

Section 12: SR 167 Corridor Recommendations and Phasing

What is the Recommended 2030 Vision?

WSDOT looked at several options and modeled them for performance. The information that the model provides is helpful but is not the sole driving force behind which option is to be recommended. WSDOT considers financial reality an important factor in the decision, as well as the input and desires of the local communities and businesses along the corridor. WSDOT must balance all of the issues discussed in this document in order to make a final recommendation for the future of this vital corridor.

Balancing the need to address current and future travel demand with the amount of funding that can be reasonably assumed to become available between now and the year 2030, WSDOT concluded that adding one additional lane in each direction could be accomplished by phasing projects through 2030. Additional funding will be essential to meet the 2030 vision.

According to RCW 47.04.280, WSDOT needs to continuously improve the effectiveness and efficiency of the transportation system. WSDOT currently uses Intelligent Transportation Systems (ITS) to maintain vehicle throughput such as ramp metering, traveler information, incident response, commercial vehicle information systems networks (CVISN), and coordinated signal technology. New Active Traffic Management (ATM) strategies such as speed harmonization and queue warning should be considered in order to maximize the capacity of the existing roadway. These strategies have been shown to reduce delay caused by collisions and improve vehicle throughput.

Of the options analyzed and considered, the final recommendation is a modified version of Option 2. The analyses indicate that the extreme costs of Options 4 and 4A outweigh the benefits (improved travel time). While Options 2

and 2A cost less, they carry a large price tag in comparison to available funding resources.

Based on these factors an Option 2 Modified, which is based on Options 2 and the baseline considerations, was determined to be the most cost-effective and beneficial option for the SR 167 Corridor. Option 2 Modified allows for expanding the capacity, enhancing the efficiencies of the HOV/HOT lane by completing the system, and minimizing the impacts to the natural resources in the SR 167 Corridor.

The components that define this solution are:

The long-term 2030 recommendation is:

Option 2 Modified

North of SR 18:

Eight-lane configuration between I-405 and SR 18, which includes one HOV/HOT lane in each direction.

South of SR 18:

Six-lane configuration between SR 18 and SR 512, which includes one HOV/HOT lane in each direction.

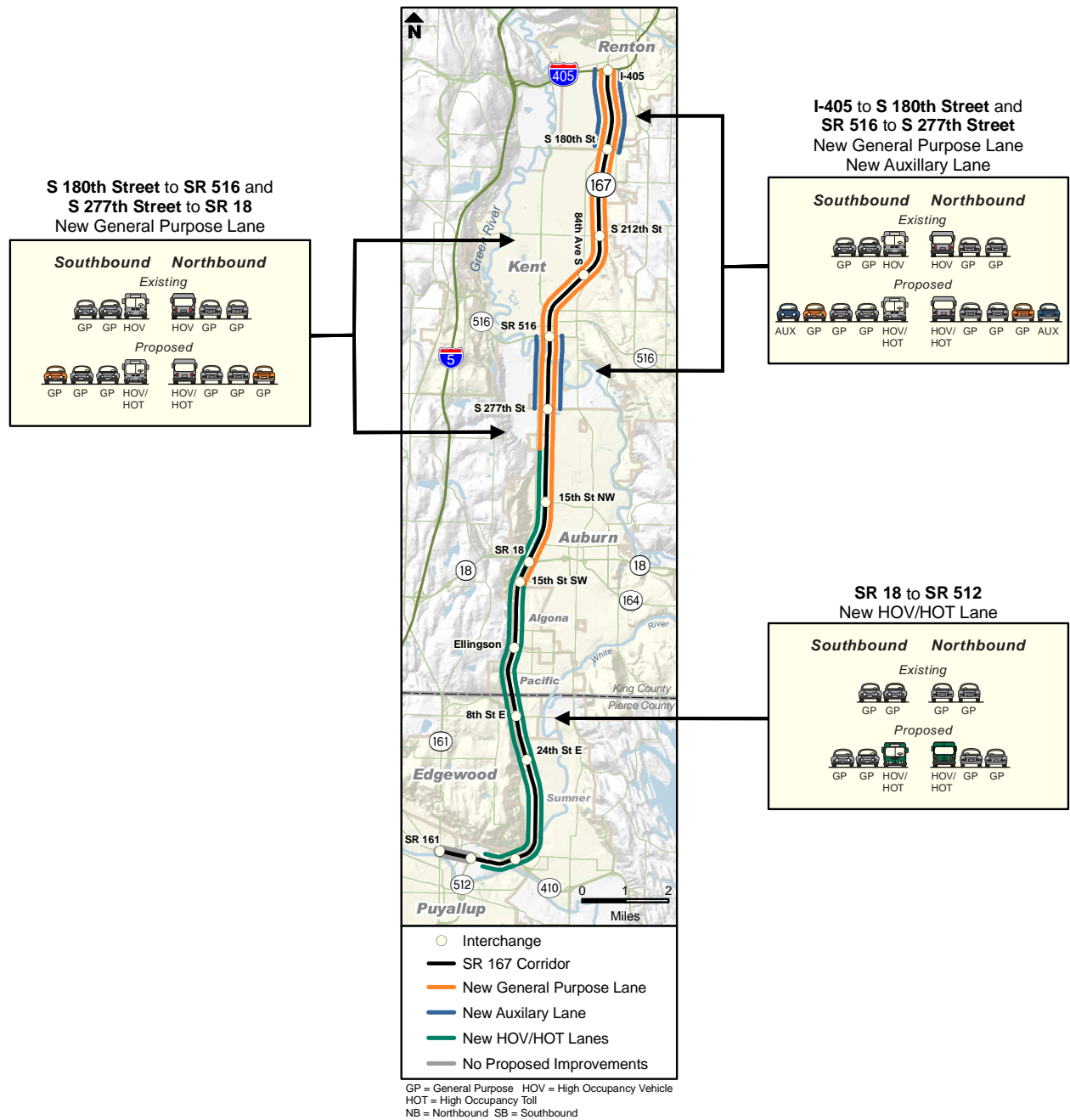
Additionally:

Additional northbound and southbound auxiliary lanes between I-405 and S 180th Street, as well as between SR 516 and S 277th Street.

Option 2 Modified is estimated to cost between \$1.4 and \$2.0 billion.

Exhibit 12-1 illustrates the recommended 2030 vision of SR 167 Option 2 Modified.

Exhibit 12-1
Option 2 Modified Conceptual Design



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 43rd Street.
Construction: 2008
- Extend the southbound HOT lane from S 277th Street to 8th 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 8th Street E to 15th Street SW.
Construction 2020
- Add northbound and southbound auxiliary lanes from SR 516 to S 277th Street.
Construction 2020
- Add northbound and southbound general purpose lanes from S 180th Street to SR 516.
Construction 2020
- Extend the northbound and southbound HOT lanes from 8th 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.

What are the Travel Conditions for Option 2 Modified in the Year 2030?

Exhibit 12-2 illustrates the results of the Year 2030 traffic model for **Option 2 Modified**, illustrated in a “thermal scan” of the congestion that will likely occur in the general purpose lanes during a typical weekday 24-hour period. This is compared to the Year 2030 **No Build** option “thermal scan”.

It is assumed that the SR 167 Extension project will be extended to the west to connect to the Port of Tacoma and I-5 by the Year 2030. This will ultimately provide two general purpose and one HOV/HOT lane in each direction between the Port and SR 18, north of which there will be additional general purpose and auxiliary lanes as described above.

Southbound SR 167

During the afternoon peak commute period, **Option 2 Modified** shows significantly less congestion both in terms of time duration and the physical extent of the congestion. Average travel speeds are more than twice those projected for the Year 2030 **No Build** option. Southbound SR 167 would operate at free-flow speeds during the morning peak hours through the entire corridor.

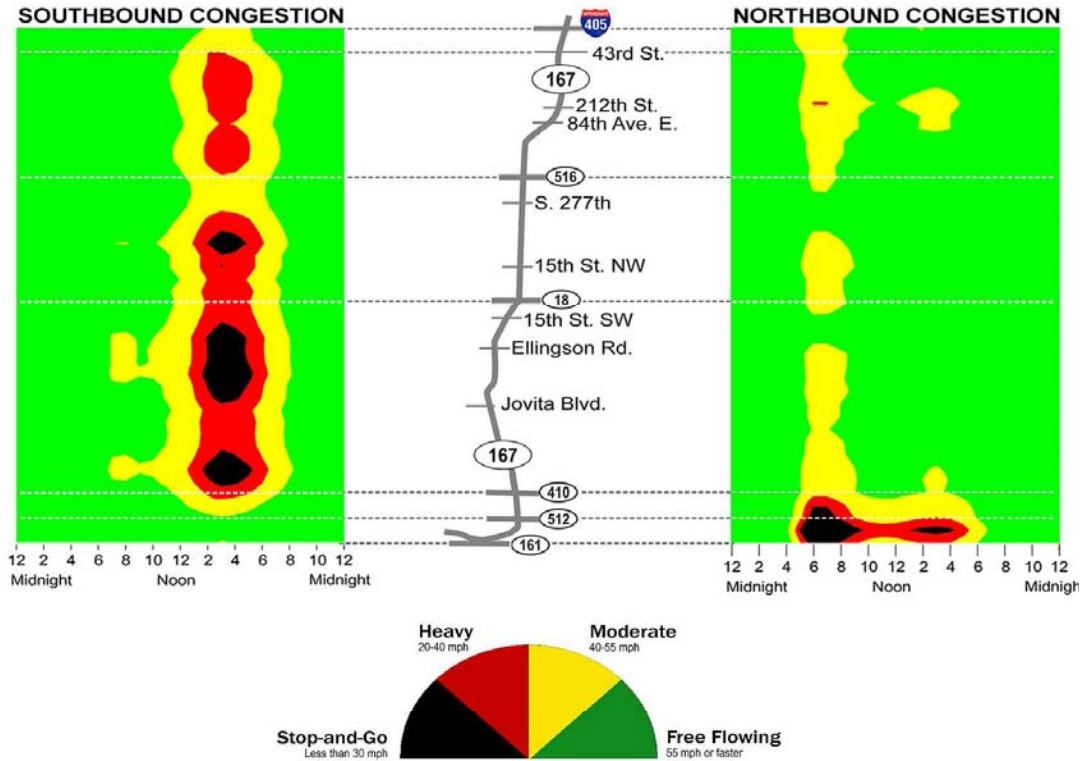
The “thermal scan” illustrates a small area of black, which represents “stop-and-go” traffic, just south of the S 277th Street interchange on-ramps and north of the 15th Street NW off-ramps. Similar “stop-and-go” areas are illustrated between the Ellingson Road and the Jovita Boulevard / 8th Street E interchanges, as well as between the 24th Street E and the SR 410 interchanges. These congestion areas are a result of the traffic weaving between the stream of on-ramp vehicles merging onto SR 167 at one interchange and the stream of mainline vehicles preparing to exit at the next interchange. An auxiliary lane between the on- and off-ramps at these interchanges could reduce the congestion even further.

The travel speeds would not drop below 30 mph between I-405 and S 277th Street during the afternoon peak commute period. This validates the sufficiency of only four southbound lanes in

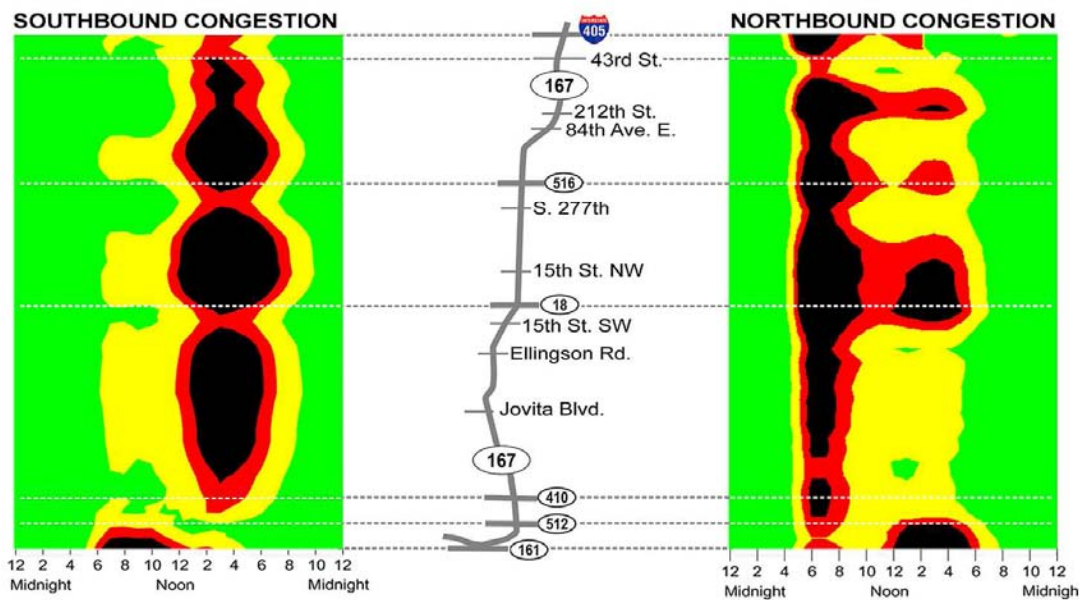
Exhibit 12-2

Option 2 Modified Year 2030 Traffic Conditions

Weekday Traffic in the SR 167 Corridor with Option 2 Modified (Projection for the Year 2030)



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



Source: Perteet

this area, plus the auxiliary lanes that are recommended in **Option 2 Modified**.

It is important to note that the reduction from four southbound lanes to three at the SR 18 interchange area would produce congestion from Jovita Boulevard to Ellingson Road for three hours in the afternoon. This congestion could be relieved with an auxiliary lane between these interchanges. This is a significant improvement over the six hours of congestion this area would experience in the No Build condition. These results indicate the preferred option significantly reduces congestion, which further emphasizes that **Option 2 Modified** is the appropriate recommendation for this corridor.

Northbound SR 167

With the assumption that the SR 167 Extension to the Port of Tacoma will be built by the Year 2030, there will be more traffic through the SR 161, SR 512, and SR 410 interchanges. This will contribute to the “stop-and-go” traffic conditions during the morning peak commute period. Other interchange improvements, such as those illustrated in Section 9, could be considered to reduce this congestion. The remainder of the northbound SR 167 corridor would operate at travel speeds in the range of 40 mph to 60 mph during the morning and afternoon peak commute periods, which is a significant improvement compared to the existing conditions and to the Year 2030 No Improvement (No Build) option.

A minor slowing of traffic is expected as northbound SR 167 approaches I-405. The resulting traffic conditions would still be significantly better than current conditions, mainly due to the I-405/SR 167 HOV to HOV direct connection ramps that are assumed to be built by the Year 2030.

Though the southbound traffic is the peak direction of travel during the afternoon peak hours, there would still be some “stop-and-go” congestion in the northbound direction at the SR 161, SR 512, and SR 410 interchanges due to their close proximity to each other. The small black area in the “thermal scan” between 2 p.m. and 4 p.m. on northbound SR 167 is a

result of the significant west-to-east commuter-traffic volume that travels from northbound SR 512 onto SR 167 and then immediately exits to eastbound SR 410.

What are the Phasing Options?

In order to fulfill the entire 2030 vision the corridor needs to be phased into smaller, more manageable projects such as bottleneck or segment projects. These smaller segments are easier to secure funding for while improving safety and congestion in spot locations.

The following list of projects falls into three categories:

- HOV/HOT lanes
- Additional lanes (general purpose or auxiliary lanes)
- Interchanges

The priority is to complete the core SR 167 HOV/HOT system all the way to SR 410 first. Following this, construct the additional lane in the southbound direction. Traffic modeling demonstrated a stronger need for this improvement than in the northbound direction. Finally, complete the additional northbound lane. Interchanges should be improved along with the corresponding highway widening projects. The projects funded or partially funded are illustrated in Exhibit 12-3.

WSDOT is committed to completing the HOV lanes system on SR 167 between I-405 and SR 410. HOV/HOT lanes are the most efficient way to improve “people moving capacity” because the HOV/HOT lanes move more people in fewer vehicles during the peak periods, as compared to the general purpose lanes. HOV/HOT projects are particularly important given the growth anticipated by 2030 and funding constraints.

Assuming the HOT Lane Pilot Project is successful, WSDOT could extend the benefits of the HOT lanes to more people by finishing the HOV/HOT system on SR 167 south to SR 410.

Exhibit 12-4 provides the recommendation for phasing the improvements, in priority order, to reach the 2030 vision:

Exhibit 12-3
SR 167 Funded and Partially Funded Projects

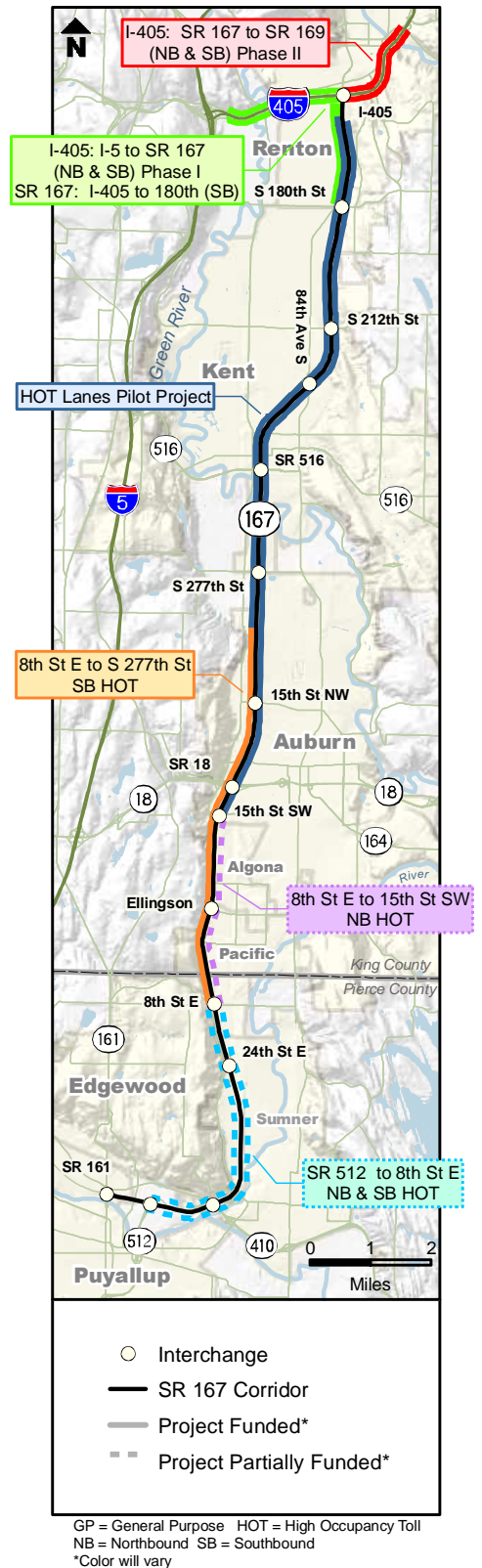
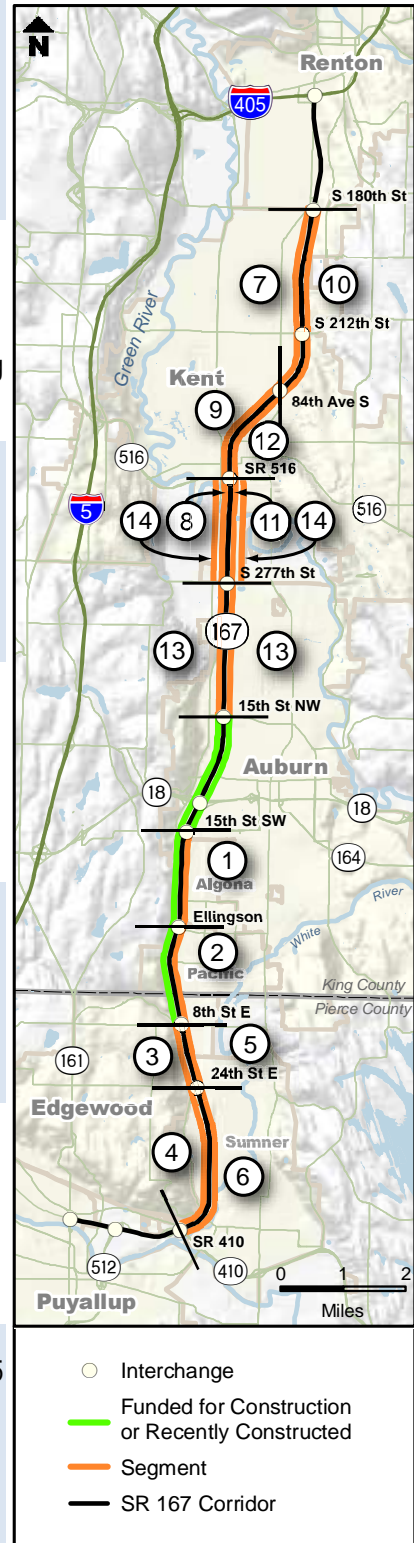


Exhibit 12-4

Improvement Projects Phasing Priority Recommendation

Priority	Project Limits	Cost* (Millions)	Benefit
1	Ellingson Road to 15 th Street SW Northbound HOT Lane	\$67 to \$95	Extends the SR 167 HOV/HOT lane system in King County, providing additional capacity, faster options, reduced collisions, and more reliable travel time for this very congested morning peak northbound segment
2	8 th Street E to Ellingson Road Northbound HOT Lane	\$69 to \$94	Completion of the SR 167 HOV/HOT lane system in King County, providing additional capacity, faster options, reduced collisions, and more reliable travel time for this very congested morning peak northbound segment
3	8 th Street E to 24 th Street E Southbound HOT Lane	\$42 to \$58	Extends the southbound SR 167 HOV/HOT lane system, providing additional capacity, faster options, reduced collisions, and more reliable travel time for this very congested afternoon peak southbound segment
4	24 th Street E to SR 410 Southbound HOT Lane	\$104 to \$165	Completion of the southbound SR 167 HOV/HOT lane system, providing additional capacity, faster options, reduced collisions, and more reliable travel time for this very congested afternoon peak southbound segment
5	24 th Street E to 8 th Street E Northbound HOT Lane	\$43 to \$60	Extends the northbound SR 167 HOV/HOT lane system, providing additional capacity, faster options, reduced collisions, and more reliable travel time for this very congested morning peak northbound segment
6	SR 410 to 24 th Street E Northbound HOT Lane	\$117 to \$178	Completion of the entire SR 167 HOV/HOT lane system, providing additional capacity, faster options, reduced collisions, and more reliable travel time for this very congested morning peak northbound corridor
7	S 180 th Street to 84 th Avenue S Southbound Additional Lane	\$156 to \$238	Provides an additional southbound lane from I-405 to the busy 84 th Avenue exit in Kent, significantly reducing collisions by eliminating weaving movements, and reducing vehicular delay by adding roadway capacity



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Priority	Project Limits	Cost* (Millions)	Benefit
8	SR 516 to S 277 th Street Southbound Auxiliary Lane	\$60 to \$96	Provides a southbound auxiliary lane for this segment that has a large volume of traffic that gets on at SR 516 and immediately off at S 277 th Street, significantly reducing collisions by eliminating weaving movements, and reducing vehicular delay by adding roadway capacity
9	84 th Avenue S to SR 516 Southbound Additional Lane	\$107 to \$184	This segment completes the fourth southbound lane from I-405 to S 277 th Street, providing additional capacity, reducing collisions, and reducing delays through the congested Kent vicinity
10	84 th Avenue S to S 180 th Street Northbound Additional Lane	\$172 to \$258	Provides an additional northbound lane from the busy 84 th Avenue Kent on-ramp to I-405, significantly reducing collisions by eliminating weaving movements, and reducing vehicular delay by adding roadway capacity
11	S 277 th Street to SR 516 Northbound Auxiliary Lane	\$42 to \$63	Provides a northbound auxiliary lane for this segment that has a large volume of traffic that gets on at S 277 th Street and immediately off at SR 516, significantly reducing collisions by eliminating weaving movements, and reducing vehicular delay by adding roadway capacity
12	SR 516 to 84 th Avenue S Northbound Additional Lane	\$108 to \$178	This segment completes the fourth northbound lane from S 277 th Street to I-405, providing additional capacity, reducing collisions, and reducing delays through the congested Kent vicinity
13	S 277 th Street to 15 th Street NW North & Southbound Additional Lanes	\$171 to \$268	This segment completes the fourth northbound and southbound additional lanes from I-405 to 15 th Street NW, providing additional capacity, reducing collisions, and reducing delays
14	SR 516 to S 277 th Street North & Southbound Additional Lanes	\$105 to \$130	This segment completes the fifth northbound and southbound additional (auxiliary) lanes between SR 516 and S 277 th Street, significantly reducing collisions by eliminating weaving movements, and reducing vehicular delay by adding roadway capacity

* Cost estimates based on a January 2007 CEVP, in millions, for the Year of Expenditure, see Exhibit 10-2 for additional detail
See Exhibit 10-1 for the Segment Map

Interchanges

All existing interchanges are able to accommodate four lanes in each direction on SR 167, with accommodations for reduced lane and/or shoulder widths. The interchanges, therefore, do not need major reconstruction for the 2030 vision.

What Are The Low Cost Improvements That Should Be Implemented?

Balancing short and long-term improvement options is important for planning, however, it is also important to identify short-term, lower cost improvements due to the limitations imposed by the reduced transportation revenue.

While this document lays out a phasing plan for strategically adding capacity to SR 167, there are also lower cost improvements that can be made to improve mobility. These improvements also have the advantage of being easier to construct with much less resultant construction related traffic congestion. Strong consideration should be given to implementing the lower cost improvements as a first order of work.

- Install Intelligent Transportation System (ITS) infrastructure including traffic cameras, data loop stations and variable message signs where they do not currently exist and implement Active Traffic Management (ATM) Strategies throughout the SR 167 corridor. South of SR 18, the corridor lacks the ITS infrastructure needed to provide drivers with information about congestion, incidents and other factors that will help them make informed decisions regarding travel on SR 167. In addition to providing drivers with timely travel information, ATM strategies take the use of technology a step further. Gantries are placed over the roadway at regular intervals in order to manage speeds and lane changes to help reduce the number of collisions that tend to occur on congested highway facilities. Collisions account for a significant amount of the congestion experienced on the highway system. Reducing the number of collisions not only improves safety, it also

reduces traffic congestion. The planning level cost estimate to install the ITS and ATM infrastructure from Puyallup to Renton is \$152 million.

- Add ramp meters to on-ramps at interchanges where they do not currently exist. Ramp meters help smooth freeway traffic and ease congestion during times of heavy travel demand. Ramp meters are traffic signals at freeway on-ramps used to improve traffic flow and safety by staggering vehicles as they merge onto the freeway. The on-ramps south of SR 18 are not currently metered. The average cost to install a ramp meter is \$1.5 million each. The following eight interchange on-ramps are not currently metered (for a total cost of approximately \$12 million for all):
 - 15th Street SW (northbound only)
 - Ellingson Road (north and southbound)
 - 8th Street E (north and southbound)
 - 24th Street E (north and southbound)
 - SR 161 (northbound only)

In addition to the ramp meters themselves, each location should be evaluated during project development to determine if HOV bypass lanes are needed in association with the ramp meter. This determination will depend largely on the number of transit/HOV vehicles that use the on-ramp at the time of the evaluation. By-pass lanes can cost \$1 to \$6 million each, depending on the location and existing natural and built environment. Most of the ramps along the SR 167 corridor have not warranted HOV by-pass lanes. The following eleven interchange on-ramps do not currently have HOV by-pass lanes (for a total cost of approximately \$19 to \$66 million for all):

- S 212th Street (northbound only)
- 15th Street SW (north and both southbound)
- Ellingson Road (north and southbound)
- 8th Street E (north and southbound)
- 24th Street E (north and southbound)
- SR 161 (northbound only)

- There are two off-ramp termini that meet signal warrants but remain stop controlled (stop sign rather than traffic signal) intersections. At these locations, traffic operations could be improved with the installation of a traffic signal. A traffic signal generally costs approximately \$250,000 each. The following locations should be considered for traffic signal installation:
 - 8th Street E (southbound)
 - Ellingson Road (southbound)
- Continue to monitor and refine the traffic signal timing on the major arterial streets that both parallel and cross SR 167. While Section 3 of this document indicates the signals on all major arterials have been coordinated, this is a condition that needs to be regularly monitored and adjusted to make certain optimal signal timing is maintained.
- Consider the advanced development of wetland impact mitigation sites. Wetlands exist all along the SR 167 corridor (See Section 6). Any capacity expansion project we choose to undertake is likely to disrupt a wetland in some way. Identifying locations for new wetland establishment and, at a minimum, purchasing the needed right of way will help save dollars in the future. As real estate increases in value over time, securing the property needed for wetland mitigation sites well in advance of construction will reduce the amount of investment needed in the future.

For future improvement project identification studies on the SR 167 corridor, the following should be considered:

1. Use the collision analysis methodology detailed in the Design Manual Supplement, available at: (<http://www.wsdot.wa.gov/publications/manuals/fulltext/M22-01/SafetyImprovementProject.pdf>). This analysis method will ensure statewide consistency in identifying safety needs.

2. To avoid multiple studies in the same locations, analysis of mobility and safety needs should be transferable to future work including scoping or other planning studies such as the Highway System Update where multimodal corridor improvements are among the alternatives analyzed.
3. Methodology used for mobility analysis should be consistent with the methodology used for evaluating solutions in the Highway System Plan (HSP).
4. Include Benefit/Cost analysis as described in the current and future HSP.

What is Recommended After the 2030 Vision?

The travel demand growth and the growing importance of SR 167 (I-405 to I-5) as a freight corridor, particularly with the SR 167 Extension project to the Port of Tacoma, justify the consideration of building out SR 167 beyond the 2030 vision. The recommendation is to ultimately provide a 10-lane footprint with major interchange reconstruction at S 180th Street, SR 18, and SR 410/SR 512.

The following list of bottleneck/segment improvement projects are recommended after the 2030 vision (Option 2 Modified) is completed. The priority will need to be assessed at the time of funding to determine which project will provide the greatest benefit at that time.

- Add an additional general purpose lane in each direction between SR 512 and I-405 (could be a second HOV/HOT lane). This would make the corridor 10 lanes north of SR 18 and eight lanes south of SR 18.
- Reconstruct the S 180th Street Interchange (which includes the 41st Street on- and off-ramps) to improve safety and traffic flow by consolidating the arterial connections with SR 167.

- Improve the SR 18 Interchange, which would provide the “missing ramps” in the southwest quadrant (northbound SR 167 to westbound SR 18 and eastbound SR 18 to southbound SR 167). Improvements to the 15th Street SW interchange are also recommended as part of this project. The current State Highway System Plan has proposed recommendations to fund just the “missing ramps”, without any additional interchange improvements, by 2026.
- Improve the SR 410/SR 512 Interchange, which would improve the traffic-weave section between SR 410 and SR 512 and provide direct connections between the HOV/HOT lane system on SR 167 and SR 410.
- Add an additional lane in each direction between SR 512 and SR 18, which would be the fifth lane in each direction.

What are the possible Economic Benefits from these Investments?

Economic studies conducted by the Port of Seattle and Port of Tacoma indicate that the overall economic vitality and growth of the region has benefited from the both Ports. The Port of Seattle supports up to 200,000 jobs in the Puget Sound region, generates more than \$12 billion in business revenue, and generates over \$600 million in state and local taxes².

The construction of these recommended improvements, plus the SR 167 extension project to the Port of Tacoma, would improve freight mobility and job growth in the Valley cities. The Valley cities, similar to the Ports, generate sales tax with the freight and warehouse industries, supplying over \$200 million dollars in annual sales tax revenue to the State.

It is of strategic importance to invest in this Corridor to support freight movement and promote the economic development of this key industrial center of the state.

² Port of Seattle, City of Auburn

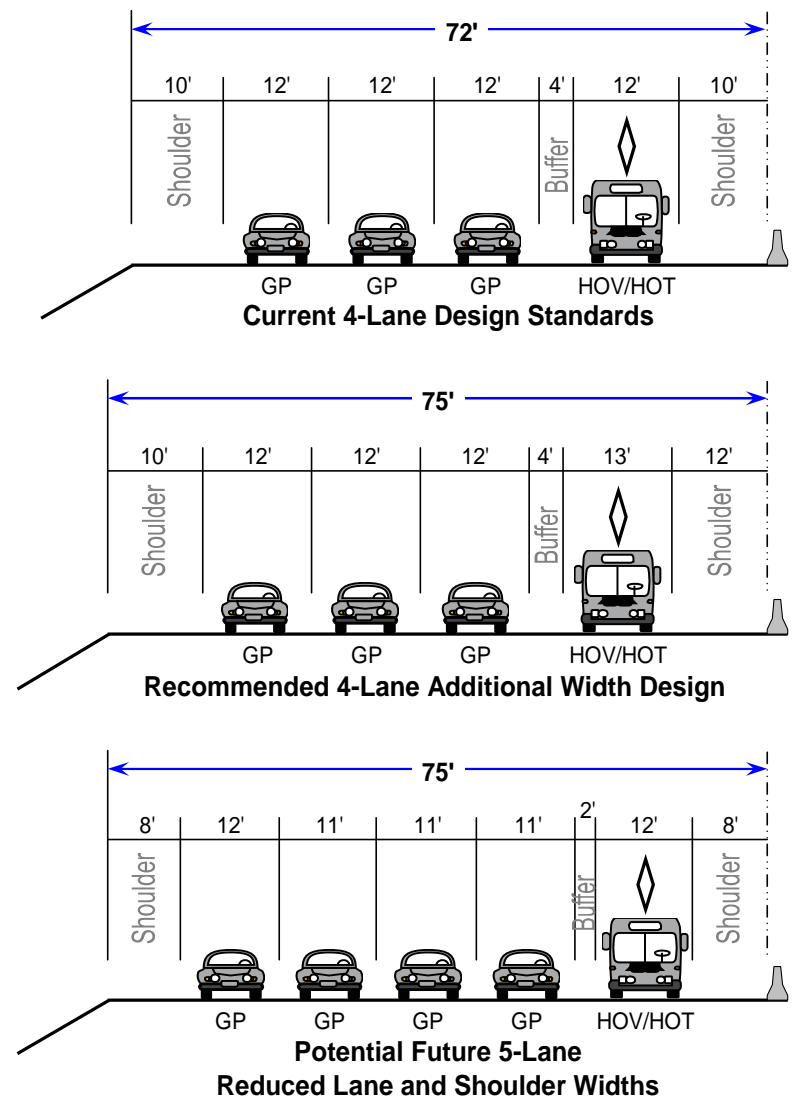
What are Design Considerations That All Projects and Options Should Consider?

All future projects should consider some common themes:

- Add longer on-ramp merge areas for large trucks to reach freeway speed and merge into traffic
- Add large turning radii at intersections at or near the freeway on- and off-ramps to accommodate long trucks navigating turns
- Construct retaining walls and bridges so that they can ultimately accommodate a 10-lane footprint on SR 167
- Consideration should be given to designating additional lanes as HOV/HOT lanes versus general purpose
- Widen SR 167 to a minimum of 75 feet in each direction, as illustrated in Exhibit 12-5. 75 feet is three feet wider than the current design-standard width for four lanes in one direction. In the future, if additional capacity is needed, this same 75-foot width might be re-striped for five lanes in each direction, if some lane and shoulder width design-standards can be deviated (narrowed). This may be an option for adding additional capacity further in the future with minimal cost. These deviations from standards would require close examination at that time, and are not guaranteed to be approved.

Exhibit 12-5

Potential Option for Future Capacity



Vision 2040

VISION 2040 is a regional strategy to accommodate the additional 1.7 million people and 1.2 million new jobs expected to be in the region by the year 2040.

VISION 2040 is an integrated, long-range vision for the future that lays out a strategy for maintaining a healthy region - one that promotes the well-being of people and communities, economic vitality, and a healthy environment. It contains an environmental framework, a numeric regional growth strategy, six policy sections guided by overarching goals, as well as implementation actions and measures to monitor progress.

The concept of people, prosperity, and planet provides a central theme for VISION 2040. This concept signals that our regional leaders use an approach that takes into account social, cultural, economic, and environmental benefits when making decisions. VISION 2040 is the result of extensive public involvement in determining the growth pattern for our counties and cities and in crafting the policy direction to manage that growth. In response to public comment, sustainability is woven throughout VISION 2040.

What are the Other Recommendations for the Corridor?

PSRC has prepared “Vision 2040”, the growth management, environmental, economic, and transportation strategy for the region. This vision predicts significant growth in population, employment, and vehicle miles traveled by 2030. To meet the growing demand more than additional roadway capacity must be provided. A comprehensive package that includes transportation demand management and efficiency strategies is also needed.

Future corridor improvements should focus on the following:

- Develop a sub-regional/regional TDM program that includes WSDOT, King County, Metro, Pierce County, Pierce Transit, Sound Transit, and local cities
- Add additional services to allow commuters to join a carpool, use transit, or use Sounder rail service
- Provide more parking stalls at park-and-ride lots that service the Sounder train
- Provide Sounder train service options for mid-day and reverse-commute hours
- Provide additional pedestrian-friendly connections between neighborhoods and transit centers
- Continue to implement land-use development policies that promote transit-oriented development in urban centers
- Provide additional local transit service
- Provide safe access from one side of the corridor to the other for pedestrians and bicyclists
- Form agencies/citizens groups to pursue funding for projects

Transportation Demand Management (TDM)

WSDOT is not an agency that can directly implement TDM strategies alone. WSDOT is responsible for building and maintaining the HOV facilities, but it must rely on the participation of transit agencies, state government, and local jurisdictions to promote TDM. The combined efforts of these agencies in the areas of transportation infrastructure are key to the success of the SR 167 Corridor.

WSDOT supports TDM strategies for the SR 167 Corridor by:

- Expanding the HOV lanes along the corridor to help reduce the number of trips made by solo drivers
- Work with Sound Transit to plan for the addition of some direct access ramps (direct access ramps are a component of Sound Transit's program)
- Completing the four year High Occupancy Toll (HOT) Lane pilot project
- Supporting other agencies as they implement the Commute Trip Reduction (CTR) Act

Public Transit

Transit service can be an effective option to reducing the overall demand for additional lane capacity on the SR 167 Corridor. Regional express bus routes can use the HOT lanes to maintain good travel time reliability.

Direct HOV-to-HOV ramps at the I-405/SR 167 interchange and the potential implementation of HOT lanes on I-405 could provide an opportunity for Bus Rapid Transit (BRT) service between Puyallup/Auburn and the Bellevue/Overlake areas and extend service further north to Lynnwood.

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