CHAPTER 5.7 Transportation

The project will improve HOV access between the local street system and SR 520, improve the reliability of HOV travel times, and provide the infrastructure and operational improvements needed to support anticipated growth in transit services in the study area. The project also includes new facilities for improving bicycle and pedestrian connections and enhancing nonmotorized travel. Project construction will result in temporary effects to travel along the SR 520 corridor; these effects might include reduced speed limits, reduced lanes on arterial streets, and limited freeway access from some arterials.

Please refer to the Transportation Discipline Report in Appendix Q for additional information about the transportation analysis.

This chapter describes the key findings from the analysis of transportation effects related to the project, and discusses freeway and local traffic volumes and operations, nonmotorized facilities, transit operations, parking supply, freight, and safety, with and without the project.

Why is transportation considered in this EA?

Understanding the effects of a proposed public transportation project and its alternatives on the transportation system is an important part of any environmental assessment and is required by law. The National Environmental Policy Act (NEPA) requires federal agencies to integrate environmental values into their decision-making processes. Federal, state, and local agencies must consider the environmental effects of their proposed actions and reasonable alternatives to those actions.

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

The project team used a travel demand model to forecast freeway traffic volumes for the Build Alternative and No Build Alternative to assess potential project effects on roadway operations throughout the study area. The team also studied traffic volumes on local streets around SR 520 to determine current traffic conditions at four interchanges: 84th Avenue

NE, 92nd Avenue NE, Bellevue Way NE, and 108th Avenue NE. This information provided the basis for forecasting transportation conditions on SR 520 and adjacent local streets under the Build Alternative and No Build Alternative.

What are the key assumptions used in the traffic analysis?

The I-5 to Medina: Bridge Replacement and HOV Project, and tolling of SR 520, were not included as background assumptions for traffic modeling purposes.

The forecasts and traffic analysis included the effects of other regional projects that were known to be planned and funded at the time analysis commenced. For information about other planned projects that are assumed to be part of the SR 520 transportation network, please refer to the Transportation Discipline Report in Appendix Q.

To determine the effects of the Build Alternative, the project team compared it to the No Build Alternative. This comparison allows analysts to determine the difference in future traffic operations if the project is built or is not built. In addition to the traffic analysis, the team evaluated the project's direct effects upon nonmotorized travel, transit, and parking. The team also analyzed the project's construction and cumulative effects.

What is traffic like now along SR 520 and what will it be like in the future?

Under existing conditions, an average of 115,000 vehicles pass through the study area each day. The existing configuration of SR 520 does not meet current WSDOT design guidelines and reduces the freeway's capacity to provide reliable and safe travel for buses and carpools (HOV) and general-purpose traffic. These conditions result in congestion due to traffic demand that exceeds the capacity of the corridor. The congestion reduces both general-purpose (GP) and high-occupancy vehicle (HOV) trip reliability. Sections of SR 520 are typically congested at the following locations:

- In Medina, beginning where the HOV lane terminates east of the SR 520 bridge, during the westbound morning and evening commutes.
- Between 124th Avenue NE and I-405 during the westbound evening commute.
- Beginning at the SR 520 terminus at Avondale Road during the eastbound evening commute.

Between today and 2030, it is estimated that the region's population will grow by 1.1 million people, add over 850,000 new jobs, and need to accommodate close to 50 percent more traffic on major transportation facilities. Exhibit 5-25 shows the forecasted changes in people (represented by daily vehicle demand volumes) traveling on SR 522, SR 520, and I-90 for the Build Alternative and No Build Alternative.

For the Build Alternative, volumes on SR 520 (135,000 vehicles) will be similar to the No Build Alternative (132,900 vehicles). The project will not substantially affect demand volumes for people traveling on SR 520, I-90, or SR 522 because it will not add any general-purpose capacity. While more people will want to use the roadways in 2030 (represented by demand volumes), congestion will limit how much traffic can actually pass through the corridor (described as throughput) during peak hours. Year 2030 peak-hour traffic will not be substantially different than it is today. Overall, a growth in HOV travel (carpools and buses) during the morning and afternoon peak-hour commute can be expected because a higher percentage of people (66,400) will use SR 520 than vehicles (58,600).

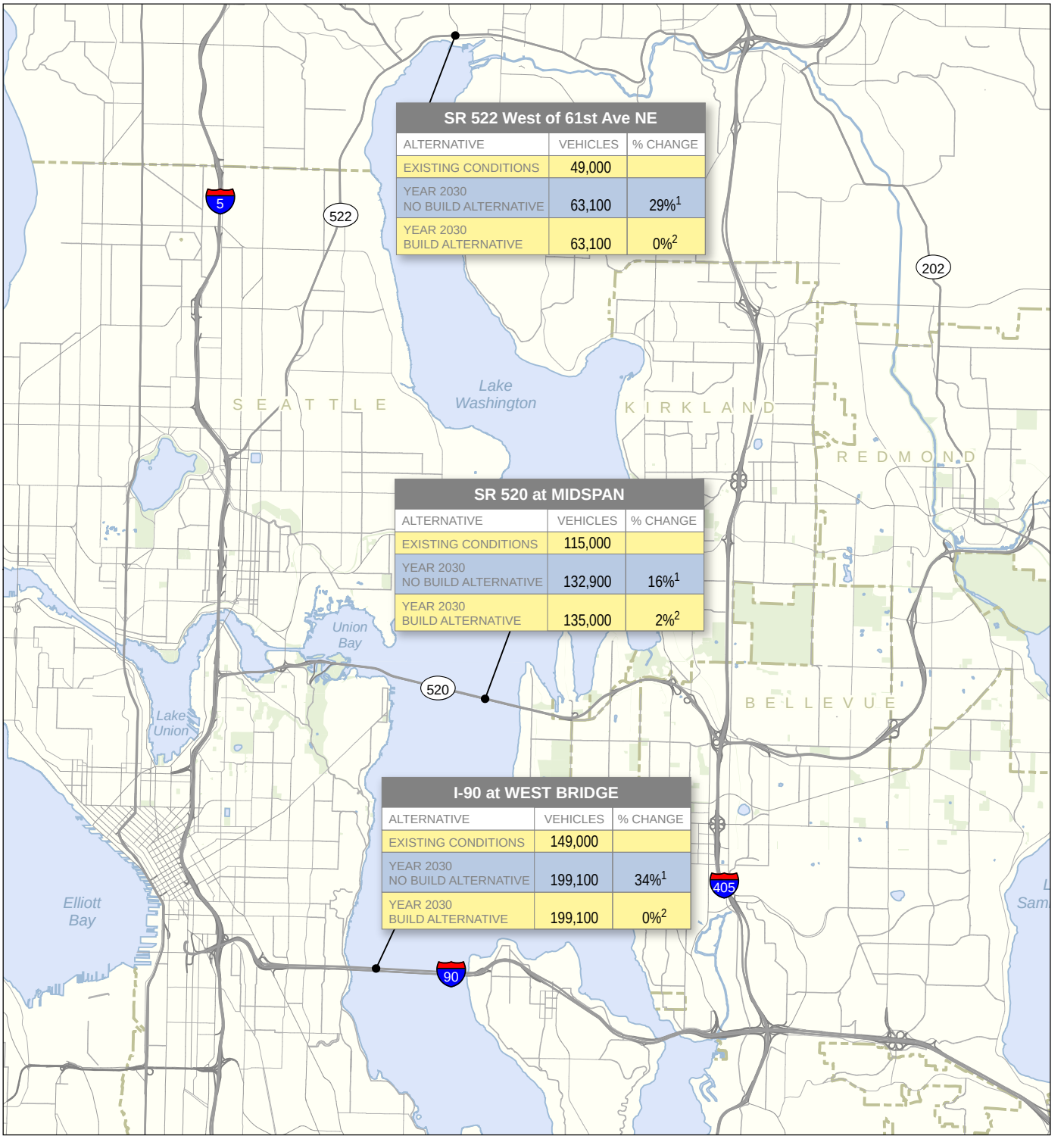
Throughput is the number of vehicles being carried on a facility. This is usually measured at a specific point on the roadway facility for a predetermined period of time (WSDOT 2008b).

How will the completed project affect traffic on SR 520?

The Build Alternative will improve many of today's substandard conditions along the SR 520 corridor and relocate the HOV traffic to the inside lanes of the corridor. These improvements will have substantial travel time, reliability, and safety benefits—especially for buses and carpools.

The project will result in the following beneficial effects to the SR 520 corridor in 2030:

- Improved travel time reliability for buses and carpools between I-5 and SR 202, particularly during the afternoon commute. Up to 5,500 carpool and bus users per hour during the afternoon commute will benefit from this improvement and bypass general-purpose lane congestion.



SR 522 West of 61st Ave NE

ALTERNATIVE	VEHICLES	% CHANGE
EXISTING CONDITIONS	49,000	
YEAR 2030 NO BUILD ALTERNATIVE	63,100	29%[1]
YEAR 2030 BUILD ALTERNATIVE	63,100	0%[2]

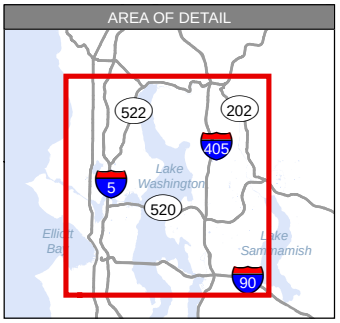
SR 520 at MIDSPAN

ALTERNATIVE	VEHICLES	% CHANGE
EXISTING CONDITIONS	115,000	
YEAR 2030 NO BUILD ALTERNATIVE	132,900	16%[1]
YEAR 2030 BUILD ALTERNATIVE	135,000	2%[2]

I-90 at WEST BRIDGE

ALTERNATIVE	VEHICLES	% CHANGE
EXISTING CONDITIONS	149,000	
YEAR 2030 NO BUILD ALTERNATIVE	199,100	34%[1]
YEAR 2030 BUILD ALTERNATIVE	199,100	0%[2]

AREA OF DETAIL



[1]Compared to Existing Conditions
[2]Compared to Year 2030 No Build Alternative

Source: King County (2008) GIS Data (Streams, Streets, Water Bodies), CH2M HILL (2008) GIS Data (Parks). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

N

0 1 2 Miles

Exhibit 5-25. **Daily Vehicle Demand Volumes on SR 522, SR 520, and I-90**

Medina to SR 202: Eastside Transit and HOV Project

- In the afternoon commute, westbound HOV travel times will improve between 18 and 45 minutes over the No Build Alternative and be 29 to 44 minutes faster than general-purpose travel times. Eastbound HOV travel times will improve between 5 and 16 minutes over the No Build Alternative and be 5 to 8 minutes faster than general-purpose travel times.
- Safety will be improved due to wider shoulders and the HOV lane at the inside of the corridor, which reduces higher-speed HOV/general-purpose conflict points.
- Freeway mainline operations at merge points with ramps, transit stations, and HOV lane terminations will improve due to deceleration and acceleration lane improvements, including the addition of auxiliary lanes between ramps. Capacity, speeds, and safety will be improved as a result.
- With improved merge points, more traffic will be served on the on-ramps at the 84th, 92nd, and Bellevue Way NE/108th Avenue NE interchanges. This will reduce congestion on the local streets.
- HOV traffic to and from the west will have a more direct transit and HOV connection between SR 520 and the South Kirkland Park-and-Ride lot. This connection will improve transit travel times and reliability.

How will the completed project affect local arterials and streets, interchange areas, and HOV access?

The project will alleviate some of the freeway-related congestion on local streets and improve transit and HOV access to SR 520 from local streets. However, intersection level of service (LOS) will be the same with or without the project. Although there will still be congestion with the Build Alternative, it will not last as long as that for the No Build Alternative.

Overall, the project will improve mobility for people traveling in the SR 520 corridor. Morning and afternoon peak-hour traffic volumes on local streets will be slightly higher with the Build Alternative (approximately 5 percent). SR 520 project improvements will change freeway access by shifting traffic

Level of service (LOS) is a measure of how well a freeway or local signalized intersection operates. For freeways, LOS is a measure of traffic congestion typically based on volume-to-capacity ratios. For local intersections, LOS is based on how long it takes a typical vehicle to clear the intersection. Other criteria also may be used to gauge the operating performance of transit, non-motorized, and other transportation modes.

patterns, thereby increasing traffic volumes on some local streets. The greatest increase will be 150 vehicles per hour (vehicles per hour) on Northup Way.

More specifically, it is anticipated that the project will result in the following beneficial effects to local arterials and streets:

- At 84th Avenue NE, freeway mainline improvements will allow the on-ramp to serve more vehicles (50 vehicles per hour) while maintaining SR 520 mainline operations. There will be less congestion on the on-ramp and, therefore, less congestion on 84th Avenue NE and NE 8th Street during the afternoon peak-hour.
- At 92nd Avenue NE, traffic circulation will be improved with a new roundabout at the intersection of the westbound SR 520 off-ramp and a new drop-off and pick-up area on the interchange lid.
- At Bellevue Way NE, a new ramp reconfiguration will eliminate the weave condition between the loop ramps on northbound Bellevue Way NE, reducing congestion during the afternoon commute.
- At 108th Avenue NE, the existing SR 520 westbound off-ramp to this avenue will be reconstructed to the south to create a new intersection with the HOV direct access ramps. The effects of this change on local traffic are as follows:
    - Improved operations for both SR 520 westbound off-ramp and 108th Avenue NE northbound traffic because of the increased distance between the westbound off-ramp and the Northup Way/108th Avenue NE intersections.
    - Northbound traffic on 108th Avenue NE will travel to Bellevue Way NE for access, instead of turning left onto the SR 520 westbound on-ramp.

How will the completed project affect transit operations?

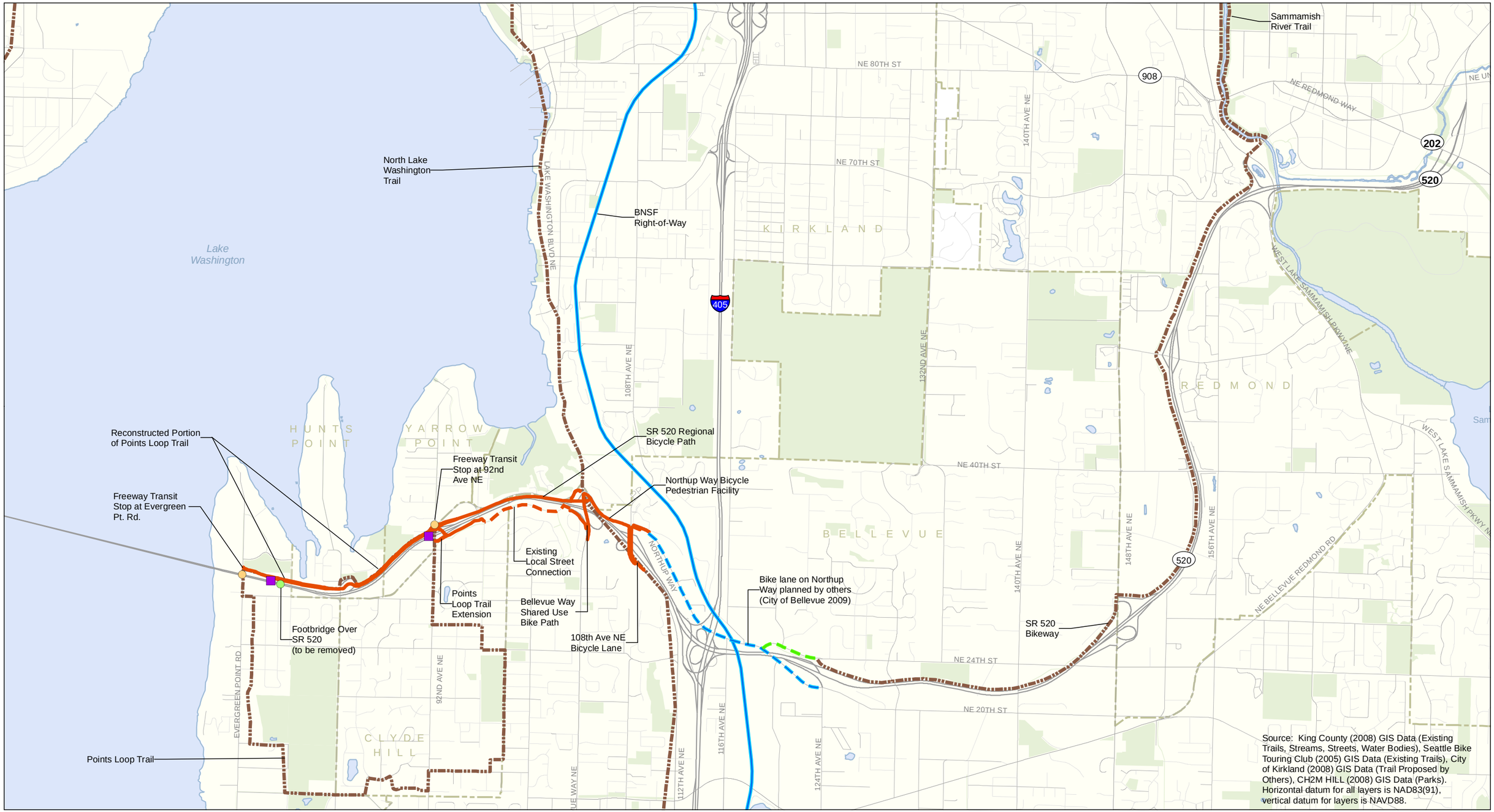
Relocating the HOV lane to the inside of the SR 520 corridor between Medina and SR 202 will allow carpools and buses to reliably bypass congestion. HOV lane operations and safety will also improve as general-purpose drivers no longer need

to merge across the lane to access ramps. The project will have the following beneficial effects on transit operations:

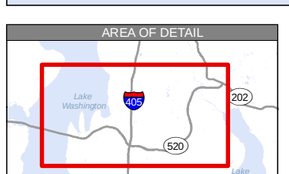
- Travel time savings will be the greatest for westbound buses and carpools during the afternoon peak period, which is when the westbound general-purpose lanes will be congested as far east as the NE 40th/51st Street interchange in Redmond.
- HOV travel times between I-5 and SR 202 are expected to reliably average 20 minutes westbound and 15 minutes eastbound. This is a 20- to 50-minute improvement for westbound traffic and a 5- to 15-minute improvement eastbound (compared with the No Build Alternative).
- Westbound HOV travel will be 30 to 45 minutes faster than general-purpose travel. Eastbound HOV travel will be 5 to 10 minutes faster. This travel time benefit, along with the reliability improvements, will increase the attractiveness of transit as an alternative to driving alone.
- With the movement of the HOV lane to the inside of SR 520, the addition of an HOV direct access ramp at 108th Avenue NE will improve access between SR 520 and the South Kirkland Park-and-Ride, especially for eastbound buses.
- The 92nd Avenue NE and Evergreen Point freeway transit stations will be moved to the inside with improved deceleration and acceleration lanes , enhancing transit operations and safety.
- Transit station design and access will be incorporated into the interchange lids, making the stations integral parts of the local communities served. The transit station design features will improve the waiting experience for transit users and be Americans with Disabilities Act (ADA) compliant.

How will the completed project affect nonmotorized facilities?

The project's nonmotorized improvements will substantially enhance both the commuting and recreational opportunities in the SR 520 corridor. Exhibit 5-26 shows existing and proposed nonmotorized facilities.



Source: King County (2008) GIS Data (Existing Trails, Streams, Streets, Water Bodies), Seattle Bike Touring Club (2005) GIS Data (Existing Trails), City of Kirkland (2008) GIS Data (Trail Proposed by Others), CH2M HILL (2008) GIS Data (Parks). Horizontal datum for all layers is NAD83(91), vertical datum for layers is NAVD88.



- Existing Footbridge
- Transit Stop
- Project Proposed Transit Stop
- Project Proposed Trail
- Existing Trail
- Trail Proposed by Others
- Bike Lane Proposed by Others
- Off-street Path Proposed by Others

N

0 1,000 2,000 4,000 Feet

Note: Existing and proposed sidewalks not shown.

Exhibit 5-26. **Existing and Proposed Nonmotorized Facilities**

Medina to SR 202: Eastside Transit and HOV Project

The project will be consistent with regional planning efforts. Design of the nonmotorized facilities will retain flexibility for future roadway and nonmotorized facility design in the region and will facilitate future connections to regional and local trail systems.

More specifically, the project will have the following beneficial effects on nonmotorized facilities:

- Approximately 2 miles of paved trail will be added for the exclusive use bicycles, pedestrians, and other nonmotorized means of travel between Bellevue Way NE and Evergreen Point Road.
- The SR 520 regional path will provide a more direct, ADA-compliant commuting option compared with the No Build Alternative.
- The Points Loop Trail will be reconstructed between Evergreen Point Road and 92nd Avenue NE, improving conditions through the interchanges with lids and tunnels.
- The interchange lids will provide green space, allow access to the SR 520 median transit stations, and enhance community connectivity.
- The SR 520 regional path and the Points Loop Trail will improve cross-corridor routes and connections between neighborhoods. They will also provide direct connections for pedestrians and cyclists to access transit facilities.

What is the SR 520 regional path?

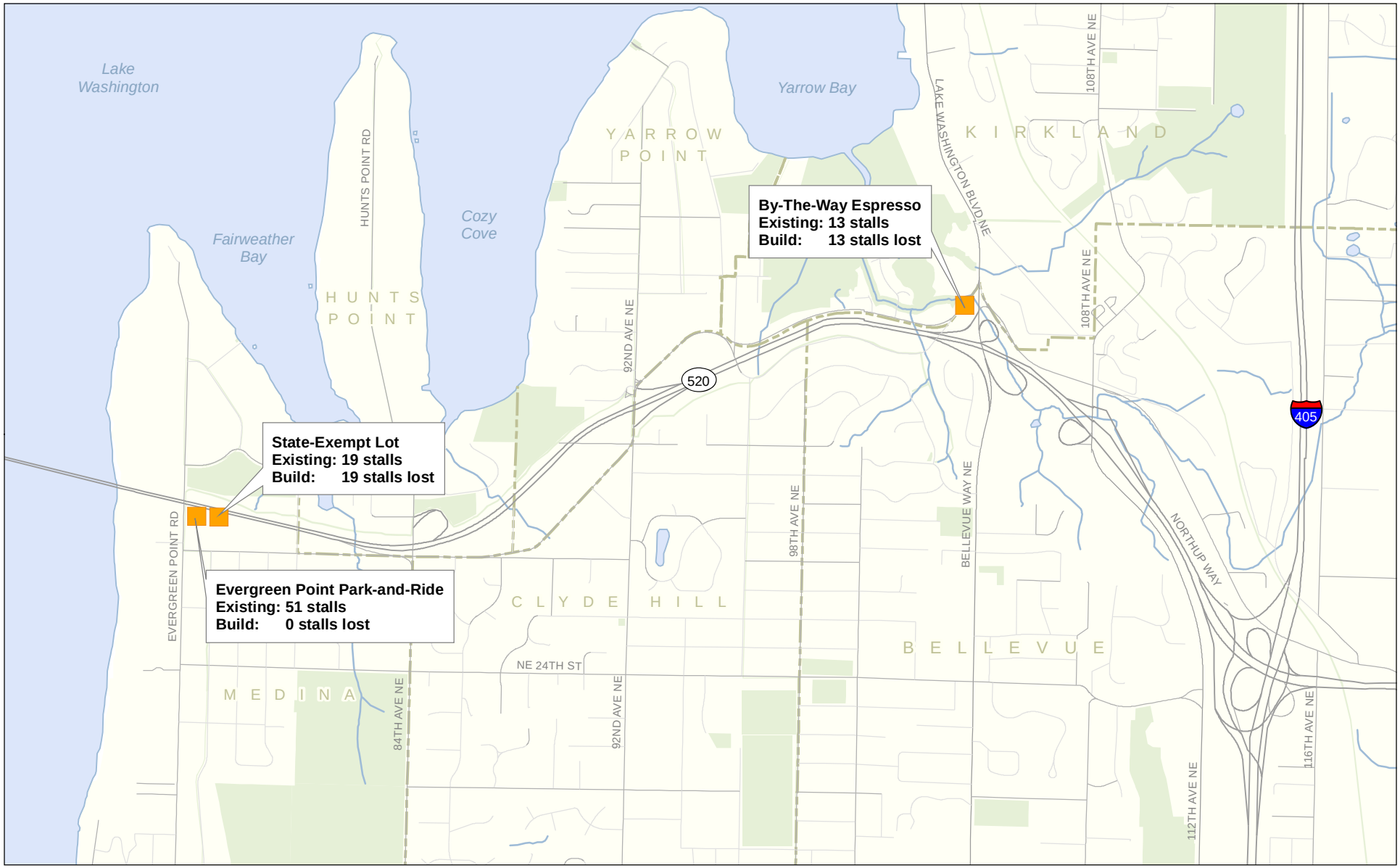
The SR 520 regional bicycle path will be a 14-foot-wide, Class I, paved regional trail. The path will originate from an at-grade connection with Evergreen Point Road (which will also connect to the existing Points Loop Trail at this location) and extend east to South Bellevue Way. The path will cross 84th Avenue NE at-grade. At both South Bellevue Way and 92nd Avenue NE, switchbacks onto the elevated crossings will be constructed to access the local streets. Undercrossings will be provided at South Bellevue Way and 92nd Avenue NE for the nonmotorized traffic continuing east.

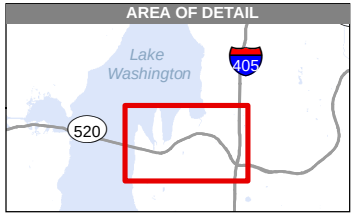
How will the completed project affect parking?

Exhibit 5-27 shows the potentially affected parking areas. The project will result in a loss of 32 parking spaces from two locations:

- The entire 19-space WSDOT-owned lot in Medina will be eliminated. This lot is available only to official WSDOT vehicles and is minimally used.
- The 13-space parking lot adjacent to the By the Way Espresso Stand in Kirkland has been purchased. This parking lot was minimally used and will not be replaced.

  An additional 10-15 parking stalls will be added at the Evergreen Point Road Park and Ride lot.





Parking Area

Park

City Limits

N

0 500 1,000 2,000 Feet

Source: King County (2008) GIS Data (Streams, Streets, Water Bodies), CH2M HILL (2008) GIS Data (Parks). Horizontal datum for all layers is NAD83(91), vertical datum for layers is NAVD88.

Exhibit 5-27. **Potentially Affected Parking Areas**

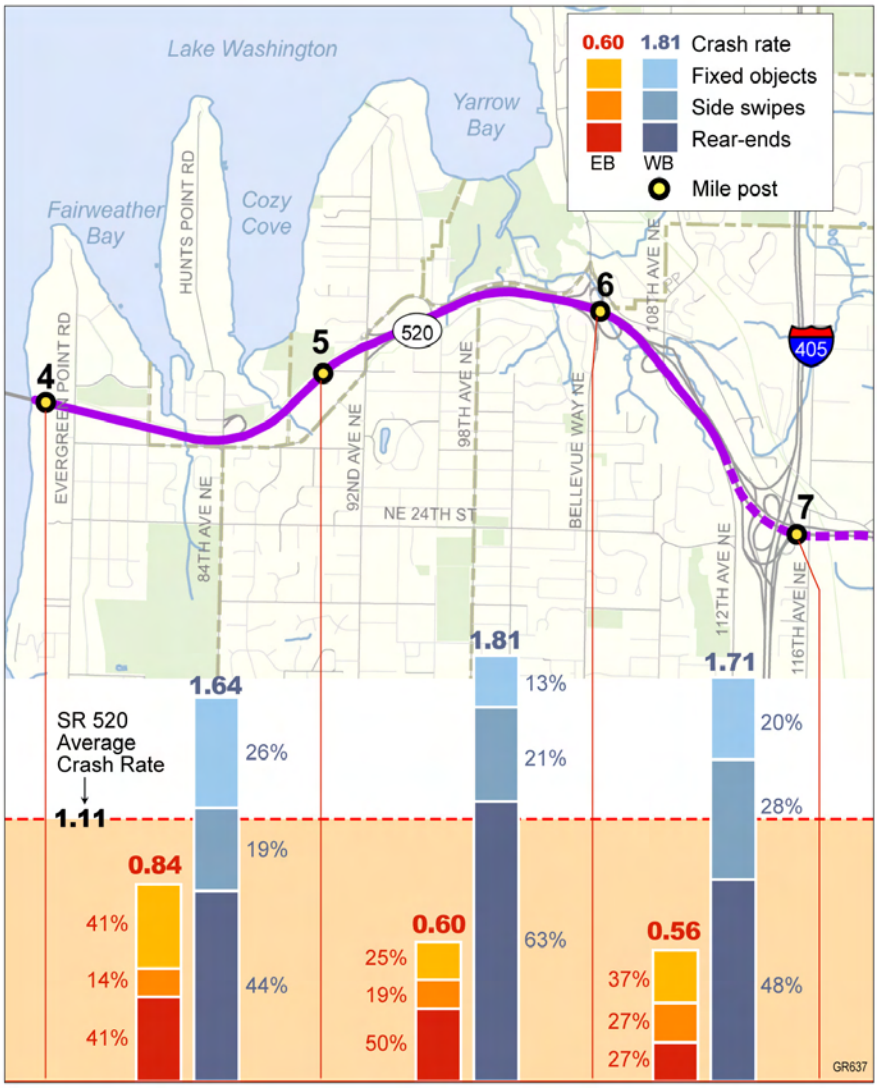
Medina to SR 202: Eastside Transit and HOV Project

How will the completed project affect safety?

The existing configuration of SR 520 does not meet current WSDOT design guidelines and reduces the freeway's capacity to provide reliable and safe travel for buses and carpools (HOV) and general-purpose traffic. For example, congestion, and the weaving activity between the ramps and outside HOV lanes, contributes to an accident rate up to 1.81 accidents per million vehicle miles traveled for westbound traffic between I-405 and Medina. This rate is notably higher than the average accident rate for the entire SR 520 corridor (1.11). Exhibit 5-28 shows east and westbound collision rates along the SR 520 mainline between Medina and I-405.

Under the Build Alternative, the project will improve roadway safety with wider shoulders, longer merge distances, and inside HOV lanes. The project will also improve ramps in the SR 520 project area, bringing the design up to current design guidelines and helping to alleviate current safety issues along the SR 520 mainline and ramps. The proposed design will allow smoother transitions for vehicles to change lanes, merge onto, and exit from the freeway.

Adding a direct access HOV lane from 108th Avenue NE will reduce potential conflicts at this interchange because HOV traffic will no longer need to make multiple lane changes to exit and access the HOV lane.



Source: SR 520 Crash Data (January 2006 through December 2008) (WSDOT 2009c)
Note: All crash rates are listed in crashes/mvmt.

Exhibit 5-28. Collision Safety Data

How will travel be affected during construction?

Construction will take approximately 4 years and include approximately 5 stages. The potential influence the project may have over traffic patterns, interchanges, transit stations, nonmotorized facilities, and other corridor elements is described below.

General

- SR 520 will remain open between 5:00 am and 9:00 pm on weekdays throughout construction and operate with all lanes, including the westbound HOV lane.
- Construction effects to SR 520 traffic during the weekday morning and afternoon commute times will be minimal.
- Multiple full-weekend closures are expected; however, closure hours and dates will be restricted to avoid special events and other freeway closures that might occur. The primary detour route for an SR 520 closure is the I-90 bridge. However, traffic conditions on I-5, I-405, and SR 522, as well as primary arterials surrounding Lake Washington, will also be affected.
- Nighttime lane and ramp closures will occur outside of peak commute hours.

Lid and Interchange Activities

- Traffic on the Evergreen Point Road NE, 84th Avenue NE, and 92nd Avenue NE overpasses will be maintained at all times during construction of the proposed lids because there are no alternative detour routes on the north side of the freeway.
- The Bellevue Way NE overpass will also remain open throughout construction; however, there may be stages where the roadway is reduced from five to three lanes (approximately 10 months) and four lanes (approximately 1 year).

  The southbound Bellevue Way NE to westbound on-ramp may be closed for 2 to 3 months and the 108th Avenue NE westbound on-ramp for 6 to 9 months during construction.

  Construction restrictions will be in place to prevent closures of both ramps at the same time. A detour route between the two ramps via Northup Way will be in place during the ramp closures.
- Sidewalks along all arterials will be maintained during construction.

Freeway Transit Stations

- The Evergreen Point Road and 92nd Avenue NE freeway transit stations may need to be closed for short durations (4 to 6 months). Construction restrictions will be in place to prevent closure of both stations at the same time.
- The freeway transit stations will remain on the outside shoulders of SR 520 during Stages 1 through 4 of construction and will not shift to the inside of the freeway until Stage 5, when all supporting infrastructure is in place. This staging will minimize disruption to current commuters and ensure that full and safe access is available to the new facilities.

Truck Traffic

- Construction on surface streets and the lid structures will require truck traffic on arterial roadways because the work site will not be accessible from the freeway; however, trucks are not expected to measurably affect traffic on arterial streets due to the anticipated low rate of occurrence (one truck every 5 minutes).

Nonmotorized Facilities

Several nonmotorized facilities will be affected on a short-term basis during construction, including the following:

- Points Loop Trail – Evergreen Point Road to 92nd Avenue NE on the north side of SR 520.
- Points Drive NE (which is commonly used by bicyclists) – 92nd Avenue NE to Bellevue Way NE on the north side of SR 520.
- Freeway Crossings – Evergreen Point Road bridge sidewalk, pedestrian bridge (near 79th Avenue), 84th Avenue NE bridge sidewalk, 92nd Avenue NE bridge sidewalk, Bellevue Way NE bridge sidewalk, and 108th Avenue NE sidewalk.
- Freeway Transit Stations – Evergreen Point Road and 92nd Avenue NE stations.

With the exception of the pedestrian bridge, construction restrictions will be in place to prevent any long-term closures of these facilities. The pedestrian bridge will be permanently demolished as part of this project. Pedestrians currently using this bridge will need to use an alternative crossing, such as Evergreen Point Road or 84th Avenue NE. In the event that a short-term closure at either of these crossings is required, a temporary ADA-compliant detour route around the construction activity will be provided so that the effects on these facilities and their users will be minimal.