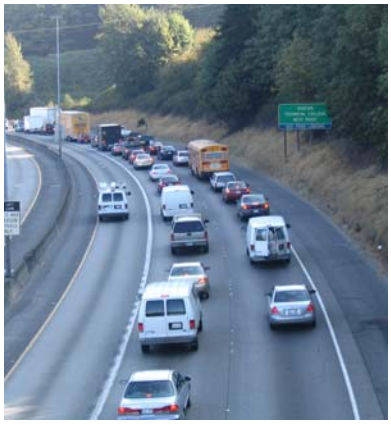
CHAPTER 5.1 Traffic and Transportation

The Tukwila to Renton Project will increase the number of vehicles able to travel through the study area, improve travel speeds, and improve safety by reducing the potential for congestion-related accidents.

The I-405 corridor serves as an important transportation thoroughfare for the region. Traffic levels in the corridor have increased as a result of growth in the regional economy and associated changes in employment and population.

Understanding how traffic and transportation conditions change over time is important in developing and maintaining an efficient and effective transportation system. This section of the EA describes the current conditions on this portion of I-405, between I-5 and SR 169, and on SR 167 and predicts what those conditions will be like in the future, both with and without the Tukwila to Renton Project.



Morning traffic congestion on northbound I-405 in Renton

Please refer to the Tukwila to Renton Project Traffic and Transportation Discipline Report in Appendix Q for a complete discussion of the traffic analysis.

How did WSDOT evaluate traffic and transportation data for this project?

The I-405 Team used the Puget Sound Regional Council four-county travel forecast model as a starting point for determining future travel demand. This model predicts traffic volumes and travel patterns based on adopted land use plans within the region. We then refined the model to include the specific details of the I-405 freeway.

We used VISSIM, microsimulation software, to evaluate the freeway traffic operations for the whole I-405 corridor and the adjacent highways. To analyze the performance of freeway traffic operations, we used vehicle trips, person trips, and speed to measure effectiveness.

Traffic data from the year 2005 were used to represent existing conditions in the corridor. Traffic was then predicted for 2014, to include the completed Renton Nickel Improvement Project (Phase 1). The 2014 model represents the baseline conditions for the Tukwila to Renton Project and is used as a basis for comparing the Build and No Build Alternatives. The Build and No Build Alternatives were modeled for 2014 and 2030.

What is traffic like now along I-405 and what will it be like in the future?

In 2005, an average of 146,000 vehicles passed through the study area each day. The I-405 and SR 167 general-purpose lanes currently experience congestion and reduced speeds in the peak travel directions for both the morning and afternoon commuting periods. The I-405/SR 167 interchange acts as a bottleneck limiting the flow of traffic between I-405 and SR 167. The WSDOT Gray Notebook[2] describes the I-405 and SR 167 interchange as one of the most congested and inefficient sections of roadway in the region.

The slowest average travel speeds in the general-purpose lanes are 20 to 35 miles per hour (mph) on northbound SR 167 during the peak of the morning commute. The high volume of northbound SR 167 vehicles trying to merge onto northbound I-405 in the morning causes the slow travel speeds. The general-purpose lanes on I-405 at this time of day typically flow at 30 to 50 mph.

The high occupancy vehicle (HOV) lanes in the study area generally operate well during the morning and afternoon peak hours running at 45 to 55 mph. Speed is reduced in the HOV lanes only when the adjacent general-purpose lanes are heavily congested.

Between now and 2014, the Renton Nickel Improvement Project will be completed. Under these baseline traffic conditions, about 166,000 vehicles will travel this part of I-405 each day. Even though the Renton Nickel Improvement Project will increase capacity, travel speeds in the general-purpose lanes are predicted to remain slow for most locations in the study area. The slowest average travel speeds in the general-purpose lanes will be 10 to 25 mph on northbound SR 167 during the peak of the morning commute.

We forecast that future HOV 2+ traffic levels will continue to increase, and the speeds in the HOV lanes will begin to fall below WSDOT's 45 mph performance goal for HOV lanes. Consequently, we have assumed that the HOV occupancy requirement will be increased to HOV 3+, which will improve travel speeds in the HOV lanes.

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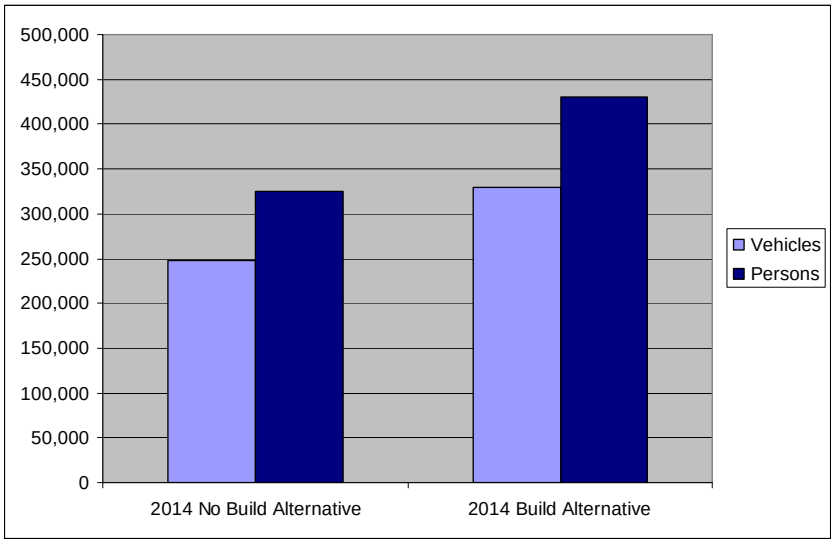
[2] *WSDOT, 2006*

How will the completed project affect traffic on I-405?

The Tukwila to Renton Project will improve peak travel speeds for most locations in the study area by an average of 20 mph. This allows more vehicles and people to travel through the study area. The proposed direct-connector ramps at the I-405/SR 167 interchange will have more capacity and improve the efficiency of the freeway system. Exhibit 5-2 shows the improved capacity at the interchange.

Exhibit 5-2: Vehicles and Persons Traveling Through the I-405/SR 167 Interchange During the Busiest 10 Hours



The highest increases in average travel speeds are for northbound I-405, which raises the speeds by as much as 30 mph. The project improves northbound I-405 average travel speeds during the morning and afternoon peak hours for the years 2014 and 2030. However, the project will lower average travel speeds in some locations. This is because the project improves operations, which in turn delivers higher traffic volumes to the bottleneck locations at the edges of the study area: southbound I-405 approaching I-5 and southbound SR 167 south of SW 43rd Street. The higher traffic volumes can create more congestion in the bottleneck locations and slow travel speeds in those areas. In the year 2014, the slowest average travel speeds in the general-purpose lanes are 10 to 25 mph on northbound SR 167 approaching I-405 during the morning peak hour, which is the same condition expected for the No Build Alternative.

How will the completed project affect local arterials and streets?

What do we mean by "level of service"?

Transportation analysts rate intersection delay as a level of service (LOS) that is graded from A to F. LOS F is the worst condition with very long delays and heavy congestion.

The level of service at most study intersections will stay the same or improve once the project is built. The project will increase freeway volumes and, in turn, more vehicles will use the local streets to enter and exit the freeway. While more vehicles will use the local streets near the freeway interchanges, the project will construct major local street improvements to accommodate the higher traffic volumes.

How will the completed project affect freight movement?

Nine percent of the daily traffic volumes are projected to be truck traffic in 2014. This project will improve freight travel speeds by an average of 20 mph through most of the study area.

How will the completed project affect safety?

Historically, the majority of crashes on I-405 have been rear-end collisions related to congestion. The project will improve safety by adding capacity to I-405 and SR 167, and by reducing stop-and-go traffic. The reduced congestion is expected to decrease the overall crash rate in the study area, in particular the frequency of rear-end crashes on I-405 and SR 167.

The project will also improve safety by reducing the frequency and severity of accidents related to merging into the HOV lanes. This is accomplished by limiting access to the HOV lanes to defined merge points and adding a four-foot-wide striped buffer that separates the HOV lanes from the general-purpose lanes. The project will also add direct-connector HOV ramps that will allow HOV traffic to flow between I-405 and SR 167 without merging out of the HOV lane.

Several ramps and intersections designated as High Accident Locations (HALs) will be rebuilt by this project, reducing the crashes at each one:

- The on-ramp to northbound I-405 from Tukwila Parkway
- The off-ramp from northbound I-405 to Interurban Avenue (SR 181)

- The off-ramp from southbound I-405 to Interurban Avenue (SR 181)
- The stretch of Interurban Avenue (SR 181) between Fort Dent Way and S 156th Street
- The northbound I-405 lane that directs traffic onto southbound SR 167
- The interchange-ramp from southbound I-405 to southbound SR 167
- The interchange-ramp from southbound I-405 to northbound SR 167 (Rainer Avenue S)
- The interchange-ramp from northbound SR 167 to northbound I-405
- The off-ramp from northbound I-405 to southbound SR 169

The safety concerns at these locations are all related to congestion and the roadway configuration. With the improvements in place, all of the HAL ramps should experience a reduction in rear-end crashes due to reduced congestion on the I-405 mainline and surface streets near the interchanges. As an example, the project will remove the northbound I-405 on-ramp from Tukwila Parkway, a HAL, thereby increasing safety on the freeway by eliminating the merge of slower vehicles entering the freeway. Once the Tukwila to Renton Project is completed, we anticipate that the section of I-405 from I-5 to SR 167 will no longer be classified as a High Accident Corridor.

How will the completed project affect transit and HOVs?

The project will add HOV direct-connector ramps at the I-405/SR 167 interchange. The new HOV direct-connector ramps will be built from the northbound SR 167 HOV lane to the northbound I-405 HOV lane, and from the southbound I-405 HOV lane to southbound SR 167 HOV lane. The new ramps will make the freeway system more efficient and save time for transit and HOVs as they will no longer have to weave across the general-purpose lanes to enter and exit the freeway. The HOV direct-connector ramps are expected to operate at free-flow conditions during the morning and afternoon peak periods.

The project will allow access into and out of HOV-only lanes at designated locations, and will add a four-foot-wide striped buffer separating the HOV lanes from the general-purpose lanes. The HOV-lane buffers and limited entry and exit points will discourage random access to the lanes. Drivers will be less concerned with vehicles merging into the HOV lane from the slower, general-purpose lanes, thereby enabling traffic to flow more smoothly as drivers are better able to maintain their travel speeds. We anticipate the HOV lanes will operate at 60 mph for locations with the buffers.

How will the completed project affect bicycle and pedestrian facilities?

The new Tukwila Parkway extension will have sidewalks providing a new pedestrian crossing of the Green River. Currently, the Interurban Trail crosses underneath I-405 at SR 181. To provide a more direct connection, the Interurban Trail will be relocated to the east to travel underneath I-405 adjacent to the Union Pacific railroad tracks. The project will also reconstruct the Cedar River Trail pedestrian bridge across the Cedar River at a new location. Finally, the project will construct a new trail connecting the Renton Hill Neighborhood with Renton's parks and trails

How will travel be affected during construction?

During the widening of I-405 and northbound SR 167, WSDOT will shift and/or realign the mainline lanes through the construction area. We anticipate no weekday daytime lane closures to construct this project. Temporary night and weekend lane closures may be required for mainline widening. Full freeway closures will be required at limited times to shift traffic between construction steps or during the replacement of bridges over I-405 at 66th Avenue S, Lind Avenue SW, and Renton Avenue S, and the removal of the Cedar Avenue S bridge. SR 167 will be closed temporarily to reconstruct the I-405 bridges and the northbound I-405 frontage road. Full closures of I-405 and SR 167 will also be required during the construction of the direct-connector ramps between I-405 and SR 167. The traffic effects of these closures are anticipated to be localized in the immediate Tukwila/south Renton area and are not likely to affect neighboring jurisdictions such as Seattle, SeaTac, Kent, Auburn, or

Bellevue. Measures to minimize the effects of road closures and detours have been incorporated into the project and are detailed in Section 6.

The Green River Trail, Interurban Trail, Springbrook Trail, and Cedar River Trail are existing regional pedestrian trails that travel through the study area. The project will reconstruct I-405 where the Green River Trail, Interurban Trail, and Cedar River Trail cross underneath I-405. When there is overhead construction on I-405, these three trails will be closed to pedestrians and bicyclists for public safety. A signed detour will be provided during these trail closures and notices will be posted and provided to bicycle clubs to keep the public informed about construction.

What would traffic be like if WSDOT did not build the project?

Traffic demand on I-405 will continue to increase. If WSDOT does not build this project, peak travel periods would continue to lengthen with congestion lasting longer than it does today. In the year 2014, the slowest general-purpose lanes average travel speeds are 10 to 25 mph. By the year 2030, we project the traffic congestion would continue to worsen and travel speeds would continue to decrease without the project.

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