

Chapter 8–Transit

What is in this chapter?

This chapter describes existing and anticipated future transit service and facilities on the SR 520 corridor without and with the project. It describes and quantifies how improving the SR 520 HOV lane system and transit facilities between Medina and SR 202 would affect transit service and operations.

What are SR 520 HOV facilities and transit services like today?

HOV Lanes

Exhibit 8-1 shows the existing HOV lane system on the SR 520 corridor. Although buses currently use SR 520 HOV lanes, the SR 520 HOV lane system is currently incomplete, making it difficult for buses to stay on schedule. The two primary gaps in the SR 520 HOV lane system are eastbound between Medina and I-405 and westbound between 124th Avenue NE and 108th Avenue NE.

Furthermore, the HOV lanes and outside shoulder lanes are narrow, requiring buses to travel slower. Drivers changing lanes between the inside general-purpose lanes and on- and off-ramps affect buses using the HOV lanes. During the commute periods, general-purpose drivers entering SR 520 must sometimes stop in the HOV lane as they wait for an opportunity to merge into the congested general-purpose lanes.

Between 124th Avenue NE and West Lake Sammamish Parkway, there is an outside HOV lane (2+) in both directions. Between 108th Avenue NE and Evergreen Point Road, there is only a westbound HOV lane, and the occupancy requirement changes to three or more people (3+). All of the SR 520 on-ramps have HOV bypass lanes. HOV lanes (2+) are also provided in both directions along I-405, both north and south of the SR 520 interchange. These existing HOV facilities help maintain travel times and schedule reliability for buses using the SR 520 corridor.



SR 520 Transit Service

At present, 23 routes serve the Evergreen Point Bridge – 18 Metro routes, 4 Sound Transit Regional Express routes, and 1 route operated by Community Transit (Exhibit 8-2). The majority of routes connect Eastside communities to downtown Seattle, while five routes connect to the University District and four connect to north Seattle. The emphasis of SR 520 bus service is on peak-period travel, carrying Eastside commuters to employment and education centers in Seattle, westbound in the morning and eastbound in the evening.

A few core routes provide two-way all-day service, and a few routes provide reverse peak service from downtown Seattle and north Seattle to Eastside destinations. One route provides late-night eastbound service across SR 520. Because transit service is designed to serve three distinct areas (east, north, and south), the Evergreen Point Freeway Station serves as a critical location for transfers, allowing high-frequency service between the major transit markets on the east and west sides of the lake.

Today, King County Metro and Sound Transit provide approximately 600 bus trips and carry almost 16,000 riders across the Evergreen Point Bridge on an average weekday. On an average weekday, there are approximately 295 westbound bus trips carrying 7,900 riders and 306 eastbound bus trips carrying 8,100 riders.

During the morning peak period (6:00 to 9:00 a.m.), approximately 5,200 riders cross the bridge in both directions in 178 bus trips (not including Community Transit service and school bus routes provided by King County Metro), with 70 percent of riders traveling westbound and 30 percent of riders traveling eastbound. During the evening peak period (3:00 to 6:00 p.m.), approximately 5,000 riders cross the bridge in both directions in 169 bus trips, with 30 percent of riders traveling westbound and 70 percent of riders traveling eastbound. Transit trip origins and destinations are discussed in the *Destinations and Ridership* section of this chapter (KCM 2006).



Did you know?

A **bus route** is the established path a bus follows between two points.

A **bus trip** is the time a bus travels from one end of the route to the other while carrying passengers.

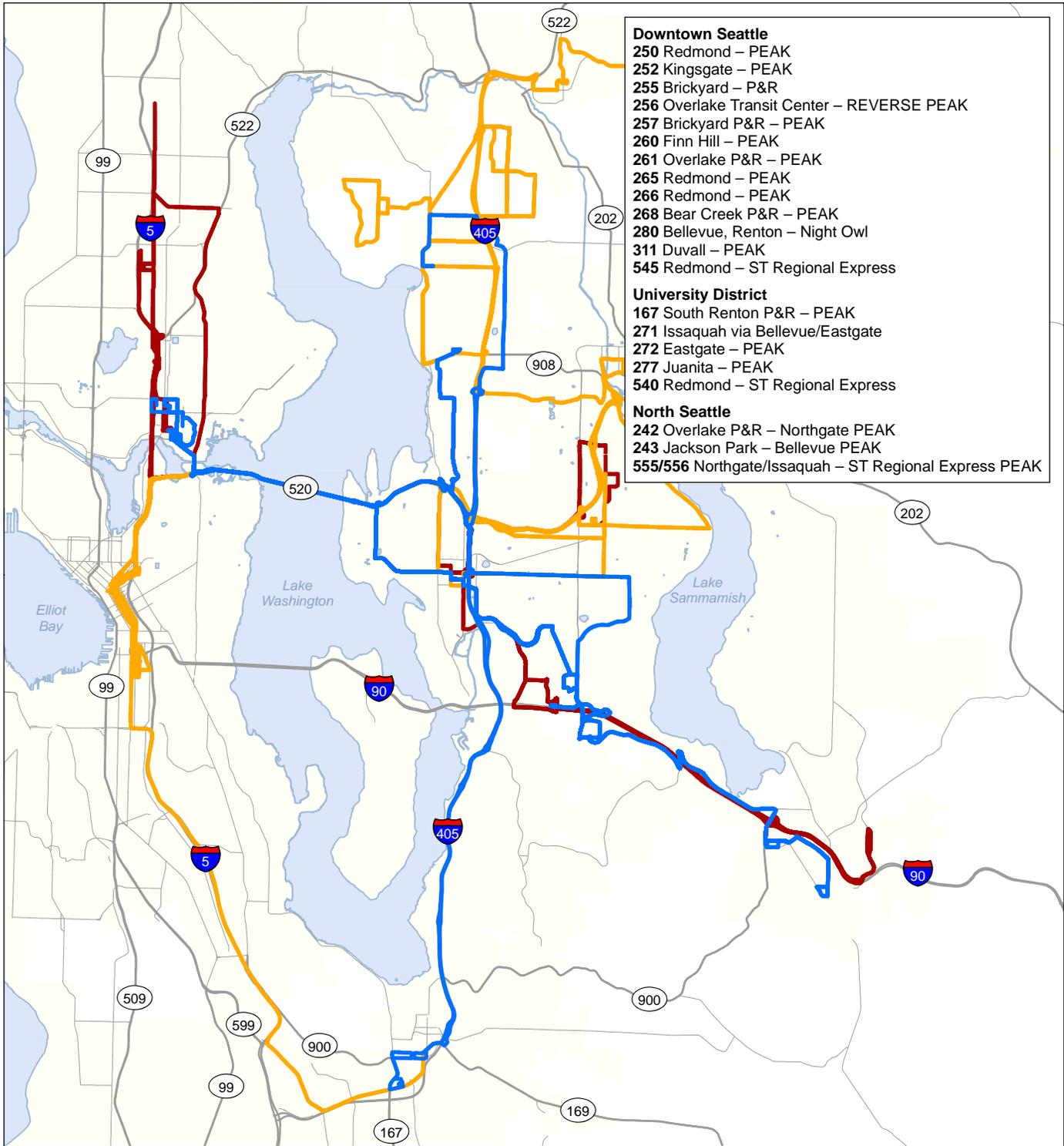
Number of buses refers to the number buses required to provide the scheduled number of bus trips on each bus route. The factors that influence the number of required buses are the frequency (number of trips in a given time period), round-trip length (in minutes) and recovery time at each end for the bus to return to schedule and provide a driver break. Some buses may provide service on multiple bus routes (see example below).

Example of the difference between number of buses and bus trips.

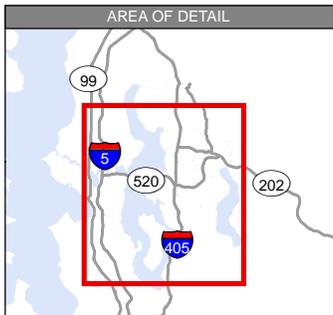
One bus leaves the bus base and provides a single trip on Route 252 from Kingsgate to Seattle (across SR-520). The bus then drives out of service to Issaquah and provides a bus trip on Route 214 from Issaquah to Seattle (across I-90).

One bus provides 2 bus trips: one trip on Route 214 and one trip on Route 252.





- Downtown Seattle**
 250 Redmond – PEAK
 252 Kingsgate – PEAK
 255 Brickyard – P&R
 256 Overlake Transit Center – REVERSE PEAK
 257 Brickyard P&R – PEAK
 260 Finn Hill – PEAK
 261 Overlake P&R – PEAK
 265 Redmond – PEAK
 266 Redmond – PEAK
 268 Bear Creek P&R – PEAK
 280 Bellevue, Renton – Night Owl
 311 Duvall – PEAK
 545 Redmond – ST Regional Express
- University District**
 167 South Renton P&R – PEAK
 271 Issaquah via Bellevue/Eastgate
 272 Eastgate – PEAK
 277 Juanita – PEAK
 540 Redmond – ST Regional Express
- North Seattle**
 242 Overlake P&R – Northgate PEAK
 243 Jackson Park – Bellevue PEAK
 555/556 Northgate/Issaquah – ST Regional Express PEAK



- Downtown Seattle
- University District
- North Seattle

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

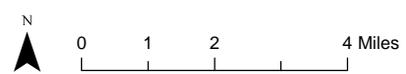


Exhibit 8-2. Existing SR 520 Bus Service
 Medina to SR 202: Eastside Transit and HOV Project

Service Frequencies

Frequencies for individual routes serving SR 520 currently reach as high as one bus every 10 minutes during peak periods, with midday service provided at 30-minute frequencies. The combined frequency of all the routes using SR 520 to cross the lake provides a scheduled bus trip serving the freeway stations west of I-405 every 1 to 4 minutes during the morning and afternoon peak periods. In addition to Metro and Sound Transit routes, Microsoft commuters also have the option of using the Microsoft Connector service on SR 520, which provides service for Microsoft employees between Microsoft and Seattle, Bothell, Mill Creek, Issaquah, and Sammamish. Exhibit 8-3 shows existing frequencies for SR 520 routes .

Destinations and Ridership

Exhibits 8-4 and 8-5 illustrate the origins and destinations of morning and afternoon peak-period riders on the bridge (KCM 2006). During the morning SR 520 peak period (between 6:00 and 9:00 a.m.), approximately 122 westbound and 56 eastbound bus trips carry 3,640 and 1,600 riders, respectively. Of the westbound travelers, about 67 percent head to downtown Seattle, 30 percent head to the University District, and the remainder head to north Seattle. Of the eastbound riders, the destination of approximately 50 percent is the Overlake area; 20 percent to downtown Bellevue.

During the morning commute, fewer trips are provided eastbound than westbound. Eight routes provide eastbound morning peak service across SR 520 compared to 18 westbound routes. Sound Transit Route 545 has the greatest number of trips and carries the most riders during the morning commute.

Fewer trips are provided eastbound than westbound for several reasons. Commuter destinations in East King County are more dispersed, making transit service more difficult and costly. Also, transit service investments are supported by three subareas, East, West, and South, and most cross-lake service is currently paid for solely by East King County residents because of the need to move commuters from East King County to downtown Seattle and the University District. In contrast, the West King County subarea prioritizes “intra-subarea” travel, which results in a slower response time to the growing “reverse commute” demand from the Westside to Eastside (King County Metro 2007).

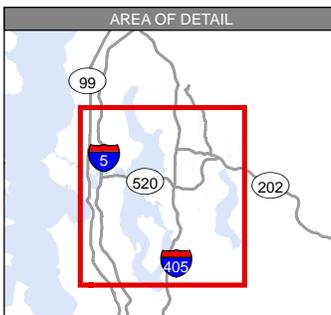
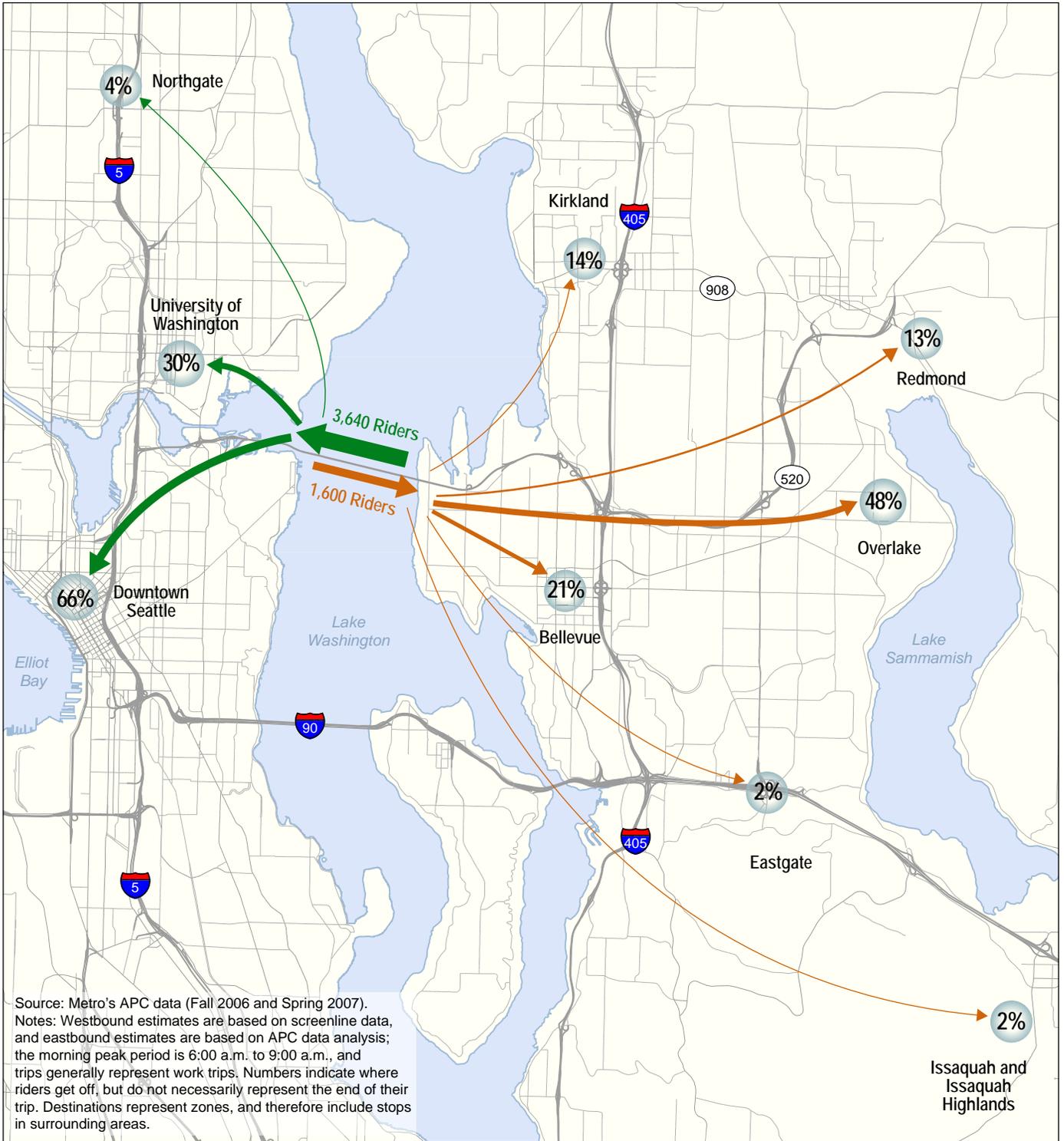


Exhibit 8-3. SR 520 Transit Routes and Service Frequencies

Route	Name	Headways	
		Peak	Off-Peak
167	Univ-Kent Ex	30	--
242	N. City-Overlake	20	--
243	Bell-Lk City	60	--
250	Overlake/Redmond	30	--
252	Kingsgate	20	--
255	Kingsgate	15	30
255	Kingsgate Ex	15	--
256	Overlake	30	--
257	Kingsgate Ex	30	--
260	Juanita Ex	60	--
261	Seattle-Overlake	25	--
265	Sea-Redmond	30	--
266	Redmond Ex-CBD	20	--
268	Redmond-Sahalee	30	--
271	Univ-Issaq	30	30
271	Univ-EGATE	20	--
272	Univ-Bell Ex	30	60
277	Udist-Juanita	30	--
311	Duvall-Wdvll-CBD	15	--
424	Snoh-Monroe	60	--
540	Udist-Kirk Ex	25	--
540	Udist-BrCrk Ex	25	30
545	Redmond-Sea Exp	12	30
555	NrthGt-Issqh Exp	30	--

Route 280 is a night-owl route with one departure.





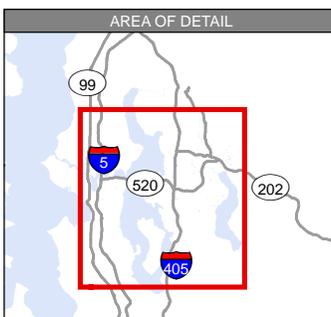
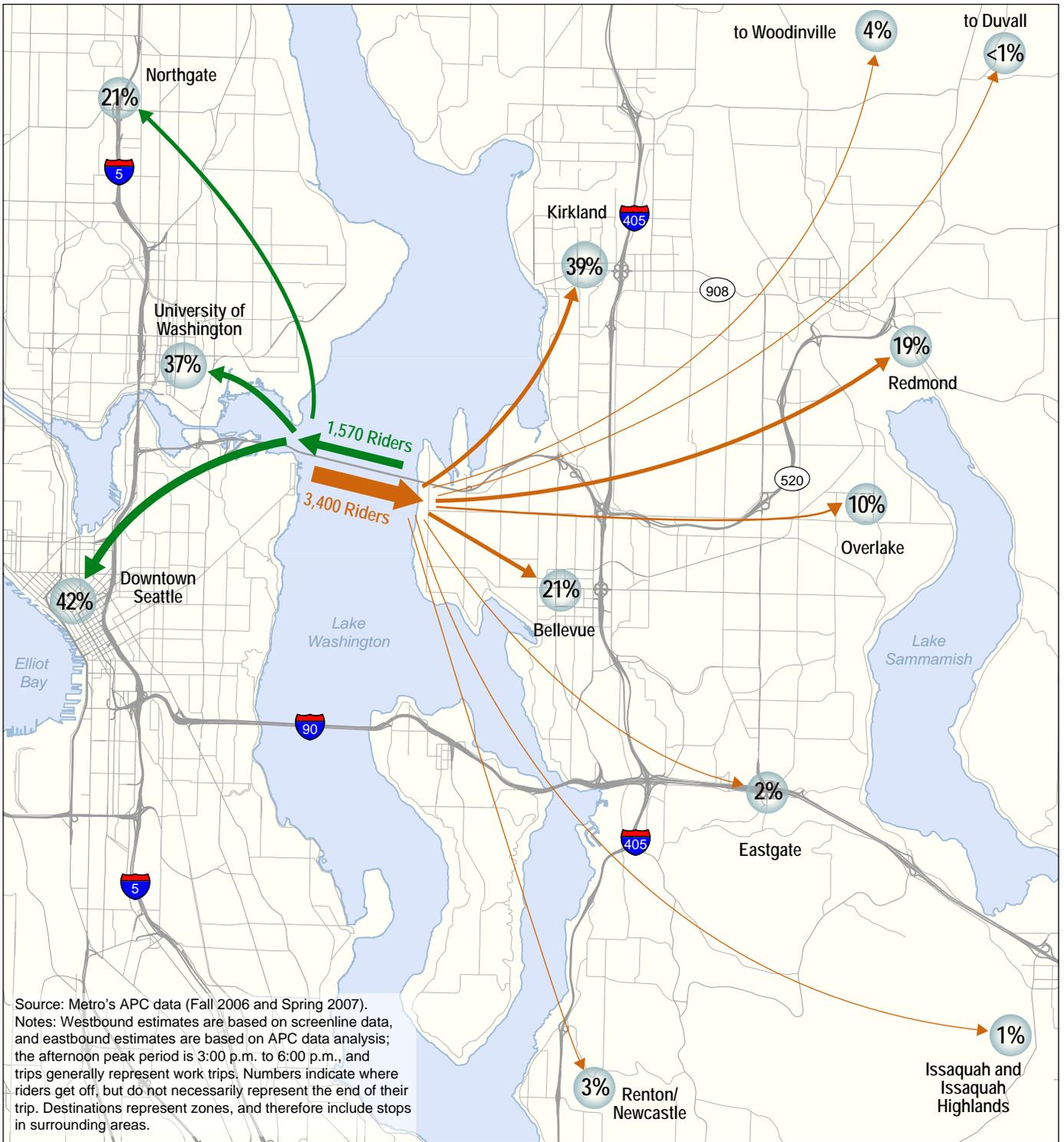
Westbound
 Eastbound



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

Exhibit 8-4. Morning Peak Transit Ridership

Medina to SR 202: Eastside Transit and HOV Project



█ Westbound
█ Eastbound



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

Exhibit 8-5. Afternoon Peak Transit Ridership

Medina to SR 202: Eastside Transit and HOV Project

The pattern reverses during the evening peak period (between 3:00 and 6:00 p.m.), but volumes tend to be spread over longer periods.

Approximately 52 westbound and 117 eastbound bus trips use SR 520, carrying 1,570 and 3,400 riders, respectively. Of the westbound travelers, approximately 40 percent head to downtown Seattle, 40 percent head to the University District, and the remainder head to north Seattle. Of the eastbound riders, approximately 40 percent are destined for the Kirkland area, 20 percent to downtown Bellevue, and 10 percent to Overlake. The remaining 30 percent of the riders are going to various other Eastside destinations.

Travel Time and Reliability

Traffic congestion in the SR 520 corridor – combined with frequent and highly unpredictable delays caused by traffic accidents and minor incidents – results in widely varying travel times in both directions throughout much of the day, affecting transit service reliability. Recent travel time data reviewed by Metro indicate that actual bus travel times between NE 51st Street in Redmond and the Montlake Freeway Transit Station during the morning commute can range from 10 to 30 minutes for both westbound and eastbound trips, with most trips (more than 90 percent) taking an average of 16 minutes.

Eastbound transit travel times in the evening are similar to the morning; however, westbound travel times in the evening can range from 10 to 55 minutes, with an average of approximately 22 minutes. Approximately 20 percent of the westbound transit trips take more than 30 minutes to travel between NE 51st Street in Redmond and the Montlake Freeway Transit Station (KCM 2009).

This high variability means that travelers who need to keep a regular schedule must plan for the worst conditions and anticipate a relatively long travel time. Unpredictability also makes transferring between routes and services difficult and adds substantial cost to providing bus service.

Transit Stations on or near SR 520

As shown in Exhibit 8-1, four freeway stations are located on the shoulder or ramps of SR 520 east of Lake Washington:



1. Evergreen Point Freeway Transit Station (shoulder station)
2. 92nd Avenue NE Freeway Transit Station (shoulder station)
3. NE 40th Street/Overlake (ramp station)
4. NE 51st Street (ramp station)

Exhibit 8-6 illustrates the relative passenger volumes at each of the freeway stations (total boardings and alightings). In the following sections, these freeway transit stations are described, as well as other services and facilities currently on or near SR 520, including the South Kirkland Park-and-Ride and bus routes on I-405 that use the SR 520 corridor.

Evergreen Point Freeway Transit Station

The Evergreen Point Freeway Transit Station is located west of I-405 near the east end of the Evergreen Point Bridge. Both eastbound and westbound bus platforms and shelters are located on the shoulders of SR 520. On the south side of SR 520, the Evergreen Point Park-and-Ride provides 51 parking stalls just southwest of the eastbound bus platform. Approximately 20 routes serve this freeway station. Over 80 percent of the activity at the westbound station is transfer activity, primarily to University District-bound buses. At the eastbound station, transfers account for 95 percent of the activity.

The majority of riders using the Evergreen Point Freeway Transit Station transfer to and from bus routes serving the University of Washington (over 50 percent) or downtown Seattle (over 30 percent). Many of the connecting Eastside routes originate in Redmond, Kirkland, or Bellevue. Some Medina residents and students busing to private schools in Seattle also use the freeway station.

As Exhibit 8-7 shows, approximately 1,100 riders per day used this station in 2007. Many bicyclists use this stop because it is the last opportunity to put bikes on buses before crossing the SR 520 floating bridge. On a daily basis, both stops have similar levels of activity, with

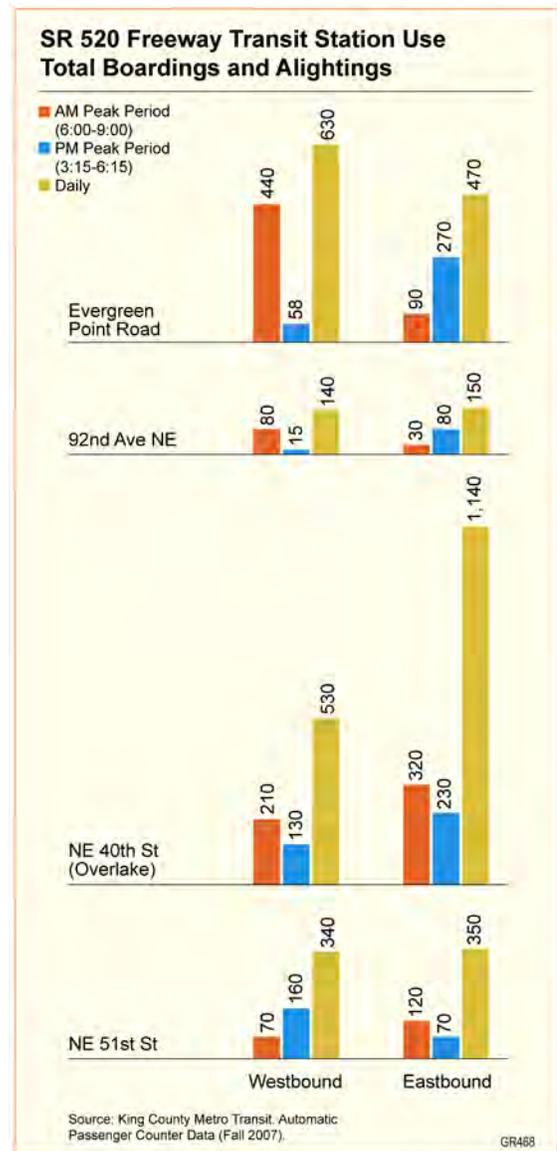


Exhibit 8-6. SR 520 Daily Freeway Transit Station Use (Fall 2007)



the westbound station being slightly busier (67 percent of total daily boardings and alightings).

92nd Avenue NE Freeway Transit Station

The 92nd Avenue NE Freeway Transit Station in Clyde Hill provides bus access for Hunts Point, Yarrow Point, Medina, and Clyde Hill to routes crossing the Evergreen Point Bridge. Most bus riders using this station transfer to and from bus routes serving the University of Washington or work locations in downtown Seattle. Students busing to private schools in Seattle on special Metro routes also use this freeway transit station. Bicyclists often use this stop to load bikes onto buses to be able to cross the lake.

The freeway station is served by 19 routes. It is the least-used station in the corridor at just under 300 riders per day in 2007 (see Exhibit 8-8); 72 percent of the activity occurs during the peak periods. Boardings are greatest in the morning at the westbound station; the eastbound station serves the return trips in the evening.

NE 40th Street Freeway Transit Station at Overlake Transit Center

East of I-405, the NE 40th Street Freeway Transit Station is the most used in terms of passenger volume because of the number of large employers in the areas, most notably Microsoft. The station is adjacent to the Overlake Transit Center, a hub for Microsoft campus shuttles. The eastbound ramp station is served by four routes, and the westbound ramp station is served by six.

On a daily basis, the station serves nearly 1,700 people (see Exhibit 8-9), with 53 percent of the activity during the peak periods. The eastbound station is the busiest, with a total of 1,140 daily trips compared with 530 daily trips at the westbound station.

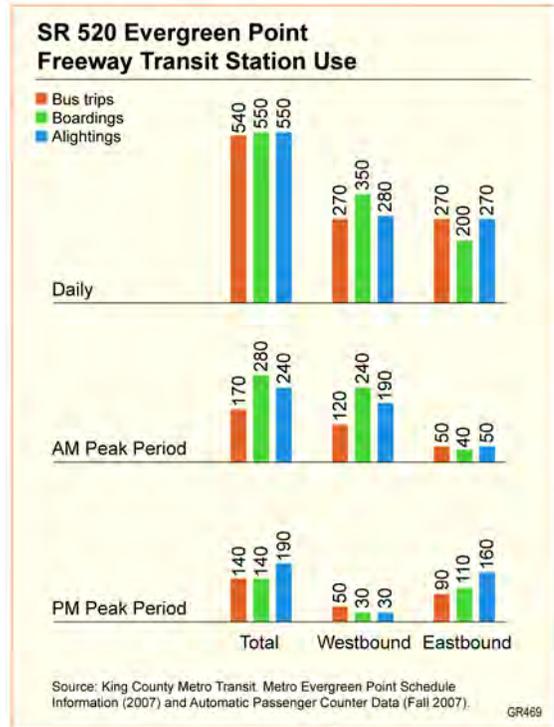


Exhibit 8-7. SR 520/Evergreen Point Freeway Transit Station Use (Fall 2007)

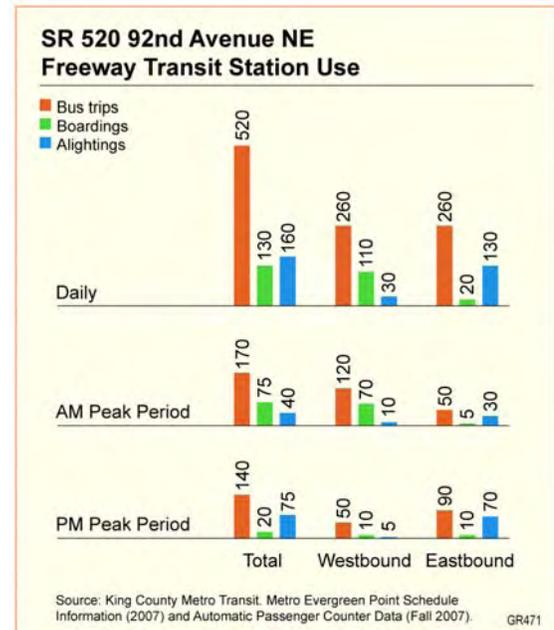


Exhibit 8-8. SR 520/92nd Avenue NE Freeway Transit Station Use (Fall 2007)



Factors that contribute to the difference in use between the two stations during the peak period are the variability in afternoon commute times and modes. For example, people could be leaving later or carpooling home following post-work activities. Microsoft employees could be using the Microsoft shuttle for their return trip.

NE 51st Street Freeway Transit Station

The NE 51st Street Freeway Transit Station primarily serves the surrounding residential area and, similar to the 92nd Avenue NE Station, has lower passenger volumes than the Evergreen Point and NE 40th Stations. The NE 51st Street Freeway Transit Station, located on the collector-distributor lane system between the NE 40th and NE 51st Street interchanges, is served by seven routes. The station serves nearly 700 people every day (see Exhibit 8-10) with identical daily activity for both directions. The station is busiest in the evening peak period, which accounts for 37 percent of the daily activity; 28 percent of the daily activity occurs in the morning peak period. Alightings are mostly in the morning at the eastbound station; the westbound station serves the evening return trips.

South Kirkland Park-and-Ride

The South Kirkland Park-and-Ride is located approximately 1/4 mile north of the SR 520 corridor. Metro route 255 and Sound Transit route 540 provide all-day service between the South Kirkland Park-and-Ride and downtown Seattle (255) and the University District (540).

For westbound trips on SR 520, buses use the westbound on-ramp at the 108th interchange, which requires them to travel just under 1/4 mile on arterial streets between the South Kirkland Park-and-Ride and the ramp, including one signalized intersection at 108th Avenue NE/Northrup Boulevard. Eastbound buses use the Bellevue Way NE eastbound-to-northbound off-ramp to access the

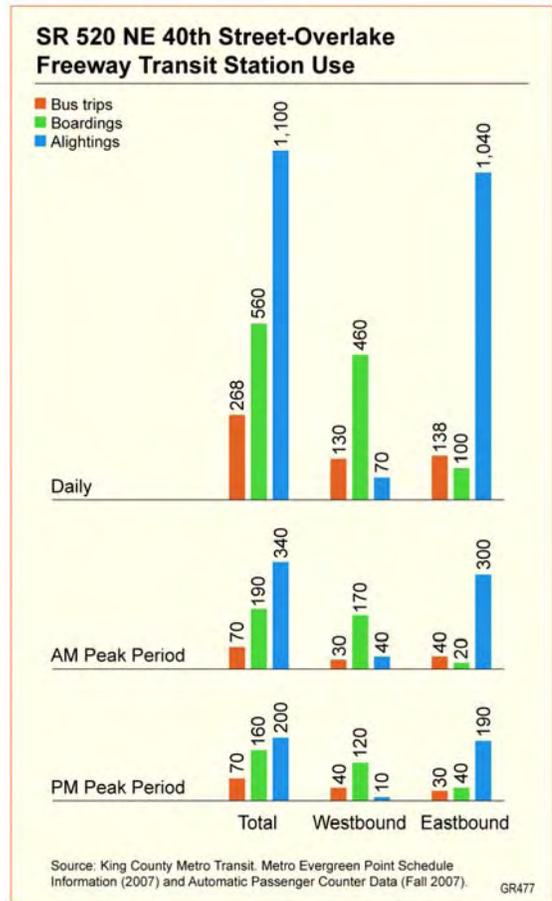


Exhibit 8-9. SR 520/NE 40th Street/Overlake Freeway Transit Station Use (Fall 2007)

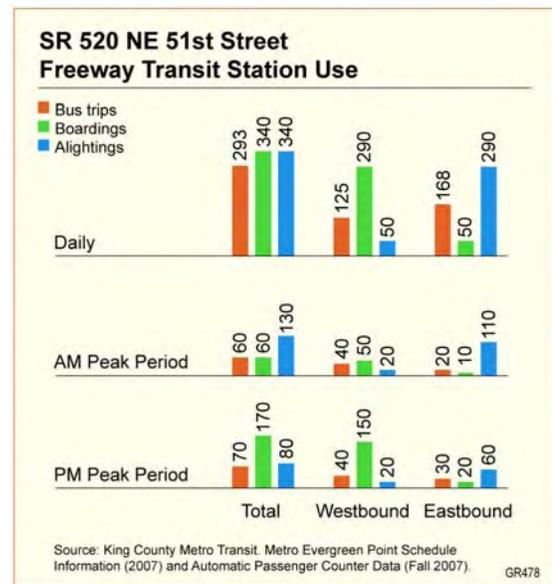


Exhibit 8-10. SR 520/NE 51st Street Freeway Transit Station Use (Fall 2007)



South Kirkland Park-and-Ride because there is no eastbound off-ramp at the 108th Avenue NE interchange. This route requires buses to travel just under a mile (0.90 mile) on arterial streets and to pass through two signalized intersections, one at the Bellevue Way NE/Northrup Way intersection and one at the 108th Avenue NE/Northrup Way intersection.

During the peak commute periods, these arterials and intersections are currently congested, affecting transit travel times and reliability, especially for eastbound buses. However, the right-turn movement that buses use at the Bellevue Way NE /Northrup Way intersection is not included in the signal (yield), which minimizes the amount of time buses are delayed.

During the morning peak period, approximately 24 buses use the 108th Avenue NE westbound on-ramp, and 15 buses use the eastbound off-ramp to Bellevue Way northbound. During the afternoon peak period, approximately 18 buses use the 108th Avenue NE westbound on-ramp, and 24 buses use the eastbound off-ramp to Bellevue Way northbound.

I-405 Buses Using SR 520

There are 10 bus routes on I-405 that use SR 520, all providing peak-period service only. There are no routes that provide all-day service between areas north and south along I-405 and Seattle or the University District. These 10 routes travel directly between SR 520 and I-405 and do not serve the South Kirkland Park-and-Ride.

Westbound bus volumes are substantial during the morning peak period (6:00 to 9:00 a.m.), with approximately 50 buses using the SR 520/I-405 interchange. During the afternoon peak period, most of the routes serve the return eastbound commute. There are also five westbound buses traveling between areas north of I-405 and Seattle.

What will transit facilities and services be like with the No Build Alternative?

Transit Facilities

Transit facilities were assumed to remain as they are today.



Transit Service Network

There are four routes that currently provide all-day service on SR 520, with the remaining 18 routes providing peak-period or specialized service between the major transit markets on the west and east sides of Lake Washington. For purposes of this transportation analysis, we assumed that this general service structure would continue into the future, but with improved service frequencies during peak and off-peak periods and addition or modification of a few bus routes. The transit network and operating plan assumptions for the 2030 No Build Alternative are consistent with those identified for other corridor projects in the region, including:

- King County Metro *Transit Now* and *RapidRide* programs
- Sound Transit's light rail service between Sea-Tac and Northgate
- Seattle streetcar service between South Lake Union and the Seattle Waterfront

As in the No Build, it was assumed that the current general service structure would continue into the future but with improved service frequencies and additional bus routes during peak and off-peak periods. WSDOT – along with Sound Transit, King County Metro, and the University of Washington – has developed a separate High Capacity Transit Plan to determine the effects of different transit service structures, including bus rapid transit, on the SR 520 corridor. The Final High-Capacity Transit Plan (WSDOT 2008d) provides more information about this work.

King County Metro's Transit Now and RapidRide

Transit service in the SR 520 corridor is projected to grow by the year 2015 through Metro's *Transit Now* investments and other service expansion opportunities. *Transit Now* will add service to two core routes, Route 271 and Route 255, across the Evergreen Point Bridge, primarily in the midday and on weekends. *Transit Now* investments will also create an Eastside *RapidRide* route along the Bellevue-Redmond Road corridor. The Bellevue-Redmond *RapidRide* route will connect to the SR 520 corridor and provide high-frequency transit service between Bellevue and Redmond 7 days per week, approximately 18 hours per day or more. With a projected initial ridership of 3,500 daily riders when the route is launched in 2011, the



Did you know?

The *Transit Now* initiative, approved by King County voters in the general election on Nov. 7, 2006, will expand Metro transit service by 15 to 20 percent over the next 10 years. Intended to help Metro keep pace with regional growth, the initiative is funded by a 1/10th of 1 percent sales tax increase.

RapidRide is a rapid transit service that will provide frequent, fast, and reliable bus service in certain major arterial corridors. At full implementation, *RapidRide* will feature:

- Frequent, all-day service
- Transit stations at high-ridership and high-transfer locations with real-time bus arrival signs and enhanced shelters
- High-capacity, low-emission hybrid buses with low floors designed for fast boarding and rider comfort



RapidRide line will make the cross-lake services more accessible by providing fast, reliable connections.

Sound Transit Light Rail and Express Bus Routes

It was assumed that light rail would be in place between Sea-Tac Airport and Northgate by the year 2030. The 15-mile initial segment of light rail between downtown Seattle and the airport is under construction and scheduled to open in 2009. Sound Transit has recently obtained approval from the Federal Transit Administration (FTA) to start final design on the segment (called U-Link) north from downtown Seattle to the University of Washington Station near Husky Stadium. Sound Transit and the University of Washington have also executed an agreement covering the terms and responsibilities for constructing U-Link. The environmental documentation and preliminary design for the University of Washington to Northgate segment is complete, and funds for construction are included in the Sound Transit 2 (ST2) Plan approved by voters in November 2008.

The ST2 Plan includes an extension of light rail (known as East Link) from downtown Seattle across I-90 to downtown Bellevue by 2021, east to the Overlake Transit Center and north to 164th and Ash Way in Snohomish County by 2027. The ST2 Plan also includes an extension of light rail from Sea-Tac Airport south to Tacoma by 2027. The extensions to Bellevue, Snohomish County, and Tacoma – although not included in the No Build Alternative – are addressed in the Indirect and Cumulative Effects analysis in Chapter 11.

Transit Service Hours

Based on discussions with King County Metro, it was assumed that the increases in transit service planned for the Transit Now program will account for growth between 2006 and 2016. A 1.0 percent per year increase in service hours was assumed between the year 2016 and 2030. For Sound Transit Service, total transit service hours were assumed to increase approximately 1/2 percent a year between the base year (2006) and (or about) 2013. This assumption is consistent with Sound Transit's Service Implementation Plan. Currently, there are no funds for increased service after 2013.



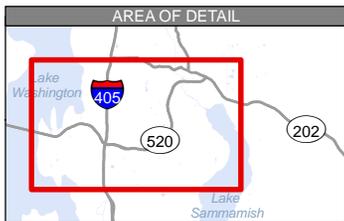
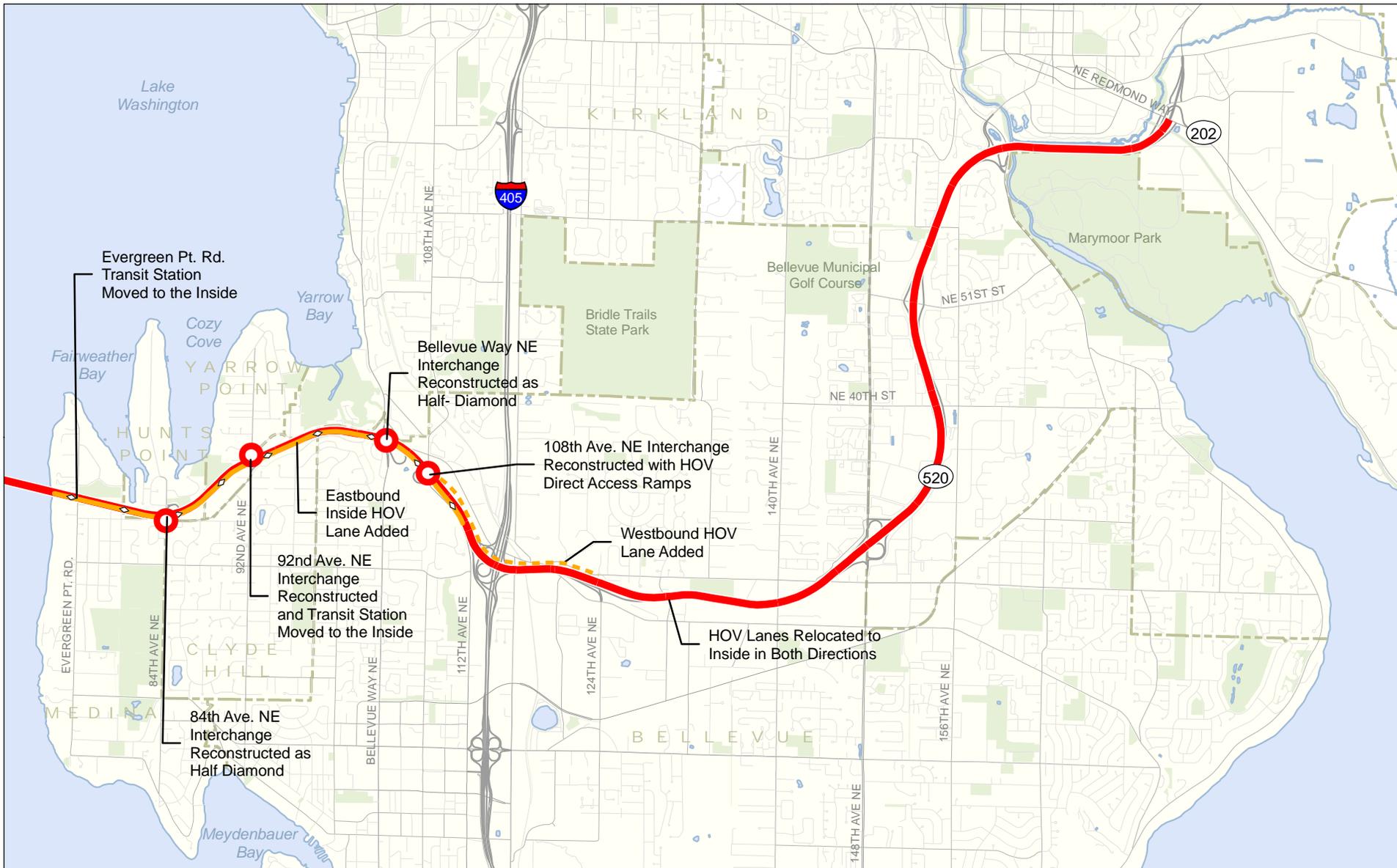
What would transit services and facilities be like with the Build Alternative?

The Build Alternative includes the SR 520 Eastside Transit and HOV Project, which consists of the following transportation components:

1. **Completing the eastbound SR 520 HOV lane** from Lake Washington to the existing eastbound HOV lane west of the I-405 interchange. This improvement will complete the currently discontinuous HOV network on the Eastside and improve travel time reliability for buses and carpools.
2. **Relocating the HOV lanes from the outside to the inside lanes** from Lake Washington to SR 202. This change will enhance safety by eliminating the existing need for merging vehicles to weave across the faster-moving HOV lanes to reach the general purpose lanes.
3. **Constructing HOV direct access ramps at 108th Avenue NE.** This improvement will connect SR 520 with 108th Avenue NE, eliminating the need to connect to the South Kirkland Park-and-Ride via local streets and saving as much as 15 minutes for peak-period bus trips.
4. **Building inside transit stops** at 92nd Avenue NE and Evergreen Point Road. These transit stops will support the inside HOV lanes, and access will be integrated with the proposed lids over the highway.
5. **Adding a bike/pedestrian path** between 108th Avenue NE and Evergreen Point Road. This improvement will facilitate non-motorized use of SR 520, provide transit connections for bikes and pedestrians, and complement the existing non-motorized transportation network on the Eastside.
6. **Improving interchanges** at 84th Avenue NE, 92nd Avenue NE, Bellevue Way, and 108th Avenue NE to ease traffic congestion.

These improvements are highlighted in Exhibit 8-11 and discussed in more detail in Chapter 1. These changes to the transportation systems were modeled to determine how they would affect transit and carpool





- Study Interchange
- Project Limits
- HOV Lane Added



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 8-11. Eastside Transit Improvements

Medina to SR 202: Eastside Transit and HOV Project

demand and operations. It was assumed that, upon opening, the HOV lane designation would be 3+ and that the corridor would be untolled.

As described in Chapter 1, the Build Alternative for this project assumes that the SR 520 bridge would not yet be replaced. Therefore, there would be no HOV lanes across the bridge when this project is complete, requiring the westbound HOV lane to terminate before the bridge but from the inside lane. The project would include design elements that would improve current merge conditions, allowing HOV vehicles to enter the traffic stream at higher speeds.

The freeway transit stations at NE 40th Street/Overlake and NE 51st Street are assumed to remain outside ramp stations. These freeway stations are both served off of the collector-distributor system between the NE 40th and NE 51st interchanges, which means that buses only have to exit and enter the SR 520 mainline once. This section of SR 520 between the 148th Avenue NE and 40th/51st Street interchanges is generally not as congested, meaning that the travel time effects of weaving between the inside HOV lane and the collector-distributor access to the freeway stations would not substantially affect transit travel times and reliability.

Freeway Transit Stations

The freeway transit stations at 92nd Avenue NE and Evergreen Point Road would be moved to the inside of SR 520 to become center median stations. Access would be provided from the new lids at both locations and would include both elevator and stair access. Covered waiting areas would be provided both on top of the lids and at the transit stations. Real-time transit schedule information could be included on the top of the lids, giving people the option to wait away from the freeway.

Based on community input and to improve the wait experience, the transit stations would not be located under the lids. Exhibits 8-12, 8-13, and 8-14 show concept designs for the lid and transit station waiting areas. Bicycle racks, and potentially storage lockers, would be located at both transit stations. The Evergreen Point Road Park-and-Ride would be reconstructed and improved. For more information regarding the design of the lids, see Chapter 7, Nonmotorized Facilities.

Bus routes 261 and 271 would no longer be able to serve the Evergreen Point Freeway Transit Station because the station will be relocated to





Exhibit 8-12. Conceptual Design for 92nd Avenue NE Lid Transit Access (source: WSDOT 2009)

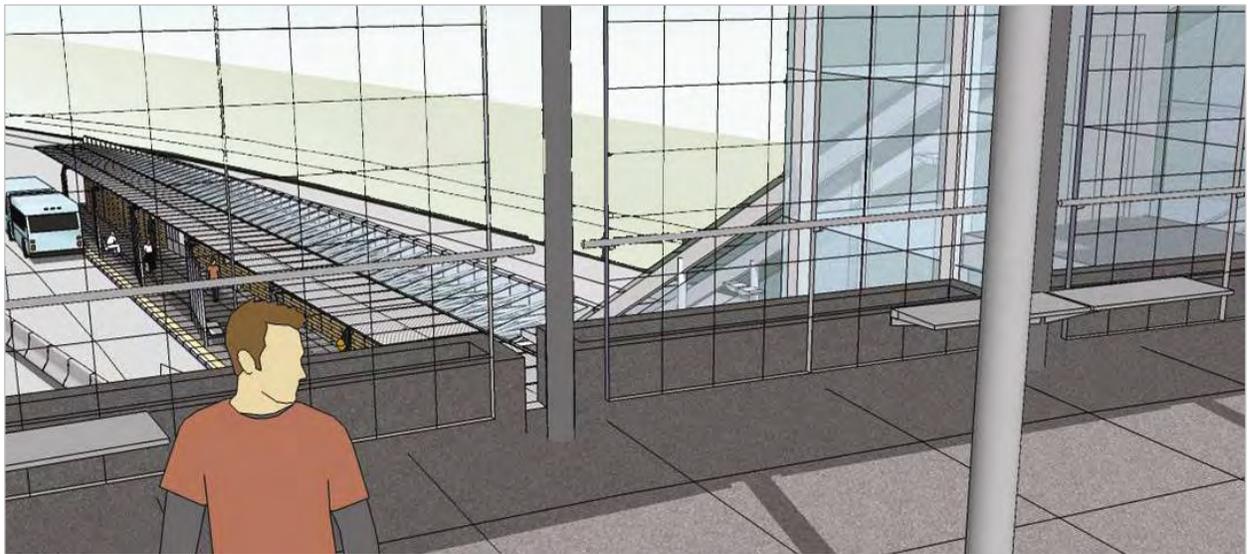


Exhibit 8-13. Relationship Between Lid Waiting Area and Transit Station Platform (Conceptual Design) (source: WSDOT 2009)



Exhibit 8-14. Conceptual Design for Transit Station Platform and Relationship to Lid (source: WSDOT 2009)



the inside of SR 520. Both of these routes use the 84th Avenue interchange to access SR 520. The distance between the 84th Avenue NE ramps and transit access to the inside Evergreen Point Freeway Transit Station would not be great enough to allow buses to travel between them. The routes could either be changed, or transfers could occur near the 84th Avenue interchange and new lid.

How would travel times change between now and the year 2030 without and with the project?

Year 2030 travel times for carpool and bus traffic using the HOV lanes would change as shown in Exhibit 8-15 without and with the project. Travel times are shown for between I-5 and SR 202 to capture the total effect because most SR 520 trips cross the bridge and are not just traveling between Eastside cities and towns.



Did you know?

Congestion affects bus service by increasing the time required to complete a round-trip. Generally, congestion and, therefore, travel times are greatest during commute “peak” periods compared to the middle of the day, or “off peak” periods of the day. Therefore, a round-trip in the middle of the day may take 120 minutes (includes recovery/layover time); so in order to provide 30-minute frequency, 4 buses would be needed to complete a round-trip.

In the peak period, when it is congested, a round trip may take 150 minutes; so a 30-minute frequency would need 5 buses to operate. The number of buses required to provide a certain frequency is variable in that some increase in travel time can be absorbed through reduction in recovery/layover time. However, there comes a point when another bus must be added in order to maintain the proposed schedule. This increases operational costs.

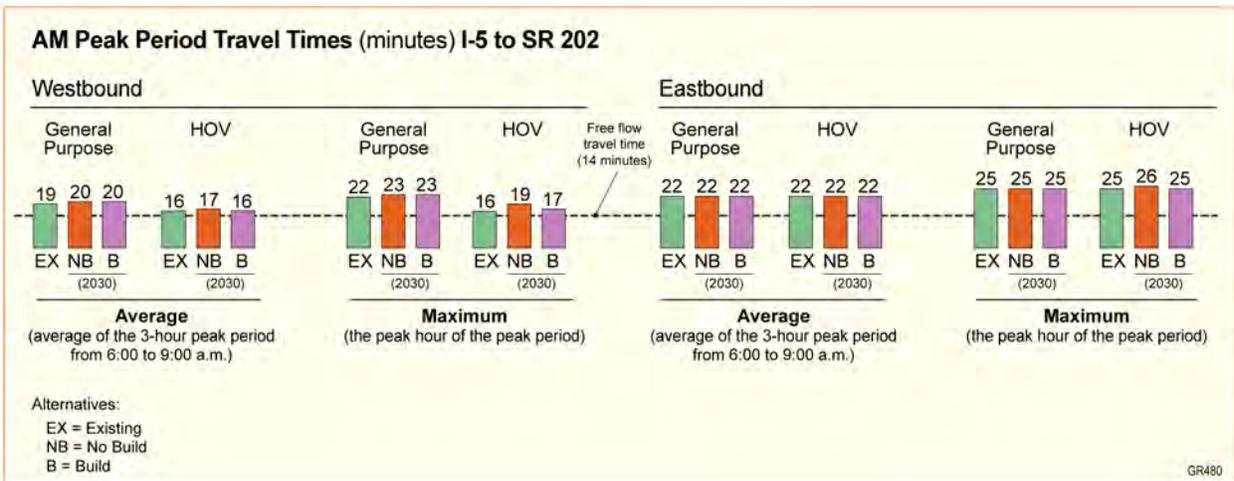


Exhibit 8-15. SR 520 Morning Peak Period Travel Times between I-5 and SR 202

Morning Peak Period

Year 2030 No Build Alternative

Westbound and eastbound travel times between I-5 and SR 202 during the morning commute in the year 2030 are forecast to be similar to what they are today.



Year 2030 Build Alternative

With the Build Alternative, westbound HOV lane travel times would be slightly less (by 1 to 2 minutes) during the morning commute because the project would improve the HOV lane merge conditions and roadway design approaching the bridge. Moving the HOV lanes to the inside of SR 520 and extending them through the I-405 interchange would also improve travel times and reliability of high-occupancy vehicles. While the project would include a new eastbound HOV lane between Medina and I-405, HOV travel times for the Build Alternative would be the same as the No Build Alternative because there is little to no congestion on the Eastside during the morning commute time.

Afternoon Peak Period

Year 2030 No Build Alternative

Between now and the year 2030, traffic volumes are forecast to increase, and, therefore, congestion is expected to worsen. As a result, westbound HOV travel times would increase between 15 and 39 minutes and general-purpose travel times would increase between 16 and 34 minutes compared to today (see Exhibit 8-16). Even with these increases, HOV lane travel would provide a 7 to 11 minute travel time benefit over general-purpose lane travel.

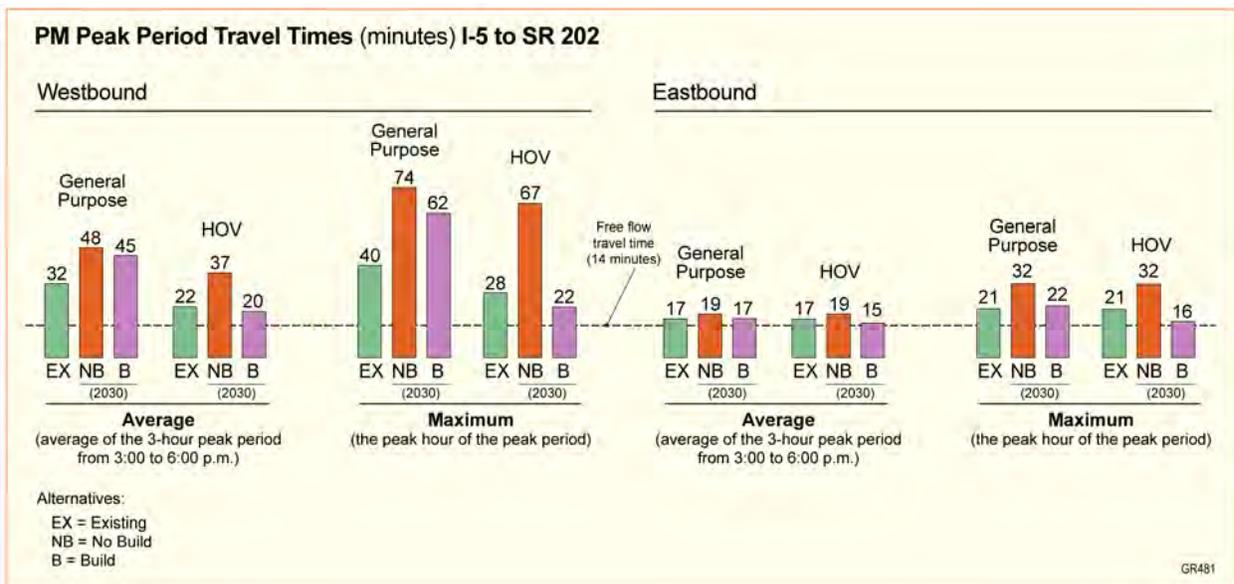


Exhibit 8-16. SR 520 Afternoon Peak Period Travel Times between I-5 and SR 202

Without the project, buses would travel in the general-purpose lanes as they do today. Travel times in the eastbound general-purpose travel would increase between 2 and 11 minutes by the year 2030 because of



increased congestion on I-405 spilling back onto SR 520. Without an eastbound HOV lane between Medina and I-405, buses would not be able to reliably bypass congestion.

Year 2030 Build Alternative

With the project and the relocation of the HOV lanes to the inside, transit travel times and reliability would improve substantially. Buses would be able to reliably bypass congestion between Medina and SR 202. Buses would no longer be delayed by general-purpose traffic merging across the HOV lane, which would also improve safety for both general-purpose and HOV vehicles.

Travel time savings would be the greatest for westbound buses and carpools during the afternoon peak period, which is when the westbound general-purpose lanes would be congested as far east as the NE 51st/NE 40th Street interchange. Moving the HOV lanes to the inside would reduce travel times for westbound buses by 20 to 45 minutes compared to the No Build Alternative. Buses would be able to bypass congestion approaching the SR 520/I-405 interchange and Evergreen Point Road (westbound HOV lane termination/merge). With the project, westbound HOV travel would be 30 to 45 minutes faster than general-purpose travel during the evening commute.

Westbound HOV lane travel time would reliably average 20 minutes between SR 202 and I-5 (13 miles). Today, travel times can range between 10 and 55 minutes to travel the section of SR 520 between the NE 51st Street and Montlake Freeway Stations (10 miles).

Approximately 20 percent of the westbound transit trips currently take over 30 minutes.

What would transit demand be without and with the project?

Without the project, daily and peak-period transit person trips would increase by approximately 50 percent over today, with similar increases during both morning and evening commute periods. The daily transit demand results for SR 520 are shown in Exhibit 8-17. This increase in ridership reflects two considerations: 1) gains in population and employment expected along the corridor over the next 20 years, and 2) mode choice changes in response to increasing congestion, climate change concerns, and other societal factors.



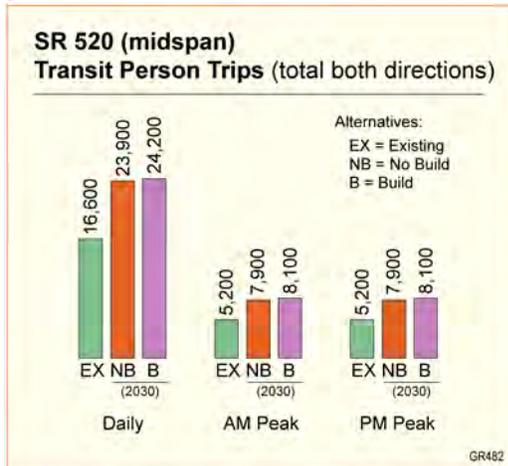


Exhibit 8-17. SR 520 (midspan) Peak Period Transit Person Trips (total both directions)

Without the project, the number of total daily bus vehicle trips across the SR 520 bridge is expected to remain the same as today; however, there would be nearly a 17 percent increase in the number of buses serving the corridor during the evening and morning commute periods (180 to 210). With the project, transit demand would be similar to the No Build Alternative because the project is not adding a substantial amount of HOV capacity.

Assuming that westbound morning transit service remains the peak ridership time, and transit travel patterns remain similar to today, approximately 6,800 seats could be available for approximately 5,700 riders during the westbound morning transit commute. The system would be running at 84 percent of capacity over the entire 3-hour peak. However, during the peak of the peak, it is likely that there will be some routes with standing room only, similar to today.

Based on peak hour load calculations¹, it is estimated that at the peak of the peak, westbound capacity could be approximately 7 percent over capacity, which could be accommodated by standing capacity. While not assumed in the transportation analysis, additional buses and service might also be provided through the Urban Partnership Agreement to help meet this demand.

¹Assumed that within the peak 3 hours, demand might peak at 130 percent of the 3-hour average rate. Peak loads calculation $(1.3 * (5,700/3)) / (6,800/3)$.



