

## Section 7: 2030 Travel Conditions

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### How Were Future Traffic Conditions Forecasted?

Detailed traffic modeling was conducted for the base year of 2005 and future years of 2010, 2020, and 2030. System-level modeling was based on the regional travel demand model developed by the Puget Sound Regional Council (PSRC). Local intersection/interchanges were analyzed for operations with Synchro and VISSIM traffic-simulation modeling software.

In May 2008, WSDOT reconfigured all the existing HOV lanes on SR 167 to operate as HOT (High Occupancy Toll) lanes. This project is a four-year pilot study to analyze the best use of HOT lanes in Washington. At the conclusion of the four-year study WSDOT will determine if the HOT lanes will remain as designed, be reconfigured, operated differently, or be returned to HOV-only lanes. For the purposes of the 2030 forecasting different scenarios were used, some operating the managed lane as a HOV lane and some as a HOT lane.

To prepare the regional model for 2030 forecasting, the following assumptions were made in the model:

- The core HOV lanes from SR 410 north to I-405 are completed.
- HOV/HOT lanes would extend through SR 512 to connect into the SR 167 new freeway extension between SR 512 and SR 509 at the Port of Tacoma. The SR 167 extension would include two general purpose lanes and an HOV/HOT lane in each direction, as a 6-lane section, with a full interchange at I-5.
- Both HOV and HOT lanes were considered in different scenarios. If an HOV lane was considered, it was assumed to be 3+ (3 or more persons are required to be in the vehicle for valid use of the HOV lane). For HOT lanes, it was assumed to be 2+.

#### What is Travel Demand Modeling?

A travel demand model is a program or set of complex computer programs and data with information entered into the model that includes the transportation network (highways, roads, transit routes, etc). and land use variables such as population, employment, households, dwelling units, trip generation rates, transit fares and other information. The results are traffic forecasts that are based on forecasted population growth, land use, demographics, and travel patterns that are unique to a particular region.

For details on modeling methodology and results, see **Technical Memorandum No. 5: Corridor Improvement Options** and **Technical Memorandum No. 6: Future Travel Demand Travel Operations**

**No Build Scenario:**

The **No Build** (No Improvement) Scenario assumes that no SR 167 projects will be constructed beyond those currently funded:

- Add a southbound auxiliary lane from I-405 to 43<sup>rd</sup> Street.  
*Construction: 2008*
- Extend the southbound HOT lane from S 277<sup>th</sup> Street to 8<sup>th</sup> Street E.  
*Construction: 2012-2014*

**Baseline Scenario:**

The **Baseline** Scenario assumes the projects listed in the “No Build” scenario are constructed plus other projects that can be reasonably assumed to be funded and built by 2030, as recommended by “Destination 2030”:

- Extend the northbound HOT lane from 8<sup>th</sup> Street E to 15<sup>th</sup> Street SW.  
*Construction 2020*
- Add northbound and southbound auxiliary lanes from SR 516 to S 277<sup>th</sup> Street.  
*Construction 2020*
- Add northbound and southbound general purpose lanes from S 180<sup>th</sup> Street to SR 516.  
*Construction 2020*
- Extend the northbound and southbound HOT lanes from 8<sup>th</sup> Street E to SR 410.  
*Construction 2030*

“Destination 2030” is the region’s long range transportation plan prepared by PSRC. It is a strategy to meet regional transportation demands in King, Kitsap, Pierce, and Snohomish counties until the year 2030.

- Improved interchange at S 180<sup>th</sup> Street (see Section 9 for potential concept).
- Improved interchange at SR 18 (see Section 9 for potential concept).
- Improved interchange at SR 410/SR 512 (see Section 9 for potential concept).

In addition to the assumptions above, projects specified in Exhibit 7-1 were also assumed to have been completed by the year specified. .

Exhibit 7-1  
**SR 167 Corridor Planned Projects and Model Completion Year**

Facility	Project Title and Description	Model Year
SR 167	Stage 3 HOV/HOT Lane – Extends the northbound HOV/HOT lane from 15 <sup>th</sup> Street SW to 15 <sup>th</sup> Street NW.	2010
SR 167	Stage 4 HOV/HOT Lane – Extends the southbound HOV/HOT lane from 15 <sup>th</sup> Street NW to King County Line	2020
SR 167	Stage 5 King Co. HOV/HOT Lane – Northbound HOV/HOT lane extension from 15 <sup>th</sup> Street SW to King County Line	2020
SR 167	Kent Auxiliary Lane Improvement - Adds a northbound and southbound auxiliary lane from SR-516 to S 277 <sup>th</sup> Street.	2020
SR 167	Renton-Kent GP Lanes Improvement - Adds one general purpose lane in both directions from S 180 <sup>th</sup> Street to SR-516	2020
SR 167	Stage 6 Pierce Co. HOV/HOT Lane - Extend one HOV/HOT lane both directions from King County Line to SR 410	2030

The options that were carried forward were modeled as having one HOT lane in each direction and as having two HOT lanes (convert one of the general purpose lanes to HOT lane) in each direction to provide a comparison of the two operational approaches.

It is important to note that the local intersection modeling forecasts out to 2010 only, with some limited 2020 forecasts. The regional model does not work at the intersection level and operational models do not exist to allow accurate modeling at the intersection level.

## Why Pick the Year 2030 to Forecast?

The year 2030 has been selected as the outer horizon year by the Puget Sound Regional Council (PSRC). Traditionally, forecasts for transportation projects extend at least 20 years into the future. The current planning horizon year designated by PSRC is 2030. This timeframe provides a realistic period for identifying projects based on projected population and employment growth.

## What Types of Land Use Will the SR 167 Corridor Likely See in the Future?

*Technical Memorandum No. 3: Existing Conditions* describes the SR 167 Corridor's recent population and employment growth. Between 1980 and 2000, the population in cities along the corridor increased from 175,000 to 294,000, an increase of 68%. Employment growth has also been significant – 180,600 jobs in 2000 compared to 94,900 jobs in 1980. This trend is expected to continue. The population and job growth is a direct result of the relative affordability of housing in the Green River Valley compared with other areas in the Puget Sound region.

The Green River Valley has substantial warehousing and storage facilities for trucks and trailers that support the Port of Tacoma. This connection to the Port will also play a role in the area's growth. Improvements to the SR 167 Corridor will result in a more efficient connection to the Port and will likely result in additional truck traffic along a corridor that already has a significant volume of trucks.

## How Much Population and Employment Growth Can the SR 167 Corridor Expect?

Population and employment forecasts are described in greater detail in *Technical Memorandum 4: Existing Traffic Operations*. Current forecasts indicate the corridor's population will grow to more than 410,000 by 2030, a 39% increase over the 2000 population. While historically much of the growth has been in the north end of the SR 167 Corridor,

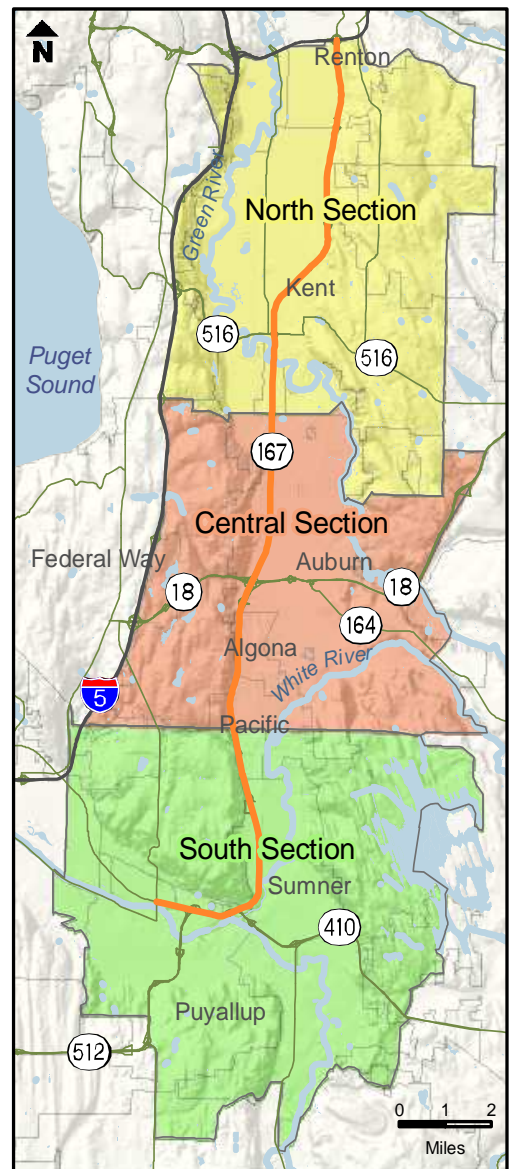
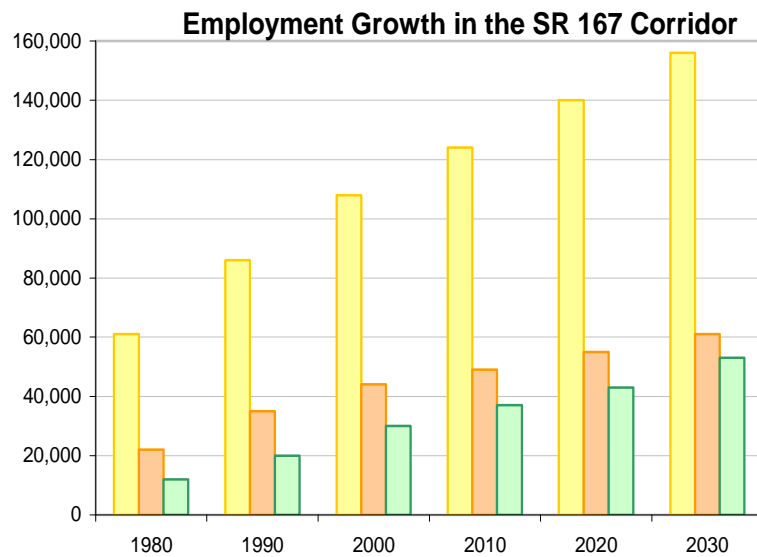
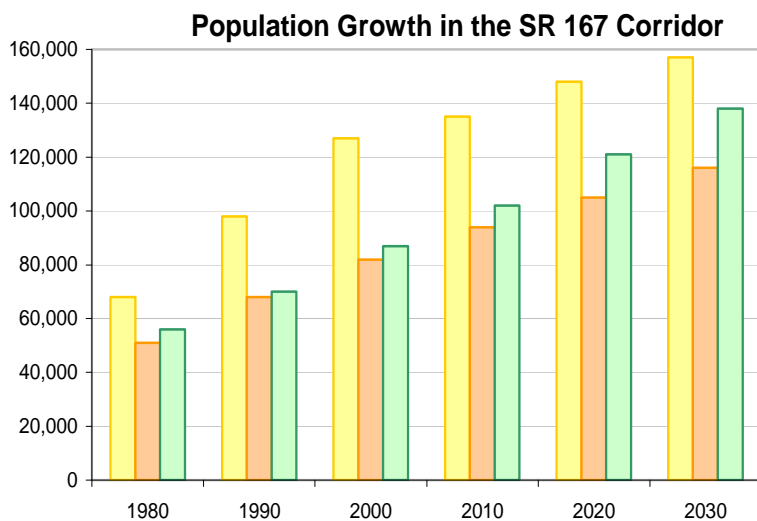
### PSRC Model

The PSRC Model is the industry standard by which all large transportation projects base their forecasts on. The model includes all funded projects and all projects reasonably expected to be funded by the year 2030.

models predict that future residential growth will be stronger in the southern end of the corridor as illustrated in Exhibit 7-2.

Likewise, it is forecasted that employment along the Corridor will also increase. Employment is expected to increase by 54% from the year 2000 to the year 2030. The model predicts that most of the employment (approximately 60%) will continue to be focused in the northern end of the corridor.

**Exhibit 7-2  
Population and Employment Growth in the SR 167 Corridor**



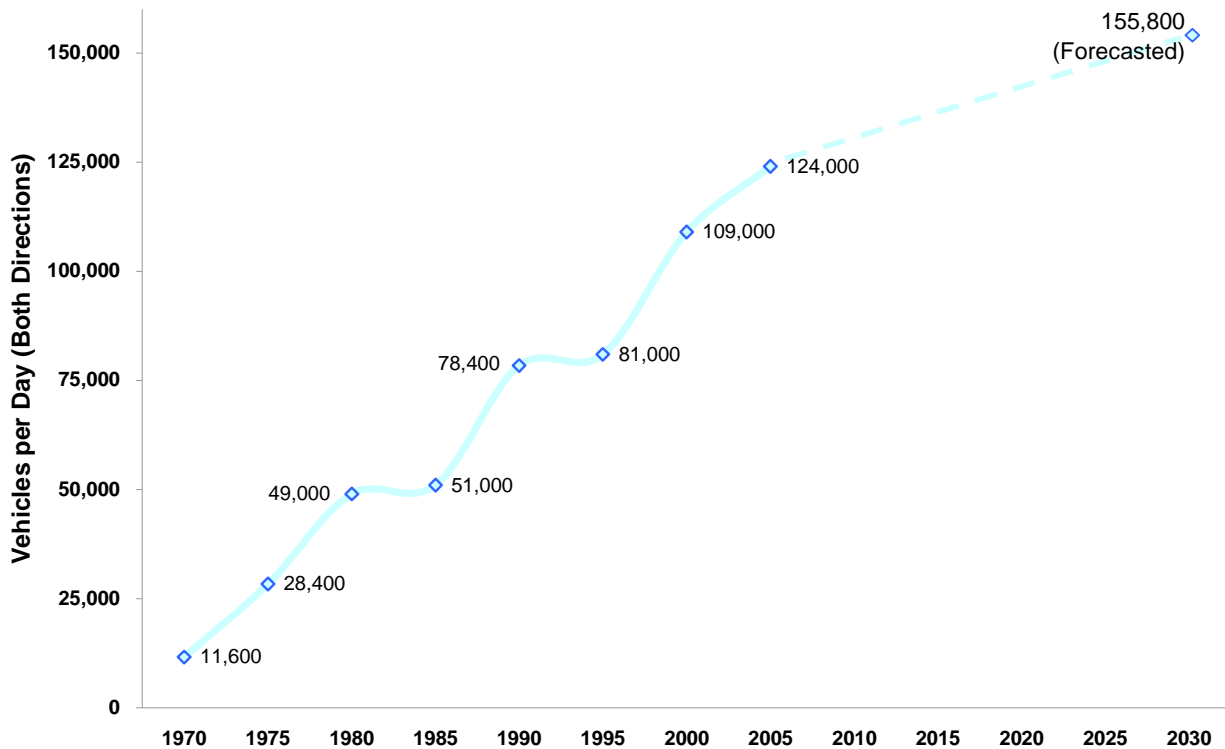
Source: PSRC

## What Could Travel Conditions Be Like in the Year 2030?

Today, on average, more than 127,000 vehicles use SR 167 per day. Exhibit 7-3 illustrates how traffic has grown in the corridor since it was constructed in the 1970's. In the year 2030, the average volume for the entire SR 167 Corridor will climb to 155,800 vehicles per day. The greatest increase in travel demand occurs in the northern section where congestion occurs today during the morning and afternoon commutes.

For details on existing traffic, see **Technical Memorandum No. 3: Existing Conditions**

Exhibit 7-3  
**Traffic Growth History in the SR 167 Corridor**



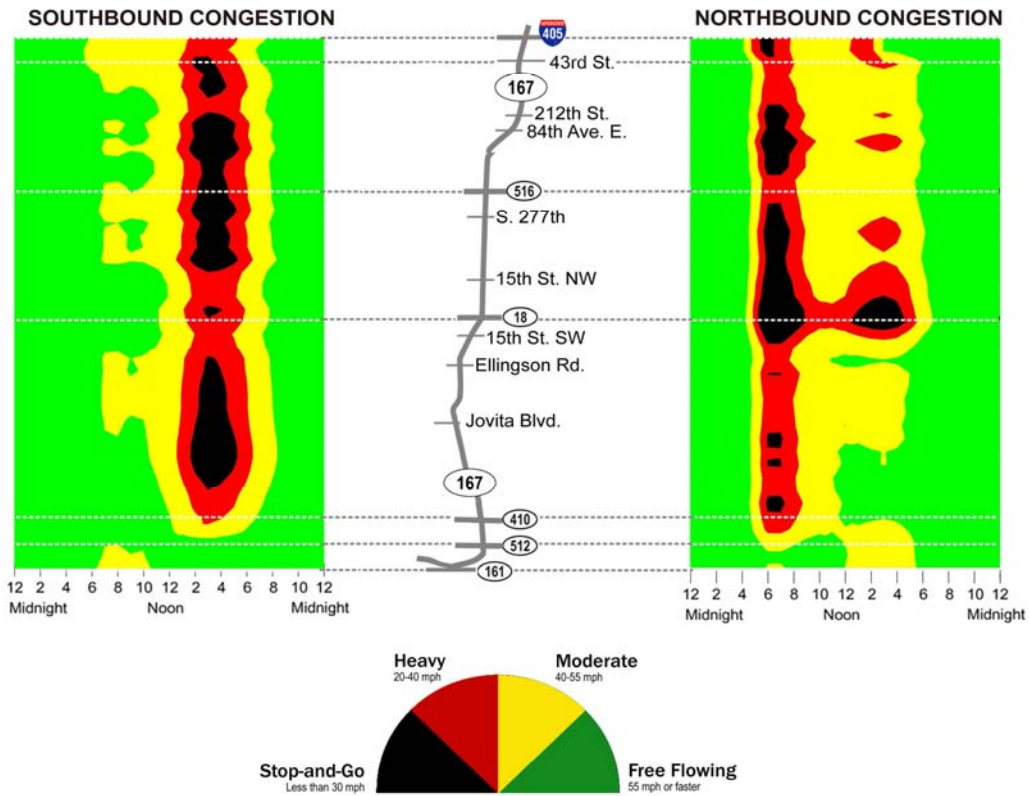
Source: WSDOT & Petteet

Exhibit 7-4 provides a summary of traffic congestion in 2005 and the model projected increased traffic congestion by 2030 in the northbound and southbound directions.

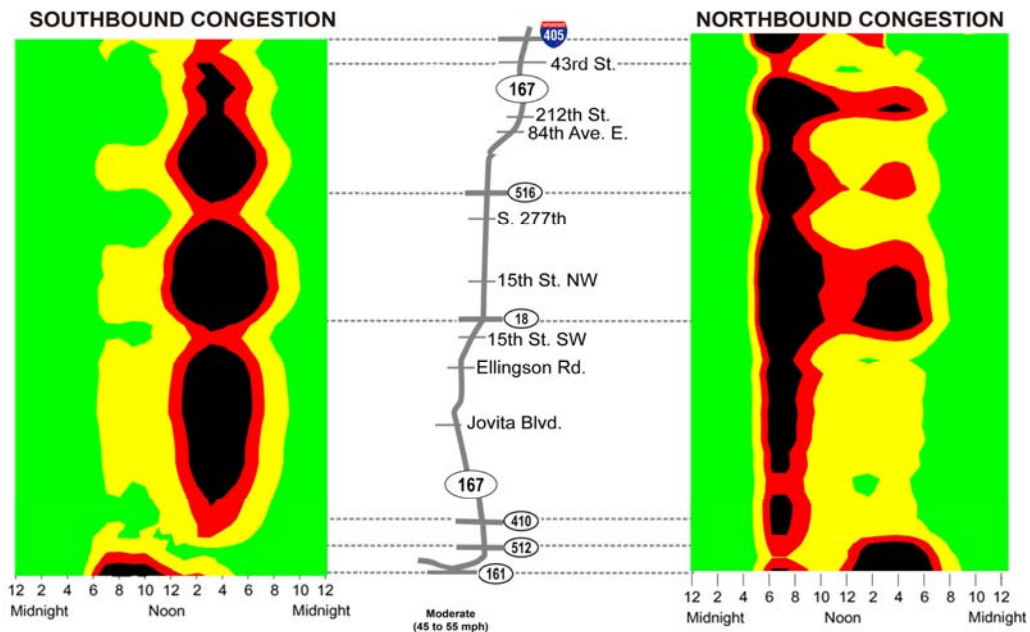
Exhibit 7-4

**Typical Weekday Traffic Congestion (2005 and Forecasted 2030)**

**Weekday Traffic in the SR 167 Corridor (2005 data)**



**Weekday Traffic in the SR 167 Corridor with No Improvements (Projection for the Year 2030)**



Source: Perfeet

## ***What are the Northbound and Southbound Congestion Problems Forecasted for 2030?***

### **Southbound SR 167**

#### 2030 No Build Scenario (No Improvements)

The No Build scenario assumes the only improvements implemented on SR 167 by the year 2030 are those that are currently funded.

The model results for southbound SR 167 in 2030 indicate that without capacity improvements peak travel periods become longer and travel deteriorates to stop-and-go traffic through most of the corridor.

Between I-405 and SR 512 the travel time in the general purpose lanes during the afternoon peak period increases to approximately an hour and a half, with an average speed of 14 mph. The greatest delay occurs through the central section of the corridor with speeds as low as 8 miles per hour.

#### 2030 Baseline Scenario

The Baseline scenario assumes by 2030 all the improvements in the No Build scenario are completed plus additional projects that can be reasonably assumed to be funded (see page 82 for additional details).

The model also forecasted traffic volumes on the major arterials parallel to SR 167 and within the interchange areas for the 2030 Baseline Scenario. In the northern section, where there are assumed interchange improvements at I-405 and an increase in commuter rail trips, vehicle trips on the arterials show a minor decrease of approximately 400 vph total across three parallel arterials. Traffic volumes on arterial streets increase more than 40% in the central and southern sections as compared to today. The large increases in the central and southern sections, compared to the northern section occur because the existing arterial streets are operating below capacity and, as such, provide less delay than using SR 167.

Travel time will increase for the general purpose lanes from an average of 39 minutes today to 88 minutes in 2030, while the HOV/HOT lanes will be able to maintain travel times similar to 2005 of approximately 27 minutes for a trip between I-405 in Renton and SR 512 in Puyallup.

Exhibit 7-5 illustrates the projected level of service in 2020 at selected intersections on the local arterials. Intersection modeling was not conducted for 2030 due to the reduced level of technical reliability of the modeling software beyond 2020.

### **Northbound SR 167**

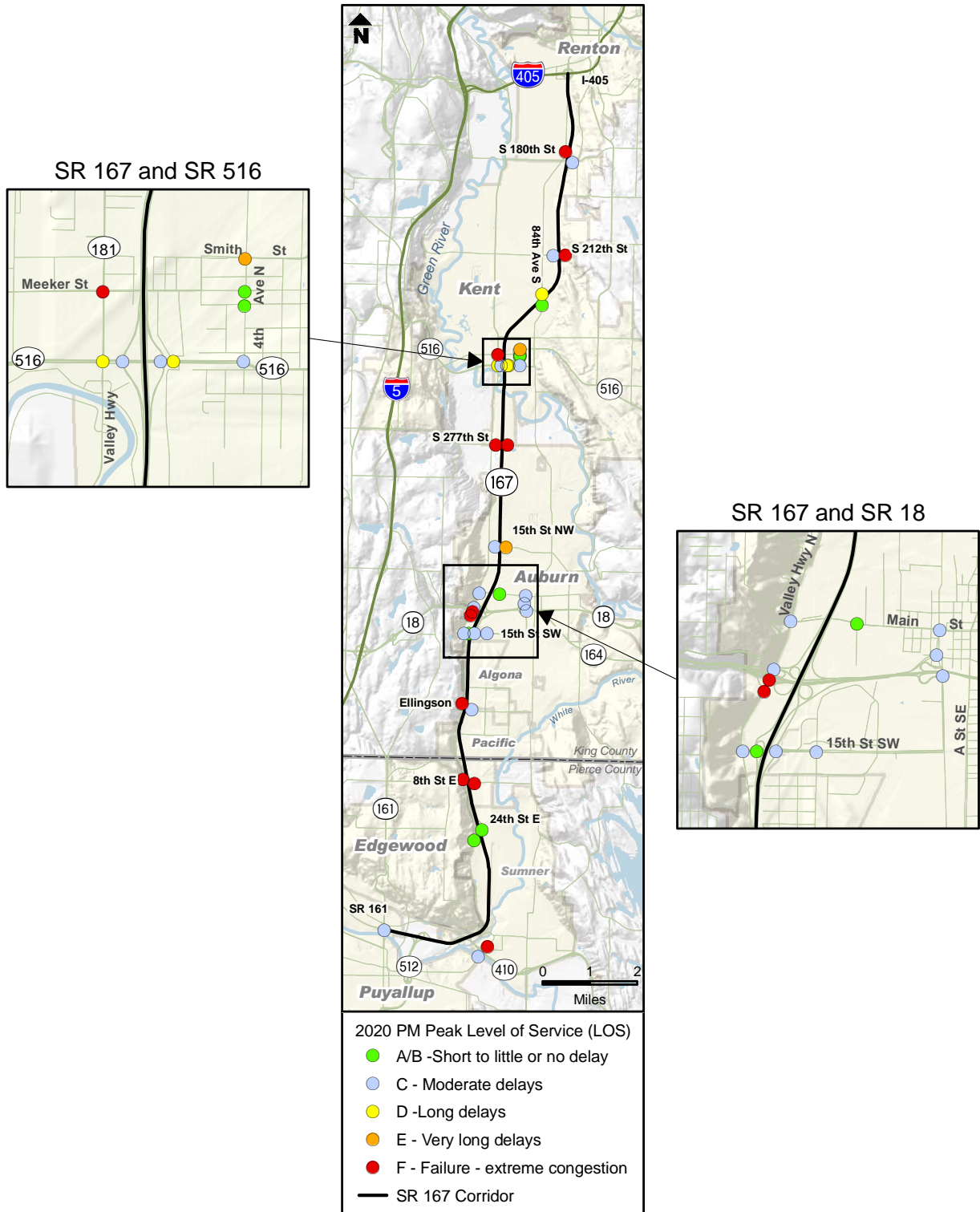
The 2030 Baseline Scenario results for northbound are slightly better, as compared to southbound, with an average corridor speed of 49 mph. Focusing our traffic modeling and forecast on the southbound direction and understanding those issues will provide greater or equal beneficial impacts for the northbound direction.

### ***How Will HOT Lanes Benefit Forecasted Traffic Conditions in 2030?***

HOT lane users will benefit significantly from the completed HOT lanes through the corridor. The average travel time in the HOT lane is 27 minutes with an average speed of 45 mph. For all of the alternatives, the average HOT lane travel time and speed remains constant. This is because the variable toll rate would be designed to maintain an average speed of 45 mph.

Just over a third of the person-trip demand on the corridor is two persons and three-plus persons (per vehicle) trips. This is equivalent to 1,000 vehicles per hour (vph), which means there should be about 500 vehicles per hour of HOT lane capacity available for drive alone trips.

Exhibit 7-5  
**Arterial Intersection Level of Service (Forecasted 2020)**



Source: Perteet

## **Key Findings of This Section**

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### **Forecasting Future Traffic Conditions**

- The Puget Sound Regional Council's EMME/2 model was the primary modeling tool used to forecast future traffic volumes.
- Synchro and VISSIM were used for modeling at the interchanges and local intersections.
- The year 2030 was the primary forecast year for the corridor. The year 2020 was the primary forecast year for the arterial intersections.

### **Population and Traffic Growth**

- Population in the corridor will grow to more than 410,000 by 2030, a 39% increase over the year 2000 population.
- By 2030 up to 155,800 vehicles will use SR 167 daily, an increase of 23%.

### **Average Speed in Corridor**

- By 2030, southbound traffic will average 14 mph in the afternoon peak period for the No Build Scenario.

### **HOV/HOT Lanes**

- The complete HOV/HOT system from I-405 to SR 512 would provide users with a consistent travel time along the SR 167 Corridor.