (0.69)	C (C)	20.4 (30.3)	0.63 (0.88)
I-5 Southbound Ramps and S 272nd St	D	C (E)	23.4 (72.7)	0.59 (0.94)	C (E)	22.7 (74)	0.6 (0.96)
I-5 Northbound Ramps and S 272nd St	D	E (E)	69.6 (60.7)	0.98 (0.65)	F (E)	80.4 (76.9)	1.01 (0.67)
Military Rd S and S 272nd St	E	-- (F)	-- (120)	-- (1.33)	-- (F)	-- (127.8)	-- (1.34)
SR 99 and S 276th St	D	B (B)	11.8 (19.9)	0.6 (0.72)	B (C)	12.4 (26.3)	0.64 (0.76)
SR 99 and 16th Ave S	D	-- (C)	-- (21.3)	-- (0.59)	-- (C)	-- (22.8)	-- (0.61)
SR 99 and S 288th St	D	-- (D)	-- (53.8)	-- (0.81)	-- (D)	-- (53.7)	-- (0.82)
SR 99 and Dash Point Rd	D	-- (C)	-- (27.8)	-- (0.85)	-- (C)	-- (32.7)	-- (0.89)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity (v/c) was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; -- = not analyzed

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TABLE D-8
No Build and Preferred Alternative Intersection Level of Service: Federal Way City Center Station Area Options

Intersection ID	LOS Standard[a]	Alternative/Station Option											
		No Build			Preferred Federal Way Transit Center			Federal Way I-5			Federal Way S 320th P&R		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 304th St	D	-- (C)	-- (31.1)	-- (0.7)	-- (C)	-- (30.5)	-- (0.69)	-- (C)	-- (31.5)	-- (0.7)	-- (C)	-- (31.3)	-- (0.7)
SR 99 and S 308th St	D	-- (C)	-- (23.2)	-- (0.78)	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (23.5)	-- (0.79)
SR 99 and S 312th St	D	-- (D)	-- (40.9)	-- (0.8)	-- (D)	-- (41.4)	-- (0.83)	-- (D)	-- (41)	-- (0.8)	-- (D)	-- (41.4)	-- (0.8)
Pete von Reichbauer Way and S 312th St	F[c]	-- (B)	-- (18.3)	-- (0.41)	-- (B)	-- (18.6)	-- (0.43)	-- (B)	-- (18.3)	-- (0.41)	-- (B)	-- (17.7)	-- (0.41)
23rd Ave. S and S 312th St	F[c]	-- (C)	-- (33.8)	-- (0.65)	-- (C)	-- (29.7)	-- (0.65)	-- (C)	-- (33.1)	-- (0.65)	-- (C)	-- (29.8)	-- (0.65)
SR 99 and S 316th St	D	B (D)	17.3 (41.9)	0.43 (0.94)	B (D)	18 (39.1)	0.44 (0.91)	B (D)	18.8 (45.6)	0.45 (0.93)	C (D)	27.6 (49.3)	0.57 (1.03)
Pete von Reichbauer Way and S 316th St	F[c]	-- (C)	-- (22.2)	-- (0.56)	-- (C)	-- (22.3)	-- (0.57)	-- (C)	-- (20.7)	-- (0.56)	-- (C)	-- (24.6)	-- (0.75)
21st Ave. S and S 316th St	F[c]	A (B)	9.8 (12.8)	0.07 (0.37)	B (B)	10.2 (13.5)	0.1 (0.4)	B (B)	10.2 (13)	0.1 (0.37)	A (B)	10 (12.9)	0.07 (0.35)
23rd Ave. S and S 316th St	F[c]	-- (A)	-- (9.4)	-- (0.4)	-- (A)	-- (9.4)	-- (0.4)	-- (B)	-- (10.2)	-- (0.4)	-- (A)	-- (10)	-- (0.4)
23rd Ave. S and S 317th St	F[c]	A (C)	9.6 (28.6)	0.39 (0.85)	B (C)	12.5 (26.8)	0.42 (0.82)	B (C)	10 (27.6)	0.09 (0.82)	B (C)	11.6 (31.1)	0.4 (0.67)
S 317th St and 28th Ave. S	F[c]	A (B)	2.5 (14.1)	0.582 (0.754)	A (B)	7.9 (10.9)	0.542 (0.678)	A (B)	7.9 (10.8)	0.543 (0.675)	A (B)	7.9 (10.9)	0.542 (0.678)
SR 99 and S 320th St	D	D (D)	51.1 (50.3)	0.91 (0.95)	E (E)	60.3 (57)	0.98 (1)	E (D)	58.6 (47.9)	0.97 (0.97)	D (D)	53.7 (52.2)	0.94 (0.96)
Pete von Reichbauer Way and S 320th St	F[c]	-- (C)	-- (26.9)	-- (0.91)	-- (C)	-- (29.8)	-- (0.95)	-- (C)	-- (20.4)	-- (0.93)	-- (C)	-- (31.5)	-- (0.94)
21st Ave. S and S 320th St	F[c]	-- (B)	-- (14.8)	-- (0.25)	-- (C)	-- (21.5)	-- (0.64)	-- (C)	-- (18.4)	-- (0.31)	-- (C)	-- (15.6)	-- (0.26)
23rd Ave. S and S 320th St	F[c]	C (E)	30.2 (61.2)	0.68 (1.06)	D (E)	36.4 (76)	0.73 (1.12)	D (E)	37.4 (79.2)	0.74 (1.12)	C (E)	33 (64.9)	0.72 (1.07)
25th Ave. S and S 320th St	F[c]	B (C)	13.7 (22.9)	0.65 (1.26)	B (C)	13.3 (22.7)	0.68 (1.26)	B (D)	13.3 (52.8)	0.68 (1.62)	B (C)	13.5 (22.4)	0.67 (1.26)
I-5 Southbound Ramps and S 320th St	D	B (D)	14.9 (43.8)	0.63 (0.97)	B (D)	15.2 (44.8)	0.64 (0.98)	B (D)	15.1 (42.6)	0.64 (0.98)	B (D)	15 (44.5)	0.63 (0.98)
I-5 Northbound Ramps and S 320th St	D	B (C)	14.2 (23.3)	0.65 (0.76)	B (C)	14.7 (24.2)	0.67 (0.78)	B (C)	14.9 (24)	0.66 (0.78)	B (C)	14.6 (23.9)	0.67 (0.77)
23rd Ave. S and S 322nd St	F[c]	A (B)	8 (11.3)	0.23 (0.41)	A (B)	8.1 (11.4)	0.23 (0.41)	A (B)	8.2 (11.2)	0.26 (0.43)	A (B)	8.1 (11.4)	0.23 (0.41)
SR 99 and S 324th St	D	-- (D)	-- (40.3)	-- (0.96)	-- (D)	-- (44.7)	-- (1.16)	-- (D)	-- (48.1)	-- (0.97)	-- (D)	-- (44.8)	-- (1.16)
S 320th P&R and 23rd Ave. S/S 324th St	F[c]	B (B)	13.3 (13)	0.05 (0.13)	B (B)	13.3 (13)	0.05 (0.13)	B (B)	14.2 (13.3)	0.05 (0.13)	B (B)	13.3 (13)	0.05 (0.13)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity (v/c) was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

[c] City of Federal Way LOS standard is based on volume-to-capacity (v/c) ratio, as described in Table 3-11 in Chapter 3 of this document. For purposes of this table a LOS F standard represents an average V/C ratio of 1.1 for the City Center area. Detailed v/c ratio calculations are provided in Appendix D.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; -- = not analyzed

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TABLE D-9

No Build and SR 99 to I-5 Alternative Intersection Level of Service: Kent/Des Moines Station Area

Intersection	LOS Standard[a]	Alternative/Station Options					
		No Build			Kent/Des Moines		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 200th St	E	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)
SR 99 and S 204th St	E	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)
SR 99 and S 208th St	E	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)
Military Rd S and S 216th St	E	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)
24th Ave. S and S 216th St	E	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (37.6)	-- (0.91)
SR 99 and S 216th St	D	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (63.2)	-- (1.32)
S 220th St and SR 99	D	-- (B)	-- (13.1)	-- (0.78)	-- (B)	-- (13.3)	-- (0.8)
SR 99 and S 224th St	D	-- (B)	-- (18.2)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)
25th Ave. S/24th Ave S and Kent-Des Moines Rd	D	-- (B)	-- (11.7)	-- (0.67)	-- (B)	-- (12.5)	-- (0.66)
SR 99 and Kent-Des Moines Rd	D	E (F)	58.5 (98.1)	0.95 (1.57)	E (F)	70.6 (104)	1.26 (1.38)
30th Ave. S and Kent-Des Moines Rd	D	-- (B)	-- (12.8)	-- (0.56)	-- (B)	-- (12.9)	-- (0.58)
16th Ave. S and S 240th St	D	-- (B)	-- (10.5)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)
28th Ave. S/Highline College Driveway and S 240th St	D	-- (B)	-- (14.3)	-- (0.26)	-- (B)	-- (14.6)	-- (0.28)
S 240th St and Highline College Drop-Off Loop	D	-- (B)	-- (12.2)	-- (0.25)	-- (B)	-- (12.7)	-- (0.26)
Military Rd S and Kent-Des Moines P&R	E	-- (D)	-- (31)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)
I-5 Southbound Ramps and Kent-Des Moines Rd	D	C (D)	23 (46.6)	0.63 (0.93)	C (D)	25.8 (51.4)	0.71 (0.98)
I-5 Northbound Ramps and Kent-Des Moines Rd	D	C (B)	30.4 (19.5)	0.6 (0.7)	C (B)	30.3 (19.1)	0.63 (0.75)
Military Rd S and Kent-Des Moines Rd	E	-- (E)	-- (58.5)	-- (0.99)	-- (E)	-- (59.7)	-- (1)
SR 99 and S 236th Street	D	A (B)	5.9 (15.7)	0.6 (0.73)	D (D)	41.8 (52)	0.72 (0.83)
SR 99 and S 240th St	D	E (D)	57.2 (49.4)	0.91 (0.93)	E (D)	70.2 (51.9)	0.96 (1)
S 240th St and 30th Ave. S	E	B (B)	12.9 (13.3)	0.15 (0.29)	B (B)	14.6 (11.8)	0.19 (0.27)
Military Rd S and S 240th St	E	-- (E)	-- (38.2)	-- (0.25)	-- (E)	-- (39.2)	-- (0.26)
SR 99 and S 252nd St	D	-- (B)	-- (13.8)	-- (0.74)	-- (B)	-- (15.6)	-- (0.75)
SR 99 and Fred Meyer	D	-- (C)	-- (30.2)	-- (0.84)	-- (C)	-- (30.8)	-- (0.85)
SR 99 and S 260th St	D	-- (D)	-- (40.6)	-- (0.9)	-- (D)	-- (44.8)	-- (0.93)
Military Rd S and 259th Pl/S Reith Rd	E	-- (F)	-- (112.5)	-- (1.16)	-- (F)	-- (119.8)	-- (1.18)
16th Ave. S and S 260th St	D	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (24.7)	-- (0.8)

TABLE D-9

No Build and SR 99 to I-5 Alternative Intersection Level of Service: Kent/Des Moines Station Area

Intersection	LOS Standard[a]	Alternative/Station Options					
		No Build			Kent/Des Moines		
		LOS	Delay	V/C	LOS	Delay	V/C
I-5 Northbound Ramps and Veterans Dr	D	C (C)	23.7 (27.6)	0.83 (0.67)	C (C)	23.7 (26.8)	0.83 (0.67)
I-5 Southbound Ramps and Veterans Dr	D	B (C)	16.3 (26.9)	0.24 (0.86)	B (C)	17.3 (27.1)	0.25 (0.86)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity (v/c) was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; -- = not analyzed

TABLE D-10

No Build and SR 99 to I-5 Alternative Intersection Level of Service: S 272nd Star Lake Station Area

Intersection	LOS Standard[a]	Alternative					
		No Build			S 272nd Star Lake		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave. S and S 272nd St	D	-- (D)	-- (40.4)	-- (0.88)	-- (D)	-- (40.5)	-- (0.88)
SR 99 and S 272nd St	D	F (D)	126.3 (38.6)	1.23 (0.92)	F (D)	143.7 (47.2)	1.29 (1)
S Star Lake Rd and S 272nd St	E	-- (E)	-- (67.2)	-- (1.06)	-- (F)	-- (127.5)	-- (1.25)
26th Ave. S and Star Lake P&R North Driveway	E	-- (A)	-- (8.7)	-- (0.03)	-- (A)	-- (9.2)	-- (0.04)
26th Ave. S and Star Lake P&R South Driveway	E	-- (A)	-- (9.9)	-- (0.15)	-- (C)	-- (18.5)	-- (0.64)
S 272nd St and 26th Ave. S	E	A (B)	6 (10.7)	0.48 (0.69)	C (C)	20.4 (30.3)	0.63 (0.88)
I-5 Southbound Ramps and S 272nd St	D	C (E)	23.4 (72.7)	0.59 (0.94)	C (E)	22.7 (74)	0.6 (0.96)
I-5 Northbound Ramps and S 272nd St	D	E (E)	69.6 (60.7)	0.98 (0.65)	F (E)	80.4 (76.9)	1.01 (0.67)
Military Rd S and S 272nd St	E	-- (F)	-- (120)	-- (1.33)	-- (F)	-- (127.8)	-- (1.34)
SR 99 and S 276th St	D	B (B)	11.8 (19.9)	0.6 (0.72)	B (C)	12.4 (26.3)	0.64 (0.76)
SR 99 and 16th Ave. S	D	-- (C)	-- (21.3)	-- (0.59)	-- (C)	-- (22.8)	-- (0.61)
SR 99 and S 288th St	D	-- (D)	-- (53.8)	-- (0.81)	-- (D)	-- (53.7)	-- (0.82)
SR 99 and Dash Point Rd	D	-- (C)	-- (27.8)	-- (0.85)	-- (C)	-- (32.7)	-- (0.89)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity (v/c) was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; -- = not analyzed

TABLE D-11

No Build and SR 99 to I-5 Alternative Intersection Level of Service: Federal Way Transit Center Station Area

Intersection ID	LOS Standard[a]	Alternative/Station Option					
		No Build			Federal Way Transit Center		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 304th St	D	-- (C)	-- (31.1)	-- (0.7)	-- (C)	-- (31.5)	-- (0.7)
SR 99 and S 308th St	D	-- (C)	-- (23.2)	-- (0.78)	-- (C)	-- (23.5)	-- (0.79)
SR 99 and S 312th St	D	-- (D)	-- (40.9)	-- (0.8)	-- (D)	-- (41.3)	-- (0.81)
Pete von Reichbauer Way and S 312th St	F[c]	-- (B)	-- (18.3)	-- (0.41)	-- (B)	-- (18.4)	-- (0.43)
23rd Ave. S and S 312th St	F[c]	-- (C)	-- (33.8)	-- (0.65)	-- (C)	-- (31.2)	-- (0.64)
SR 99 and S 316th St	D	B (D)	17.3 (41.9)	0.43 (0.94)	B (D)	17.9 (49.8)	0.44 (0.96)
Pete von Reichbauer Way and S 316th St	F[c]	-- (C)	-- (22.2)	-- (0.56)	-- (C)	-- (21.9)	-- (0.57)
21st Ave. S and S 316th St	F[c]	A (B)	9.8 (12.8)	0.07 (0.37)	B (B)	10.3 (13.6)	0.1 (0.4)
23rd Ave. S and S 316th St	F[c]	-- (A)	-- (9.4)	-- (0.4)	-- (A)	-- (9.1)	-- (0.4)
23rd Ave. S and S 317th St	F[c]	A (C)	9.6 (28.6)	0.39 (0.85)	B (C)	12.5 (28.3)	0.42 (0.82)
S 317th St and 28th Ave. S	F[c]	A (B)	2.5 (14.1)	0.582 (0.754)	A (B)	7.9 (10.8)	0.542 (0.674)
SR 99 and S 320th St	D	D (D)	51.1 (50.3)	0.91 (0.95)	E (D)	60.4 (52.6)	0.98 (1)
Pete von Reichbauer Way and S 320th St	F[c]	-- (C)	-- (26.9)	-- (0.91)	-- (C)	-- (24.7)	-- (0.95)
21st Ave. S and S 320th St	F[c]	-- (B)	-- (14.8)	-- (0.25)	-- (C)	-- (21.8)	-- (0.65)
23rd Ave. S and S 320th St	F[c]	C (E)	30.2 (61.2)	0.68 (1.06)	C (E)	33.9 (74.3)	0.73 (1.11)
25th Ave. S and S 320th St	F[c]	B (C)	13.7 (22.9)	0.65 (1.26)	B (C)	13.3 (23)	0.68 (1.26)
I-5 Southbound Ramps and S 320th St	D	B (D)	14.9 (43.8)	0.63 (0.97)	B (D)	15.2 (45.1)	0.64 (0.98)
I-5 Northbound Ramps and S 320th St	D	B (C)	14.2 (23.3)	0.65 (0.76)	B (C)	14.9 (24.2)	0.67 (0.78)
23rd Ave. S and S 322nd St	F[c]	A (B)	8 (11.3)	0.23 (0.41)	A (B)	8.1 (12.2)	0.23 (0.41)
SR 99 and S 324th St	D	-- (D)	-- (40.3)	-- (0.96)	-- (D)	-- (47)	-- (0.97)
S 320th P&R and 23rd Ave. S/S 324th St	F[c]	B (B)	13.3 (13)	0.05 (0.13)	B (B)	13.3 (13)	0.05 (0.13)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] v/c was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

[c] City of Federal Way LOS standard is based on volume-to-capacity (v/c) ratio, as described in Table 3-11 in Chapter 3 of this document. For purposes of this table a LOS F standard represents an average V/C ratio of 1.1 for the City Center area. Detailed v/c ratio calculations are provided in Appendix D.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; v/c = volume to capacity; -- = not analyzed

TABLE D-12

No Build and I-5 to SR 99 Alternative Intersection Level of Service: Kent/Des Moines Station Area

Intersection	LOS Standard[a]	Alternative/Station Options					
		No Build Alternative			Kent/Des Moines		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 200th St	E	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)
SR 99 and S 204th St	E	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)
SR 99 and S 208th St	E	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)
Military Rd S and S 216th St	E	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)
24th Ave. S and S 216th St	E	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (37.6)	-- (0.91)
SR 99 and S 216th St	D	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (63.2)	-- (1.32)
S 220th St and SR 99	D	-- (B)	-- (13.1)	-- (0.78)	-- (B)	-- (13.3)	-- (0.8)
SR 99 and S 224th St	D	-- (B)	-- (18.2)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)
25th Ave. S/24th Ave S and Kent-Des Moines Rd	D	-- (B)	-- (11.7)	-- (0.67)	-- (B)	-- (12.5)	-- (0.66)
SR 99 and Kent-Des Moines Rd	D	E (F)	58.5 (98.1)	0.95 (1.57)	E (F)	69.3 (104)	1.26 (1.49)
30th Ave. S and Kent-Des Moines Rd	D	-- (B)	-- (12.8)	-- (0.56)	-- (B)	-- (12.9)	-- (0.58)
16th Ave. S and S 240th St	D	-- (B)	-- (10.5)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)
28th Ave. S/Highline College Driveway and S 240th St	D	-- (B)	-- (14.3)	-- (0.26)	-- (B)	-- (14.6)	-- (0.28)
S 240th St and Highline College Drop-Off Loop	D	-- (B)	-- (12.2)	-- (0.25)	-- (B)	-- (12.7)	-- (0.26)
Military Rd S and Kent-Des Moines P&R	E	-- (D)	-- (31)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)
I-5 Southbound Ramps and Kent-Des Moines Rd	D	C (D)	23 (46.6)	0.63 (0.93)	C (D)	25.7 (51.6)	0.71 (0.98)
I-5 Northbound Ramps and Kent-Des Moines Rd	D	C (B)	30.4 (19.5)	0.6 (0.7)	C (B)	30.3 (19.9)	0.63 (0.75)
Military Rd S and Kent-Des Moines Rd	E	-- (E)	-- (58.5)	-- (0.99)	-- (E)	-- (60.1)	-- (1.00)
SR 99 and S 236th Street	D	A (B)	5.9 (15.7)	0.6 (0.73)	D (D)	51.2 (54.6)	0.75 (0.81)
SR 99 and S 240th St	D	E (D)	57.2 (49.4)	0.91 (0.93)	E (D)	65.8 (54.4)	0.93 (1)
S 240th St and 30th Ave. S	E	B (B)	12.9 (13.3)	0.15 (0.29)	B (B)	11 (11.1)	0.15 (0.26)
Military Rd S and S 240th St	E	-- (E)	-- (38.2)	-- (0.25)	-- (E)	-- (39.2)	-- (0.26)
SR 99 and S 252nd St	D	-- (B)	-- (13.8)	-- (0.74)	-- (B)	-- (15.6)	-- (0.75)
SR 99 and Fred Meyer	D	-- (C)	-- (30.2)	-- (0.84)	-- (C)	-- (30.8)	-- (0.85)
SR 99 and S 260th St	D	-- (D)	-- (40.6)	-- (0.9)	-- (D)	-- (45.4)	-- (0.93)
Military Rd S and 259th Pl/S Reith Rd	E	-- (F)	-- (112.5)	-- (1.16)	-- (F)	-- (119.6)	-- (1.18)
16th Ave. S and S 260th St	D	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (24.7)	-- (0.8)
I-5 Northbound Ramps and Veterans Dr	D	C (C)	23.7 (27.6)	0.83 (0.67)	C (C)	23.7 (27.8)	0.83 (0.67)

TABLE D-12

No Build and I-5 to SR 99 Alternative Intersection Level of Service: Kent/Des Moines Station Area

Intersection	LOS Standard[a]	Alternative/Station Options					
		No Build Alternative			Kent/Des Moines		
		LOS	Delay	V/C	LOS	Delay	V/C
I-5 Southbound Ramps and Veterans Dr	D	B (C)	16.3 (26.9)	0.24 (0.86)	B (C)	17.3 (27.1)	0.25 (0.86)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; -- = not analyzed

TABLE D-13

No Build and I-5 to SR 99 Alternative Intersection Level of Service: S 272nd Redondo Station Area

Intersection	LOS Standard[a]	Alternative					
		No Build			S 272nd Redondo		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave. S and S 272nd St	E	-- (D)	-- (40.4)	-- (0.88)	-- (D)	-- (40.7)	-- (0.88)
SR 99 and S 272nd St	D	F (D)	126.3 (38.6)	1.23 (0.92)	F (E)	135.2 (59.6)	1.3 (1.01)
S Star Lake Rd and S 272nd St	E	-- (E)	-- (67.2)	-- (1.06)	-- (F)	-- (91.4)	-- (1.16)
26th Ave. S and Star Lake P&R North Driveway	E	-- (A)	-- (8.7)	-- (0.03)	-- (A)	-- (8.8)	-- (0.04)
26th Ave. S and Star Lake P&R South Driveway	E	-- (A)	-- (9.9)	-- (0.15)	-- (A)	-- (9.9)	-- (0.15)
S 272nd St and 26th Ave. S	E	A (B)	6 (10.7)	0.48 (0.69)	A (B)	6.1 (10.6)	0.5 (0.71)
I-5 Southbound Ramps and S 272nd St	D	C (E)	23.4 (72.7)	0.59 (0.94)	C (E)	22.7 (75.2)	0.61 (0.97)
I-5 Northbound Ramps and S 272nd St	D	E (E)	69.6 (60.7)	0.98 (0.65)	F (F)	85.7 (84.7)	1.03 (0.69)
Military Rd S and S 272nd St	E	-- (F)	-- (120)	-- (1.33)	-- (F)	-- (130.7)	-- (1.35)
SR 99 and S 276th St	D	B (B)	11.8 (19.9)	0.6 (0.72)	D (B)	52.5 (17.9)	0.89 (0.9)
SR 99 and 16th Ave. S	D	-- (C)	-- (21.3)	-- (0.59)	-- (D)	-- (26)	-- (0.67)
SR 99 and S 288th St	D	-- (D)	-- (53.8)	-- (0.81)	-- (D)	-- (54.5)	-- (0.83)
SR 99 and Dash Point Rd	D	-- (C)	-- (27.8)	-- (0.85)	-- (D)	-- (35.5)	-- (0.91)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity (v/c) was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

TABLE D-14

No Build and I-5 to SR 99 Alternative Intersection Level of Service: Federal Way Transit Center Station Area

Intersection ID	LOS Standard[a]	Alternative/Station Option					
		No Build			Federal Way Transit Center		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 304th St	D	-- (C)	-- (31.1)	-- (0.7)	-- (C)	-- (31.3)	-- (0.7)
SR 99 and S 308th St	D	-- (C)	-- (23.2)	-- (0.78)	-- (C)	-- (23.5)	-- (0.79)
SR 99 and S 312th St	D	-- (D)	-- (40.9)	-- (0.8)	-- (D)	-- (41.4)	-- (0.81)
Pete von Reichbauer Way and S 312th St	F[c]	-- (B)	-- (18.3)	-- (0.41)	-- (B)	-- (18.6)	-- (0.43)
23rd Ave. S and S 312th St	F[c]	-- (C)	-- (33.8)	-- (0.65)	-- (C)	-- (31.4)	-- (0.64)
SR 99 and S 316th St	D	B (D)	17.3 (41.9)	0.43 (0.94)	B (D)	17.9 (41)	0.44 (0.93)
Pete von Reichbauer Way and S 316th St	F[c]	-- (C)	-- (22.2)	-- (0.56)	-- (C)	-- (22.6)	-- (0.57)
21st Ave. S and S 316th St	F[c]	A (B)	9.8 (12.8)	0.07 (0.37)	B (B)	10.2 (13.5)	0.1 (0.4)
23rd Ave. S and S 316th St	F[c]	-- (A)	-- (9.4)	-- (0.4)	-- (A)	-- (9.2)	-- (0.4)
23rd Ave. S and S 317th St	F[c]	A (C)	9.6 (28.6)	0.39 (0.85)	B (C)	12.5 (26.9)	0.42 (0.82)
S 317th St and 28th Ave. S	F[c]	A (B)	2.5 (14.1)	0.58 (0.75)	A (B)	8 (10.9)	0.546 (0.678)
SR 99 and S 320th St	D	D (D)	51.1 (50.3)	0.91 (0.95)	E (E)	61.4 (56.8)	0.98 (1)
Pete von Reichbauer Way and S 320th St	F[c]	-- (C)	-- (26.9)	-- (0.91)	-- (C)	-- (29.8)	-- (0.95)
21st Ave. S and S 320th St	F[c]	-- (B)	-- (14.8)	-- (0.25)	-- (C)	-- (21.3)	-- (0.64)
23rd Ave. S and S 320th St	F[c]	C (E)	30.2 (61.2)	0.68 (1.06)	C (E)	33.8 (75.7)	0.72 (1.12)
25th Ave. S and S 320th St	F[c]	B (C)	13.7 (22.9)	0.65 (1.26)	B (C)	13.4 (22.7)	0.67 (1.26)
I-5 Southbound Ramps and S 320th St	D	B (D)	14.9 (43.8)	0.63 (0.97)	B (D)	15.2 (44.8)	0.64 (0.98)
I-5 Northbound Ramps and S 320th St	D	B (C)	14.2 (23.3)	0.65 (0.76)	B (C)	14.9 (24.2)	0.67 (0.78)
23rd Ave. S and S 322nd St	F[c]	A (B)	8 (11.3)	0.23 (0.41)	A (B)	8.1 (11.3)	0.23 (0.41)
SR 99 and S 324th St	D	-- (D)	-- (40.3)	-- (0.96)	-- (D)	-- (44.7)	-- (1.16)
S 320th P&R and 23rd Ave. S/S 324th St	F[c]	B (B)	13.3 (13)	0.05 (0.13)	B (B)	13.3 (13)	0.05 (0.13)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] v/c was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

[c] City of Federal Way LOS standard is based on v/c ratio, as described in Table 3-11 in Chapter 3 of this document. For purposes of this table a LOS F standard represents an average v/c ratio of 1.1 for the City Center area. Detailed v/c ratio calculations are provided in Appendix D.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; v/c = volume to capacity; -- = not analyzed

TABLE D-15

No Build and Preferred Alternative Intersection Level of Service: Kent/Des Moines Station Area Interim Terminus Conditions

Intersection	LOS Standard[a]	Station/Station Option											
		No Build			Preferred			I-5			At-Grade		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 200th St	E	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)
SR 99 and S 204th St	E	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)
SR 99 and S 208th St	E	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)
Military Rd S and S 216th St	E	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)
24th Ave. S and S 216th St	E	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (37.6)	-- (0.91)	-- (D)	-- (37.6)	-- (0.91)	-- (D)	-- (37.6)	-- (0.91)
SR 99 and S 216th St	D	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (63.2)	-- (1.32)	-- (E)	-- (63.2)	-- (1.32)	-- (E)	-- (63.2)	-- (1.32)
S 220th St and SR 99	D	-- (B)	-- (13.1)	-- (0.78)	-- (B)	-- (13.3)	-- (0.8)	-- (B)	-- (13.3)	-- (0.8)	-- (B)	-- (13.3)	-- (0.8)
SR 99 and S 224th St	D	-- (B)	-- (18.2)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)
25th Ave. S/24th Ave S and Kent-Des Moines Rd	D	-- (B)	-- (11.7)	-- (0.67)	-- (B)	-- (12.4)	-- (0.66)	-- (B)	-- (12.4)	-- (0.66)	-- (B)	-- (12.5)	-- (0.66)
SR 99 and Kent-Des Moines Rd	D	E (F)	58.5 (98.1)	0.95 (1.57)	E (F)	69.4 (104.4)	1.26 (1.44)	E (F)	69.6 (104.3)	1.25 (1.51)	E (F)	68.3 (110)	1.04 (1.8)
30th Ave. S and Kent-Des Moines Rd	D	-- (B)	-- (12.8)	-- (0.56)	-- (B)	-- (12.9)	-- (0.58)	-- (B)	-- (12.9)	-- (0.58)	-- (B)	-- (12.9)	-- (0.58)
16th Ave. S and S 240th St	D	-- (B)	-- (10.5)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)	-- (B)	-- (10.7)	-- (0.61)
28th Ave. S/Highline College Driveway and S 240th St	D	-- (B)	-- (14.3)	-- (0.26)	-- (B)	-- (14.6)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)	-- (B)	-- (14.6)	-- (0.28)
S 240th St and Highline College Drop-Off Loop	D	-- (B)	-- (12.2)	-- (0.25)	-- (B)	-- (12.7)	-- (0.26)	-- (B)	-- (12.7)	-- (0.26)	-- (B)	-- (12.7)	-- (0.26)
Military Rd S and Kent-Des Moines P&R	E	-- (D)	-- (31)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)
I-5 Southbound Ramps and Kent-Des Moines Rd	D	C (D)	23 (46.6)	0.63 (0.93)	C (D)	24.9 (51.1)	0.7 (0.98)	C (D)	24.8 (51)	0.69 (0.97)	C (D)	24.8 (51)	0.69 (0.97)
I-5 Northbound Ramps and Kent-Des Moines Rd	D	C (B)	30.4 (19.5)	0.6 (0.7)	C (B)	30.3 (19.3)	0.62 (0.72)	C (B)	30.2 (18.9)	0.62 (0.72)	C (B)	30.2 (18.9)	0.62 (0.72)

TABLE D-15

No Build and Preferred Alternative Intersection Level of Service: Kent/Des Moines Station Area Interim Terminus Conditions

Intersection	LOS Standard[a]	Station/Station Option											
		No Build			Preferred			I-5			At-Grade		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Military Rd S and Kent-Des Moines Rd	E	-- (E)	-- (58.5)	-- (0.99)	-- (E)	-- (59.6)	-- (1)	-- (E)	-- (59.5)	-- (1)	-- (E)	-- (59.5)	-- (1)
SR 99 and S 236th Street	D	A (B)	5.9 (15.7)	0.6 (0.73)	D (D)	45.6 (54.6)	0.69 (0.8)	D (D)	42.9 (45.8)	0.72 (0.82)	A (B)	7.1 (14.9)	0.56 (0.75)
SR 99 and S 240th St	D	E (D)	57.2 (49.4)	0.91 (0.93)	E (D)	67.9 (51.5)	0.94 (1)	E (D)	67.4 (53)	0.93 (1)	F (E)	123.3 (66.2)	1.08 (1.03)
S 240th St and 30th Ave. S	E	B (B)	12.9 (13.3)	0.15 (0.29)	B (B)	11.2 (11.6)	0.17 (0.3)	B (B)	12 (11.7)	0.16 (0.26)	C (C)	19.2 (21)	0.24 (0.45)
Military Rd S and S 240th St	E	-- (E)	-- (38.2)	-- (0.25)	-- (E)	-- (39.2)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)	-- (E)	-- (39.2)	-- (0.26)
SR 99 and S 252nd St	D	-- (B)	-- (13.8)	-- (0.74)	-- (B)	-- (15.6)	-- (0.75)	-- (B)	-- (15.6)	-- (0.75)	-- (B)	-- (15.7)	-- (0.75)
SR 99 and Fred Meyer	D	-- (C)	-- (30.2)	-- (0.84)	-- (C)	-- (30.8)	-- (0.85)	-- (C)	-- (30.8)	-- (0.85)	-- (C)	-- (30.8)	-- (0.85)
SR 99 and S 260th St	D	-- (D)	-- (40.6)	-- (0.9)	-- (D)	-- (45)	-- (0.93)	-- (D)	-- (44.8)	-- (0.93)	-- (D)	-- (44.8)	-- (0.93)
Military Rd S and 259th Pl/S Reith Rd	E	-- (F)	-- (112.5)	-- (1.16)	-- (F)	-- (120)	-- (1.18)	-- (F)	-- (119.6)	-- (1.18)	-- (F)	-- (119.6)	-- (1.18)
16th Ave. S and S 260th St	D	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (23.9)	-- (0.79)	-- (C)	-- (23.9)	-- (0.79)	-- (C)	-- (23.9)	-- (0.79)
I-5 Northbound Ramps and Veterans Dr	D	C (C)	23.7 (27.6)	0.83 (0.67)	C (C)	24 (27.1)	0.84 (0.68)	C (C)	24.1 (27.3)	0.84 (0.68)	C (C)	24.1 (27.3)	0.84 (0.68)
I-5 Southbound Ramps and Veterans Dr	D	B (C)	16.3 (26.9)	0.24 (0.86)	B (C)	17.3 (27)	0.25 (0.86)	B (C)	17.3 (27)	0.25 (0.86)	B (C)	17.3 (27)	0.25 (0.86)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] v/c was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; v/c = volume to capacity; -- = not analyzed

TABLE D-16

No Build and Preferred Alternative Intersection Level of Service: S 272nd Star Lake Station Area Interim Terminus Conditions

Intersection	LOS Standard[a]	Alternative					
		No Build			S 272nd Star Lake		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave. S and S 272nd St	D	-- (D)	-- (40.4)	-- (0.88)	-- (D)	-- (40.6)	-- (0.71)
SR 99 and S 272nd St	D	F (D)	126.3 (38.6)	1.23 (0.92)	F (D)	146.3 (45.6)	1.3 (0.99)
S Star Lake Rd and S 272nd St	E	-- (E)	-- (67.2)	-- (1.06)	-- (F)	-- (121.4)	-- (1.24)
26th Ave. S and Star Lake P&R North Driveway	E	-- (A)	-- (8.7)	-- (0.03)	-- (A)	-- (9.8)	-- (0.21)
26th Ave. S and Star Lake P&R South Driveway	E	-- (A)	-- (9.9)	-- (0.15)	-- (C)	-- (16.7)	-- (0.51)
S 272nd St and 26th Ave. S	E	A (B)	6 (10.7)	0.48 (0.69)	C (C)	23.6 (29.6)	0.57 (0.8)
I-5 Southbound Ramps and S 272nd St	D	C (E)	23.4 (72.7)	0.59 (0.94)	C (E)	23.1 (75.4)	0.61 (0.97)
I-5 Northbound Ramps and S 272nd St	D	E (E)	69.6 (60.7)	0.98 (0.65)	F (F)	94.2 (81.4)	1.08 (0.71)
Military Rd S and S 272nd St	E	-- (F)	-- (120)	-- (1.33)	-- (F)	-- (132.2)	-- (1.34)
SR 99 and S 276th St	D	B (B)	11.8 (19.9)	0.6 (0.72)	B (C)	12.3 (24.4)	0.64 (0.75)
SR 99 and 16th Ave. S	D	-- (C)	-- (21.3)	-- (0.59)	-- (C)	-- (22.8)	-- (0.61)
SR 99 and S 288th St	D	-- (D)	-- (53.8)	-- (0.81)	-- (D)	-- (53.4)	-- (0.82)
SR 99 and Dash Point Rd	D	-- (C)	-- (27.8)	-- (0.85)	-- (C)	-- (32.2)	-- (0.88)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] v/c was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; v/c = volume to capacity; -- = not analyzed

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TABLE D-17

No Build and SR 99 Alternative Intersection Level of Service: Kent/Des Moines Station Area Interim Terminus Conditions

Intersection	LOS Standard[a]	Alternative/Station Options														
		No Build			SR 99			HC Campus			SR 99 Median			SR 99 East		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 200th St	E	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)
SR 99 and S 204th St	E	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)
SR 99 and S 208th St	E	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)
Military Rd S and S 216th St	E	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)
24th Ave. S and S 216th St	E	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (37.6)	-- (0.78)	-- (D)	-- (37.6)	-- (0.78)	-- (D)	-- (37.6)	-- (0.78)	-- (D)	-- (37.6)	-- (0.78)
SR 99 and S 216th St	D	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (63.2)	-- (1.08)	-- (E)	-- (63.2)	-- (1.08)	-- (E)	-- (63.3)	-- (1.08)	-- (E)	-- (63.2)	-- (1.08)
S 220th St and SR 99	D	-- (B)	-- (13.1)	-- (0.78)	-- (B)	-- (13.3)	-- (0.63)	-- (B)	-- (13.3)	-- (0.63)	-- (B)	-- (13.3)	-- (0.63)	-- (B)	-- (13.3)	-- (0.63)
SR 99 and S 224th St	D	-- (B)	-- (18.2)	-- (0.67)	-- (B)	-- (18.5)	-- (0.63)	-- (B)	-- (18.5)	-- (0.63)	-- (B)	-- (18.5)	-- (0.63)	-- (B)	-- (18.5)	-- (0.63)
25th Ave. S/24th Ave S and Kent-Des Moines Rd	D	-- (B)	-- (11.7)	-- (0.67)	-- (B)	-- (12.7)	-- (0.67)	-- (B)	-- (12.7)	-- (0.67)	-- (B)	-- (12.7)	-- (0.67)	-- (B)	-- (12.7)	-- (0.67)
SR 99 and Kent-Des Moines Rd	D	E (F)	58.5 (98.1)	0.95 (1.57)	F (F)	90.9 (113.9)	1.01 (1.09)	F (F)	91.2 (113.7)	1.02 (1.09)	F (F)	95 (113.5)	1.04 (1.09)	F (F)	90.9 (113.2)	1.01 (1.09)
30th Ave. S and Kent-Des Moines Rd	D	-- (B)	-- (12.8)	-- (0.56)	-- (B)	-- (13.2)	-- (0.19)	-- (B)	-- (13.2)	-- (0.19)	-- (B)	-- (13.2)	-- (0.19)	-- (B)	-- (13.4)	-- (0.43)
16th Ave. S and S 240th St	D	-- (B)	-- (10.5)	-- (0.61)	-- (B)	-- (10.7)	-- (0.58)	-- (B)	-- (10.7)	-- (0.58)	-- (B)	-- (10.7)	-- (0.58)	-- (B)	-- (10.7)	-- (0.58)
28th Ave. S/Highline College Driveway and S 240th St	D	-- (B)	-- (14.3)	-- (0.26)	-- (B)	-- (14.7)	-- (0.1)	-- (B)	-- (14.7)	-- (0.1)	-- (B)	-- (14.7)	-- (0.1)	-- (B)	-- (14.7)	-- (0.1)
S 240th St and Highline College Drop-Off Loop	D	-- (B)	-- (12.2)	-- (0.25)	-- (B)	-- (12.7)	-- (0.18)	-- (B)	-- (12.7)	-- (0.18)	-- (B)	-- (12.7)	-- (0.18)	-- (B)	-- (12.7)	-- (0.18)
Military Rd S and Kent-Des Moines P&R	E	-- (D)	-- (31)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)
I-5 Southbound Ramps and Kent-Des Moines Rd	D	C (D)	23 (46.6)	0.63 (0.93)	C (D)	29.2 (52.6)	0.77 (1)	C (D)	27.3 (52.6)	0.75 (1)	C (D)	26.3 (52.5)	0.73 (1)	C (D)	27.3 (54.3)	0.75 (1.01)
I-5 Northbound Ramps and Kent-Des Moines Rd	D	C (B)	30.4 (19.5)	0.6 (0.7)	C (C)	31.9 (21)	0.67 (0.73)	C (C)	32.1 (21)	0.67 (0.73)	C (C)	32.3 (21.3)	0.67 (0.75)	C (C)	32.1 (20.8)	0.67 (0.72)
Military Rd S and Kent-Des Moines Rd	E	-- (E)	-- (58.5)	-- (0.99)	-- (E)	-- (60.6)	-- (1)	-- (E)	-- (60.6)	-- (1)	-- (E)	-- (60.6)	-- (1)	-- (E)	-- (60.6)	-- (1)
SR 99 and S 236th Street	D	A (B)	5.9 (15.7)	0.6 (0.73)	D (D)	46.9 (54.6)	0.8 (1.03)	D (D)	38 (42)	0.81 (0.98)	C (D)	21.3 (43.9)	0.76 (0.96)	D (D)	49.4 (36.2)	0.85 (0.8)
SR 99 and S 240th St	D	E (D)	57.2 (49.4)	0.91 (0.93)	F (F)	80.2 (93.8)	0.95 (1.03)	E (F)	79.7 (92.2)	0.97 (1.04)	F (F)	82.7 (85.2)	0.97 (0.99)	E (F)	79 (83.3)	0.99 (1.06)
S 240th St and 30th Ave. S	E	B (B)	12.9 (13.3)	0.15 (0.29)	B (B)	11.2 (10.9)	0.13 (0.21)	B (B)	11.1 (11.1)	0.14 (0.26)	B (B)	13.3 (10.9)	0.15 (0.21)	B (B)	11 (11.5)	0.2 (0.32)
Military Rd S and S 240th St	E	-- (E)	-- (38.2)	-- (0.25)	-- (E)	-- (39.1)	-- (0.26)	-- (E)	-- (39.1)	-- (0.26)	-- (E)	-- (39.1)	-- (0.26)	-- (E)	-- (39.1)	-- (0.26)
SR 99 and S 252nd St	D	-- (B)	-- (13.8)	-- (0.74)	-- (B)	-- (15.9)	-- (0.79)	-- (B)	-- (16)	-- (0.79)	-- (B)	-- (16.2)	-- (0.79)	-- (B)	-- (15.8)	-- (0.79)
SR 99 and Fred Meyer	D	-- (C)	-- (30.2)	-- (0.84)	-- (C)	-- (30.4)	-- (0.87)	-- (C)	-- (30.4)	-- (0.87)	-- (C)	-- (31.3)	-- (0.87)	-- (C)	-- (30.3)	-- (0.87)
SR 99 and S 260th St	D	-- (D)	-- (40.6)	-- (0.9)	-- (D)	-- (48.2)	-- (0.95)	-- (D)	-- (48.2)	-- (0.95)	-- (D)	-- (48.5)	-- (0.95)	-- (D)	-- (48.2)	-- (0.95)
Military Rd S and 259th Pl/S Reith Rd	E	-- (F)	-- (112.5)	-- (1.16)	-- (F)	-- (142.9)	-- (1.24)	-- (F)	-- (142.9)	-- (1.24)	-- (F)	-- (144.1)	-- (1.24)	-- (F)	-- (142.9)	-- (1.24)
16th Ave. S and S 260th St	D	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (24.9)	-- (0.71)	-- (C)	-- (24.9)	-- (0.71)	-- (C)	-- (24.9)	-- (0.71)	-- (C)	-- (24.9)	-- (0.71)
I-5 NB Ramps and Veterans Dr	D	C (C)	23.7 (27.6)	0.83 (0.67)	C (C)	23.6 (27.7)	0.83 (0.67)	C (C)	23.6 (27.7)	0.83 (0.67)	C (C)	23.6 (27.8)	0.83 (0.67)	C (C)	23.7 (27.7)	0.84 (0.67)
I-5 SB Ramps and Veterans Dr	D	B (C)	16.3 (26.9)	0.24 (0.86)	B (C)	17.1 (27.1)	0.25 (0.86)	B (C)	17.1 (27.1)	0.25 (0.86)	B (C)	17.1 (27.1)	0.25 (0.86)	B (C)	17.1 (27.4)	0.25 (0.87)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] v/c was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; v/c = volume to capacity; -- = not analyzed

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TABLE D-18

No Build and SR 99 Alternative Intersection Level of Service: S 272nd Redondo Station Area Interim Terminus Conditions

Intersection	LOS Standard[a]	Alternative					
		No Build			S 272nd Redondo		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave. S and S 272nd St	D	-- (D)	-- (40.4)	-- (0.88)	-- (D)	-- (40.8)	-- (0.72)
SR 99 and S 272nd St	D	F (D)	126.3 (38.6)	1.23 (0.92)	F (E)	149.5 (69.5)	1.34 (1.04)
S Star Lake Rd and S 272nd St	E	-- (E)	-- (67.2)	-- (1.06)	-- (F)	-- (116)	-- (1.24)
26th Ave. S and Star Lake P&R North Driveway	E	-- (A)	-- (8.7)	-- (0.03)	-- (A)	-- (8.8)	-- (0.04)
26th Ave. S and Star Lake P&R South Driveway	E	-- (A)	-- (9.9)	-- (0.15)	-- (A)	-- (9.9)	-- (0.15)
S 272nd St and 26th Ave. S	E	A (B)	6 (10.7)	0.48 (0.69)	A (B)	6.2 (10.6)	0.52 (0.73)
I-5 Southbound Ramps and S 272nd St	D	C (E)	23.4 (72.7)	0.59 (0.94)	C (E)	23.3 (76.2)	0.61 (0.98)
I-5 Northbound Ramps and S 272nd St	D	E (E)	69.6 (60.7)	0.98 (0.65)	F (F)	100.6 (83.9)	1.11 (0.72)
Military Rd S and S 272nd St	E	-- (F)	-- (120)	-- (1.33)	-- (F)	-- (129)	-- (1.37)
SR 99 and S 276th St	D	B (B)	11.8 (19.9)	0.6 (0.72)	E (B)	69.3 (18)	1.15 (0.9)
SR 99 and 16th Ave. S	D	-- (C)	-- (21.3)	-- (0.59)	-- (C)	-- (23.2)	-- (0.63)
SR 99 and S 288th St	D	-- (D)	-- (53.8)	-- (0.81)	-- (D)	-- (54.2)	-- (0.83)
SR 99 and Dash Point Rd	D	-- (C)	-- (27.8)	-- (0.85)	-- (C)	-- (34)	-- (0.9)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] Volume to capacity (v/c) was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; v/c = volume to capacity; -- = not analyzed

TABLE D-19

No Build and SR 99 to I-5 Alternative Intersection Level of Service: Kent/Des Moines Station Area Interim Terminus Conditions

Intersection ID	LOS Standard[a]	Alternatives					
		No Build			Kent/Des Moines		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 200th St	E	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)
SR 99 and S 204th St	E	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)
SR 99 and S 208th St	E	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)
Military Rd S and S 216th St	E	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)
24th Ave. S and S 216th St	E	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (37.6)	-- (0.78)
SR 99 and S 216th St	D	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (63.2)	-- (1.08)
S 220th St and SR 99	D	-- (B)	-- (13.1)	-- (0.78)	-- (B)	-- (13.3)	-- (0.63)
SR 99 and S 224th St	D	-- (B)	-- (18.2)	-- (0.67)	-- (B)	-- (18.5)	-- (0.63)
25th Ave. S/24th Ave S and Kent-Des Moines Rd	D	-- (B)	-- (11.7)	-- (0.67)	-- (B)	-- (12.7)	-- (0.67)
SR 99 and Kent-Des Moines Rd	D	E (F)	58.5 (98.1)	0.95 (1.57)	F (F)	89 (112.5)	1 (1.08)
30th Ave. S and Kent-Des Moines Rd	D	-- (B)	-- (12.8)	-- (0.56)	-- (B)	-- (14.7)	-- (0.54)
16th Ave. S and S 240th St	D	-- (B)	-- (10.5)	-- (0.61)	-- (B)	-- (10.7)	-- (0.58)
28th Ave. S/Highline College Driveway and S 240th St	D	-- (B)	-- (14.3)	-- (0.26)	-- (B)	-- (14.7)	-- (0.1)
S 240th St and Highline College Drop-Off Loop	D	-- (B)	-- (12.2)	-- (0.25)	-- (B)	-- (13)	-- (0.13)
Military Rd S and Kent-Des Moines P&R	E	-- (D)	-- (31)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)
I-5 Southbound Ramps and Kent-Des Moines Rd	D	C (D)	23 (46.6)	0.63 (0.93)	C (D)	27.3 (52.4)	0.75 (1)
I-5 Northbound Ramps and Kent-Des Moines Rd	D	C (B)	30.4 (19.5)	0.6 (0.7)	C (C)	32 (20.9)	0.67 (0.73)
Military Rd S and Kent-Des Moines Rd	E	-- (E)	-- (58.5)	-- (0.99)	-- (E)	-- (60.5)	-- (1)
SR 99 and S 236th Street	D	A (B)	5.9 (15.7)	0.6 (0.73)	D (D)	49.3 (54.4)	0.88 (0.81)
SR 99 and S 240th St	D	E (D)	57.2 (49.4)	0.91 (0.93)	E (E)	79.7 (75)	0.96 (1.04)
S 240th St and 30th Ave. S	E	B (B)	12.9 (13.3)	0.15 (0.29)	B (B)	12.5 (12.3)	0.19 (0.33)
Military Rd S and S 240th St	E	-- (E)	-- (38.2)	-- (0.25)	-- (E)	-- (39.1)	-- (0.26)
SR 99 and S 252nd St	D	-- (B)	-- (13.8)	-- (0.74)	-- (B)	-- (14.6)	-- (0.77)
SR 99 and Fred Meyer	D	-- (C)	-- (30.2)	-- (0.84)	-- (C)	-- (30.4)	-- (0.87)
SR 99 and S 260th St	D	-- (D)	-- (40.6)	-- (0.9)	-- (D)	-- (48)	-- (0.94)
Military Rd S and 259th Pl/S Reith Rd	E	-- (F)	-- (112.5)	-- (1.16)	-- (F)	-- (142.1)	-- (1.24)
16th Ave. S and S 260th St	D	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (24.9)	-- (0.71)
I-5 Northbound Ramps and Veterans Dr	D	C (C)	23.7 (27.6)	0.83 (0.67)	C (C)	23.7 (27.6)	0.83 (0.67)

TABLE D-19

No Build and SR 99 to I-5 Alternative Intersection Level of Service: Kent/Des Moines Station Area Interim Terminus Conditions

Intersection ID	LOS Standard[a]	Alternatives					
		No Build			Kent/Des Moines		
		LOS	Delay	V/C	LOS	Delay	V/C
I-5 Southbound Ramps and Veterans Dr	D	B (C)	16.3 (26.9)	0.24 (0.86)	B (C)	17.1 (27.1)	0.25 (0.86)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] v/c was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; v/c = volume to capacity; -- = not analyzed

TABLE D-20

No Build and SR 99 to I-5 Alternative Intersection Level of Service: S 272nd Star Lake Station Area Interim Terminus Conditions

Intersection ID	LOS Standard[a]	Alternative					
		No Build			S 272nd Star Lake		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave. S and S 272nd St	D	-- (D)	-- (40.4)	-- (0.88)	-- (D)	-- (40.6)	-- (0.71)
SR 99 and S 272nd St	D	F (D)	126.3 (38.6)	1.23 (0.92)	F (D)	146.3 (45.6)	1.3 (0.99)
S Star Lake Rd and S 272nd St	E	-- (E)	-- (67.2)	-- (1.06)	-- (F)	-- (121.4)	-- (1.24)
26th Ave. S and Star Lake P&R North Driveway	E	-- (A)	-- (8.7)	-- (0.03)	-- (A)	-- (9.8)	-- (0.21)
26th Ave. S and Star Lake P&R S Driveway	E	-- (A)	-- (9.9)	-- (0.15)	-- (C)	-- (16.7)	-- (0.51)
S 272nd St and 26th Ave. S	E	A (B)	6 (10.7)	0.48 (0.69)	C (C)	23.6 (29.6)	0.57 (0.8)
I-5 Southbound Ramps and S 272nd St	D	C (E)	23.4 (72.7)	0.59 (0.94)	C (E)	23.1 (75.4)	0.61 (0.97)
I-5 Northbound Ramps and S 272nd St	D	E (E)	69.6 (60.7)	0.98 (0.65)	F (F)	94.2 (81.4)	1.08 (0.71)
Military Rd S and S 272nd St	E	-- (F)	-- (120)	-- (1.33)	-- (F)	-- (132.2)	-- (1.34)
SR 99 and S 276th St	D	B (B)	11.8 (19.9)	0.6 (0.72)	B (C)	12.3 (24.4)	0.64 (0.75)
SR 99 and 16th Ave. S	D	-- (C)	-- (21.3)	-- (0.59)	-- (C)	-- (22.8)	-- (0.61)
SR 99 and S 288th St	D	-- (D)	-- (53.8)	-- (0.81)	-- (D)	-- (53.4)	-- (0.82)
SR 99 and Dash Point Rd	D	-- (C)	-- (27.8)	-- (0.85)	-- (C)	-- (32.2)	-- (0.88)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] v/c was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; v/c = volume to capacity; -- = not analyzed

TABLE D-21

No Build and I-5 to SR 99 Alternative Intersection Level of Service: Kent/Des Moines Station Area Interim Terminus Conditions

Intersection	LOS Standard [a]	Alternatives					
		No Build			Kent/Des Moines		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and S 200th St	E	-- (D)	-- (36.2)	-- (0.63)	-- (D)	-- (36.2)	-- (0.63)
SR 99 and S 204th St	E	-- (C)	-- (22.8)	-- (0.62)	-- (C)	-- (22.8)	-- (0.62)
SR 99 and S 208th St	E	-- (C)	-- (28.4)	-- (0.78)	-- (C)	-- (28.4)	-- (0.78)
Military Rd S and S 216th St	E	-- (D)	-- (53.3)	-- (1.02)	-- (D)	-- (53.3)	-- (1.02)
24th Ave. S and S 216th St	E	-- (D)	-- (37.6)	-- (0.27)	-- (D)	-- (37.6)	-- (0.78)
SR 99 and S 216th St	D	-- (E)	-- (63.3)	-- (1.32)	-- (E)	-- (63.2)	-- (1.08)
S 220th St and SR 99	D	-- (B)	-- (13.1)	-- (0.78)	-- (B)	-- (13.3)	-- (0.63)
SR 99 and S 224th St	D	-- (B)	-- (18.2)	-- (0.67)	-- (B)	-- (18.5)	-- (0.63)
25th Ave. S/24th Ave S and Kent-Des Moines Rd	D	-- (B)	-- (11.7)	-- (0.67)	-- (B)	-- (12.7)	-- (0.67)
SR 99 and Kent-Des Moines Rd	D	E (F)	58.5 (98.1)	0.95 (1.57)	F (F)	90 (112.7)	1.01 (1.08)
30th Ave. S and Kent-Des Moines Rd	D	-- (B)	-- (12.8)	-- (0.56)	-- (B)	-- (13.4)	-- (0.43)
16th Ave. S and S 240th St	D	-- (B)	-- (10.5)	-- (0.61)	-- (B)	-- (10.7)	-- (0.58)
28th Ave. S/Highline College Driveway and S 240th St	D	-- (B)	-- (14.3)	-- (0.26)	-- (B)	-- (14.7)	-- (0.1)
S 240th St and Highline College Drop-Off Loop	D	-- (B)	-- (12.2)	-- (0.25)	-- (B)	-- (12.7)	-- (0.18)
Military Rd S and Kent-Des Moines P&R	E	-- (D)	-- (31)	-- (0.32)	-- (D)	-- (31.4)	-- (0.32)
I-5 Southbound Ramps and Kent-Des Moines Rd	D	C (D)	23 (46.6)	0.63 (0.93)	C (D)	28.7 (52.4)	0.77 (1)
I-5 Northbound Ramps and Kent-Des Moines Rd	D	C (B)	30.4 (19.5)	0.6 (0.7)	C (C)	31.4 (20.9)	0.66 (0.73)
Military Rd S and Kent-Des Moines Rd	E	-- (E)	-- (58.5)	-- (0.99)	-- (E)	-- (60.5)	-- (1)
SR 99 and S 236th Street	D	A (B)	5.9 (15.7)	0.6 (0.73)	D (D)	46.5 (50)	0.85 (0.84)
SR 99 and S 240th St	D	E (D)	57.2 (49.4)	0.91 (0.93)	F (E)	80.9 (74.5)	0.99 (1.05)
S 240th St and 30th Ave. S	E	B (B)	12.9 (13.3)	0.15 (0.29)	B (B)	11 (11.6)	0.2 (0.34)
Military Rd S and S 240th St	E	-- (E)	-- (38.2)	-- (0.25)	-- (E)	-- (39.1)	-- (0.26)
SR 99 and S 252nd St	D	-- (B)	-- (13.8)	-- (0.74)	-- (B)	-- (15.9)	-- (0.78)
SR 99 and Fred Meyer	D	-- (C)	-- (30.2)	-- (0.84)	-- (C)	-- (30.3)	-- (0.87)
SR 99 and S 260th St	D	-- (D)	-- (40.6)	-- (0.9)	-- (D)	-- (48)	-- (0.94)
Military Rd S and 259th Pl/S Reith Rd	E	-- (F)	-- (112.5)	-- (1.16)	-- (F)	-- (142.1)	-- (1.24)
16th Ave. S and S 260th St	D	-- (C)	-- (23.5)	-- (0.79)	-- (C)	-- (24.9)	-- (0.71)
I-5 Northbound Ramps and Veterans Dr	D	C (C)	23.7 (27.6)	0.83 (0.67)	C (C)	23.7 (27.6)	0.83 (0.67)
I-5 Southbound Ramps and Veterans Dr	D	B (C)	16.3 (26.9)	0.24 (0.86)	B (C)	16.8 (27.1)	0.25 (0.86)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] v/c was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

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TABLE D-22

No Build and I-5 to SR 99 Alternative Intersection Level of Service: S 272nd Redondo Station Area Interim Terminus Conditions

Intersection	LOS Standard[a]	Alternative					
		No Build			S 272nd Redondo		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave. S and S 272nd St	D	-- (D)	-- (40.4)	-- (0.88)	-- (D)	-- (40.8)	-- (0.72)
SR 99 and S 272nd St	D	F (D)	126.3 (38.6)	1.23 (0.92)	F (E)	149.5 (69.5)	1.34 (1.04)
S Star Lake Rd and S 272nd St	E	-- (E)	-- (67.2)	-- (1.06)	-- (F)	-- (116)	-- (1.24)
26th Ave. S and Star Lake P&R North Driveway	E	-- (A)	-- (8.7)	-- (0.03)	-- (A)	-- (8.8)	-- (0.04)
26th Ave. S and Star Lake P&R South Driveway	E	-- (A)	-- (9.9)	-- (0.15)	-- (A)	-- (9.9)	-- (0.15)
S 272nd St and 26th Ave. S	E	A (B)	6 (10.7)	0.48 (0.69)	A (B)	6.2 (10.6)	0.52 (0.73)
I-5 Southbound Ramps and S 272nd St	D	C (E)	23.4 (72.7)	0.59 (0.94)	C (E)	23.3 (76.2)	0.61 (0.98)
I-5 Northbound Ramps and S 272nd St	D	E (E)	69.6 (60.7)	0.98 (0.65)	F (F)	100.6 (83.9)	1.11 (0.72)
Military Rd S and S 272nd St	E	-- (F)	-- (120)	-- (1.33)	-- (F)	-- (129)	-- (1.37)
SR 99 and S 276th St	D	B (B)	11.8 (19.9)	0.6 (0.72)	E (B)	69.3 (18)	1.15 (0.9)
SR 99 and 16th Ave. S	D	-- (C)	-- (21.3)	-- (0.59)	-- (C)	-- (23.2)	-- (0.63)
SR 99 and S 288th St	D	-- (D)	-- (53.8)	-- (0.81)	-- (D)	-- (54.2)	-- (0.83)
SR 99 and Dash Point Rd	D	-- (C)	-- (27.8)	-- (0.85)	-- (C)	-- (34)	-- (0.9)

Notes:
AM LOS (PM LOS)
Gray shading indicates intersection does not meet LOS standard.

[a] LOS designation based on local jurisdiction or WSDOT HSS/Non-HSS Standards.

[b] v/c was also used in assessing LOS impacts for intersections in Federal Way and Des Moines.

HSS = Highway of Statewide Significance; LOS = level of service; P&R = park-and-ride; v/c = volume to capacity; -- = not analyzed

Appendix E

I-5 Ramp Terminal Queue Length Results

TABLE E-1
Year 2035 Build I-5 Interchange Queue Lengths: Full-Length Alternatives

Intersection ID	Effective Storage	Physical Storage	Peak Hour	No Build	Preferred Alternative Station/Station Options					SR 99 Alternative Station/Station Options									I-5 to SR 99	SR 99 to I-5
					Preferred Alternative	Kent/Des Moines I-5	Kent/Des Moines At-Grade	Federal Way I-5	Federal Way S 320th P&R	SR 99 Alternative	Kent/Des Moines HC Campus	Kent/Des Moines SR 99 Median	Kent/Des Moines SR 99 East	S 216th West	S 216th East	S 260th West	S 260th East	Federal Way SR 99		
Veterans Drive SB Off-Ramp	3,120	3,800	AM	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
			PM	875	875	875	875	875	875	875	875	875	875	875	875	875	875	875	875	875
Kent-Des Moines SB Off-Ramp	470	470	AM	225	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
			PM	650	650	650	650	650	650	700	700	700	700	650	650	650	650	650	650	650
Veterans Drive NB On-Ramp	820	820	AM	350	325	325	325	325	325	325	350	325	325	350	350	350	350	350	325	325
			PM	600	525	525	525	525	525	625	625	625	625	625	625	625	625	625	625	500
Kent-Des Moines NB Off-Ramp	870	1,425	AM	325	300	300	300	300	300	300	300	300	300	325	325	325	325	300	300	300
			PM	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
S 272nd SB Off-Ramp	950	1,625	AM	225	225	225	225	225	225	225	225	225	225	250	250	250	250	225	225	225
			PM	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075
S 272nd NB Off-Ramp	920	1,575	AM	350	350	350	350	350	350	350	350	350	350	375	375	375	375	350	350	350
			PM	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
S 320th SB Off-Ramp	860	1,525	AM	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
			PM	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825
S 320th NB Off-Ramp	600	1,300	AM	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375
			PM	550	575	575	575	575	600	575	575	575	575	575	575	575	575	575	575	575

Notes:
Queue length results reported are Year 2035 95th percentile values rounded to the nearest 25.
Effective storage length does not include ramp deceleration length.

HC = Highline College; NB = northbound; SB = southbound

TABLE E-2
Year 2035 Build I-5 Interchange Queue Lengths: Interim Terminus Conditions

Intersection ID	Effective Storage	Physical Storage	Peak Hour	Kent/Des Moines Station Interim Terminus Conditions										S 272nd Station Interim Terminus Conditions	
					Preferred Alternative Station/Station Options			SR 99 Alternative Station/Station Options							
				No Build	Preferred Alternative	Kent/Des Moines I-5	Kent/Des Moines At-Grade	SR 99 Alternative	Kent/Des Moines HC Campus	Kent/Des Moines SR 99 Median	Kent/Des Moines SR 99 East	I-5 to SR 99	SR 99 to I-5	SR 99 Alternative	Preferred Alternative
Veterans Drive SB Off-Ramp	3,120	3,800	AM	75	75	75	75	75	75	75	75	75	75	75	75
			PM	875	875	875	875	875	875	875	900	875	875	875	875
Kent-Des Moines SB Off-Ramp	470	470	AM	225	325	325	325	525	325	325	325	475	325	300	300
			PM	650	700	700	700	700	700	700	750	700	700	675	650
Veterans Drive NB On-Ramp	820	820	AM	350	325	325	325	325	325	325	325	325	325	325	325
			PM	600	525	525	525	600	600	600	625	625	600	600	525
Kent-Des Moines NB Off-Ramp	870	1,425	AM	325	375	375	375	375	375	375	375	350	375	325	300
			PM	300	300	300	300	300	300	300	300	300	300	300	300
S 272nd SB Off-Ramp	950	1,625	AM	225	225	225	225	225	225	225	225	225	225	250	250
			PM	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075
S 272nd NB Off-Ramp	920	1,575	AM	350	350	350	350	350	350	350	350	350	350	625	600
			PM	125	125	125	125	125	125	125	125	125	125	175	175
S 320th SB Off-Ramp	860	1,525	AM	100	100	100	100	100	100	100	100	100	100	100	100
			PM	825	825	825	825	825	825	825	825	825	825	825	825
S 320th NB Off-Ramp	600	1,300	AM	375	375	375	375	375	375	375	375	375	375	375	375
			PM	550	550	550	550	550	550	550	550	550	550	550	550

Notes:
Queue length results reported are Year 2035 95th percentile values rounded to the nearest 25.
Effective storage length does not include ramp deceleration length.

HC = Highline College; NB = northbound; SB = southbound

TABLE E-3

Year 2035 Mitigated Build Interchange Queue Lengths: Full-Length Alternatives

Intersection ID	Effective Storage	Physical Storage	Peak Hour	No-Build	Preferred Alternative Station/Station Options					SR 99 Alternative Station/Station Options									I-5 to SR 99	SR 99 to I-5
					Preferred Alternative	Kent/Des Moines I-5	Kent/Des Moines At-Grade	Federal Way I-5	Federal Way S 320th P&R	SR 99 Alternative	Kent/Des Moines HC Campus	Kent/Des Moines SR 99 Median	Kent/Des Moines SR 99 East	S 216th West	S 216th East	S 260th West	S 260th East	Federal Way SR 99		
Veterans Drive SB Off-Ramp	3,120	3,800	AM	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
			PM	875	875	875	875	875	875	875	875	875	875	875	875	875	875	875	875	875
Kent-Des Moines SB Off-Ramp	470	470	AM	225	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
			PM	650	650	650	650	650	650	675	700	700	700	650	650	650	650	650	650	650
Veterans Drive NB On-Ramp	820	820	AM	350	325	325	325	425	325	325	350	325	325	350	350	350	350	350	325	325
			PM	600	525	525	525	525	525	625	625	625	625	625	625	625	625	625	600	500
Kent-Des Moines NB Off-Ramp	870	1,425	AM	325	300	300	300	300	300	300	300	300	300	325	325	325	325	300	300	300
			PM	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
S 272nd SB Off-Ramp	950	1,625	AM	225	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175
			PM	1075	650	650	650	650	650	675	675	675	675	675	675	675	675	675	650	650
S 272nd NB Off-Ramp	920	1575	AM	350	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
			PM	125	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175
S 320th SB Off-Ramp	860	1,525	AM	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
			PM	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825	825
S 320th NB Off-Ramp	600	1,300	AM	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375
			PM	550	575	575	575	575	600	575	575	575	575	575	575	575	575	575	575	575

Notes:
Queue length results reported are Year 2035 95th percentile values rounded to the nearest 25.
Effective storage length does not include ramp deceleration length.

HC = Highline College; NB = northbound; SB = southbound

TABLE E-4

Year 2035 Mitigated Build Interchange Queue Lengths: Interim Terminus Conditions

Intersection ID	Effective Storage	Physical Storage	Peak Hour	No-Build	Kent/Des Moines Station Interim Terminus Conditions									S 272nd Station Interim Terminus Conditions	
					Preferred Alternative Station/ Station Options			SR 99 Alternative Station/ Station Options				I-5 to SR 99	SR 99 to I-5	SR 99 Alternative	Preferred Alternative
					Preferred Alternative	Kent/Des Moines I-5	Kent/Des Moines At-Grade	SR 99 Alternative	Kent/Des Moines HC Campus	Kent/Des Moines SR 99 Median	Kent/Des Moines SR 99 East				
Veterans Drive SB Off-Ramp	3,120	3,800	AM	75	75	75	75	75	75	75	75	75	75	75	75
			PM	875	875	875	875	875	875	875	900	875	875	875	875
Kent-Des Moines SB Off-Ramp	470	470	AM	225	325	325	325	525	325	325	325	475	325	300	300
			PM	650	700	650	700	700	700	700	750	700	700	675	650
Veterans Drive NB On-Ramp	820	820	AM	350	325	325	325	325	325	325	325	325	325	325	325
			PM	600	525	525	525	600	600	600	625	600	600	600	525
Kent-Des Moines NB Off-Ramp	870	1,425	AM	325	375	375	375	375	375	375	375	350	375	325	300
			PM	300	300	300	300	300	300	300	300	300	300	300	300
S 272nd SB Off-Ramp	950	1,625	AM	225	225	225	225	225	225	225	225	225	225	175	175
			PM	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	700	700
S 272nd NB Off-Ramp	920	1,575	AM	350	350	350	350	350	350	350	350	350	350	275	275
			PM	125	125	125	125	125	125	125	125	125	125	150	100
S 320th SB Off-Ramp	860	1,525	AM	100	100	100	100	100	100	100	100	100	100	100	100
			PM	825	825	825	825	825	825	825	825	825	825	825	825
S 320th NB Off-Ramp	600	1,300	AM	375	375	375	375	375	375	375	375	375	375	375	375
			PM	550	550	550	550	550	550	550	550	550	550	550	550

Notes:
Queue length results reported are Year 2035 95th percentile values rounded to the nearest 25.
Effective storage length does not include ramp deceleration length.

HC = Highline College; NB = northbound; SB = southbound

TABLE E-5

Year 2035 Mitigated Build Interchange SimTraffic Queue Lengths: Preferred Alternative Interim Terminus Conditions

Intersection	Approach	Movement	Lane Group	Segment Length/Physical Storage Length (ft)	AM - 95th % Queue Length (ft)			PM - 95th % Queue Length (ft)		
					2035 No Build	2035 Build - Mitigation	Delta	2035 No Build	2035 Build - Mitigation	Delta
Kent/Des Moines Interim Terminus Condition										
I-5 SB RAMPS & S KENT-DES MOINES RD	EB	EBT	T/R	670	250	225	-25	200	225	25
		EBR	R	670	250	250	0	225	225	0
	WB	WBL	L	520	125	125	0	250	250	0
		WBT	T	660	100	125	25	250	225	-25
	SB	SBL	L	230	125	125	0	325	350	25
		SBT	L/T	470	125	100	-25	625	600	-25
		SBR	R	470	225	350	125	550	525	-25
I-5 SB RAMPS & VETERANS DR	WB	WBL	L	320	200	275	75	425	475	50
	SB	SBL	L/T	3,800[a]	125	125	0	3600	2275	-1325
		SBT								
I-5 NB RAMPS & S KENT-DES MOINES RD	EB	EBL	L	520	650	650	0	250	250	0
		EBT	T	660	575	600	25	275	250	-25
	WB	WBT	T	740	275	300	25	725	375	-350
		WBR	R	740	525	450	-75	275	125	-150
	NB	NBL	L	1425 [a]	275	300	25	575	525	-50
		NBT	L/T		450	375	-75	650	500	-150
		NBR	R	260	200	150	-50	200	125	-75
I-5 NB RAMPS & VETERANS DR	EB	EBL	L/T	340	125	125	0	350	375	25
		EBT								
	WB	WBT	T	320	125	175	50	5200	4450	-750
		WBR	R	320	300	350	50	5150	4150	-1000
	NB	NBL	L	820	650	475	-175	425	450	25
		NBT	T							
		NBR	R							
S 272nd Interim Terminus Condition										
I-5 SB RAMPS & S 272ND ST	EB	EBT	T	450	550	650	100	550	400	-150
		EBR	R	450	50	75	25	100	125	25
	WB	WBL	L	60	175	175	0	125	175	50
		WBT	T	680	350	250	-100	150	350	200
	SB	SBL	L	850	1050	125	-925	3225	2925	-300
		SBT	L/T/R	1625[b]	1025	125	-900	3225	3100	-125
		SBR	R	610	525	75	-450	900	925	25

TABLE E-5

Year 2035 Mitigated Build Interchange SimTraffic Queue Lengths: Preferred Alternative Interim Terminus Conditions

Intersection	Approach	Movement	Lane Group	Segment Length/Physical Storage Length (ft)	AM - 95th % Queue Length (ft)			PM - 95th % Queue Length (ft)		
					2035 No Build	2035 Build - Mitigation	Delta	2035 No Build	2035 Build - Mitigation	Delta
I-5 NB RAMPS and S 272ND ST	EB	EBL	L	140	225	275	50	300	275	-25
		EBT	T	650	775	875	100	925	925	0
	WB	WBT	T/R	540	2925	1800	-1125	475	125	-350
		WBR							250	
	NB	NBL	L/T	1575 [b]	325	225	-100	275	150	-125
		NBT								
		NBR	R	180	250	125	-125	225	300	75

Note: Queue length results reported using SimTraffic and are rounded to the nearest 25 feet.

[a] K-DM effective storage length for Southbound I-5 Off-Ramp is 3,120 feet, effective storage length for Northbound I-5 Off-Ramp is 870 feet.

[b] 272nd effective storage length for Southbound I-5 Off-Ramp is 950 feet, effective storage length for Northbound I-5 Off-Ramp is 920 feet.

EB = eastbound; EBL = eastbound left; EBR = eastbound right; EBT = eastbound through; ft = feet; L = left; L/T = left/through; L/T/R = left/through/right; NB = northbound; NBL = northbound left; NBR = northbound right; NBT = northbound through; R = right; SB = southbound; SBL = southbound left; SBR = southbound right; SBT = southbound through; T = through; WB = westbound; WBL = westbound left; WBR = westbound right; WBT = westbound through

Appendix F

Pedestrian Level of Service

TABLE F-1

2035 No Build Alternative and FWLE Alternatives PM Peak Hour Pedestrian LOS

Station	Intersection	Intersection Leg	Pedestrian LOS Score				
			No Build	Preferred Alternative	SR 99 Alternative	SR 99 to I-5	I-5 to SR 99
Kent/Des Moines	SR 99/ S 236th Street	North	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**
		South	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**D**
		East	-	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
		West	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
	SR 99/ S 240th Street	North	a/A/**C**	a/A/**C**	a/A/**D**	a/A/**C**	a/A/**C**
		South	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**
		East	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
		West	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
S 272nd Redondo	SR 99/S 272th Street	North	a/A/**C**	-	a/A/**C**	-	a/A/**C**
		South	a/A/**D**	-	a/A/**D**	-	a/A/**D**
		East	a/A/**C**	-	a/A/**C**	-	a/A/**C**
		West	a/A/**B**	-	a/A/**B**	-	a/A/**B**
	SR 99/S 276th Street	North	a/A/**C**	-	a/A/**D**	-	a/A/**D**
		South	a/A/**C**	-	a/A/**D**	-	a/A/**D**
		East	a/A/**B**	-	a/A/**B**	-	a/A/**B**
		West	a/A/**B**	-	a/A/**B**	-	a/A/**B**
S 272nd Star Lake	26th Avenue S/ S 272nd Street	North	a/A/**B**	a/A/**C**	-	a/A/**B**	-
		South	**-**	a/A/**A**	-	-	-
		West	a/A/**C**	a/A/**C**	-	a/A/**C**	-
Federal Way Transit Center	23rd Avenue S/S 316th Street	North	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
		South	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
		West	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
	23rd Avenue S/S 317th Street	North	a/A/**B**	-	a/A/**B**	a/A/**B**	a/A/**B**
		East	a/A/**B**	-	a/A/**B**	a/A/**B**	a/A/**B**
		West	a/A/**A**	-	a/A/**A**	a/A/**A**	a/A/**A**
	23rd Avenue S/S 320th Street	North	a/A/**B**	a/A/**B**	-	-	-
		South	a/A/**C**	a/A/**C**	-	-	-
		East	a/A/**D**	a/A/**D**	-	-	-
		West	a/A/**C**	a/A/**C**	-	-	-

Note: Scores are based on the following x/X/**X**, where the lower case value indicates the intersection corner quality of service, the upper case value indicates the crosswalk circulation score, while the bold value represents the overall pedestrian LOS score.

LOS = level of service; - = values that are not applicable at that location or condition.

TABLE F-2

2035 Kent/Des Moines Station Full-Length Options PM Peak Hour Pedestrian LOS

Station	Intersection	Intersection Leg	Pedestrian LOS Score					
				SR 99 Alternative Station Options			Preferred Alternative Station Options	
			No Build	Kent/Des Moines HC Campus	Kent/Des Moines SR 99 East	Kent/Des Moines SR 99 Median	Kent/Des Moines I-5 Station	Kent/Des Moines At-Grade
Kent/Des Moines	SR 99/ S 236th Street	North	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**
		South	a/A/**C**	a/B/**D**	a/B/**D**	a/D/**D**	a/A/**D**	a/A/**C**
		East	-	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	-
		West	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
	SR 99/ S 240th Street	North	a/A/**C**	a/A/**D**	a/A/**C**	a/A/**D**	a/A/**C**	a/A/**D**
		South	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**
		East	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
		West	a/A/**B**	a/B/**B**	a/A/**B**	a/B/**B**	a/A/**B**	a/A/**B**

Note: Scores are based on the following x/X/X, where the lower case value indicates the intersection corner quality of service, the upper case value indicates the crosswalk circulation score, while the bold value represents the overall pedestrian LOS score.

HC = Highline College; LOS = level of service; - = values that are not applicable at that location or condition.

TABLE F-3

2035 Federal Way Transit Center Station Full-Length Options PM Peak Hour Pedestrian LOS

Station	Intersection	Intersection Leg	Pedestrian LOS Score			
				Preferred Alternative Station Options		SR 99 Alternative Station Option
			No Build	Federal Way I-5 Station	Federal Way S 320th Street Park-and-Ride	Federal Way SR 99
Federal Way Transit Center	20th Avenue S/S 316th Street	North	a/A/**B**	-	-	a/A/**B**
		South	a/A/**B**	-	-	a/B/**B**
		East	a/A/**B**	-	-	a/A/**B**
		West	a/A/**B**	-	-	a/A/**B**
	SR 99/S 316th Street	North	a/A/**C**	-	-	a/A/**C**
		South	a/A/**D**	-	-	a/A/**D**
		East	a/A/**B**	-	-	a/A/**B**
		West	a/A/**B**	-	-	a/A/**B**
	23rd Avenue S/S 317th Street	North	a/A/**B**	a/A/**B**	-	-
		East	a/A/**B**	a/B/**B**	-	-
		West	a/A/**A**	a/A/**A**	-	-
	23rd Avenue S/S 320th Street	North	a/A/**B**	a/A/**B**	-	-
		South	a/A/**C**	a/A/**C**	-	-
		East	a/A/**D**	a/A/**D**	-	-
		West	a/A/**C**	a/A/**C**	-	-
	25rd Avenue S/S 320th Street	North	a/A/**B**	a/A/**B**	-	-
		South	a/A/**B**	a/A/**B**	-	-
		East	a/A/**D**	a/A/**D**	-	-
		West	a/A/**D**	a/A/**D**	-	-
	23rd Avenue S/S 322nd Street	North	a/A/**B**	-	a/A/**C**	-
		South	a/A/**B**	-	a/A/**C**	-
		East	a/A/**B**	-	a/A/**C**	-
		West	a/A/**B**	-	a/A/**B**	-

Note: Scores are based on the following x/X/X, where the lower case value indicates the intersection corner quality of service, the upper case value indicates the crosswalk circulation score, while the bold value represents the overall pedestrian LOS score.

LOS = level of service; - = values that are not applicable at that location or condition.

TABLE F-4

2035 Full-Length Potential Additional Station Options PM Peak Hour Pedestrian LOS

Station	Intersection	Intersection Leg	Pedestrian LOS Scores				
				S 216th Street		S 260th Street	
			No Build	West	East	West	East
S 216th Street	SR 99/S 216th Street	North	a/A/**D**	a/B/**D**	a/A/**D**	-	-
		South	a/A/**C**	a/B/**C**	b/B/**C**	-	-
		East	a/A/**B**	a/A/**B**	a/B/**B**	-	-
		West	a/A/**C**	a/A/**C**	a/A/**C**	-	-
S 260th Street	SR 99/S 260th Street	North	a/A/**C**	-	-	a/B/**C**	a/A/**C**
		South	a/A/**C**	-	-	a/A/**C**	a/A/**C**
		East	a/A/**C**	-	-	a/A/**C**	a/A/**C**
		West	a/A/**B**	-	-	a/A/**B**	a/A/**B**

Note: Scores are based on the following x/X/**X**, where the lower case value indicates the intersection corner quality of service, the upper case value indicates the crosswalk circulation score, while the bold value represents the overall pedestrian LOS score.

LOS = level of service; - = values that are not applicable at that location or condition.

TABLE F-5

2035 Kent/Des Moines Station Interim Terminus Condition Options PM Peak Hour Pedestrian LOS

Station	Intersection	Intersection Leg	Pedestrian LOS Score							
				SR 99 Alternative Station Options			Preferred Alternative Station Options		SR 99 to I-5	I-5 to SR 99
			No Build	Kent/ Des Moines HC Campus	Kent/ Des Moines SR 99 East	Kent/ Des Moines SR 99 Median	Kent/ Des Moines I-5	Kent/ Des Moines At-Grade	Kent/ Des Moines 30th Ave East	Kent/ Des Moines 30th Ave West
Kent/ Des Moines	SR 99/S 236th Street	North	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**
		South	a/A/**C**	a/C/**D**	a/C/**D**	a/E/**D**	a/A/**D**	a/A/**D**	a/B/**D**	a/A/**D**
		East	-	a/A/**B**	a/E/**B**	a/B/**B**	a/A/**B**	-	a/A/**B**	a/A/**B**
		West	a/A/**B**	a/B/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
	SR 99/S 240th Street	North	a/A/**C**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**	a/A/**D**
		South	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**
		East	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**
		West	a/A/**B**	a/B/**B**	a/A/**B**	a/B/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**

Note: Scores are based on the following x/X/**X**, where the lower case value indicates the intersection corner quality of service, the upper case value indicates the crosswalk circulation score, while the bold value represents the overall pedestrian LOS score.

LOS = level of service; - = values that are not applicable at that location or condition.

TABLE F-6

2035 S 272nd Station Interim Terminus Condition Alternatives PM Peak Hour Pedestrian LOS

Station	Intersection	Intersection Leg	No Build	Pedestrian LOS Score	
				Preferred Alternative	SR 99 Alternative
Kent/ Des Moines	SR 99/ S 236th Street	North	a/A/**D**	a/*A*/**D**	a/*A*/**D**
		South	a/A/**C**	a/*A*/**C**	a/*A*/**C**
		East	-	a/*A*/**B**	a/*A*/**B**
		West	a/A/**B**	a/*A*/**B**	a/*B*/**B**
	SR 99/ S 240th Street	North	a/A/**C**	a/*A*/**C**	a/*A*/**D**
		South	a/A/**C**	a/*A*/**C**	a/*A*/**C**
		East	a/A/**B**	a/*A*/**B**	a/*A*/**B**
		West	a/A/**B**	a/*A*/**B**	a/*B*/**B**
S 272nd Redondo	SR 99/ S 272nd Street	North	a/A/**C**	-	a/*A*/**C**
		South	a/A/**D**	-	a/*B*/**D**
		East	a/A/**C**	-	a/*A*/**C**
		West	a/A/**B**	-	a/*A*/**B**
	SR 99/ S 276th Street	North	a/A/**C**	-	a/*A*/**D**
		South	a/A/**C**	-	a/*A*/**D**
		East	a/A/**B**	-	a/*A*/**B**
		West	a/A/**B**	-	a/*A*/**B**
S 272nd Star Lake	S 272nd /26th Ave S	North	a/A/**B**	a/*A*/**C**	-
		South	**-**	a/*A*/**A**	-
		West	a/A/**C**	a/*A*/**C**	-

Note: Scores are based on the following x/X/X, where the lower case value indicates the intersection corner quality of service, the upper case value indicates the crosswalk circulation score, while the bold value represents the overall pedestrian LOS score.

LOS = level of service; - = values that are not applicable at that location or condition.

TABLE F-7

2035 Kent/Des Moines Station Interim Terminus Condition Alternatives PM Peak Hour Pedestrian LOS

Station	Intersection	Intersection Leg	No Build	Pedestrian LOS Score	
				SR 99 Alternative	Preferred Alternative
Kent/Des Moines	SR 99/ S 236th Street	North	a/A/**D**	a/*A*/**D**	a/*A*/**D**
		South	a/A/**C**	a/*D*/**D**	a/*A*/**D**
		East	-	a/*A*/**B**	a/*A*/**B**
		West	a/A/**B**	a/*D*/**B**	a/*A*/**B**
	SR 99/ S 240th Street	North	a/A/**C**	a/*A*/**D**	a/*A*/**D**
		South	a/A/**C**	a/*A*/**C**	a/*A*/**C**
		East	a/A/**B**	a/*A*/**B**	a/*A*/**B**
		West	a/A/**B**	a/*B*/**B**	a/*A*/**B**

Note: Scores are based on the following x/X/**X**, where the lower case value indicates the intersection corner quality of service, the upper case value indicates the crosswalk circulation score, while the bold value represents the overall pedestrian LOS score.

LOS = level of service; - = values that are not applicable at that location or condition.

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