5.0 Construction

This chapter provides an overview of potential construction impacts and mitigation measures for regional transportation facilities and travel, transit, arterials and local streets, parking, nonmotorized facilities, and freight mobility and access that would be caused by construction of the Federal Way Link Extension (FWLE) build alternatives. Construction activities for the FWLE would include civil construction, systems installation, testing, and startup activities. Civil construction includes site preparation as well as the construction of the physical infrastructure. Activities would be most intense in the initial part of construction, with later years involving stations and trench finishing and systems installation.

For all build alternatives, construction would likely be staged and occur in work zones approximately 1/2 mile long. Construction activities expected to have roadway impacts are utility relocation, street reconstruction, foundation and column construction, guideway placement, truck hauling, demolition, and construction staging. The impacts from truck hauling were evaluated based on the number of truck trips and potential haul routes, as discussed in the following subsection.

Construction of the build alternatives would result in temporary impacts on the roadways, transit service, sidewalks, and parking within most construction zones. The overall construction duration would be about 3.5 to 5 years; however, most impacts would occur during the civil construction period, which would range from 1 to 4 years. To reduce the overall project construction period, the contractor may be required to use multiple work crews/work zones along the FWLE corridor at any given time. The general schedule for the construction activities listed above are:

- The utility relocation phase would last approximately 3 to 6 months for all relocations in a 1/2-mile segment.
- Street reconstruction would last approximately 6 months for a 1/2-mile segment of roadway.
- Foundation and column construction would last approximately 6 to 8 months for each 1/2-mile segment. Construction of longer guideway spans would take longer, up to a year and a half.
- The last major construction activity with roadway impacts—guideway placement—would last approximately 6 months for a 1/2-mile segment.

Most of the construction activities listed above may include temporary lane closures and require traffic control plans to maintain circulation and property access.

Key observations and findings related to the construction of the build alternatives include the following:

- Wherever an elevated guideway alignment is constructed over a street, nighttime closures of lanes would be required for portions of the construction period.

- Trenching under S 216th Street, S 240th Street, S 272nd Street, and State Route (SR) 99 would be completed in stages to maintain full access for traffic. Construction could result in the temporary narrowing or closure of lanes, removal of dedicated turn lanes, and roadway re-alignments.
- Trenching under the S 272nd Street and S 320th Street Interstate 5 (I-5) southbound on-/off-ramps would require periodic nighttime or weekend ramp closures.
- Truck access to the guideway construction would be along city arterials leading to streets adjacent to the guideway. Access is not expected directly from the I-5 mainline, although trucks may use I-5 for trips to and from other locations in the region. For these trips, access would be from existing on- and off-ramps.
- Construction of the light rail station at either the S 272nd Redondo Trench Station Option or S 272nd Star Lake Station Option park-and-rides would temporarily reduce or eliminate park-and-ride spaces available for use by transit patrons.
- During construction, where the light rail alignment is parallel to the I-5 mainline (from approximately S 211th Street to S 317th Street), a temporary construction barrier would be placed near the southbound I-5 edge of pavement where barriers are not already present. This could result in an increase of up to four crashes per year.

A Maintenance of Traffic Plan that addresses all modes would be prepared during subsequent FWLE design phases for agency approval. Construction Impacts specific to each alternative and station option are described below.

5.1 Regional Facilities and Travel

State Route (SR) 99 and I-5 are the two key regional facilities that serve the study area. All alternatives along SR 99 would have some impact on travel along SR 99 and could affect short portions of regional travel through the study area. Approval would be needed from the Washington State Department of Transportation (WSDOT) and/or local jurisdictions for traffic control plans on SR 99 and I-5 for all alternatives. Impacts specific to each alternative are described below.

5.1.1 Impacts by Alternative

5.1.1.1 SR 99 Alternative

Under the SR 99 Alternative, the major civil construction within the median of SR 99 would likely occur in 1/2-mile segments over a period of approximately 1 year, including reconstruction of SR 99 (up to 6 months) and guideway construction (6 to 8 months). Construction of the SR 99 Alternative in the median of SR 99 would require the closure of adjacent travel lanes. On SR 99, during peak hours, one travel lane in each direction of travel would likely be closed directly adjacent to the construction area. It is expected that this lane closure would have temporary impacts on traffic operations along SR 99. Therefore, within the construction area, the existing high-occupancy vehicle (HOV) lanes would be converted to allow access for all traffic during the construction.

During peak periods, many intersections along SR 99 operate at level of service (LOS) D or worse, and therefore a reduction in peak direction capacity would increase congestion and travel time through the

construction area. This impact would be less in the non-peak direction because volumes are lower. Converting the HOV lane to allow all vehicles access would provide some congestion relief for the 1/2-mile segment being constructed. In general, during off-peak periods and overnight, a maximum of two lanes in each direction would be closed for construction activities because traffic volumes along SR 99 decrease substantially, especially overnight.

When the guideway transitions to and from the SR 99 median, a direction of SR 99 could be closed or the travel lanes could be realigned when installing box girders. This would be a short-term closure that would likely occur during nights or over a weekend. Once the girders are installed, at least two lanes of traffic would be maintained in each direction during peak periods for the remaining long-term civil construction period. During construction, vertical clearance would be maintained on SR 99. To reduce the overall project construction periods, the contractor may be required to use multiple work crews/work zones along the corridor at any given time. Any changes in SR 99 operations would require approval from WSDOT.

As the guideway transitions from the SR 99 median into the Federal Way Transit Center from approximately S 308th Street to S 316th Street, the construction period would increase and may require short-term closures of SR 99 because the guideway width would be wider through this section. Detour routes may include 14th Avenue S and 18th Avenue S.

At signalized intersections within the construction zone, left-turning vehicles from SR 99 would be restricted and vehicles would be rerouted to a nearby intersection. These vehicles could either turn in advance of the construction zone or make a U-turn after the construction zone. Midblock U-turns would also be closed within the construction area, and vehicles would be rerouted to another intersection.

With SR 99 lane closures, some traffic may divert to parallel roads, including I-5, Military Road, 24th Avenue S, 30th Avenue S, and 16th Avenue S to avoid delays on SR 99. If a portion of SR 99 is temporarily closed for nights and/or weekends, the traffic detour routes for SR 99 north of Kent-Des Moines Road would likely include 24th Avenue S west of SR 99 and 30th Avenue S and possibly Military Road east of SR 99. South of Kent Des-Moines Road, 16th Avenue S could serve as a detour route west of SR 99, but there would be limited detour options east of SR 99 and the detour would likely require the use of Military Road S. During off-peak periods and weekends, traffic volumes are generally lower than during peak commute periods, and detour routes would have more capacity to handle increased traffic from SR 99. Traffic impacts on arterials and local streets are discussed further in Section 5.3.2.

Up to 15 trucks per hour would access the construction area along SR 99. For station construction and staging areas, 4 to 15 trucks per hour are estimated from each work area. These trucks include construction material deliveries (steel, concrete, and other miscellaneous materials), haul excavation and backfill vehicles, and contractor vehicles. For elevated guideway construction, peak truck trips are estimated at 4 to 8 trucks per hour for concrete delivery. The increase in trucks could cause a small delay increase at intersections along the haul route.

Station Options

S 216th Station Options

Impacts on regional facilities with the potential additional S 216th West or East station option would be the same as the SR 99 Alternative.

Kent/Des Moines HC Campus Station Option

Impacts on regional facilities with the Kent/Des Moines HC Campus Station Option would be the same as the SR 99 Alternative.

Kent/Des Moines HC from S 216th West Station Option

From S 208th Street to approximately 1/4 mile north of Kent-Des Moines Road, the Kent/Des Moines HC from S 216th West Station Option would not have any impacts on SR 99 because the guideway would be located west of SR 99. This station option would have the same impacts as the SR 99 Alternative south of S 242nd Street.

Kent/Des Moines SR 99 Median Station Option

The Kent/Des Moines SR 99 Median Station option would be constructed in multiple phases and would shift southbound traffic to the east or west of the median, depending on the construction phase. Northbound traffic would be rerouted to 30th Avenue S at S 240th Street and rerouted back on to SR 99 at S 236th Lane. Additional rerouting is discussed in Section 5.3.2.1. This station option would have the same impacts as the SR 99 Alternative north of Kent-Des Moines Road and south of S 242nd Street.

Kent/Des Moines SR 99 East Station Option

Impacts on regional facilities with the Kent/Des Moines SR 99 East Station Option would be the same as the SR 99 Alternative.

S 260th Station Options

Impacts on regional facilities from the potential additional S 260th West or East station option would be the same as the SR 99 Alternative.

S 272nd Redondo Trench Station Option

Construction activities for the trench under SR 99 south of S 279th Street for the S 272nd Redondo Trench Station Option would likely be completed in stages in order to maintain traffic on SR 99 in all directions during trench construction. Construction would likely require the narrowing of lanes and the median to shift traffic through the construction zone in order to maintain two lanes in each direction during peak periods. Plates over the guideway construction area may be required on SR 99. The trenching under SR 99 would likely occur over a period of up to 1 year.

From 16th Avenue S to S 308th Street, this station option would not impact SR 99 because the guideway is located to the west of SR 99.

Federal Way SR 99 Station Option

Impacts on regional facilities with the Federal Way SR 99 Station Option would be the same as the SR 99 Alternative, except south of S 312th Street. Impacts on this segment of SR 99 would be minimized

because the guideway would transition out of the SR 99 median at this location and would not require any substantial closures of SR 99 besides occasional nights or weekends.

5.1.1.2 I-5 Alternative

Construction for the I-5 Alternative would have minimal impacts on highway operations on the I-5 mainline or shoulders. All of the construction activities would occur west of the I-5 mainline. The I-5 southbound ramps at the Kent-Des Moines Road interchange would require closure or temporary realignment of the ramps during the installation of the girders for the guideway bridges across Kent-Des Moines Road. These short-term closures would occur during nights or over a weekend.

Construction of the I-5 Alternative guideway over SR 99 near S 208th Street would require periodic nighttime or weekend closures of SR 99 and lane reductions during other hours. The inside southbound travel lane would be closed during construction of a column in the median. The existing southbound SR 99 HOV lane in this construction area would be converted to allow access for all traffic during construction. Full night and weekend closures of all northbound lanes or southbound lanes (at different times) would be required when guideway construction is occurring over these lanes.

The roundabout at S 317th Street and 28th Avenue S. would require reconstruction where the guideway crosses under the intersection. The temporary conversion of this intersection from a roundabout to a stop-controlled intersection during construction is not expected to result in impacts on the I-5 317th direct-access ramps or the I-5 mainline because this intersection has low traffic volumes.

Up to 15 trucks per hour would access the construction area via arterials, local streets, and I-5 interchanges. This increase in trucks could cause a small increase in delay at the ramp terminal intersections.

Station and Alignment Options

Kent/Des Moines At-Grade Station Option

The Kent/Des Moines At-Grade Station Option would have the same regional facilities impacts as the I-5 Alternative.

Kent/Des Moines SR 99 East Station Option

The Kent/Des Moines SR 99 East Station Option would have similar impacts to regional facilities as the I-5 Alternative, although no impacts would occur at the I-5 southbound ramps at Kent-Des Moines Road.

Landfill Median Alignment Option

Construction of the guideway within the I-5 median for the Landfill Median Alignment Option would require the closure of the inside shoulder for approximately 1/2 mile between S 240th Street and S 259th Place in each direction on I-5 during the guideway construction, which could take approximately 4 to 6 months. Closing the I-5 inside shoulder would reduce the I-5 mainline capacity through this ½-mile work zone.

Construction over the southbound lanes of I-5 would have impacts on I-5 traffic operations during installation of the girders for the guideway bridges. Cast-in-place construction methods, if used, could

require a shoring tower within southbound I-5 mainline to support the straddle bents while they are being constructed. To maintain safe operations of I-5, either closing one to two lanes for up to 2 months or restriping the southbound I-5 mainline travel lanes around the construction area would be coordinated with and subject to a separate agreement with WSDOT. Even if the southbound I-5 travel lanes were able to be fully accommodated and re-striped around the construction area during this construction period, capacity on I-5 southbound would be reduced. Using precast cap beams across southbound I-5 would avoid the need for shoring towers but would require the full closure of southbound I-5 for multiple overnight and/or weekends for each span. If I-5 southbound is closed, the likely detour route would use the Kent/Des Moines interchange to SR 99 and/or Military Road, with traffic rerouted back to I-5 at S 272nd Street. During off-peak periods and weekends, traffic volumes along these routes are generally lower than during peak commute periods, and detour routes would have additional capacity to accommodate some traffic from I-5. Either of these revisions to I-5 southbound mainline would require advanced signage and restriping to ensure safe operations through this construction area. Construction vehicle access to the median construction area would be provided directly from the northbound and/or southbound I-5 mainline. Construction access points, closures, and changes in I-5 operations would require approval from WSDOT. Vertical clearance would be maintained on I-5.

Federal Way I-5 Station Option

The Federal Way I-5 Station Option would have the same regional facilities impacts as the I-5 Alternative.

Federal Way S 320th Park-and-Ride Station Option

The Federal Way S 320th Park-and-Ride Station Option would have similar impacts to regional facilities as the I-5 Alternative, except the S 320th Street southbound ramps would require night and weekend closures for guideway construction. The two-lane off-ramp would also need to be reconfigured in two phases during construction and would have a long-term construction impact that would reduce the southbound off-ramp, right-turn pocket storage length by approximately 250 feet for a substantial portion of the construction period. The off-ramp would be restored to existing conditions after construction is complete. The temporary reduction in the right turn pocket length would not likely cause traffic to back up onto the I-5 mainline.

5.1.1.3 SR 99 to I-5 Alternative

North of Kent-Des Moines Road, where the SR 99 to I-5 Alternative would be located on SR 99, impacts would be similar to those described for the SR 99 Alternative. South of S 240th Street, where the alternative would be within the I-5 right-of-way, impacts would be the same as with the I-5 Alternative, including for the Landfill Median Alignment Option. There would be no additional impacts to regional facilities between Kent-Des Moines Road and S 240th Street where the alternative transitions from SR 99 to I-5.

5.1.1.4 I-5 to SR 99 Alternative

North of Kent-Des Moines Road, where the I-5 to SR 99 Alternative would be the same as the I-5 Alternative, impacts would be the same as with the I-5 Alternative. South of S 240th Street, where the

SR 99 to I-5 Alternative is located on SR 99, impacts would be similar to those described for the SR 99 Alternative. There would be no additional impacts to regional facilities between Kent-Des Moines Road and S 240th Street where the alternative transitions from SR 99 to I-5.

5.1.2 Potential Mitigation Measures

During FWLE construction, Sound Transit would work with WSDOT and the local agencies to develop a construction plan. This plan would coordinate construction activities, such as incident management, construction staging, and traffic control where the light rail construction might affect either I-5 or SR 99. Sound Transit would also coordinate with WSDOT to disseminate construction closure information to the public as needed.

5.2 Transit Operations

5.2.1 Impacts Common to All Alternatives

All alternatives would involve some level of lane closures, bus stop relocations, partial or full temporary closures of park-and-ride facilities, and sidewalk impacts that would have some impact on the transit operations within the FWLE study area during construction. Impacts of each alternative are described in this section.

5.2.2 Impacts by Alternative

5.2.2.1 SR 99 Alternative

Bus operations and transit riders traveling on SR 99 would be affected in the construction areas by the decrease in road capacity and increase in delay that would result from the reduced number of lanes within the 1/2-mile construction area. Bus stops along SR 99 would be maintained where feasible but may need to be temporarily relocated during construction in some instances. The use of the existing HOV lane for all traffic would affect the speed and reliability of buses in these construction areas and would make bus schedules less reliable as congestion and delay increase, in particular in the northbound direction during the morning weekday commute and southbound during the evening weekday commute. Some bus routes may require rerouting when left-turn restrictions are in place at intersections or when side streets are closed.

Service at the Redondo Park-and-Ride lot would be disrupted during construction of the S 272nd Redondo Station; however, bus routes serving this transit center could be relocated to the Star Lake Park-and-Ride during the station construction period. Bus service at the existing Federal Way Transit Center is not expected to be disrupted with construction of the Federal Way Transit Center Station.

Station Options

S 216th Station Options

Impacts on transit with the potential additional S 216th West or East station option would be similar to the SR 99 Alternative.

Kent/Des Moines HC Campus Station Option

Impacts on transit with the Kent/Des Moines HC Campus Station Option would be similar to the SR 99 Alternative.

Kent/Des Moines HC from S 216th West Station Option
Impacts on transit with the Kent/Des Moines HC from S 216th West Station Option would be less than the SR 99 Alternative. No impacts on transit would occur along SR 99 between S 216th Street and Kent-Des Moines Road because the guideway would be located west of SR 99.

Kent/Des Moines SR 99 Median Station Option
The Kent/Des Moines SR 99 Median Station Option would be constructed in multiple phases and would shift southbound traffic to the east or west of the median, depending on the construction phase. Northbound traffic, including transit, would be rerouted to 30th Avenue S at S 240th Street and rerouted back on to SR 99 at S 236th Lane. This would result in longer transit travel times and the relocation of transit stops along SR 99 in this area.

Kent/Des Moines SR 99 East Station Option
Impacts on transit with the Kent/Des Moines SR 99 East Station Option would be similar to the SR 99 Alternative.

S 260th Station Options
Impacts on transit with the potential additional S 260th West or East station option would be similar to the SR 99 Alternative.

S 272nd Redondo Trench Station Option
Impacts on transit would be more isolated than the SR 99 Alternative with the S 272nd Redondo Trench Station Option because the guideway would be located west of SR 99 between S 279th Street and S 304th Street, and no impacts on transit would occur through this segment. However, impacts on transit where the trench alignment crosses under SR 99 near 16th Avenue S would be longer in duration (up to a year) compared to the SR 99 Alternative.

Federal Way SR 99 Station Option
Impacts on transit with the Federal Way SR 99 Station Option would be similar to the SR 99 Alternative.

5.2.2.2 I-5 Alternative

Nearly all the construction for the I-5 Alternative would have minimal impacts on transit service because the guideway would be located west of the I-5 southbound mainline, with the exception of the Star Lake Park-and-Ride. It is likely parking would be lost at the Star Lake Park-and-Ride lot during construction and generally would not be avoidable because of site constraints around the station. Temporary parking would be provided as needed and where feasible to mitigate the impacts. Transit service could be relocated to the Redondo Heights Park-and-Ride and/or the Kent-Des Moines Park-and-Ride during the station construction. The additional travel time for buses serving the Redondo Heights location could lead to longer transit travel times for riders accessing transit service at this station location.

Trenching under the S 317th Street roundabout would be conducted in stages. As the guideway is constructed under the existing roundabout, the S 317th Street and 28th Avenue S intersection would be converted into a stop-controlled intersection, which could result in an increase in bus travel times.

Station Options

Kent/Des Moines At-Grade Station Option

The Kent/Des Moines At-Grade Station Option would have the same impacts as the I-5 Alternative.

Kent/Des Moines SR 99 East Station Option

The Kent/Des Moines SR 99 East Station Option would have similar impacts as the I-5 Alternative.

Landfill Median Alignment Option

The closure of the inside shoulder of I-5 between S 240th Street and S 259th Place with the Landfill Median Alignment Option may result in slightly slower speeds in the HOV lane through this 1/2-mile segment. Night and weekend closures of I-5 southbound for guideway girder placement across I-5 southbound would also require transit to use a detour route, resulting in longer transit travel times.

Federal Way I-5 Station Option

The Federal Way I-5 Station Option requires the S 317th Street and 28th Avenue S roundabout to be removed temporarily during construction. A phased long-term closure of both 28th Avenue S and S 317th Street would be required, resulting in a transit reroute to S 312th Street or S 320th Street or other roads and an increase in transit travel times.

Federal Way S 320th Park-and-Ride Station Option

The Federal Way S 320th Park-and-Ride Station Option could potentially construct the guideway under the roundabout at S 317th Street in fewer stages compared to the I-5 Alternative, resulting in fewer impacts on transit through this area.

At the S 320th Street Park-and-Ride, construction of the light rail station would require the temporary closure of the park-and-ride and transit service would be rerouted to other transit centers, such as the Federal Way Transit Center. Bus routes that currently only serve the S 320th Park-and-Ride may have a longer travel time if they are rerouted to the Federal Way Transit Center or another location.

5.2.2.3 SR 99 to I-5 Alternative

North of Kent-Des Moines Road, where the SR 99 to I-5 Alternative would be located on SR 99, impacts would be similar to those described for the SR 99 Alternative. South of S 240th Street, where the alternative would be within the I-5 right-of-way, impacts would be the same as with the I-5 Alternative. There would be no additional transit impacts between Kent-Des Moines Road and S 240th Street.

5.2.2.4 I-5 to SR 99 Alternative

North of Kent-Des Moines Road, where the I-5 to SR 99 Alternative would be the same as the I-5 Alternative, impacts would be the same as with the I-5 Alternative. South of S 240th Street, where the SR 99 to I-5 Alternative is located on SR 99, impacts would be similar to those described for the SR 99 Alternative. There would be no additional transit impacts between Kent-Des Moines Road and S 240th Street.

5.2.3 Potential Mitigation Measures

During construction of alternatives within street rights-of-way, buses would either continue service on the street or would be rerouted to nearby roadways, where appropriate, to maintain transit service. Bus stops would be maintained in their existing location where possible, but in construction areas may

need to be relocated. Access between the surrounding land uses and the bus stops would be maintained to the extent feasible. Transit service modifications would be coordinated with Metro, Pierce Transit, and Sound Transit to minimize impacts and disruptions to bus facilities and service during construction. These measures could include posting informative signage before construction at existing transit stops that would be affected by construction activities and developing modified service plans to accommodate park-and-ride closures during construction of stations at those locations.

5.3 Arterials and Local Streets Operations

5.3.1 Impacts Common to All Alternatives

With each of the FWLE alternatives, construction would require local road closures, lane closures, traffic detours, and property access modifications to maintain traffic flow. Streets that intersect the alternatives would require full and/or partial closures for short durations to construct the guideway or other associated features. If driveway closures are required, then temporary alternate property access to these properties would be provided to the extent possible. If alternative access is not available, then the specific construction activity would be reviewed to determine whether it could occur during non-business hours. Specific construction activities, including long term roadway closures, would be reviewed in coordination with local jurisdictions, WSDOT, and Sound Transit during the final design and permitting phases of the project and would be agreed upon prior to implementing any long-term road closures.

Appendix G, Construction Staging Areas and Haul Routes, shows the proposed construction staging areas and truck haul routes for each FWLE alternative and option. In general, the potential construction staging areas and truck haul routes would be adjacent to where alignment construction would occur, and the staging areas would generally be located in the vicinity of the station areas. For the elevated guideway construction, peak truck trips are estimated at 10 to 15 trucks per hour for concrete delivery, or between 80 and 240 trips per day, assuming 8 to 16 hours per day of active construction. A similar level of truck activity is expected for earthwork activities, but this would be focused on trucks hauling material during excavation. Construction impacts along SR 99 or I-5 for all FWLE alternatives and station options are discussed in Section 5.1, Regional Facilities and Travel.

Generally, construction truck traffic would use SR 99 and, if required, other arterials to access the construction areas. There would be no direct access via the I-5 mainline except for the I-5 Landfill Median Alignment Option, although it is expected that trucks would use I-5 for a portion of their trip between the construction area and other locations in the region

5.3.2 Impacts by Alternative

5.3.2.1 SR 99 Alternative

Construction of the guideway over-crossings would create impacts at the arterial and local cross streets that intersect SR 99 between S 200th Street and S 316th Street. Street crossings of note would occur at S 208th Street, S 216th Street, Kent-Des Moines Road, S 240th Street, S 260th Street, S 272nd Street, S 288th Street, S 304th Street, S 312th Street, and S 316th Street.

Depending on the type and length of guideway, construction over arterials, local streets, and driveways along SR 99 might require temporary nighttime and weekend closures and detours for local traffic to other nearby arterials during the installation of the girders for the guideway bridges. Detours would result in impacts on traffic, buses, bicyclists, and pedestrians. Construction activities might also reduce or restrict property access during construction; however, the contractor would need to maintain access during construction when possible and could minimize impacts on access via nighttime and weekend closures where allowed. Highline College access would be provided from SR 99, either via S 240th Street, or from completion of the S 236th Street Lane extension.

Local roads along the guideway between S 308th Street and S 316th Street may have closures or access modifications that would extend for a longer duration because of the larger construction area required for this segment of the guideway. Construction of the guideway and station near the Federal Way Transit Center would require temporary nighttime closures of S 316th Street and 20th Avenue S during guideway construction. 21st Avenue S, south of the existing transit center, would likely require temporary nighttime or weekend closures during construction of the station and guideway.

Construction vehicle access for the SR 99 Alternative and station options would be located along SR 99. Generally, construction truck traffic to the construction and staging areas would use arterials and local streets. Up to 15 trucks per hour could use SR 99, arterials, and local streets, and intersection delays may increase slightly. Haul routes to and from SR 99 would include I-5 and the three major east-west streets with I-5 interchanges—Kent-Des Moines Road, S 272nd Street, and S 320th Street. Potential construction staging areas would be located at the three station areas—Kent/Des Moines, S 272nd Redondo, and Federal Way Transit Center.

The potential temporary closure of the Redondo Heights Park-and-Ride during construction would change traffic circulation patterns around S 272nd Street. Vehicle trips would likely relocate to the Star Lake Park-and-Ride, and some intersections near these two park-and-rides may have increased congestion. However, the current transit demand at the Redondo Heights Park-and-Ride is relatively low, so any traffic impacts caused by this closure would likely be minimal.

Station Options

For station options that have portions of the guideway located in a trench, the use of temporary plates and lane reductions would be required to maintain traffic flow on cross streets over the trench for up to a year. For roads that have two or more lanes in each direction, at least one lane in each direction would be kept open during construction. For some station options, roads that have only one lane in each direction may be closed for certain periods during construction.

S 216th Station Options

Generally, the construction of the potential additional S 216th West Station Option or S 216th East Station Option would have minimal impacts on traffic in the station vicinity and would occur over a period of 18 to 30 months. Construction of the trench under S 216th Street for the S 216th Street West Station Option would likely require narrowing of the travel lanes, removal of dedicated turn lanes, and/or the closure of one through lane in each direction. Some nighttime and weekend closures of S 216th Street may be required for placement of plates. Local traffic could be detoured along S 220th

Street to avoid delays through the construction area. Congestion on S 220th Street could increase during construction.

Kent/Des Moines HC Campus Station Option

Impacts on local streets with the Kent/Des Moines HC Campus Station Option would be the same as the SR 99 Alternative except across S 240th Street. To maintain traffic flow, plates would be required on 240th Street for a period up to 1 year, and may require turn restrictions and lane closures. However, access to Highline College would be provided from SR 99, either via S 240th Street, or from the completion of the S 236th Street Lane extension.

Kent/Des Moines HC from S 216th West Station Option

With the Kent/Des Moines HC from S 216th West Station Option, trenching would be required across several roads, including S 216th Street, S 220th Street, S 222nd Street, S 224th Street, and S 226th Street. For S 216th Street, at least one lane in each direction would be kept open during construction, which may occur for up to a year. The remaining roads could be closed during construction; however, construction would be phased to maintain reasonable detour routes. For example, S 220th Street may be closed during construction; however, S 224th Street could remain open and would be signed as a detour route. Then when construction is complete on S 220th Street, it could be used as a detour route when S 224th Street is closed.

Construction of this station option would also require trenching adjacent to properties, and the use of plates over the guideway would be temporarily required to maintain business access. Night and weekend closures may be required for placement of plates. If alternative access to a business is not available, then the specific construction activity would be reviewed to determine if it could occur during nonbusiness hours. Highline College access would be provided from SR 99, either via S 240th Street, or from the completion of the S 236th Street Lane extension.

Kent/Des Moines SR 99 Median Station Option

Construction of the Kent/Des Moines SR 99 Median Station Option would occur over a period of 18 to 30 months and would require completely reconstructing SR 99 in each direction. This would result in a wider roadway and would require part of the SR 99 reconstruction to occur within existing private property outside of the existing right-of-way. During the construction period, there would be lane reductions in each direction of SR 99 as lanes are shifted, and speed reductions would likely be required. Northbound SR 99 would also be closed during a portion of station construction. 30th Avenue S, a low-volume road, would be used as the main detour route. Traffic would be routed from SR 99 to 30th Avenue S via S 240th Street. S 236th Lane between SR 99 and 30th Avenue S would be constructed and completed prior to closing northbound SR 99, and traffic would be rerouted back onto SR 99 via this new road connection. Some of the SR 99 northbound traffic would likely continue north on 30th Avenue S to eastbound Kent-Des Moines Road and I-5. During the peak period, traffic volumes on this detour route could increase by over 1,000 vehicles per hour, and without temporary widening of 30th Avenue S, traffic congestion would be expected. Drivers could potentially avoid this area by using other roads in the area, which could increase congestion on those streets.

Kent/Des Moines SR 99 East Station Option

The Kent/Des Moines SR 99 East Station Option would likely require the closure of 30th Avenue S between S 236th Lane and S 240th Street during station construction. 30th Avenue S is currently a low-volume facility, and traffic would likely be detoured to SR 99. During the closure, local business access would be provided.

S 260th Station Options

The arterial and local street impacts with these station options would be the same as the SR 99 Alternative except at S 260th Street for the S 260th East Station Option. Construction of the station would require the closure of S 260th Street. S 260th Street provides access across I-5, and the nearest detour route with access across I-5 would be at S 272nd Street. Local traffic would likely be detoured via S 252nd Street, S 272nd Street, and Military Road, and congestion on these roads would likely increase.

S 272nd Redondo Trench Station Option

With the S 272nd Redondo Trench Station Option, construction activities for the trench under S 272nd Street just east of SR 99 would likely be completed with cut-and-cover construction in order to maintain traffic lanes on a portion of the existing roadway. South 272nd Street is currently two lanes in each direction, with dual westbound left turn lanes at the intersection of SR 99. Removal of one westbound left turn lane at SR 99 and S 272nd Street would likely be required to allow for two lanes in each direction during construction. The reduction in left-turn capacity would result in increased vehicle queues and delays. Specific impacts on SR 99 are discussed above in Section 5.1.1.1.

Construction activities might reduce or restrict property access during construction; however, the contractor would need to maintain access during construction where possible and could minimize access impacts via nighttime and weekend closures.

Federal Way SR 99 Station Option

The Federal Way SR 99 Station Option would span S 316th Street west of 20th Avenue S. During station construction, S 316th Street between SR 99 and 20th Avenue would likely require a full closure during construction of the station. The likely detour route for traffic traveling to and from the north on SR 99 would be via S 312th Street to 20th Avenue S.

5.3.2.2 I-5 Alternative

Construction of the guideway over local streets and arterials would be more limited with the I-5 Alternative but would still occur at S 208th Street, S 216th Street, Kent-Des Moines Road, S 259th Street, S 272nd Street, Military Road (two locations), S 288th Street, S 317th Street, and 23rd Avenue S. In general, construction activities would require weekend and nighttime road and lane closures of these street with detour routes provided except at S 216th Street and S 272nd Street. S 216th Street would require construction of a temporary bridge approach to maintain traffic across I-5 and may result in lane closures and detours for up to 6 months. At 272nd Street, plates would be required where the guideway crosses under the road and one lane in each direction would be closed for up to one year. Because of the limited number of crossings along I-5, detour routes for weekend or nighttime

closures could be circuitous and would likely use SR 99 or Military Road. The I-5 Alternative would not go over or under the I-5 travel lanes.

The roundabout at S 317th Street and 28th Avenue S would require reconstruction where the guideway crosses under the intersection. The intersection would be temporarily modified. Construction would be in three phases and would convert the existing roundabout into a stop-controlled intersection. The temporary conversion of this intersection from a roundabout to a stop-controlled intersection would likely increase vehicle delay. When the guideway construction is completed, the roundabout would be reconstructed in its current location. Construction of the guideway and station near the Federal Way Transit Center would require temporary nighttime closures of 21st Avenue S and 23rd Avenue S during guideway construction.

Construction vehicle access for the I-5 Alternative and station options would be provided via a temporary construction road adjacent to the guideway. This road may be up to 30 feet wide to allow for two-way traffic. The temporary construction road would be located west of the light rail alignment between S 204th Street and Kent-Des Moines Road and to the east of the alignment from Kent-Des Moines Road south to S 317th Street. Access to the construction road would only be provided from arterials, local streets, and/or I-5 interchange areas. No direct access would be provided from the I-5 mainline. Potential primary access points to the temporary construction road include the following roads:

- S 204th Street
- S 208th Street
- S 211th Street
- S 216th Street
- I-5 Kent-Des Moines Road Southbound ramps
- 30th Avenue S
- S 259th Place
- S 272nd Street
- Military Road (two locations)
- S 288th Street
- S 317th Street

Secondary access points may be provided via local roads to allow 1/2 mile spacing between access points. While these access points would primarily be intended to provide emergency access to the site, some truck traffic may use these locations. If these access locations were problematic for larger construction vehicles, these vehicles would be rerouted to primary access points. The contractor may propose modifications to the construction road and its access during the development of the Maintenance of Traffic plan.

The potential closure of the Star Lake Park-and-Ride during construction would change traffic circulation patterns around S 272nd Street. Vehicle trips would likely relocate to the Redondo Heights Park-and-Ride, and some intersections near this park-and-ride could have additional congestion.

Station and Alignment Options

Kent/Des Moines At-Grade Station Option

The Kent/Des Moines At-Grade Station Option would have the same local street and arterial impacts as the I-5 Alternative.

Kent/Des Moines SR 99 East Station Option

The Kent/Des Moines SR 99 East Station Option would have the same local street and arterial impacts as the I-5 Alternative.

Landfill Median Alignment Option

The Landfill Median Alignment Option would have the same local street and arterial impacts as the I-5 Alternative. Impacts on the I-5 mainline are discussed in Section 5.1.1.2.

Federal Way I-5 Station Option

The roundabout at S 317th Street and 28th Avenue S would require reconstruction where the guideway crosses under the intersection. The intersection would be reconstructed in two phases and would convert the existing roundabout into a through street. The first phase would close S 317th Street and traffic would reroute to S 312th Street or S 320th Street, increasing vehicle delays on these facilities. The second phase would require the closure of 28th Avenue S. Both phases would last between 6 and 9 months. During construction of the roundabout modification, both the I-5 mainline and the S 317th Street direct access ramps would not likely experience any impacts. With this option, guideway construction would impact 23rd Avenue S. Once the guideway construction is complete, the roundabout would be reconstructed in its current location.

Federal Way S 320th Park-and-Ride Station Option

The Federal Way S 320th Park-and-Ride Station Option would have the same local street and arterial impacts as the I-5 Alternative except construction of the guideway under the roundabout at S 317th Street may be completed in fewer stages compared with the I-5 Alternative. Completion in fewer stages would occur because the impacts would be farther east of the roundabout under the S 317th Street direct access ramp, thus resulting in less impacts than the I-5 Alternative because guideway construction would not affect 23rd Avenue S and 28th Avenue S.

5.3.2.3 SR 99 to I-5 Alternative

Impacts with the SR 99 to I-5 Alternative north of Kent-Des Moines Road would be the same as under the SR 99 Alternative. South of S 240th Street, impacts would be similar to the I-5 Alternative. Between Kent-Des Moines Road and S 240th Street, construction would have impacts on 30th Avenue S and would likely require its temporary closure north of the proposed S 236th Lane. The local traffic using this road would be detoured to SR 99, with local property access maintained.

5.3.2.4 I-5 to SR 99 Alternative

Impacts with the I-5 to SR 99 Alternative north of Kent-Des Moines Road would be the same as under the I-5 Alternative. South of S 240th Street, impacts would be similar to the SR 99 Alternative. Between Kent-Des Moines Road and S 240th Street, construction would have impacts on 30th Avenue S and would likely require its temporary closure north of the proposed S 236th Lane. The local traffic using this road would be detoured to SR 99, with local property access maintained.

5.3.3 Potential Mitigation Measures

All mitigation measures associated with constructing the FWLE would comply with local regulations governing construction traffic control and construction truck routing. Sound Transit would finalize detailed construction plans in close coordination with local jurisdictions and WSDOT during the final design and permitting phases of the project. Mitigation measures for traffic impacts caused by light rail construction could include the following practices:

- Conform to the *Manual on Uniform Traffic Control Devices* (FHWA, 2009) and jurisdictional agency requirements for all traffic plan maintenance.
- Clearly sign and provide reasonable detour routes when cross streets are closed for trench construction. The contractor would be required to keep nearby parallel facilities open to facilitate access and mobility.
- Use lighted or reflective signage to direct drivers to truck haul routes to ensure visibility during nighttime work hours.
- Communicate public information through tools such as print, radio, posted signs, web sites, and email to provide information regarding street closures, hours of construction, business access, and parking impacts. Sound Transit would provide this plan.
- Coordinate access closures with affected businesses and residents. The contractor would be required to perform this task in coordination with Sound Transit staff. If access closures are required, property access to residences and businesses would be maintained to the extent possible. If access to the property cannot be maintained, the specific construction activity would be reviewed to determine if it could occur during non-business hours, or if the parking spaces and users of this access (for example, deliveries) could be provided at an alternative location.
- Post advance notice signs prior to construction in areas where construction activities would affect access to surrounding businesses.
- Provide regular updates to schools, emergency service providers, local agencies, solid waste utilities, and postal services, and assist public school officials in providing advance and ongoing notice to students and parents concerning construction activity near schools.
- Schedule traffic lane closures and high volumes of construction truck traffic during off-peak hours to minimize delays during periods of higher traffic volumes as much as possible.
- Cover potholes and open trenches, where possible, and use protective barriers to protect drivers from open trenches.
- For the Kent/Des Moines SR 99 Median Station Option, improve 30th Avenue S and S 236th Lane prior to the station construction to accommodate increased traffic from SR 99 when lanes are closed.

5.4 Safety

5.4.1 Impacts Common to All Alternatives

With each of the FWLE alternatives, traffic diversion and detours caused by light rail guideway construction would lead to additional traffic increases on those facilities. The additional traffic volumes could lead to a potential increase in collision frequency; however, crash rates should remain similar to existing conditions. In locations where there is no physical change to the roadway, the types of crashes could also remain similar to existing conditions. Currently, the majority of crashes in the study area are property damage only.

5.4.2 Impacts by Alternative

5.4.2.1 SR 99 Alternative

Access modifications (such as right-in, right-out) and left-turn restrictions at intersections along SR 99 would occur in FWLE construction areas. This would eliminate some vehicle conflicts at these locations. Detour routes would change the traffic circulation and could lead to driver confusion and a possible increase in the potential for crashes. Signing and advanced communication of these changes to travel patterns and detours would minimize the potential safety impacts and would be addressed in the Maintenance of Traffic plan. Other measures that would be used to minimize safety impacts through construction areas are described in Section 5.3.3.

There would be no additional safety impacts with any of the station options.

5.4.2.2 I-5 Alternative

The guideway construction area for the I-5 Alternative would be located near the I-5 pavement edge in several locations. Full travel lane and shoulder widths along I-5 would be maintained during construction.

During construction, there would be temporary impacts on the clear zone along most of southbound I-5, in particular south of Kent-Des Moines Road. Where the light rail alignment is parallel to the I-5 mainline, from approximately S 211th Street to S 317th Street, a temporary construction barrier would be placed near the southbound I-5 edge of pavement where barriers are not already present. This temporary construction barrier would be present for the duration of guideway construction, approximately 1 to 4 years. Performing a similar analysis using the *Highway Safety Manual*, as described in Section 4.4, placing a temporary barrier along the I-5 southbound mainline (approximately 22,900 feet) could result in an increase of up to four crashes per year. The majority of these crashes would likely be property damage only, based on the severity distribution of the existing crash history.

Converting the S 317th Street and 28th Avenue S roundabout to a temporary stop-controlled intersection would increase the potential for crashes, as suggested in the HSM. The roundabout has a low crash frequency (three crashes over 5 years) at this location, with the potential for crashes to increase by up to 65 percent (AASHTO, 2014) with the temporary stop-controlled intersection configuration during the construction period.

Station and Alignment Options

Kent/Des Moines Station Options

Both Kent/Des Moines station options would have the same safety impacts as the I-5 Alternative.

Landfill Median Alignment Option

Construction of the guideway with the I-5 Landfill Median Alignment Option would require short-term, temporary narrowing of the inside I-5 shoulder to provide adequate construction space between approximately S 240th Street and S 252nd Street. Temporary shoulder closures could occur intermittently over a period of 4 to 6 months. Construction barriers would be placed along the median for northbound and southbound I-5 and after construction, a permanent barrier would be provided. The addition of median barrier could result in up to one crash a year on I-5.

As mentioned in Section 5.2.2.2, if cast-in-place construction methods are used, a shoring tower in the middle of southbound I-5 to support the straddle bents may be required. This would require closure of one to two lanes or restriping southbound I-5 mainline travel lanes around the construction area. The addition to a fixed objected in the roadway could increase the crash potential, however, this construction area would be designed to minimize any safety impacts.

Federal Way City Center Station Options

Both Federal Way City Center station options would have the same safety impacts as the I-5 Alternative.

5.4.2.3 SR 99 to I-5 Alternative

Safety impacts north of Kent-Des Moines Road would be the same as with the SR 99 Alternative. South of S 240th Street, impacts would be the same as with the I-5 Alternative. No additional impacts would occur between Kent-Des Moines Road and S 240th Street.

5.4.2.4 I-5 to SR 99 Alternative

Safety impacts north of Kent-Des Moines Road with the I-5 to SR 99 Alternative would be the same as under the I-5 Alternative. South of S 240th Street, impacts would be the same as under the SR 99 Alternative. No additional impacts would occur between Kent-Des Moines Road and S 240th Street.

5.4.3 Potential Mitigation Measures

Potential safety mitigation measures along local street and arterials are described above in Section 5.3.3. With FWLE alternatives near I-5, potential mitigation measures include placing a temporary construction barrier near the southbound I-5 edge of pavement where barriers are not already present to separate construction activity from I-5 mainline traffic. Additional mitigation measures that address safety on regional facilities are described in Section 5.1.2.

5.5 Parking

5.5.1 Impacts Common to All Alternatives

Parking by construction workers would be provided within the construction area where possible. Construction worker parking could also occur on local streets and arterials where parking is unrestricted. Construction worker parking near designated construction staging areas could affect the nearby parking supply during heavy construction periods. Contractors are generally responsible for

providing parking for construction workers where necessary. It is expected that some worker parking could be accommodated at the staging areas and along the alignment construction area.

5.5.2 Impacts by Alternative

5.5.2.1 SR 99 Alternative

Loss of available parking at the Redondo Heights Park-and-Ride lot is expected during construction of the SR 99 Alternative. The existing park-and-ride facility would be partially or fully closed while the parking structure is constructed. The facility is currently underutilized, with less than 10 percent use, which equals approximately 60 spaces. The Star Lake Park-and-Ride lot has enough capacity (approximately 240 spaces available) to accommodate any displaced riders with the closure of the Redondo Heights Park-and-Ride.

Construction activities at the Federal Way Transit Center could have minor traffic impacts on the streets adjacent to the existing park-and-ride during station construction because of the construction activity and increased truck traffic in the area. Although the transit facility would remain open with its full supply of parking available for transit patrons during the entire construction period. There would be no additional transit and/or public parking impacts with any of the station options.

There is no on-street parking allowed along the length of SR 99. The available on-street parking is generally located along the streets east and west of SR 99 and would not likely be affected by construction activity.

There would be no additional private parking impacts with any of the station options except for the Kent/Des Moines HC Campus Station Option. During construction and FWLE operation, some Highline College student parking would be removed from a highly utilized Highline College parking lot. Permanent replacement parking for Highline College would be provided by Sound Transit prior to station construction.

5.5.2.2 I-5 Alternative

A limited amount of on-street parking, located in neighborhoods west of I-5 in the Kent/Des Moines Station area, is allowed along the length of the I-5 Alternative. This parking would be removed during construction.

Station construction at the Star Lake Park-and-Ride would likely take 18 to 30 months to complete. The existing park-and-ride facility is 60 percent utilized today, with over 300 of the 540 parking stalls being occupied. The park-and-ride would be partially or fully closed during the construction period while the station and parking structure are being built. Some parking would be unavailable and temporary parking would be provided where necessary and where feasible to mitigate the impacts. If bus service was rerouted to the Redondo Heights Park-and-Ride, this location would have enough capacity (approximately 640 spaces) to accommodate the displaced riders from the Star Lake Park-and-Ride.

Construction activities at the Federal Way Transit Center could have minor traffic impacts on the streets adjacent to the existing park-and-ride during station construction because of the increased truck traffic in the area. The transit facility would remain open with its full supply of parking available

for transit patrons during the entire construction period. There would be no additional transit and/or public parking impacts with any of the station options.

Station and Alignment Options

Kent/Des Moines At-Grade Station Option

The Kent/Des Moines At-Grade Station Option would have the same parking impacts as the I-5 Alternative.

Kent/Des Moines SR 99 East Station Option

The Kent/Des Moines SR 99 East Station Option would have the same parking impacts as the I-5 Alternative.

Landfill Median Alignment Option

Construction worker parking would not be allowed in the I-5 median; therefore, the Landfill Median Alignment Option would have the same parking impacts as the I-5 Alternative

Federal Way I-5 Station Option

The Federal Way I-5 Station Option would have the same parking impacts as the I-5 Alternative.

Federal Way S 320th Park-and-Ride Station Option

There would be impacts on parking at the existing Federal Way S 320th Park-and-Ride lot during the construction of this station option. The existing park-and-ride would be partially or fully closed while the station and parking structure are being constructed. The existing Federal Way S 320th Park-and-Ride is currently 45 percent utilized, with almost 400 of the 877 parking stalls occupied. Displaced riders would need to use the Federal Way Transit Center, which is currently at capacity, or other facilities that are under-capacity, such as the Star Lake Park-and-Ride.

5.5.2.3 SR 99 to I-5 Alternative

Impacts north of Kent-Des Moines Road would be the same as for the SR 99 Alternative. South of S 240th Street, impacts would be the same as for the I-5 Alternative, including impacts at the Star Lake Park-and-Ride. Between Kent-Des Moines Road and S 240th Street, no additional parking impacts were identified.

5.5.2.4 I-5 to SR 99 Alternative

Parking impacts north of Kent-Des Moines Road with the I-5 to SR 99 Alternative would be the same as under the I-5 Alternative. South of S 240th Street, impacts would be the same as for the SR 99 Alternative, including impacts at the Redondo Heights Park-and-Ride. Between Kent-Des Moines Road and S 240th Street, no additional parking impacts were identified.

5.5.3 Potential Mitigation Measures

Depending on the alternative and station options selected, the existing Star Lake, Redondo Heights, or S 320th Street park-and-ride lots could be fully closed. Measures to mitigate the loss of parking at these locations could include the following:

- Route transit riders that use these locations to available spaces at other nearby park-and-ride lots.

- Consider service increases or other measures to encourage transit trips that do not require automobile access.
- Lease parking lots and/or new parking areas within the vicinity of the closed park-and-ride lots.
- Provide temporary transit service at a nearby off-street location.

5.6 Nonmotorized Facilities

5.6.1 Impacts Common to All Alternatives

All FWLE alternatives would either close sidewalks or reduce the sidewalk width within the construction areas. Impacts specific to each alternative are described in this section.

5.6.2 Impacts by Alternative

5.6.2.1 SR 99 Alternative

There would be some impact on nonmotorized travel modes from constructing the elevated guideway within the SR 99 median, including for very short periods where crosswalks may be closed for construction in that area. Crosswalks would be maintained to the extent feasible. Nonmotorized travel would be affected in areas where roadway reconstruction includes sidewalks. Wherever feasible, sidewalks would remain open. Protected sidewalks next to the construction area would be provided when detour routes are not feasible. Short sections of sidewalks may need to be closed during construction on the roadway and would require pedestrians to detour to the closest signalized crossing of SR 99. Because of the spacing of SR 99 crossings, detours for pedestrians could be circuitous. Bicycle routes and lanes adjacent to the construction areas, such as those located along S 216th Street, may be temporarily removed during construction. Nonmotorized travel would also be affected in the vicinity of station construction, as well as from construction of the elevated guideway over local arterials.

Crosswalks located at signalized intersections would remain open, except when SR 99 or side streets are temporarily closed. The midblock pedestrian crossing north of Kent-Des Moines Road would be closed during the construction period in that area and would require pedestrians to detour to another crossing. Near the Kent/Des Moines Station area, S 236th Lane would be built prior to station construction to provide an additional SR 99 pedestrian crossing that would minimize pedestrian impacts near the Highline College campus if sidewalks are temporarily closed. In addition, a protected pathway along S 236th Lane or S 240th Street would be provided to facilitate pedestrian movement to and from the Highline College campus and SR 99 through the construction area.

During the S 272nd Redondo Station construction, sidewalks on the east side of SR 99 may be closed or a protected sidewalk would be provided next to the station. If sidewalks are closed on the east side of SR 99, pedestrians may require a circuitous reroute because the nearest SR 99 crossings are at S 260th Street and S 288th Street. Sidewalks would remain open at the two signalized intersections adjacent to the station area (S 272nd Street and S 276th Street). During the Federal Way Transit Center Station construction, sidewalks would be maintained, except along short portions of 20th Avenue S, 21st Avenue S, and 23rd Avenue S, where the sidewalks may be temporarily closed or a protected sidewalk would be provided through the construction area.

Station Options

S 216th Station Options

With either of the potential additional S 216th station options (West or East), the impacts on nonmotorized facilities would be similar to the SR 99 Alternative.

Kent/Des Moines HC Campus Station Option

The impacts on nonmotorized facilities of the Kent/Des Moines HC Campus Station Option would be similar as the SR 99 Alternative except that the midblock pedestrian crossing on SR 99 between S 226th Street and Kent-Des Moines Road would remain open. A protected pathway along S 236th Lane would be provided to facilitate pedestrian movement between Highline College campus and SR 99 through the construction area.

Kent/Des Moines HC from S 216th West Station Option

The midblock pedestrian crossing on SR 99 between S 226th Street and Kent-Des Moines Road would remain open with the Kent/Des Moines HC from S 216th W Station Option. Sidewalks along SR 99 would not be impacted with this option between S 216th Street and Kent-Des Moines Road. Along S 240th Street, sidewalk on at least one side of the street would remain open during construction. Students accessing the Highline College campus may be required to use alternate routes to avoid the construction area.

In addition, a protected pathway along S 236th Lane would be provided to facilitate pedestrian movement between the Highline College campus and SR 99 through the construction area.

Kent/Des Moines SR 99 Median Station Option

The impacts on nonmotorized facilities with the Kent/Des Moines SR 99 Median Station Option would be similar to the SR 99 Alternative.

Kent/Des Moines SR 99 East Station Option

The impacts on nonmotorized facilities with the Kent/Des Moines East SR 99 Station Option would be similar to the SR 99 Alternative, except pedestrian movement to and from the Highline College campus should not be affected.

S 260th Station Options

With either of the potential additional S 260th Street station options (West or East), the impacts on nonmotorized facilities would be similar to the SR 99 Alternative.

S 272nd Redondo Trench Station Option

The impacts on nonmotorized facilities with the S 272nd Redondo Trench Station Option would be the same as the SR 99 Alternative.

Federal Way SR 99 Station Option

The impacts on nonmotorized facilities with the Federal Way SR 99 Station Option would be similar to the SR 99 Alternative except no nonmotorized impacts would occur on 20th Avenue S, 21st Avenue S, and 23rd Avenue S.

5.6.2.2 I-5 Alternative

Under the I-5 Alternative, nonmotorized travel could be affected in the vicinity of station construction and from construction of the elevated guideway over arterials and local streets. The limited number of I-5 crossings restricts the pedestrian and bicycle activity in the study area. Therefore, existing nonmotorized facilities across I-5 would be maintained to the extent feasible.

Near the Kent/Des Moines Station area, S 236th Lane would be constructed to provide an additional pedestrian crossing at SR 99. Since the Kent/Des Moines station would be located near I-5 and nonmotorized facilities are currently not provided, impacts on nonmotorized travel would be minimal during station construction.

During the S 272nd Star Lake Station construction, sidewalks on the north side of S 272nd Street may be closed or a protected sidewalk would be provided next to the station. Crosswalks would remain open at the two signalized I-5 ramp terminal intersections adjacent to the station area allowing pedestrians to use the I-5 transit flyer stops during construction.

During the Federal Way Transit Center Station construction, sidewalks would be maintained, except along portions of S 317th Street, 25th Avenue S, 23rd Avenue S, 21st Avenue S, and 20th Avenue S, where the sidewalks may be temporarily closed or a protected sidewalk would be provided through the work area.

Station and Alignment Options

Kent/Des Moines Station Options

Both Kent/Des Moines station options would have similar impacts on nonmotorized facilities as the I-5 Alternative.

Landfill Median Alignment Option

The Landfill Median Alignment Option would have similar impacts on nonmotorized facilities as the I-5 Alternative.

Federal Way I-5 Station Option

The Federal Way I-5 Station Option would have similar impacts on nonmotorized facilities as the I-5 Alternative, except no nonmotorized impacts would occur on 23rd Avenue S and portions of Gateway Center Boulevard may have sidewalk closures.

Federal Way S 320th Park-and-Ride Station Option

The Federal Way S 320th Park-and-Ride Station Option would have similar on nonmotorized facilities impacts as the I-5 Alternative north of S 317th Street. With this station option, no nonmotorized impacts would occur near the existing Federal Way Transit Center.

5.6.2.3 SR 99 to I-5 Alternative

Impacts on nonmotorized facilities north of Kent-Des Moines Road with the SR 99 to I-5 Alternative would be the same as with the SR 99 Alternative. South of S 240th Street, impacts would be the same as with the I-5 Alternative. Between Kent-Des Moines Road and S 240th Street, no additional impacts are identified.

5.6.2.4 I-5 to SR 99 Alternative

Impacts on nonmotorized facilities north of Kent-Des Moines Road with the I-5 to SR 99 Alternative would be the same as with the I-5 Alternative. South of S 240th Street, impacts would be the same as with the SR 99 Alternative. Between Kent-Des Moines Road and S 240th Street, no additional impacts are identified.

5.6.3 Potential Mitigation Measures

Most of the nonmotorized impacts during construction would be related to the closure of sidewalks along SR 99 and other arterial and local streets. Sound Transit would minimize potential impacts on pedestrian and bicycle facilities by providing detours within construction areas, such as protected walkways, and would notify the public as determined appropriate by the project team.

5.7 Freight Mobility and Access

5.7.1 Impacts Common to All Alternatives

Impacts on the movement of trucks carrying freight would be approximately the same as impacts on general traffic, as described in Sections 5.1 and 5.3.

The SR 99 lane closures within the construction areas could temporarily affect freight mobility in a manner similar to the general traffic. When partial lane closures are necessary during construction on SR 99, the intended purpose of any provided detour routes is to provide an alternate route for general purpose traffic. It is expected that freight would continue to travel on SR 99 or on other designated freight corridors. Temporary closures of access for some businesses could also occur, thus affecting freight (such as deliveries). If driveway closures are required, access to these properties would be maintained to the extent possible. With driveway closures, detours for freight would be treated similar to what is described for the general traffic.

With the I-5 Alternative, some of the short-term (nights and weekends) I-5 interchange ramp closures (at Kent-Des Moines Road and S 272nd Street) would affect freight. In addition, freight would be affected with the S 320th Park-and-Ride Station Option as a short-term (nights and weekends) southbound on-ramp closure at the S 320th Street interchange would be required. This would require rerouting or rescheduling of freight trips during these periods. Detour routes for freight would need to be approved by affected jurisdictions. Construction activities with the Landfill Median Alignment Option could have short-term travel impacts on freight because of increased congestion on I-5 or along any detour routes.

5.7.2 Potential Mitigation Measures

To minimize potential freight impacts, Sound Transit would coordinate with affected businesses throughout the construction period to notify them of lane and/or access closures and maintain business access as much as possible.

For any construction activities that might have possible I-5 impacts, Sound Transit would coordinate with freight stakeholder groups and provide construction information to WSDOT for use in the state's freight notification system. Sound Transit would provide information in a format required by WSDOT.

6.0 Indirect Impacts

This chapter discusses indirect transportation impacts that would be caused by the Federal Way Link Extension (FWLE).

6.1 Regional Facilities and Travel

The completion of the FWLE would provide reliable light rail service between Federal Way and a majority of the region's urban centers. Light rail service could help facilitate potential increases in residential and employment uses around the stations. This could lead to changes in regional and local travel patterns as trips both to and from these areas increase for all travel modes, thus affecting transit, local traffic volumes, parking demand, and nonmotorized users.

6.2 Transit Operations

The FWLE could also affect ridership on other transit routes in the FWLE corridor, particularly on parallel and feeder transit service along the State Route (SR) 99 corridor. Longer distance bus trips could decrease as some riders shift to light rail, and shorter bus trips could increase as more riders use other transit service to access light rail.

In addition to the future conceptual bus service plan assumed for each alternative, other changes in transit service within the FWLE corridor that are not yet planned or anticipated in response to the FWLE could also result in shifts in ridership. For instance, Sound Transit and King County Metro Transit (Metro) could redeploy and/or reinvest in bus service that would be replaced by light rail service above and beyond what has been assumed in the FWLE Draft EIS.

Light rail service could facilitate a concentration of residential and commercial land uses, known as transit-oriented development, surrounding the stations. The population and employment projections used in Sound Transit's ridership forecasting model were the Puget Sound Regional Council's (PSRC) 2013 Land Use Targets data. These plans forecast a substantial amount of population and employment growth in and around the FWLE study area by the year 2035.

Land Use Targets Data

PSRC's 2013 Land Use Targets data reflect a dataset based on local growth targets developed by each county to align with VISION 2040's Regional Growth Strategy. The Land Use Targets data were developed based on local planned development capacities and regional policies adopted in VISION 2040. It represents a regional development pattern consistent with what local jurisdictions are planning for under the first set of VISION 2040-aligned local growth targets (PSRC, 2013)

Because the Sound Transit and PSRC models already include adopted land use changes, the overall FWLE ridership is not expected to substantially change as a result of concentrated development (transit-oriented) around future light rail stations. However, the mode of access to and from stations may shift to a greater percentage of nonmotorized access and lower percentage of automobile access as the population and employment densities increase within station walksheds and bikesheds. For example, if development were to be focused around the Kent/Des Moines Station, or any other light rail station in the FWLE corridor, this could result in an increase in the walk access trips, which would likely be offset by a

reduction of park-and-ride or bus-transfer riders and/or small ridership decreases in other parts of the system or region.

The PSRC's Forecast Analysis Zone that encompasses the Kent/Des Moines Station area includes almost a 50 percent increase in population and employment for the area in the next 20 years. This equates to over 7,000 more jobs and households by 2035. This projected growth is already captured in the Sound Transit ridership model. Within the Midway subarea, the City of Kent's Transportation Master Plan forecasts employment and household increases of less than 2,000 by 2031 (City of Kent, 2011). Since then, the City of Kent's Midway Subarea Plan identified a "land use capacity" for the area that is beyond the 2,000 employment and household forecast in the City's Transportation Master Plan. These land use capacities are expected to be achieved beyond the FWLE's year 2035 planning horizon. Even so, the 7,000 more jobs and households forecasted by PSRC in the Midway subarea could incorporate all of the City of Kent's Transportation Master Plan forecast as well as additional development in line with the vision of the Midway Subarea Plan.

Any development beyond the PSRC's adopted population and employment land use forecasts for 2035 would require further regional and local planning and policy decisions and could result in additional increases in overall ridership in the FWLE corridor.

6.3 Arterial and Local Streets Operations

Increased automobile and bus trips to and from the station areas could result from potential increases in land use development around the light rail stations along the corridor. The increase in traffic could cause additional impacts on the arterials and local streets. Mode shifts from automobile transit, bicycle, and pedestrian could also result from increased development along the FWLE corridor.

6.4 Safety

The potential for increases in residential and employment uses around the light rail stations could lead to an increase in nonmotorized activity and further conflicts between all travel modes (automobile, transit, and nonmotorized).

6.5 Parking

Increase in parking demand around station areas along the FWLE corridor might result from the potential increase in land use development surrounding these areas. The demand for park-and-ride spaces beyond 1/4 mile from the stations could increase because riders could park along feeder bus routes and travel to the station by bus. Loss in park-and-ride demand on parallel corridors could result from riders shifting to the light rail service.

6.6 Nonmotorized Vehicles

Additional pedestrian and bicycle trips to the station could result from potential increases in higher-density residential and commercial developments. Light rail ridership at the affected station could potentially increase. These trips could travel along older streets that lack Americans with Disabilities

Act accessibility but could encourage improvements to these facilities by local jurisdictions as increased usage becomes evident.

6.7 Freight Mobility and Access

Increased automobile and bus trips to and from the station areas could result from potential increases in land use development around the light rail stations along the FWLE corridor. The increase in traffic could cause additional impacts on the arterials and local street operations near stations, which could affect freight mobility and access on local roadways. Any impacts on freight would be similar to those for automobiles.

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7.0 Potential Mitigation Measures

This chapter describes whether mitigation would be needed and describes potential mitigation measures for the transportation elements analyzed in this report.

7.1 Regional Facilities and Travel

No transportation impacts were identified for regional facilities as a result of the Federal Way Link Extension (FWLE); therefore, no mitigation would be needed for these elements.

7.2 Transit Service and Operations

Mitigation for transit services and operations with the FWLE would not be expected. The FWLE would improve the regional transit system and provide Sound Transit, King County Metro Transit (Metro), and Pierce Transit the ability to develop bus service integration plans that coordinate bus service with the regional light rail system. Sound Transit would also provide expanded park-and-ride facilities to accommodate the expected increase in transit ridership with the project.

7.3 Arterial and Local Street Operations

Mitigation could be required at intersections where the intersection level of service (LOS) would be worse than with the No Build Alternative and would not meet the applicable agency LOS standard. If an intersection is not expected to meet agency LOS standards with the No Build Alternative, mitigation could be required if the FWLE would further degrade the intersection performance. Under this scenario, improvements were identified if the build alternatives would result in further vehicle delay increases of over 10 percent at signalized and unsignalized intersections compared with the No Build Alternative.

Potential improvements for up to seven intersections not meeting the described LOS and delay thresholds are summarized in Table 7-1. As the project advances in design, Sound Transit will continue to work with local jurisdictions and agencies to evaluate potential mitigation strategies for safe and efficient operations. Final mitigation would be determined and agreed upon by Sound Transit and the affected jurisdiction(s) and agency(s). Sound Transit will work with affected agencies during the permitting process to determine Sound Transit's contribution to improve intersections, which may include contributing a proportionate share of costs to improve intersections affected by the FWLE. This could be determined by the project's proportionate ratio of trips at the intersection or another equitable method.

7.3.1 Full Length Build Alternatives

The following intersections would be affected by all build alternatives and require mitigation:

- State Route (SR) 99/Kent-Des Moines Road
- I-5 southbound ramp/Kent-Des Moines Road
- I-5 northbound ramps/S 272nd Street

TABLE 7-1
Potential Transportation Mitigation

Intersection	FWLE Alternative/Option Requiring Mitigation	Full Length Condition	Kent/Des Moines Interim Terminus Condition	S 272nd Interim Terminus Condition
SR 99/Kent-Des Moines Road	All alternatives and Kent/Des Moines station options	Provide a second northbound right-turn pocket at SR 99/ Kent-Des Moines Road intersection that could transition into a third eastbound lane on Kent-Des Moines Road until transitioning with the I-5 northbound loop on-ramp.	Same as full-length condition.	Same as full-length condition.
I-5 Southbound Ramps/Kent-Des Moines Road	All alternatives and Kent/Des Moines station options		Same as full-length condition.	Same as full-length condition.
SR 99/S 240th Street	I-5 Alternative with the Kent/Des Moines At-Grade Station Option	Provide a second southbound left-turn lane that would require widening of S 240th Street between SR 99 and 30th Avenue S and construct a northbound right-turn pocket. Provide flashing yellow arrow phasing for eastbound/west bound approaches.	Same as full length condition.	Same as full-length condition.
I-5 Northbound Ramps/S 272nd Street	All alternatives	Provide northbound left-turn pocket.	Same as full-length condition.	Same as full-length condition.
I-5 Northbound Ramps/ Kent-Des Moines Road (Kent/Des Moines Interim Condition only)	All alternatives	No mitigation required	Provide a traffic signal for the off-ramp and westbound traffic on Kent-Des Moines Road	No mitigation required
I-5 Southbound Ramps/S 272nd Street (S 272nd Interim Condition Only)	SR 99 Alternative and I-5 to SR 99 Alternative	No mitigation required	No mitigation required	Provide eastbound right turn pocket to I-5 southbound ramp.
SR 99/S 276th Street (S 272nd Interim Condition Only)	SR 99 Alternative and I-5 to SR 99 Alternative	No mitigation required	No mitigation required	Provide northbound right-turn pocket from SR 99 to S 276th Street.

The first two intersections listed above would have impacts associated with the Kent/Des Moines Station, while the third intersection would have impacts associated with any of the S 272nd Street stations.

No mitigation is proposed around the potential additional stations at S 216th Street and S 260th Street, or within the Federal Way Transit Center Station area because the surrounding intersections would meet jurisdictional LOS standards or operate the same as, or better, than the No Build Alternative.

Table 7-2 identifies how the three affected intersections would operate with mitigation under the build alternatives and station options (although because none of the intersections are around the Federal Way Transit Center, those station options are not included). With the Kent/Des Moines At-Grade Station Option, an additional intersection (SR 99/S 240th street) would also require mitigation. Vehicle

queue lengths are also expected to be similar or improved compared to the No Build Alternative at intersections with potential mitigation.

TABLE 7-2
Comparison of Intersection LOS for No Build and Mitigated Full-Length Build Alternatives

	Intersection ID			
	SR 99/Kent-Des Moines Road	**I-5 Southbound Ramps/ Kent Des Moines Road**	**I-5 Northbound Ramps/ S 272nd Street**	**SR 99/ S 240th Street**
LOS Standard	D	D	D	D
No Build Alternative	**F (F)**	**C (E)**	**E (D)**	**D(D)**
SR 99 Alternative	**F (F) / F (E)**	**C (C) / E (E)**	**E (E) / D (D)**	**D (D) / C (C)**
Kent/Des Moines Station Options				
HC Campus Station Option	F (F) / F (E)	C (C) / E (E)	E (E) / D (D)	D (D) / D (D)
SR 99 Median Station Option	F (F) / F (E)	C (C) / E (E)	E (E) / D (D)	D (D) / D (D)
SR 99 East Station Option	F (F) / F (E)	C (C) / E (E)	E (E) / D (D)	D (D) / D (D)
I-5 Alternative	**F (F) / F (E)**	**C (C) / E (E)**	**F (E) / D (D)**	**D (D) / D (D)**
Kent/Des Moines Station Options				
At-Grade Station Option	F (F) / F (E)	C (C) / E (E)	F (E) / D (D)	F (D) / E (D)
SR 99 East Station Option	F (F) / F (E)	C (C) / E (E)	F (E) / D (D)	D (D) / D (D)
SR 99 to I-5 Alternative	**F (F) / F (E)**	**C (C) / E (E)**	**F (E) /D (D)**	**D (D) / D (D)**
I-5 to SR 99 Alternative	**F (F) / F (E)**	**C (C) / E (E)**	**E (E) / D (D)**	**D (D) / D (D)**

Notes:
Data in table formatted as AM LOS Unmitigated (AM LOS Mitigated) / PM LOS Unmitigated (PM LOS Mitigated).
LOS designation based on local jurisdiction or WSDOT Standards.
N/A = not applicable; mitigation not proposed for intersection.

7.3.2 Interim Terminus Conditions

7.3.2.1 Kent/Des Moines Station Interim Terminus Conditions

In the Kent/Des Moines Station interim terminus condition, mitigation is proposed at the following intersections, regardless of alternative or station option:

- SR 99/Kent-Des Moines Road
- I-5 southbound ramps/Kent-Des Moines Road
- I-5 northbound ramps/Kent-Des Moines Road

In the build condition, intersection operations would degrade at these intersections from the No Build Alternative and not meet LOS standards. The potential mitigation identified in Table 7-1 would improve intersection operations to operate the same as, or better, than under the No Build Alternative.

In addition, with the I-5 Alternative Kent/Des Moines At-Grade station option, the intersection operations at SR 99 and S 240th Street would not meet LOS standards, so mitigation is also proposed at that intersection. The potential mitigation identified in Table 7-1 would improve intersection operations to operate the same as, or better than, the No Build Alternative. Vehicle queue lengths are also expected to be similar or improved compared with the No Build Alternative at intersections with

the potential mitigation. Table 7-3 provides mitigated LOS results for each of the improved intersections.

TABLE 7-3
Comparison of Standard, No Build, and Mitigated Build Intersection LOS for Kent/Des Moines Interim Terminus Condition

Alternative	SR 99/Kent-Des Moines Road	I-5 Southbound Ramps/Kent-Des Moines Road	I-5 Northbound Ramps/ Kent-Des Moines Road	SR 99/S 240th Street
LOS Standard	D	D	D	D
No Build Alternative	**F (F)**	**C (E)**	**C (B)**	**D (D)**
SR 99 Alternative	**F (F) / F (F)**	**C (C) / E (E)**	**F (C) / B (B)**	**N/A**
Kent/Des Moines Station Options				
HCC Campus Station Option	F (F) / F (F)	C (C) / E (E)	F (D) / B (B)	N/A
SR 99 Median Option	F (F) / F (F)	C (C) / E (E)	F (C) / B (B)	N/A
SR 99 East Station Option	F (F) / F (F)	C (C) / E (E)	F (C) / B (B)	N/A
I-5 Alternative	**F (F) / F (F)**	**C (C) / E (E)**	**F (C) / B (B)**	**D (D) / D (D)**
Kent/Des Moines Station Options				
At-Grade Station Option	F (F) / F (F)	C (C) / E (E)	F (C) / B (B)	F (D) / E (D)
SR 99 East Station Option	F (F) / F (F)	C (C) / E (E)	F (C) / B (B)	D (D) / D (D)
SR 99 to I-5 Alternative	**F (F) / F (F)**	**C (C) / E (E)**	**F (C) / B (B)**	**D (D) / D (D)**
I-5 to SR 99 Alternative	**F (F) / F (F)**	**C (C) / E (E)**	**F (C) / B (B)**	**N/A**

Notes:
Data in table formatted as AM LOS Unmitigated (AM LOS Mitigated) / PM LOS Unmitigated (PM LOS Mitigated)
LOS designation based on local jurisdiction or WSDOT Standards.
N/A = not applicable; mitigation not proposed for intersection.

7.3.2.2 S 272nd Redondo Station Interim Terminus Conditions

SR 99 Alternative and I-5 to SR 99 Alternative

In the S 272nd Station interim terminus condition, mitigation is proposed at the following intersections in the S 272nd Redondo Station area:

- SR 99/Kent-Des Moines Road
- I-5 southbound ramps/Kent-Des Moines Road
- I-5 southbound ramps/S 272nd Street
- I-5 northbound ramps/S 272nd Street
- SR 99/S 276th Street

In the build condition, intersection operations would degrade at these intersections relative to the No Build Alternative and not meet LOS standards. The potential mitigation identified in Table 7-1 would

improve operations at these intersections to meet the jurisdictional LOS standards or No Build Alternative conditions. Levels of service for the intersections identified above with potential mitigation by build alternative are provided in Table 7-4, along with LOS for the No Build Alternative.

TABLE 7-4
Comparison of Standard, No Build, and Mitigated Build Intersection LOS for S 272nd Interim Terminus Condition

Alternative	SR 99/ Kent-Des Moines Road	I-5 Southbound Ramps/ Kent-Des Moines Road	I-5 Southbound Ramps/ S 272nd Street	I-5 Northbound Ramps/ S 272nd Street	SR 99/ S 276th Street
LOS Standard	D	D	D	D	D
No Build Alternative	**F (F)**	**C (E)**	**C (D)**	**E (D)**	**B (B)**
SR 99 Alternative	**F (F) / F (E)**	**C (C) / E (E)**	**C (C) / E (D)**	**F (E) / E (D)**	**E (D) / B (B)**
I-5 Alternative	**F (F) / F (E)**	**C (C) / E (E)**	**N/A**	**F (E) / D (D)**	**N/A**
SR 99 to I-5 Alternative	**F (F) / F (E)**	**C (C) / E (E)**	**N/A**	**F (E) / D (D)**	**N/A**
I-5 to SR 99 Alternative	**F (F) / F (E)**	**C (C) / E (E)**	**C (C) / E (D)**	**F (E) / E (D)**	**E (D) / B (B)**

Notes:
Data in table formatted as AM LOS Unmitigated (AM LOS Mitigated) / PM LOS Unmitigated (PM LOS Mitigated).
LOS designation based on local jurisdiction or WSDOT Standards.
N/A = not applicable; mitigation not proposed for intersection.

7.3.2.3 S 272nd Star Lake Station Interim Terminus Conditions

I-5 Alternative and SR 99 to I-5 Alternative

In the S 272nd Star Lake Station interim terminus condition, mitigation is proposed at the following three intersections under build conditions, regardless of the station option:

- SR 99/Kent-Des Moines Road
- I-5 southbound ramps/Kent-Des Moines Road
- I-5 northbound ramps/S 272nd Street

In the build condition, the I-5 northbound ramps and S 272nd Street intersection would operate below No Build Alternative conditions in the AM peak period. The potential mitigation identified in Table 7-1 would improve intersection operations to operate the same as, or better than, under the No Build Alternative. Table 7-4 provides mitigated LOS results for each of the improved intersections.

7.4 Safety

The FWLE alternatives would have no effects on the transportation safety in the FWLE corridor that require mitigation, except as noted along I-5. By designing the project elements (such as placement of guideway columns) to roadway standards, no additional mitigation would be required to improve transportation safety. Within the FWLE study area along the I-5 southbound mainline, there are approximately 11,500 feet of existing guardrail, walls, or barriers that would shield vehicles from light rail columns.

In instances where the minimum I-5 clear zone could not be maintained through grading, Sound Transit would coordinate with the Washington State Department of Transportation to identify the appropriate safety treatment. These treatments may include additional guardrail, barriers, and/or walls.

7.5 Parking

For acquired off-street parking resulting from partial property acquisitions, business opportunities might be reduced. The value of acquired parking depends on the quantity of spaces lost and the business type. Sound Transit would work with private business owners to determine fair market value of the acquired spaces.

The potential additional S 216th West or East and S 260th West or East station options also would have the potential for hide-and-ride activity because no parking would be provided at the station; however, the hide-and-ride potential would be minimized at the S 216th West or either S 260th Station because there is a low amount of easily accessible on-street public spaces near these stations. A greater likelihood for hide-and-ride parking exists near the potential additional S 216th East Station and may require mitigation. Sound Transit would work with local jurisdictions to develop a plan to evaluate and, if necessary, implement hide-and-ride mitigation that could consist of parking meters, restricted parking, passenger and truck load zones, and residential parking zones (RPZs). For parking controls agreed to with local jurisdictions, Sound Transit would be responsible for the cost of installing the parking controls agreed to with the local jurisdictions for 1 year after the opening of the FWLE. The local jurisdictions would be responsible for monitoring the parking controls and providing all enforcement and maintenance, including ongoing RPZ-related costs. Off-street private lot owners would be responsible for monitoring and preventing potential hide-and-ride parking within their own lots.

At the Kent/Des Moines Station, Sound Transit could consider a parking management program to maximize the parking capacity and to deter Highline College students from parking at the station parking areas. The parking management program could include restricted parking signage, permit parking only, priced parking similar to Highline College pricing rates, and/or working with Highline College to develop on-campus pricing strategies that make on-campus parking more attractive.

7.6 Nonmotorized Facilities

The FWLE would not result in any adverse impacts on existing nonmotorized facilities because all of the nonmotorized analysis indicate an LOS D or better near the stations. At stations, Sound Transit would provide pedestrian and bicycle improvements to safely accommodate the projected increase in pedestrian and bicycle travel associated with the FWLE in accordance with Sound Transit System Access Policy. Sound Transit would also work with local agencies to determine which pedestrian and bicycle improvements would be most appropriate to support station access and safety. Any new facilities would be expected to meet local and federal design standards for pedestrian and bicycle facilities.

7.7 Freight Mobility and Access

No transportation impacts were identified for freight mobility and access as a result of the FWLE; therefore, no mitigation would be needed for these elements.

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8.0 Cumulative Impacts

This chapter discusses potential cumulative transportation mobility impacts that would be caused by the Federal Way Link Extension (FWLE). The analysis of the No Build Alternative and the FWLE alternatives is inherently cumulative because it is based on regional forecasts that assume future funded projects and future growth in population and employment, located in designated growth centers, and consistent with adopted land use plans. However, there could be differences in effects based on the details of other individual transportation or development projects and the actual rate and timing of population or employment growth in a given community.

8.1 Regional Facilities and Travel

The cumulative effect of the FWLE in conjunction with the planned extension of State Route (SR) 509 between its current terminus near S 188th Street and I-5 could improve overall traffic operations beyond the conditions forecasted with the No Build or build alternatives. The cumulative effect of the FWLE and the completion of the SR 509 Extension Project would likely result in less congestion on I-5 and along major north-south arterials like SR 99 in the vicinity of the study area than would occur with constructing only the FWLE.

Beyond the SR 509 Extension Project, Washington State Department of Transportation (WSDOT), as part of the I-5 Puget Sound Gateway Project, could implement lane management strategies, such as express tolled lanes. Depending on how lane management strategies were administered, managed lanes could improve travel conditions on I-5 for some travel modes.

8.2 Transit Service and Operations

Future extensions of the regional mass transit network are depicted in Sound Transit's *Regional Transit Long-Range Vision* and include an extension south to Tacoma (Sound Transit 1996a). If voters approve funding for construction of additional extensions, transit accessibility for the communities in the FWLE corridor would be increased through connections to additional regional destinations.

8.3 Arterial and Local Street Operations

The future transportation impacts discussed in Chapter 4 were based on the results of traffic and ridership modeling that incorporates funded and approved future actions as well as projected growth that would include development in the region. Other planned, but not funded, regional and local transportation and development projects could have some effects on transit ridership and travel patterns within the study area, including traffic operations near the FWLE stations. This includes the potential for transit-oriented development. This form of land development could change how people access the stations, with a likely increase in people walking or biking to the station as nearby development occurs.

The current design of the SR 509 extension proposes closing S 208th Street east of SR 99 and extending S 211th Street east to 32nd Lane S to maintain neighborhood access to SR 99. If the I-5 Alternative or I-5 to SR 99 Alternative is identified as the Preferred Alternative, roadway improvements in this area proposed as part of the SR 509 Extension Project would need to be redesigned to maintain neighborhood access and maintain a grade-separated light rail guideway in this area. Sound Transit would coordinate with WSDOT on potential alternatives to the current roadway design for S 211th Street.

8.4 Safety

The SR 509 Extension Project would require widening of the I-5 mainline between S 200th Street and S 310th Street. For the No Build and I-5 alternatives, a clear zone assessment of the I-5 mainline and ramps was completed for the southbound I-5 mainline with the SR 509 Extension Project. This assessment assumed the most recent SR 509 conceptual design (2003). Table 8-1 documents the southbound I-5 roadside conditions between S 211th Street and S 317th Street with the SR 509 extension and without and with the FWLE I-5 Alternative alignment. Table 8-1 includes the length of where barriers along I-5 are located, or proposed with SR 509, the length of clear zone impact that would result from the FWLE alignment, and the resulting length of available clear zone along I-5. Additional clear zone data are provided in Chapter 3, Section 3.4.2; Chapter 4, Section 4.4.3.1; and Appendix H of this report.

TABLE 8-1
Southbound I-5 No Build and I-5 Alternative Clear Zone Summary with SR 509 Extension Project (Between S 211th Street and S 317th Street)

Condition	No Build	I-5 Alternative	I-5 Landfill Median Alignment Option
Length of barrier provided (in feet)[a]	20,900	21,700 (+800)	22,800 (+1,900)
Length of available clear zone (in feet)[b]	15,100	14,300	13,200
Total segment length (in feet)	36,000	36,000	36,000

Notes:
( ) Values shown in parenthesis represents the additional length of the corridor where the FWLE would be located in an existing clear zone. Mitigation, such as barrier or guardrails, may be required with the project in these locations.
[a] Represents areas where barriers are proposed with the SR 509 Extension Project. These areas include shielding to protect highway infrastructure, tree stands, steep side slopes, and other landscaping elements, or would be used to protect grade-separated crossings.
[b] Represents areas where future conditions meet the definition of a clear zone.

If the SR 509 Extension Project is constructed prior to the FWLE, 15,100 feet of clear zone would be provided along I-5 southbound. The SR 509 Extension Project proposes about 20,900 feet of longitudinal barrier, which would increase the shielded segments of southbound I-5 by 9,400 feet compared to the no SR 509 Extension condition. The shielded segments of the southbound I-5 roadside include 18,800 feet where WSDOT could potentially create a clear zone by alteration of, removal, or relocation of the roadside hazards described in Chapter 3, Section 3.4.2 of this report. Approximately 2,900 feet of barrier would shield grade-separated streets, and a clear zone cannot be created.

The I-5 and the I-5 to SR 99 alternatives would have a slight impact on the I-5 southbound clear zone. There would be a short distance (approximately 800 feet) on the Kent-Des Moines Road southbound

on-ramp to I-5 where a clear zone would not be provided and guardrails or barriers would be provided to protect the light rail guideway columns. No other I-5 southbound clear zones would be affected. Based on *Highway Safety Manual* (AASHTO, 2014) analysis, adding guardrail or barrier along the Kent-Des Moines Road southbound on-ramp could result in an increase of up to one crash per year. This on-ramp currently has had one crash over a recent 5-year period (2007–2011).

If the SR 509 Extension Project is constructed and the I-5 median is used for tolling, the I-5 Alternative's Landfill Median Alignment Option would require the reduction of the inside shoulder width on I-5 from approximately 10 feet to 6 feet for approximately 1/2 mile. The light rail guideway would be located less than 30 feet from the edge of traveled way when the alignment is in the I-5 median. A barrier along the inside shoulder of I-5 southbound and northbound mainlines would be proposed to protect the guideway columns from vehicle collisions. Furthermore, as the guideway transitions to and from the I-5 median, barrier would be required along the southbound I-5 outside shoulder (up to 600 feet for the northernmost transition section and up to 500 feet for the southernmost transition section) to shield the guideway. Based on safety analysis using the HSM, adding a barrier such as a guardrail through this median section of both directions of I-5 and along the southbound I-5 outside shoulder could result in an increase of up to two crashes per year.

Maintenance impacts when the I-5 Alternative is next to the I-5 mainline with the SR 509 Extension Project would have the same impacts as identified in Chapter 4, Section 4.3.1.3. No additional maintenance impacts would be expected with operation of the FWLE and with the construction of the SR 509 Extension Project.

8.5 Parking

Parking within the FWLE corridor could be affected by land use and transportation infrastructure changes that are not reflected in this analysis. In particular, transportation projects that increase roadway capacity could increase parking demand within the corridor. Conversely, increases in regional transit connectivity could decrease parking demand as travelers shift their modes of travel.

8.6 Nonmotorized Facilities

Future unfunded projects or accelerated growth could add more pedestrian and bicycle trips to the street network surrounding the light rail stations. These projects could also improve nonmotorized facilities associated with the FWLE.

8.7 Freight Mobility and Access

As described in the future transportation impacts in Chapter 4, none of the build alternatives would have long-term travel impacts on automobile or truck traffic in the Puget Sound Region because the light rail guideway would operate in its own right-of-way. Therefore, there would be no potential cumulative transportation mobility impacts on freight mobility and access with any of the build alternatives.

8.8 Construction

If the SR 509 Extension Project is completed prior to FWLE construction, there would be no direct impact on the I-5 travel lanes with the I-5 Alternative. However, the light rail construction area for the I-5 Alternative could be located adjacent to the I-5 pavement edge in the following two locations:

- Midway Landfill between S 246th and S 252nd streets (approximately 1/2 mile) and
- McSorley Creek wetland area in the vicinity of S 272nd Street (approximately 1/4 mile).

Short-term, temporary I-5 shoulder reductions would be required in these two locations. In these locations, the freeway capacity could be reduced temporarily due to the loss of shoulder width and could result in slower vehicle speeds through the construction areas. For the remaining construction areas along I-5, full shoulder widths would be maintained during construction. A Maintenance of Traffic plan that addresses all travel modes would be prepared during final design for agency approval.

The clear zone would already be reduced along many sections of I-5 through the study area compared with the No Build Alternative if the current design of the SR 509 Extension Project were constructed. Even so, temporary impacts on the I-5 southbound clear zone would occur. About 1,000 feet of clear zone would remain during construction (from approximately S 240th Street to S 243rd Street). However, a temporary construction barrier would be placed for approximately 15,100 feet near the southbound I-5 edge of pavement where barriers would not already be present. Based on the safety analysis using HSM methodologies, placing a temporary barrier along southbound I-5 between S 211th Street and S 317th Street could result in an increase of up to three crashes per year during the construction period. This would be a smaller increase than the condition without the SR 509 Extension Project because more permanent barriers would already be present with that project.

Between approximately S 240th Street and S 252nd Street, construction of the guideway with the I-5 Landfill Median Alignment Option would require the temporary closure of one southbound lane and the temporary narrowing of the inside shoulder to provide adequate space during construction of the guideway. This would likely occur over 4 to 6 months. During this period, the freeway capacity would be temporarily reduced in this short section from the loss of shoulder and travel lanes. The loss of capacity would result in slower vehicle speeds through this area and could require detours.

Construction of the girders for the guideway bridges over the southbound lanes of I-5 would have impacts on I-5 traffic operations during installation. If cast-in place construction methods are used, this could require a shoring tower in the middle of southbound I-5 to support the straddle bents while they are being constructed, thus requiring closure of one to two lanes for up to 6 weeks, or restriping southbound I-5 mainline travel lanes around the construction area. Using precast cap beams across southbound I-5 would avoid the need for shoring towers but would require multiple overnight and/or weekend closures. If I-5 southbound is closed, the likely detour route would use the Kent/Des Moines interchange to SR 99 and/or Military Road, with traffic rerouted back to I-5 at S 272nd Street. Either of these revisions to the I-5 southbound mainline would require advanced signage and restriping to ensure safe operations through this construction area.

Simultaneous construction of the SR 509 Extension and FWLE projects could result in an increased number of trucks within the study area. Construction of the SR 509 Extension would have direct impacts on the I-5 mainline and would require construction access directly from I-5, whereas construction of the FWLE would not require direct vehicle access via I-5 and would have no direct impacts on the I-5 mainline operations, except with the I-5 Landfill Median Alignment Option. Any lane closures and detour routes would be coordinated to minimize any traffic impacts related to simultaneous construction.

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Appendix A

Transportation Technical Analysis Methodology

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Appendix A

Transportation Technical Analysis Methodology

A.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:

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

A.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.

A.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 A-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).

A.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);

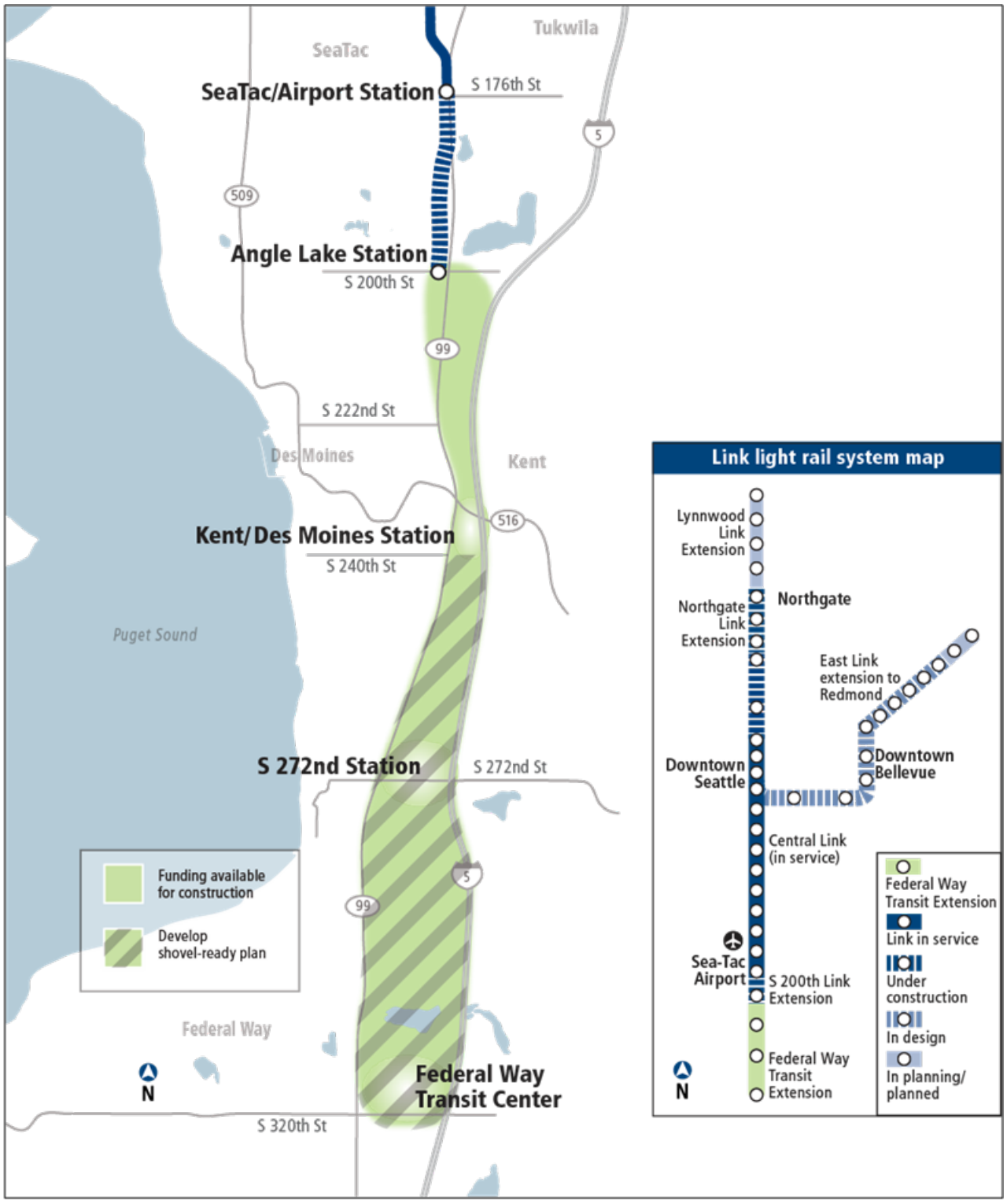

EXHIBIT A-1
FWLE Study Area

- 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); and
- 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).

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:

- 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); and
- 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).

A.5 Agency Coordination

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

A.5.1. NEPA Lead Agency

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

A.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

A.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.

A.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.

A.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.

A.6.3. EIS Alternatives

The EIS analysis will be developed for the conditions listed in Table A-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 A-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.

A.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.

A.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.

A.8 Study Area and Area of Effect

A.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 A-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.

A.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 A-2 shows the locations of these intersections and Table A-2 shows the jurisdiction, control type, and the proposed count period (PM peak or short).

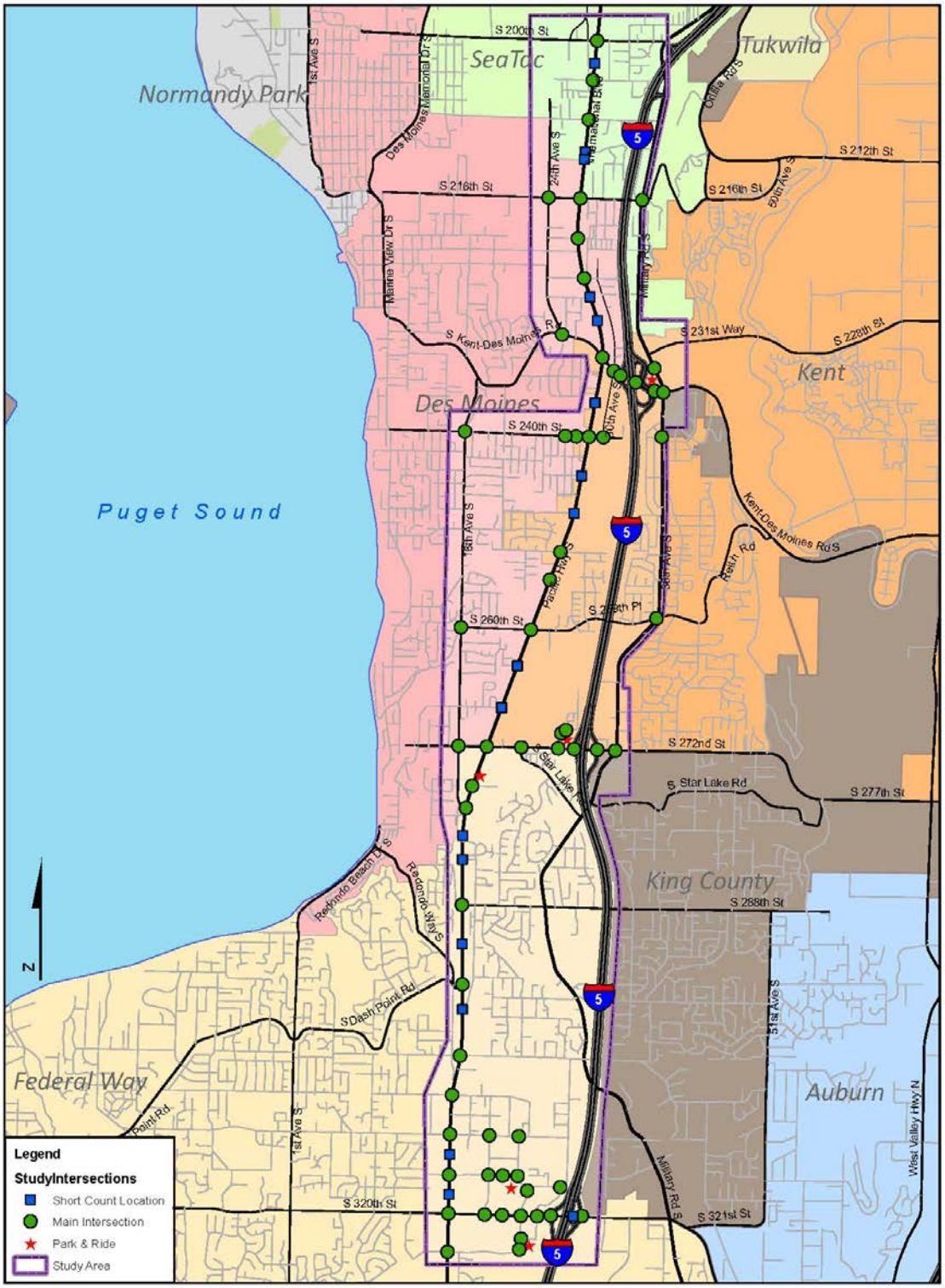

EXHIBIT A-2
FWLE Study Area Intersections

TABLE A-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	✓	
K19	S Star Lake Road	S 272nd Street	Signal	✓	

TABLE A-2
Proposed Study Intersections

ID #	North/South Street	East/West Street	Control Type	PM LOS Analysis	Short Count
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	✓	

A.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 A-3.

TABLE A-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.

A.9 Analysis Tools

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

A.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 A-3 illustrates the relationship between the demand models.

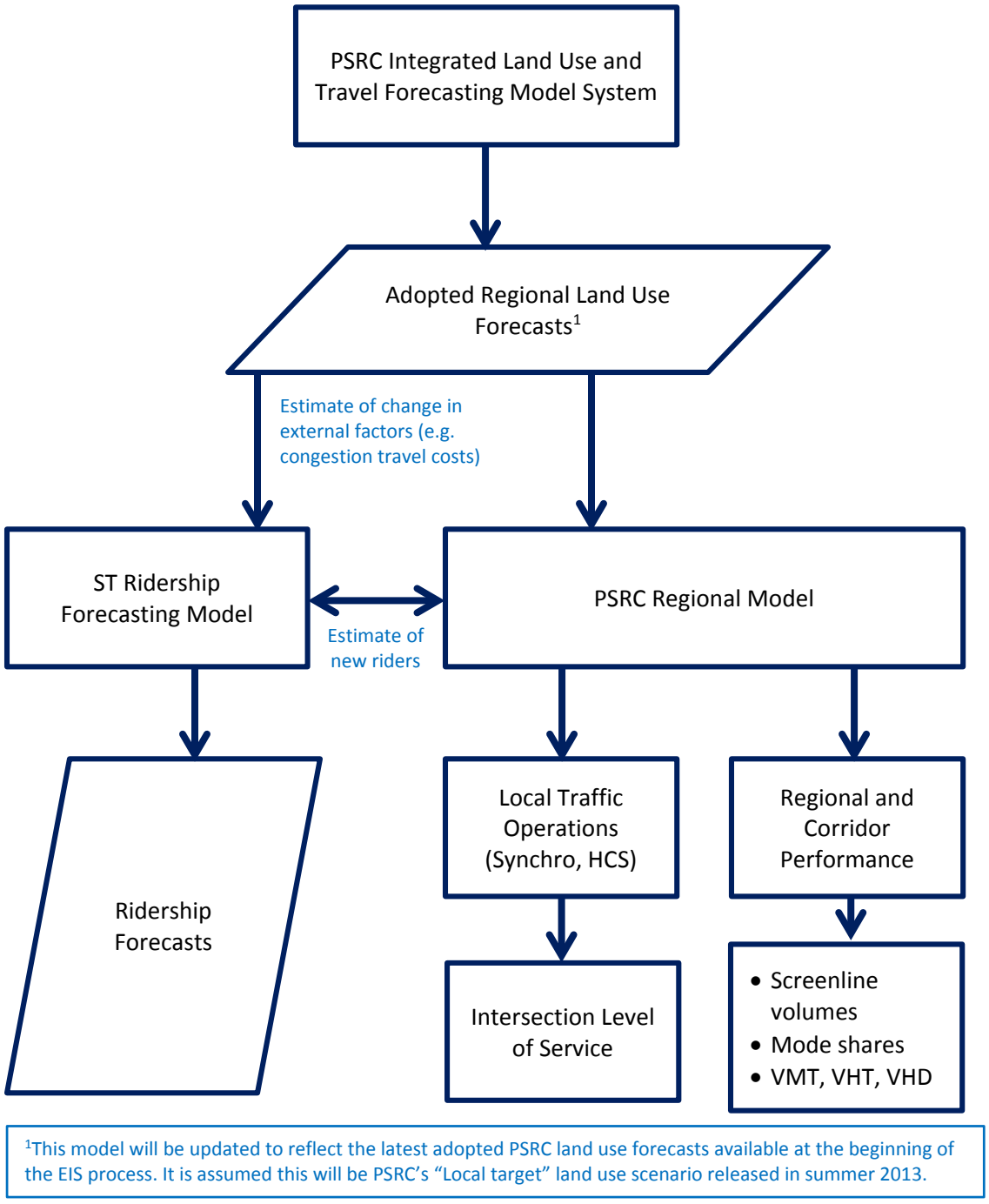

EXHIBIT A-3
FWLE Travel Demand Model Relationship

A.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.

A.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.

A.9.2. Traffic Operations Analysis

A.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.

A.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.

A.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.

A.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.

A.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.

A.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.

A.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 A-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.

A.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.

A.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.

A.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 A-4 provides a summary list of the transportation analysis criteria by assessment level.

TABLE A-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.

A.11.1. Regional Transportation System

A.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.

A.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.

A.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.

A.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:

- 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 A-4, are:

- 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.

A.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.

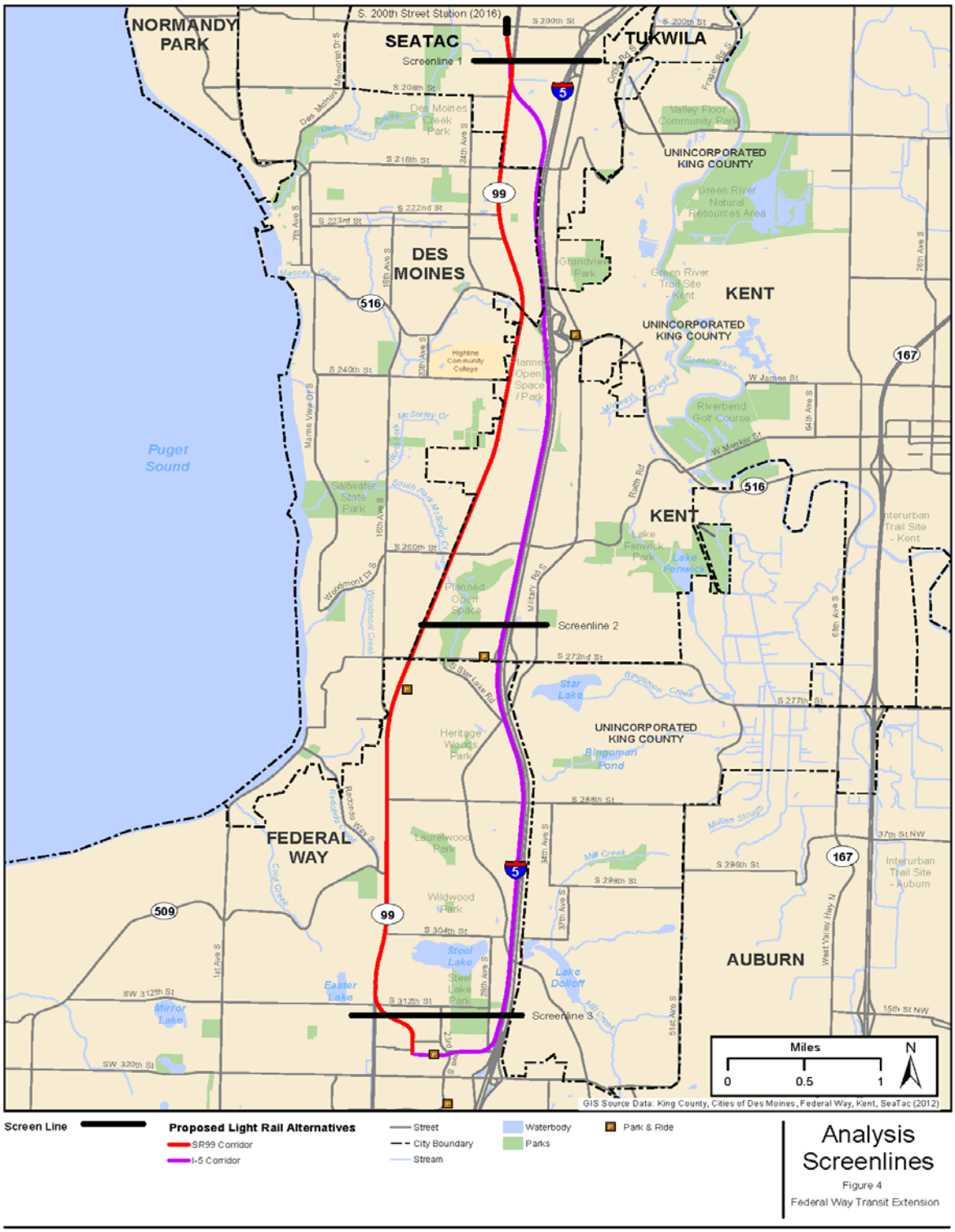

EXHIBIT A-4
FWLE Screenline Locations

- 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.

A.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.

A.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 A-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.

A.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.

A.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 A-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 A-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 A-6 and described in the following sub-sections.

TABLE A-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 A-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.

[1] The Xc is a measure of the critical volume to capacity ratio for the approach lane groups that have the highest flow ratio for a given phase. In effect, the Xc is the volume to capacity ratio for the critical movement, assuming green time is allocated proportionately.

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 A-7 provides assumptions for existing and future year (No-Build and Build alternatives) input values and assumptions when data are not available.

TABLE A-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 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

TABLE A-7
Default Synchro Parameters and Assumptions

Arterial Intersection Parameters	Analysis Year	
	Existing Year 2013	Design Year 2035
		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.

A.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.

A.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.

A.11.3.6. Nonmotorized Facilities and Modes

The alternatives will be qualitatively assessed regarding existing and future nonmotorized (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.

A.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.

A.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.)

A.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.

A.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.

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

A.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.

A.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).

A.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.

A.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.

A.12 Mitigation Measures

A.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.

A.12.2. Mitigation

A.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.

A.13 Summary of Technical Activity by Analysis Year

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

TABLE A-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	✓	✓	✓
Nonmotorized 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 A-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

A.14 Documentation

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

- EIS section
- Transportation Technical Report

A.15 References

Bay Area Rapid Transit (BART). 2008. *2008 BART Station Profile Study.* BART and Corey, Canapary and Galanis Research.

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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

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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 0 to 5 minutes late; early departures are not considered on time.

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

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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 Rapid Ride A	Northbound	21.5	48.0	0.45	A
Metro 131	Northbound	9.1	35.0	0.26	A
Metro 132	Northbound	15.3	49.5	0.31	A
Metro 180	Northbound	18.1	35.0	0.52	B
ST 574	Northbound	13.0	48.7	0.27	A
ST 578	Northbound	22.4	57.0	0.39	A
ST 590	Northbound	12.1	42.0	0.29	A
ST 594	Northbound	34.9	54.5	0.64	B
Metro Rapid Ride A	Southbound	31.0	48.0	0.64	B
Metro 121	Southbound	12.8	58.0	0.22	A
Metro 122	Southbound	8.3	35.0	0.24	A
Metro 152	Southbound	29.8	35.0	0.85	C
Metro 157	Southbound	28.8	35.0	0.82	C
Metro 158	Southbound	42.6	45.5	0.94	C
Metro 159	Southbound	26.5	56.0	0.47	A
Metro 162	Southbound	25.9	56.0	0.46	A
Metro 173	Southbound	11.4	35.0	0.33	A
Metro 175	Southbound	20.9	35.0	0.60	B
Metro 177	Southbound	46.7	50.8	0.92	C
Metro 179	Southbound	35.8	35.0	1.02	D
Metro 180	Southbound	17.3	35.0	0.49	A
Metro 190	Southbound	25.0	35.0	0.71	B
Metro 192	Southbound	22.5	35.0	0.64	B
Metro 193	Southbound	32.5	56.0	0.58	B
Metro 196	Southbound	30.5	35.0	0.87	C
Metro 197	Southbound	46.0	49.0	0.94	C
ST 574	Southbound	24.2	46.2	0.52	B
ST 577	Southbound	40.8	57	0.72	B
ST 586	Southbound	33.1	54.5	0.61	B
ST 590	Southbound	28.7	48.7	0.59	B
ST 592	Southbound	24.2	44.7	0.54	B
ST 595	Southbound	34.6	57.0	0.61	B
Total Screenline[a]	Northbound	21.4	49.6	0.43	A
Total Screenline[a]	Southbound	29.7	47.7	0.62	B

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 312th Street					
Metro Rapid Ride A	Northbound	12.9	48.0	0.27	A
Metro 183	Northbound	13.1	32.5	0.40	A
ST 574	Northbound	14.2	48.7	0.29	A
ST 578	Northbound	22.4	57.0	0.39	A
ST 590	Northbound	12.1	42.0	0.29	A
ST 594	Northbound	34.9	54.5	0.64	B
Metro Rapid Ride A	Southbound	17.9	48.0	0.37	A
Metro 173	Southbound	9.0	35.0	0.26	A
Metro 177	Southbound	46.7	50.8	0.92	C
Metro 179	Southbound	35.8	35.0	1.02	D
Metro 183	Southbound	2.4	32.5	0.07	A
Metro 193	Southbound	15.1	56.0	0.27	A
Metro 196	Southbound	30.5	35.0	0.87	C
Metro 197	Southbound	25.7	49.0	0.52	B
ST 574	Southbound	23.9	46.2	0.52	B
ST 577	Southbound	40.8	57.0	0.72	B
ST 586	Southbound	33.1	54.5	0.61	B
ST 590	Southbound	28.7	48.7	0.59	B
ST 592	Southbound	24.2	44.7	0.54	B
ST 595	Southbound	34.6	57.0	0.61	B
Total Screenline[a]	Northbound	20.4	50.0	0.41	A
Total Screenline[a]	Southbound	28.8	48.8	0.59	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; 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 131	Southbound	>60	F	63%	-	F
	Metro 132	Southbound	35	E	47%	-	F
	Metro 134	Southbound	60	E	80%	-	D
	Metro 152	Southbound	31	E	64%	-	F
	Metro 158	Southbound	31	E	73%	-	F
	Metro 159	Southbound	37	E	29%	-	F
	Metro 162	Southbound	>60	F	57%	-	F
	Metro 175	Southbound	50	E	66%	-	F
	Metro 177	Southbound	16	C	60%	-	F
	Metro 179	Southbound	29	D	59%	-	F
	Metro 190	Southbound	33	E	76%	-	E
	Metro 192	Southbound	32	E	29%	-	F
	Metro 196	Southbound	32	E	87%	-	C
	ST 577	Southbound	16	C	29%	-	F
				Station Average[a]	58%	-	F
Kent-Des Moines Park-and-Ride/Kent-Des Moines I-5 Freeway Stop	Metro 158	Southbound	31	E	50%	-	F
	Metro 159	Southbound	37	E	13%	-	F
	Metro 162	Southbound	>60	F	46%	-	F
	Metro 166	Northbound	31	E	56%	-	F
	Metro 173	Southbound	>60	F	70%	-	F
	Metro 175	Southbound	50	E	41%	-	F
	Metro 192	Southbound	32	E	22%	-	F
	Metro 193	Southbound	30	D	39%	-	F
	Metro 197	Southbound	32	E	16%	-	F
	ST 574	Northbound	30	D	74%	-	F
				Station Average[a]	48%	-	F
Highline College	Metro 121	Southbound	22	D	77%	-	E
	Metro 122	Southbound	47	E	92%	-	B
	Metro 131	Northbound	59	E	99%	-	A
	Metro 132	Northbound	>60	F	97%	-	A
	Metro 166	Southbound	32	E	64%	-	F
	Metro RapidRide A	Northbound	10	B	-	0.29	B
				Station Average[a]	82%	-	D

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
Star Lake Park-and-Ride	Metro 152	Southbound	31	E	24%	-	F
	Metro 173	Southbound	>60	F	58%	-	F
	Metro 177	Southbound	18	C	44%	-	F
	Metro 183	Southbound	33	E	22%	-	F
	Metro 190	Southbound	33	E	31%	-	F
	Metro 193	Southbound	30	D	32%	-	F
	Metro 197	Southbound	32	E	16%	-	F
	ST 574	Northbound	30	D	72%	-	F
				Station Average[a]	45%	-	F
Federal Way Transit Center	Metro 173	Southbound	>60	F	100%	-	A
	Metro 177	Southbound	16	C	37%	-	F
	Metro 178	Southbound					
	Metro 179	Southbound	29	D	46%	-	F
	Metro 181	Westbound	30	D	65%	-	F
	Metro 182	Northbound	35	E	77%	-	E
	Metro 183	Northbound	34	E	91%	-	B
	Metro 193	Southbound	30	D	34%	-	F
	Metro 197	Southbound	32	E	19%	-	F
	ST 574	Northbound	30	D	55%	-	F
	ST 577	Southbound	16	C	45%	-	F
	ST 578	Northbound	36	E	84%	-	D
	Metro RapidRide A	Southbound	10	B	-	0.35	C
				Station Average[a]	66%	-	F

Source: King County Metro Transit, Automatic Passenger Counter Data, 2012.
[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	SR 99	3,000	1,900	23%	19%	59%
	I-5	2,000	1,000	36%	34%	29%
	SR 99 to I-5	2,500	1,400	28%	25%	47%
	I-5 to SR 99	2,500	1,500	26%	23%	52%
S 272nd Star Lake Station	I-5	2,000	1,400	30%	22%	48%
	SR 99 to I-5	2,000	1,400	30%	21%	49%
S 272nd Redondo Station	SR 99	1,500	1,100	56%	19%	25%
	I-5 to SR 99	1,500	1,100	55%	19%	26%
Federal Way Transit Center Station	SR 99	9,000	6,200	26%	<1%	74%
	I-5	9,000	6,500	29%	<1%	71%
	SR 99 to I-5	9,000	6,200	29%	<1%	71%
	I-5 to SR 99	9,000	6,100	26%	<1%	74%

Source: Sound Transit Ridership Model, 2012.
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	1,000	500	6%	90%	4%
Kent/Des Moines Station	SR 99	HC Campus Station SR 99 East Station SR 99 Median Station	3,000	1,900	23%	19%	59%
	I-5	At-Grade Station	2,000	1,000	36%	34%	31%
		SR 99 East Station	2,500	1,500	25%	22%	53%
S 260th Street	SR 99, I-5 to SR 99	S 260th West Station S 260th East Station	1,000	400	3%	97%	<1%
Federal Way Transit Center Station	SR 99, I-5 to SR 99	SR 99 Station	8,500	6,500	26%	4%	70%
	I-5, SR 99 to I-5	I-5 Station	8,500	6,100	32%	1%	67%
		S 320th Park-and-Ride Station	9,000	6,400	36%	<1%	64%

Source: Sound Transit Ridership Model, 2012.
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	SR 99	SR 99 West Station (Baseline) HC Campus Station SR 99 East Station SR 99 Median Station	4,500	3,700	15%	7%	77%
	I-5	I-5 Station (Baseline) At-Grade Station SR 99 East Station	3,000	2,300	22%	10%	67%
	SR 99 to I-5	30th Avenue East Station	4,500	3,700	15%	7%	77%
	I-5 to SR 99	30th Avenue West Station	4,500	3,700	15%	7%	77%

Source: Sound Transit Ridership Model, 2012.
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	SR 99	SR 99 West Station (Baseline) HC Campus Station SR 99 East Station SR 99 Median Station	3,000	2,900	15%	10%	75%
	I-5	I-5 Station (Baseline) At-Grade Station SR 99 East Station	1,500	1,000	36%	27%	37%
	SR 99 to I-5	30th Avenue East Station	3,000	2,900	15%	10%	75%
	I-5 to SR 99	30th Avenue West Station	3,000	2,900	15%	10%	75%
S 272nd Redondo Station	SR 99, I-5 to SR 99	N/A	3,500	1,800	55%	11%	34%
S 272nd Star Lake Station	I-5, SR 99 to I-5	N/A	4,000	2,800	34%	10%	56%

Source: Sound Transit Ridership Model, 2012.
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					
Metro Rapid Ride A	Northbound	27.4	48.0	0.57	B
Metro 180	Northbound	13.0	35.0	0.37	A
ST 574	Northbound	34.6	48.7	0.71	B
ST 578	Northbound	15.7	57.0	0.27	A
ST 594	Northbound	38.2	54.5	0.70	B
Metro Rapid Ride A	Southbound	45.8	48.0	0.95	C
Metro 121	Southbound	2.8	58.0	0.05	A
Metro 122	Southbound	8.8	35.0	0.25	A
Metro 177	Southbound	73.1	50.8	1.44	E
Metro 178	Southbound	73.2	50.8	1.44	E
Metro 179	Southbound	86.2	35.0	2.46	F
Metro 180	Southbound	15.5	35.0	0.44	A
Metro 190	Southbound	21.0	35.0	0.60	B
ST 574	Southbound	69.7	46.2	1.51	E
ST 577	Southbound	77.5	57	1.36	E
ST 590	Southbound	72.4	48.7	1.49	E
ST 592	Southbound	24.5	44.7	0.55	B
ST 595	Southbound	47.2	57.0	0.83	C
Total Screenline[a]	**Northbound**	**26.8**	**48.5**	**0.55**	**B**
Total Screenline[a]	**Southbound**	**51.4**	**46.8**	**1.10**	**D**
Screenline : North of S 272nd Street					
Metro Rapid Ride A	Northbound	13.2	48.0	0.27	A
Metro 180	Northbound	11.6	35.0	0.33	A
Metro 183	Northbound	5.2	48.7	0.11	A
Metro 184[b]	Northbound	1.3	35.0	0.04	A
ST 574	Northbound	35.6	54.5	0.65	B
ST 578	Northbound	15.7	57.0	0.27	A
ST 594	Northbound	38.2	54.5	0.70	B
Metro Rapid Ride A	Southbound	35.7	48	0.74	B
Metro 152	Southbound	10.0	35.0	0.29	A
Metro 177	Southbound	73.1	50.8	1.44	E
Metro 178	Southbound	73.2	50.8	1.44	E

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
Metro 179	Southbound	86.2	35.0	2.46	F
Metro 183	Southbound	12.2	32.5	0.37	A
Metro 184[b]	Southbound	2.8	35.0	0.08	A
Metro 190	Southbound	21.0	35.0	0.60	B
ST 574	Southbound	66.9	46.2	1.45	E
ST 577	Southbound	77.5	57	1.36	E
ST 578	Southbound	77.5	57	1.36	E
ST 590	Southbound	72.4	48.7	1.49	E
ST 592	Southbound	24.5	44.7	0.55	B
ST 594	Southbound	67.2	54.5	1.23	D
ST 595	Southbound	47.2	57	0.83	C
Total Screenline[a]	**Northbound**	**15.8**	**46.9**	**0.34**	**A**
Total Screenline[a]	**Southbound**	**47.6**	**45.2**	**1.05**	**D**
Screenline : South of S 312th Street					
Metro Rapid Ride A	Northbound	13.6	48.0	0.28	A
Metro 183	Northbound	5.3	32.5	0.16	A
Metro 184[b]	Northbound	1.8	35.0	0.05	A
Metro 901	Northbound	14.6	35.0	0.42	A
ST 574	Northbound	36.2	48.7	0.74	B
ST 578	Northbound	15.7	57.0	0.27	A
ST 594	Northbound	38.2	54.5	0.70	B
Metro Rapid Ride A	Southbound	22.4	48.0	0.47	A
Metro 177	Southbound	73.1	50.8	1.44	E
Metro 178	Southbound	73.2	50.8	1.44	E
Metro 179	Southbound	86.2	35.0	2.46	F
Metro 183	Southbound	5.3	32.5	0.16	A
Metro 184[b]	Southbound	2.6	35.0	0.08	A
Metro 901	Southbound	4.7	35.0	0.13	A
ST 574	Southbound	63.0	46.2	1.36	E
ST 577	Southbound	77.5	57.0	1.36	E
ST 578	Southbound	77.5	57.0	1.36	E
ST 590	Southbound	72.4	48.7	1.49	E
ST 592	Southbound	24.5	44.7	0.55	B

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 594	Southbound	67.2	54.5	1.23	D
ST 595	Southbound	47.2	57.0	0.83	C
Total Screenline[a]	**Northbound**	**16.7**	**43.7**	**0.38**	**A**
Total Screenline[a]	**Southbound**	**46.5**	**45.9**	**1.01**	**D**

Source: Sound Transit Ridership Model, 2012.
Note: 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.
[b] New King County Metro Route between Federal Way and Des Moines.
Metro = King County Metro Transit; ST = Sound Transit

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	1.8	48.0	0.04	A
Metro 180	Northbound	12.8	35.0	0.37	A
ST 578	Northbound	1.2	57.0	0.02	A
ST 594	Northbound	26.3	54.5	0.48	A
Metro RapidRide A	Southbound	3.5	48.0	0.07	A
Metro 121	Southbound	1.8	58.0	0.03	A
Metro 122	Southbound	4.3	35.0	0.12	A
Metro 178	Southbound	2.5	50.8	0.05	A
Metro 179	Southbound	4.5	35.0	0.13	A
Metro 180	Southbound	9.7	35.0	0.28	A
Metro 190	Southbound	1.2	35.0	0.03	A
ST 577	Southbound	4.3	57	0.08	A
ST 590	Southbound	71.8	48.7	1.48	E
ST 592	Southbound	24.5	44.7	0.55	B
ST 595	Southbound	47.2	57.0	0.83	C
Total Screenline[a,b]	**Northbound**	**7.6**	**48.4**	**0.16**	**A**
Total Screenline[a,b]	**Southbound**	**20.6**	**47.2**	**0.44**	**A**
LINK	Northbound	77.0	-	0.26	A
	Southbound	277.9	-	0.93	C
Screenline : North of S 272nd Street					
Metro RapidRide A	Northbound	2.4	48.0	0.05	A

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
Metro 180	Northbound	31.6	35.0	0.90	C
Metro 183	Northbound	4.2	48.7	0.09	A
Metro 184[c]	Northbound	0.5	35.0	0.01	A
ST 578	Northbound	1.2	57.0	0.02	A
ST 594	Northbound	26.3	54.5	0.48	A
Metro RapidRide A	Southbound	7.4	48	0.15	A
Metro 152	Southbound	22.3	35.0	0.64	B
Metro 178	Southbound	2.5	50.8	0.05	A
Metro 179	Southbound	4.5	35.0	0.13	A
Metro 183	Southbound	6.9	32.5	0.21	A
Metro 184[c]	Southbound	8.6	35.0	0.25	A
Metro 190	Southbound	1.2	35.0	0.03	A
ST 577	Southbound	4.3	57	0.08	A
ST 578	Southbound	4.3	57	0.08	A
ST 590	Southbound	71.8	48.7	1.48	E
ST 592	Southbound	24.5	44.7	0.55	B
ST 594	Southbound	66.2	54.5	1.21	D
ST 595	Southbound	47.2	57	0.83	C
Total Screenline[a,b]	**Northbound**	**10.7**	**45.8**	**0.23**	**A**
Total Screenline[a,b]	**Southbound**	**23.0**	**45.3**	**0.51**	**A**
LINK	Northbound	49.9	-	0.17	A
	Southbound	243.3	-	0.81	C
Screenline : South of S 312th Street					
Metro RapidRide A	Northbound	6.4	48.0	0.13	A
Metro 183	Northbound	7.3	32.5	0.23	A
Metro 184[c]	Northbound	3.5	35.0	0.10	A
Metro 901	Northbound	22.7	35.0	0.65	B
ST 578	Northbound	1.2	57.0	0.02	A
ST 594	Northbound	26.3	54.5	0.48	A
Metro RapidRide A	Southbound	7.2	48.0	0.15	A
Metro 178	Southbound	2.5	50.8	0.05	A
Metro 179	Southbound	4.5	35.0	0.13	A
Metro 183	Southbound	2.1	32.5	0.06	A

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
Metro 184[c]	Southbound	5.0	35.0	0.14	A
Metro 901	Southbound	8.6	35.0	0.24	A
ST 577	Southbound	4.3	57.0	0.08	A
ST 578	Southbound	4.3	.57.0	0.08	A
ST 590	Southbound	71.8	48.7	1.48	E
ST 592	Southbound	24.5	44.7	0.55	B
ST 594	Southbound	66.2	54.5	1.21	D
ST 595	Southbound	47.2	57.0	0.83	C
Total Screenline[a,b]	**Northbound**	**10.4**	**42.9**	**0.24**	**A**
Total Screenline[a,b]	**Southbound**	**22.4**	**46.1**	**0.48**	**A**
LINK	Northbound	43.7	-	0.15	A
	Southbound	206.6	-	0.69	B

Source: King County Metro Transit, Automatic Passenger Counter Data, 2012.
Note: 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.
[b] The total screenline is average for buses only. Link performance is reported separately.
[c] New King County Metro Transit route between Federal Way and Des Moines.
Metro = King County Metro Transit; ST = Sound Transit

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	5.2	48.0	0.11	A
Metro 180	Northbound	12.3	35.0	0.35	A
ST 578	Northbound	1.3	57.0	0.02	A
ST 594	Northbound	26.2	54.5	0.48	A
Metro RapidRide A	Southbound	11.1	48.0	0.23	A
Metro 121	Southbound	2.0	58.0	0.03	A
Metro 122	Southbound	3.5	35.0	0.10	A
Metro 178	Southbound	2.7	50.8	0.05	A
Metro 179	Southbound	6.0	35.0	0.17	A
Metro 180	Southbound	9.8	35.0	0.28	A
Metro 190	Southbound	1.8	35.0	0.05	A
ST 577	Southbound	5.8	57	0.10	A
ST 590	Southbound	71.8	48.7	1.48	E
ST 592	Southbound	24.5	44.7	0.55	B
ST 595	Southbound	47.2	57.0	0.83	C
Total Screenline[a,b]	**Northbound**	**9.2**	**48.4**	**0.19**	**A**
Total Screenline[a,b]	**Southbound**	**22.4**	**47.2**	**0.47**	**A**
LINK	Northbound	74.8	-	0.25	A
	Southbound	267.9	-	0.89	C
Screenline : North of S 272nd Street					
Metro RapidRide A	Northbound	4.2	48.0	0.09	A
Metro 180	Northbound	0.7	35.0	0.02	A
Metro 183	Northbound	4.2	48.7	0.09	A
Metro 184[c]	Northbound	0.5	35.0	0.01	A
ST 578	Northbound	1.3	57.0	0.02	A
ST 594	Northbound	26.2	54.5	0.48	A
Metro RapidRide A	Southbound	8.7	48	0.18	A
Metro 152	Southbound	4.1	35.0	0.12	A
Metro 178	Southbound	2.7	50.8	0.05	A
Metro 179	Southbound	6.0	35.0	0.17	A
Metro 183	Southbound	7.6	32.5	0.23	A
Metro 184[c]	Southbound	6.7	35.0	0.19	A
Metro 190	Southbound	1.8	35.0	0.05	A
ST 577	Southbound	5.8	57	0.10	A
ST 578	Southbound	5.8	57	0.10	A
ST 590	Southbound	71.8	48.7	1.48	E

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
ST 592	Southbound	24.5	44.7	0.55	B
ST 594	Southbound	66.2	54.5	1.21	D
ST 595	Southbound	47.2	57	0.83	C
Total Screenline[a,b]	**Northbound**	**5.0**	**45.8**	**0.11**	**A**
Total Screenline[a,b]	**Southbound**	**21.7**	**45.3**	**0.48**	**A**
LINK	Northbound	64.9	-	0.22	A
	Southbound	249.8	-	0.83	C
Screenline : South of S 312th Street					
Metro RapidRide A	Northbound	12.7	48.0	0.26	A
Metro 183	Northbound	5.0	32.5	0.15	A
Metro 184[c]	Northbound	2.0	35.0	0.06	A
Metro 901	Northbound	23.3	35.0	0.67	B
ST 578	Northbound	1.3	57.0	0.02	A
ST 594	Northbound	26.2	54.5	0.48	A
Metro RapidRide A	Southbound	8.3	48.0	0.17	A
Metro 178	Southbound	2.7	50.8	0.05	A
Metro 179	Southbound	6.0	35.0	0.17	A
Metro 183	Southbound	3.1	32.5	0.09	A
Metro 184[c]	Southbound	5.1	35.0	0.15	A
Metro 901	Southbound	9.0	35.0	0.26	A
ST 577	Southbound	5.8	57.0	0.10	A
ST 578	Southbound	5.8	57.0	0.10	A
ST 590	Southbound	71.8	48.7	1.48	E
ST 592	Southbound	24.5	44.7	0.55	B
ST 594	Southbound	66.2	54.5	1.21	D
ST 595	Southbound	47.2	57.0	0.83	C
Total Screenline[a,b]	**Northbound**	**11.8**	**42.9**	**0.28**	**A**
Total Screenline[a,b]	**Southbound**	**23.0**	**46.1**	**0.50**	**A**
LINK	Northbound	42.7	-	0.14	A
	Southbound	217.2	-	0.72	B

Source: King County Metro Transit, Automatic Passenger Counter Data, 2012.
Note: 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.
[b] The total screenline is average for buses only. Link performance is reported separately.
[c] New Metro route between Federal Way and Des Moines.
Metro = King County Metro Transit; ST = Sound Transit

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Appendix D

Existing and Future Intersection Level of Service Results

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Existing Conditions

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TABLE D-1
Existing AM Peak-Hour and PM Peak-Hour Intersection Level of Service

Intersection ID	Control Type		AM Peak-Hour			PM Peak-Hour		
		LOS Standard[a]	LOS	Delay	V/C	LOS	Delay	V/C
Kent/Des Moines Station Area								
International Blvd & S 200th St	Signalized	E	--	--	--	D	48	0.81
International Blvd & S 202nd St	OWSC	E	--	--	--	A	10	0.01
International Blvd & S 204th St	Signalized	E	--	--	--	B	13	0.47
International Blvd & S 208th St	Signalized	E	--	--	--	B	14	0.56
International Blvd & S 211th St	OWSC	E	--	--	--	B	11	0.02
Military Rd S & S 216th St	Signalized	E	--	--	--	C	34	0.76
International Blvd & S 212th St	Signalized	E	--	--	--	B	13	0.40
24th Ave S & S 216th St	Signalized	E	--	--	--	B	12	0.62
SR 99/International Blvd & S 216th St	Signalized	D	--	--	--	D	44	0.78
S 220th St & SR 99	Signalized	D	--	--	--	A	9	0.61
SR 99 & S 224th St	Signalized	D	--	--	--	B	14	0.56
SR 99 & S 226th St	OWSC	D	--	--	--	B	12	0.12
SR 99 & Ped X-ing	Signalized	D	--	--	--	A	5	0.40
25th Ave S/24th Ave S & Kent-Des Moines Rd	Signalized	D	--	--	--	A	9	0.67
SR 99 & Kent-Des Moines Rd	Signalized	D	**E**	**72.6**	**1.20**	**E**	**67**	**1.50**
30th Ave S & Kent-Des Moines Rd	TWSC	D	--	--	--	B	13	0.58
16th Ave S & S 240th St	Signalized	D	--	--	--	A	9	0.53
28th Ave S/Highline College Driveway & S 240th St	TWSC	D	--	--	--	C	17	0.26
S 240th St & Highline College Drop-Off Loop		D	--	--	--	A	8	0.01
Military Rd S & Kent-Des Moines Rd P&R	OWSC	E	--	--	--	C	24	0.26
I-5 SB Ramps & Kent-Des Moines Rd	Signalized	D	C	21.3	0.62	E	60	0.92
I-5 NB Ramps & Kent-Des Moines Rd	TWSC	D	B	14.5	0.35	B	12	0.36
I-5 NB Ramps & Kent Des Moines Rd & I-5 NB On Bus	Signalized	D	B	12.6	0.62	B	12	0.70
Military Rd S & Kent-Des Moines Rd	Signalized	E	--	--	--	E	56	0.86
SR 99 & S 236th Lane	OWSC/Signalized[b]	D	A	8.6	0.05	C	19	0.08
SR 99 & S 240th St	Signalized	D	C	32.7	0.68	D	43	0.78
S 240th St & 30th Ave S	OWSC	E	A	8.9	0.07	A	9	0.09
Military Rd S & S 240th St	OWSC	E	--	--	--	C	22	0.11
SR 99 & S 244th St	TWSC	D	--	--	--	B	10	0.01
SR 99 & S 248th St	TWSC	D	--	--	--	C	15	0.03
SR 99 & S 252nd St	Signalized	D	--	--	--	B	15	0.58
SR 99 & Fred Meyer	Signalized	D	--	--	--	C	24	0.67

TABLE D-1
Existing AM Peak-Hour and PM Peak-Hour Intersection Level of Service

Intersection ID	Control Type		AM Peak-Hour			PM Peak-Hour		
		LOS Standard[a]	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 & S 260th St	Signalized	D	--	--	--	D	39	0.70
Military Rd S & 259th Pl/S Reith Rd	Signalized	E	--	--	--	E	56	0.89
16th AVE S & S 260th St	Signalized	D	--	--	--	C	20	0.74
S 272nd Station Area								
16th Ave S & S 272nd St	Signalized	D	--	--	--	D	44	0.93
SR 99 & S 264th St	OWSC	D	--	--	--	B	13	0.02
SR 99 & S 268th St	OWSC	D	--	--	--	C	17	0.14
SR 99 & S 272nd St	Signalized	D	C	32.4	0.67	D	38	0.77
S Star Lake Rd & S 272nd St	Signalized	E	--	--	--	B	16	0.74
26th Ave S & Star Lake P&R North Driveway	OWSC	E	--	--	--	A	9	0.03
26th Ave S & Star Lake P&R South Driveway	OWSC	E	--	--	--	A	10	0.14
S 272nd St & 26th Ave S	Signalized	E	A	5.9	0.35	A	8	0.50
I-5 SB Ramps & S 272nd St	Signalized	D	C	24.1	0.53	D	37	0.80
I-5 N**B** Ramps & S 272nd St	Signalized	D	C	34.2	0.71	C	31	0.67
Military Rd S & S 272nd St	Signalized	E	--	--	--	D	46	0.76
SR 99 & S 276th St	Signalized	D	B	10.4	0.50	A	7	0.53
SR 99 & Crestview Dwy	OWSC	D	--	--	--	B	12	0.08
SR 99 & 16th Ave S	OWSC	D	--	--	--	C	17	0.36
SR 99 & S 283rd Pl	OWSC	D	--	--	--	B	12	0.15
SR 99 & S 288th St	Signalized	D	--	--	--	D	37	0.63
SR 99 & 29300 block U-turn	TWSC	D	--	--	--	A	0	0.00
SR 99 & Dash Point Rd	Signalized	D	--	--	--	B	18	0.64
Federal Way Transit Center Station Area								
SR 99 & 18th Ave S	OWSC	D	--	--	--	B	11	0.06
SR 99 & S 304th St	Signalized	D	--	--	--	C	24	0.53
SR 99 & S 308th St	Signalized	D	--	--	--	B	16	0.51
SR 99 & S 312th St	Signalized	D	--	--	--	D	48	0.68
20th Ave S & S 312th St	Signalized	E	--	--	--	B	13	0.32
23rd Ave S & S 312th St	Signalized	E	--	--	--	B	20	0.43
SR 99 & Pavilions Centre Dwy	TWSC	D	--	--	--	B	11	0.09
SR 99 & S 316th St	Signalized	D	B	13.1	0.30	C	35	0.69
20th Ave S & S 316th St	Signalized	E	--	--	--	B	20	0.36
21st Ave S & S 316th St	OWSC	E	A	9.6	0.05	B	11	0.23
23rd Ave S & S 316th St	Signalized	E	--	--	--	B	15	0.24

TABLE D-1
Existing AM Peak-Hour and PM Peak-Hour Intersection Level of Service

Intersection ID	Control Type		AM Peak-Hour			PM Peak-Hour		
		LOS Standard[a]	LOS	Delay	V/C	LOS	Delay	V/C
23rd Ave S & S 317th St	Signalized	E	A	9.4	0.34	B	14	0.51
S 317th St & 28th Ave S	Roundabout	E	A	7.4	0.31	A	8	0.42
SR 99 & S 318th Pl	TWSC	D	--	--	--	B	11	0.09
SR 99 & S 320th St	Signalized	D	D	42.6	0.59	D	39	0.68
20th Ave S & S 320th St	Signalized	E	--	--	--	C	22	0.69
21st Ave S & S 320th St	TWSC	E	--	--	--	B	12	0.11
23rd Ave S & S 320th St	Signalized	E	C	30.2	0.51	D	41	0.74
25th Ave S & S 320th St	Signalized	E	B	13.2	0.48	B	11	0.60
I-5 Southbound Ramps and S 320th St	Signalized	D	B	13.5	0.76	C	31	0.87
I-5 Northbound and S 320th St	Signalized	D	B	16.5	0.59	C	25	0.67
23rd Ave S & S 322nd St	Signalized	E	A	4.2	0.12	A	9	0.25
SR 99 & S 324th St	Signalized	D	--	--	--	C	33	0.62
P&R & 23rd Ave S/S324th St	OWSC	E	A	9.9	0.02	B	12	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 volume to capacity (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.
HSS = Highway of Statewide Significance; LOS = level of service; NB = northbound; OWSC = one-way stop control; SB = southbound; TWSC = two-way stop control; -- = not analyzed

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Future 2035 Intersection LOS Results

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TABLE D-2

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

Intersection	LOS Standard[a]	Alternative/Station Options														
		No Build			SR 99			Highline College			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 & S 200th St	E	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.4)	-- (0.83)
SR 99 & S 202nd St	E	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)
SR 99 & S 204th St	E	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)
SR 99 & S 208th St	E	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (15.3)	-- (0.51)
SR 99 & S 211th St	E	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)
Military Rd S & S 216th St	E	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (51.1)	-- (0.93)
SR 99 & S 212th St	E	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.9)	-- (0.4)
24th Ave S & S 216th St	E	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.3)	-- (0.88)
SR 99 & S 216th St	D	-- (E)	-- (57.1)	-- (1.07)	-- (E)	-- (57)	-- (1.07)	-- (E)	-- (57)	-- (1.07)	-- (E)	-- (57)	-- (1.07)	-- (E)	-- (58.1)	-- (1.09)
S 220th St & SR 99	D	-- (B)	-- (13.5)	-- (0.76)	-- (B)	-- (13.5)	-- (0.78)	-- (B)	-- (13.5)	-- (0.78)	-- (B)	-- (13.5)	-- (0.78)	-- (B)	-- (13.6)	-- (0.78)
SR 99 & S 224th St	D	-- (B)	-- (15.6)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)
SR 99 & S 226th St	D	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)
SR 99 & Pedestrian crossing	D	-- (A)	-- (5.4)	-- (0.48)	-- (A)	-- (2.7)	-- (0.48)	-- (A)	-- (2.7)	-- (0.48)	-- (A)	-- (2.7)	-- (0.48)	-- (A)	-- (2.7)	-- (0.48)
25th Ave S/24th Ave S & Kent-Des Moines Rd	D	-- (B)	-- (15.5)	-- (0.76)	-- (B)	-- (16.2)	-- (0.79)	-- (B)	-- (16.2)	-- (0.79)	-- (B)	-- (16.2)	-- (0.79)	-- (B)	-- (16.2)	-- (0.79)
SR 99 & S Kent-Des Moines Rd	D	F (F)	119.6 (83)	1.24 (1.36)	F (F)	128.6 (93.7)	1.24 (1.54)	F (F)	130.3 (91.5)	1.26 (1.63)	F (F)	130.7 (92.3)	1.26 (1.56)	F (F)	125.7 (92.8)	1.24 (1.52)
30th Ave S & Kent-Des Moines Rd	D	-- (B)	-- (14.3)	-- (0.22)	-- (B)	-- (14)	-- (0.21)	-- (B)	-- (14)	-- (0.21)	-- (B)	-- (14)	-- (0.21)	-- (B)	-- (14)	-- (0.21)
16th Ave S & S 240th St	D	-- (B)	-- (11.8)	-- (0.64)	-- (B)	-- (11.9)	-- (0.65)	-- (B)	-- (11.9)	-- (0.65)	-- (B)	-- (11.9)	-- (0.65)	-- (B)	-- (11.9)	-- (0.64)
28th Ave S/Highline College Driveway & S 240th St	D	-- (C)	-- (17)	-- (0.29)	-- (B)	-- (14.8)	-- (0.1)	-- (B)	-- (14.8)	-- (0.1)	-- (B)	-- (14.8)	-- (0.1)	-- (B)	-- (14.8)	-- (0.1)
S 240th St & Highline College Drop-Off Loop	D	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)
Military Rd S & KDM P&R	E	-- (D)	-- (26.8)	-- (0.29)	-- (D)	-- (27.5)	-- (0.3)	-- (D)	-- (27.5)	-- (0.3)	-- (D)	-- (27.5)	-- (0.3)	-- (D)	-- (27.4)	-- (0.3)
I-5 Southbound	D	C (E)	23.7 (69.8)	0.67 (1.01)	C (E)	24.2 (78.9)	0.7 (1.06)	C (E)	24.1 (78.9)	0.7 (1.06)	C (E)	24.2 (78.9)	0.7 (1.06)	C (E)	24.2 (78.4)	0.7 (1.06)

TABLE D-2

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

Intersection	LOS Standard[a]	Alternative/Station Options														
		No Build			SR 99			Highline College			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
Ramps & Kent-Des Moines Rd																
I-5 Northbound Ramps & Kent-Des Moines Rd	D	C (B)	24.6 (12.9)	0.67 (0.45)	D (B)	30 (13.4)	0.73 (0.47)	D (B)	30 (13.4)	0.73 (0.47)	D (B)	30 (13.4)	0.73 (0.47)	D (B)	30 (13.3)	0.73 (0.47)
I-5 Northbound Ramps & Kent-Des Moines Rd & I-5 Northbound On Bus	D	B (B)	15.9 (13.9)	0.77 (0.73)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)
Military Rd S & Ken- Des Moines Rd	E	-- (E)	-- (56.5)	-- (0.95)	-- (E)	-- (61.3)	-- (0.99)	-- (E)	-- (61.3)	-- (0.99)	-- (E)	-- (61.3)	-- (0.99)	-- (E)	-- (60.9)	-- (0.99)
SR 99 & S 236th Lane	D	A (C)	8.9 (23)	0.06 (0.16)	B (D)	12.5 (35.4)	0.6 (0.78)	B (C)	12.4 (31.2)	0.62 (0.72)	B (C)	11.2 (26.3)	0.59 (0.7)	B (C)	19.6 (34.5)	0.66 (0.77)
SR 99 & S 240th St[b]	D	D (D)	40.7 (42)	0.8 (0.86)	D (C)	45.9 (32.6)	0.79 (0.9)	D (C)	45.9 (33.6)	0.8 (0.9)	D (D)	48.6 (43)	0.79 (0.85)	D (D)	46.1 (31.9)	0.8 (0.89)
S 240th St & 30th Ave S	E	A (A)	9.4 (9.6)	0.08 (0.14)	A (A)	9.5 (9.6)	0.08 (0.14)	A (A)	9.5 (9.7)	0.09 (0.16)	A (A)	9.5 (9.7)	0.09 (0.16)	A (A)	9.5 (9.6)	0.1 (0.14)
Military Rd S & S 240th St	E	-- (C)	-- (18.7)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)
SR 99 & S 244th St	D	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (11)	-- (0.07)	-- (B)	-- (10.9)	-- (0.03)
SR 99 & S 248th St	D	-- (C)	-- (18.8)	-- (0.11)	-- (C)	-- (19.7)	-- (0.11)	-- (C)	-- (19.7)	-- (0.11)	-- (C)	-- (19.7)	-- (0.11)	-- (C)	-- (19.7)	-- (0.11)
SR 99 & S 252nd St	D	-- (B)	-- (15.8)	-- (0.69)	-- (B)	-- (18.1)	-- (0.71)	-- (B)	-- (18.2)	-- (0.71)	-- (B)	-- (18.6)	-- (0.71)	-- (B)	-- (18.3)	-- (0.71)
SR 99 & Fred Meyer	D	-- (C)	-- (24.3)	-- (0.7)	-- (C)	-- (20.1)	-- (0.76)	-- (C)	-- (20.1)	-- (0.76)	-- (B)	-- (19.9)	-- (0.76)	-- (B)	-- (20.4)	-- (0.76)
SR 99 & S 260th St	D	-- (D)	-- (38.3)	-- (0.82)	-- (D)	-- (40.1)	-- (0.83)	-- (D)	-- (40.1)	-- (0.83)	-- (D)	-- (39.8)	-- (0.83)	-- (D)	-- (46.5)	-- (0.84)
Military Rd S & 259th Pl/S Reith Rd	E	-- (C)	-- (34.9)	-- (0.68)	-- (D)	-- (36)	-- (0.7)	-- (D)	-- (36)	-- (0.7)	-- (D)	-- (36)	-- (0.7)	-- (D)	-- (37.9)	-- (0.7)
16th Ave S & S 260th St	D	-- (C)	-- (22.2)	-- (0.82)	-- (C)	-- (23)	-- (0.83)	-- (C)	-- (23)	-- (0.83)	-- (C)	-- (23)	-- (0.83)	-- (C)	-- (22.9)	-- (0.83)

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 volume to capacity (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.

OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; -- = not analyzed

TABLE D-3
No Build and SR 99 Alternative Intersection Level of Service: S 272nd Station Area Options

Intersection	LOS Standard[a, b]	Alternative					
		No Build			Redondo Heights		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave S and S 272nd St	D	-- (D)	-- (47)	-- (0.94)	-- (D)	-- (45.8)	-- (0.91)
SR 99 and S 264th St	D	-- (C)	-- (15.1)	-- (0.04)	-- (C)	-- (18.5)	-- (0.02)
SR 99 and S 268th St	D	-- (C)	-- (22.4)	-- (0.22)	-- (C)	-- (24.3)	-- (0.3)
SR 99 and S 272nd St	D	D (D)	44.1 (44.8)	0.89 (0.9)	D (D)	47.1 (42.1)	0.93 (0.91)
S Star Lake Rd and S 272nd St	E	-- (C)	-- (22.9)	-- (0.87)	-- (C)	-- (31.9)	-- (0.94)
26th Ave S and Star Lake P&R North Driveway	E	-- (A)	-- (8.9)	-- (0.04)	-- (A)	-- (8.9)	-- (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 (A)	6.1 (9.2)	0.36 (0.51)	A (A)	6 (9)	0.4 (0.53)
I-5 Southbound Ramps and S 272nd St	D	C (D)	27.8 (42.5)	0.53 (0.93)	C (D)	28.1 (50.6)	0.54 (0.99)
I-5 Northbound Ramps and S 272nd St	D	E (D)	65.1 (38.6)	0.94 (0.75)	E (D)	74.8 (49.4)	0.99 (0.77)
Military Rd S and S 272nd St	E	-- (D)	-- (35)	-- (0.65)	-- (D)	-- (36.1)	-- (0.69)
SR 99 and S 276th St	D	B (B)	12.2 (18)	0.58 (0.63)	C (C)	30.8 (20.3)	0.9 (0.82)
SR 99 and Crestview Dwy	D	-- (B)	-- (14.5)	-- (0.13)	-- (C)	-- (15.3)	-- (0.16)
SR 99 and 16th Ave S	D	-- (C)	-- (19.2)	-- (0.56)	-- (D)	-- (29.2)	-- (0.7)
SR 99 and S 283rd Pl	D	-- (C)	-- (15.7)	-- (0.26)	-- (C)	-- (17)	-- (0.31)
SR 99 and S 288th St	D	-- (D)	-- (46.5)	-- (0.72)	-- (D)	-- (47.4)	-- (0.75)
SR 99 and 29300 Block U-turn	D	-- (A)	-- (0)	-- (0)	-- (A)	-- (0)	-- (0)
SR 99 and Dash Point Rd	D	-- (C)	-- (21.4)	-- (0.7)	-- (C)	-- (23.1)	-- (0.77)

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.
HSS = Highway of Statewide Significance; LOS = level of service; -- = not analyzed

TABLE D-4

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

Intersection	LOS Standard[a, b]	Alternative/Station Options								
		No Build			FWTC			FWTC SR 99		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and 18th Ave S	D	-- (B)	-- (12.4)	-- (0.09)	-- (B)	-- (12.4)	-- (0.09)	-- (B)	-- (12.4)	-- (0.09)
SR 99 and S 304th St	D	-- (C)	-- (28.3)	-- (0.65)	-- (C)	-- (28.4)	-- (0.65)	-- (C)	-- (28.4)	-- (0.65)
SR 99 and S 308th St	D	-- (C)	-- (21.5)	-- (0.71)	-- (C)	-- (21.6)	-- (0.72)	-- (C)	-- (21.6)	-- (0.72)
SR 99 and S 312th St	D	-- (D)	-- (39.7)	-- (0.75)	-- (D)	-- (40.3)	-- (0.75)	-- (D)	-- (40)	-- (0.75)
20th Ave S and S 312th St	E	-- (B)	-- (15.4)	-- (0.36)	-- (B)	-- (8.7)	-- (0.38)	-- (B)	-- (11)	-- (0.36)
23rd Ave S and S 312th St	E	-- (B)	-- (19.7)	-- (0.51)	-- (B)	-- (13.2)	-- (0.5)	-- (B)	-- (14.7)	-- (0.5)
SR 99 and Pavilions Centre Dwy	D	-- (B)	-- (11.6)	-- (0.11)	-- (B)	-- (11.5)	-- (0.11)	-- (B)	-- (11.6)	-- (0.11)
SR 99 and S 316th St	D	B (C)	16.5 (34.5)	0.36 (0.8)	B (C)	16.7 (32.8)	0.36 (0.79)	C (D)	23.6 (35.4)	0.47 (0.84)
20th Ave S and S 316th St	E	-- (B)	-- (19)	-- (0.38)	-- (B)	-- (22.8)	-- (0.39)	-- (B)	-- (19.9)	-- (0.43)
21st Ave S and S 316th St	E	B (B)	10.1 (12)	0.06 (0.26)	B (B)	10.3 (12.3)	0.08 (0.28)	B (B)	10.2 (12.1)	0.06 (0.25)
23rd Ave S and S 316th St	E	-- (B)	-- (17.6)	-- (0.32)	-- (B)	-- (15.6)	-- (0.32)	-- (B)	-- (13.6)	-- (0.32)
23rd Ave S and S 317th St	E	A (B)	8.8 (15.3)	0.34 (0.59)	A (B)	9.2 (16.1)	0.35 (0.59)	A (B)	8.7 (16)	0.34 (0.57)
S 317th St and 28th Ave S	E	A (A)	6.5 (9.3)	0.329 (0.49)	A (A)	6.6 (9.1)	0.331 (0.48)	A (A)	6.6 (9.1)	0.33 (0.48)
SR 99 and S 318th Pl	D	-- (B)	-- (11.3)	-- (0.11)	-- (B)	-- (11)	-- (0.1)	-- (B)	-- (11.6)	-- (0.11)
SR 99 and S 320th St	D	D (D)	42.9 (47.6)	0.66 (0.83)	D (D)	44.5 (48.9)	0.72 (0.87)	D (D)	42.9 (46.7)	0.7 (0.86)
20th Ave S and S 320th St	E	-- (C)	-- (23.1)	-- (0.7)	-- (C)	-- (24.5)	-- (0.74)	-- (C)	-- (30.2)	-- (0.8)
21st Ave S and S 320th St	E	-- (B)	-- (11.6)	-- (0.18)	-- (B)	-- (15.5)	-- (0.53)	-- (B)	-- (12.3)	-- (0.19)
23rd Ave S and S 320th St	E	C (D)	26.2 (36)	0.54 (0.84)	C (D)	27.5 (41.1)	0.58 (0.9)	C (D)	25.4 (36.7)	0.55 (0.86)
25th Ave S and S 320th St	E	A (B)	8.9 (13.1)	0.47 (0.69)	A (B)	9 (14.2)	0.49 (0.71)	A (B)	8.9 (13.9)	0.49 (0.71)

TABLE D-4

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

Intersection	LOS Standard[a, b]	Alternative/Station Options								
		No Build			FWTC			FWTC SR 99		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
I-5 Southbound Ramps and S 320th St	D	-- (C)	-- (25.2)	-- (0.79)	B (C)	14.5 (25.2)	0.66 (0.8)	B (C)	13.7 (25.1)	0.66 (0.8)
I-5 Northbound and S 320th St	D	B (C)	15.9 (20.9)	0.52 (0.64)	B (C)	17.4 (21.2)	0.55 (0.66)	B (C)	17.5 (21.1)	0.55 (0.66)
23rd Ave S and S 322nd St	E	A (A)	4.6 (9.3)	0.12 (0.25)	A (A)	4.4 (9.3)	0.12 (0.25)	A (A)	4.4 (9.3)	0.12 (0.25)
SR 99 and S 324th St	D	-- (C)	-- (29.8)	-- (0.77)	-- (C)	-- (30.2)	-- (0.8)	-- (C)	-- (30.5)	-- (0.8)
P&R and 23rd Ave S/S324th St	E	A (B)	9.8 (12.6)	0.03 (0.09)	A (B)	9.8 (12.6)	0.03 (0.09)	A (B)	9.8 (12.6)	0.03 (0.09)

Note:
AM Peak Hour (PM Peak Hour)
[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; -- = not analyzed

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TABLE D-5
No Build and SR 99 Alternative Intersection Level of Service: Kent/Des Moines Station Design Area

Intersection	LOS Standard[a, b]	Alternative/Station Options																	
		No Build			SR 99			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 & S 200th St	E	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.4)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.4)	-- (0.83)
SR 99 & S 202nd St	E	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)
SR 99 & S 204th St	E	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)
SR 99 & S 208th St	E	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (15.1)	-- (0.51)	-- (B)	-- (15.3)	-- (0.51)	-- (B)	-- (15.1)	-- (0.51)	-- (B)	-- (15.3)	-- (0.51)
SR 99 & S 211th St	E	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)
Military Rd S & S 216th St	E	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (51.1)	-- (0.93)	-- (D)	-- (51.1)	-- (0.93)	-- (D)	-- (51.1)	-- (0.93)	-- (D)	-- (51.1)	-- (0.93)
SR 99 & S 212th St	E	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.9)	-- (0.4)	-- (A)	-- (4.9)	-- (0.4)	-- (A)	-- (4.9)	-- (0.4)	-- (A)	-- (4.9)	-- (0.4)
24th Ave S & S 216th St	E	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.3)	-- (0.88)	-- (C)	-- (31.3)	-- (0.88)	-- (C)	-- (31.3)	-- (0.88)	-- (C)	-- (31.3)	-- (0.88)
SR 99 & S 216th St	D	-- (E)	-- (57.1)	-- (1.07)	-- (E)	-- (57)	-- (1.07)	-- (E)	-- (57.3)	-- (1.08)	-- (E)	-- (58.1)	-- (1.09)	-- (E)	-- (57.3)	-- (1.08)	-- (E)	-- (58.1)	-- (1.09)
S 220th St & SR 99	D	-- (B)	-- (13.5)	-- (0.76)	-- (B)	-- (13.5)	-- (0.78)	-- (B)	-- (13.6)	-- (0.78)	-- (B)	-- (13.6)	-- (0.78)	-- (B)	-- (13.6)	-- (0.78)	-- (B)	-- (13.6)	-- (0.78)
SR 99 & S 224th St	D	-- (B)	-- (15.6)	-- (0.67)	-- (B)	-- (18.5)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)	-- (B)	-- (18.4)	-- (0.67)
SR 99 & S 226th St	D	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)
SR 99 & Pedestrian crossing	D	-- (A)	-- (5.4)	-- (0.48)	-- (A)	-- (2.7)	-- (0.48)	-- (A)	-- (2.7)	-- (0.48)	-- (A)	-- (2.7)	-- (0.48)	-- (A)	-- (2.7)	-- (0.48)	-- (A)	-- (2.7)	-- (0.48)
25th Ave S/24th Ave S & Kent-Des Moines Rd	D	-- (B)	-- (15.5)	-- (0.76)	-- (B)	-- (16.2)	-- (0.79)	-- (B)	-- (16.2)	-- (0.79)	-- (B)	-- (16.2)	-- (0.79)	-- (B)	-- (16.2)	-- (0.79)	-- (B)	-- (16.2)	-- (0.79)
SR 99 & S Kent Des Moines Rd	D	F (F)	119.6 (83)	1.24 (1.36)	F (F)	128.6 (93.7)	1.24 (1.54)	F (F)	127.8 (92.8)	1.24 (1.52)	F (F)	127.8 (92.8)	1.26 (1.52)	F (F)	127.8 (92.8)	1.24 (1.52)	F (F)	127.8 (92.8)	1.26 (1.52)
30th Ave S & Kent-Des Moines Rd	D	-- (B)	-- (14.3)	-- (0.22)	-- (B)	-- (14)	-- (0.21)	-- (B)	-- (14)	-- (0.21)	-- (B)	-- (14)	-- (0.21)	-- (B)	-- (14)	-- (0.21)	-- (B)	-- (14)	-- (0.21)
16th Ave S & S 240th St	D	-- (B)	-- (11.8)	-- (0.64)	-- (B)	-- (11.9)	-- (0.65)	-- (B)	-- (11.9)	-- (0.64)	-- (B)	-- (11.9)	-- (0.64)	-- (B)	-- (11.9)	-- (0.64)	-- (B)	-- (11.9)	-- (0.64)
28th Ave S/Highline College Driveway & S 240th St	D	-- (C)	-- (17)	-- (0.29)	-- (B)	-- (14.8)	-- (0.1)	-- (B)	-- (14.8)	-- (0.1)	-- (B)	-- (14.8)	-- (0.1)	-- (B)	-- (14.8)	-- (0.1)	-- (B)	-- (14.8)	-- (0.1)
S 240th St & Highline College Drop-Off Loop	D	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)
Military Rd S & Kent-Des Moines Rd P&R	E	-- (D)	-- (26.8)	-- (0.29)	-- (D)	-- (27.5)	-- (0.3)	-- (D)	-- (27.4)	-- (0.3)	-- (D)	-- (27.4)	-- (0.3)	-- (D)	-- (27.4)	-- (0.3)	-- (D)	-- (27.4)	-- (0.3)
I-5 Southbound Ramps & Kent-Des Moines Rd	D	C (E)	23.7 (69.8)	0.67 (1.01)	C (E)	24.2 (78.9)	0.7 (1.06)	C (E)	24 (78.4)	0.69 (1.06)	C (E)	24 (78.4)	0.69 (1.06)	C (E)	24 (78.4)	0.69 (1.06)	C (E)	24 (78.4)	0.69 (1.06)
I-5 Northbound Ramps & Kent-Des Moines Rd	D	C (B)	24.6 (12.9)	0.67 (0.45)	D (B)	30 (13.4)	0.73 (0.47)	D (B)	29.6 (13.3)	0.73 (0.47)	D (B)	29.6 (13.3)	0.73 (0.47)	D (B)	29.6 (13.3)	0.73 (0.47)	D (B)	29.6 (13.3)	0.73 (0.47)
I-5 Northbound Ramps & Kent-Des Moines Rd & I-5 Northbound On Bus	D	B (B)	15.9 (13.9)	0.77 (0.73)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)
Military Rd S & Kent-Des Moines Rd	E	-- (E)	-- (56.5)	-- (0.95)	-- (E)	-- (61.3)	-- (0.99)	-- (E)	-- (60.9)	-- (0.99)	-- (E)	-- (60.9)	-- (0.99)	-- (E)	-- (60.9)	-- (0.99)	-- (E)	-- (60.9)	-- (0.99)
SR 99 & Highline College	D	A (C)	8.9 (23)	0.06 (0.16)	B (D)	12.5 (35.4)	0.6 (0.78)	B (C)	12.2 (34.6)	0.59 (0.77)	B (C)	12.2 (34.5)	0.59 (0.77)	B (C)	12.2 (34.6)	0.59 (0.77)	B (C)	12.2 (34.5)	0.59 (0.77)
SR 99 & S 240th St	D	D (D)	40.7 (42)	0.8 (0.86)	D (C)	45.9 (32.6)	0.79 (0.9)	D (C)	45.9 (31.8)	0.79 (0.89)	D (C)	45.9 (31.9)	0.79 (0.89)	D (C)	45.9 (31.8)	0.79 (0.89)	D (C)	45.9 (31.9)	0.79 (0.89)
S 240th St & 30th Ave S	E	A (A)	9.4 (9.6)	0.08 (0.14)	A (A)	9.5 (9.6)	0.08 (0.14)	A (A)	9.5 (9.6)	0.08 (0.14)	A (A)	9.5 (9.6)	0.08 (0.14)	A (A)	9.5 (9.6)	0.08 (0.14)	A (A)	9.5 (9.6)	0.08 (0.14)
Military Rd S & S 240th St	E	-- (C)	-- (18.7)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)
SR 99 & S 244th St	D	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (10.9)	-- (0.03)

TABLE D-5
No Build and SR 99 Alternative Intersection Level of Service: Kent/Des Moines Station Design Area

Intersection	LOS Standard[a, b]	Alternative/Station Options																	
		No Build			SR 99			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 & S 248th St	D	-- (C)	-- (18.8)	-- (0.11)	-- (C)	-- (19.7)	-- (0.11)	-- (C)	-- (19.7)	-- (0.11)	-- (C)	-- (19.7)	-- (0.11)	-- (C)	-- (19.7)	-- (0.11)	-- (C)	-- (19.7)	-- (0.11)
SR 99 & S 252nd St	D	-- (B)	-- (15.8)	-- (0.69)	-- (B)	-- (18.1)	-- (0.71)	-- (B)	-- (18.3)	-- (0.71)	-- (B)	-- (18.3)	-- (0.71)	-- (B)	-- (18.3)	-- (0.71)	-- (B)	-- (18.3)	-- (0.71)
SR 99 & Fred Meyer	D	-- (C)	-- (24.3)	-- (0.7)	-- (C)	-- (20.1)	-- (0.76)	-- (C)	-- (20.3)	-- (0.76)	-- (C)	-- (20.4)	-- (0.76)	-- (C)	-- (20.3)	-- (0.76)	-- (C)	-- (20.4)	-- (0.76)
SR 99 & S 260th St	D	-- (D)	-- (38.3)	-- (0.82)	-- (D)	-- (40.1)	-- (0.83)	-- (D)	-- (50.2)	-- (0.85)	-- (D)	-- (46.5)	-- (0.84)	-- (D)	-- (50.2)	-- (0.85)	-- (D)	-- (46.5)	-- (0.84)
Military Rd S & 259th Pl/S Reith Rd	E	-- (C)	-- (34.9)	-- (0.68)	-- (D)	-- (36)	-- (0.7)	-- (D)	-- (38.6)	-- (0.7)	-- (D)	-- (37.9)	-- (0.7)	-- (D)	-- (38.6)	-- (0.7)	-- (D)	-- (37.9)	-- (0.7)
16th Ave S & S 260th ST	D	-- (C)	-- (22.2)	-- (0.82)	-- (C)	-- (23)	-- (0.83)	-- (C)	-- (22.9)	-- (0.83)	-- (C)	-- (22.9)	-- (0.83)	-- (C)	-- (22.9)	-- (0.83)	-- (C)	-- (22.9)	-- (0.83)
16th Ave S and S 272nd St	D	-- (D)	-- (45.8)	-- (0.91)	-- (D)	-- (45.8)	-- (0.91)	-- (D)	-- (45.8)	-- (0.91)	-- (D)	-- (45.8)	-- (0.91)	-- (D)	-- (45.8)	-- (0.91)			
SR 99 and S 264th St	D	-- (C)	-- (18.5)	-- (0.02)	-- (C)	-- (18.5)	-- (0.02)	-- (C)	-- (18.5)	-- (0.02)	-- (C)	-- (18.5)	-- (0.02)	-- (C)	-- (18.5)	-- (0.02)			
SR 99 and S 268th St	D	-- (C)	-- (24.3)	-- (0.3)	-- (C)	-- (24.2)	-- (0.29)	-- (C)	-- (24.2)	-- (0.29)	-- (C)	-- (24.2)	-- (0.29)	-- (C)	-- (24.2)	-- (0.29)			
SR 99 and S 272nd St	D	D (D)	47.1 (42.1)	0.93 (0.91)	D (D)	47.1 (40.6)	0.93 (0.91)	D (D)	47.1 (40.9)	0.93 (0.91)	D (D)	47.1 (40.6)	0.93 (0.91)	D (D)	47.1 (40.9)	0.93 (0.91)			
S Star Lake Rd and S 272nd St	E	-- (C)	-- (31.9)	-- (0.94)	-- (C)	-- (31.7)	-- (0.94)	-- (C)	-- (31.7)	-- (0.94)	-- (C)	-- (31.7)	-- (0.94)	-- (C)	-- (31.7)	-- (0.94)			
26th Ave S and Star Lake P&R North Driveway	E	-- (A)	-- (8.9)	-- (0.04)	-- (A)	-- (8.9)	-- (0.04)	-- (A)	-- (8.9)	-- (0.04)	-- (A)	-- (8.9)	-- (0.04)	-- (A)	-- (8.9)	-- (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)			
S 272nd St and 26th Ave S	E	A (A)	6 (9)	0.4 (0.53)	A (A)	6 (9)	0.4 (0.53)	A (A)	6 (9)	0.4 (0.53)	A (A)	6 (9)	0.4 (0.53)	A (A)	6 (9)	0.4 (0.53)			
I-5 Southbound Ramps and S 272nd St	D	C (D)	28.1 (50.6)	0.54 (0.99)	C (D)	28.1 (50.4)	0.54 (0.99)	C (D)	28.1 (50.4)	0.54 (0.99)	C (D)	28.1 (50.4)	0.54 (0.99)	C (D)	28.1 (50.4)	0.54 (0.99)			
I-5 Northbound Ramps and S 272nd St	D	E (D)	74.8 (49.4)	0.99 (0.77)	E (D)	74.5 (49.1)	0.99 (0.77)	E (D)	74.7 (49.1)	0.99 (0.77)	E (D)	74.5 (49.1)	0.99 (0.77)	E (D)	74.7 (49.1)	0.99 (0.77)			
Military Rd S and S 272nd St	E	-- (D)	-- (36.1)	-- (0.69)	-- (D)	-- (36.1)	-- (0.69)	-- (D)	-- (36.1)	-- (0.69)	-- (D)	-- (36.1)	-- (0.69)	-- (D)	-- (36.1)	-- (0.69)			

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; -- = not analyzed

TABLE D-6

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

Intersection	LOS Standard[a, b]	Alternative/Station Options											
		No Build			I-5			SR 99 East			At Grade		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 & S 200th St	E	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)
SR 99 & S 202nd St	E	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)
SR 99 & S 204th St	E	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)
SR 99 & S 208th St	E	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (14.8)	-- (0.51)
SR 99 & S 211th St	E	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)
Military Rd S & S 216th St	E	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)
SR 99 & S 212th St	E	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.3)	-- (0.4)
24th Ave S & S 216th St	E	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)
SR 99 & S 216th St	D	-- (E)	-- (57.1)	-- (1.07)	-- (E)	-- (57.1)	-- (1.07)	-- (E)	-- (57.1)	-- (1.07)	-- (E)	-- (57.1)	-- (1.07)
S 220th St & SR 99	D	-- (B)	-- (13.5)	-- (0.76)	-- (B)	-- (13.2)	-- (0.77)	-- (B)	-- (13.2)	-- (0.77)	-- (B)	-- (13.2)	-- (0.77)
SR 99 & S 224th St	D	-- (B)	-- (15.6)	-- (0.67)	-- (B)	-- (15.7)	-- (0.67)	-- (B)	-- (15.7)	-- (0.67)	-- (B)	-- (15.7)	-- (0.67)
SR 99 & S 226th St	D	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)
SR 99 & Pedestrian crossing	D	-- (A)	-- (5.4)	-- (0.48)	-- (A)	-- (5.4)	-- (0.48)	-- (A)	-- (5.4)	-- (0.48)	-- (A)	-- (5.4)	-- (0.48)
25th Ave S/24th Ave S & Kent-Des Moines Rd	D	-- (B)	-- (15.5)	-- (0.76)	-- (B)	-- (16.2)	-- (0.79)	-- (B)	-- (16.2)	-- (0.79)	-- (B)	-- (16.2)	-- (0.79)
SR 99 & Kent-Des Moines Rd	D	F (F)	119.6 (83)	1.24 (1.36)	F (F)	125.1 (87.8)	1.24 (1.36)	F (F)	130.9 (90.6)	1.24 (1.47)	F (F)	129.8 (93.7)	1.26 (1.66)
30th Ave S & Kent-Des Moines Rd	D	-- (B)	-- (14.3)	-- (0.22)	-- (B)	-- (14)	-- (0.21)	-- (B)	-- (14)	-- (0.21)	-- (B)	-- (14)	-- (0.21)
16th Ave S & S 240th St	D	-- (B)	-- (11.8)	-- (0.64)	-- (B)	-- (11.9)	-- (0.64)	-- (B)	-- (11.9)	-- (0.65)	-- (B)	-- (11.9)	-- (0.64)
28th Ave S/Highline College Driveway & S 240th St	D	-- (C)	-- (17)	-- (0.29)	-- (B)	-- (14.8)	-- (0.1)	-- (B)	-- (14.8)	-- (0.1)	-- (C)	-- (17.5)	-- (0.3)
S 240th St & Highline College Drop-Off Loop	D	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.4)	-- (0.02)	-- (A)	-- (8.5)	-- (0.02)
Military Rd S & Kent-Des Moines Rd P&R	E	-- (D)	-- (26.8)	-- (0.29)	-- (D)	-- (27.4)	-- (0.3)	-- (D)	-- (27.5)	-- (0.3)	-- (D)	-- (27.4)	-- (0.3)
I-5 Southbound Ramps & Kent-Des Moines Rd	D	C (E)	23.7 (69.8)	0.67 (1.01)	C (E)	24 (78)	0.69 (1.06)	C (E)	24.1 (77.3)	0.7 (1.06)	C (E)	24 (78)	0.69 (1.06)
I-5 Northbound On & Kent-Des Moines Rd & I-5 Northbound Off	D	C (B)	24.6 (12.9)	0.67 (0.45)	D (B)	29.5 (13.3)	0.73 (0.46)	D (B)	30 (13.4)	0.73 (0.47)	D (B)	29.5 (13.3)	0.73 (0.46)
I-5 Northbound Ramps & Kent-Des Moines Rd & I-5 Northbound On Bus	D	B (B)	15.9 (13.9)	0.77 (0.73)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)
Military Rd S & Kent-Des Moines Rd	E	-- (E)	-- (56.5)	-- (0.95)	-- (E)	-- (60.7)	-- (0.98)	-- (E)	-- (60.1)	-- (0.98)	-- (E)	-- (60.7)	-- (0.98)
SR 99 & S 236th Lane	D	A (C)	8.9 (23)	0.06 (0.16)	B (C)	14.1 (26.2)	0.61 (0.65)	B (C)	17.5 (30.4)	0.66 (0.66)	A (C)	9.6 (24.5)	0.07 (0.17)
SR 99 & S 240th St	D	D (D)	40.7 (42)	0.8 (0.86)	D (D)	43.8 (36.5)	0.79 (0.89)	D (D)	45.1 (35.4)	0.8 (0.89)	F (E)	115.8 (62.8)	0.95 (0.95)
S 240th St & 30th Ave S	E	A (A)	9.4 (9.6)	0.08 (0.14)	A (B)	9.8 (10)	0.1 (0.18)	A (A)	9.5 (9.8)	0.1 (0.17)	B (B)	10.8 (11.1)	0.11 (0.18)
Military Rd S & S 240th St	E	-- (C)	-- (18.7)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)
SR 99 & S 244th St	D	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (10.9)	-- (0.03)	-- (B)	-- (11.4)	-- (0.07)
SR 99 & S 248th St	D	-- (C)	-- (18.8)	-- (0.11)	-- (C)	-- (19.6)	-- (0.11)	-- (C)	-- (19.7)	-- (0.11)	-- (C)	-- (19.4)	-- (0.11)
SR 99 & S 252nd St	D	-- (B)	-- (15.8)	-- (0.69)	-- (B)	-- (13.5)	-- (0.71)	-- (B)	-- (13.5)	-- (0.71)	-- (B)	-- (13.4)	-- (0.7)
SR 99 & Fred Meyer	D	-- (C)	-- (24.3)	-- (0.7)	-- (C)	-- (23.4)	-- (0.72)	-- (C)	-- (23.4)	-- (0.72)	-- (C)	-- (23.6)	-- (0.71)
SR 99 & S 260th St	D	-- (D)	-- (38.3)	-- (0.82)	-- (D)	-- (38.6)	-- (0.82)	-- (D)	-- (38.7)	-- (0.82)	-- (D)	-- (38.3)	-- (0.82)

TABLE D-6

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

Intersection	LOS Standard[a, b]	Alternative/Station Options											
		No Build			I-5			SR 99 East			At Grade		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Military Rd S & 259th Pl/S Reith Rd	E	-- (C)	-- (34.9)	-- (0.68)	-- (D)	-- (35.9)	-- (0.7)	-- (D)	-- (35.9)	-- (0.7)	-- (D)	-- (35.8)	-- (0.7)
16th Ave S & S 260th St	D	-- (C)	-- (22.2)	-- (0.82)	-- (C)	-- (23)	-- (0.83)	-- (C)	-- (23)	-- (0.83)	-- (C)	-- (22.9)	-- (0.83)

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; -- = not analyzed

TABLE D-7

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

Intersection	LOS Standard[a, b]	Alternative					
		No Build			Star Lake		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave S and S 272nd St	D	-- (D)	-- (47)	-- (0.94)	-- (D)	-- (41.5)	-- (0.84)
SR 99 and S 264th St	D	-- (C)	-- (15.1)	-- (0.04)	-- (C)	-- (18.5)	-- (0.01)
SR 99 and S 268th St	D	-- (C)	-- (22.4)	-- (0.22)	-- (C)	-- (23.7)	-- (0.27)
SR 99 and S 272nd St	D	D (D)	44.1 (44.8)	0.89 (0.9)	D (D)	48.5 (41.3)	0.95 (0.92)
S Star Lake Rd and S 272nd St	E	-- (C)	-- (22.9)	-- (0.87)	-- (E)	-- (55.5)	-- (1.04)
26th Ave S and Star Lake P&R North Driveway	E	-- (A)	-- (8.9)	-- (0.04)	-- (A)	-- (9.3)	-- (0.02)
26th Ave S and Star Lake P&R South Driveway	E	-- (A)	-- (9.9)	-- (0.15)	-- (C)	-- (18.5)	-- (0.66)
S 272nd St and 26th Ave S	E	A (A)	6.1 (9.2)	0.36 (0.51)	C (C)	21.8 (21.7)	0.63 (0.67)
I-5 Southbound Ramps and S 272nd St	D	C (D)	27.8 (42.5)	0.53 (0.93)	C (D)	27.5 (51.9)	0.54 (0.98)
I-5 Northbound Ramps and S 272nd St	D	E (D)	65.1 (38.6)	0.94 (0.75)	F (D)	86.1 (48.4)	1.04 (0.77)
Military Rd S and S 272nd St	E	-- (D)	-- (35)	-- (0.65)	-- (D)	-- (35.8)	-- (0.68)
SR 99 and S 276th St	D	B (B)	12.2 (18)	0.58 (0.63)	B (B)	12.5 (15.6)	0.62 (0.67)
SR 99 and Crestview Dwy	D	-- (B)	-- (14.5)	-- (0.13)	-- (C)	-- (15.1)	-- (0.15)
SR 99 and 16th Ave S	D	-- (C)	-- (19.2)	-- (0.56)	-- (C)	-- (19.1)	-- (0.56)
SR 99 and S 283rd Pl	D	-- (C)	-- (15.7)	-- (0.26)	-- (C)	-- (16.6)	-- (0.3)
SR 99 and S 288th St	D	-- (D)	-- (46.5)	-- (0.72)	-- (D)	-- (48.4)	-- (0.74)
SR 99 and 29300 Block U-turn	D	-- (A)	-- (0)	-- (0)	-- (A)	-- (0)	-- (0)
SR 99 and Dash Point Rd	D	-- (C)	-- (21.4)	-- (0.7)	-- (C)	-- (22.3)	-- (0.74)

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-8

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

Intersection	LOS Standard[a, b]	Alternative/Station Options											
		No Build			FWTC			FWTC I-5			FWTC S 320th P&R		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and 18th Ave S	D	-- (B)	-- (12.4)	-- (0.09)	-- (B)	-- (12.4)	-- (0.09)	-- (B)	-- (12.4)	-- (0.09)	-- (B)	-- (12.4)	-- (0.09)
SR 99 and S 304th St	D	-- (C)	-- (28.3)	-- (0.65)	-- (C)	-- (28.4)	-- (0.65)	-- (C)	-- (28.4)	-- (0.65)	-- (C)	-- (28.5)	-- (0.65)
SR 99 and S 308th St	D	-- (C)	-- (21.5)	-- (0.71)	-- (C)	-- (21.7)	-- (0.72)	-- (C)	-- (21.7)	-- (0.72)	-- (C)	-- (21.7)	-- (0.72)
SR 99 and S 312th St	D	-- (D)	-- (39.7)	-- (0.75)	-- (D)	-- (40.9)	-- (0.76)	-- (D)	-- (40.9)	-- (0.76)	-- (D)	-- (40.8)	-- (0.75)
20th Ave S and S 312th St	E	-- (B)	-- (15.4)	-- (0.36)	-- (B)	-- (11.6)	-- (0.38)	-- (B)	-- (11.6)	-- (0.37)	-- (B)	-- (11.7)	-- (0.37)
23rd Ave S and S 312th St	E	-- (B)	-- (19.7)	-- (0.51)	-- (B)	-- (13.6)	-- (0.5)	-- (B)	-- (14.2)	-- (0.51)	-- (B)	-- (14.1)	-- (0.51)
SR 99 and Pavilions Centre Dwy	D	-- (B)	-- (11.6)	-- (0.11)	-- (B)	-- (11.5)	-- (0.11)	-- (B)	-- (11.5)	-- (0.11)	-- (B)	-- (11.6)	-- (0.11)
SR 99 and S 316th St	D	B (C)	16.5 (34.5)	0.36 (0.8)	B (C)	16.5 (34)	0.36 (0.79)	B (C)	16.5 (34.1)	0.36 (0.79)	B (C)	16.4 (34.7)	0.36 (0.8)
20th Ave S and S 316th St	E	-- (B)	-- (19)	-- (0.38)	-- (B)	-- (17.1)	-- (0.39)	-- (B)	-- (17.5)	-- (0.38)	-- (B)	-- (17.3)	-- (0.38)
21st Ave S and S 316th St	E	B (B)	10.1 (12)	0.06 (0.26)	B (B)	10.3 (12.3)	0.08 (0.28)	B (B)	10.1 (12)	0.06 (0.25)	B (B)	10.1 (12)	0.06 (0.25)
23rd Ave S and S 316th St	E	-- (B)	-- (17.6)	-- (0.32)	-- (B)	-- (16.6)	-- (0.32)	-- (B)	-- (16.2)	-- (0.32)	-- (B)	-- (16.1)	-- (0.32)
23rd Ave S and S 317th St	E	A (B)	8.8 (15.3)	0.34 (0.59)	A (B)	9.2 (16.3)	0.36 (0.59)	A (B)	9 (16.4)	0.35 (0.59)	A (B)	9.5 (16.8)	0.37 (0.6)
S 317th St and 28th Ave S	E	A (A)	6.5 (9.3)	0.329 (0.49)	A (A)	6.6 (9.1)	0.33 (0.48)	A (A)	6.6 (9.1)	0.33 (0.48)	A (A)	6.7 (9.2)	0.34 (0.49)
SR 99 and S 318th Pl	D	-- (B)	-- (11.3)	-- (0.11)	-- (B)	-- (11)	-- (0.1)	-- (B)	-- (11)	-- (0.1)	-- (B)	-- (11.2)	-- (0.11)
SR 99 and S 320th St	D	D (D)	42.9 (47.6)	0.66 (0.83)	D (D)	44.6 (49.3)	0.72 (0.87)	D (D)	44 (47.5)	0.72 (0.86)	D (D)	43 (46.2)	0.72 (0.87)
20th Ave S and S 320th St	E	-- (C)	-- (23.1)	-- (0.7)	-- (C)	-- (24)	-- (0.74)	-- (C)	-- (23.3)	-- (0.74)	-- (C)	-- (23.1)	-- (0.74)
21st Ave S and S 320th St	E	-- (B)	-- (11.6)	-- (0.18)	-- (C)	-- (15.7)	-- (0.54)	-- (B)	-- (12.5)	-- (0.3)	-- (B)	-- (12.4)	-- (0.19)
23rd Ave S and S 320th St	E	C (D)	26.2 (36)	0.54 (0.84)	C (D)	27.4 (40.3)	0.58 (0.9)	C (D)	26.6 (42.9)	0.59 (0.92)	C (D)	31.2 (47.9)	0.68 (0.95)
25th Ave S and S 320th St	E	A (B)	8.9 (13.1)	0.47 (0.69)	A (B)	8.9 (14.4)	0.49 (0.71)	B (C)	14.7 (24.1)	0.56 (0.82)	B (B)	10.3 (17.8)	0.55 (0.77)
I-5 Southbound Ramps and S 320th St	D	-- (C)	-- (25.2)	-- (0.79)	B (C)	14.3 (25.4)	0.66 (0.8)	B (C)	15.7 (23.3)	0.66 (0.8)	B (C)	13.5 (25.3)	0.67 (0.81)
I-5 Northbound and S 320th St	D	B (C)	15.9 (20.9)	0.52 (0.64)	B (C)	17.6 (21.4)	0.55 (0.67)	B (C)	17 (21.4)	0.55 (0.66)	B (C)	18.1 (22)	0.57 (0.67)
23rd Ave S and S 322nd St	E	A (A)	4.6 (9.3)	0.12 (0.25)	A (A)	4.4 (9.3)	0.12 (0.25)	A (A)	4.4 (9.4)	0.12 (0.25)	A (B)	9.5 (12.2)	0.49 (0.54)
SR 99 and S 324th St	D	-- (C)	-- (29.8)	-- (0.77)	-- (C)	-- (29.8)	-- (0.8)	-- (C)	-- (29.7)	-- (0.8)	-- (C)	-- (34)	-- (0.82)
P&R and 23rd Ave S/S324th St	E	A (B)	9.8 (12.6)	0.03 (0.09)	A (B)	9.8 (12.6)	0.03 (0.09)	A (B)	9.8 (12.6)	0.03 (0.09)	B (C)	10.9 (15.7)	0.14 (0.34)

Note: AM LOS (PM LOS)

[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; -- = not analyzed

TABLE D-9

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

Intersection	LOS Standard[a,b]	Alternative/Station Options					
		No Build			SR 99 to I-5		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 & S 200th St	E	-- (D)	50.5	0.83	-- (D)	-- (50.5)	-- (0.83)
SR 99 & S 202nd St	E	-- (B)	10.1	0.02	-- (B)	-- (10.1)	-- (0.02)
SR 99 & S 204th St	E	-- (B)	12.7	0.45	-- (B)	-- (12.7)	-- (0.45)
SR 99 & S 208th St	E	-- (B)	14.8	0.51	-- (B)	-- (14.8)	-- (0.51)
SR 99 & S 211th St	E	-- (B)	11.2	0.03	-- (B)	-- (11.2)	-- (0.03)
Military Rd S & S 216th St	E	-- (D)	50.2	0.93	-- (D)	-- (50.2)	-- (0.93)
SR 99 & S 212th St	E	-- (A)	4.3	0.4	-- (A)	-- (4.3)	-- (0.4)
24th Ave S & S 216th St	E	-- (C)	31.2	0.87	-- (C)	-- (31.2)	-- (0.87)
SR 99 & S 216th St	D	-- (E)	57.1	1.07	-- (E)	-- (57)	-- (1.07)
S 220th St & SR 99	D	-- (B)	13.5	0.76	-- (B)	-- (13.2)	-- (0.76)
SR 99 & S 224th St	D	-- (B)	15.6	0.67	-- (B)	-- (17.4)	-- (0.67)
SR 99 & S 226th St	D	-- (B)	14.4	0.16	-- (B)	-- (14.4)	-- (0.16)
SR 99 & Pedestrian crossing	D	-- (A)	5.4	0.48	-- (A)	-- (2.6)	-- (0.48)
25th Ave S/24th Ave S & Kent-Des Moines Rd	D	-- (B)	15.5	0.76	-- (B)	-- (16.2)	-- (0.79)
SR 99 & Kent-Des Moines Rd	D	F (F)	119.6 (83)	1.24 (1.36)	F (F)	128 (90.1)	1.24 (1.46)
30th Ave S & Kent-Des Moines Rd	D	-- (B)	14.3	0.22	-- (B)	-- (14)	-- (0.21)
16th Ave S & S 240th St	D	-- (B)	11.8	0.64	-- (B)	-- (11.9)	-- (0.64)
28th Ave S/Highline College Driveway & S 240th St	D	-- (C)	17	0.29	-- (B)	-- (14.8)	-- (0.1)
S 240th St & Highline College Drop-Off Loop	D	-- (A)	8.4	0.02	-- (A)	-- (8.4)	-- (0.02)
Military Rd S & Kent-Des Moines Rd P&R	E	-- (D)	26.8	0.29	-- (D)	-- (27.4)	-- (0.3)
I-5 Southbound Ramps & Kent-Des Moines Rd	D	C (E)	23.7 (69.8)	0.67 (1.01)	C (E)	24 (78.5)	0.69 (1.06)

TABLE D-9

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

Intersection	LOS Standard[a,b]	Alternative/Station Options					
		No Build			SR 99 to I-5		
		LOS	Delay	V/C	LOS	Delay	V/C
I-5 Northbound Ramps O & Kent-Des Moines Rd	D	C (B)	24.6 (12.9)	0.67 (0.45)	D (B)	29.6 (13.3)	0.73 (0.47)
I-5 Northbound Ramps & Kent-Des Moines Rd & I-5 Northbound On Bus	D	B (B)	15.9 (13.9)	0.77 (0.73)	B (B)	16.2 (14)	0.8 (0.74)
Military Rd S & Kent-Des Moines Rd	E	-- (E)	56.5	0.95	-- (E)	-- (60.9)	-- (0.99)
SR 99 & S 236th Lane	D	A (C)	8.9 (23)	0.06 (0.16)	B (C)	14.5 (25.8)	0.65 (0.66)
SR 99 & S 240th St	D	D (D)	40.7 (42)	0.8 (0.86)	D (D)	48.7 (36.6)	0.79 (0.89)
S 240th St & 30th Ave S	E	A (A)	9.4 (9.6)	0.08 (0.14)	A (A)	9.5 (9.8)	0.1 (0.18)
Military Rd S & S 240th St	E	-- (C)	18.7	0.12	-- (C)	-- (18.9)	-- (0.12)
SR 99 & S 244th St	D	-- (B)	10.9	0.03	-- (B)	-- (10.9)	-- (0.03)
SR 99 & S 248th St	D	-- (C)	18.8	0.11	-- (C)	-- (19.7)	-- (0.11)
SR 99 & S 252nd St	D	-- (B)	15.8	0.69	-- (B)	-- (18.3)	-- (0.71)
SR 99 & Fred Meyer	D	-- (C)	24.3	0.7	-- (B)	-- (19.9)	-- (0.76)
SR 99 & S 260th St	D	-- (D)	38.3	0.82	-- (D)	-- (39.9)	-- (0.83)
Military Rd S & 259th Pl/S Reith Rd	E	-- (C)	34.9	0.68	-- (D)	-- (36)	-- (0.7)
16th Ave S & S 260th St	D	-- (C)	22.2	0.82	-- (C)	-- (23)	-- (0.83)

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 Options

Intersection	LOS Standard[a,b]	Alternative					
		No Build			SR 99 to I-5		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave S and S 272nd St	D	-- (D)	47	0.94	-- (D)	-- (41.5)	-- (0.84)
SR 99 and S 264th St	D	-- (C)	15.1	0.04	-- (C)	-- (18.5)	-- (0.01)
SR 99 and S 268th St	D	-- (C)	22.4	0.22	-- (C)	-- (23.7)	-- (0.27)
SR 99 and S 272nd St	D	D (D)	44.1 (44.8)	0.89 (0.9)	D (D)	48.5 (41.3)	0.95 (0.92)
S Star Lake Rd and S 272nd St	E	-- (C)	22.9	0.87	-- (E)	-- (55.5)	-- (1.04)
26th Ave S and Star Lake P&R North Driveway	E	-- (A)	8.9	0.04	-- (A)	-- (9.3)	-- (0.02)
26th Ave S and Star Lake P&R South Driveway	E	-- (A)	9.9	0.15	-- (C)	-- (18.5)	-- (0.66)
S 272nd St and 26th Ave S	E	A (A)	6.1 (9.2)	0.36 (0.51)	C (C)	21.8 (21.7)	0.63 (0.67)
I-5 Southbound Ramps and S 272nd St	D	C (D)	27.8 (42.5)	0.53 (0.93)	C (D)	26.9 (48.5)	0.54 (0.98)
I-5 Northbound Ramps and S 272nd St	D	E (D)	65.1 (38.6)	0.94 (0.75)	F (D)	87.1 (47.8)	1.04 (0.77)
Military Rd S and S 272nd St	E	-- (D)	35	0.65	-- (D)	-- (35.8)	-- (0.68)
SR 99 and S 276th St	D	B (B)	12.2 (18)	0.58 (0.63)	B (B)	12.5 (15.6)	0.62 (0.67)
SR 99 and Crestview Dwy	D	-- (B)	14.5	0.13	-- (C)	-- (15.1)	-- (0.15)
SR 99 and 16th Ave S	D	-- (C)	19.2	0.56	-- (C)	-- (19.1)	-- (0.56)
SR 99 and S 283rd Pl	D	-- (C)	15.7	0.26	-- (C)	-- (16.6)	-- (0.3)
SR 99 and S 288th St	D	-- (D)	46.5	0.72	-- (D)	-- (48.4)	-- (0.74)
SR 99 and 29300 Block U-turn	D	-- (A)	0	0	-- (A)	-- (0)	-- (0)
SR 99 and Dash Point Rd	D	-- (C)	21.4	0.7	-- (C)	-- (22.3)	-- (0.74)

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 Options

Intersection	LOS Standard[a,b]	Alternative					
		No Build			SR 99 to I-5		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and 18th Ave S	D	-- (B)	-- (12.4)	-- (0.09)	-- (B)	-- (12.4)	-- (0.09)
SR 99 and S 304th St	D	-- (C)	-- (28.3)	-- (0.65)	-- (C)	-- (28.4)	-- (0.65)
SR 99 and S 308th St	D	-- (C)	-- (21.5)	-- (0.71)	-- (C)	-- (21.6)	-- (0.72)
SR 99 and S 312th St	D	-- (D)	-- (39.7)	-- (0.75)	-- (D)	-- (40.3)	-- (0.75)
20th Ave S and S 312th St	E	-- (B)	-- (15.4)	-- (0.36)	-- (A)	-- (8.7)	-- (0.38)
23rd Ave S and S 312th St	E	-- (B)	-- (19.7)	-- (0.51)	-- (B)	-- (13.2)	-- (0.5)
SR 99 and Pavilions Centre Dwy	D	-- (B)	-- (11.6)	-- (0.11)	-- (B)	-- (11.5)	-- (0.11)
SR 99 and S 316th St	D	B (C)	16.5 (34.5)	0.36 (0.8)	B (C)	16.7 (32.8)	0.36 (0.79)
20th Ave S and S 316th St	E	-- (B)	-- (19)	-- (0.38)	-- (C)	-- (22.7)	-- (0.39)
21st Ave S and S 316th St	E	B (B)	10.1 (12)	0.06 (0.26)	B (B)	10.3 (12.3)	0.08 (0.28)
23rd Ave S and S 316th St	E	-- (B)	-- (17.6)	-- (0.32)	-- (B)	-- (15.7)	-- (0.32)
23rd Ave S and S 317th St	E	A (B)	8.8 (15.3)	0.34 (0.59)	A (B)	9.2 (16.1)	0.35 (0.59)
S 317th St and 28th Ave S	E	A (A)	6.5 (9.3)	0.329 (0.49)	A (A)	6.6 (9.1)	0.33 (0.48)
SR 99 and S 318th Pl	D	-- (B)	-- (11.3)	-- (0.11)	-- (B)	-- (11)	-- (0.1)
SR 99 and S 320th St	D	D (D)	42.9 (47.6)	0.66 (0.83)	D (D)	44.5 (48.9)	0.72 (0.86)
20th Ave S and S 320th St	E	-- (C)	-- (23.1)	-- (0.7)	-- (C)	-- (24.6)	-- (0.74)
21st Ave S and S 320th St	E	-- (B)	-- (11.6)	-- (0.18)	-- (C)	-- (15.4)	-- (0.52)
23rd Ave S and S 320th St	E	C (D)	26.2 (36)	0.54 (0.84)	C (D)	27.4 (41)	0.58 (0.9)
25th Ave S and S 320th St	E	A (B)	8.9 (13.1)	0.47 (0.69)	A (B)	9 (14.2)	0.49 (0.71)
I-5 Southbound Ramps and S 320th St	D	-- (C)	-- (25.2)	-- (0.79)	B (C)	14.2 (25.4)	0.66 (0.8)
I-5 Northbound and S 320th St	D	B (C)	15.9 (20.9)	0.52 (0.64)	B (C)	17.4 (21.2)	0.55 (0.66)
23rd Ave S and S 322nd St	E	A (A)	4.6 (9.3)	0.12 (0.25)	A (A)	4.4 (9.3)	0.12 (0.25)
SR 99 and S 324th St	D	-- (C)	-- (29.8)	-- (0.77)	-- (C)	-- (30.2)	-- (0.8)
P&R and 23rd Ave S/S324th St	E	A (B)	9.8 (12.6)	0.03 (0.09)	A (B)	9.8 (12.6)	0.03 (0.09)

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; -- = not analyzed

TABLE D-12
No Build and SR I-5 to SR 99 Alternative Intersection Level of Service: Kent/Des Moines Station Area Options

Intersection	LOS Standard[a,b]	Alternative/Station Options					
		No Build			SR 99 to I-5		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 & S 200th St	E	-- (D)	50.5	0.83	-- (D)	-- (50.5)	-- (0.83)
SR 99 & S 202nd St	E	-- (B)	10.1	0.02	-- (B)	-- (10.1)	-- (0.02)
SR 99 & S 204th St	E	-- (B)	12.7	0.45	-- (B)	-- (12.7)	-- (0.45)
SR 99 & S 208th St	E	-- (B)	14.8	0.51	-- (B)	-- (14.8)	-- (0.51)
SR 99 & S 211th St	E	-- (B)	11.2	0.03	-- (B)	-- (11.2)	-- (0.03)
Military Rd S & S 216th St	E	-- (D)	50.2	0.93	-- (D)	-- (50.2)	-- (0.93)
SR 99 & S 212th St	E	-- (A)	4.3	0.4	-- (A)	-- (4.3)	-- (0.4)
24th Ave S & S 216th St	E	-- (C)	31.2	0.87	-- (C)	-- (31.2)	-- (0.87)
SR 99 & S 216th St	D	-- (E)	57.1	1.07	-- (E)	-- (57)	-- (1.07)
S 220th St & SR 99	D	-- (B)	13.5	0.76	-- (B)	-- (13.2)	-- (0.76)
SR 99 & S 224th St	D	-- (B)	15.6	0.67	-- (B)	-- (17.4)	-- (0.67)
SR 99 & S 226th St	D	-- (B)	14.4	0.16	-- (B)	-- (14.4)	-- (0.16)
SR 99 & Pedestrian crossing	D	-- (A)	5.4	0.48	-- (A)	-- (2.6)	-- (0.48)
25th Ave S/24th Ave S & Kent-Des Moines Rd	D	-- (B)	15.5	0.76	-- (B)	-- (16.2)	-- (0.79)
SR 99 & Kent-Des Moines Rd	D	F (F)	119.6 (83)	1.24 (1.36)	F (F)	128 (90.1)	1.24 (1.46)
30th Ave S & Kent-Des Moines Rd	D	-- (B)	14.3	0.22	-- (B)	-- (14)	-- (0.21)
16th Ave S & S 240th St	D	-- (B)	11.8	0.64	-- (B)	-- (11.9)	-- (0.64)
28th Ave S/Highline College Driveway & S 240th St	D	-- (C)	17	0.29	-- (B)	-- (14.8)	-- (0.1)
S 240th St & Highline College Drop-Off Loop	D	-- (A)	8.4	0.02	-- (A)	-- (8.4)	-- (0.02)
Military Rd S & Kent-Des Moines Rd P&R	E	-- (D)	26.8	0.29	-- (D)	-- (27.4)	-- (0.3)
I-5 Southbound Ramps & Kent-Des Moines Rd	D	C (E)	23.7 (69.8)	0.67 (1.01)	C (E)	24 (78.5)	0.69 (1.06)
I-5 Northbound Ramps & Kent-Des Moines Rd	D	C (B)	24.6 (12.9)	0.67 (0.45)	D (B)	29.6 (13.3)	0.73 (0.47)

TABLE D-12

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

Intersection	LOS Standard[a,b]	Alternative/Station Options					
		No Build			SR 99 to I-5		
		LOS	Delay	V/C	LOS	Delay	V/C
I-5 Northbound Ramps & Kent-Des Moines Rd & I-5 Northbound On Bus	D	B (B)	15.9 (13.9)	0.77 (0.73)	B (B)	16.2 (14)	0.8 (0.74)
Military Rd S & Kent-Des Moines Rd	E	-- (E)	56.5	0.95	-- (E)	-- (60.9)	-- (0.99)
SR 99 & S 236th Lane	D	A (C)	8.9 (23)	0.06 (0.16)	B (C)	14.5 (25.8)	0.65 (0.66)
SR 99 & S 240th St	D	D (D)	40.7 (42)	0.8 (0.86)	D (D)	48.7 (36.6)	0.79 (0.89)
S 240th St & 30th Ave S	E	A (A)	9.4 (9.6)	0.08 (0.14)	A (A)	9.5 (9.8)	0.1 (0.18)
Military Rd S & S 240th St	E	-- (C)	18.7	0.12	-- (C)	-- (18.9)	-- (0.12)
SR 99 & S 244th St	D	-- (B)	10.9	0.03	-- (B)	-- (10.9)	-- (0.03)
SR 99 & S 248th St	D	-- (C)	18.8	0.11	-- (C)	-- (19.7)	-- (0.11)
SR 99 & S 252nd St	D	-- (B)	15.8	0.69	-- (B)	-- (18.3)	-- (0.71)
SR 99 & Fred Meyer	D	-- (C)	24.3	0.7	-- (B)	-- (19.9)	-- (0.76)
SR 99 & S 260th St	D	-- (D)	38.3	0.82	-- (D)	-- (39.9)	-- (0.83)
Military Rd S & 259th Pl/S Reith Rd	E	-- (C)	34.9	0.68	-- (D)	-- (36)	-- (0.7)
16th Ave S & S 260th St	D	-- (C)	22.2	0.82	-- (C)	-- (23)	-- (0.83)

Notes:
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[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-13

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

Intersection	LOS Standard[a,b]	Alternative					
		No Build			I-5 to SR 99		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave S and S 272nd St	D	-- (D)	47	0.94	-- (D)	-- (45.8)	-- (0.91)
SR 99 and S 264th St	D	-- (C)	15.1	0.04	-- (C)	-- (18.5)	-- (0.02)
SR 99 and S 268th St	D	-- (C)	22.4	0.22	-- (C)	-- (24.3)	-- (0.3)
SR 99 and S 272nd St	D	D (D)	44.1 (44.8)	0.89 (0.9)	D (D)	47.1 (42.2)	0.93 (0.91)
S Star Lake Rd and S 272nd St	E	-- (C)	22.9	0.87	-- (C)	-- (32.2)	-- (0.94)
26th Ave S and Star Lake P&R North Driveway	E	-- (A)	8.9	0.04	-- (A)	-- (8.9)	-- (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 (A)	6.1 (9.2)	0.36 (0.51)	A (A)	6.1 (9)	0.4 (0.53)
I-5 Southbound Ramps and S 272nd St	D	C (D)	27.8 (42.5)	0.53 (0.93)	C (D)	28.1 (53.2)	0.54 (0.99)
I-5 Northbound Ramps and S 272nd St	D	E (D)	65.1 (38.6)	0.94 (0.75)	E (D)	74.8 (49.6)	0.99 (0.78)
Military Rd S and S 272nd St	E	-- (D)	35	0.65	-- (D)	-- (36.1)	-- (0.69)
SR 99 and S 276th St	D	B (B)	12.2 (18)	0.58 (0.63)	D (C)	42.6 (20.7)	0.83 (0.84)
SR 99 and Crestview Dwy	D	-- (B)	14.5	0.13	-- (C)	-- (15.3)	-- (0.16)
SR 99 and 16th Ave S	D	-- (C)	19.2	0.56	-- (D)	-- (26.1)	-- (0.66)
SR 99 and S 283rd Pl	D	-- (C)	15.7	0.26	-- (C)	-- (17)	-- (0.31)
SR 99 and S 288th St	D	-- (D)	46.5	0.72	-- (D)	-- (47.4)	-- (0.75)
SR 99 and 29300 Block U-turn	D	-- (A)	0	0	-- (A)	-- (0)	-- (0)
SR 99 and Dash Point Rd	D	-- (C)	21.4	0.7	-- (C)	-- (23.1)	-- (0.77)

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-14

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

Intersection	LOS Standard[a,b]	Alternative					
		No Build			I-5 to SR 99		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 and 18th Ave S	D	-- (B)	-- (12.4)	-- (0.09)	-- (B)	-- (12.4)	-- (0.09)
SR 99 and S 304th St	D	-- (C)	-- (28.3)	-- (0.65)	-- (C)	-- (28.4)	-- (0.65)
SR 99 and S 308th St	D	-- (C)	-- (21.5)	-- (0.71)	-- (C)	-- (21.7)	-- (0.72)
SR 99 and S 312th St	D	-- (D)	-- (39.7)	-- (0.75)	-- (D)	-- (40.9)	-- (0.76)
20th Ave S and S 312th St	E	-- (B)	-- (15.4)	-- (0.36)	-- (B)	-- (11.6)	-- (0.38)
23rd Ave S and S 312th St	E	-- (B)	-- (19.7)	-- (0.51)	-- (B)	-- (13.6)	-- (0.5)
SR 99 and Pavilions Centre Dwy	D	-- (B)	-- (11.6)	-- (0.11)	-- (B)	-- (11.5)	-- (0.11)
SR 99 and S 316th St	D	B (C)	16.5 (34.5)	0.36 (0.8)	B (C)	16.5 (34)	0.36 (0.79)
20th Ave S and S 316th St	E	-- (B)	-- (19)	-- (0.38)	-- (B)	-- (17.1)	-- (0.39)
21st Ave S and S 316th St	E	B (B)	10.1 (12)	0.06 (0.26)	B (B)	10.3 (12.3)	0.08 (0.28)
23rd Ave S and S 316th St	E	-- (B)	-- (17.6)	-- (0.32)	-- (B)	-- (16.6)	-- (0.32)
23rd Ave S and S 317th St	E	A (B)	8.8 (15.3)	0.34 (0.59)	A (B)	9.2 (16.2)	0.35 (0.59)
S 317th St and 28th Ave S	E	A (A)	6.5 (9.3)	0.329 (0.49)	A (A)	6.6 (9.1)	0.33 (0.48)
SR 99 and S 318th Pl	D	-- (B)	-- (11.3)	-- (0.11)	-- (B)	-- (11)	-- (0.1)
SR 99 and S 320th St	D	D (D)	42.9 (47.6)	0.66 (0.83)	D (D)	44.5 (49.3)	0.72 (0.87)
20th Ave S and S 320th St	E	-- (C)	-- (23.1)	-- (0.7)	-- (C)	-- (23.9)	-- (0.74)
21st Ave S and S 320th St	E	-- (B)	-- (11.6)	-- (0.18)	-- (C)	-- (15.5)	-- (0.53)
23rd Ave S and S 320th St	E	C (D)	26.2 (36)	0.54 (0.84)	C (D)	27.4 (40.2)	0.58 (0.9)
25th Ave S and S 320th St	E	A (B)	8.9 (13.1)	0.47 (0.69)	A (B)	8.9 (14.4)	0.49 (0.71)
I-5 Southbound Ramps and S 320th St	D	-- (C)	-- (25.2)	-- (0.79)	B (C)	14.2 (25.4)	0.66 (0.8)
I-5 Northbound and S 320th St	D	B (C)	15.9 (20.9)	0.52 (0.64)	B (C)	17.5 (21.4)	0.55 (0.66)
23rd Ave S and S 322nd St	E	A (A)	4.6 (9.3)	0.12 (0.25)	A (A)	4.4 (9.3)	0.12 (0.25)
SR 99 and S 324th St	D	-- (C)	-- (29.8)	-- (0.77)	-- (C)	-- (29.8)	-- (0.8)
P&R and 23rd Ave S/S324th St	E	A (B)	9.8 (12.6)	0.03 (0.09)	A (B)	9.8 (12.6)	0.03 (0.09)

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; -- = not analyzed

TABLE D-15

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

Intersection	LOS Standard[a,b]	Alternative/Station Options														
		No Build			SR 99			Highline College			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 & S 200th St	E	-- (D)	50.5	0.83	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (50.5)
SR 99 & S 202nd St	E	-- (B)	10.1	0.02	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)	-- (B)	-- (10.4)	-- (10.4)
SR 99 & S 204th St	E	-- (B)	12.7	0.45	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (12.7)
SR 99 & S 208th St	E	-- (B)	14.8	0.51	-- (B)	-- (14.9)	-- (0.51)	-- (B)	-- (14.9)	-- (0.51)	-- (B)	-- (14.9)	-- (0.51)	-- (B)	-- (14.9)	-- (14.9)
SR 99 & S 211th St	E	-- (B)	11.2	0.03	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (11.2)
Military Rd S & S 216th St	E	-- (D)	50.2	0.93	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (50.2)
SR 99 & S 212th St	E	-- (A)	4.3	0.4	-- (A)	-- (4.2)	-- (0.4)	-- (A)	-- (4.2)	-- (0.4)	-- (A)	-- (4.2)	-- (0.4)	-- (A)	-- (4.2)	-- (4.2)
24th Ave S & S 216th St	E	-- (C)	31.2	0.87	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (31.2)
SR 99 & S 216th St	D	-- (E)	57.1	1.07	-- (E)	-- (58.3)	-- (1.07)	-- (E)	-- (57.3)	-- (1.07)	-- (E)	-- (58.3)	-- (1.07)	-- (E)	-- (58.3)	-- (58.3)
S 220th St & SR 99	D	-- (B)	13.5	0.76	-- (B)	-- (18.5)	-- (0.78)	-- (B)	-- (17.9)	-- (0.78)	-- (B)	-- (18.5)	-- (0.78)	-- (B)	-- (18.5)	-- (18.5)
SR 99 & S 224th St	D	-- (B)	15.6	0.67	-- (B)	-- (19.6)	-- (0.67)	-- (C)	-- (21.4)	-- (0.67)	-- (B)	-- (19.6)	-- (0.67)	-- (B)	-- (19.6)	-- (19.6)
SR 99 & S 226th St	D	-- (B)	14.4	0.16	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)	-- (B)	-- (14.5)	-- (14.5)
SR 99 & Pedestrian crossing	D	-- (A)	5.4	0.48	-- (A)	-- (4)	-- (0.48)	-- (A)	-- (1.7)	-- (0.48)	-- (A)	-- (4)	-- (0.48)	-- (A)	-- (4)	-- (4)
25th Ave S/24th Ave S & Kent-Des Moines Rd	D	-- (B)	15.5	0.76	-- (B)	-- (16.4)	-- (0.79)	-- (B)	-- (16.4)	-- (0.79)	-- (B)	-- (16.4)	-- (0.79)	-- (B)	-- (16.4)	-- (16.4)
SR 99 & Kent-Des Moines Rd	D	F (F)	119.6 (83)	1.24 (1.36)	F (F)	140.8 (101.6)	1.26 (1.66)	F (F)	140.4 (101)	1.25 (1.71)	F (F)	140.7 (101.3)	1.25 (1.73)	F (F)	135.6 (97.7)	135.6 (97.7)
30th Ave S & Kent-Des Moines Rd	D	-- (B)	14.3	0.22	-- (B)	-- (13.9)	-- (0.21)	-- (B)	-- (13.9)	-- (0.21)	-- (B)	-- (13.9)	-- (0.21)	-- (B)	-- (13.8)	-- (13.8)
16th Ave S & S 240th St	D	-- (B)	11.8	0.64	-- (B)	-- (11.9)	-- (0.65)	-- (B)	-- (11.9)	-- (0.65)	-- (B)	-- (11.9)	-- (0.65)	-- (B)	-- (11.9)	-- (11.9)

TABLE D-15

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

Intersection	LOS Standard[a,b]	Alternative/Station Options														
		No Build			SR 99			Highline College			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 & S 240th St	D	-- (C)	17	0.29	-- (B)	-- (14.9)	-- (0.1)	-- (B)	-- (14.9)	-- (0.1)	-- (B)	-- (14.9)	-- (0.1)	-- (B)	-- (14.9)	-- (14.9)
S 240th St & Highline College Drop-Off Loop	D	-- (A)	8.4	0.02	-- (A)	-- (8.5)	-- (0.02)	-- (A)	-- (8.5)	-- (0.02)	-- (A)	-- (8.5)	-- (0.02)	-- (A)	-- (8.5)	-- (8.5)
Military Rd S & Kent-Des Moines Rd P&R	E	-- (D)	26.8	0.29	-- (D)	-- (27.4)	-- (0.3)	-- (D)	-- (27.4)	-- (0.3)	-- (D)	-- (27.4)	-- (0.3)	-- (D)	-- (27.4)	-- (27.4)
I-5 Southbound Ramps & Kent-Des Moines Rd	D	C (E)	23.7 (69.8)	0.67 (1.01)	C (E)	24.5 (77.7)	0.71 (1.07)	C (E)	24.5 (80)	0.71 (1.07)	C (E)	24.5 (80)	0.71 (1.07)	C (E)	24.5 (79.1)	24.5 (79.1)
I-5 Northbound Ramps & Kent-Des Moines Rd	D	C (B)	24.6 (12.9)	0.67 (0.45)	F (B)	56.9 (14.4)	0.94 (0.53)	F (B)	56.9 (14.4)	0.94 (0.53)	F (B)	56.9 (14.4)	0.94 (0.53)	F (B)	56.9 (14.3)	56.9 (14.3)
I-5 Northbound Ramps & Kent-Des Moines Rd & I-5 Northbound On Bus	D	B (B)	15.9 (13.9)	0.77 (0.73)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	0.8 (0.74)	B (B)	16.2 (14)	16.2 (14)
Military Rd S & Kent-Des Moines Rd	E	-- (E)	56.5	0.95	-- (E)	-- (59.7)	-- (0.98)	-- (E)	-- (59.7)	-- (0.98)	-- (E)	-- (59.7)	-- (0.98)	-- (E)	-- (59.7)	-- (59.7)
SR 99 & S 236th Lane	D	A (C)	8.9 (23)	0.06 (0.16)	C (D)	20 (40.6)	0.66 (0.84)	D (D)	35.1 (42.7)	0.67 (0.76)	B (C)	14.8 (30.6)	0.7 (0.78)	D (D)	40.7 (35.6)	40.7 (35.6)
SR 99 & S 240th St	D	D (D)	40.7 (42)	0.8 (0.86)	D (C)	43.6 (31)	0.83 (0.89)	D (C)	47.6 (31.3)	0.82 (0.9)	D (D)	53.5 (54.3)	0.82 (0.91)	D (D)	49.2 (37)	49.2 (37)
S 240th St & 30th Ave S	E	A (A)	9.4 (9.6)	0.08 (0.14)	A (A)	9.4 (9.6)	0.08 (0.14)	A (A)	9.5 (9.8)	0.1 (0.18)	A (A)	9.4 (9.6)	0.08 (0.14)	A (B)	9.7 (10.2)	9.7 (10.2)
Military Rd S & S 240th St	E	-- (C)	18.7	0.12	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (18.9)
SR 99 & S 244th St	D	-- (B)	10.9	0.03	-- (B)	-- (11.1)	-- (0.07)	-- (B)	-- (11.4)	-- (0.07)	-- (B)	-- (11.7)	-- (0.07)	-- (B)	-- (12)	-- (12)

TABLE D-15

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

Intersection	LOS Standard[a,b]	Alternative/Station Options														
		No Build			SR 99			Highline College			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 & S 248th St	D	-- (C)	18.8	0.11	-- (C)	-- (21.5)	-- (0.13)	-- (C)	-- (21.5)	-- (0.13)	-- (C)	-- (21.5)	-- (0.13)	-- (C)	-- (21.5)	-- (21.5)
SR 99 & S 252nd St	D	-- (B)	15.8	0.69	-- (B)	-- (16.5)	-- (0.74)	-- (B)	-- (14.9)	-- (0.74)	-- (B)	-- (14.5)	-- (0.74)	-- (B)	-- (14.8)	-- (14.8)
SR 99 & Fred Meyer	D	-- (C)	24.3	0.7	-- (C)	-- (21.8)	-- (0.75)	-- (C)	-- (22)	-- (0.75)	-- (C)	-- (22.6)	-- (0.75)	-- (C)	-- (22.5)	-- (22.5)
SR 99 & S 260th St	D	-- (D)	38.3	0.82	-- (D)	-- (42.4)	-- (0.83)	-- (D)	-- (41.6)	-- (0.83)	-- (D)	-- (41.7)	-- (0.83)	-- (D)	-- (41.9)	-- (41.9)
Military Rd S & 259th Pl/S Reith Rd	E	-- (C)	34.9	0.68	-- (D)	-- (36.6)	-- (0.72)	-- (D)	-- (36.6)	-- (0.72)	-- (D)	-- (36.5)	-- (0.72)	-- (D)	-- (36.6)	-- (36.6)
16th Ave S & S 260th St	D	-- (C)	22.2	0.82	-- (C)	-- (24.2)	-- (0.84)	-- (C)	-- (24.2)	-- (0.84)	-- (C)	-- (24.2)	-- (0.84)	-- (C)	-- (24.2)	-- (24.2)

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-16

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

Intersection	LOS Standard[a,b]	Alternative					
		No Build			Star Lake		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave S and S 272nd St	D	-- (D)	47	0.94	-- (D)	-- (45.5)	-- (0.91)
SR 99 and S 264th St	D	-- (C)	15.1	0.04	-- (C)	-- (18.4)	-- (0.01)
SR 99 and S 268th St	D	-- (C)	22.4	0.22	-- (C)	-- (23.4)	-- (0.26)
SR 99 and S 272nd St	D	D (D)	44.1 (44.8)	0.89 (0.9)	D (D)	39.4 (45.2)	0.95 (0.92)
S Star Lake Rd and S 272nd St	E	-- (C)	22.9	0.87	-- (D)	-- (42.6)	-- (1)
26th Ave S and Star Lake P&R North Driveway	E	-- (A)	8.9	0.04	-- (A)	-- (8.9)	-- (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 (A)	6.1 (9.2)	0.36 (0.51)	A (A)	6.1 (8.9)	0.43 (0.54)
I-5 Southbound Ramps and S 272nd St	D	C (D)	27.8 (42.5)	0.53 (0.93)	C (E)	32 (75.1)	0.57 (1.05)
I-5 Northbound Ramps and S 272nd St	D	E (D)	65.1 (38.6)	0.94 (0.75)	F (E)	91.7 (57.3)	1.06 (0.78)
Military Rd S and S 272nd St	E	-- (D)	35	0.65	-- (D)	-- (36.1)	-- (0.69)
SR 99 and S 276th St	D	B (B)	12.2 (18)	0.58 (0.63)	E (B)	66.3 (19.4)	0.89 (0.82)
SR 99 and Crestview Dwy	D	-- (B)	14.5	0.13	-- (C)	-- (15.2)	-- (0.15)
SR 99 and 16th Ave S	D	-- (C)	19.2	0.56	-- (D)	-- (25.9)	-- (0.66)
SR 99 and S 283rd Pl	D	-- (C)	15.7	0.26	-- (C)	-- (16.7)	-- (0.3)
SR 99 and S 288th St	D	-- (D)	46.5	0.72	-- (D)	-- (48.6)	-- (0.74)
SR 99 and 29300 Block U-turn	D	-- (A)	0	0	-- (A)	-- (0)	-- (0)
SR 99 and Dash Point Rd	D	-- (C)	21.4	0.7	-- (C)	-- (22.5)	-- (0.75)

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; -- = not analyzed

TABLE D-17

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

Intersection	LOS Standard[a,b]	Alternative/Station Options											
		No Build			I-5			SR 99 East			At-Grade		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
SR 99 & S 200th St	E	-- (D)	50.5	0.83	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)	-- (D)	-- (50.5)	-- (0.83)
SR 99 & S 202nd St	E	-- (B)	10.1	0.02	-- (B)	-- (10.4)	-- (0.02)	-- (B)	-- (10.4)	-- (0.02)	-- (B)	-- (10.1)	-- (0.02)
SR 99 & S 204th St	E	-- (B)	12.7	0.45	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)	-- (B)	-- (12.7)	-- (0.45)
SR 99 & S 208th St	E	-- (B)	14.8	0.51	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (14.8)	-- (0.51)	-- (B)	-- (14.8)	-- (0.51)
SR 99 & S 211th St	E	-- (B)	11.2	0.03	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)	-- (B)	-- (11.2)	-- (0.03)
Military Rd S & S 216th St	E	-- (D)	50.2	0.93	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)	-- (D)	-- (50.2)	-- (0.93)
SR 99 & S 212th St	E	-- (A)	4.3	0.4	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.3)	-- (0.4)	-- (A)	-- (4.3)	-- (0.4)
24th Ave S & S 216th St	E	-- (C)	31.2	0.87	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)	-- (C)	-- (31.2)	-- (0.87)
SR 99 & S 216th St	D	-- (E)	57.1	1.07	-- (E)	-- (57.2)	-- (1.07)	-- (E)	-- (57.2)	-- (1.07)	-- (E)	-- (57.2)	-- (1.07)
S 220th St & SR 99	D	-- (B)	13.5	0.76	-- (B)	-- (16.6)	-- (0.78)	-- (B)	-- (16.7)	-- (0.78)	-- (B)	-- (16.7)	-- (0.78)
SR 99 & S 224th St	D	-- (B)	15.6	0.67	-- (B)	-- (17.8)	-- (0.67)	-- (B)	-- (17.7)	-- (0.67)	-- (B)	-- (17.7)	-- (0.67)
SR 99 & S 226th St	D	-- (B)	14.4	0.16	-- (B)	-- (14.5)	-- (0.16)	-- (B)	-- (14.5)	-- (0.16)	-- (B)	-- (14.4)	-- (0.16)
SR 99 & Pedestrian crossing	D	-- (A)	5.4	0.48	-- (A)	-- (2.2)	-- (0.48)	-- (A)	-- (2.1)	-- (0.48)	-- (A)	-- (2.1)	-- (0.48)
25th Ave S/24th Ave S & Kent-Des Moines Rd	D	-- (B)	15.5	0.76	-- (B)	-- (16.4)	-- (0.79)	-- (B)	-- (16.4)	-- (0.79)	-- (B)	-- (16.4)	-- (0.79)
SR 99 & Kent-Des Moines Rd	D	F (F)	119.6 (83)	1.24 (1.36)	F (F)	131.1 (91.6)	1.26 (1.37)	F (F)	134 (96.3)	1.27 (1.64)	F (F)	141.2 (102.4)	1.27 (1.78)
30th Ave S & Kent-Des Moines Rd	D	-- (B)	14.3	0.22	-- (B)	-- (13.9)	-- (0.21)	-- (B)	-- (13.9)	-- (0.21)	-- (B)	-- (13.9)	-- (0.21)
16th Ave S & S 240th St	D	-- (B)	11.8	0.64	-- (B)	-- (11.9)	-- (0.65)	-- (B)	-- (11.9)	-- (0.65)	-- (B)	-- (11.9)	-- (0.65)
28th Ave S/Highline College Driveway & S 240th St	D	-- (C)	17	0.29	-- (B)	-- (14.9)	-- (0.1)	-- (B)	-- (14.9)	-- (0.1)	-- (C)	-- (17.7)	-- (0.3)
S 240th St & Highline College Drop-Off Loop	D	-- (A)	8.4	0.02	-- (A)	-- (8.5)	-- (0.02)	-- (A)	-- (8.5)	-- (0.02)	-- (A)	-- (8.5)	-- (0.02)
Military Rd S & Kent-Des Moines Rd P&R	E	-- (D)	26.8	0.29	-- (D)	-- (27.3)	-- (0.3)	-- (D)	-- (27.3)	-- (0.3)	-- (D)	-- (27.3)	-- (0.3)
I-5 Southbound Ramps & Kent-Des Moines Rd	D	C (E)	23.7 (69.8)	0.67 (1.01)	C (E)	24.2 (78.8)	0.71 (1.06)	C (E)	24.4 (78.7)	0.71 (1.06)	C (E)	24.4 (78.8)	0.71 (1.06)

TABLE D-17

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

Intersection	LOS Standard[a],[b]	Alternative/Station Options											
		No Build			I-5			SR 99 East			At-Grade		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
I-5 Northbound Ramps & Kent-Des Moines Rd	D	C (B)	24.6 (12.9)	0.67 (0.45)	F (B)	52.2 (14)	0.92 (0.51)	F (B)	53 (14.1)	0.92 (0.52)	F (B)	53 (14.2)	0.92 (0.52)
I-5 Northbound Ramps & Kent-Des Moines Rd & I-5 Northbound On Bus	D	B (B)	15.9 (13.9)	0.77 (0.73)	B (B)	16.2 (14.1)	0.8 (0.74)	B (B)	16.2 (14.1)	0.8 (0.74)	B (B)	16.2 (14.1)	0.8 (0.74)
Military Rd S & Kent-Des Moines Rd	E	-- (E)	56.5	0.95	-- (E)	-- (59.8)	-- (0.98)	-- (E)	-- (59.8)	-- (0.98)	-- (E)	-- (59.8)	-- (0.98)
SR 99 & S 236th Lane	D	A (C)	8.9 (23)	0.06 (0.16)	B (C)	18.4 (28.9)	0.68 (0.67)	C (C)	21.8 (28)	0.73 (0.69)	B (D)	10.1 (25.8)	0.08 (0.18)
SR 99 & S 240th St	D	D (D)	40.7 (42)	0.8 (0.86)	D (D)	50.6 (38.1)	0.83 (0.93)	D (D)	47 (40)	0.82 (0.93)	F (E)	121.5 (63)	1.04 (0.99)
S 240th St & 30th Ave S	E	A (A)	9.4 (9.6)	0.08 (0.14)	A (B)	9.9 (10.2)	0.13 (0.24)	A (B)	9.6 (10)	0.13 (0.22)	B (B)	11.4 (12.3)	0.12 (0.21)
Military Rd S & S 240th St	E	-- (C)	18.7	0.12	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)	-- (C)	-- (18.9)	-- (0.12)
SR 99 & S 244th St	D	-- (B)	10.9	0.03	-- (B)	-- (11.9)	-- (0.07)	-- (B)	-- (11.8)	-- (0.07)	-- (B)	-- (12.3)	-- (0.08)
SR 99 & S 248th St	D	-- (C)	18.8	0.11	-- (C)	-- (21.3)	-- (0.13)	-- (C)	-- (21.3)	-- (0.13)	-- (C)	-- (21)	-- (0.12)
SR 99 & S 252nd St	D	-- (B)	15.8	0.69	-- (B)	-- (16.2)	-- (0.74)	-- (B)	-- (16.2)	-- (0.74)	-- (B)	-- (16.2)	-- (0.73)
SR 99 & Fred Meyer	D	-- (C)	24.3	0.7	-- (C)	-- (20.9)	-- (0.78)	-- (C)	-- (20.9)	-- (0.78)	-- (C)	-- (20.8)	-- (0.78)
SR 99 & S 260th St	D	-- (D)	38.3	0.82	-- (D)	-- (42.7)	-- (0.83)	-- (D)	-- (42.7)	-- (0.83)	-- (D)	-- (43.1)	-- (0.84)
Military Rd S & 259th Pl/S Reith Rd	E	-- (C)	34.9	0.68	-- (D)	-- (36.4)	-- (0.72)	-- (D)	-- (36.4)	-- (0.72)	-- (D)	-- (36.3)	-- (0.72)
16th Ave S & S 260th St	D	-- (C)	22.2	0.82	-- (C)	-- (24.2)	-- (0.84)	-- (C)	-- (24.2)	-- (0.84)	-- (C)	-- (24.2)	-- (0.84)

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-18

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

Intersection	LOS Standard[a,b]	Alternative					
		No Build			Star Lake		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave S and S 272nd St	D	-- (D)	47	0.94	-- (D)	-- (46)	-- (0.92)
SR 99 and S 264th St	D	-- (C)	15.1	0.04	-- (C)	-- (18.4)	-- (0.01)
SR 99 and S 268th St	D	-- (C)	22.4	0.22	-- (C)	-- (23.2)	-- (0.25)
SR 99 and S 272nd St	D	D (D)	44.1 (44.8)	0.89 (0.9)	D (D)	47.5 (40.9)	0.94 (0.91)
S Star Lake Rd and S 272nd St	E	-- (C)	22.9	0.87	-- (D)	-- (50.1)	-- (1.02)
26th Ave S and Star Lake P&R North Driveway	E	-- (A)	8.9	0.04	-- (A)	-- (10)	-- (0.03)
26th Ave S and Star Lake P&R South Driveway	E	-- (A)	9.9	0.15	-- (C)	-- (24.7)	-- (0.75)
S 272nd St and 26th Ave S	E	A (A)	6.1 (9.2)	0.36 (0.51)	C (C)	21.7 (24.7)	0.68 (0.75)
I-5 Southbound Ramps and S 272nd St	D	C (D)	27.8 (42.5)	0.53 (0.93)	C (D)	31 (54.1)	0.56 (1.02)
I-5 Northbound Ramps and S 272nd St	D	E (D)	65.1 (38.6)	0.94 (0.75)	F (D)	105.7 (53.1)	1.1 (0.75)
Military Rd S and S 272nd St	E	-- (D)	35	0.65	-- (D)	-- (35.6)	-- (0.68)
SR 99 and S 276th St	D	B (B)	12.2 (18)	0.58 (0.63)	B (B)	12.5 (16)	0.61 (0.66)
SR 99 and Crestview Dwy	D	-- (B)	14.5	0.13	-- (C)	-- (15.1)	-- (0.15)
SR 99 and 16th Ave S	D	-- (C)	19.2	0.56	-- (C)	-- (19.2)	-- (0.56)
SR 99 and S 283rd Pl	D	-- (C)	15.7	0.26	-- (C)	-- (16.5)	-- (0.29)
SR 99 and S 288th St	D	-- (D)	46.5	0.72	-- (D)	-- (48.3)	-- (0.74)
SR 99 and 29300 Block U-turn	D	-- (A)	0	0	-- (A)	-- (0)	-- (0)
SR 99 and Dash Point Rd	D	-- (C)	21.4	0.7	-- (C)	-- (22.2)	-- (0.74)

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-19

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

Intersection	LOS Standard[a,b]	Alternative/Station Options					
		No Build			SR 99 to I-5		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 & S 200th St	E	-- (D)	50.5	0.83	-- (D)	-- (50.5)	-- (0.83)
SR 99 & S 202nd St	E	-- (B)	10.1	0.02	-- (B)	-- (10.1)	-- (0.02)
SR 99 & S 204th St	E	-- (B)	12.7	0.45	-- (B)	-- (12.7)	-- (0.45)
SR 99 & S 208th St	E	-- (B)	14.8	0.51	-- (B)	-- (14.8)	-- (0.51)
SR 99 & S 211th St	E	-- (B)	11.2	0.03	-- (B)	-- (11.2)	-- (0.03)
Military Rd S & S 216th St	E	-- (D)	50.2	0.93	-- (D)	-- (50.2)	-- (0.93)
SR 99 & S 212th St	E	-- (A)	4.3	0.4	-- (A)	-- (4.3)	-- (0.4)
24th Ave S & S 216th St	E	-- (C)	31.2	0.87	-- (C)	-- (31.2)	-- (0.87)
SR 99 & S 216th St	D	-- (E)	57.1	1.07	-- (E)	-- (57.1)	-- (1.07)
S 220th St & SR 99	D	-- (B)	13.5	0.76	-- (B)	-- (16.7)	-- (0.77)
SR 99 & S 224th St	D	-- (B)	15.6	0.67	-- (B)	-- (17.6)	-- (0.67)
SR 99 & S 226th St	D	-- (B)	14.4	0.16	-- (B)	-- (14.4)	-- (0.16)
SR 99 & Pedestrian crossing	D	-- (A)	5.4	0.48	-- (A)	-- (2.1)	-- (0.48)
25th Ave S/24th Ave S & Kent-Des Moines Rd	D	-- (B)	15.5	0.76	-- (B)	-- (16.4)	-- (0.79)
SR 99 & Kent-Des Moines Rd	D	F (F)	119.6 (83)	1.24 (1.36)	F (F)	134 (96.7)	1.27 (1.66)
30th Ave S & Kent-Des Moines Rd	D	-- (B)	14.3	0.22	-- (B)	-- (13.9)	-- (0.21)
16th Ave S & S 240th St	D	-- (B)	11.8	0.64	-- (B)	-- (11.9)	-- (0.65)
28th Ave S/Highline College Driveway & S 240th St	D	-- (C)	17	0.29	-- (B)	-- (14.9)	-- (0.1)
S 240th St & Highline College Drop-Off Loop	D	-- (A)	8.4	0.02	-- (A)	-- (8.5)	-- (0.02)
Military Rd S & Kent-Des Moines Rd P&R	E	-- (D)	26.8	0.29	-- (D)	-- (27.3)	-- (0.3)
I-5 Southbound Ramps & Kent-Des Moines Rd	D	C (E)	23.7 (69.8)	0.67 (1.01)	C (E)	24.4 (79.9)	0.71 (1.06)
I-5 Northbound Ramps & Kent-Des Moines Rd	D	C (B)	24.6 (12.9)	0.67 (0.45)	F (B)	53 (14.2)	0.92 (0.52)
I-5 Northbound Ramps & Kent-Des Moines Rd & I-5 Northbound On Bus	D	B (B)	15.9 (13.9)	0.77 (0.73)	B (B)	16.2 (14.1)	0.8 (0.74)
Military Rd S & Kent-Des Moines Rd	E	-- (E)	56.5	0.95	-- (E)	-- (59.8)	-- (0.98)
SR 99 & S 236th Lane	D	A (C)	8.9 (23)	0.06 (0.16)	B (C)	19.6 (27.9)	0.73 (0.67)
SR 99 & S 240th St	D	D (D)	40.7 (42)	0.8 (0.86)	D (D)	53.4 (41.4)	0.84 (0.94)
S 240th St & 30th Ave S	E	A (A)	9.4 (9.6)	0.08 (0.14)	A (A)	9.5 (9.8)	0.13 (0.24)

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	LOS Standard[a,b]	Alternative/Station Options					
		No Build			SR 99 to I-5		
		LOS	Delay	V/C	LOS	Delay	V/C
Military Rd S & S 240th St	E	-- (C)	18.7	0.12	-- (C)	-- (18.9)	-- (0.12)
SR 99 & S 244th St	D	-- (B)	10.9	0.03	-- (B)	-- (11.6)	-- (0.07)
SR 99 & S 248th St	D	-- (C)	18.8	0.11	-- (C)	-- (21.3)	-- (0.13)
SR 99 & S 252nd St	D	-- (B)	15.8	0.69	-- (B)	-- (16.3)	-- (0.74)
SR 99 & Fred Meyer	D	-- (C)	24.3	0.7	-- (C)	-- (20.9)	-- (0.78)
SR 99 & S 260th St	D	-- (D)	38.3	0.82	-- (D)	-- (42.7)	-- (0.83)
Military Rd S & 259th Pl/S Reith Rd	E	-- (C)	34.9	0.68	-- (D)	-- (36.4)	-- (0.72)
16th Ave S & S 260th St	D	-- (C)	22.2	0.82	-- (C)	-- (24.2)	-- (0.84)

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; -- = 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	LOS Standard[a,b]	Alternative					
		No Build			SR 99 to I-5		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave S and S 272nd St	D	-- (D)	47	0.94	-- (D)	-- (46)	-- (0.92)
SR 99 and S 264th St	D	-- (C)	15.1	0.04	-- (C)	-- (18.4)	-- (0.01)
SR 99 and S 268th St	D	-- (C)	22.4	0.22	-- (C)	-- (23.2)	-- (0.25)
SR 99 and S 272nd St	D	D (D)	44.1 (44.8)	0.89 (0.9)	D (D)	47.5 (40.9)	0.94 (0.91)
S Star Lake Rd and S 272nd St	E	-- (C)	22.9	0.87	-- (D)	-- (50.1)	-- (1.02)
26th Ave S and Star Lake P&R North Driveway	E	-- (A)	8.9	0.04	-- (A)	-- (10)	-- (0.03)
26th Ave S and Star Lake P&R South Driveway	E	-- (A)	9.9	0.15	-- (C)	-- (24.7)	-- (0.75)
S 272nd St and 26th Ave S	E	A (A)	6.1 (9.2)	0.36 (0.51)	C (C)	21.7 (24.7)	0.68 (0.75)
I-5 Southbound Ramps and S 272nd St	D	C (D)	27.8 (42.5)	0.53 (0.93)	C (D)	31 (54.1)	0.56 (1.02)
I-5 Northbound Ramps and S 272nd St	D	E (D)	65.1 (38.6)	0.94 (0.75)	F (D)	105.7 (53.1)	1.1 (0.75)
Military Rd S and S 272nd St	E	-- (D)	35	0.65	-- (D)	-- (35.6)	-- (0.68)
SR 99 and S 276th St	D	B (B)	12.2 (18)	0.58 (0.63)	B (B)	12.5 (16)	0.61 (0.66)
SR 99 and Crestview Dwy	D	-- (B)	14.5	0.13	-- (C)	-- (15.1)	-- (0.15)
SR 99 and 16th Ave S	D	-- (C)	19.2	0.56	-- (C)	-- (19.2)	-- (0.56)
SR 99 and S 283rd Pl	D	-- (C)	15.7	0.26	-- (C)	-- (16.5)	-- (0.29)
SR 99 and S 288th St	D	-- (D)	46.5	0.72	-- (D)	-- (48.3)	-- (0.74)
SR 99 and 29300 Block Dwy	D	-- (A)	0	0	-- (A)	-- (0)	-- (0)
SR 99 and Dash Point Rd	D	-- (C)	21.4	0.7	-- (C)	-- (22.2)	-- (0.74)

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-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,b]	Alternative/Station Options					
		No Build			I-5 to SR 99		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 & S 200th St	E	-- (D)	50.5	0.83	-- (D)	-- (50.5)	-- (0.83)
SR 99 & S 202nd St	E	-- (B)	10.1	0.02	-- (B)	-- (10.4)	-- (0.02)
SR 99 & S 204th St	E	-- (B)	12.7	0.45	-- (B)	-- (12.7)	-- (0.45)
SR 99 & S 208th St	E	-- (B)	14.8	0.51	-- (B)	-- (14.8)	-- (0.51)
SR 99 & S 211th St	E	-- (B)	11.2	0.03	-- (B)	-- (11.2)	-- (0.03)
Military Rd S & S 216th St	E	-- (D)	50.2	0.93	-- (D)	-- (50.2)	-- (0.93)
SR 99 & S 212th St	E	-- (A)	4.3	0.4	-- (A)	-- (4.3)	-- (0.4)
24th Ave S & S 216th St	E	-- (C)	31.2	0.87	-- (C)	-- (31.2)	-- (0.87)
SR 99 & S 216th St	D	-- (E)	57.1	1.07	-- (E)	-- (57.2)	-- (1.07)
S 220th St & SR 99	D	-- (B)	13.5	0.76	-- (B)	-- (16.8)	-- (0.78)
SR 99 & S 224th St	D	-- (B)	15.6	0.67	-- (B)	-- (17.8)	-- (0.67)
SR 99 & S 226th St	D	-- (B)	14.4	0.16	-- (B)	-- (14.5)	-- (0.16)
SR 99 & Pedestrian crossing	D	-- (A)	5.4	0.48	-- (A)	-- (2.1)	-- (0.48)
25th Ave S/24th Ave S & Kent-Des Moines Rd	D	-- (B)	15.5	0.76	-- (B)	-- (16.4)	-- (0.79)
SR 99 & Kent-Des Moines Rd	D	F (F)	119.6 (83)	1.24 (1.36)	F (F)	131.3 (90.7)	1.27 (1.36)
30th Ave S & Kent-Des Moines Rd	D	-- (B)	14.3	0.22	-- (B)	-- (13.9)	-- (0.21)
16th Ave S & S 240th St	D	-- (B)	11.8	0.64	-- (B)	-- (11.9)	-- (0.65)
28th Ave S/Highline College Driveway & S 240th St	D	-- (C)	17	0.29	-- (B)	-- (14.9)	-- (0.1)
S 240th St & Highline College Drop-Off Loop	D	-- (A)	8.4	0.02	-- (A)	-- (8.5)	-- (0.02)
Military Rd S & Kent-Des Moines Rd P&R	E	-- (D)	26.8	0.29	-- (D)	-- (27.3)	-- (0.3)
I-5 Southbound Ramps & Kent-Des Moines Rd	D	C (E)	23.7 (69.8)	0.67 (1.01)	C (E)	24.4 (78.8)	0.71 (1.06)
I-5 Northbound Ramps & Kent-Des Moines Rd	D	C (B)	24.6 (12.9)	0.67 (0.45)	F (B)	53 (14.1)	0.92 (0.52)
I-5 Northbound Ramps & Kent-Des Moines Rd & I-5 Northbound On Bus	D	B (B)	15.9 (13.9)	0.77 (0.73)	B (B)	16.2 (14.1)	0.8 (0.74)
Military Rd S & Kent-Des Moines Rd	E	-- (E)	56.5	0.95	-- (E)	-- (59.8)	-- (0.98)
SR 99 & S 236th Lane	D	A (C)	8.9 (23)	0.06 (0.16)	C (C)	23.7 (27.8)	0.73 (0.69)
SR 99 & S 240th St	D	D (D)	40.7 (42)	0.8 (0.86)	D (D)	43.3 (40.2)	0.82 (0.93)
S 240th St & 30th Ave S	E	A (A)	9.4 (9.6)	0.08 (0.14)	A (A)	9.8 (9.8)	0.12 (0.21)
Military Rd S & S 240th St	E	-- (C)	18.7	0.12	-- (C)	-- (18.9)	-- (0.12)
SR 99 & S 244th St	D	-- (B)	10.9	0.03	-- (B)	-- (11.8)	-- (0.07)

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,b]	Alternative/Station Options					
		No Build			I-5 to SR 99		
		LOS	Delay	V/C	LOS	Delay	V/C
SR 99 & S 248th St	D	-- (C)	18.8	0.11	-- (C)	-- (21.3)	-- (0.13)
SR 99 & S 252nd St	D	-- (B)	15.8	0.69	-- (B)	-- (16.1)	-- (0.74)
SR 99 & Fred Meyer	D	-- (C)	24.3	0.7	-- (C)	-- (20.9)	-- (0.78)
SR 99 & S 260th St	D	-- (D)	38.3	0.82	-- (D)	-- (42.7)	-- (0.83)
Military Rd S & 259th Pl/S Reith Rd	E	-- (C)	34.9	0.68	-- (D)	-- (36.4)	-- (0.72)
16th Ave S & S 260th St	D	-- (C)	22.2	0.82	-- (C)	-- (24.2)	-- (0.84)

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; -- = not analyzed

TABLE D-22

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

Intersection	LOS Standard[a,b]	Alternative					
		No Build			I-5 to SR 99		
		LOS	Delay	V/C	LOS	Delay	V/C
16th Ave S and S 272nd St	D	-- (D)	47	0.94	-- (D)	-- (45.5)	-- (0.91)
SR 99 and S 264th St	D	-- (C)	15.1	0.04	-- (C)	-- (18.4)	-- (0.01)
SR 99 and S 268th St	D	-- (C)	22.4	0.22	-- (C)	-- (23.4)	-- (0.26)
SR 99 and S 272nd St	D	D (D)	44.1 (44.8)	0.89 (0.9)	D (D)	39.4 (45.2)	0.95 (0.92)
S Star Lake Rd and S 272nd St	E	-- (C)	22.9	0.87	-- (D)	-- (42.6)	-- (1)
26th Ave S and Star Lake P&R North Driveway	E	-- (A)	8.9	0.04	-- (A)	-- (8.9)	-- (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 (A)	6.1 (9.2)	0.36 (0.51)	A (A)	6.1 (8.9)	0.43 (0.54)
I-5 Southbound Ramps and S 272nd St	D	C (D)	27.8 (42.5)	0.53 (0.93)	C (E)	32 (75.1)	0.57 (1.05)
I-5 Northbound Ramps and S 272nd St	D	E (D)	65.1 (38.6)	0.94 (0.75)	F (E)	91.7 (57.3)	1.06 (0.78)
Military Rd S and S 272nd St	E	-- (D)	35	0.65	-- (D)	-- (36.1)	-- (0.69)
SR 99 and S 276th St	D	B (B)	12.2 (18)	0.58 (0.63)	E (B)	66.3 (19.4)	0.89 (0.82)
SR 99 and Crestview Dwy	D	-- (B)	14.5	0.13	-- (C)	-- (15.2)	-- (0.15)
SR 99 and 16th Ave S	D	-- (C)	19.2	0.56	-- (D)	-- (25.9)	-- (0.66)
SR 99 and S 283rd Pl	D	-- (C)	15.7	0.26	-- (C)	-- (16.7)	-- (0.3)
SR 99 and S 288th St	D	-- (D)	46.5	0.72	-- (D)	-- (48.6)	-- (0.74)
SR 99 and 29300 Block U-turn	D	-- (A)	0	0	-- (A)	-- (0)	-- (0)
SR 99 and Dash Point Rd	D	-- (C)	21.4	0.7	-- (C)	-- (22.5)	-- (0.75)

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; -- = not analyzed

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Appendix E

I-5 Ramp Terminal Queue Length Results

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TABLE E-1

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

Intersection ID	Effective Storage	Peak Hour	SR 99 Alternative Design Options									I-5 Alternative Design Options					I-5 to SR 99	SR 99 to I-5
			SR 99 Alternative	Highline College	SR 99 Median	SR 99 East	S 216th St West	S 216th St East	S 260th St West	S 260th St East	FWTC SR 99	I-5 Alternative	SR 99 East	At-Grade	FWTC I-5	FWTC S 320th P&R		
Kent-Des Moines SB Off-Ramp	1,200	AM	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240
		PM	780	780	780	780	780	750	780	750	780	780	780	780	780	780	780	780
Kent-Des Moines NB to WB Off-Ramp	815	AM	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
		PM	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Kent-Des Moines NB to EB Off-Ramp	1,285	AM	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510
		PM	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340
S 272nd SB Off-Ramp	1,175	AM	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	180
		PM	710	710	710	710	710	710	710	710	710	700	700	700	700	700	710	700
S 272nd NB Off-Ramp	1,185	AM	600	600	410	600	600	410	600	410	410	600	600	600	600	600	600	600
		PM	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
S 320th SB Off-Ramp	1,600	AM	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
		PM	400	400	400	400	400	400	400	400	400	400	400	400	400	410	400	400
S 320th NB Off-Ramp	885	AM	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380
		PM	510	510	510	510	510	510	510	510	510	510	510	510	510	520	510	510

Notes:
Queue length results reported are Year 2035 95th percentile values rounded to the nearest 10.
Effective storage length does not include ramp deceleration length.
NB = northbound; SB = southbound

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

Intersection ID	Effective Storage	Peak Hour	Kent/Des Moines Station Interim Terminus Conditions									S 272nd Station Interim Terminus Conditions	
			SR 99 Alternative Station Options				I-5 Alternative Station Options						
			SR 99 Alternative	Highline College	SR 99 Median	SR 99 East	I-5 Alternative	SR 99 East	At-Grade	I-5 to SR 99	SR 99 to I-5	SR 99	I-5
Kent-Des Moines Rd SB Off-Ramp	1,200	AM	270	270	270	270	260	260	260	260	260	240	240
		PM	780	780	780	780	800	800	800	800	780	780	780
Kent-Des Moines Rd NB to WB Off-Ramp	815	AM	290	290	290	290	270	270	270	270	290	160	150
		PM	80	80	80	80	80	80	80	80	80	60	60
Kent-Des Moines Rd NB to EB Off-Ramp	1,285	AM	510	510	510	510	500	500	500	500	500	510	510
		PM	340	340	340	340	340	340	340	340	340	340	340
S 272nd Street SB Off-Ramp	1,175	AM	170	170	170	170	170	170	170	170	170	150	160
		PM	680	680	680	680	680	680	680	680	680	720	720
S 272nd Street NB Off-Ramp	1,185	AM	570	570	570	570	570	570	570	570	570	750	710
		PM	240	240	240	240	240	240	240	240	240	240	240
S 320th Street SB Off-Ramp	1,600	AM	120	120	120	120	120	120	120	120	120	120	120
		PM	390	390	390	390	390	390	390	390	390	750	390
S 320th Street NB Off-Ramp	885	AM	360	360	360	360	360	360	360	360	360	360	360
		PM	440	440	440	440	440	440	440	440	440	440	740

Notes:
Queue length results reported are Year 2035 95th percentile values rounded to the nearest 10.
Effective storage length does not include ramp deceleration length.
NB = northbound; SB = southbound

TABLE E-3
Year 2035 Mitigated Build Interchange Queue Lengths: Full Length Alternatives

Intersection ID	Effective Storage	Peak Hour	SR 99 Alternative Station Options									I-5 Alternative Station Options					I-5 to SR 99	SR 99 to I-5
			I-5 Alternative	Highline College	SR 99 Median	SR 99 East	S 216th St West	S 216th St East	S 260th St West	S 260th St East	FWTC SR 99	SR 99 Alternative	SR 99 East	At-Grade	FWTC I-5	FWTC S 320th P&R		
Kent-Des Moines Rd SB Off-Ramp	1,200	AM	230	240	240	240	230	240	230	240	240	240	240	230	230	230	230	240
		PM	760	760	760	760	750	750	750	750	760	750	760	750	750	750	750	760
Kent-Des Moines NB to WB Off-Ramp	815	AM	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
		PM	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Kent-Des Moines NB to EB Off-Ramp	1,285	AM	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510
		PM	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340
S 272nd SB Off-Ramp	1,175	AM	170	170	170	170	170	170	170	170	170	180	180	180	180	180	170	180
		PM	710	710	710	710	710	710	710	710	710	700	700	700	700	700	710	700
S 272nd NB Off-Ramp	1,185	AM	410	390	410	410	410	410	410	410	410	390	390	390	390	390	410	390
		PM	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
S 320th SB Off-Ramp	1,600	AM	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
		PM	400	400	400	400	400	400	400	400	400	400	400	400	400	410	400	400
S 320th NB Off-Ramp	885	AM	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380
		PM	510	510	510	510	510	510	510	510	510	510	510	510	510	520	510	510

Notes:
Queue length results reported are Year 2035 95th percentile values rounded to the nearest 10.
Effective storage length does not include ramp deceleration length.
NB = northbound; SB = southbound

TABLE E-4
Year 2035 Mitigated Build Interchange Queue Lengths: Interim Terminus Conditions

Intersection ID	Effective Storage	Peak Hour	Kent/Des Moines Station Interim Terminus Conditions									S 272nd Station Interim Terminus Conditions	
			SR 99 Alternative Station Options				I-5 Alternative Station Options						
			SR 99 Alternative	Highline College	SR 99 Median	SR 99 East	I-5 Alternative	SR 99 East	At-Grade	I-5 to SR 99	SR 99 to I-5	SR 99	I-5
Kent-Des Moines Rd SB Off-Ramp	1,200	AM	270	270	270	270	260	250	250	250	260	240	230
		PM	780	780	780	780	770	770	770	770	780	770	750
Kent-Des Moines Rd NB to WB Off-Ramp	815	AM	60	60	60	60	60	60	60	60	60	160	150
		PM	30	30	30	30	30	30	30	30	30	60	60
Kent-Des Moines Rd NB to EB Off-Ramp	1,285	AM	510	510	510	510	500	500	500	500	500	510	510
		PM	340	340	340	340	340	340	340	340	340	340	340
S 272nd Street SB Off-Ramp	1,175	AM	170	170	170	170	170	170	170	170	170	170	150
		PM	680	680	680	680	680	680	680	680	680	720	720
S 272nd Street NB Off-Ramp	1,185	AM	570	570	570	570	570	570	570	570	570	410	370
		PM	240	240	240	240	240	240	240	240	240	240	220
S 320th Street SB Off-Ramp	1,600	AM	120	120	120	120	120	120	120	120	120	120	120
		PM	390	390	390	390	390	390	390	390	390	750	390
S 320th Street NB Off-Ramp	885	AM	360	360	360	360	360	360	360	360	360	360	360
		PM	440	440	440	440	440	440	440	440	440	440	740

Notes:
Queue length results reported are Year 2035 95th percentile values rounded to the nearest 10.
Effective storage length does not include ramp deceleration length.
NB = northbound; SB = southbound

Appendix F

Pedestrian Level of Service

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TABLE F-1

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

Station Area	Intersection	Int. Leg	Pedestrian LOS Scores				
			No Build	SR 99	I-5	SR 99 to I-5	I-5 to SR 99
Kent/Des Moines	SR 99/ S 236th Lane	North	-	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**
		South	-	a/B/**C**	a/A/**C**	a/A/**C**	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**
	SR 99/ S 240th Street	North	a/A/**C**	a/A/**C**	a/A/**C**	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/B/**B**	a/A/**B**	a/A/**B**	a/A/**B**
S 272nd Redondo	SR 99/S 276th Street	North	a/A/**C**	a/A/**C**	-	-	a/A/**C**
		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/**B**	a/A/**B**	-
		East	a/A/**C**	-	a/A/**C**	a/A/**C**	-
		West	a/A/**C**	-	a/A/**C**	a/A/**C**	-
Federal Way Transit Center	23rd Avenue S & S 317th Street	North	a/A/**B**	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**	a/A/**B**
		West	a/A/**A**	a/A/**A**	a/A/**A**	a/A/**A**	a/A/**A**
	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**

Notes:
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.
- = 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	Int. Leg	Pedestrian LOS Scores					
				SR 99 Options			I-5 Options	
			No Build	Highline College	SR 99 East	SR 99 Median	SR 99 East	At-Grade
Kent/Des Moines	SR 99/ S 236th Lane	North	-	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	-
		South	-	a/A/**C**	a/A/**C**	a/C/**C**	a/A/**C**	-
		East	-	a/A/**A**	a/A/**B**	a/A/**B**	a/A/**B**	-
		West	-	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/**C**	a/A/**C**	a/A/**C**	a/A/**C**
		South	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/B/**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/A/**B**	a/A/**B**	a/A/**B**

Notes:
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.
- = 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	Int. Leg	Pedestrian LOS Scores			
				SR 99 Opt.	I-5 Options	
			No Build	SR 99	I-5	S 320th Street
Federal Way Transit Center	20th Avenue S & S 316th Street	North	a/A/**B**	a/A/**B**	-	-
		South	a/A/**B**	a/A/**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/**C**	a/A/**C**	-	-
		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/A/**B**	-
		West	a/A/**A**	-	a/A/**A**	-
	23rd Avenue S & S 320th Street	North	a/A/**C**	-	a/A/**C**	-
		South	a/A/**C**	-	a/A/**C**	-
		East	a/A/**B**	-	a/A/**B**	-
		West	a/A/**B**	-	a/A/**B**	-
	25rd Avenue S & S 320th Street	North	a/A/**C**	-	a/A/**C**	-
		South	a/A/**C**	-	a/A/**C**	-
		East	a/A/**B**	-	a/A/**B**	-
		West	a/A/**B**	-	a/A/**B**	-
	23rd Avenue S & S 322nd Street	North	a/A/**B**	-	-	a/A/**C**
		South	a/A/**B**	-	-	a/A/**B**
		East	a/A/**B**	-	-	a/A/**C**
		West	a/A/**B**	-	-	a/A/**B**

Notes:
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.
- = 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	Int. 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/**C**	a/A/**C**	a/A/**C**	-	-
		South	a/A/**C**	a/C/**D**	a/C/**D**	-	-
		East	a/A/**B**	a/A/**B**	a/A/**B**	-	-
		West	a/A/**C**	a/A/**C**	a/A/**C**	-	-
S 260th Street	SR 99/ S 260th Street	North	a/A/**C**	-	-	a/A/**C**	a/A/**C**
		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/A/**B**

Notes:
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.
- = 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	Int. Leg	Pedestrian LOS Scores							
				SR 99 Options			I-5 Options		SR 99 to I-5	I-5 to SR 99
			No Build	Highline College	SR 99 East	SR 99 Median	SR 99 East	At-Grade	30th Ave East	30th Ave West
Kent/ Des Moines	SR 99/ S 236th Lane	North	-	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	-	a/A/**C**	a/A/**C**
		South	-	b/C/**C**	a/A/**C**	c/D/**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/A/**B**	d/C/**B**	a/A/**B**	-	a/A/**B**	a/A/**B**
	SR 99/ S 240th Street	North	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**
		South	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/A/**C**	a/B/**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/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**	a/A/**B**

Notes:
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.
- = values that are not applicable at that location or condition.

TABLE F-6

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

Station	Intersection	Int. Leg	Pedestrian LOS Scores		
			No Build	SR 99	I-5
Kent/Des Moines	SR 99/ S 236th Lane	North	-	a/A/**C**	a/A/**C**
		South	-	b/C/**C**	a/A/**C**
		East	-	a/A/**B**	a/A/**B**
		West	-	c/C/**B**	a/A/**B**
	SR 99/ S 240th Street	North	a/A/**C**	a/A/**C**	a/A/**C**
		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/A/**B**
S 272nd Redondo	SR 99/ S 276th Street	North	a/A/**C**	a/A/**C**	-
		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/**B**
		East	a/A/**C**	-	a/A/**C**
		West	a/A/**C**	-	a/A/**C**

Notes:
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.
- = values that are not applicable at that location or condition.

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Appendix G

Construction Staging Areas and Haul Route Assumptions

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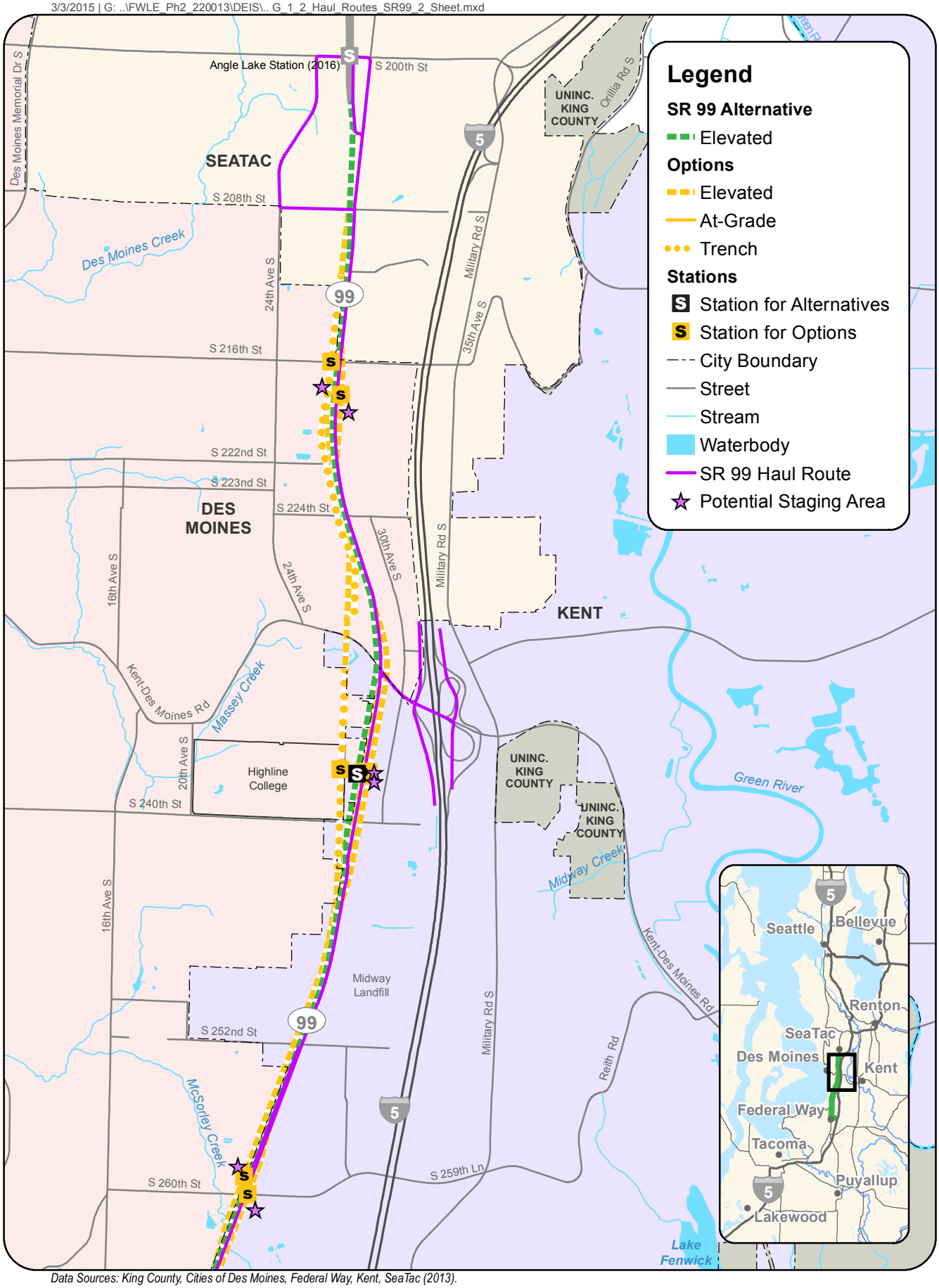


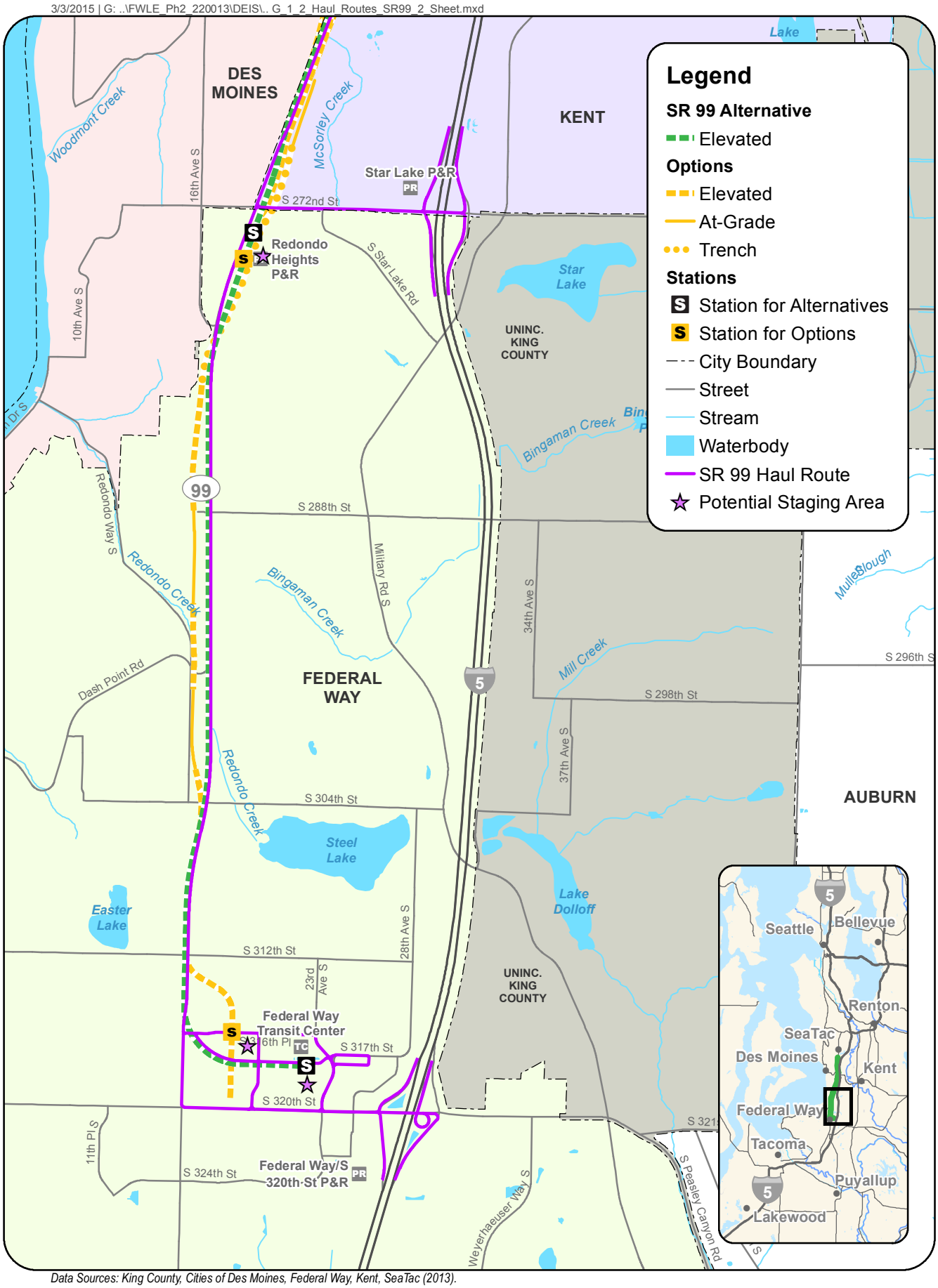
Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac (2013).

N

0 0.25 0.5 1 Miles

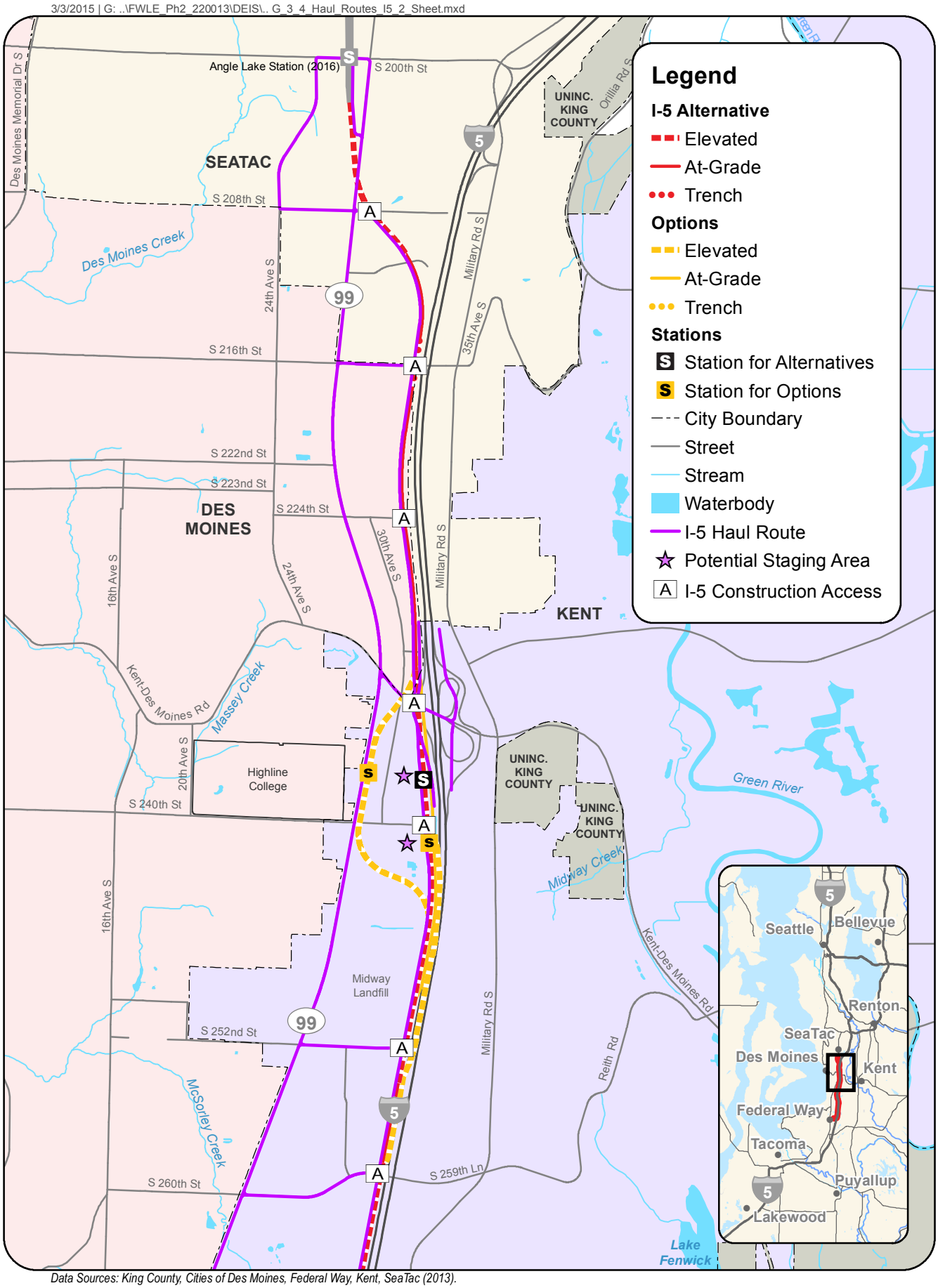
Appendix G-1
SR 99 Truck Hauling Routes (North)

Federal Way Link Extension



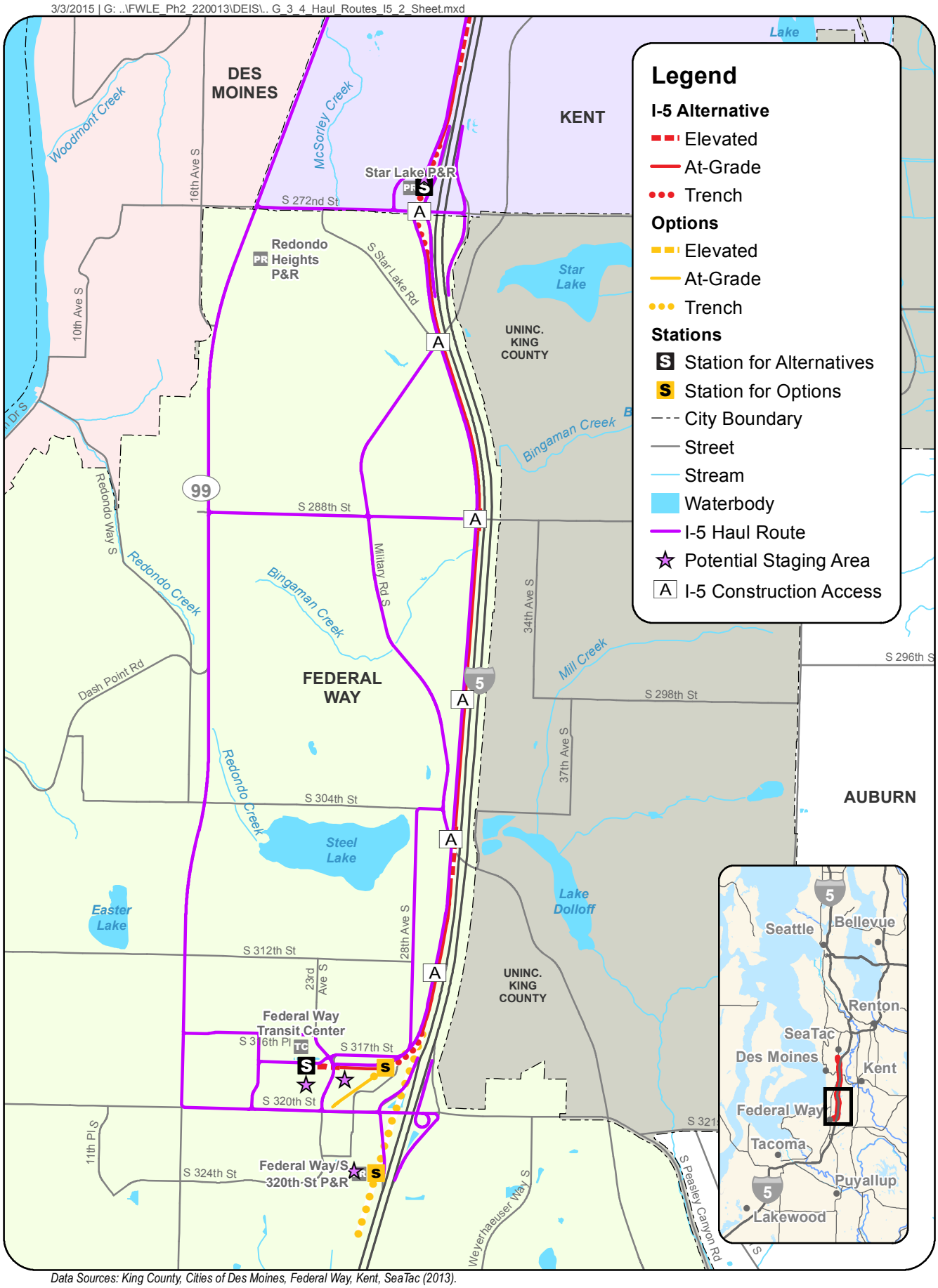
Appendix G-2
SR 99 Truck Hauling Routes (South)

Federal Way Link Extension



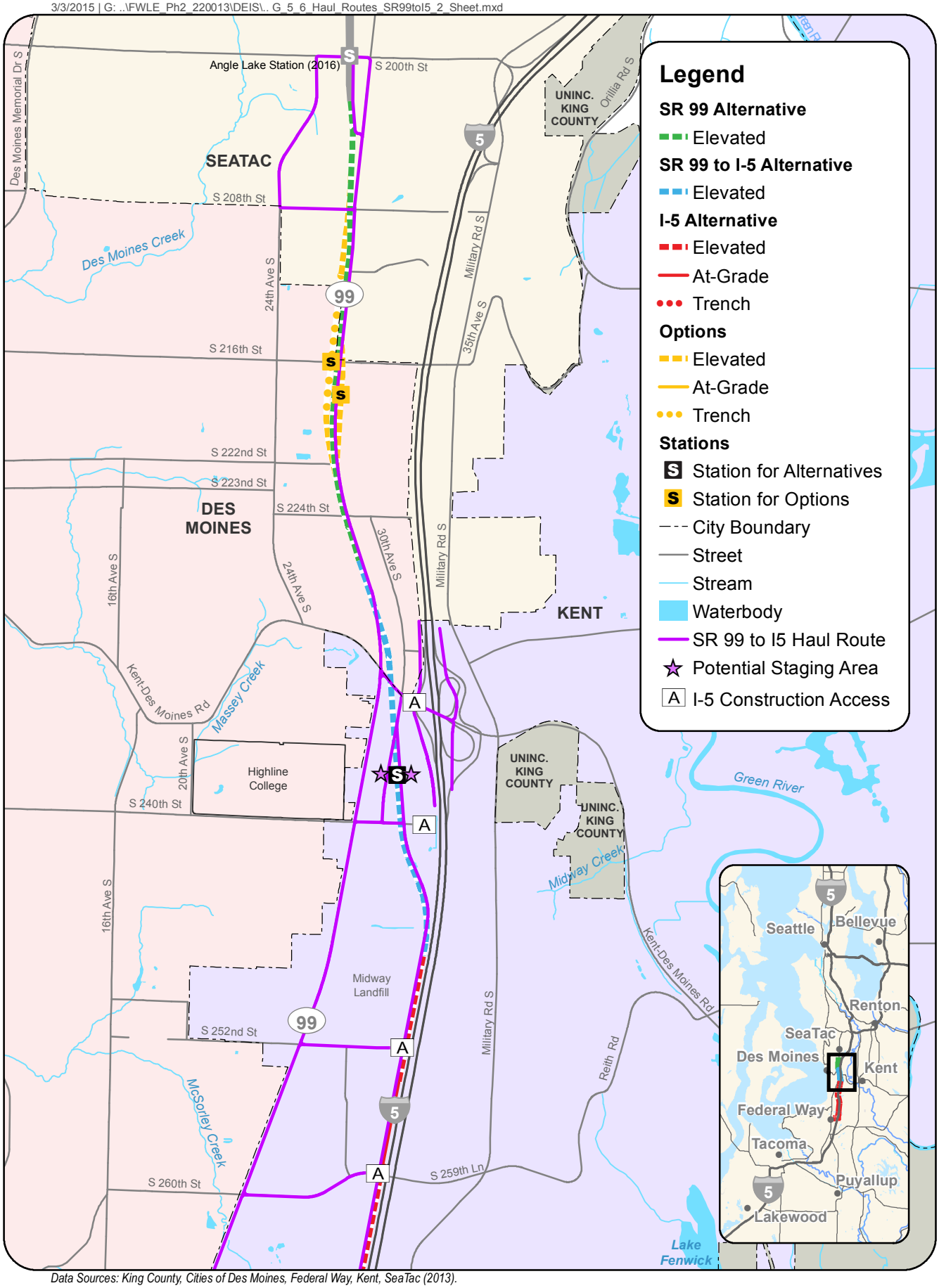
Appendix G-3
I-5 Truck Hauling Routes (North)

Federal Way Link Extension



Appendix G-4
I-5 Truck Hauling Routes (South)

Federal Way Link Extension



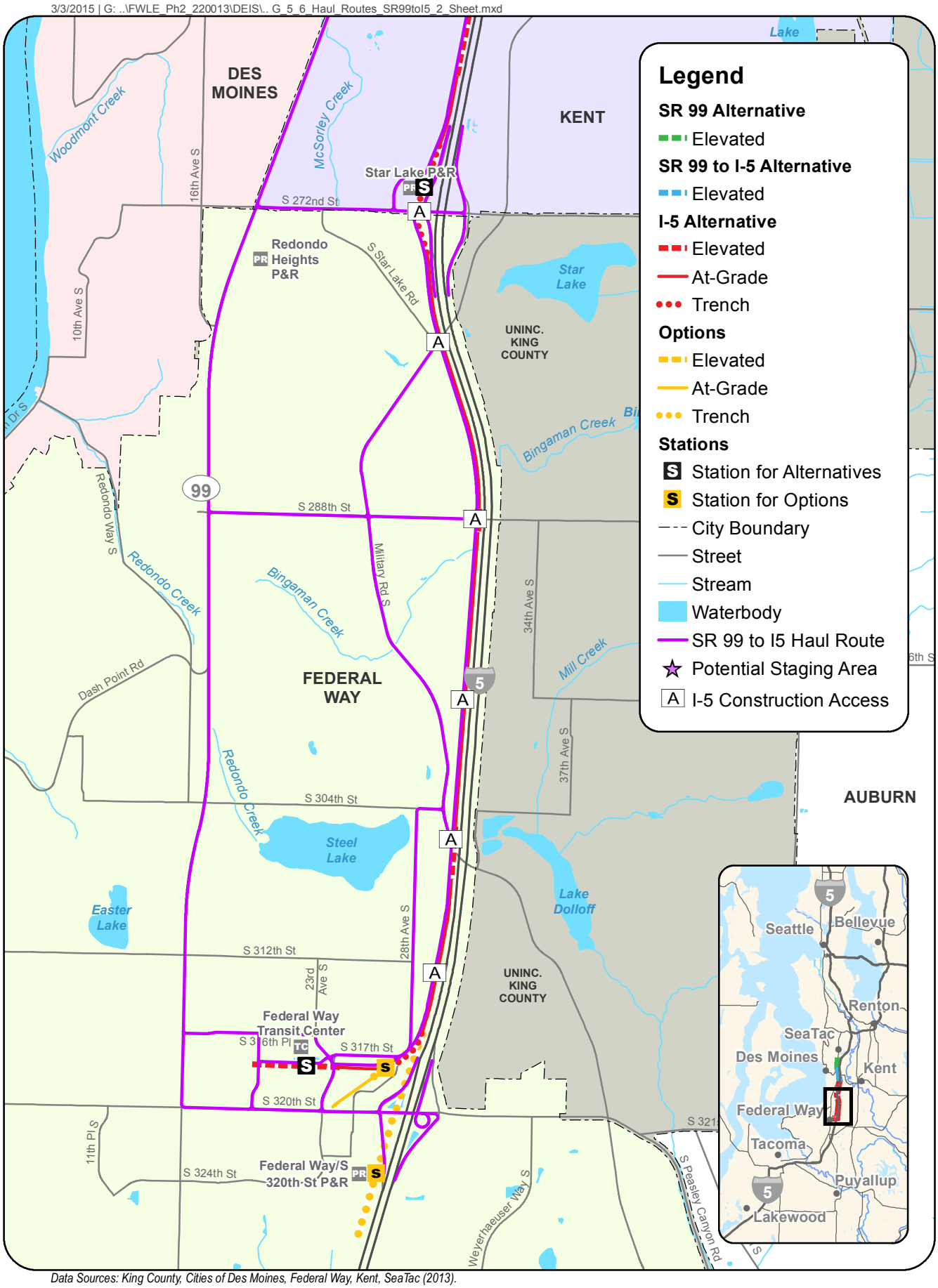
Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac (2013).

N

0 0.25 0.5 1 Miles

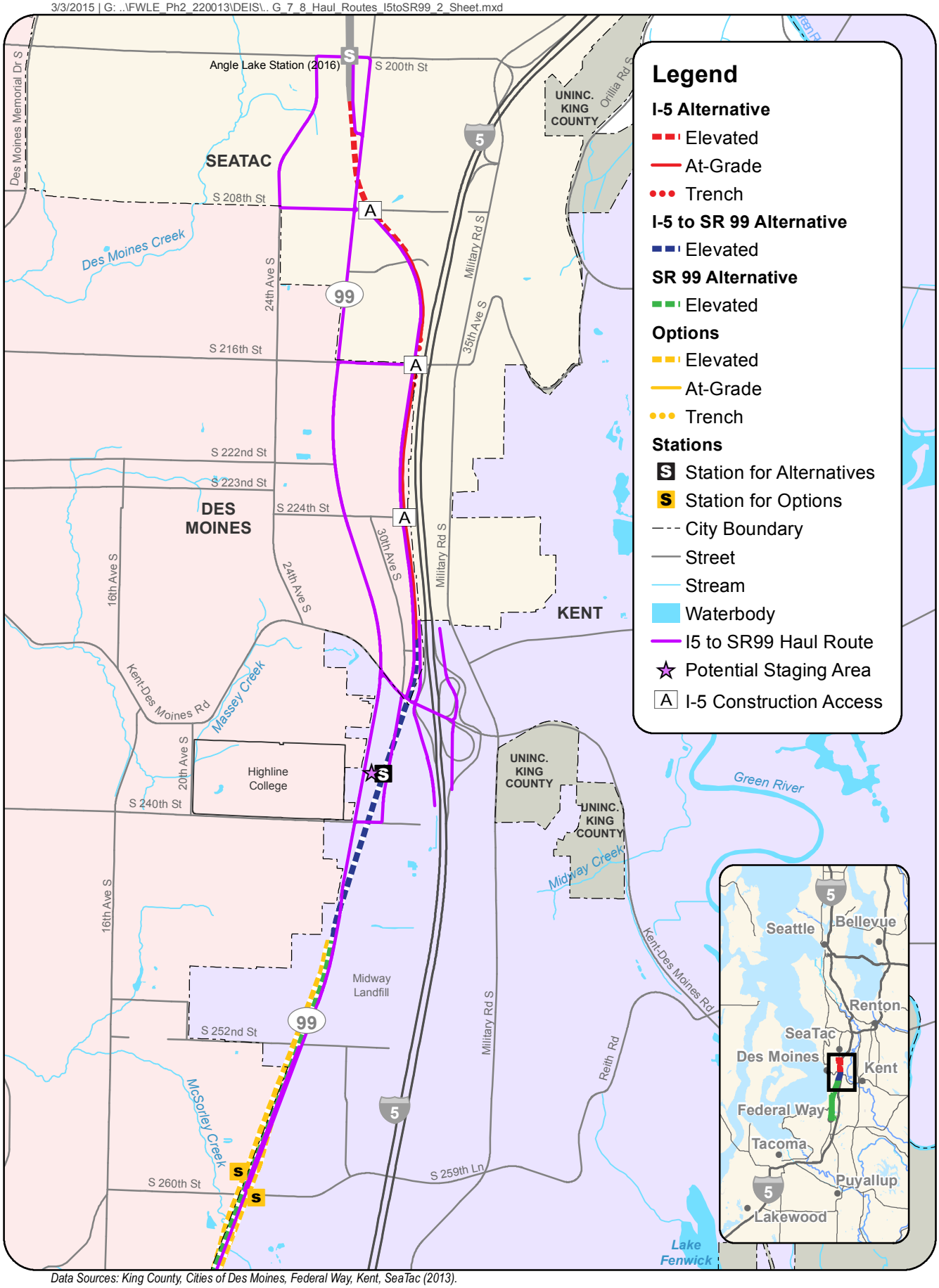
Appendix G-5
SR 99 To I-5 Truck Hauling Routes (North)

Federal Way Link Extension



Appendix G-6
SR 99 To I-5 Truck Hauling Routes (South)

Federal Way Link Extension



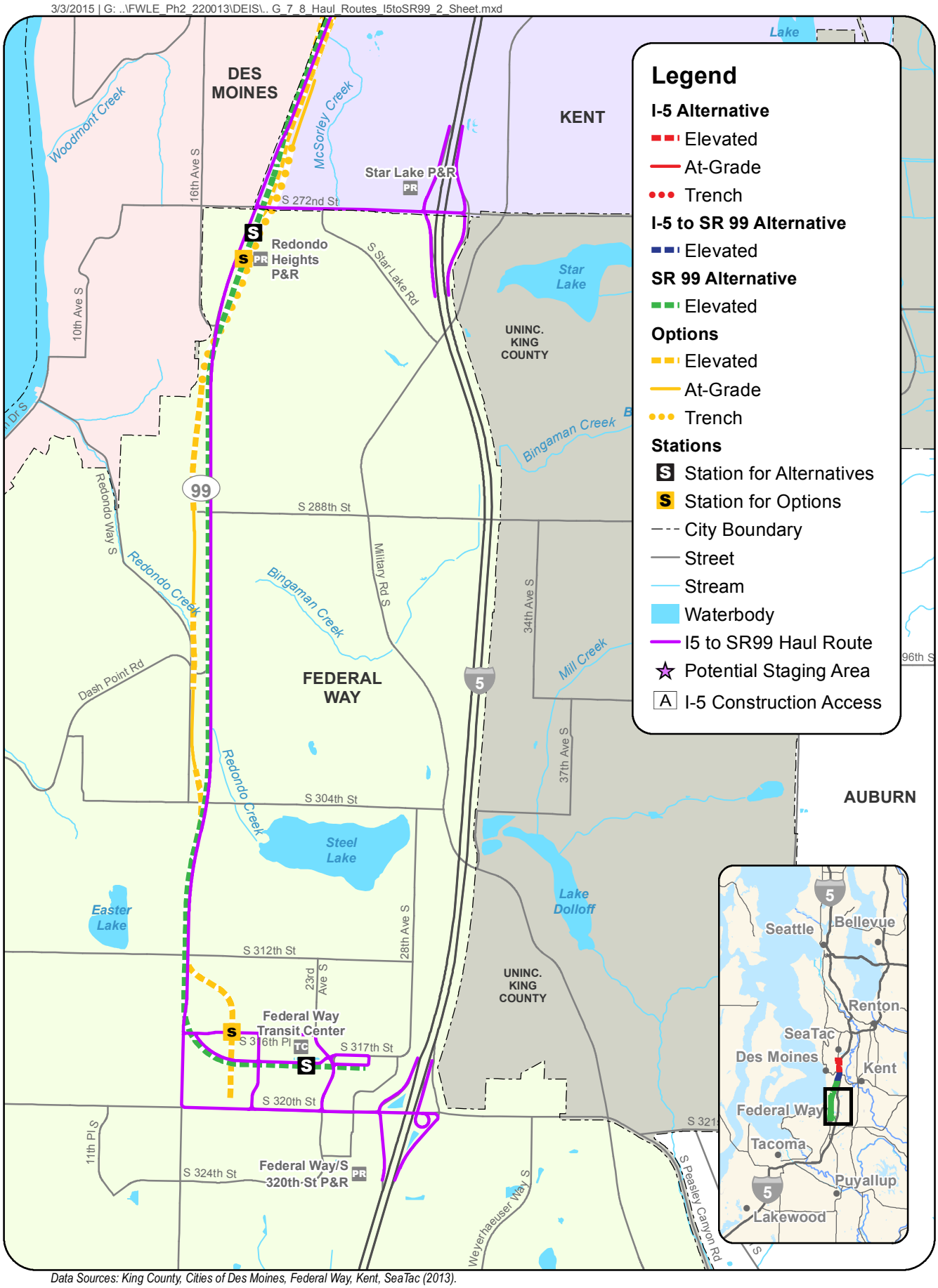
Data Sources: King County, Cities of Des Moines, Federal Way, Kent, SeaTac (2013).

N

0 0.25 0.5 1 Miles

Appendix G-7
I-5 to SR 99 Truck Hauling Routes (North)

Federal Way Link Extension



Appendix G-8
I-5 to SR 99 Truck Hauling Routes (South)

Federal Way Link Extension

Appendix H

I-5 Clear Zone Analysis

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TABLE H-1

I-5 Clear Zone Analysis – Existing and Future without SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
138+00	146+50	850	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
146+50	148+50	200	Guardrail/Barrier		29	Relocate ITS equipment	-	-	-	-
148+50	149+50	100	Guardrail/Barrier			Barrier required for S 216th St Underpass	-	-	-	-
149+50	159+50	1000	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
159+50	161+00	150	Guardrail/Barrier		29	Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
161+00	171+00	1000	Guardrail/Barrier		45	~3:1 Fill Section: Grade to 4:1, WSDOT DM Exhibit 1600-2	-	-	-	-
171+00	194+00	2300	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
194+00	195+00	100	Guardrail/Barrier		29	Relocate guide sign structure	-	-	-	-
195+00	206+00	1100	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
206+00	211+00	500	Guardrail/Barrier			Barrier required for Kent Des Moines Rd Overpass	-	-	-	-
211+00	218+00	700	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-

TABLE H-1

I-5 Clear Zone Analysis – Existing and Future without SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
218+00	225+50	750	Drainage Ditch	37		Ditch Section: 32' to backslope + 5', WSDOT DM Exhibit 1600-5 Case	-	-	-	-
225+50	230+50	500	6:1 Fill Slope	34		Fill Section: 6:1, WSDOT DM Exhibit 1600-2	-	-	-	-
230+50	243+00	1250	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	x
243+00	267+50	2450	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1		x		x
267+50	268+50	100	Guardrail/Barrier		29	Relocate ITS equipment and guide sign structure	-	x	-	x
268+50	272+50	400	Drainage Ditch	43		Ditch Section: 38' to backslope + 5', WSDOT DM Exhibit 1600-5 Case 1	-	x	-	x
272+50	286+50	1400	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x
286+50	288+50	200	Guardrail/Barrier		29	Relocate ITS equipment and guide sign structure	-	x	-	x
288+50	291+00	250	Guardrail/Barrier			Barrier required for S 259th Pl Overpass	-	-	-	-
291+00	305+00	1400	Guardrail/Barrier		45	~1:1 Fill Section: Grade to 4:1 with retaining wall or wetland fill, WSDOT DM Exhibit 1600-2	-	x	x	x
305+00	309+00	400	Guardrail/Barrier		29	Relocate storm water detention pond	-	x	-	x
309+00	316+50	750	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x

TABLE H-1

I-5 Clear Zone Analysis – Existing and Future without SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
316+50	325+50	900	5:1 Fill Slope	37		Fill Section: 5:1, WSDOT DM Exhibit 1600-2	-	x	-	x
325+50	328+50	300	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x
328+50	336+00	750	Guardrail/Barrier			Barrier required for S 272nd St Overpass	-	-	-	-
336+00	344+00	800	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	x
344+00	347+50	350	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1		x		x
347+50	354+00	650	Guardrail/Barrier		45	~3:1 Fill Section: 4:1, WSDOT DM Exhibit 1600-2	-	x	-	x
354+00	356+00	200	Guardrail/Barrier			Barrier required for Military Rd S Overpass	-	-	-	-
356+00	375+00	1900	Drainage Ditch	32		Ditch Section: 27' to backslope + 5', WSDOT DM Exhibit 1600-5 Case 1	-	x	-	x
375+00	379+00	400	Drainage Ditch	37		Ditch Section: 32' to backslope + 5', WSDOT DM Exhibit 1600-5 Case 1	-	x	x	x
379+00	382+00	300	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x
382+00	386+50	450	Guardrail/Barrier		29	Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x
386+50	388+00	150	Guardrail/Barrier		37	Fill Section: 5:1, WSDOT DM Exhibit 1600-2	-	x	x	x

TABLE H-1

I-5 Clear Zone Analysis – Existing and Future without SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
388+00	390+00	200	Guardrail/Barrier			Barrier required for S 288th St Overpass	-	-	-	-
390+00	391+50	150	Guardrail/Barrier		30	Fill Section: 10:1, WSDOT DM Exhibit 1600-2	-	-	-	-
391+50	394+50	300	10:1 Fill Slope	30		Fill Section: 10:1, WSDOT DM Exhibit 1600-2	-	-	x	x
394+50	397+00	250	10:1 Fill & Noise Wall		30	Relocate Noise Wall	-	x	x	x
397+00	401+50	450	6:1 Fill & Noise Wall		34	Relocate Noise Wall	-	x	x	x
401+50	403+50	200	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x
403+50	414+00	1050	Guardrail/Barrier		45	~3:1 Fill Section: Grade to 4:1, WSDOT DM Exhibit 1600-2	-	x	x	x
414+00	421+00	700	Guardrail/Barrier		29	Relocate ITS equipment and guide sign structure	-	x	-	x
421+00	443+00	2200	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
443+00	446+50	350	Guardrail/Barrier		45	~3:1 Fill Section: Grade to 4:1 & relocate storm water detention pond	-	x	x	x
446+50	449+00	250	Guardrail/Barrier			Barrier required for S 317th St Underpass	-	-	-	-
449+00	452+00	300	Guardrail/Barrier		45	Fill Section: 4:1, WSDOT DM Exhibit 1600-2	-	x	x	x
452+00	455+50	350	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x

TABLE H-1

I-5 Clear Zone Analysis – Existing and Future without SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
455+50	458+50	300	Guardrail/Barrier		29	Relocate guide sign structure	-	x	-	x
458+50	472+50	1400	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x
472+50	482+00	950	Guardrail/Barrier		29	Relocate guide sign structure & rebuild retaining walls	-	x	x	x
138+00	146+50	850	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
146+50	148+50	200	Guardrail/Barrier		29	Relocate ITS equipment	-	-	-	-
148+50	149+50	100	Guardrail/Barrier			Barrier required for S 216th St Underpass	-	-	-	-
149+50	159+50	1000	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
159+50	161+00	150	Guardrail/Barrier		29	Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
161+00	171+00	1000	Guardrail/Barrier		45	~3:1 Fill Section: Grade to 4:1, WSDOT DM Exhibit 1600-2	-	-	-	-
171+00	194+00	2300	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
194+00	195+00	100	Guardrail/Barrier		29	Relocate guide sign structure	-	-	-	-
195+00	206+00	1100	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-

TABLE H-1

I-5 Clear Zone Analysis – Existing and Future without SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
206+00	211+00	500	Guardrail/Barrier			Barrier required for Kent Des Moines Rd Overpass	-	-	-	-
211+00	218+00	700	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
218+00	225+50	750	Drainage Ditch	37		Ditch Section: 32' to backslope + 5', WSDOT DM Exhibit 1600-5 Case	-	-	-	-
225+50	230+50	500	6:1 Fill Slope	34		Fill Section: 6:1, WSDOT DM Exhibit 1600-2	-	-	-	-
230+50	243+00	1250	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	x
243+00	267+50	2450	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1		x		x
267+50	268+50	100	Guardrail/Barrier		29	Relocate ITS equipment and guide sign structure	-	x	-	x
268+50	272+50	400	Drainage Ditch	43		Ditch Section: 38' to backslope + 5', WSDOT DM Exhibit 1600-5 Case 1	-	x	-	x
272+50	286+50	1400	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x
286+50	288+50	200	Guardrail/Barrier		29	Relocate ITS equipment and guide sign structure	-	x	-	x
288+50	291+00	250	Guardrail/Barrier			Barrier required for S 259th Pl Overpass	-	-	-	-
291+00	305+00	1400	Guardrail/Barrier		45	~1:1 Fill Section: Grade to 4:1 with retaining wall or wetland fill, WSDOT DM Exhibit 1600-2	-	x	x	x

TABLE H-1

I-5 Clear Zone Analysis – Existing and Future without SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
305+00	309+00	400	Guardrail/Barrier		29	Relocate storm water detention pond	-	x	-	x
309+00	316+50	750	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x
316+50	325+50	900	5:1 Fill Slope	37		Fill Section: 5:1, WSDOT DM Exhibit 1600-2	-	x	-	x
325+50	328+50	300	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x
328+50	336+00	750	Guardrail/Barrier			Barrier required for S 272nd St Overpass	-	-	-	-
336+00	344+00	800	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	x
344+00	347+50	350	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1		x		x
347+50	354+00	650	Guardrail/Barrier		45	~3:1 Fill Section: 4:1, WSDOT DM Exhibit 1600-2	-	x	-	x
354+00	356+00	200	Guardrail/Barrier			Barrier required for Military Rd S Overpass	-	-	-	-
356+00	375+00	1900	Drainage Ditch	32		Ditch Section: 27' to backslope + 5', WSDOT DM Exhibit 1600-5 Case 1	-	x	-	x
375+00	379+00	400	Drainage Ditch	37		Ditch Section: 32' to backslope + 5', WSDOT DM Exhibit 1600-5 Case 1	-	x	x	x
379+00	382+00	300	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x

TABLE H-1

I-5 Clear Zone Analysis – Existing and Future without SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
382+00	386+50	450	Guardrail/Barrier		29	Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x
386+50	388+00	150	Guardrail/Barrier		37	Fill Section: 5:1, WSDOT DM Exhibit 1600-2	-	x	x	x
388+00	390+00	200	Guardrail/Barrier			Barrier required for S 288th St Overpass	-	-	-	-
390+00	391+50	150	Guardrail/Barrier		30	Fill Section: 10:1, WSDOT DM Exhibit 1600-2	-	-	-	-
391+50	394+50	300	10:1 Fill Slope	30		Fill Section: 10:1, WSDOT DM Exhibit 1600-2	-	-	x	x
394+50	397+00	250	10:1 Fill & Noise Wall		30	Relocate Noise Wall	-	x	x	x
397+00	401+50	450	6:1 Fill & Noise Wall		34	Relocate Noise Wall	-	x	x	x
401+50	403+50	200	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x
403+50	414+00	1050	Guardrail/Barrier		45	~3:1 Fill Section: Grade to 4:1, WSDOT DM Exhibit 1600-2	-	x	x	x
414+00	421+00	700	Guardrail/Barrier		29	Relocate ITS equipment and guide sign structure	-	x	-	x
421+00	443+00	2200	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
443+00	446+50	350	Guardrail/Barrier		45	~3:1 Fill Section: Grade to 4:1 & relocate storm water detention pond	-	x	x	x
446+50	449+00	250	Guardrail/Barrier			Barrier required for S 317th St Underpass	-	-	-	-

TABLE H-1

I-5 Clear Zone Analysis – Existing and Future without SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
449+00	452+00	300	Guardrail/Barrier		45	Fill Section: 4:1, WSDOT DM Exhibit 1600-2	-	x	x	x
452+00	455+50	350	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x
455+50	458+50	300	Guardrail/Barrier		29	Relocate guide sign structure	-	x	-	x
458+50	472+50	1400	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x
472+50	482+00	950	Guardrail/Barrier		29	Relocate guide sign structure & rebuild retaining walls	-	x	x	x

[a] Western alignment conditions are documented in the Draft EIS and the Transportation Technical Report and only applies to alternatives within the I-5 right-of-way.
[b] The information provided for the eastern alignment conditions supports the analysis summarized in Appendix H of the Draft EIS, Location of I-5 Alternative within I-5 Right-of-Way. The eastern alignment condition was not analyzed as part of the Draft EIS (Chapter 3) or in the Transportation Technical Report.

TABLE H-2
I-5 Clear Zone Analysis – Existing and Future with SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
122+00	127+00	500	Guardrail/Barrier		30	Fill Section: 10:1, WSDOT DM Exhibit 1600-2	x	x	x	x
127+00	130+00	300	Guardrail/Barrier		20	Cut Section: 3:1, WSDOT DM Exhibit 1600-2	-	x	-	x
130+00	131+00	100	Guardrail/Barrier			Barrier required for S 211th St Underpass	-	-	-	-
131+00	145+00	1400	Guardrail/Barrier		20	Cut Section: 3:1, WSDOT DM Exhibit 1600-2				
145+00	156+00	1100	Guardrail/Barrier		20	Cut Section: 3:1, WSDOT DM Exhibit 1600-2	x	x	x	x
156+00	162+00	600	Guardrail/Barrier		20	Cut Section: 3:1, WSDOT DM Exhibit 1600-2				
162+00	172+00	1000	Guardrail/Barrier		30	Fill Section with Retaining Walls: 10:1, WSDOT DM Exhibit 1600-2	x	x	x	x
172+00	202+00	3000	Guardrail/Barrier		30	Cut/Fill Section: 10:1, WSDOT DM Exhibit 1600-2	x	x	x	x
202+00	212+00	1000	Guardrail/Barrier			Barrier required for Kent Des Moines Rd Overpass	-	-	-	-
212+00	220+00	800	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	x	x	x	x
220+00	228+00	800	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	-	x
228+00	238+00	1000	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	-	-	-
238+00	248+00	1000	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x

TABLE H-2
I-5 Clear Zone Analysis – Existing and Future with SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
248+00	271+00	2300	Guardrail/Barrier		20	Cut Section: 3:1, WSDOT DM Exhibit 1600-2	-	x	-	x
271+00	286+00	1500	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x
286+00	289+00	300	Drainage Ditch		30	Fill Section: 10:1, WSDOT DM Exhibit 1600-2	-	x	x	x
289+00	291+00	200	Guardrail/Barrier			Barrier required for S 259th Pl Overpass	-	-	-	-
291+00	304+00	1300	Guardrail/Barrier		45	Fill Section: 4:1, WSDOT DM Exhibit 1600-2	x	x	x	x
304+00	319+00	1500	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x
319+00	327+00	800	Guardrail/Barrier		30	Fill Section: 10:1, WSDOT DM Exhibit 1600-2	-	x	x	x
327+00	336+00	900	Guardrail/Barrier			Barrier required for S 272nd St Overpass	-	-	-	-
336+00	340+00	400	Guardrail/Barrier		30	Fill Section: 10:1 with Retaining Walls, WSDOT DM Exhibit 1600-2	-	-	-	-
340+00	348+00	800	Drainage Ditch	30		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 2	-	x	x	x
348+00	355+00	700	Guardrail/Barrier		30	Fill Section: 10:1, WSDOT DM Exhibit 1600-2	-	x	x	x
355+00	358+00	300	Guardrail/Barrier			Barrier required for Military Rd S Overpass	-	-	-	-
358+00	360+00	200	Guardrail/Barrier		30	Fill Section: 10:1 with Retaining Walls, WSDOT DM Exhibit 1600-2	-	x	x	x

TABLE H-2
I-5 Clear Zone Analysis – Existing and Future with SR 509/I-5 Widening

Approximate Station Segment		Length (feet)	Existing Clear Zone Conditions	Existing Clear Zone Distance (Feet)	Potential Clear Zone Distance (Feet)	Notes	Western Alignment Clear Zone Impact[a]		Eastern Alignment Clear Zone Impact[b]	
Begin	End						Operations	Construction	Operations	Construction
360+00	383+00	2300	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x
383+00	389+00	600	Guardrail/Barrier		30	Fill Section: 10:1, WSDOT DM Exhibit 1600-2	-	x	x	x
389+00	391+00	200	Guardrail/Barrier			Barrier required for S 288th St Overpass	-	-	-	-
391+00	404+00	1300	Guardrail/Barrier		30	Fill Section: 10:1, WSDOT DM Exhibit 1600-2	-	x	x	x
404+00	414+00	1000	Guardrail/Barrier		45	Fill Section: 4:1, WSDOT DM Exhibit 1600-2	-	x	x	x
414+00	444+00	3000	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x
444+00	447+00	300	4:1 Fill Slope		45	Fill Section: 4:1, WSDOT DM Exhibit 1600-2	-	x	x	x
447+00	449+00	200	Guardrail/Barrier			Barrier required for Military Rd S Overpass	-	-	-	-
449+00	461+00	1200	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x
461+00	473+00	1200	Drainage Ditch	29		Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x
473+00	482+00	900	Drainage Ditch		29	Ditch Section: 10:1 cut, WSDOT DM Exhibits 1600-2 & 1600-5 Case 1	-	x	x	x

[a] Western alignment conditions are documented in the Draft EIS and the Transportation Technical Report, and only apply to alternatives within the I-5 right-of-way.
[b] The information provided for the eastern alignment conditions supports the analysis summarized in Appendix H of the Draft EIS, Location of I-5 Alternative within I-5 Right-of-Way. The eastern alignment condition was not analyzed as part of the Draft EIS (Chapter 3) or in the Transportation Technical Report.