



# 3

# TRAVEL FORECASTS AND ALTERNATIVES EVALUATION



# CHAPTER 3: TRAVEL FORECASTS AND ALTERNATIVES EVALUATION

In addition to addressing existing needs, the City's transportation systems must accommodate forecast growth.

The GMA requires that the transportation planning horizon be at least ten years in the future. For the 2015 Transportation Element (TE) and Transportation Master Plan (TMP), the City (in discussions with the Port of Seattle and Puget Sound Regional Council) selected a horizon year of 2035, consistent with the Land Use Element. An interim forecast year of 2025 was also evaluated in order to help address the timing and phasing needs for major transportation improvements, such as the extension of the SR 509 freeway.

The following provides an overview of the travel demand model used to create the forecasts and evaluate alternatives. It summarizes the land use assumptions and network alternatives. The alternatives evaluations are then presented, resulting in the development of the framework for the City's TMP and TE. The framework for the TMP and TE is then refined into the Transportation Systems Plans and improvement projects which are presented in Chapter 4.

## 3.1 Travel Demand Model

The travel forecasts and analyses for the City of SeaTac's TMP which are the basis of the TE were prepared using a travel demand forecast model. The travel demand model provides a tool for forecasting long-range traffic volumes based on the projected growth in housing and

employment in and around the City of SeaTac. The City/Port model incorporates detailed vehicle trip generation related to Sea-Tac Airport related activities, such as passenger arrivals and departures, employees, and freight operations. In addition to understanding future travel demands on City roadways, the model is also useful in evaluating the impact of changes to the transportation system, such as the planned extension of SR 509.

The City's TMP travel demand model is an update of the Port of Seattle's Sea-Tac Airport model which was developed in 2010 to support Airport transportation planning efforts. The Port's 2010 model had a base year of 2006 and a forecast year of 2040. The Port and the City decided that it was in both of their transportation planning interests to jointly update the model to support the City's TMP and TE and the Port's Sustainable Airport Master Plan (SAMP). The City led the update of the model because of the June 2015 GMA timeline for the required Comprehensive Plan update; the Port's SAMP schedule is longer term than the City's requirement under GMA. The City and Port also agreed that the model and travel forecasts should be consistent with the travel demand models prepared by the Puget Sound Regional Council's (PSRC) VISION 2040 and Transportation 2040 plans for the region.

HORIZON YEAR OF  
**2035**



The Port's prior model base year of 2006 was updated to 2010 to be consistent with the current PSRC model and land use data. The 2010 base year also incorporates the extension of the Link light rail to the City of SeaTac and to Sea-Tac Airport; the light rail was not in place in 2006. The forecast year for the model was jointly established by the City and Port as 2035. The 2035 forecast year is consistent with the City's Land Use Element and overall Comprehensive Plan. The 2035 horizon year also would be consistent with the Port's estimated maximum forecast of 66 million air passengers (MAP) by 2034.

The model directly ties in the PSRC land use forecasts, trip generation, and travel patterns from areas outside the City of SeaTac. The City/Port model incorporates the regional mode share forecasts based on the 2035 forecasts from the PSRC's Vision 2040 planning models. This is a key part of the forecasting assumptions for both the City and Port's planning needs which support the use of alternative travel modes, including the existing and future extension of Sound Transit's Link light rail to serve the Airport and the City's designated urban center.

The model was used to forecast 2025 and 2035 weekday PM peak hour volumes and travel patterns. The average weekday PM peak hour represents one hour between 4 and 6 pm. which is consistent with the highest traffic volumes on the majority of City's arterials and collector streets, as discussed in Chapter 2. Traffic volumes at Sea-Tac Airport peak earlier in the afternoon, as shown for North Airport Expressway (NAE) in the discussion in Chapter 2. However, since the

focus of the initial application of the model is to support the update of the City's TE, the weekday PM peak hour commute period was selected for the forecast period and evaluation of alternatives. The model set-up also allows the Port of Seattle to adjust the model to reflect the Airport weekday peak travel periods for its use in the SAMP.

Additional detail and the modeling assumptions, data, processes and operations are available in the City of SeaTac and Sea-Tac Airport Travel Model document (Transpo Group, July 2015).

### 3.2 Land Use and Trip Generation Forecasts

Travel forecasts are largely derived based on changes in households and employment within the study area. For the areas associated with the Sea-Tac Airport, travel forecasts are based on the level of air passenger and air cargo activity, which can be correlated to traffic volumes at the arrivals and departures drives, parking garage, taxis, shuttles and other modes based on historical data. In addition, the travel forecasts must incorporate growth in the volume of traffic entering and exiting the greater Puget Sound Region, including connections to/from the Airport and through traffic on freeways such as I-5 and I-405.

The model land use forecasts reflect regional planning assumptions for 2035 based on King County's growth allocations and PSRC VISION 2040 travel demand models. PSRC converted the land use data into the primary trip generation inputs to the City/Port model. These are then

converted into the 2010 and 2035 weekday PM peak hour vehicle trips through application of the regional mode share forecasts and other parameters. The vehicle forecasts for 2025 reflect straight-line interpolation between 2010 and 2035 PM peak hour vehicle trip tables.

The following summarizes the overall projected growth in residential households and employment that were used in forecasting the 2025 and 2035 travel demands.

#### 3.2.1 City Growth

Growth forecasts for areas within the City of SeaTac (exclusive of the Airport) are based on the adopted King County Growth Targets for SeaTac. These forecasts basically reflect maximum build out of the City's land capacity ("full build out"). The King County growth forecasts result in a significantly higher level of development than has historically occurred in the City. The forecasts in the travel demand model must be consistent with the City's Land Use Element and regional planning; therefore, the King County forecasts were the basis for the 2035 travel demand model assumptions.

Table 3-1 and Figure 3-1 summarize the existing 2010 and forecast 2035 land use data which are used as inputs to the travel demand model. Household and employment data are not shown for Sea-Tac Airport because the travel demands for the Airport are based on employment and air passenger and other related data.

The City allocated the growth to transportation analysis zones (TAZs) based on the land use plans and buildable lands analysis. The City's Urban



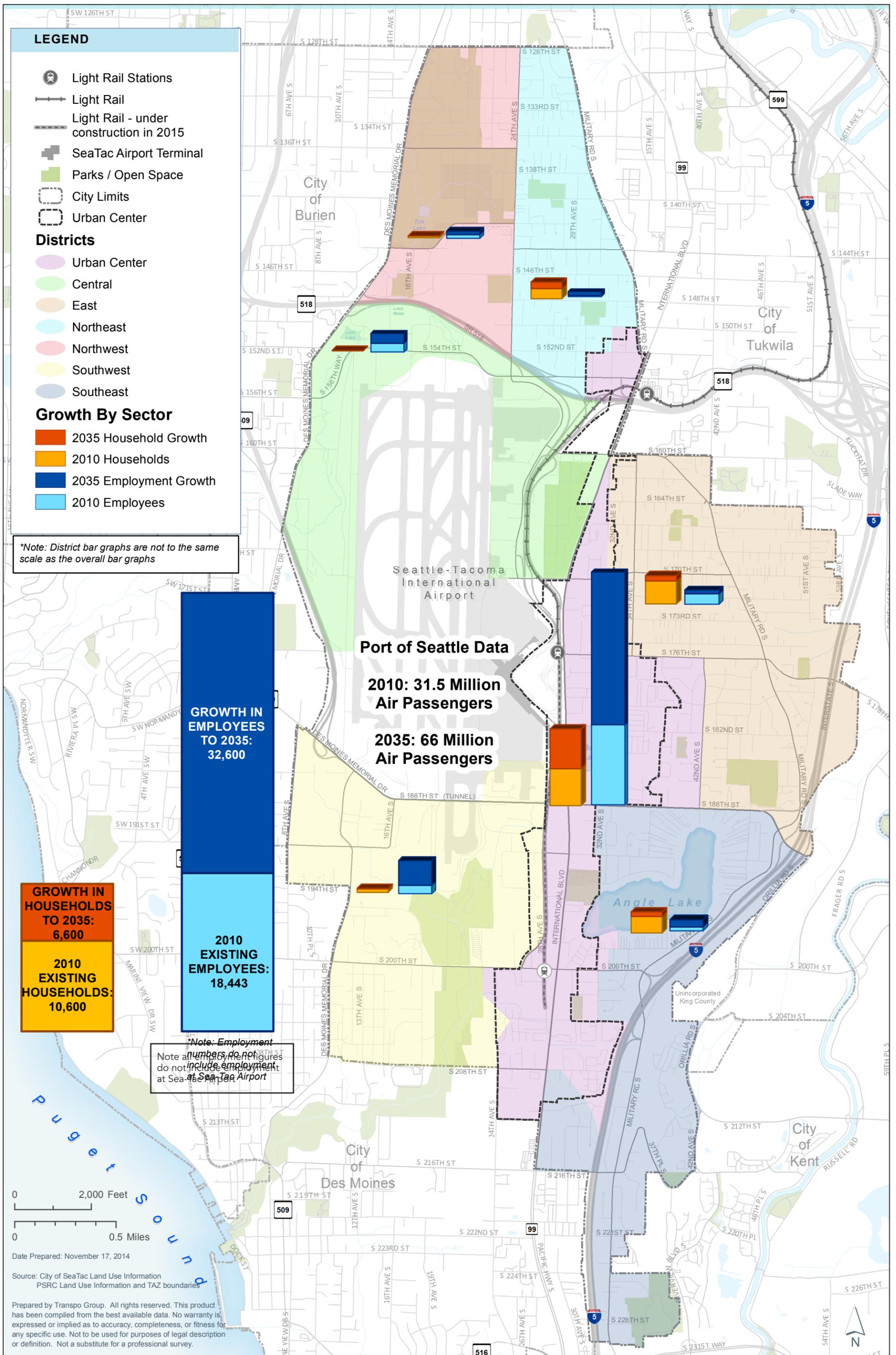


Figure 3-1: 2010-2035 City of SeaTac Housing & Employment Growth Assumptions

Center encompasses the commercial core from S 150th Street to S 212th Street and includes the City Center, the S 154th Street Station Area, and the Angle Lake Station Area, which are all served (or will be served) by Link light rail. The Land Use Element calls for focusing the majority of the City's commercial and residential growth, and redevelopment, into these three subareas within the Urban Center. Directing the growth to the Urban Center supports the use of Link light rail, bus transit, and also supports walking and bicycling modes of travel. Figure 3-1 shows the location of the Urban Center.

Households within the City are forecast to increase by 6,600 units, compared to the existing 10,600 units, or an increase of over 60 percent. Approximately 69 percent of this growth is anticipated to occur in the Urban Center area of the City along International Boulevard. This is consistent with the Land Use Element. The remaining growth is generally allocated within the eastern areas of the City (Northeast, East, and Southeast)

Employment within the City is forecast to increase by 32,600 jobs not including growth in employment at Sea-Tac Airport. This is an increase of 175 percent over the 2010 level of employment. Approximately 75 percent of this growth is anticipated to occur in the Urban Center area of the City, which reflects the goals and policies of the City. Employment growth is also expected to be high in the southwest area of the City, with about 3,800 new jobs.

The City land use data were converted to PM peak hour vehicle trips based on PSRC's trip

Table 3-1: 2010 and 2035 Housing and Employment Data by District

DISTRICT	HOUSEHOLDS			EMPLOYEES		
	2010	2035	Growth	2010	2035	Growth
Airport	NA <sup>1</sup>					
Urban Center	4,265	8,847	4,582	12,756	37,101	24,345
Central	3	50	47	1,404	2,977	1,573
Northeast	1,156	1,908	752	159	780	621
East	2,648	3,270	622	1,622	2,235	613
Southeast	1,897	2,419	522	621	1,763	1,142
Southwest	408	471	63	1,294	5,064	3,770
Northwest	202	229	27	587	1,157	570
<b>Total</b>	<b>10,579</b>	<b>17,194</b>	<b>6,615</b>	<b>18,443</b>	<b>51,079</b>	<b>32,636</b>

Source: City of SeaTac

1. Households and employment were not compiled for the Airport area. The travel demand model uses the number of air passengers and other related data to forecast travel demands.
2. Totals do not include employment at Sea-Tac Airport

generation rates and application of mode splits and other parameters. The process results in an increase of 9,600 vehicle trips during the weekday PM peak hour generated within the City's Urban Center and 2,300 new PM peak hour trips in other parts of the City. This is an increase of nearly 12,000 PM peak hour trips, exclusive of traffic growth at the Airport. This is a doubling of the PM peak hour vehicle trips between 2010 and 2035 which is significantly lower than the combined 135 percent increase in households plus employment in the City. This indicates that the forecast vehicular trips are forecast to increase at a rate 25 percent slower than the changes in the combined growth in housing and employment. The lower increase in PM peak hour vehicle trips reflects the higher transit and other travel mode shares, consistent with the regional forecasts that incorporate the

extension of Link light rail and addition of bus transit serving the City of SeaTac and Sea-Tac Airport. This directly reflects the City's plans and regional growth strategy to concentrate growth around increased transit. In addition, the lower growth in vehicles reflects the higher potential for walking and bicycling supported by the high density and concentrated growth in the Urban Center.

### 3.2.2 Sea-Tac Airport

Sea-Tac Airport generates person and vehicle trips in a different way than typical land uses within the City; therefore, land uses and travel demands for the Airport area were summarized in a way that better correlates with trip generation. Rather than only using forecasts of households and employment, traffic growth at Sea-Tac Airport also takes into account the



level of air passenger travel. In 2010, the airport processed 31.5 million air passengers (MAP). By 2034, the airport is expected to reach its maximum passenger total at 66 MAP. The Port's SAMP will further define the maximum level of air passenger traffic, but the 66 MAP was used for the 2035 model forecasts based on direction from the Port. The projected increase in MAP is more than double the 2010 level of air passengers. This is an annual growth rate of approximately 3 percent. For comparison, City households are expected to grow at 2 percent per year and employment is expected to grow at 4.2 percent annually. These data were then converted to PM peak hour vehicle trips based on the relationship of vehicle traffic counts at the Airport and air passenger levels. The net result is an increase of over 3,800 additional PM peak hour vehicle trips to/from the Airport.

The forecast process also applies the changes in regional mode share to incorporate increases in

**66**  
MILLION AIR  
PASSENGERS

the maximum passenger total the airport is expected to reach by 2034.

transit use to/from the Airport. While the number of air passengers doubles, the application of the increased transit and higher occupancy vehicle shares results in Airport vehicle trips increasing by only 70 percent. The reduced growth rate in vehicle travel at the Airport is similar to that forecast for the City Urban Center.

### 3.2.3 Areas Outside the City

For model areas outside the City of SeaTac, the 2035 PSRC land use forecast were directly used in the City/Port model. For some areas adjacent to the City of SeaTac, the PSRC data were divided into smaller TAZs to better match the arterial and collector roadways which were being evaluated. This process was coordinated with PSRC. Further away from the City of SeaTac travel demand model used the PSRC TAZ structure and land use data without any changes.

The City/Port model does not include the entire Puget Sound Region. For areas beyond the model area, regional traffic is assigned to "external" zones based on the PSRC model for that year (e.g. 2010 or 2035). This process incorporates the regional model data for travel into/out-of, and through the City/Port model study area.

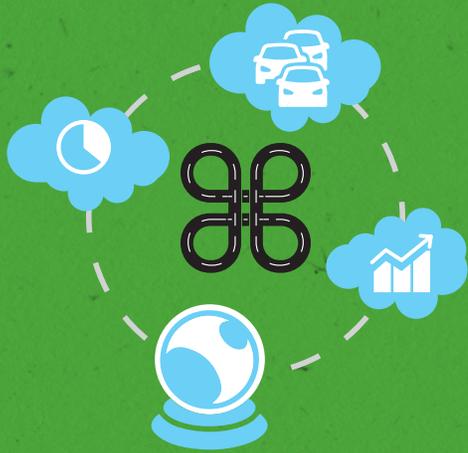
## 3.3 Transportation System Alternatives

The updated travel forecasting model was used to convert the 2010 and forecast (2025 and 2035) land use data into travel demands. The 2010 data were used to calibrate and validate the model. The forecast model assigns the future land use and resulting trips to transportation system scenarios in order to understand where transportation improvements may be needed to add capacity, improve traffic operations, or support connectivity. Several network alternatives were defined, building from regional and local plans. The assumptions for the alternative improvements were coordinated with PSRC, WSDOT, the Port of Seattle, and the adjacent cities.

As previously noted, the travel demand forecasts take into account the reduced vehicle trip generation associated with the planned extension of the Link light rail south of the City of SeaTac and other regional transit service planes. Therefore, all of the alternatives analyses include those assumptions.

The potential extension of the SR 509 freeway between S 188th Street and I-5 has been discussed and planned for over 25 years. Current plans call for the SR 509 freeway extension to be phased. The phases are discussed further below under the transportation alternatives. The SR 509 freeway extension also would support and be part of the planned South Airport Expressway (SAE) which would provide a fairly direct, grade-separated freeway connection between I-5 and the Airport terminal drive system and





The planned SR 509 freeway extension and South Airport connection provide the primarily basis for defining transportation system alternatives. Alternatives for the SR 509 freeway extension and the South Airport Access were developed and analyzed to help answer the following questions related to the timing of the benefits of specific phases of these planned improvements.

1. How long will the transportation system “work” without the SR 509 extension?
2. How will the completion of the SR 509 Phase I in conjunction with the Interim Airport South Access via 24th/28th Avenue S meet future demands, and for how long?
3. What additional benefit would the full SR 509 and South Airport Expressway (SAE) provide?

main parking garage. This would be similar to the NAE which currently connects the Airport to the regional freeway system. Studies prepared by WSDOT in conjunction with the Port, City of SeaTac, and other stakeholders also defined an option for providing an Interim South Airport connection between the terminal and initial phase of the SR 509 freeway extension (see sidebar left).

### 3.3.1 2025 Transportation System Alternatives Definitions

Two primary transportation networks were defined for the 2025 forecasts to help address these big picture questions. Additional refinements were incorporated based on the forecast results. The two 2025 alternatives were developed and analyzed to help answer the key questions. These are defined below and are labeled:

- 2025 Without the Extension of the SR 509 Freeway
- 2025 Baseline with SR 509 Phase 1 and Interim Airport South Access.

#### 2025 Without the SR 509 Freeway Extension

The 2025 forecast model was initially set up assuming only currently committed and funded transportation improvement projects that would be constructed by 2025. This includes completion of the 28th/24th Avenue S arterial link between S 188th Street and S 216th Street. Other local roadway improvements that were under construction and/or funded for construction in the next several years also were included if they would add capacity to the arterials or highway

system.

This option essentially reflects that the major investments in the regional highways serving the City of SeaTac and Sea-Tac Airport would not be completed in the next 10 years. The lack of these major investments may result in a slower rate of growth compared to the projected forecasts used in the 2025 horizon year. However, in order to provide a consistent basis for the alternatives evaluation no changes to the land use and/or trip generation forecasts for 2025 were made in the model.

#### 2025 Baseline - SR 509 Phase 1 and Interim Airport South Access

This scenario provides a baseline for identifying potential alternative transportation improvement needs in the mid-to-long term horizon. It includes the improvements included in the 2025 Without SR 509 Extension scenario. The 2025 Baseline model was developed based on capacity improvement projects identified in prior plans including the PSRC VISION 2040 travel demand model assumptions and the transportation improvement project lists prepared by WSDOT, King County, the City of SeaTac, and the other adjacent cities. Some of these improvements are funded or are expected to be funded in the next few years. These improvements are shown on Figure 3-2 and summarized below.

- **28th/24th Avenue S Arterial** – Completes the construction and widening of 28th/24th Avenue S between S 188th Street and S 216th Street (included as part of the 2025 Without the SR 509 Extension alternative).
- **SR 509 Extension Phase 1** - Extend the



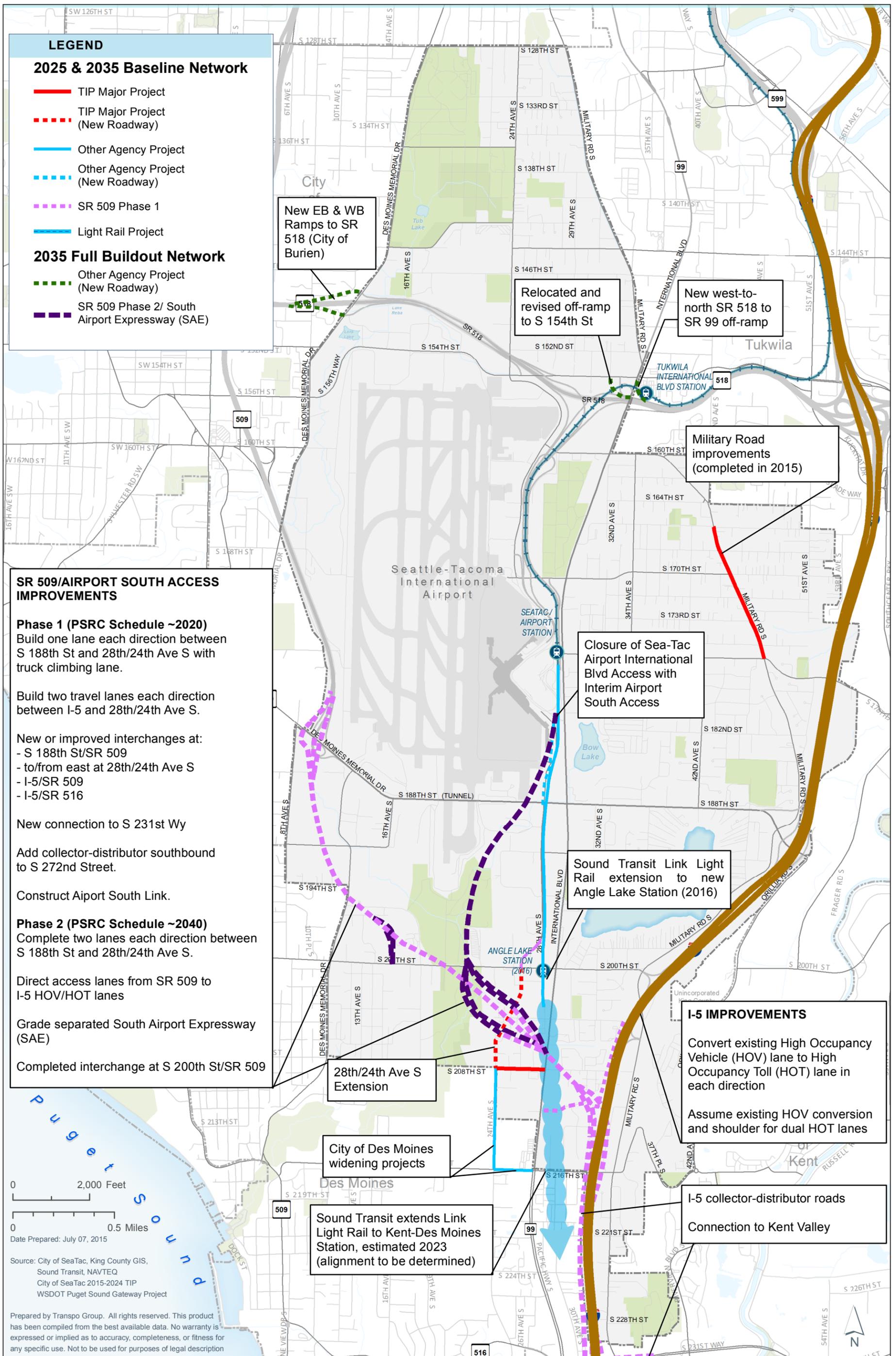


Figure 3-2: Major Transportation Alternatives

existing SR 509 freeway to connect between S 188th Street and I-5 as a tolled highway.

Phase 1 includes:

- > One lane in each direction between S 188th Street and 28th/24th Avenue S arterial with added truck climbing lanes in each direction;
- > Two lanes between 28th/24th Avenue S and I-5;
- > A new full interchange at SR 509/28th/24th Avenue S;
- > A modified interchange at SR 509/S 188th Street;
- > New collector–distributor roadways on I-5 from SR 509 interchange to south of the SR 516 interchange and modify the SR 516 interchange.



HIGH OCCUPANCY TOLL LANE ON SR 167

- **Interim South Access (24th/28th Avenue S arterial)** – based on WSDOT studies conducted in 2011 and 2012, and Interim Airport South Access configuration was defined. This includes:

- > Port construction of its proposed South Link project between the terminal drive system and parking garage to S 188th Street;
- > Port closing the existing Airport terminal access intersection with International Boulevard/S 182nd Street;
- > Completion of a new interchange of SR 509 with 28th/24th Avenue S.

- **I-5 High Occupancy Toll (HOT) Lanes** – HOT lanes can be used by transit, vanpools, and carpools. They also can be used by non-carpools by payment of a toll.

- > Converts the existing High Occupancy Vehicle (HOV) lanes on I-5 to HOT lanes;
- > Reconstructs freeway shoulder as a second HOT lane on I-5 between I-405 and Federal Way.

- **SR 518 Eastbound Off-ramp to Des Moines Memorial Drive S** – the City of Burien is working with WSDOT to construct new ramps to/from the west at the SR 518/Des Moines Memorial Drive S interchange. The City of Burien is moving forward with designs for the eastbound off-ramp; the westbound on-ramp has some constraints, so it was not assumed in the 2025 Baseline network.

### 3.3.2 2035 Transportation System Alternatives Definitions

#### **2035 Baseline - SR 509 Phase 1 and Interim Airport South Access**

The network for this alternative is the same as described for the 2025 Baseline alternative. The only change is the higher level of growth and trips based on the 2035 land use forecasts. The alternative also addresses the second question, especially as it relates to how long will the SR 509 Phase 1 and Interim Airport South Access roadway accommodate travel in this part of the Puget Sound Region.

#### **2035 With SR 509 Phase 1 and South Airport Expressway**

This alternative network builds from the evaluation of the 2035 Baseline scenario which indicated that the Interim Airport South Access via 28th/24th Avenue S would not be adequate to accommodate the projected growth at Sea-Tac Airport and the City's Urban Center. Building from the prior Port, WSDOT, and PSRC regional plans, this alternative adds the grade-separated South Airport Expressway (SAE) to the 2025 and 2035 Baseline network described above. The SR 509 freeway extension is assumed to remain as defined under Phase 1.

#### **2035 With SR 509 Full Build and South Airport Expressway**

This alternative incorporates the planned final stage of the SR 509 freeway extension project. In addition, it includes other longer-term transportation system improvements identified in prior transportation plans and/or identified as part of the development of the TMP. It starts from



the above 2035 with SR 509 Phase 1 and South Airport Expressway network and adds:

- Widening of SR 509 freeway to four lanes between S 188th Street and 28th/24th Avenue S;
- New partial (to/from the west) SR 509 Interchange at S 200th Street;
- SR 518 Westbound on-ramp from Des Moines Memorial Drive S;
- Relocated and revised SR 518 off-ramp to S 154th Street;
- New westbound-to-northbound off-ramp from SR 518 to International Boulevard (SR 99).

### 3.4 Alternatives Evaluation

As previously noted, the purpose of the alternatives evaluation is to answer the major questions about key elements of the City's future transportation system. In addition, the analyses provide input to the transportation improvements projects discussed in Chapter 4.

The travel demand model results were evaluated to understand changes in the relative level of traffic volumes on the arterials and at key intersections based on the forecast growth and changes in travel patterns resulting from new roadway facilities defined for each scenario. The focus of the alternatives analyses is on the locations that were shown to have congestion or operational issues under existing or forecast conditions and areas that are forecasts to have significant growth. The analyses reviewed generalized roadway volume/capacity results to

understand the overall levels of congestion on the arterial system. In addition, the analyses included a review of intersection traffic operations, similar to those defined for the existing transportation system. The Supporting Materials include additional tables related to the travel forecasts and alternatives analyses.

#### 3.4.1 Evaluation of 2025 Travel Forecasts

The 2025 forecast analyses assumed a straight line growth in traffic growth between the 2010 base year on 2035 forecast horizon used in the travel demand model. The City's prior Transportation Element (1994) was prepared and adopted assuming timely completion of the SR 509 freeway extension and SAE projects. Due to the delays in funding and constructing those projects, the TMP analyses for 2025 starts with evaluating traffic volumes and operations without those major regional investments. Based on the results of the without SR 509 extension, 2025 forecasts with Phase 1 of the SR 509 freeway extension and the Interim Airport South Access was evaluated to determine if those projects would be adequate to address the mid-term growth forecasts.

Figure 3-3 shows the resulting weekday PM peak hour intersection levels of service for the two 2025 alternatives. The existing 2014 levels of service are shown for comparison. The 2025 PM peak hour level of services shown on Figure 3-3 include additional improvements that would be needed to address poor levels of service. For example, the intersection of S 154th Street/

SR 518 westbound off-ramp was assumed to be signalized. This improvement results in LOS B conditions for 2025 without the SR 509 extension compared to the LOS F in 2014. As discussed below, some intersections may not be able to cost effectively be brought up to the City's and /or WSDOT's traffic level of service standards.

#### ***How long will the transportation system "work" without the SR 509 freeway extension?***

By 2025, forecast traffic volumes during the PM hour at the most currently congested locations within the City will increase by 25 to 35 percent over 2014 volumes. These include all of the major intersections along International Boulevard. This is directly related to the substantial housing and employment growth in the City's Urban Center and projected growth in traffic at Sea-Tac Airport. Significant increases in PM peak hour traffic also would occur at the City of SeaTac's interchanges. Without the SR 509 freeway extension, access to the regional freeway system from the core areas of the City will continue to focus on the I-5 interchanges at S 200th Street/Military Road S and S 188th Street. Growth in Airport traffic

**“BY 2025, forecast traffic volumes during the PM peak hour at the most currently congested locations within the City will increase by 25 to 35 percent over 2014 volumes without the planned extension of the SR 509 freeway**





and in the S 154th Street Station Area in the north end of the City will impact traffic volumes and operations at the SR 518 interchange at International Boulevard.

The increase in traffic volumes would result in several intersections operating at LOS E or LOS F during the PM peak hour. These include four key intersections along International Boulevard – S 154th Street, S 170th Street, S 188th Street, and S 200th Street. These poorly operating intersections would result in greatly increased travel times and delays along the City's major north-south arterial. These intersections are also the major east-west arterials serving the City. The congestion would not only affect vehicular traffic flow, but would likely result in significant impacts to traffic safety. Furthermore, these are key intersections for pedestrian and bicycle travel and access to transit. The added congestion would affect the comfort and safety of for these



MOVING TOWARDS A MULTIMODAL INTERNATIONAL BOULEVARD

other travel modes and would also adversely affect the reliability of bus transit in the City.

The congestion along International Boulevard also could likely result in traffic diversion to other corridors, such as S 176th Street. The diversion of traffic would result in LOS F conditions at the intersection of S 176th Street/Military Road S, which was improved in 2015. Traffic also would likely divert through neighborhoods, adversely affecting the quality of life in those residential areas.

Major intersection improvements would be needed to accommodate this growth at key intersections such as S 188th Street/International Boulevard, but these improvements would not be considered cost effective, especially with the future extension of SR 509 freeway. These intersection improvements would also result in wider roadways and would be less accommodating to pedestrians and bicyclists. The City's transportation plans and policies call for the Urban Center (and the rest of the City, as well) to become more multi-modal, including enhancing walking, bicycling, and access to transit.

The added congestion and lack of improved regional access that would be provided with the SR 509 freeway extension also could result in lower levels of growth than forecast for the Urban Center. The City will need to monitor growth and prioritize intersection and roadway improvements to support the resulting level of employment and housing.

### ***How will completion of SR 509 Phase I with an Interim Airport South Access meet future 2025 traffic demands?***

Through 2025, SR 509 and Interim Airport South Access (as defined in the alternatives section above) will greatly reduce traffic growth along International Boulevard south of S 176th Street. For example, 2025 PM peak hour traffic volumes at the intersection of S 188th Street/International Boulevard are forecast to increase by 30 percent over 2014 volumes without SR 509 Extension and Interim Airport South Access, but only increase 10 percent with these new roadways. This results from the shift of Airport traffic from the existing S 182nd Street/International Boulevard intersection to the 28th/24th Avenue S corridor west of International Boulevard.

The shift of Airport traffic to the Interim Airport South Access would greatly increase traffic at the intersection of S 188th Street/28th Avenue S. The increase in traffic would result in LOS F conditions even with the Port's previously identified improvement concept for the intersection. A major issue at this location is the resulting traffic queues on S 188th Street between 28th Avenue S and International Boulevard. In order to reduce traffic operation issues and the queues on S 188th Street, the analyses resulted in a recommendation to eliminate the south-to-east left-turn movement from 28th Avenue S to S 188th Street. These left-turns would be re-directed to S 192nd Street to connect back to International Boulevard. While this adds travel distance, overall travel times would be comparable due to the reduced congestion. The analyses also showed that the existing north-to-east right-turn lane on



International Boulevard to S 188th Street should be extended in the future when the adjacent properties redevelop.

The Interim Airport South Access also increases traffic volumes at S 200th Street/26th Avenue S. This intersection will, however, operate at LOS D with the forecast PM peak hour traffic. The increased traffic at S 200th Street/International Boulevard would result in LOS F conditions. However, the LOS F at this intersection would be barely below LOS E; based on the uncertainty of achieving the high levels of projected growth by 2025, it is likely that the intersection would operate at LOS E or better under this scenario. In addition, the City plans to sign traffic traveling to/from the south of S 200th Street to use S 208th Street once it is improved. This will help disperse traffic to multiple routes, reducing the forecast levels of congestion.

Other changes include reductions in forecast growth in traffic volumes at S 188th and S 200th Street Interchanges with I-5 compared to the Without SR 509 extension alternative. This result is due to the more direct and faster travel times provided by SR 509 to/from I-5 compared to using S 188th Street or S 200th Street interchanges.

The traffic forecasts with the SR 509 freeway extension show very little traffic volume growth on Des Moines Memorial Drive S. As previously noted, Des Moines Memorial Drive S currently carries lots of traffic that exits SR 509 at S 188th Street where the existing freeway ends. The extension of the freeway provides an alternative route for that traffic.

### ***How will completion of SR 509 Phase I and Interim Airport South Access affect other locations in the City?***

Completion of SR 509 Phase I with Interim Airport South Access supports increased development in City's Urban Center by enhancing accessibility and reduces congestion. Other roadways and intersections in the City will see some more limited benefits and would need improvements to meet 2025 traffic volume demands.

The intersection of S 170th Street/International Boulevard is forecast to operate at LOS F under this alternative. However, the forecast traffic delays would be reduced by approximately 15 percent compared to the forecasts without the SR 509 extension. There are no easy solutions for improving the forecast operations at this intersection due to impacts on adjacent properties. The City will continue to monitor the operations at this intersection and adjust signal timing to help reduce delays and impacts of traffic queues.

The SR 509 freeway extension and closure of the S 182nd Street/International Boulevard access to the Sea-Tac Airport terminal reduce the forecast traffic volumes at S 176th Street/Military Road S. This reduction in traffic results in LOS E under this alternative compared to LOS F without those improvements.

The intersection of S 154th Street/International Boulevard is forecast to operate at LOS E with the increase in traffic volumes of approximately 25 percent. The increase in traffic at this intersection is partly due to the development proposed in the S 154th Street Station Area Plan. In addition, this intersection is a key location connecting SeaTac with the regional highway system via SR 518.

# SR509

## COMPLETION SUPPORTS INCREASED DEVELOPMENT IN THE CITY'S URBAN CENTER.



### 3.4.2 Evaluation of 2035 Travel Forecasts

The 2035 forecast analyses are based on the long-term growth projections for the City and Airport. They basically reflect build-out conditions for the SeaTac area. As noted above, three network alternatives were evaluated for 2035 to establish the framework for the City's TE and TMP. The first 2035 alternative network is the same baseline network analyzed for 2025. The second option adds the grade-separated South Airport Expressway (SAE) to the network. The final 2035 alternative adds in Phase 2 of the SR 509 freeway extension project, as described above.

Figure 3-4 shows the resulting weekday PM peak hour intersection levels of service for the 2035 alternatives. The 2035 PM peak hour level of services shown on Figure 3-4 include additional improvements that would be needed to address poor levels of service. For example, the left-turn restriction from southbound 28th Avenue S to eastbound S 188th Street and other improvements discussed for the 2025 Baseline alternative are included in all three of the 2035 levels of service shown on Figure 3-4.

#### **How long will SR 509 Phase I with Interim Airport South Access serve future travel demands?**

While the SR 509 Phase I/Interim South Access will generally accommodate forecast growth through 2025, by 2035 the analyses show that they will not adequately accommodate traffic south of the Airport. Traffic volumes at key intersections along 28th/24th Avenue S and on International Boulevard are forecast to be 15 to

20 percent higher than the PM peak hour volumes for 2025 Baseline scenario. These increases in PM peak hour volumes will result in three key intersections operating at a forecast LOS F during the PM peak hour. These include:

- S 188th Street/International Boulevard
- S 188th Street/28th Avenue S
- S 200th Street/International Boulevard.

For these three intersections and associated road segments of S 188th and S 200th Streets:

- The shorter term (2025) improvements will not meet 2035 traffic demands;
- Additional turn lanes would be required resulting in a large roadway footprint;
- Any significant improvements would impact existing businesses;
- Widening the roadways and intersections would be inconsistent with the City's Urban Center and Angle Lake Station Area plans for a more walkable and bike friendly neighborhood in the corridor.

The SR 509 Phase I/Interim Airport South Access alternative also would not address forecast congestion issues in north part of the City. The intersection of S 170th Street/International Boulevard is forecast to be heavily congestion with no additional improvements. As discussed above, improvements at this intersection would be very difficult and costly. They also would impact adjacent properties.

The intersection of S 154th Street/International Boulevard also would operate at LOS F under this

scenario. The S 154th Station Area Plan identified a project to construct a new west-to-north off-ramp from SR 518 to International Boulevard (SR 99). That would greatly reduce the flow of east-to-north left-turns and would result in LOS E. The new off-ramp also may allow the elimination of one of the two existing east-to-north lanes, which would reduce pedestrian crossing distances in this transit-oriented development area.

The intersection of S 150th Street/Military Road S would operate at a forecast LOS E. This intersection is unsignalized; installing a traffic signal (when warranted) and/or adding in turn lanes would resolve the LOS E condition.

The intersection of S 176th Street/Military Road S would continue to operate at LOS E, similar to the 2025 results.

#### **What additional benefits would the South Airport Expressway (SAE) and Phase 2 of SR 509 provide?**

To address the 2035 traffic operations and congestion issues identified under the Baseline scenario with Phase 1 of SR 509 and Interim Airport South Access, the travel demand model was adjusted to evaluate traffic shifts and intersection operations with the addition of the SAE with the SR 509 Phase 1 freeway extension and the SAE with the additional capacity provided under Phase 2 of the SR 509 freeway extension project. An option with the Phase 2 of the SR 509 Extension without SAE did not address the key issues along the 28th/24th Avenue S or International Boulevard corridors, so more detailed analyses were not conducted for that strategy.



The SR 509 and SAE reduce traffic growth on several City roadways including:

- International Boulevard south of the Airport,
- 24th/28th Avenue S arterial (the Interim Airport South Access corridor),
- S 188th Street corridor, and at;
- the I-5 interchanges serving the City of SeaTac.

SAE provides the higher benefit to the City compared to the additional widening of SR 509 under Phase 2. The SAE reduces future traffic volumes on City arterials as well as reduces traffic at I-5 interchanges in SeaTac. As shown in Figure 3-4, the addition of SAE to the 2035 Baseline alternative results in LOS E at 28th Avenue S/S 188th Street. The addition of the SR 509 Phase 2 widening and additional interchange ramps at S 200th Street further reduce traffic volumes on S 188th Street resulting in LOS D at this intersection.

The intersections of S 188th Street/International Boulevard and S 200th Street/International Boulevard are forecast to remain at LOS F with the addition of the SAE with or without the SR 509 Phase 2 widening. However, the forecast delays at these key intersections would be reduced compared to those reported for the 2035 Baseline scenario.

These scenarios also carry over the construction of a new west-to-north off-ramp from SR 518 to International Boulevard. As noted above, the new ramp reduces the volume of east-to-north left turns and would likely allow removal of one of the existing two left turn lanes. The improvement would provide LOS E.

The reduction of Airport-related traffic on City streets also improves safety for non-motorized trips made by residents, employees and visitors in general.

The addition of the SAE and SR 509 Phase 2 do not resolve the capacity and operational issues for S 170th Street/International Boulevard. The City will need to continue to monitor this location and adjust traffic signal timing to best reduce delays, traffic queue impacts, and safety issues that may arise.

SR 509 Phase 2 improvements also provide specific benefits. For example, traffic is reduced on Des Moines Memorial Drive S west of International Boulevard. However, traffic increases traffic on S 200th Street.

### 3.5 Framework for the 2035 Transportation Element

As previously discussed, the traffic forecasts basically assume build-out of the Airport and City; therefore, the reported levels of congestion may not result by 2035 under any of the scenarios. However, the analyses provide for insights into the strategies for phasing major and localized transportation improvements to help the City accommodate the growth. Based on the 2025 and 2035 alternatives evaluation, the City established a framework for its long-range highway and street system. The framework builds from the City's prior Transportation Element, as well as other agency transportation improvement programs. These transportation improvements will support economic development through improved regional accessibility.

Key elements of the framework plan by horizon year include:

#### By 2025:

- Target state and regional funding for construction of SR 509 Phase I;
- Port construction of its South Link project to connect the terminal to S 188th Street and close S 182nd Street/International Boulevard terminal access;
- Completion of 28th/24th Avenue S between S 188th Street and S 216th Street, including interchange with the SR 509 Phase 1 freeway extension as Interim Airport South Access;
- Construction of additional intersection and other associated roadway improvements in connection with these major projects.

#### By 2035:

- Work with Port and regional stakeholders to fund and construct implement the grade-separated South Airport Expressway (SAE). The SAE reduces the need for larger intersection and roadway improvements. In addition, it reduces travel times to/from Airport compared to Interim Airport South Access.

#### By 2040:

- Continue working with WSDOT and regional stakeholders to advance Phase 2 of SR 509 by 2040, consistent with PSRC vision 2040.



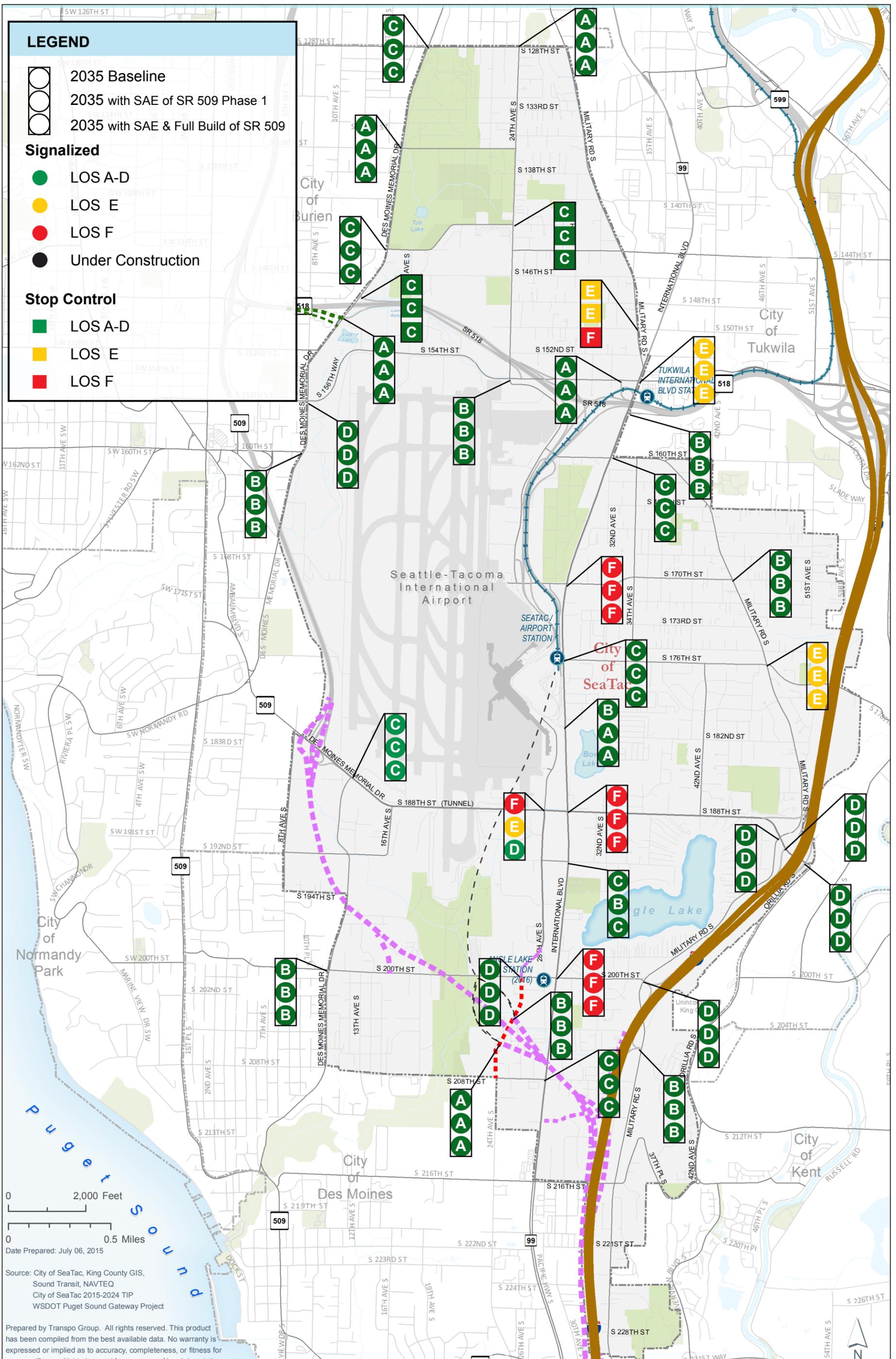


Figure 3-4: 2035 PM Peak Hour Intersection Levels of Service

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