Chapter 3

Transportation Environment and Consequences

3.1 Introduction

This chapter summarizes the characteristics of the transportation system in the East Link Project vicinity and discusses potential impacts and mitigation associated with the project alternatives described in Chapter 2. This chapter first describes the existing transportation environment, and then presents the analysis and results showing potential impacts and mitigation. A more detailed discussion of the transportation analysis and results is provided in the *Transportation Technical Report*, located in Appendix H1 of this Draft EIS.

3.1.1 Transportation Elements and Study Area

The analysis of the transportation system considered the following transportation elements:

- Regional facilities and travel patterns
- Transit operations
- Highway operations and safety
- Arterial and local street operations, safety, and parking
- Nonmotorized facilities
- Freight mobility and access
- Navigable waterways

This chapter is organized with a section on each transportation element. Each section discusses its methodology, affected environment, environmental impacts, and potential mitigation. For each of these elements, the affected environment is described under current conditions (2007), and the environmental impacts are described for the two future years, 2020 and 2030. The year 2020 was selected for analysis because it conservatively estimates the year of opening. The year 2030 provides a horizon-year analysis consistent with the planning period of regional and local agencies. The impact analysis compares the No Build Alternative to the East Link (light rail) alternatives.

The study area for this transportation analysis consists of the I-90 corridor between Seattle and I-405, South Bellevue, Downtown Bellevue, the Bel-Red area of Bellevue and Redmond, State Route (SR) 520 between Overlake and Downtown Redmond, and Downtown Redmond.

Exhibits 3-1 through 3-3 identify the transportation and local street analysis areas within in the study area. Different analysis areas for different transportation elements are shown in these exhibits. Within the study area, approximately 150 intersections were analyzed. Pedestrian circulation was evaluated within a one-half mile radius surrounding stations, and parking within a one-quarter-mile radius. Bicycle circulation was evaluated within a one-mile radius around the stations. Regional and corridor roadway operations were evaluated using six screenlines that assessed transit and vehicle travel performance in key subareas through the study area. As described in the transit section of this chapter (3.4), Sound Transit and Metro service planners reviewed future bus routes as part of this project.

3.1.2 Meeting the Need for the Project

As summarized in the following points, the analysis in this chapter demonstrates that the East Link Project would meet and exceed the need for the project in all the categories presented in Chapter 1:

- **Increased Demand for Transit Services.** Without East Link, existing and projected transit service would not meet transportation reliability and capacity needs for the Eastside corridor. The East Link Project would increase the I-90 person capacity across Lake Washington by close to 60 percent without any roadway widening. Being able to move more people in both directions, especially in the reverse-peak direction (eastbound in the morning [AM] and westbound in the afternoon [PM]), when travel times are expected to double in the future, would improve the mobility into and out of the urban centers (Seattle, Bellevue, Overlake, and Redmond) on both sides of Lake Washington that this project would serve.

  East Link would meet a growing demand for reliable transit alternatives. Within the East Link corridor, the travel mode in the future is predicted to shift; generally reducing the percentage of

single-occupant vehicles and increasing the percentage of high-occupancy vehicles (HOVs) [vanpools and carpools]) and transit (buses and light rail), a mode that carries more people within the limited transportation space. With the project, the percentage of transit ridership across Lake Washington would increase by 25 to 33 percent compared to the no-build condition during the PM peak period; therefore, about 25 percent of people traveling across the lake would be in transit vehicles. This shift to using transit indicates the growing demand for transit that is consistent with urban environments and is crucial to providing person mobility rather than vehicle capacity.

- **Increased Congestion on I-90.** The vehicular capacity of I-90 is expected to be reached within the near future (around year 2015) (WSDOT, 2006). This would further constrain travel for all modes, including freight, HOVs, and buses. In addition, roads leading into and out of the urban centers of Seattle and Downtown Bellevue are forecast to be at capacity in the near future, increasing travel time between these two key employment and population centers. This would substantially constrain the ability to travel to key employment and population areas of the region and highlights the need for increased transit use, which provides greater capacity and is more reliable than single-occupant vehicles and also provides a safer transportation alternative.

- **Regional Urban Center Growth Plans Require High-Capacity Transit Investments.** To meet planned growth in the corridor and the Growth Management Act objectives, Bellevue, Seattle, and Redmond have made land use and planning decisions for increased employment and residential density based in part on the long-term promise of high-capacity transit (HCT) connections across I-90. Traffic projections indicate that most major roadways in the study area would be congested and would fail to effectively move vehicle travel by 2030. This would occur even with implementation of planned transportation improvements on SR 520, I- 90 (without East Link), and I-405. With the East Link Project, HCT would connect the region's dense commercial and residential centers, as well as major employers, across Lake Washington without being hindered by the increasingly congested highway conditions.

Level of Service (LOS)

Describes traffic conditions in terms of speed and travel time, freedom to maneuver, comfort, convenience, and safety. LOS A is considered to be the ideal "free-flowing" condition, while LOS F is considered to be the least desirable condition, with stop-and-go traffic.

- **Operating Deficiencies in Regional Bus Transit.** The travel time between the key urban centers of Seattle and Downtown Bellevue would improve with light rail service because light rail has faster travel time and better reliability than bus or auto. The East Link Project analysis estimates that light rail travel between Seattle and Downtown Bellevue would take less than 20 minutes, and between Seattle and Downtown Redmond, about 35 minutes, regardless of time of day or level of traffic congestion. This is a savings of up to 30 minutes compared to an automobile currently traveling between these locations—in the afternoon peak period it currently can take up to 47 minutes to travel between Seattle and Bellevue (via I-90) and up to 63 minutes to travel between Seattle and Redmond (via SR 520) (WSDOT, 2008). In the future, these automobile times are expected to continue to worsen and therefore light rail would provide an even greater travel-time savings.

  In addition, light rail service to the Eastside would substantially improve transit service reliability throughout the project vicinity. It is expected that bus reliability in the future would continue to operate at failing levels (not meeting level of service [LOS] standards) without the project, and a majority of the bus routes would not meet scheduled headways (the time between bus arrivals). Buses would continue to be an unreliable travel choice in the project area, for instance across Lake Washington and in Downtown Bellevue and Redmond, because bus service would be slowed by heavily congested roadways. Bus speeds between Downtown Seattle and Downtown Bellevue are predicted to decrease by up to 30 percent by year 2030 as congestion worsens, even with improvements to I-90, because arterials connecting I-90 to these urban centers would not be improved. This poor bus reliability would not benefit transit ridership and would not provide an attractive transportation choice for the region. The frequency of transit throughout the day would improve because light rail would arrive every 15 minutes or less, in comparison to the buses arriving on average every 30 minutes or more during off-peak hours. Light rail would also serve more hours of the day with expanded service coverage of 20 hours—a substantial improvement over existing and planned bus service.

- **Limited Transit Capacity and Connectivity.** Light rail service not only provides increased service frequency, faster travel times, and longer hours of service throughout the day, it would also be able to carry more passengers to connecting bus routes. These connecting bus routes that share connections with the light rail system would likely experience higher ridership. By the year 2030, up to 10,000 new riders would choose to use transit each day with the addition of light rail serving Eastside communities. In addition, the East Link Project is forecasted to contribute between 42,500 and 48,000 daily riders to the region's light rail system. This is expected to eliminate about 215,000 vehicle miles traveled and about 15,000 hours of travel each day in the region in 2030. The East Link light rail project has the capacity to carry between 9,000 to 12,000 people per hour in each direction, or the equivalent of about 6 to 10 freeway lanes of traffic. Without light rail's ability to move more people in both directions across Lake Washington, there would continue to be peak-directional roadway capacity that would not efficiently and reliably serve the growing residential and commercial land use densities on the Eastside.

3.2 Methodology and Assumptions

The transportation impacts of the East Link Project were analyzed from three different perspectives: regional, corridor, and operations. The regional and corridor assessments addressed larger areas in the overall project vicinity. The operational assessment identified and analyzed specific roadways and intersections. The following types of information were developed and evaluated in these three analysis areas:

- Regional analysis includes information such as project-wide ridership and daily vehicle miles and hours of travel.
- Corridor analysis includes information such as transit service and ridership, roadway volume-to-capacity (v/c) ratios, and mode share.
- Operational analysis includes information on the operations (LOS) and safety of the highways, arterial and local streets, and intermodal network(s).
- The arterial and local street analysis focused on intersection operations and safety analysis, whereas the highway analysis focused on person throughput and capacity, travel time, and safety. Impacts on parking, nonmotorized facilities, transit, and freight movement were also addressed. Construction impacts on traffic circulation were assessed qualitatively for local traffic and quantitatively for I-90.

The methodology and assumptions that were used to analyze the project impacts are discussed in detail in Appendix A of the *Transportation Technical Report* (see Appendix H1 of this Draft EIS). That appendix includes further information on the following topics:

- Agency guidelines and regulations regarding the analysis of local and region-wide project impacts
- Transportation analysis methodology, including relevant definitions, data collection, regional traffic analysis, corridor traffic analysis, intersection impact analysis, and construction impact analysis
- Methods for traffic forecasting and assessing local and project-wide LOS standards and safety
- Methods for assessing impacts related to light rail station and park-and-ride areas, parking, nonmotorized facilities and modes, property access circulation, freight, transit, and construction

3.3 Regional Travel

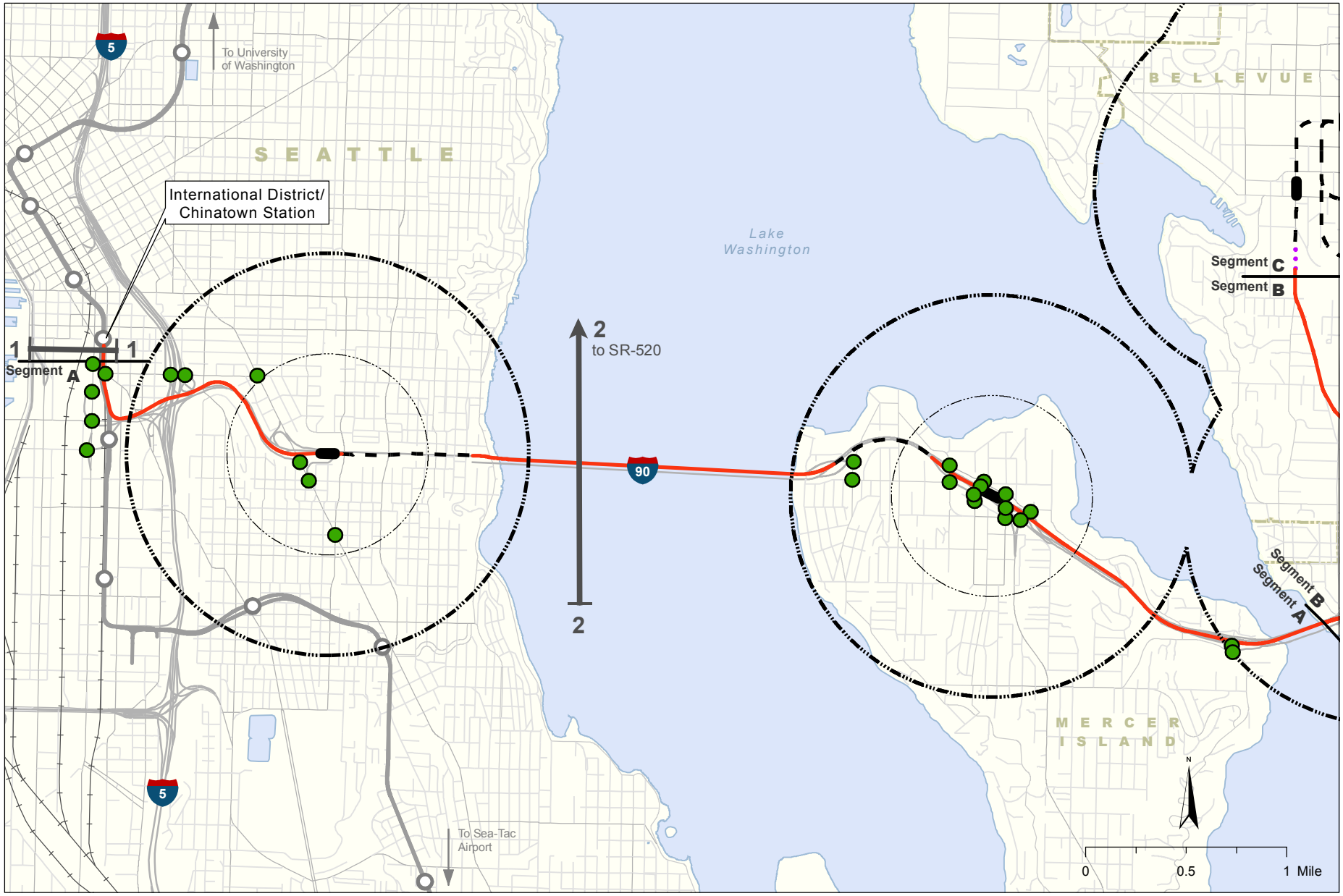
3.3.1 Methodology

This section describes existing conditions (year 2007) and potential project impacts on regional transportation facilities in the study area in years 2020 and 2030. Regional travel conditions for the East Link Project were evaluated based on future travel information obtained using the Puget Sound Regional Council (PSRC) transportation demand model and Sound Transit's transit ridership model, which includes the urbanized areas of King, Pierce, and Snohomish counties. These travel demand models were used to create 2020 and 2030 vehicle forecasts for the Puget Sound roadway system. Based on these forecasts and driver travel patterns, the number of miles and hours traveled were estimated to create VMT and VHT. On roadways in the study area, the vehicle traffic and mode share were predicted, giving the v/c ratios (congestion) and mode share at each of project screenlines. The six project screenlines are shown in Exhibits 3-1 through 3-3.

3.3.2 Affected Environment

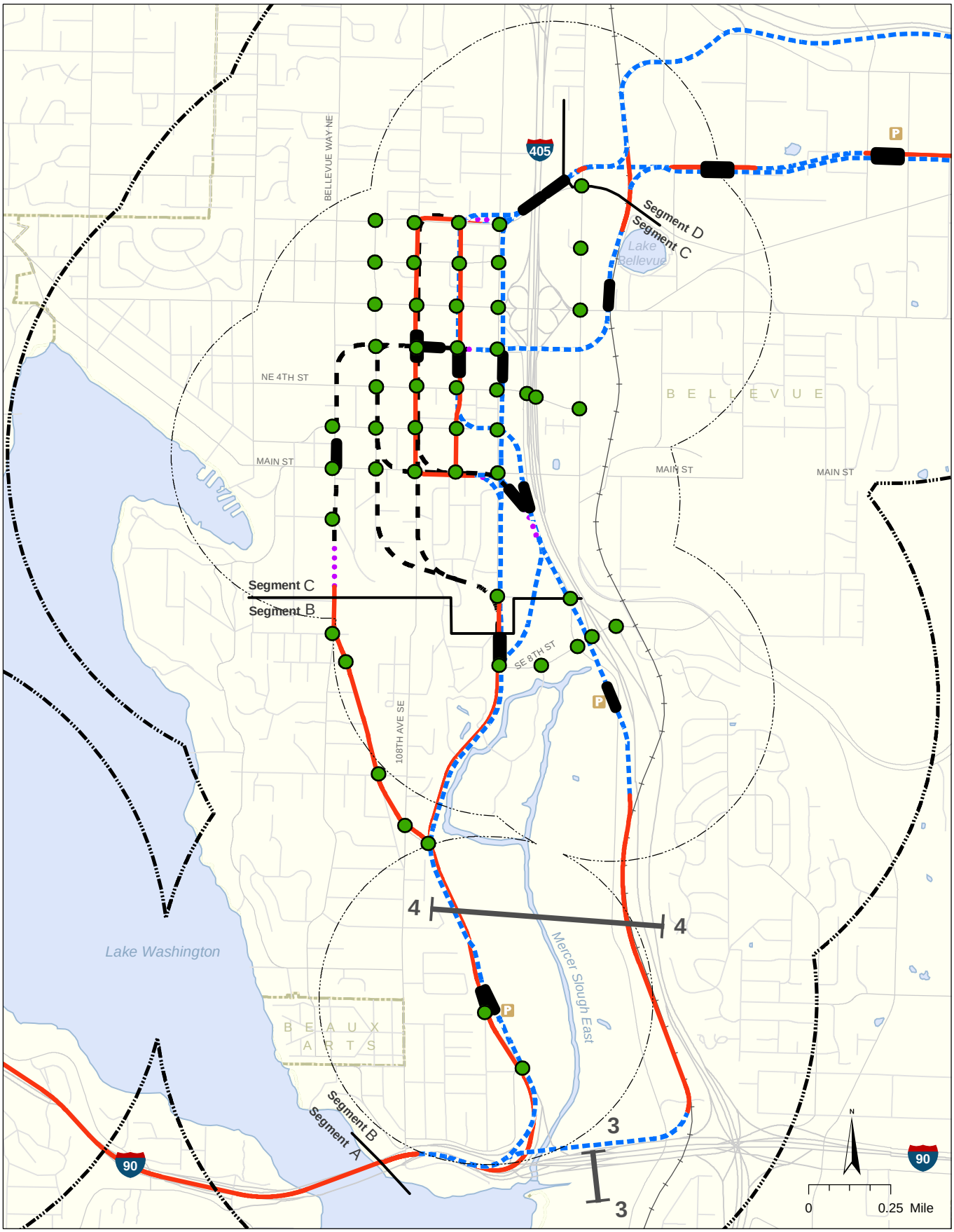
3.3.2.1 Vehicle Miles Traveled and Vehicle Hours Traveled

In the Puget Sound region, vehicles travel more than 70 million miles each day. This results in close to 2 million hours of travel for all users of the transportation system. In the AM peak period (6 to



Source: Data from King County (2006) modified by CH2M HILL.

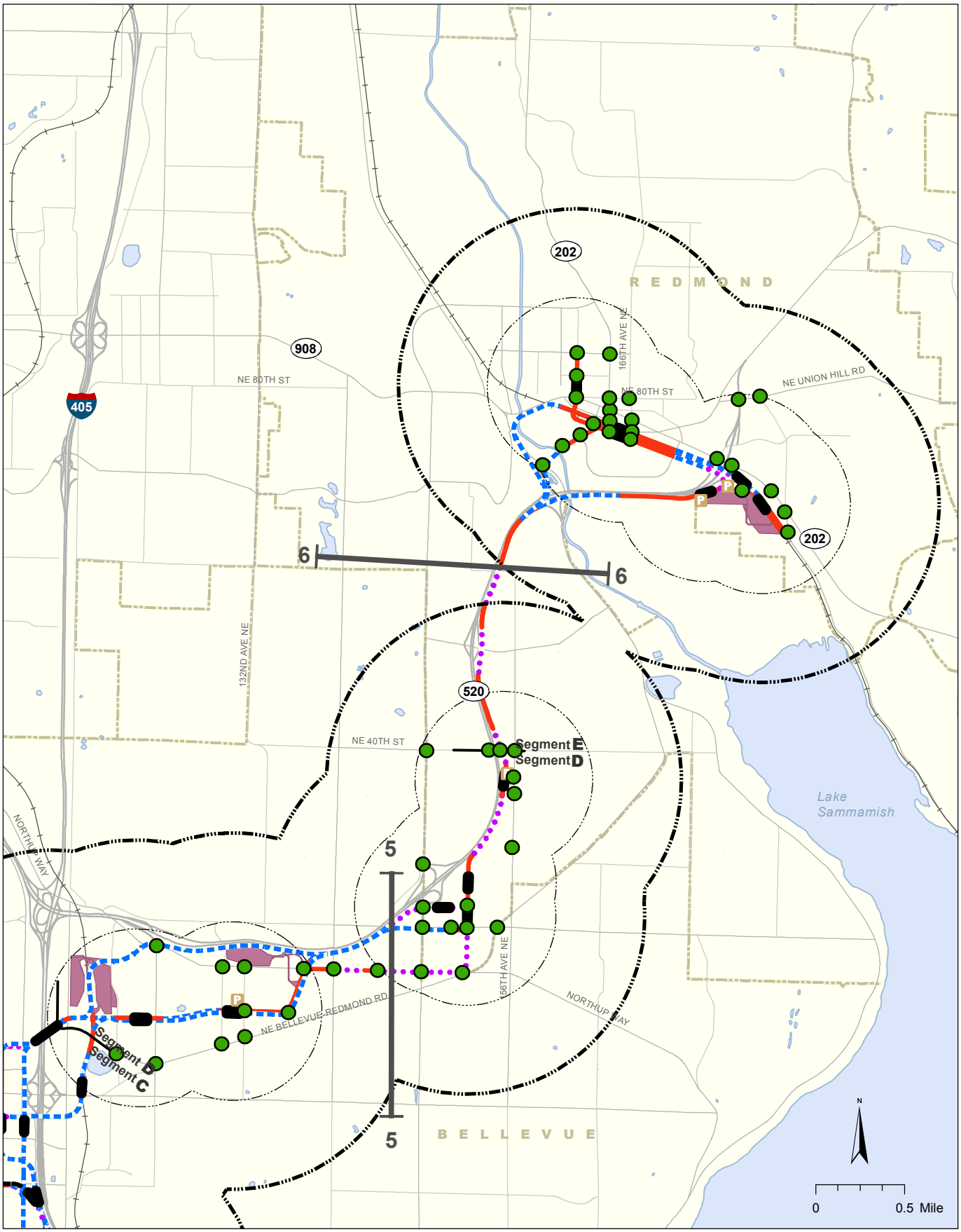
Exhibit 3-1
Transportation Analysis Study Area Segment A
East Link Project



Source: Data from King County (2006).

Study Intersection
Screenline
Sidewalk and On-Street Parking Study Area (1/2 mile)
Bicycle Study Area (1 mile)
At-Grade Route
Elevated Route
Retained-Cut Route
Tunnel Route
Proposed Station
New and/or Expanded Park-and-Ride Lot

Exhibit 3-2 **Transportation Analysis Study Area Segments B and C**
East Link Project



Source: Data from King County (2006).

Study Intersection
Screenline
Sidewalk and On-Street Parking Study Area (1/2 mile)
Bicycle Study Area (1 mile)
At-Grade Route
Elevated Route
Retained-Cut Route
Tunnel Route
Proposed Station
Maintenance Facility and Access Track
New and/or Expanded Park-and-Ride Lot

Exhibit 3-3 **Transportation Analysis Study Area Segments D and E**
East Link Project

9 a.m.), daily regional travel is about 12 million total vehicle miles and over 300,000 total vehicle hours. In the PM peak period (3 to 6 p.m.), there are about 15 million total vehicle miles traveled (VMT) and over 400,000 total vehicle hours traveled (VHT) daily. Thirty-seven percent of all miles traveled and more than 40 percent of all hours of travel occur in the AM peak and PM peak periods, indicating that the most congested periods in this region are during the AM and PM commuting periods. Within the AM and PM peak periods, the highest hour of congestion is known as the peak hour. Depending on the type of analysis, the performance measures used are based on either the peak period or the peak hour. The major regional highways within the East Link study area are I-90, I-5, I-405, and SR 520, and these highways serve a substantial amount of the vehicle trips within the Central Puget Sound region. Single-occupant vehicles were the dominant mode of region-wide travel in year 2006, accounting for 44 percent of the trips made. A large number of trips also occurred in vehicles with two or more passengers (HOV). Together, single-occupant vehicle and HOV travel accounted for 84 percent of the person trips made in 2006. The remaining trips were by transit, walk, and other modes (PSRC, 2007). The primary transit service providers within the project vicinity are King County Metro (Metro), Sound Transit, and Community Transit.

3.3.2.2 Regional Highways

I-90 is a major east-west interstate highway facility that extends all the way from Boston, through Chicago, and ending in Seattle at I-5, the western portion of the East Link Project corridor. In Washington, this interstate highway connects various freight and state routes originating in Seattle, through Mercer Island and Bellevue, to the eastern side of the state and beyond. I-90 includes three general-purpose lanes in the westbound and eastbound directions. The section of I-90 that crosses Lake Washington, including the floating bridge, has both general-purpose lanes and a reversible center roadway that operates as a westbound directional expressway during the morning and as an eastbound expressway during the afternoon and evenings. The reversible center roadway is currently used for HOV, buses, and Mercer Island drivers. These reversible lanes are located between the Mount Baker Tunnel in Seattle and the Bellevue Way SE interchange. On the Lake Washington Floating Bridge, the average daily traffic volume is 140,000 to 150,000 vehicles. This consists of about 135,000 vehicles per day in the eastbound and westbound mainline lanes and about 15,000 daily vehicles in the reversible center roadway (WSDOT, 2007).

Vehicle Miles Traveled (VMT). The total number of miles traveled each day by drivers in the region.

Vehicle Hours Traveled (VHT). The total number of hours that people drive each day in the region.

Volume-to-Capacity (v/c) Ratio. The ratio of how many vehicles are on a road compared to that road's capacity. A v/c ratio between 0.90 and 1.0 indicates slow traffic conditions, a v/c ratio between 1.0 to 1.2 indicates stop-and-go conditions, and a v/c ratio over 1.2 indicates severe traffic conditions.

Mode Share. The percentage of people using different travel modes (methods) such as single-occupant vehicles, high-occupancy vehicles (HOV), and transit.

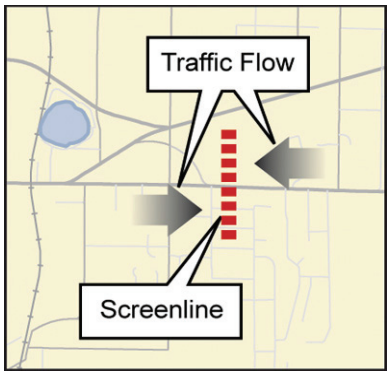
I-5 is the primary north-south West Coast route in the region, running between the U.S. borders with Canada and Mexico. In Washington, this interstate is a major transportation corridor in the Puget Sound region and serves as a main highway connection among the urban communities between Portland and Seattle. I-405 is a key interstate facility that parallels I-5 on the east side of Lake Washington and connects to I-5 in Tukwila and Lynnwood. I-405 has interchanges that connect with I-90 and additional state routes. In urban areas of the project corridor, specifically Downtown Bellevue, the facility consists of six lanes with HOV facilities. SR 520 provides an east-west connection across Lake Washington between Seattle and the Eastside communities, such as Kirkland, Bellevue, and Redmond, and connects large employment centers in Bellevue, Redmond, and Seattle.

3.3.2.3 Screenline Performance

A v/c ratio of 0.90 and above indicates slow to severe traffic conditions and the need for increased usage of HOV and transit. Screenline 2, which crosses I-90 and SR 520 (see Exhibit 3-1), and Screenline 4, which crosses I-405 (see Exhibit 3-2), cross areas of heavy congestion in both directions in the peak periods, as indicated by a v/c ratio above 0.95. This level of congestion is expected because these screenlines intersect three of the most heavily traveled roads in the region (SR 520, I-90, and I-405). Most of the other screenlines have a v/c ratio less than 0.70. Although Screenline 3 (Exhibit 3-2) is also located on I-90, its v/c ratio is considerably less than at Screenline 2 because of the additional roadway capacity (collector-distributor system) that is provided between Bellevue Way and I-405 to better manage the flow of traffic.

Within the study area, the current use of different transportation modes (mode share) varies depending on available transportation choices, congestion, and land use (e.g., commercial, residential, retail) surrounding the area. For instance, some of the higher

HOV and transit mode shares are found at locations leaving Seattle (Screenline 1 southbound and screenlines 2 and 3 eastbound). At Screenline 5 (Exhibit 3-3) westbound and Screenline 6 southbound (these routes include trips to Seattle across SR 520), a higher HOV mode share occurs compared to its counter eastbound direction into Redmond. Exhibit 3-4 shows the existing mode share during the PM peak hour at each screenline.



A **screenline** is an imaginary line across a section of freeways or arterials. These screenlines are used to provide a snapshot of how much volume is entering or exiting a particular area.

3.3.3 Environmental Impacts

This section describes the potential regional travel impacts associated with the No Build Alternative and with the proposed light rail project. The analysis shows that the East Link Project would reduce the rate of growth of regional VMT and VHT, lower v/c ratios at the screenlines, and produce a mode share with an increased emphasis on transit. The *Transportation Technical Report* provides a more detailed year 2020 and 2030 discussion of the regional VMT and VHT, v/c ratios, mode share.

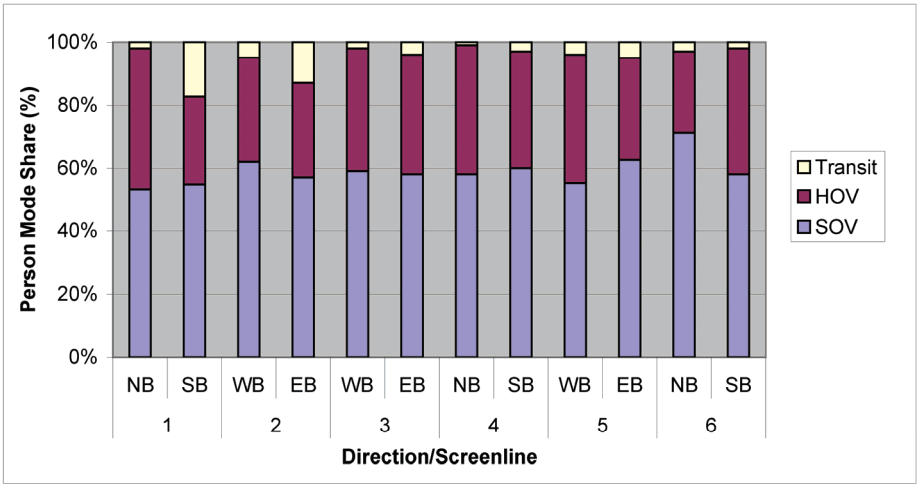
3.3.3.1 Traffic Forecasts

Future-year analysis was based on PSRC's current population and land uses forecasts for years 2020 and 2030 in the regional travel demand model. The programs and/or projects that were assumed in the analysis to occur in the future, both with and without the East Link Project, were selected because they are considered reasonably foreseeable. These projects include a mixture of state highway and local roadway projects as well as Sound Transit and Metro Transit enhancements. Attachment 1 in Appendix A of the *Transportation Technical Report* gives a complete list of future projects that were assumed to occur in the future.

According to PSRC's regional trip forecasting and regional population and employment forecasts, travel on major highway facilities will continue to increase through 2030. Future roadway projects will improve the HOV system, allowing more carpool trips, but will not include substantial improvements in high-capacity modes of travel. Roadways that lead into and out of the urban centers of Seattle and Downtown Bellevue will be at capacity in the near future. Exhibit 3-5 depicts PSRC's 2030 PM forecast without East Link for roadways with a v/c ratio of greater than 0.90, meaning slow to severe traffic conditions. This exhibit shows that, in 2030, the afternoon commute across the lake on SR 520 and I-90 and on I-5 and I-405 will range from slow, to stop-and-go, to severe traffic conditions.

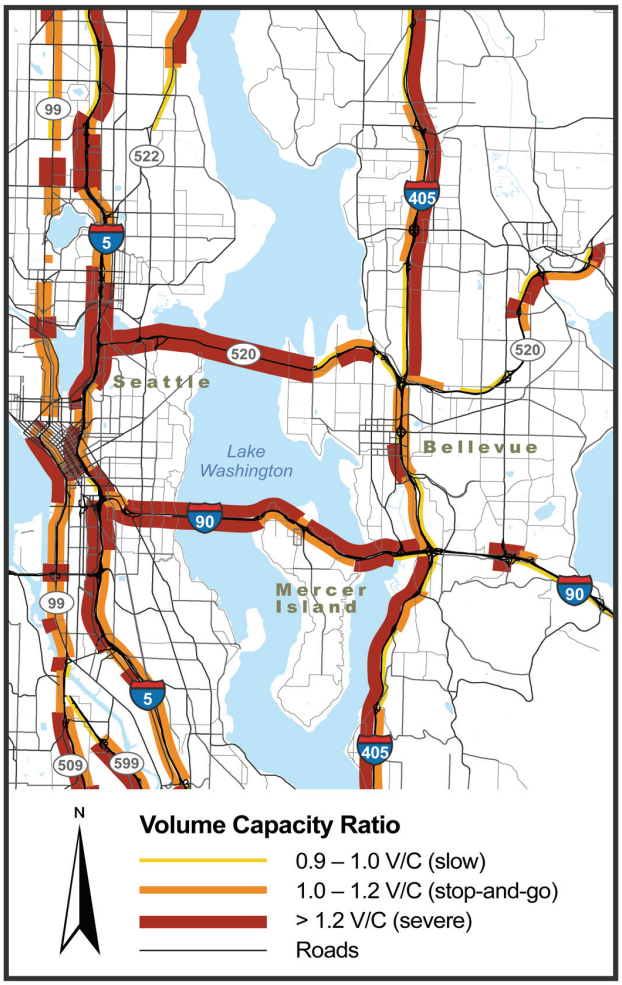
This congestion would substantially constrain the ability to travel into key employment and population areas of the region and highlights the importance of increased utilization of transit.

The East Link Project would link Seattle, the region's main urban downtown area, with the Eastside communities, connecting the region's dense commercial and residential centers as well as major employers across Lake Washington. Light rail would support increased density in Bellevue and Redmond, as well as Seattle, consistent with regional land use plans and Washington Growth Management Act goals to preserve natural resources. Higher density provides economic growth and opportunities for more effective infrastructure development with HCT. Travel between the key urban centers (Seattle and Downtown Bellevue) would improve with light rail service because it has greater capacity and is a more reliable mode of travel than single-occupant vehicles.



SOV = single-occupant vehicle

EXHIBIT 3-4
Existing PM Peak-Hour Screenline Mode Share



Source: PSRC, 2007.

EXHIBIT 3-5
PSRC 2030 PM Highway Volume-to-Capacity Ratios Without East Link

Year 2020 and 2030 annual vehicle growth rates for the PM peak hour are listed in Table 3-1. These are based on PSRC travel demand model forecasts. By year 2030, the annual vehicle growth rates within the study area will range between 1 and 2 percent per year. With East Link, a slight reduction in auto usage is forecast, as about 10,000 people shift their mode of transportation and use light rail by year 2030.

3.3.3.2 Vehicle Miles Traveled and Vehicle Hours Traveled

VMT and VHT are regional performance measures used to assess the impacts that the project alternatives would have on travel. Changes in VMT mean people are traveling either less or more distance (miles) to get to their destinations. Changes in VHT generally reflect the change in traffic congestion or the amount of time required to travel.

TABLE 3-1
Future PM Peak-Hour Traffic Forecasts for No Build Alternative

Segment	Boundary	Annual Vehicle Growth Rate (%)	
		Year 2020	Year 2030
Segment A	Seattle to South Bellevue	2.0	2.0
Segment B	South Bellevue to Central Business District	1.7	1.3
Segment C	Central Business District	2.7	1.8
Segment D	Central Business District to NE 40th (Redmond)	1.7	1.3
Segment E	NE 40th (Redmond) to Downtown Redmond	2.7	2.0

The PSRC and Sound Transit travel demand models were used to predict traffic conditions with the East Link Project in operation. The results indicate that the region-wide VMT and VHT would decrease between 0.2 and 0.6 percent, with the majority of the reductions occurring in the AM and PM peak periods. This is a reduction of slightly less than 200,000 VMT and 15,000 hours of travel each day in year 2030. Total regional VMT and VHT for year 2030 with and without East Link are shown in Table 3-2.

TABLE 3-2
2030 Regional Travel Impact Comparison Summary

	No Build	East Link	Percent Change
Total VMT	93,666,900	93,470,700	-0.21%
Total VHT	2,486,400	2,471,800	-0.60%

Source: PSRC and Sound Transit demand models.

3.3.3.3 Screenline Performance

Generally, with the project, regional roadway v/c ratios would remain the same or improve slightly compared to the No Build Alternative. Removing vehicle use from the center roadway to accommodate light rail would not affect other regional highways, such as SR 520, I-5, and I-405. Mode shares generally would become less dominated by single-occupant vehicles as the transit share increases. The mode share of people using transit would increase by up to 33 percent across Lake Washington during the PM peak period. This mode shift provides increased person mobility in a corridor with limited opportunities for road expansion.

The projected v/c ratios and mode shares are summarized in this section for each screenline. Year 2030 v/c ratios at each screenline are shown in Table 3-3. Exhibit 3-6 shows the PM peak-hour mode share at each screenline for year 2030.

Screenline 1 – City of Seattle

For the No Build Alternative, the mode share among single-occupant vehicles, HOV, and transit usage in Seattle (across Screenline 1) is expected to change little in the future. With East Link, transit usage would more than double, and the Screenline 1 v/c ratios would improve. This increase in transit share is due to modifications in transit service and the addition of light rail service across this screenline.

Screenline 2 – Lake Washington (Includes I-90 and SR 520)

In the future, the v/c ratios crossing Lake Washington (across Screenline 2) would remain similar to today's highly congested conditions with or without light rail. Because the I-90 reversible center roadway would be removed by the East Link Project, the v/c ratio in the peak directions (into Seattle in the morning and out of Seattle in the afternoon) is expected to become slightly higher than with the No Build Alternative, but overall conditions on I-90 would improve with the project. Additionally, increased transit use with the project would increase person throughput and provide increased capacity for future growth (Section 3.5.3.3). In the westbound direction, there would be almost a 10 percent reduction in v/c ratio as people shift their mode and use light rail in lieu of other travel options across the lake. Forecasted travel on these highways with the East Link Project is expected to remain similar to the No Build Alternative, indicating no diversion to other facilities.

For travel across Screenline 2 in 2020 and 2030, the percentage of single-occupant vehicles would slightly

TABLE 3-3
2030 PM Peak-Hour Volume-to-Capacity Ratios at Screenlines

Screenline	Direction	2030	
		No Build[a]	East Link
1	NB	0.61	0.60
	SB	0.87	0.82
2	WB	0.95	0.86
	EB	0.90	0.94
3	WB	0.58	0.49
	EB	0.70	0.59
4	NB	0.94	0.88
	SB	1.03	0.97
5	WB	0.76	0.70
	EB	0.82	0.80
6	NB	0.69	0.68
	SB	0.53	0.53

Source: PSRC travel demand model.

[a] No-build condition with Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project.

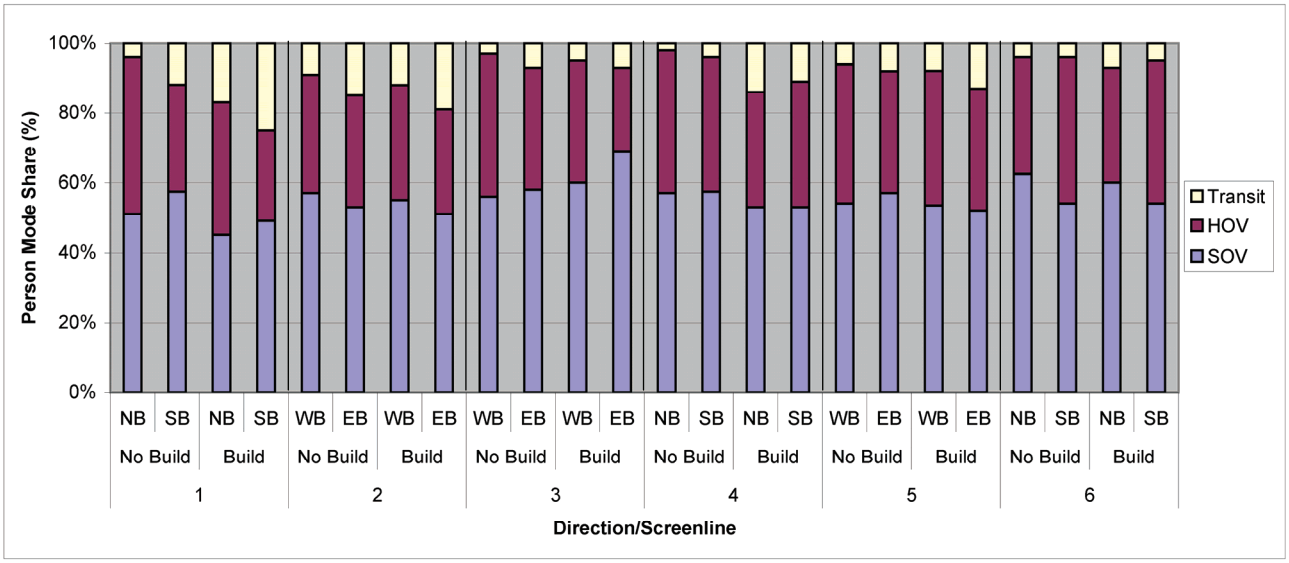


EXHIBIT 3-6
2030 PM Peak-Hour Mode Share at Screenlines

decrease with the No Build Alternative as congestion worsens and people choose alternative modes, such as HOV and transit. With light rail, both single-occupant vehicle and HOV usage would decrease as people choose to use transit. Providing light rail would increase transit usage in 2030 by up to 33 percent, which is a substantial shift to transit. There is also an expectation in 2030 for HOVs to shift slightly from I-90 to SR 520. This would occur because SR 520 is expected to have HOV lane improvements and Mercer Island drivers would be eligible to use the I-90 HOV lanes as long as the lanes meet performance standards or until such times as they become tolled lanes based on the WSDOT and Mercer Island Access Plan.

Section 3.5 discusses I-90 traffic operations and congestion patterns in detail, including vehicle and person throughput, vehicle travel time, level-of-service, and safety.

Screenline 3 – Interstate 90 (at Mercer Slough)
With the No Build Alternative, congestion in the future would remain similar to existing conditions. With the East Link Project, v/c ratios across Screenline 3 would decrease slightly because of a shift in travel patterns during the PM peak hour, indicating that congestion would improve slightly. Mode shift patterns indicate that, with the future No Build Alternative, single-occupant vehicle usage would decrease and HOV and transit usage would increase. With light rail, the HOV share would decrease slightly due to reasons explained for Screenline 2. East Link would not serve I-90 east of Bellevue Way.

Screenline 4 – South Bellevue
In 2020 and 2030 with the No Build Alternative, v/c ratios at Screenline 4 are expected to be near or at 1.0. This indicates that future travel into and out of the key eastside urban center of Downtown Bellevue would be constrained. With the East Link Project, congestion would improve slightly, but v/c ratios would still be near capacity. The percentage of people using single-occupant vehicles, HOV, and transit at this location is expected to remain fairly similar between existing conditions and the No Build Alternative. With light rail, the transit mode share would increase substantially as people adjust their travel patterns and choose to use light rail into and out of Bellevue. Overall, by 2030 the transit share of total trips is expected to reach close to 15 percent with light rail. This is an increase of over 300 percent over the 2030 No Build Alternative. This increase in transit share is due to the addition of light rail service across this screenline. For a discussion of cross-lake mode share, refer to the Screenline 2 (Lake Washington), discussed previously.

Screenlines 5 and 6 – Bellevue-Redmond (Bel-Red) and Redmond (Grasslawn)
Across screenlines 5 and 6, future v/c ratios are expected to increase and further constrain vehicle travel with the No Build Alternative. With East Link, v/c ratios would either remain similar or slightly decrease as people use light rail. Mode share percentages for the No Build Alternative would remain similar to existing conditions, with approximately 55 to 65 percent single-occupant vehicle users and 30 to 40 percent HOV users. With East Link, transit by 2030 is expected to increase by 25 to 75 percent (up to 14 percent mode share) in the eastbound direction and by about 33 percent (up to 8 percent mode share) in the westbound direction.

3.3.4 Potential Mitigation

No mitigation would be required for regional travel impacts because, overall, the highways and arterials would not experience adverse changes in operations. The v/c ratios and mode share would remain similar or would improve with the East Link Project. For specific mitigation along I-90, refer to Section 3.5.

3.4 Transit

3.4.1 Methodology

The six screenlines established for evaluating the East Link Project, along with the areas served by the project, were used to measure the transit LOS performance (buses and light rail) along key corridors within the study area (see Exhibits 3-1 through 3-3 for the screenline locations). The project alternatives include both light rail and bus service on the Eastside, whereas the No Build Alternative includes only bus service on the Eastside. The bus routes that were selected for evaluation are those most likely to have their ridership influenced by the project.

The impacts on existing and future regional and local transit services were evaluated based on the following categories:

- Coverage and circulation
- Transit LOS performance
  - Service frequency LOS
  - Hours of service LOS
  - Passenger load LOS
  - Reliability of service LOS
- Transit travel time
- Transit transfers
- Light rail ridership

The coverage area is defined as the area(s) for which transit provides service. Circulation is defined as the

Transit Level of Service. Transit conditions, such as delays at intersections, that influence how passengers perceive the quality of a transit trip.

Transit Coverage. The areas for which transit routes provide service.

Service Frequency. How often the bus arrives at scheduled stops.

Transit Headway. The length of time between transit vehicles arriving at a location.

Hours of Service. How many hours the transit route operates in a day.

Passenger Load. How full a transit vehicle is compared to its capacity.

Transit Reliability. How often the transit vehicle arrives on time at its scheduled stops.

Alighting. Transit passengers exiting the transit vehicle.

route(s) on which transit operates. Transit LOS performance was analyzed for the PM peak hour (5 to 6 p.m.) to describe transit performance during the period when traffic congestion and transit ridership are highest. For transit LOS performance, LOS A indicates more frequent service, more hours served during the day, high reliability, and minimal passenger crowding in a transit vehicle. LOS F indicates less frequent service, fewer hours served during the day, low reliability, and passenger crowding in a transit vehicle. Individual components of transit LOS performance are defined as follows:

- Service frequency LOS is the number of times within the PM peak hour that a bus or light rail train stops at a specific location. Generally, the less time riders have to wait between bus arrivals, the better the service frequency LOS. Bus routes that have headways less than 10 minutes are considered LOS A, whereas more than 60-minute headways are LOS F.
- The hours of service LOS measures the total average number of transit operating hours provided within a 24-hour (daily) period. Hours of service LOS is intended to measure the availability of transit service to riders and potential users. The longer transit service is provided throughout the day, the better the LOS.
- The passenger load LOS, which is measured at screenlines, is intended to measure passenger comfort and the ability of a rider to find a seat during the on-board portion of the trip during the PM peak hour. Passenger load LOS also measures crowding in the transit vehicle. A passenger load LOS at or worse than LOS D may reflect overcrowding, and the transit service provider may need to increase service frequency. In addition, a large number of passengers can cause the bus to wait longer at stops (dwell time) as a result of crowded passenger boarding and alighting. The longer dwell time can negatively affect travel time and service reliability.
- Service reliability LOS was analyzed at major transit hubs along the East Link route. The reliability LOS measures the degree to which a transit vehicle meets or misses its scheduled headway at its arrival station. The routes evaluated at each major transit hub were chosen using the same criteria as the routes used in passenger load LOS evaluation. Two methods were used to determine transit reliability. For transit routes with scheduled headways greater than 10 minutes, on-time reliability was analyzed in terms of on-time performance, defined as being 0 to 5 minutes late. For transit routes operating at scheduled headways of 10 minutes or less, headway adherence was used to determine reliability. Headway adherence reliability was calculated comparing actual headways to scheduled headways of transit routes at major transit centers and park-and-ride lots within the study area. Future on-time performance and headway adherence for buses was not predicted, so future bus reliability LOS was based on existing conditions. It was assumed that both Metro and Sound Transit would adjust their bus services according to the demand and congestion levels to maintain existing reliability, although unforeseen conditions may limit what is implemented.

From a bus rider's perspective, all individual bus routes that serve two areas can sometimes be perceived as a single service between these two areas. To reflect these connections, pairs of specific areas served by East Link were evaluated. These areas are Northgate, University District, Downtown Seattle, Mercer Island, South Bellevue, Downtown Bellevue, Bel-Red, Overlake, and Downtown Redmond. Transit performance of these area connections was evaluated for service frequency LOS and hours of service LOS.

The *Transportation Technical Report*, located in Appendix H1 of this EIS, provides a detailed discussion of the routes within the study area as well as the transit LOS performance analysis methodology.

3.4.2 Affected Environment

Within the study area, transit services, including regional express buses and local buses, are provided by Metro, Sound Transit, and Community Transit. The frequency and number of bus routes in service increases during the peak periods (6 to 9 a.m. and 3 to

6 p.m.), most noticeably in the peak direction of travel (into employment areas in the AM, exiting employment areas in the PM). Sound Transit and Metro transit services crossing Lake Washington and connecting Downtown Seattle to Downtown Bellevue, Overlake, and Downtown Redmond currently serve over 13,000 transit riders (King County Metro, 2008).

Major transit activities within the study area occur at transit centers and park-and-ride lots. A transit center is a central transportation hub where transportation modes and routes meet, providing transit users a central location to connect with multiple transit services and providers. There are four transit centers within the study area: International District/ Chinatown Station, Bellevue Transit Center, Overlake Transit Center, and Redmond Transit Center.

A park-and-ride lot is a parking facility in which people can park their vehicles and transfer to other modes (e.g., bus, rail, carpool, nonmotorized) to travel to destinations, mainly, urban centers (e.g., Downtown Seattle, Bellevue). There are park-and-ride lots in segments A, B, D, and E. Metro and Sound Transit provide service to transit centers and park-and-ride lots so riders can make transfers to reach their destinations. Within the study area, Community Transit provides service only to the Overlake Transit Center. Table 3-4 lists the existing transit facilities in the study area.

Sound Transit's Regional Express buses provide regional transit service to commuters within the study area as well as in King, Pierce, and Snohomish counties. Average headways of buses within the study area are 30 minutes. A few Sound Transit routes (such as ST 550, between Bellevue and Seattle) offer more frequent service, with headways around 10 minutes. In Downtown Seattle, the study area also has other Sound Transit services, including the Sounder Commuter rail and Central Link light rail. The International District/Chinatown Station, a future Central Link station, also provides a connection to Sounder and Amtrak services at the nearby King Street Station. Sounder operates during peak periods with train service between Seattle and Tacoma and between Seattle and Everett. Central Link light rail, which is scheduled to open in 2009, will offer light rail service between Downtown Seattle and Sea-Tac Airport. Headways for the light rail line are anticipated to be 6 minutes in each direction during the peak periods.

Metro provides regional and local service throughout King County. Within the study area, Metro operates most of the local fixed-route and express bus service in

TABLE 3-4

Existing Transit Facilities in Study Area

Transit Facility	Type of Facility	Served by Routes[a]	Park-and-Ride Stalls[a]
International District/Chinatown Station	Station	KCM 41, 71, 72, 73, 74X, 101, 106, 150, 174, 194, 212, 217, 225, 229, 255, 256, 301 ST 550	N/A
Bellevue Transit Center	Transit Center Station	KCM 220, 222, 230, 232, 233, 234, 237, 240, 243, 249, 253, 261, 271, 280, 342, 630, 885, 886, 921 ST 532, 535, 550, 555, 556, 560, 564, 565	N/A
South Bellevue Park-and-Ride Lot	Park-and-Ride Facility	KCM 222, 240, 942 ST 550, 560	519
Wilburton Park-and-Ride Lot	Park-and-Ride Facility	KCM 167, 243, 280, 342, 885, 921, 952 ST 560	186
Mercer Island Park-and-Ride Lot	Park-and-Ride Facility	KCM 201, 202, 203, 204, 205, 213, 216, 942 ST 550, 554	447
Bear Creek Park-and-Ride	Park-and-Ride Facility	KCM 216, 233, 251, 253, 266, 268, 269, 922 ST 540, 545	283
Overlake Transit Center	Transit Center Station, Park-and-Ride Facility	KCM 222, 225, 229, 230, 232, 233, 245, 247, 256, 268, 269, 644 CT 441 ST 545, 564, 565	170
Redmond Transit Center	Transit Center Station, Park-and-Ride Facility	KCM 220, 249, 250, 251, 253, 254, 265, 266, 291, 922, 929 ST 540, 545	377

[a] Transit routes and park-and-ride stalls are as of spring 2007 except for Mercer Island Park-and-Ride Lot, which was inventoried in February 2008 (King County Metro, 2008).

ST = Sound Transit, KCM = King County Metro, CT = Community Transit.

addition to other transit services. During peak periods, the average headway for Metro buses is about 30 minutes. Community Transit provides service between Snohomish and King Counties and has one bus route within the study area.

3.4.3 Environmental Impacts

The analysis of the East Link Project's impacts on transit indicates that the East Link Project would improve transit operations and LOS within the regional transit system. Light rail would provide regional travel benefits by extending transit access and mobility into the growing urban areas east of Lake Washington. Enhancing transit service connections with light rail between major employment centers in the Puget Sound region—Seattle, Bellevue and Redmond—would improve overall transit usage by providing these communities with more reliable transit service.

By 2030 with this project, between 42,500 and 48,000 riders would use East Link, and close to 10,000 more people would use transit than if bus service only is provided to the Eastside communities. These people would not use transit if this project is not built. Light rail would provide service between Seattle and Downtown Bellevue in under 20 minutes and between Seattle to Redmond within 35 minutes. Light rail service would close gaps in the existing transit network. Bus routes that share connections with the light rail system would likely experience higher ridership, while light rail would be able to carry an increased number of passengers to connecting bus routes. As further described in this section, light rail would improve transit service by providing increased service frequency, faster travel times, and longer hours of service throughout the day, in addition to serving both the peak and reverse-peak directions.

3.4.3.1 Coverage and Circulation

Sound Transit and Metro service planners developed a bus service plan for the 2020 and 2030 years for both the No Build and the East Link alternatives. Although the service plans would not be finalized until close to system operation, the draft plans provide a snapshot of how bus service would look with and without the project. Some of these plans are being implemented now through Transit Now, an initiative to expand Metro Transit service approved by King County voters in the general election on November 2006.

The future bus service frequency and coverage area would increase both with and without the East Link Project. With the project, bus service within the study area would change to feed the light rail system: some routes would be modified to end at the light rail stations where bus layover areas would be provided, and other routes would continue from the stations. Bus routes that serve the same markets as light rail and that are far less reliable would be eliminated. Most changes would reflect travel forecast patterns and regional growth. The following subsections briefly describe transit coverage and circulation changes associated with the project alternatives in each of the project segments.

Segment A

Along I-90, between Seattle and the Bellevue Way interchange, light rail would use the reversible center roadway. Peak direction buses would be rerouted from the reversible center roadway to the HOV lanes in the outer roadways constructed as part of the I-90 Two Way Transit and HOV Operations Project. Bus access to and from Mercer Island and the Rainier Avenue flyer stop would be maintained in all directions with a combination of the existing ramps provided on the outer roadways and the future HOV lanes and ramps built as part of the I-90 Two Way Transit and HOV Operations Project.

In Seattle, if the D2 Roadway (the ramp connection between I-90 at Rainier Avenue S and Airport Way S and the 5th Avenue S intersection) is not designated as joint use for buses and light rail, Downtown Seattle bus routes that use the D2 Roadway would more than likely be rerouted to 4th Avenue S via SR 519. Section 3.5.3.3 identifies the travel times with and without joint use operations in the D2 Roadway. Also in Seattle, as evaluated in the North Link Supplemental Final EIS (Sound Transit, 2006), buses may not operate in the Downtown Seattle Transit Tunnel once light rail extends to Northgate, which is an assumption for the East Link No Build Alternative and project alternatives.

Direct transit service between Mercer Island and the University District would not occur in the No Build Alternative because the bus route that connects these areas would be deleted per the future bus service plan. With East Link, the direct connection between these areas would be reestablished via light rail. Additional connections would also be created with light rail between Mercer Island and Northgate, Bel-Red, Overlake, and Downtown Redmond.

With the project, bus stops would be relocated on Mercer Island to serve Sound Transit Regional Express Route 554 (ST 554) at the Mercer Island Station. Although ST 554 may be planned to continue into Seattle, the project analysis assumed that ST 554 would terminate at Mercer Island. With the project, ST 550 also would be eliminated.

Segment B
With the project, ST 550 would be eliminated. For the BNSF Alternative (B7) at the 118th Station, some bus routes would be rerouted to begin and end at this station, using 118th Avenue SE. Without the project, these routes would begin and end at the Wilburton Park-and-Ride Lot. With Alternative B7, bus service would change to connect Mercer Island with the South Bellevue Park-and-Ride Lot and Downtown Bellevue. Other bus service coverage and circulation in Segment B would remain similar with and without the project.

As part of East Link, bus service would not be impacted by the closure of the eastbound HOV direct-access off-ramp or westbound HOV direct access on-ramp at Bellevue Way SE because buses that would use these ramps would be eliminated, except in Alternative B7 which includes bus service between Mercer Island and Bellevue which would be rerouted to use the general-purpose ramps at the Bellevue Way SE interchange.

With the No Build Alternative, direct connections to South Bellevue would not change. However, with light rail, South Bellevue would be directly connected to Bel-Red, Overlake, Downtown Redmond, Northgate, and the University District.

Segment C
With the East Link Project, ST 550 and 556 would be eliminated. Other bus routes, such as ST 555 and 564/565, would be truncated to end at the Bellevue Transit Center to eliminate the redundancy with light rail service. A Metro RapidRide route would be added to connect Downtown Bellevue, Overlake, and Redmond. With light rail, more direct connections would be established between Downtown Bellevue and the areas served by East Link.

Under the Couplet Alternative (C4A), transit that uses 108th Ave NE and 110th Ave NE would switch to parallel streets based on the revised direction of the one-way vehicle couplet in Downtown Bellevue. All other modifications to the future bus service that serve Segment C area would be similar with and without the project.

Segment D
To serve the project's proposed 124th Station, some bus routes would have circulation patterns that differ from the No Build Alternative. These routes would use 124th Avenue NE instead of 116th Avenue NE between NE Bel-Red Road and NE 20th Street. Some existing services between the Bellevue Transit Center and the Overlake Transit Center would be eliminated if light rail extends to the Overlake Transit Center. ST 545 would be eliminated if light rail reaches Downtown Redmond. If light rail service terminates at Overlake Village Station, some bus routes would be changed to serve that station. All other modifications to the future bus service that serve Segment D area would be similar with and without the project.

Without the project, there would be no direct connection between Bel-Red and Downtown Redmond because routes serving these areas would be deleted or modified per the bus service plan. With light rail, these areas would be directly connected. In addition, with light rail, Bel-Red and Overlake would be directly connected to South Bellevue, Mercer Island, the University District, and Northgate.

Segment E
With the Segment E project alternatives, there would be changes in transit service with the addition of the SE Redmond Park-and-Ride Lot. Some bus routes would be revised to serve the SE Redmond Station. These buses would use NE Redmond Way and NE 70th Street to access the SE Redmond Station. Some bus routes would continue using the Bear Creek Park-and-Ride Lot as they do in the No Build Alternative. All other modifications to the future bus service that serve the Segment E area would be similar with and without the project.

As previously mentioned, with the No Build Alternative, there would be no direct connection between Downtown Redmond and Bel-Red. With light rail, new direct transit connections would be established between Downtown Redmond and South Bellevue, Mercer Island, the University District, and Northgate.

3.4.3.2 Transit Level of Service and Operations
Future transit hours of service and frequency would change with or without East Link to meet future transit needs. With the project, Metro and Sound Transit routes would be modified to develop an integrated transit network with transit hubs at many East Link stations. Some routes would be eliminated where transit service duplicates light rail service. Other routes would be modified to end at light rail stations, while others would continue from the stations. Community Transit service in the area was assumed to remain unaffected.

The following subsections show results for each of the measures used to evaluate transit LOS performance**.** Table 3-5 provides LOS values and associated grades for each of the transit LOS measures. Appendices B and C in the *Transportation Technical Report* provide more information on the LOS values and descriptions.

Service Frequency Level of Service

With the No Build Alternative in both years 2020 and 2030, some areas would be connected by frequent service, however, many other areas would not have direct transit connections. Service frequency between Overlake and Downtown Seattle, and between Downtown Redmond and Downtown Seattle, would improve from the existing LOS C to LOS A. This service frequency improvement is due to planned more frequent headways of Route ST 545 in the reverse-peak direction. Between Downtown Seattle and Downtown Bellevue, the service frequency would remain at a LOS B or better. The University District, Mercer Island, Bel-Red, Overlake and Downtown Redmond areas would not have direct bus service among them. Planned modification of some routes (elimination, truncation, rerouting) would also decrease the service frequency LOS with some of the connections to and from the Bel-Red area. Service frequency would improve from LOS D to LOS C between the Downtown Bellevue and University District areas because headways would improve from 25 minutes to 15 minutes. Even though many of the bus routes are planning more frequent headways, buses would likely be unable to meet their scheduled headways in the future. The chart on the left in Exhibit 3-7 shows the service frequency LOS for the No Build Alternative during the PM peak period in years 2020 and 2030.

In both years 2020 and 2030, East Link would connect all of the areas with more frequent service. East Link trains would have peak headways between 9 and 10 minutes (LOS A and B, respectively). The Eastside areas would be directly connected with light rail service, with frequent direct connections with the Bel-Red, Overlake, and Downtown Redmond areas. The chart on the right in Exhibit 3-7 shows the service frequency LOS with the project during the PM peak period.

TABLE 3-5
Transit LOS Definitions

LOS	Service Frequency (minutes between arrivals)	Hours of Service (in a day)	Passenger Load		Reliability (% on-time[a])
			Buses (passengers per seat)	Light Rail (square feet per standing passenger)	
A	<10	19-24	0.00-0.50	>10.8[b]	95.0% - 100%
B	10-14	17-18	0.51-0.75	8.2-10.8	90.0% - 94.9%
C	15-20	14-16	0.76-1.00	5.5-8.1	85.0% - 89.9%
D	21-30	12-13	1.01-1.25	3.9-5.4	80.0% - 84.9%
E	31-60	4-11	1.26-1.50	2.2-3.8	75.0% - 79.9%
F	>60	0-3	>1.5	<2.2	<75.0%

Source: Transit Capacity and Quality Service Manual, Transportation Research Board (TRB), 2003.

[a] "On time" is 0 to 5 minutes late; early departures are not considered on time.

[b] This includes the potential for some cars to have no standing passengers.

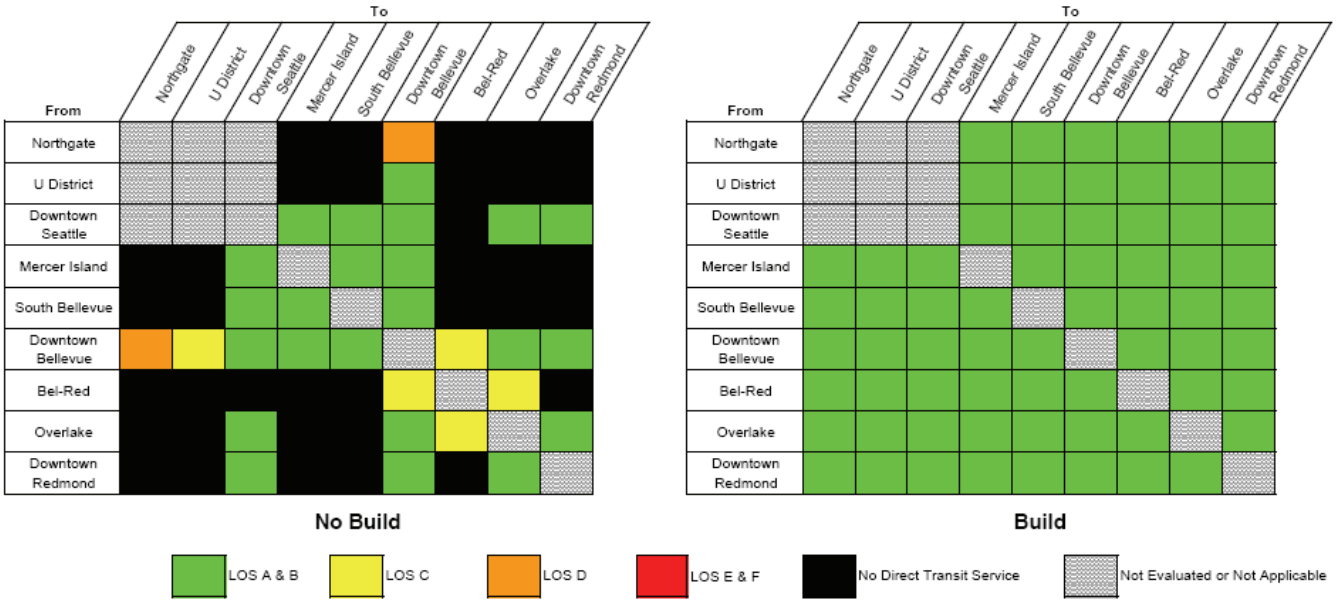


EXHIBIT 3-7
2020 and 2030 PM Peak-Period Service Frequency LOS

Hours of Service Level of Service

With the No Build Alternative, in both years 2020 and 2030, the hours of service for direct bus service between most areas would be similar to the existing conditions. Service between Downtown Seattle and Downtown Redmond would continue to operate over 19 hours per day (LOS A). All connections with the Bel-Red area would operate at LOS C or worse. University District, Mercer Island, Bel-Red, Overlake, and Downtown Redmond would continue to not have direct bus service between them. The connection between Downtown Bellevue and Northgate would continue to operate at hours of service LOS E (11 hours or less) or worse. The chart on the left in Exhibit 3-8 shows the hours of service LOS without the project between areas connected by the bus routes evaluated in the East Link transit analysis.

With the light rail, in both years 2020 and 2030, there would be substantial improvements in the hours of service LOS between most areas because East Link would introduce new direct connections among these areas. East Link would operate for 20 hours each day, which would be a longer operating duration than a majority of bus routes. The Eastside areas would be directly connected with light rail service, with most noticeable hours of service improvements in the connections with Bel-Red, Overlake, and Downtown Redmond. Downtown Seattle to Downtown Bellevue, and Downtown Seattle to Downtown Redmond, would continue to have hours of service LOS A. Northgate and the University District, with light rail, would have direct connections with Mercer Island and all the Eastside areas (South Bellevue, Downtown Bellevue, Bel-Red, Overlake, and Downtown Redmond). In addition, the hours of service would be LOS A between all areas directly connected by light rail. The chart on the right in Exhibit 3-8 shows the hours of service LOS with the project between areas connected by transit.

Passenger Load Level of Service

The future passenger load LOS was calculated differently for buses and light rail per the *Transit Capacity and Quality of Service Manual* (Transit Cooperative Research Program, 2003). Because buses are intended to provide mostly seated transit service, the number of available seats was compared to the forecast number of passengers. A ratio of more than one passenger per seat would mean that some passengers must stand. Light rail, however, is intended to provide both seated and standing service. When the number of passengers exceeds the number of available seats, some passengers must stand. Passenger load for light rail was calculated as the square footage available per standing passenger. As the available square footage decreases, the LOS worsens.

Compared to existing conditions, the No Build Alternative in 2020 and 2030 would experience an increase in bus riders that degrades the existing LOS A passenger load to LOS A through C conditions. Overall, the passenger load LOS with the No Build Alternative is expected to operate at LOS C or better. A greater number of passengers per bus would occur at Screenlines 1 (Seattle) and 2 (Lake Washington). All of the other screenlines would have a decrease in the

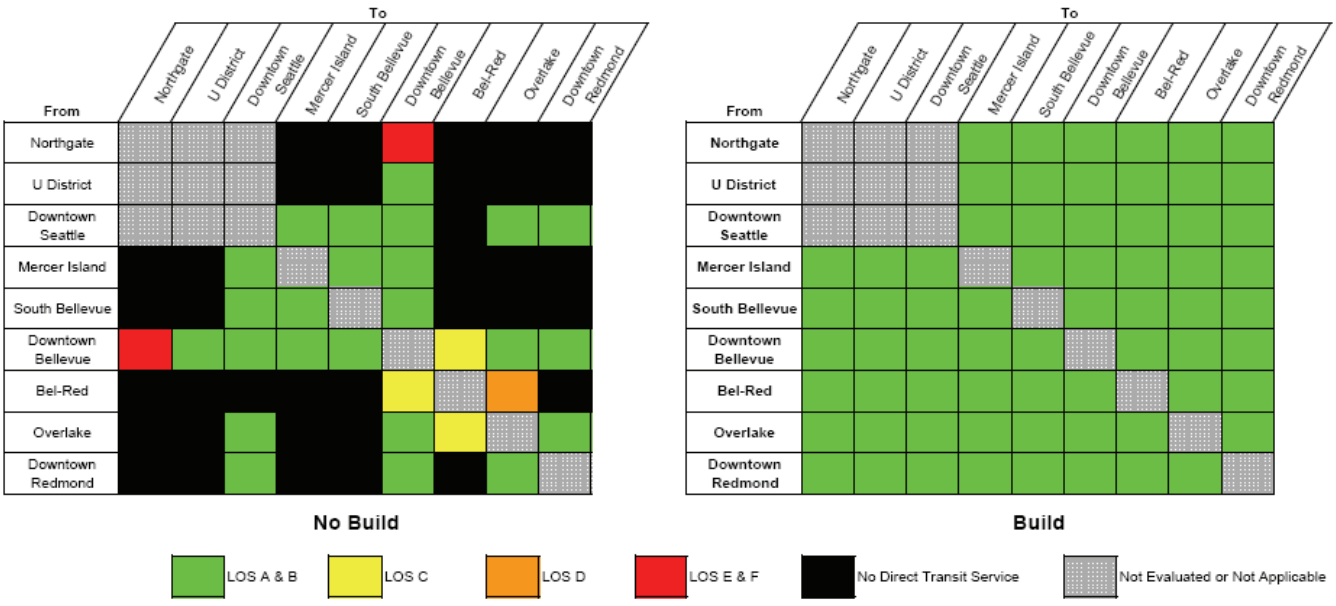


EXHIBIT 3-8
2020 and 2030 Hours of Service LOS

number of people per bus in at least one direction due to more frequent bus service in the future that would distribute riders over a greater number of buses.

With East Link, more people would choose to travel on light rail because of its frequency and reliability; therefore, the number of passengers per bus would decrease and the bus passenger load LOS would be LOS A in both 2020 and 2030 because of light rail. The improvement to LOS A for buses with the project is notable at Screenline 2, where the bus passenger load without the project would operate at LOS C. While the bus passenger load LOS would improve with light rail, the number of transit (bus and light rail combined) riders would increase by over 25 percent across the lake compared to the No Build Alternative.

For light rail, the 2020 passenger load LOS is expected to operate at LOS A. Transit use would continue to increase in 2030 with light rail as more people choose to travel on light rail because of its frequency and connections. By 2030, light rail passenger load operations are expected to be LOS A and B.

In the future, if the light rail passenger load LOS becomes unacceptable, the light rail operating plan could be adjusted to improve the passenger load LOS and passenger comfort. Adjustments to light rail operations could be made more easily than adjusting bus service operations.

In Segment A, if the D2 Roadway does not operate as joint use for bus and light rail, the buses that use the D2 Roadway would be rerouted to other roadways such as SR 519 to access Downtown Seattle. This rerouting would increase bus travel time and possibly decrease ridership, potentially affecting bus passenger load.

Screenline passenger load LOS levels are presented in Table 3-6.

Transit Reliability Level of Service

Bus Reliability. In 2020 and 2030 both with and without East Link, the majority of bus routes at each of the five stations (International District/Chinatown, Mercer Island, Bellevue Transit Center, Overlake Transit Center, and Redmond Transit Center) are expected to operate with a reliability of LOS E or F. It was assumed that in the future both Metro and Sound Transit would adjust their bus services according to the demand and congestion levels to maintain existing reliability, although unforeseen conditions may limit what is implemented.

None of the 23 transit routes at either the International District/Chinatown or Mercer Island stations are expected to have a reliability better than LOS E. Only 3 out of the 18 evaluated routes at the Bellevue Transit Center would operate better than LOS E. Sound Transit Route 550, a key transit route in the study area that follows a route similar to that of the light rail alternatives between Seattle and Downtown Bellevue, would operate at LOS F in both directions at the Mercer Island Park-and-Ride Lot, which indicates that

TABLE 3-6
PM Peak-Hour Passenger Load Level of Service at Screenlines

Screenline	Direction	Existing	2020 No Build	2020 Build		2030 No Build	2030 Build	
		Bus	Bus	Bus	Light Rail	Bus	Bus	Light Rail
1	SB	A	B	A	A	B	A	B
	NB	A	A	A	A	B	A	A
2	EB	A	B	A	A	C	A	B
	WB	A	B	A	A	C	A	A
3	EB	A	A	A	N/A	B	A	N/A
	WB	A	B	A	N/A	C	A	N/A
4	NB	A	A	A	A	A	A	A
	SB	A	A	A	A	B	A	A
5	EB	A	A	A	A	B	A	A
	WB	A	A	A	A	A	A	A
6	NB	A	A	A	A	A	A	A
	SB	A	A	A	A	A	A	A

N/A = Not applicable because light rail would not cross this screenline.

this route is almost always off schedule and has about a 50 percent reliability of arriving on time. This continuation of poor reliability between Downtown Seattle and Downtown Bellevue is expected because bus speeds between these two major urban centers are predicted to decrease by up to 30 percent by year 2030, even with improvements to I-90. This would occur because roadways connecting I-90 to these urban centers, especially to and from Bellevue, are not planned for improvements; therefore, congestion would worsen. Only at the Overlake Transit Center and Redmond Transit Center stations would some routes operate with a reliability better than LOS D. The bus reliability LOS for existing and future conditions is presented in Table 3-7.

In Segment A, if the D2 Roadway does not operate as joint use (bus and light rail), rerouting buses to other roadways to access Downtown Seattle would add up to 7 minutes in the westbound direction and up to 12 minutes in the eastbound direction to bus travel time, thus increasing travel time. In addition, with light rail using the center roadway, buses, during both construction and operation of light rail, would use the HOV lanes in the outer roadway. If performance of these HOV lanes is degraded, buses would likely not be able to maintain acceptable reliability because they would be operating in congested conditions in these HOV lanes.

With an interim terminus station at the Ashwood/Hospital or Hospital station, current bus service along SR 520 would continue to serve the Bel-Red and Overlake areas with poor reliability. With an interim terminus farther east, the transit reliability in the Bel-Red and Overlake areas would improve with the direct service provided by light rail.

Light Rail Reliability. The poor bus reliability discussed above indicates that buses would be unable to meet their scheduled arrival times and would frequently arrive close together rather than at the desired intervals due to highly congested local and regional roadways.

Poor reliability can make buses an unattractive mode for potential users and is a major deterrent to transit use. Light rail would not experience the same disruptions in transit reliability as buses because it would operate in its own dedicated right-of-way, separate from vehicle congestion, and, therefore, would be able to handle higher ridership through a more frequent and reliable service. In most cases, at-grade light rail routes would have priority at traffic signals.

Because a light rail line similar to East Link is not currently in operation in the Puget Sound region, future light rail reliability was estimated using the St. Louis light rail system's on-time performance data. St. Louis light rail includes features similar to East Link (such as at-grade crossings and tunnels) and is reported to be 93 percent on time. Other U.S. light rail lines report between 92 and 98 percent on-time performance. The *Transportation Technical Report* contains additional St. Louis light rail data. The estimated light rail reliability LOS for future conditions is presented in Table 3-7.

TABLE 3-7
Transit Reliability Level of Service at Stations

Station	Existing and Future Bus[a]		Future Light Rail[b]
	Percent On-Time Performance[c]	Level of Service[c]	Level of Service[c]
International District/ Chinatown	48.8%	F/E	A
Mercer Island	52.2%	F/F	A
Bellevue Transit Center	53.3%	F/E	A
Overlake Transit Center	52.4%	F/C	A
Redmond Transit Center	45.3%	F/D	A

[a] It is assumed that future bus reliability will plan to remain similar to existing conditions as Metro and Sound Transit adjust bus service according to demand.

[b] Future light rail reliability performance was projected using St. Louis light rail data.

[c] LOS values are station averages; existing and future bus average LOS X/Y, where X=LOS for percent on-time performance station average, Y=LOS for coefficient of variation station average (definitions provided in the *Transportation Technical Report* [Appendix H1])

Note: While the data used in this analysis was gathered during Downtown Seattle Transit Tunnel closure, data collected before the tunnel closure showed similar reliabilities (i.e., LOS E/F).

3.4.3.3 Transit Travel Times

Door-to-door (from the beginning to the end of your trip—for instance from when you leave your place of work to when you enter your home) travel time is a key factor in forecasting potential transit ridership. For some potential transit riders, especially riders who have other available travel options, the comparison between transit and auto travel time is probably as important as actual travel time. Table 3-8 shows the average transit travel times for the No Build Alternative and East Link in the PM peak period in year 2030. The comparisons reflect an average person's

door-to-door transit travel time using a particular station and includes the following factors:

- Bicycle or walk time to stop or station
- Wait time
- Transfer wait time(s), if any
- In-vehicle time (in bus and/or light rail)
- Drive, bicycle, or walk time to destination

In the analysis of light rail travel times, three combinations of East Link Project alternatives were selected to represent a range of possible travel time savings with light rail: representative, fastest, and slowest.

- Representative: A1, B2E, C8E, D3, E1
- Fastest: A1, B2E, C7E, D5, E4
- Slowest: A1, B2A, C4A, D3, E2

A description of each East Link alternative is provided in Chapter 2.

Compared to the No Build Alternative (between 50 and 71 minutes), East Link patrons in the representative alternative would save between 6 and 17 minutes in 2020 and between 5 and 17 minutes in 2030. Transit travel times for the representative, fastest, and slowest alternatives for segments A, B, and C would be relatively similar. In Segments D and E, the differences among the three alternatives would widen, with up to 4 to 7 minutes additional savings achieved in the fastest alternative compared to the representative alternative at all the potential stations in Segment D and at the Redmond Town Center. At stations in Segments D and E, the representative alternative would achieve up to 3 minutes more savings than the slowest alternative.

The average door-to-door travel time savings over all stations would be between 7 and 10 minutes by 2030. Transit riders making trips where the origin and destination area are both served by East Link would have the greatest travel time benefits, shorter waits, no transfer times, and higher in-vehicle speeds. Travel time savings would be similar in years 2020 and 2030 with East Link.

Another measure of light rail travel time is the time for a train to travel between stations. A passenger's travel time between Downtown Seattle and Downtown Redmond, after boarding light rail, would be between 29 and 39 minutes. Light rail travel time between Downtown Seattle and Downtown Bellevue would be between 17 and 19 minutes. This is a savings of up to 30 minutes compared to an automobile currently traveling between these locations, as in the afternoon peak period it now takes up to 47 minutes to travel between Seattle and Bellevue (via I-90) and up to 63 minutes to travel between Seattle and Redmond (via SR 520) (WSDOT, 2008). In the future these automobile times are expected to continue to get even longer, and therefore light rail would provide an even

TABLE 3-8
Comparative Analysis of Year 2030 Average Door-to-Door[b] PM Peak-Period Transit Travel Times

Station	Travel Time (minutes)			
	No Build	Representative Light Rail	Fastest Light Rail	Slowest Light Rail
Segment A, Interstate 90				
Rainier	53	46	46	46
Mercer Island	50	43	43	43
Segment B, South Bellevue				
South Bellevue	51	46	46	46
SE 8th	57	49	48	50
118th[a]	59	48	N/A	N/A
Segment C, Downtown Bellevue				
Old Bellevue[a]	61	52	N/A	N/A
Bellevue Transit Center	61	53	52	54
East Main[a]	63	53	N/A	N/A
Hospital[a]	64	56	N/A	N/A
Ashwood/ Hospital	60	53	51	54
Segment D, Bel-Red/Overlake				
124th	63	55	50	57
130th	65	57	50	59
Overlake Village	66	55	51	58
Overlake Transit Center	64	55	51	58
Segment E, Downtown Redmond				
Redmond Town Center	71	55	51	55
SE Redmond	64	47	45	49
Redmond Transit Center[a]	71	59	N/A	N/A
All Station Average	61	53	51	54

[a] Travel times for these stations were derived from their alternative, which is not included in the representative, fastest, or slowest alternative combinations. These alternatives are B1-C1 (B1 connecting with C1), B7, and E2.

[b] Door-to-door means from the beginning to the end of your trip, for instance from when you leave your place of work to when you enter your home)

greater travel time savings. Exhibit 3-9 shows light rail travel times between key stations.

3.4.3.4 Transfers

When transit riders are required to transfer, it is often perceived as a negative attribute of transit systems and an impediment to transit use. However, it is recognized that the quality of transfers, whether between buses or between bus and rail, has a dramatic impact on how negatively transfers are perceived. Factors determining quality of transfers include proximity of transfer location, wait time, waiting area conditions, and service reliability.

The number of transfers would be expected to stay similar with and without light rail in 2020. A slight reduction in transfer rate is predicted in 2030 with East Link because it would connect to the planned North Link light rail line and provide a one-seat transit trip between North Seattle and the Eastside.

Passengers transferring from bus to East Link would have shorter wait times compared to bus-to-bus transfers because the East Link operating plan assumes light rail trains in the peak periods would arrive every 10 minutes in 2020 and every 9 minutes in 2030. Even during off-peak hours, East Link would operate with 15-minute headways. Because of the high reliability of light rail service, riders may choose a light rail trip that would result in a shorter wait time for transfers than a longer and potentially less reliable bus-only trip.

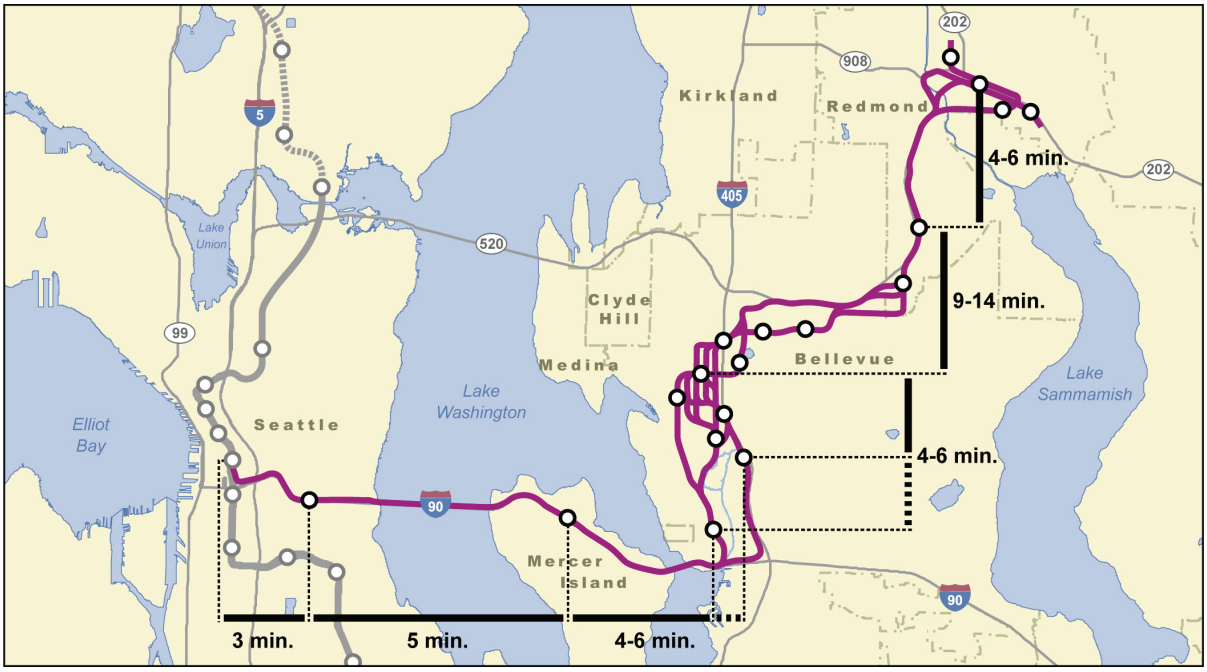
3.4.3.5 Station Parking

With the No Build Alternative, no expansion or changes would occur in existing park-and-ride capacities. With East Link, parking provided at the Mercer Island, Overlake Village, and Redmond Transit Center stations would remain unchanged. The park-and-ride lots would be expanded at the South Bellevue (proposed 1,455-1,476 stalls), 118th (proposed 1,030 stalls), and Overlake Transit Center (proposed 320 stalls) stations to better accommodate the expected ridership with the project. New park-and-ride lots would be constructed at the 130th Station (proposed 300 stalls) and SE Redmond Station (proposed 1,400 stalls). Section 3.6 provides further details on parking and parking utilization at East Link stations.

3.4.3.6 Light Rail Ridership

The Sound Transit ridership forecasting model was used to develop the 2020 and 2030 light rail system ridership forecasts for each of the project alternatives. The ridership forecasts use 2020 and 2030 land use forecasts based on the PSRC projections developed in 2005 and released in spring 2006.

The segment ridership for each project alternative is the sum of the daily boardings at the stations in that alternative. Because the route, profile, and station



Note: Estimated East Link travel time between the Mercer Island Station and the South Bellevue Station is 4 minutes (solid line), between the Mercer Island Station and the 118th Station is 6 minutes (solid plus dashed line), between the South Bellevue Station and Bellevue Transit Center is from 4 to 6 minutes (solid plus dashed line), and between the 118th Station and the Bellevue Transit Center is 4 minutes (solid line).

EXHIBIT 3-9
East Link Travel Times Between Key Stations

locations vary for each alternative, changes are expected not only in the station boardings but also in the segment and project-wide ridership. The project-wide ridership is the total number of daily riders that would use East Link.

Daily ridership differences can be considered substantial if the forecast variation among alternatives for total East Link ridership exceeds about 2,000 daily boardings. Generally, the variation among segment alternatives is expected to be less than 2,000 daily boardings because many of the segments include similar number of stations and the travel times are not different enough to cause a dramatic change in patronage.

Station mode of access is discussed in Section 3.6. Ridership analysis methodology and results, including interim terminus ridership, are presented in detail in the *Transportation Technical Report*.

Project-Wide Ridership Summary

Based on the segment ridership forecasts discussed in the following sections, the full-length East Link Project would generate approximately 32,000 riders in 2020 and up to 48,000 in 2030.

By 2030, the alternatives that would produce the highest ridership in their segments are B1 (with connections to C1), C3T, D2A, D2E, D5, and E2. These alternatives would generate a project-wide ridership between 46,000 and 48,000. The lowest ridership among alternatives by segment would be with B7, C4A, C7E, D3, E1 and E4, resulting in a project-wide ridership ranging between 42,500 and 45,500 daily riders.

There are several reasons for the variation in ridership among the alternatives. Alternative C3T would generate the highest ridership among Segment C alternatives by connecting the commercial, retail, and office core of Downtown Bellevue through a tunnel profile that provides the fastest travel time. Alternative B7, which generates the lowest project-wide ridership among Segment B alternatives, travels along a BNSF Railway/I-405 route that would not stop at the South Bellevue Park-and-Ride Lot. Alternative C7E would generate a low project-wide ridership because it does not enter into the business and retail core of Downtown Bellevue as much as the other Segment C alternatives, and, therefore, requires a longer walk to access the station. C4A would generate lower project-wide ridership mostly due to slower travel speeds. Exhibit 3-10 displays the 2030 project-wide ridership for each alternative by segment.

Although not included in these ridership results, ridership between the Eastside and Seattle would be

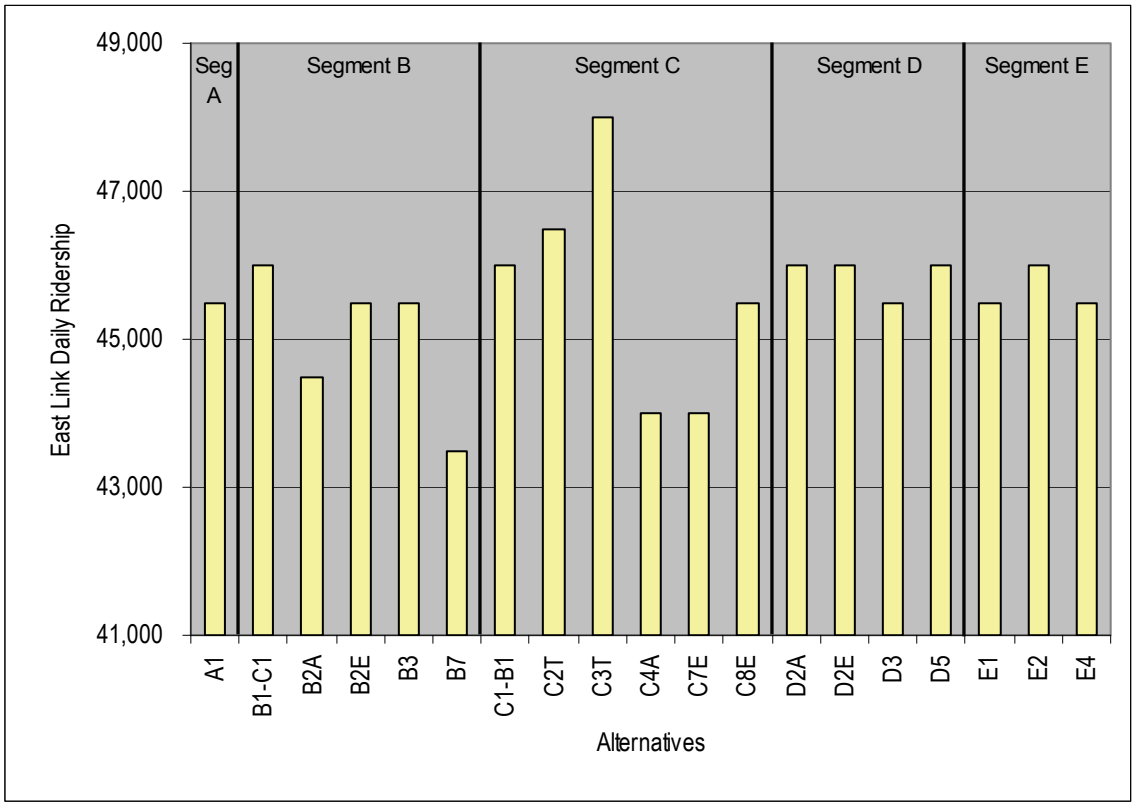


EXHIBIT 3-10
2030 Project-Wide Daily Ridership

expected to be higher on days with special events at Safeco Field, Qwest Field, or other venues near the light rail system (e.g., for concerts, trade shows, other sporting events). East Link ridership is anticipated to increase more than 8 percent on days with special events.

Segment A Alternative and Project-Wide Ridership

Although there is only one project alternative in Segment A (the I-90 Alternative [A1]), the adjacent Segment B alternatives would affect its daily boardings because of closely spaced stations. The Segment A ridership forecasts are similar for all the Segment B alternatives except one because of a proposed station at the South Bellevue Park-and-Ride Lot. The BNSF Alternative (B7), which would not have a station at South Bellevue but instead at 118th Avenue NE, would shift the travel patterns of the light rail users to the surrounding stations. The daily boardings at the Mercer Island Station in Segment A are expected to increase by a total of 500 with Alternative B7. Although this boarding information suggests a potential increase in the number of riders at the Mercer Island Station, the park-and-ride lot can only accommodate 447 vehicles; therefore, potential park-and-ride light rail riders exceeding this parking capacity would either use another station or alter their mode of access. Table 3-9 lists the projected 2020 and 2030 daily station boardings for Segment A.

Segment B Alternative and Project-Wide Ridership

In year 2020, Segment B ridership for each alternative would range from a low of 1,000 daily boardings for Alternative B7 to a high of 3,000 daily boardings generated by Alternatives B1-C1, B2E, B2A, and B3.

By 2030, ridership in Segment B would range from a low of 1,000 daily boardings with Alternative B7 to a high of 4,500 daily boardings with B2E and B2A. Table 3-10 lists the projected 2020 and 2030 Segment B alternative and station daily boardings.

The 112th SE Bypass Alternative (B3) and Alternative B7 also have an East Main Station in Segment C just north of the Segment B boundary. Due to the proximity of the East Main Station to Segment B, project-wide ridership presents a more informative assessment of alternatives B3 and B7 than Segment B daily boardings. The following section (Segment C)

TABLE 3-9
Year 2020 and 2030 Daily Ridership Forecast in Segment A

Station	2020		2030	
	A1 (combined with alternative B1, B2A, B2E, or B3)	A1 (combined with Alternative B7)	A1 (combined with alternative B1, B2A, B2E, or B3)	A1 (combined with Alternative B7)
Rainier	2,500	2,500	3,500	3,500
Mercer Island	1,500	2,000	2,000	2,500
Segment A Totals	4,000	4,500	5,500	6,000
Project-Wide Ridership	31,500-32,000	30,500	44,500-46,000	43,500

Note: Due to rounding, station ridership may not sum exactly to segment totals.

TABLE 3-10
Year 2020 and 2030 Daily Ridership Forecast in Segment B

Station	2020					2030				
	B1-C1[a]	B2E	B2A	B3	B7	B1-C1[a]	B2E	B2A	B3	B7
South Bellevue	3,000	3,000	2,500	3,000	-	4,000	4,000	4,000	4,000	-
SE 8th	-	500	500	-	-	-	500	500	-	-
118th	-	-	-	-	1,000	-	-	-	-	1,000
Segment B Totals	3,000	3,000	3,000	3,000	1,000	4,000	4,500	4,500	4,000	1,000
Project-Wide Ridership	32,500	32,000	31,500	31,500	30,500	46,000	45,500	44,500	45,500	43,500

[a] B1-C1 indicates Alternative B1 connecting with Alternative C1.

- = Station not included in alternative.

Note: Due to rounding, station ridership may not sum exactly to segment totals.

discusses the East Main Station ridership. The ridership projected for the South Bellevue Station and the SE 8th Street Station is similar for all alternatives that would access them.

Alternative B1 connecting with the Bellevue Way Tunnel Alternative (C1T) would generate the highest project-wide daily ridership among Segment B Alternatives; 32,500 riders in year 2020 and 46,000 riders in year 2030.

Alternative B7 would generate the lowest project-wide daily ridership among Segment B alternatives with 30,500 riders in 2020 and 43,500 in 2030. Two stations (Old Bellevue and East Main) in Segment C just north of the Segment B boundary would contribute to the higher project-wide ridership for alternatives B1 and B3. Both of these stations are surrounded by a high concentration of medium-to-high density mixed use neighborhoods, with easy access to commercial, retail, and office properties.

Segment C Alternative and Project-Wide Ridership

In year 2020, Segment C ridership for each alternative would range from a low of 3,500 daily boardings for the 112th NE Elevated Alternative (C7E) to a high of 5,000 daily boardings generated by the 108th NE Tunnel Alternative (C3T) and the B1 Alternative (with connections to C1). By 2030, Segment C ridership is expected to increase from a low of 5,500 daily boardings with Alternative C7E to a high of 8,000 daily boardings with C3T.

At the Bellevue Transit Center Station, a greater range of daily boardings is forecasted than at the other Segment C stations due to the different alternative routes and the station location. At the Bellevue Transit Center, between 3,000 and 4,500 daily boardings would occur in year 2020 and between 4,500 and 7,500 daily boardings would occur in year 2030. In Alternative C3T, 4,500 daily boardings in year 2020 and 7,500 daily boardings in year 2030 would occur at the Bellevue Transit Center. In contrast, the Bellevue Transit Center Station in Alternative C7E would have the lowest daily boardings, 3,000 and 4,500 in year 2020 and 2030, respectively.

The methodology used to forecast individual segment alternative ridership required a consistent combination of alternative connections outside the segment to provide an accurate comparison among alternatives. Because of this, the forecasts for the East Main Station, as its connections to alternatives B3 and B7, are not included in Table 3-11 but are provided separately in Table 3-12.

Alternative C3T would generate the highest project-wide ridership (33,500 in year 2020 and 48,000 in year 2030) by connecting the SE 8th Station to the commercial, retail, and office core of Downtown Bellevue with a station at the Bellevue Transit Center through a tunnel. An additional factor contributing to the high ridership is the travel time comparison between the Segment C alternatives. Alternative C3T is expected to have the shortest travel time because it is a tunnel profile with a relatively short length. By year 2030, Alternative C7E would result in the lowest East Link ridership, 44,000 riders. Alternative C7E would stop at the eastern edge of Downtown Bellevue and require a longer walk to the office and retail core of downtown and to the Bellevue Transit Center than the other Segment C alternatives. However, a pedestrian bridge connecting the station at 112th to the current Bellevue Transit Center would be constructed

TABLE 3-11
Year 2020 and 2030 Daily Ridership Forecasts in Segment C

Station	2020						2030					
	C1-B1[a]	C2T[b]	C3T[b]	C4A[b]	C7E[b]	C8E[b]	C1-B1[a]	C2T[b]	C3T[b]	C4A[b]	C7E[b]	C8E[b]
Old Bellevue	1,500	-	-	-	-	-	2,000	-	-	-	-	-
Bellevue Transit Center	3,000	4,000	4,500	4,000	3,000	3,500	5,000	6,500	7,500	6,000	4,500	5,500
Ashwood/Hospital	-	-	500	500	500	500	-	-	1,000	500	500	500
Hospital	500	500	-	-	-	-	500	500	-	-	-	-
Segment C Totals	5,000	4,500	5,000	4,000	3,500	4,000	8,000	7,500	8,000	6,500	5,500	6,500
Project-Wide Ridership	32,500	33,000	33,500	31,000	31,000	32,000	46,000	46,500	48,000	44,000	44,000	45,500

[a] C1-B1 indicates Alternative C1 connecting with Alternative B1.

[b] Data for Alternatives C2T, C3T, C4A, C7E, and C8E in this table are only applicable to Alternatives B2A and B2E.

- = Station not included in alternative.

Note: Due to rounding, station ridership may not sum exactly to segment totals.

TABLE 3-12
Year 2020 and 2030 Daily Ridership Forecasts in Segment C with East Main Station

Station	2020					2030				
	C2T	C3T	C4A	C7E	C8E	C2T	C3T	C4A	C7E	C8E
East Main	1,500 (2,000)	1,500 (2,000)	1,500 (2,000)	1,500 (1,500)	1,500 (2,000)	2,500 (3,000)	2,500 (3,000)	2,500 (3,000)	2,500 (3,500)	2,500 (3,000)
Bellevue Transit Center	3,000 (3,500)	3,500 (3,500)	3,000 (3,000)	2,000 (2,000)	2,500 (3,000)	5,000 (5,000)	5,500 (6,000)	4,500 (4,500)	3,000 (3,000)	4,000 (4,500)
Ashwood/ Hospital	-	500 (500)	500 (500)	500 (500)	500 (500)	-	500 (1,000)	500 (500)	500 (500)	500 (500)
Hospital	500 (500)	-	-	-	-	500 (500)	-	-	-	-
Segment C Totals	5,000 (6,000)	5,500 (6,000)	4,500 (5,500)	4,000 (4,000)	4,500 (5,500)	8,000 (9,000)	8,500 (10,000)	7,000 (8,500)	6,500 (7,500)	7,000 (8,500)
Project-Wide Ridership	32,000 (31,500)	33,500 (32,500)	31,000 (30,500)	30,500 (29,500)	31,500 (30,500)	46,000 (44,500)	47,500 (46,500)	45,000 (43,500)	44,000 (42,500)	45,500 (43,500)

Notes: Due to rounding, station ridership may not sum exactly to segment totals. Station ridership outside parentheses is for the Alternative B3 connection; station ridership within parentheses is for Alternative B7 connection.

- = Station not included in alternative.

to better connect these transit facilities.

Table 3-12 lists the projected 2020 and 2030 Segment C alternative and station daily boardings when it is connected to the B3 and B7 alternatives, which connect with the East Main Station. Bellevue Transit Center Station boardings would decline, compared to ridership forecasts in Table 3-11, due to the proximity of the East Main Station. Depending on the alternative, Bellevue Transit Center daily boardings would be between 2,000 and 3,500 in year 2020 and between 3,000 and 6,000 in year 2030. Other station boardings in Segment C would be unaffected by the East Main Station.

Regarding the connections to B3 and B7, which include the East Main Station, similar ridership comparisons would occur between the alternatives. Alternative C3T would result in the highest East Link Project-wide ridership among Segment C alternatives, and Alternative C7E would result in the lowest. Overall, alternatives that connect with Alternative B3 would generate slightly higher project-wide ridership than connections with Alternative B7.

Segment D Alternative and Project-Wide Ridership

In year 2020, ridership for all alternatives in Segment D would be 4,500 daily boardings. By 2030, Segment D ridership is expected to increase from a low of 6,000 daily boardings with the NE 20th (D3) and SR 520 (D5) alternatives to a high of 6,500 daily boardings with the NE 16th Elevated (D2E) and NE 16th At-Grade (D2A) alternatives.

At the Overlake Transit Center Station, a greater range of daily boardings is forecasted due to the different alternative routes than at the other Segment D stations. In year 2020, all Segment D alternatives are expected to have 2,500 daily boardings at the Overlake Transit Center Station except D5, which would generate 3,000 daily boardings at this station. In year 2030, the daily boardings at this station would range from a low of 3,500 riders with Alternative D3 to a high of 4,500 riders with Alternative D5. Because there are only two stations serving the Bel-Red and Overlake areas in Alternative D5, it would generate slightly higher station ridership at these stations than the other alternatives. Nearby stations in adjacent segments also would have slightly higher ridership due to D5 having a faster travel time than the other alternatives. Table 3-13 lists the projected 2020 and 2030 Segment D alternative and station daily boardings.

In year 2030, Alternative D3 would generate 45,500 project-wide riders—the lowest among the Segment D alternatives. Overall, the differences in daily boardings among the Segment D alternatives are not substantial enough to suggest one alternative would have higher ridership than another.

Although both the 124th and 130th stations are analyzed in Alternatives D2A, D2E and D3, only one station might ultimately be constructed. If this were to

occur, ridership would not substantially change from Table 3-13 because these stations' coverage areas overlap, so that riders would likely consolidate to the one station.

By early 2009, the City of Bellevue plans to adopt the Bel-Red Corridor Project Subarea Plan that accommodates 5,000 new households and over 9,200 additional jobs in the Bel-Red Corridor by 2030 (City of Bellevue, 2007, Table A-12). In addition, the City of Redmond recently adopted its Overlake Neighborhood Plan, providing for nearly 9,000 households and nearly 20 million square feet of commercial space by 2030. Much of these land use changes would include transit-oriented development around light rail stations encouraging Bel-Red and Overlake residents, workers, and shoppers to access the stations by walking, bicycling, or taking transit.

Bellevue predicts that growth under its Bel-Red Corridor Plan would generate a total of 10,200 daily light rail boardings at the Ashwood/Hospital, 124th, 130th, and Overlake Village stations. Redmond predicts that its action alternative will nearly triple the transit mode share of all trips generated by the Overlake Neighborhood, from 5.4 percent to 15.3 percent. (City of Redmond, 2007, Tables 2-2 and 3-6 and Section 3.6.3.3). These ridership increases would occur among all alternatives within Segment D; however, Alternative D5 would have the least ridership increases because it does not include the 124th Avenue NE and 130th Avenue NE Stations.

Segment E Alternative and Project-Wide Ridership

In 2020, Segment E ridership for each alternative would range from 2,000 daily boardings for the Redmond Way (E1) and Leary Way (E4) alternatives to 2,500 daily boardings for the Marymoor Alternative (E2). By 2030, Segment E ridership is expected to increase to 3,000 daily boardings for all alternatives as shown in Table 3-14. Alternative E2 would generate the highest project-wide ridership of 32,500 in year 2020, and 46,000 in year 2030. If the E2 alternative terminates at the Redmond Town Center Station, the project-wide ridership is expected to be similar to the E1 and E4 alternatives in years 2020 and 2030.

TABLE 3-14
Year 2020 and 2030 Daily Ridership Forecasts In Segment E

Station	2020			2030		
	E1	E2	E4	E1	E2	E4
Redmond Town Center	1,000	1,000	1,500	1,500	1,000	1,500
SE Redmond	1,000	1,000	1,000	1,500	1,500	1,500
Redmond Transit Center	-	500	-	-	500	-
Segment E Totals	2,000	2,500	2,000	3,000	3,000	3,000
Project-Wide Ridership	32,000	32,500	32,000	45,500	46,000	45,500

Note: Due to rounding, station ridership may not sum exactly to segment totals.

- = Station not included in alternative

Interim Terminus Ridership

The Ashwood/Hospital, Hospital, 124th, 130th, Overlake Village, Overlake Transit Center, SE Redmond, and the Redmond Town Center stations could potentially serve as interim terminus stations. Table 3-15 compares the projected year 2020 and 2030 daily interim terminus station and project-wide ridership for each station as an interim terminus. The two interim terminus stations that would expect to have a noticeable increase in ridership are at Overlake Village and Overlake Transit Center. By 2030, an increase up to 3,000 daily riders is expected at Overlake Village and an increase up to 2,500 daily

TABLE 3-13
Year 2020 and 2030 Daily Ridership Forecasts in Segment D

Station	2020				2030			
	D2A	D2E	D3	D5	D2A	D2E	D3	D5
124th	<250	<250	<250	-	500	500	500	-
130th	1,000	1,000	1,000	-	1,000	1,000	1,000	-
Overlake Village	1,000	1,000	1,000	1,000	1,000	1,500	1,000	1,500
Overlake Transit Center	2,500	2,500	2,500	3,000	4,000	4,000	3,500	4,500
Segment D Totals	4,500	4,500	4,500	4,500	6,500	6,500	6,000	6,000
Project- Wide Ridership	32,500	32,500	32,000	32,500	46,000	46,000	45,500	46,000

Note: Due to rounding, station ridership may not sum exactly to segment totals.

- = Station not included in alternative.

TABLE 3-15
Year 2020 and 2030 Daily Terminus Station and Project-Wide Ridership Forecasts for Interim Terminus Stations

Year	Ridership Category	Full-Length Project	Interim Terminus at:						
			Ashwood/ Hospital[a]	124th Avenue NE	130th Avenue NE	Overlake Village	Overlake Transit Center	Redmond Town Center	SE Redmond
2020	Interim Terminus Station Ridership[b]	N/A	500 (0)	500 (<250)	1,000 (0)	3,000 (2,000)	4,000 (1,000-1,500)	1,500 (0-500)	1,500 (500)
	Project-Wide Ridership	32,000	23,500	24,000	24,500	27,500	30,500	31,500	31,000
2030	Interim Terminus Station Ridership[b]	N/A	1,000 (500)	1,000 (500)	1,000 (0)	4,000 (2,500-3,000)	6,000 (1,500-2,500)	2,000 (500)	2,000 (500)
	Project-Wide Ridership	45,500	34,500	35,000	35,500	39,500	43,500	44,500	44,500

[a] Hospital interim terminus station ridership is similar to the ridership for Ashwood/Hospital Station.

[b] Values in parentheses are the increase in daily station ridership when the station is an interim terminus compared to the full-length alternative.

Note: Due to rounding, station ridership may not sum exactly to segment totals.

Station and project-wide ridership may vary depending on which alternative connects to the terminus station.

riders is expected at Overlake Transit Center. All other potential interim termini stations would expect an increase in daily ridership of less than 1,000. Compared to the full-length East Link Project, the daily 2030 project-wide ridership could decrease by between 1,000 (2 percent) and 11,000 (25 percent) with an interim terminus.

3.4.4 Construction Impacts

During construction of East Link, current bus service would be affected at some locations along the corridor. Bus reliability could potentially degrade along arterials with construction for East Link due to lane closures and other construction-related activity. For areas with construction in the roadway right-of-way, arterials may be reduced to one lane in each direction, affecting roadway operations, including bus service along those arterials. In general, alternatives constructed outside the roadway right-of-way would have minimal impacts on bus routes.

East Link construction impacts on Central Link operations would be minimal. Any impacts would occur with the East Link connection to Central Link in the Downtown Seattle Transit Tunnel. The Downtown Seattle Transit Tunnel construction activities would be scheduled to occur during nighttime hours when ridership is the lowest and/or outside of operating hours.

Along I-90, construction impacts would occur for the bus service stopping at Rainier Avenue S and at Mercer Island. Bus service would continue at these locations during the D2 Roadway construction but buses would use the outer I-90 mainline roadways to access the Rainier Avenue S and Mercer Island stops. During construction of light rail track on the D2 Roadway, buses would be rerouted to the I-90 mainline and this would likely affect the reliability of buses.

At the South Bellevue Park-and-Ride Lot, all or a portion of the parking lot would be closed due to the construction of the parking garage and the construction staging areas, but bus service would remain on Bellevue Way SE. In alternatives B1, B2A, and B3, the at-grade profile would require reconstruction of the roadway for all or a portion of the length of Bellevue Way SE. For alternatives B2A and B3, there would also be reconstruction of the roadway on 112th Avenue SE. This at-grade construction would require lane closures, which would reduce the reliability of buses that travel along these roads. For Alternative B7, bus service at the Wilburton Park-and-Ride Lot would continue but all or some parking would be removed.

During Bellevue Transit Center Station construction for alternatives C1T, C2T, and C3T, bus service would not be able to access the transit center due to cut-and-cover construction of the light rail tunnel station at the transit center. The Bellevue Transit Center would be closed for over a year for the construction of the underground station for these three tunnel alternatives. Therefore, bus service and stops associated with these alternatives would be rerouted and relocated along 106th, 108th, and 110th avenues NE. The remaining Segment C alternatives would

likely be able to retain current service within the Bellevue Transit Center during the construction period. Cut-and-cover construction for alternatives C1T and C2T on Bellevue Way and on 106th Avenue NE, respectively, would affect bus routes traveling along these roadways. In the C4A Alternative, construction would be at-grade and would require the reconstruction of 108th Avenue NE and 110th Avenue NE, which would affect bus service. Alternative C8E construction could potentially affect bus routes traveling on 110th Avenue NE. All of these potential effects could increase bus travel times.

At the Overlake Transit Center, bus service and stops would be routed along 156th Avenue NE during construction of the Overlake Transit Center station. Additionally, a portion of the parking lot is expected to be closed for construction of the parking garage. For D3, buses traveling on 152nd Avenue NE, north of NE 24th Street, would be affected due to the station construction at-grade in the median, and also along NE 20th Street between 136th Avenue NE and 152nd Avenue NE due to median construction. These effects could increase bus travel times.

Buses traveling along 161st Avenue NE between Cleveland Street (SR 202) and NE 87th Street would be affected by median construction for Alternative E2 and may need to be rerouted. If Alternative E2 terminates at the Redmond Town Center Station, potential construction these impacts along 161st Avenue NE would be avoided.

3.4.5 Potential Mitigation

If the D2 Roadway is not designated for joint use operations with bus and light rail, bus routes that currently use the D2 Roadway are expected to be rerouted to 4th Avenue S to access Downtown Seattle via SR 519. Transit signal priority could be implemented on 4th Avenue S at the I-90 western terminus and Airport Way S to improve bus reliability for these affected routes.

With East Link, bus routes on I-90 would not require any mitigation because the I-90 Two Way Transit and HOV Project would be completed prior to East Link construction. This project would provide HOV lanes in both directions on I-90 between Mercer Island and the Rainier Avenue S interchange. Consistent with the state's HOV policy of a vehicle able to travel at least 45 miles per hour (mph) during the peak commuting hour 90 percent of the time, bus reliability would remain similar to that of the No Build Alternative.

No other transit mitigation during operations would be required for the East Link Project because the project would have a beneficial impact on transit service. The transit integration plan provides coordinated bus service with the light rail system, and major park-and-ride lots in the study area would be expanded to better accommodate the increase in transit ridership with the project.

During construction, existing park-and-ride lots that are proposed to be expanded would close fully or partially, and the measures to mitigate the loss of parking at park-and-ride lots (South Bellevue and Overlake Transit Center) could include interim parking lots, shuttle service connecting the park-and-ride lot with interim lots, or additional bus service.

During construction of routes within street right-of-way, buses would potentially be rerouted to nearby arterials where appropriate to maintain transit service. Transit service modifications would be coordinated with Metro to minimize construction impacts and disruptions to bus facilities and service. This could include posting informative signage before construction at existing transit stops that would be affected by construction activities.

Refer to Sections 3.5 and 3.6 for mitigation regarding future I-90 and arterials and local streets traffic operations, respectively.

3.5 Highway Operations and Safety

This section describes highway operations within the study area and the potential impacts on highways from the East Link Project. I-90 is the only regional highway that would be directly affected by the project; direct impacts on SR 520 and I-405 would be limited to light rail transit overpasses and parallel routes and, therefore, operations on these two highways would be similar with or without the project.

For discussion of regional travel, including VMT, VHT, roadway v/c ratio, and mode choice at the six project screenline locations, refer to Section 3.3. For the analysis of intersection operations at or near I-90 ramp terminals refer to Section 3.6.

3.5.1 Methodology

Four key measures were established to evaluate the quality of operating conditions on I-90: vehicle and person throughput, travel time by transportation mode, LOS, and safety.

Vehicle and person throughput is a measure of the number of vehicles and people who are able to cross a specific location. Person throughput is a more appropriate assessment measure than vehicle

throughput for analysis of a transit project because it illustrates the overall efficiency of the system through number of people moved instead of vehicles. I-90 throughput information is presented at Lake Washington (Screenline 2) to explain changes in travel patterns across the lake, while the Mercer Slough screenline (Screenline 3) is intended to be used to understand I-90 conditions, east of the study area.

Vehicle Throughput. The number of vehicles that cross a location.

Person Throughput. The number of people in vehicles (autos and transit) who cross a location.

Travel times provide information on how long it would take to travel through the corridor or certain paths within the corridor. Congestion maps, which indicate roadway LOS, are charts that indicate when, how long, and how severe congestion occurrences are on I-90. A safety comparison between the No Build Alternative and the East Link Project is provided to show how the project might affect the number of I-90 accidents. The *Transportation Technical Report* provides more details on the freeway operations analysis.

3.5.2 Affected Environment

Segment A is the only segment in which the East Link Project would directly affect a regional highway, I-90, during project operations. Potential impacts on SR 520, I-5, and I-405 from East Link Project operation are not considered to be substantial, as indicated in Section 3.3. Therefore, traffic operations on SR 520 (which crosses Screenline 2) and I-5 and I-405 were not evaluated further. SR 520 is addressed in this section only when describing travel predictions across the lake in Section 3.5.2.2 and potential construction impacts (along with I-405) in Section 3.5.3.4.

Segment A spans approximately 7 miles, originating at the International District/Chinatown Station in Seattle and terminating where I-90 reaches South Bellevue. Within this segment that crosses Lake Washington, I-90 consists of two "outer" roadways that are the westbound and eastbound mainline lanes and a reversible center roadway that has peak-directional reversible lanes that are only for use by HOVs and by Mercer Island drivers between Seattle and Mercer Island. Consistent with long-standing regional objectives of connecting the urban communities in the Puget Sound region, the center roadway has always been intended as an HCT connection between Bellevue and Seattle to support higher density employment and residential land uses on both sides of Lake Washington. This is documented in Appendix G of the *Transportation Technical Report* (Appendix H1), where a 2004 amendment to the 1976 I-90 Memorandum Agreement states "Alternative R-8A, with HCT deployed in the center lanes, is the ultimate configuration for I-90 in this segment."

3.5.2.1 Vehicle and Person Throughput

In existing conditions, slightly over 55 percent of the total vehicles on I-90 travel in the peak direction (westbound in the AM peak hour and eastbound in the PM peak hour). In the AM peak hour, slightly less than 13,000 vehicles travel on I-90, while in the PM peak hour, slightly over 13,500 vehicles travel on I-90. In both AM and PM peak hours, the center roadway accommodates less than 15 percent of the total vehicles on I-90 due to its limited access. Access is provided by ramps from the outer mainline roadways and the 5th Avenue S and S Dearborn Street intersection, neither of which provides enough capacity to effectively use the two lanes in the reversible center roadway (WSDOT and Sound Transit, 2004, p 3-28). Table 3-16 lists I-90 vehicle throughput data for Screenlines 2 and 3 in the AM and PM peak hours.

In terms of person throughput, in the AM peak hour on the I-90 Floating Bridge (Screenline 2), the westbound outer roadway throughput approaches 6,300 persons. The reversible center roadway (westbound direction in the AM peak hour) person throughput is approximately 3,300 persons (of which about 25 percent are in buses). The eastbound throughput is about 6,500 persons. Overall, about 16,100 people travel I-90 in both directions during the AM peak hour. In the PM peak hour on the I-90 Floating Bridge, the westbound throughput is about 7,500 persons. The eastbound outer roadway throughput is slightly over 6,500 persons, and the reversible center roadway (eastbound direction in PM peak hour) throughput is about 3,500 persons (of which about 20 percent are in buses). Overall, about 17,500 people travel I-90 in both directions during PM peak hour.

Similar person throughput trends occur at Screenline 3, except in the eastbound direction during the PM peak hour. Transit usage decreases compared to Screenline 2 because some passengers disembark at Mercer Island and some buses exit I-90 at Bellevue Way and therefore do not cross Screenline 3. Exhibit 3-11 shows the existing AM and PM peak-hour person throughput by direction and mode at screenlines 2 and 3. The person and vehicle throughput in the reversible center roadway is included in the direction it operates, depending on the time period.

TABLE 3-16
Existing (2007) I-90 AM and PM Peak-Hour Vehicles and Persons

	AM Peak Hour				PM Peak Hour			
Screenline/ Direction	**Vehicles**	**Persons**	**Vehicle Percent of Total**	**Person Percent of Total**	**Vehicles**	**Persons**	**Vehicle Percent of Total**	**Person Percent of Total**
Screenline 2 (Lake Washington)								
Westbound Outer Roadway	5,450	6,250	43%	39%	6,000	7,500	44%	43%
Reversible Center Roadway	1,750	3,350	14%	21%	1,850	3,450	14%	20%
Eastbound Outer Roadway	5,500	6,500	43%	40%	5,650	6,500	42%	37%
Screenline 2 Total	12,700	16,100	100%	100%	13,500	17,450	100%	100%
Screenline 3 (Mercer Slough)								
Westbound Outer Roadway	7,200	9,550	58%	61%	6,000	6,500	45%	45%
Eastbound Outer Roadway	5,300	6,000	42%	39%	7,250	7,950	55%	55%
Screenline 3 Total	12,500	15,550	100%	100%	13,250	14,450	100%	100%

Source: Results from VISSIM software, CH2M HILL, 2007.

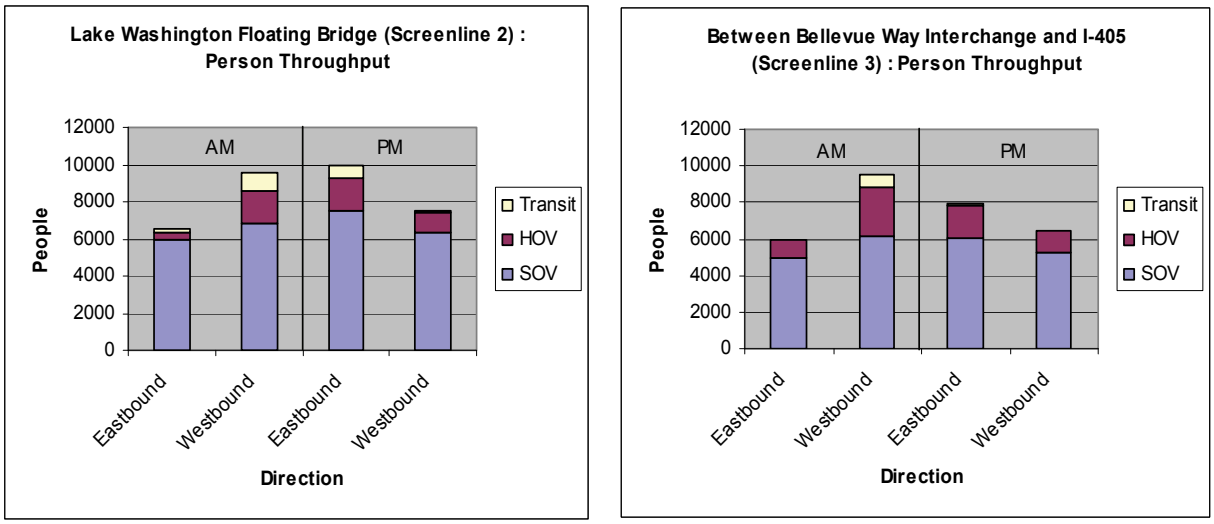


EXHIBIT 3-11
I-90 Existing AM and PM Peak-Hour Person Throughput by Mode at Screenlines 2 and 3

3.5.2.2 Travel Time

Travel time paths between Seattle, Mercer Island, Bellevue Way, and I-405 were identified to help understand local and regional trip times. The selected travel paths are listed in Table 3-17 along with the existing AM and PM travel times for single-occupant vehicle, HOV, and transit modes on these paths.

During the AM peak period, the travel time for single-occupant vehicles traveling westbound to Seattle from I-405 is approximately 12 minutes. In the eastbound direction, the travel time for single-occupant vehicles traveling between Seattle and I-405 is approximately 14 minutes. The PM peak period travel time for single-occupant vehicles traveling westbound to Seattle from I-405 is about 19 minutes. The travel time for single-occupant vehicles traveling eastbound from Seattle to I-405 is 17 minutes.

3.5.2.3 Level of Service

The existing LOS on I-90 varies throughout the study area. There is substantial congestion where vehicles travel at stop-and-go conditions (LOS F), and vehicle queues are observed throughout a majority of the peak periods, especially in the PM peak period. The congestion maps in Exhibit 3-12 illustrate the I-90 mainline LOS. These congestion maps indicate vehicle speeds over time (vertical axis) and distance (horizontal axis). The time indicated on these maps is a 2½-hour duration in both the AM (6:30 to 9:00 a.m.) and PM (3:30 to 6:00 p.m.) peak periods. The distance covers I-90 from the western terminus at SR 519 to east

TABLE 3-17
I-90 Existing Travel Times by Mode

Travel Time Path Endpoints		Travel Time (minutes)					
		AM Peak Period			PM Peak Period		
Beginning Point	**Ending Point**	**SOV**	**HOV**	**Transit[a]**	**SOV**	**HOV**	**Transit[a]**
Westbound Outer Roadway							
Mercer Island (Island Crest Way)	I-5 to Downtown Seattle	7	7	- / -	9	9	10 / 7
Bellevue Way	I-5 to Downtown Seattle	10	10	- / -	17	17	18 / -
I-405	I-5 to Downtown Seattle	12	12	- / -	19	18	20 / 17
Reversible Center Roadway[b]							
Mercer Island (77th Avenue SE)	I-5 to Downtown Seattle[c]	7	N/A	- / -	8	N/A	- / -
Mercer Island (77th Avenue SE)	Seattle (5th Avenue S)[d]	N/A	5	6 / 6	N/A	5	6 / 6
Bellevue Way	Seattle (5th Avenue S)[d]	N/A	7	11 / -	N/A	8	11 / -
I-405	Seattle (5th Avenue S)[d]	N/A	10	13 / 11	N/A	10	13 / 10
Eastbound Outer Roadway							
I-5 from Downtown Seattle	Mercer Island (Island Crest Way)	8	8	9 / 8	12	12	- / -
I-5 from Downtown Seattle	Bellevue Way	12	12	19 / -	15	15	- / -
I-5 from Downtown Seattle	I-405	14	14	25 / 16	17	17	- / -

[a] Transit routes with stops on Mercer Island / Transit routes with no stops on Mercer Island.
[b] Reversible center roadway operates westbound in the AM peak and eastbound in the PM peak.
[c] Single-occupant vehicles are required to exit/enter the reversible center roadway near Rainier Avenue S.
[d] Travel time is to/from 5th Avenue S via the D2 Roadway.

Note: Travel times are rounded to the nearest minute.

N/A = not applicable because the mode is not eligible to travel this path or the path is not prohibited.

SOV = single-occupant vehicle.

- = Buses that do not travel on this roadway during this period and/or do not travel between these points.

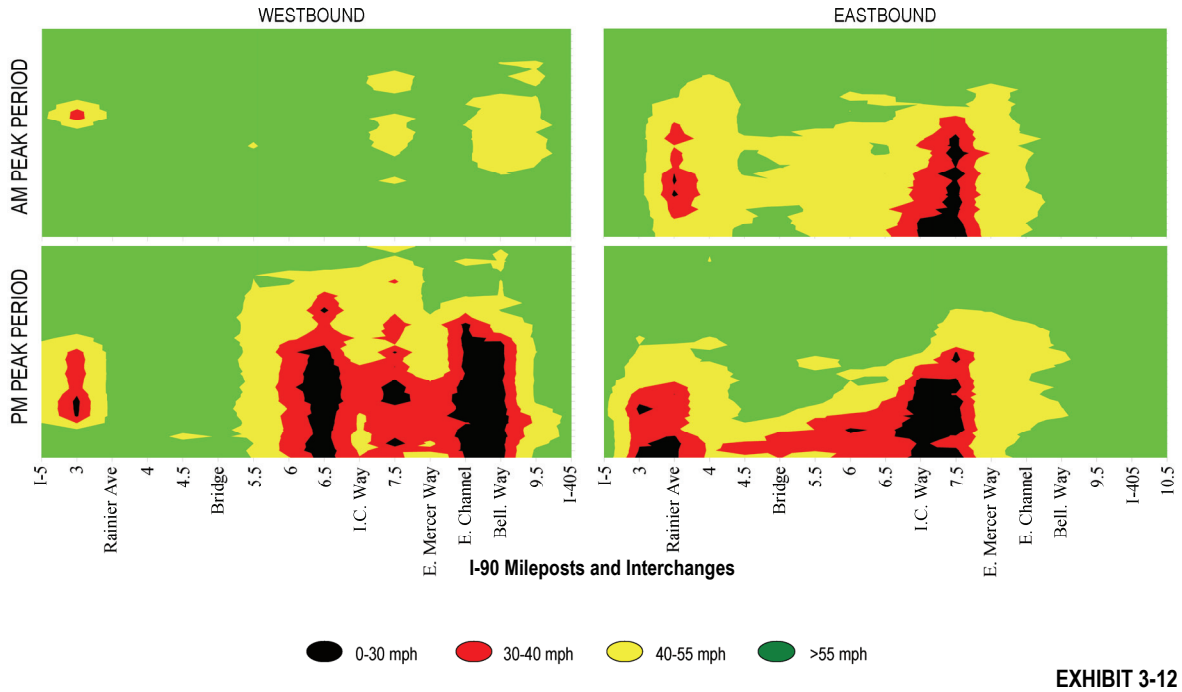


EXHIBIT 3-12
I-90 Existing Year AM and PM Peak Period Vehicle Speeds in General Purpose Lanes

of the I-405 interchange. Although LOS is based on vehicle density and the congestion maps are based on speed, the two measurements are generally related to one another. On the congestion maps, LOS E and F conditions (speeds at or below 55 mph) are indicated where areas of yellow, red, or black occur. LOS D or better conditions are portrayed by areas of green (vehicle speeds over 55 mph) occur.

During the AM peak period in the westbound direction, I-90 starting east of I-405 operates at LOS E or better until the area between the Rainier Avenue S interchange and the I-5 interchange, which operates at LOS F. Traveling in the eastbound direction, I-90 west of I-5, operates better than LOS E until the Rainier Avenue S interchange. From the Rainier Avenue S interchange to the East Mercer Way interchange, I-90 operates at LOS E or worse. East of the East Mercer interchange, I-90 operates at LOS D or better. The reversible center roadway operates at LOS B or better. The greatest congestion is at the western terminus of the reversible center roadway where center roadway automobiles merge back onto the I-90 mainline.

During the PM peak period, I-90, in the westbound direction, operates at LOS E or worse between Bellevue Way and the First Hill Tunnel in Mercer Island. West of Mercer Island, I-90 operates at LOS D or better, with the exception of the area just east of the I-5, which operates at LOS F. I-90 in the eastbound direction operates at LOS F between I-5 and the East Mercer Way interchange. Across the East Channel Bridge, I-90 operates at LOS E until the Bellevue Way interchange, where I-90 operates at LOS F. East of Bellevue Way, I-90 operates at LOS D or better. The reversible center roadway operates at LOS B or better. The highest congestion is at the western origin of the reversible center roadway where automobiles coming from the D2 Roadway and the I-90 mainline access the reversible center roadway.

3.5.2.4 Freeway Safety

WSDOT's existing I-90 accident data were collected for the 3-year period (2004 to 2006). The accident analysis included the westbound, eastbound, and reversible center roadways. The extent of the analysis was between the I-90 western terminus to just east of I-405, slightly greater than an 8-mile corridor. The corridor-length accident rates for the eastbound, westbound, and center roadways are well below the average accident rate for urban interstate facilities in WSDOT's Northwest Region.

The accident analysis also identified high-accident locations and high-accident corridor locations as defined by WSDOT. A high-accident location is a spot location, less than one mile long, determined to have a higher than average rate of severe accidents during the previous two years. A high-accident corridor is a segment of a state highway facility longer than one mile, having a higher than average rate of severe accidents during a continuous period. Three I-90 high-accident locations were identified in the study area:

- Westbound off-ramp to Rainier Avenue S northbound
- I-405 southbound HOV to I-90 westbound HOV ramp
- Westbound off-ramp to I-405

No high-accident corridors were identified in the study area. Two high-accident corridors associated with ramps to and from I-405 are at the eastern fringe of the study area and outside the influence of the project.

3.5.3 Environmental Impacts

This section describes the physical and operational changes on I-90 resulting from the No Build Alternative and from implementation of light rail for the years 2020 and 2030. Consistent with the SR 520 Bridge Replacement and HOV Project Supplemental Draft EIS, which is slated to be published in late 2009 or early 2010, the year 2030 analysis assumed SR 520 improvements and tolling strategies for both the no-build and build conditions. Year 2020 analysis does not assume any improvements or tolling implemented on SR 520.

Along I-90, the East Link Project was compared to two No Build Alternatives even though the entire I-90 Two Way Transit and HOV Operations Project would need to be completed prior to the East Link Project so that HOV traffic can be moved from the center roadway to the outer roadways. Stage 1 of the I-90 Two Way Transit and HOV Operations Project was recently completed and Stage 2 is being designed, but Stage 3 may not be completed until just before East Link construction begins. If the I-90 Two Way Transit and HOV Operations Project is completed well before East Link construction begins, the reversible center HOV lanes would be available for bus transit, HOVs, and Mercer Island drivers in conjunction with the new HOV lanes. Because the HOV lanes in the outer roadway might not be completed until just before construction of East Link, two No Build Alternatives were analyzed:

1. One with the Stage 3 HOV lanes completed immediately before East Link, so that HOV and transit traffic shifts from using the center roadway to the outer roadway HOV lanes, but never uses

both as the same time. This is referred as the No Build Alternative with Stages 1 and 2 only.

2. One with the Stage 3 HOV lanes completed and the center roadway available for transit, HOV users, and Mercer Island drivers. In this No Build Alternative, both the center roadway and outer HOV lanes are open the entire distance between Seattle and Bellevue. This is referred to as the No Build Alternative with Stages 1 through 3.

Exhibit 3-13 is a schematic of the three stages of the I-90 Two Way Transit and HOV Operations Project, and Exhibit 3-14 provides the I-90 configurations between Seattle and Mercer Island with and without East Link.

In all future conditions (no-build and build) the SR 519 Intermodal Access Project is assumed to be completed. This project, on the western edge of I-90 provides an additional ramp from I-90 to Seattle at S Atlantic Street.

The following subsection describes the proposed future access and circulation modifications to I-90. These changes were incorporated into the 2020 and 2030 No Build Alternative and East Link travel forecasts (Section 3.5.3.2) and in the operational and safety analysis (Section 3.5.3.3). The *Transportation Technical Report* further describes these future access and circulation modifications.

3.5.3.1 Access and Circulation Modifications

Access and circulation along the I-90 corridor will be modified in the No Build Alternative by the I-90 Two Way Transit and HOV Operations Project and the SR 519 Intermodal Access Project, as discussed previously. With the East Link Project, access and circulation modifications would affect the D2 roadway, access to the center reversible roadway, and the HOV ramps connecting to Bellevue Way SE.

The project includes two options for use of the D2 Roadway that connects South Seattle with I-90; either the roadway would jointly operate with buses and light rail or it would operate with light rail exclusively. HOVs would not be allowed to use this roadway for either option with the East Link project. For the option that has exclusive light rail use in the D2 roadway, buses would be rerouted to other roadways to access I-90 from South Seattle (such as 4th Avenue S via SR 519).

With the East Link Project, the reversible center roadway access would be removed as well as its ramps connecting to Mercer Island. These reversible center roadway access connections with Mercer Island

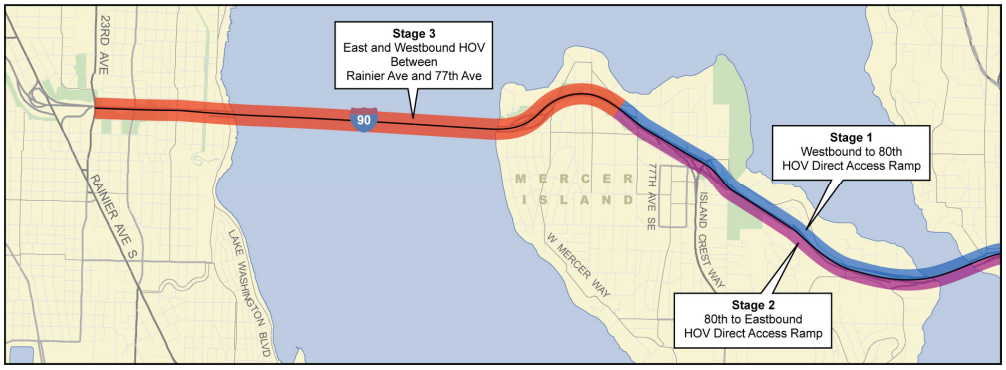
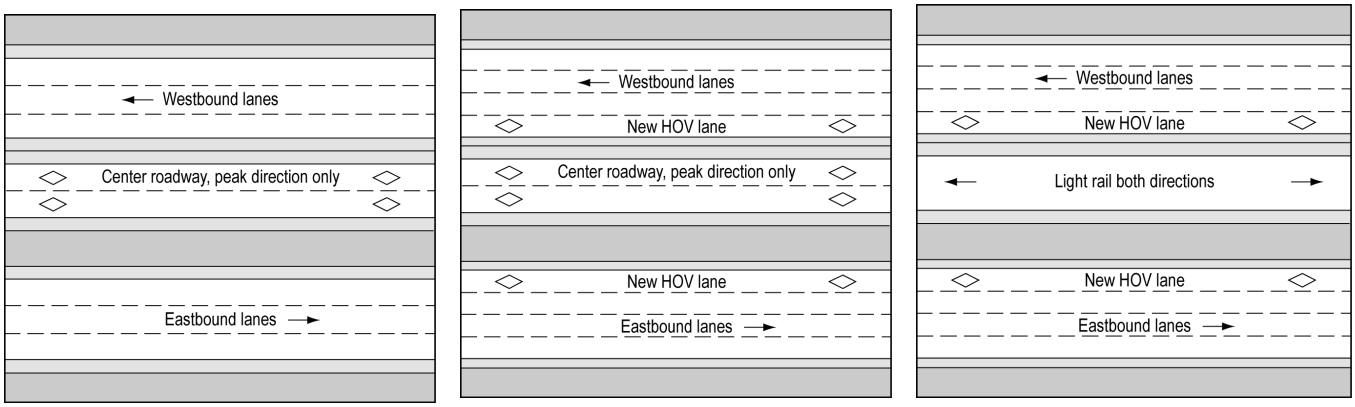


EXHIBIT 3-13
I-90 Two Way Transit and HOV Project Stages



I-90 Existing Conditions | *I-90 Two Way Transit and HOV Project* | *I-90 with Alternative A-1*

EXHIBIT 3-14
I-90 Configuration Before and After East Link

are at 77th Avenue SE and Island Crest Way. Mercer Island drivers would have direct access to the eastbound and westbound outer roadway HOV lanes. With the access modifications from the I-90 Two Way Transit and HOV Operations Project and the changes in access with light rail construction, Mercer Island drivers would continue to have access in both directions of I-90 from their downtown area (between 76th Avenue SE and Island Crest Way/SE 26th Street). In addition, with East Link, Mercer Island drivers would be eligible to use the HOV lanes in both directions of I-90 between Seattle and Island Crest Way as long as the lanes meet performance standards or until such time as they are managed differently based on the WSDOT and Mercer Island Access Plan.

If the center roadway is scheduled to be closed for light rail construction soon after the completion of the I-90 Two Way Transit and HOV Operations Project, the eastbound HOV off-ramp proposed at 77th Avenue SE, as part of the HOV Operations Project, could instead be built by Sound Transit and WSDOT to connect with the Island Crest Way eastbound off-ramp from the center roadway. This access modification is not expected to impact I-90 mainline operations and potentially could improve operations as this modification provides a connection to Mercer Island residents to the south. Bus use of the 77th Avenue SE ramp would be partially or wholly replaced by light rail service.

In Segment B, the Bellevue Way Alternative (B1), would close the I-90 eastbound HOV off-ramp and the westbound HOV direct access on-ramp at the Bellevue Way SE interchange because the light rail track would use the ramps beneath the westbound mainline roadway to exit the center roadway. The other Segment B alternatives (B2A, B2E, B3, and B7) would preserve the westbound HOV direct access on-ramp by exiting the center roadway on a new elevated structure over the westbound mainline. These other alternatives also have the option to either close or keep open the eastbound HOV off-ramp from I-90 to Bellevue Way SE. Conceptual design indicates that keeping the eastbound HOV ramp open would require reconstructing this ramp, reconstructing the eastbound I-90 to I-405 transit/HOV braided ramp, and widening the I-90 mainline to the south (see drawings in Appendix G1). The modifications to keep the ramp open would require design deviations for reduced inside shoulder width and possibly for stopping sight distance in the HOV lane, and traffic-lane widths. Further design refinement and evaluation would be required for this scenario. The analysis of these access modifications is discussed in Section 3.5.3.3, Highway Operational and Safety Impacts.

3.5.3.2 Traffic Forecasts

Vehicle traffic and transit ridership forecasts for I-90 were prepared using the PSRC and Sound Transit travel demand models, as discussed in Section 3.3.3. As part of the forecasting, the single-occupant vehicle, HOV, and transit mode share was calculated both with and without East Link. As expected with more congestion, the forecasts for the future No Build Alternative suggest that people would slightly shift towards HOV and bus usage. The forecasts suggest a substantial shift to transit across Lake Washington with the East Link Project, compared to the No Build Alternative, because light rail would provide shorter travel times than other transportation choices. At Screenline 2 (I-90 and SR 520), the results indicate a noticeable shift to using transit with the project. Table 3-18 indicates the mode share at Screenline 2. By 2030, the transit share across Lake Washington (SR 520 and I-90) would increase by up to 33 percent from the No Build Alternative. People would readjust their mode choice and choose to ride light rail because of faster travel times when compared to bus or auto modes. The overall transit mode share (combined eastbound and westbound) on I-90 alone would more than double from about an 11 and 8 percent share (AM and PM) without the project to slightly over a 20 percent share with the project in both AM and PM conditions. The pie charts in Exhibit 3-15 provide a mode share comparison between the No Build Alternative and East Link on I-90 in the year 2030 at Screenline 2. In both 2020 and 2030, the single-

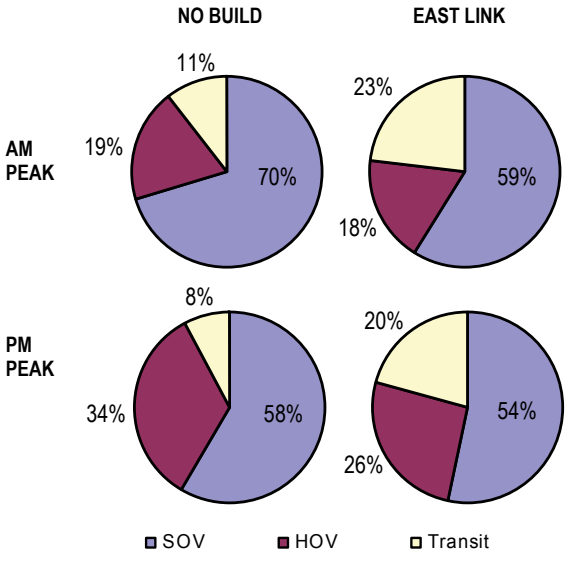


EXHIBIT 3-15
Screenline 2 (I-90 only) 2030 Mode Share

TABLE 3-18
Screenline 2 Existing, 2020, and 2030 Mode Share for I-90 and SR 520

Direction	Existing	2020 Single-Occupant Vehicle/HOV/Transit Mode Share (Percent)			2030 Single-Occupant Vehicle/HOV/Transit Mode Share (Percent)		
		No Build[a]	No Build[b]	Light Rail	No Build[a]	No Build[b]	Light Rail
AM Peak Period							
Westbound	65/20/15	70/15/15	65/21/14	56/25/19	64/16/20	62/18/20	57/21/22
Eastbound	76/18/6	74/18/8	74/18/8	69/20/11	69/18/13	69/18/13	67/17/16
PM Peak Period							
Westbound	62/33/5	60/34/6	62/32/6	61/31/8	56/34/10	57/34/9	55/33/12
Eastbound	57/30/13	54/34/12	57/31/12	56/29/15	54/30/16	53/32/15	51/30/19

[a] With Stages 1 and 2 of the I-90 Two Way Transit and HOV Operations Project.

[b] With Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project.

occupant vehicle and HOV mode share would decrease with East Link as people modify their mode choice and shift to light rail.

At Screenline 3, the transit mode share shifts would be less pronounced with the project as light rail would not cross the screenline. Slight changes to mode share are forecast at Screenline 3 in 2020 and 2030 with East Link.

3.5.3.3 Highway Operational and Safety Impacts

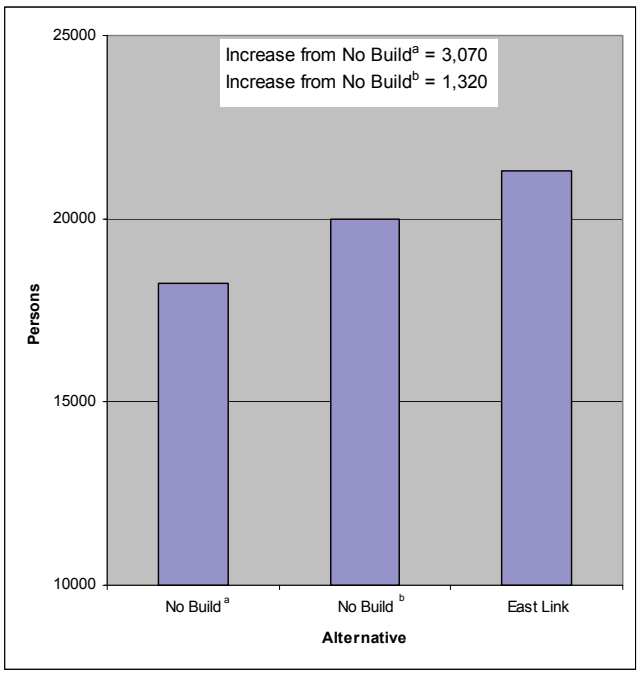
Based on the traffic forecasts discussed in Section 3.5.3.2, freeway operations during the AM and PM peak periods were analyzed for years 2020 and 2030. Similar to existing conditions, the following measures were used to assess I-90:

- Vehicle and person throughput and capacity
- Travel time
- Congestion maps/LOS
- Safety

Person and Vehicle Throughput and Capacity

Vehicle and person throughput on I-90 was tabulated at Lake Washington (Screenline 2) and Mercer Slough (Screenline 3) in the single-occupant vehicle, HOV, and transit modes. Transit includes both bus and light rail passengers for the project alternatives.

With East Link, the overall person throughput across the lake (Screenline 2) in the AM and PM peak hours in 2030 would increase by about 3,070 people (about 18 percent) when compared to the No Build Alternative with Stages 1 and 2 of the I-90 Two Way Transit and HOV Operations Project completed and about 1,320 people (about 7 percent) when compared to the No Build Alternative with Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project completed (Exhibit 3-16). This increase is because bi-directional light rail is a more efficient use of space in moving more people between Seattle and the Eastside than the one-direction center roadway with its restricted access and egress that limit vehicle capacity.



[a] With Stages 1 and 2 of the I-90 Two Way Transit and HOV Operations Project
[b] With Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project

EXHIBIT 3-16
I-90 2030 AM and PM Peak-Hour Person Throughput Across Lake Washington

In addition to the throughput improvements from East Link, the ability to carry more people across Lake Washington on I-90 would substantially improve with the project. Providing light rail in the center roadway would not only serve both directions at all times, but it would also provide a substantial capacity increase over the existing reversible center roadway capacity.

Compared to the No Build Alternative, East Link would increase the I-90 person capacity across Lake Washington. The project would use dedicated right-of-way, allowing East Link to operate reliably, independent of congested roadway conditions. The project is planned to operate during the peak periods with a train-arrival frequency (i.e., headway) of every 9 minutes by 2030. The project has the capacity to comfortably carry 600 persons per 4-car train and 800 persons with crowded conditions with 4 minute headways. During the peak period, East Link could carry a total of 18,000 to 24,000 people (9,000 to 12,000 per direction). This is the equivalent of about 6 to 10 freeway lanes of traffic (assuming that automobiles in the Puget Sound region average 1.17 persons per vehicle during commute hours, or about 2,300 persons per hour per freeway lane). The following subsections present the vehicle and person throughput results at Screenlines 2 and 3.

Screenline 2 (Lake Washington). At Screenline 2, compared to the No Build Alternative, person throughput would be substantially higher with the project for both AM and PM peak hours in 2020, as indicated in Table 3-19 and Exhibit 3-17. The greatest increase in person throughput is expected in the reverse-peak direction on I-90 (reverse peak is defined as eastbound in the AM peak period and westbound in the PM peak period) because light rail would provide a more reliable transportation option for people to use and is in the direction opposite of the reversible center roadway direction. Therefore, in these reverse-peak directions, there would be no modification to the I-90 roadway capacity across Lake Washington.

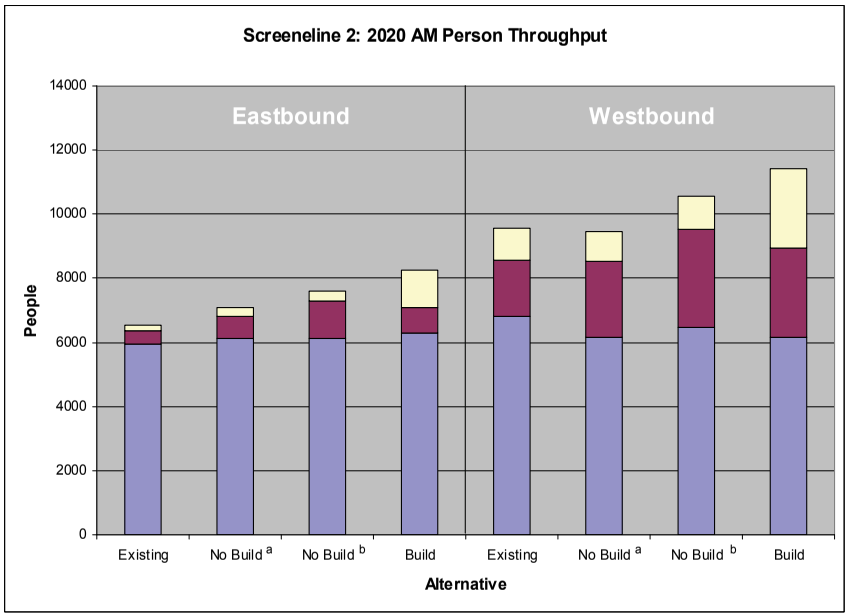
Overall, the East Link Project would increase total person throughput compared to the no-build condition by 8 to 18 percent (with Stages 1 through 3 or Stages 1 and 2 of I-90 Two-Way Transit and HOV Operations Project, respectively) in the 2020 AM peak hour and a respective 4 to 19 percent increase in the PM peak hour. In 2030, the East Link Project would increase total person throughput by 12 to 24 percent increase in the AM peak hour and a 3 to 11 percent increase in the PM peak hour compared to the two no-build conditions. In every comparison to the No Build Alternative, the person throughput with East Link is higher, except in the eastbound direction in the 2030 PM peak hour. This is due to a relatively low throughput in the eastbound HOV lane that crosses the screenline. Lane changing associated with the transition of the general-purpose lane to an HOV lane near the Rainier Avenue S interchange and the additional vehicles involved in the lane changing due to the center roadway closure result in reduced throughput in the HOV lane. If the lane were managed to accommodate more people, the throughput should be comparable between the project and the No Build Alternative.

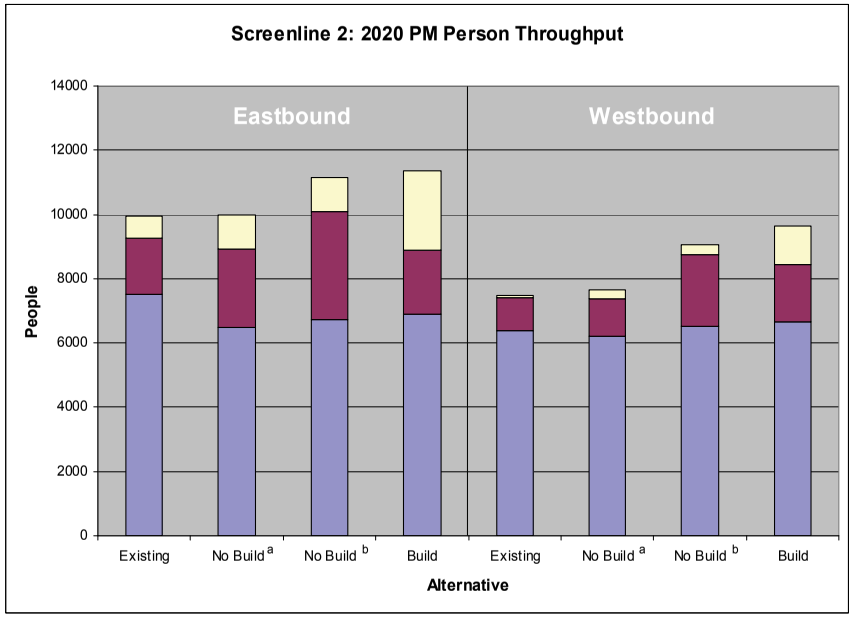
In terms of vehicle throughput, the project would have a similar to higher vehicle throughput than the No Build Alternative (with Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project) in the reverse-peak directions because roadway capacity would be unaffected in combination with people shifting to light rail. People shifting to light rail would slightly reduce congestion and therefore increase vehicle throughput. While in most cases the East Link Project would increase the person throughput in the peak direction (peak is westbound in the AM peak period and eastbound in the PM peak period), the vehicle throughput in the peak direction would be similar to slightly reduced compared to the No Build Alternative because the center roadway would be closed for vehicle access. By allowing Mercer Island drivers to use the outer roadway HOV lanes in the East Link build condition, the reduction in vehicle throughput would be minimized. Exhibit 3-17 and Table 3-19 provide Screenline 2 vehicle and person throughput for years 2020 and 2030.

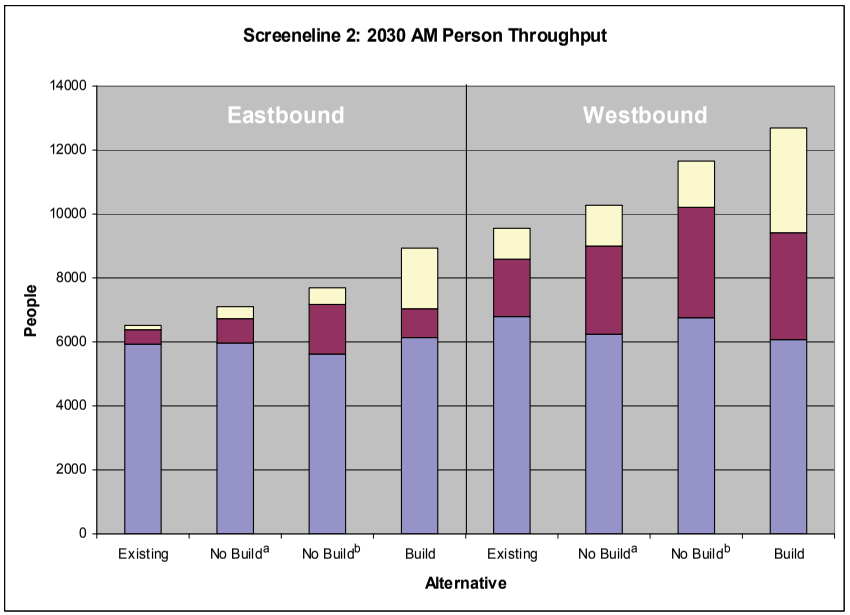
Screenline 3 (Mercer Slough). For the 2020 and 2030 total person throughput at Screenline 3, the East Link Project would increase person throughput in the AM peak hour when compared to the No Build Alternative with only Stages 1 and 2 of the I-90 Two Way Transit and HOV Project completed and would remain similar if Stage 3 of the I-90 Two Way Transit and HOV Project is completed as indicated in Table 3-20 and Exhibit 3-18. The PM peak-hour total person throughput at Screenline 3 with the East Link Project would be similar or higher compared to both no-build conditions. Compared to Screenline 2, changes in throughput at Screenline 3 would be less between the no-build and build condition, because light rail would not cross this screenline and HOV lanes are already provided at this location.

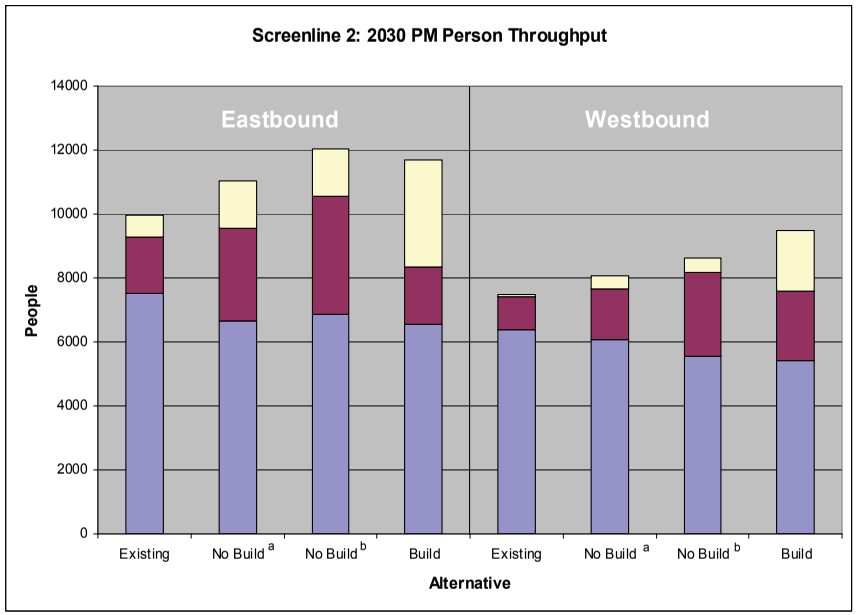
In the reverse-peak directions (eastbound in the AM peak hour and westbound in the PM peak hour), the person throughput with East Link compared to the two no-build conditions would be between 7 and 11 percent higher in the 2030 AM and PM peak hours.

In the westbound (peak) direction in the 2030 AM peak hour, person throughput with the East Link Project, compared to the two no-build conditions, is similar (2 percent less) to 7 percent higher. In the eastbound (peak) direction in the 2030 PM peak hour, person throughput would be up to 9 percent less than in the two no-build conditions. As stated in the









[a] With Stages 1 and 2 of the I-90 Two Way Transit and HOV Operations Project
[b] With Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project

SOV HOV Transit

EXHIBIT 3-17
2020 and 2030 I-90 Peak-Hour Person Throughput by Mode at Lake Washington (Screenline 2)

TABLE 3-19
2020 and 2030 Vehicle and Person Peak-Hour Throughput for I-90 at Lake Washington (Screenline 2)

	2020 AM		2020 PM		2030 AM		2030 PM	
	Vehicles	**Persons**	**Vehicles**	**Persons**	**Vehicles**	**Persons**	**Vehicles**	**Persons**
Westbound								
No Build[a]	7,200	9,500	6,000	7,650	7,550	10,300	6,250	8,050
No Build[b]	7,600	10,550	6,750	9,050	8,100	11,650	6,050	8,600
Light Rail	7,450	11,400	6,950	9,650	7,850	12,700	6,050	9,500
Percent Change in Persons[c]	+20% / +8%		+26% / +7%		+23% / +9%		+18% / +10%	
Eastbound								
No Build[a]	5,900	7,100	7,300	10,000	5,800	7,100	7,750	11,050
No Build[b]	6,200	7,600	7,550	11,150	5,900	7,700	7,950	12,050
Light Rail	6,200	8,250	7,300	11,350	6,100	8,900	6,900	11,700
Percent Change in Persons[c]	+16% / +9%		+14% / +2%		+25% / +16%		+6% / -3%	
Total								
No Build[a]	13,100	16,600	13,300	17,650	13,350	17,400	14,000	19,100
No Build[b]	13,800	18,150	14,300	20,200	14,000	19,350	14,000	20,650
Light Rail	13,650	19,650	14,250	21,000	13,950	21,600	12,950	21,200
Percent Change in Persons[c]	+18% / +8%		+19% / +4%		+24% / +12%		+11% / +3%	

[a] With Stages 1 and 2 of the I-90 Two Way Transit and HOV Operations Project.

[b] With Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project.

[C] Percent change between No Build Alternative (Stages 1 and 2) and East Link / percent change between No Build Alternative (Stages 1 through 3) and East Link.

Note: Due to rounding, values may not sum correctly.

TABLE 3-20
2020 and 2030 Vehicle and Person Peak Hour Throughput for I-90 at Mercer Slough (Screenline 3)

	2020 AM		2020 PM		2030 AM		2030 PM	
	Vehicles	**Persons**	**Vehicles**	**Persons**	**Vehicles**	**Persons**	**Vehicles**	**Persons**
Westbound								
No Build[a]	7,500	9,950	6,600	8,650	7,700	11,000	6,550	8,900
No Build[b]	8,200	11,050	7,300	9,550	8,600	12,100	6,450	8,750
Build	8,000	10,800	7,600	9,800	8,600	11,800	7,000	9,700
Percent Change in Persons[c]	+9% / -2%		+13% / +3%		+7% / -2%		+9% / +11%	
Eastbound								
No Build[a]	5,450	6,400	7,900	10,400	5,300	6,250	8,850	11,900
No Build[b]	5,550	6,500	8,100	10,700	5,350	6,350	9,050	12,150
Build	5,400	6,300	8,200	10,500	5,800	6,800	8,550	11,000
Percent Change in Persons[c]	-2% / -3%		+1% / -2%		+9% / +7%		-8% / -9%	
TOTAL								
No Build[a]	12,950	16,350	14,500	19,050	13,000	17,250	15,400	20,800
No Build[b]	13,750	17,550	15,400	20,250	13,950	18,450	15,500	20,900
Build	13,400	17,100	15,800	20,300	14,400	18,600	15,550	20,700
Percent Change in Persons[c]	+5% / -3%		+7% / 0%		+8% / +1%		0% / -1%	

[a] With Stages 1 and 2 of the I-90 Two Way Transit and HOV Operations Project.

[b] With Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project.

[C] Percent change between No Build Alternative (Stages 1 and 2) and East Link / percent change between No Build Alternative (Stages 1 through 3) and East Link. Note: Due to rounding, values may not sum correctly.

Screenline 2 (Lake Washington) discussion, the reduced eastbound HOV throughput would cause a reduction in the HOV throughput farther along at Screenline 3 (Mercer Slough).

The East Link Project also would change the travel patterns of transit riders across Screenline 3. Instead of accessing transit at the Eastgate Park-and-Ride Lot, some transit patrons would travel to the South Bellevue Station to access light rail, which would reduce the number of transit riders at Screenline 3 with the project.

In terms of vehicle throughput, East Link would accommodate a similar-to-higher vehicle throughput in the reverse-peak directions (eastbound in the AM peak hour and westbound in the PM peak hour) in years 2020 and 2030. This is because the I-90 roadway capacity would not change between the No Build Alternative and East Link and because, as people shift to light rail, the level of congestion on I-90 would slightly decrease and therefore increase vehicle throughput. In years 2020 and 2030, the vehicle throughput in the westbound direction with the project would remain similar to the No Build Alternative in the AM peak hour. Even though the reversible center roadway would be closed for vehicle access, drivers would be able to readjust and use the HOV lane in the outer roadway. In the eastbound PM direction, vehicle throughput in year 2020 would remain similar to the No Build Alternative but decrease by year 2030 when compared to the No Build Alternative for reasons stated previously in the Screenline 2 discussion. Exhibit 3-18 and Table 3-20 provide Screenline 3 vehicle and person throughput for years 2020 and 2030.

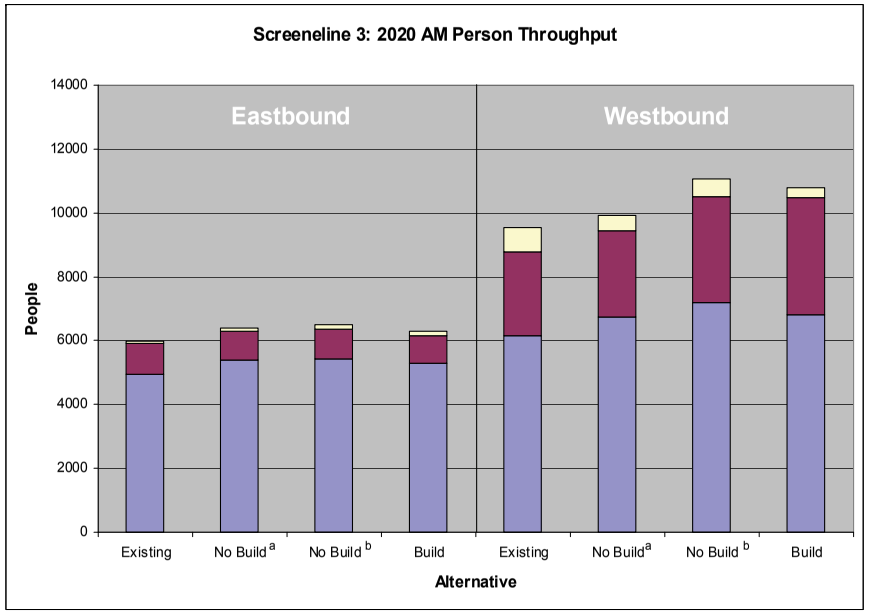
Travel Time

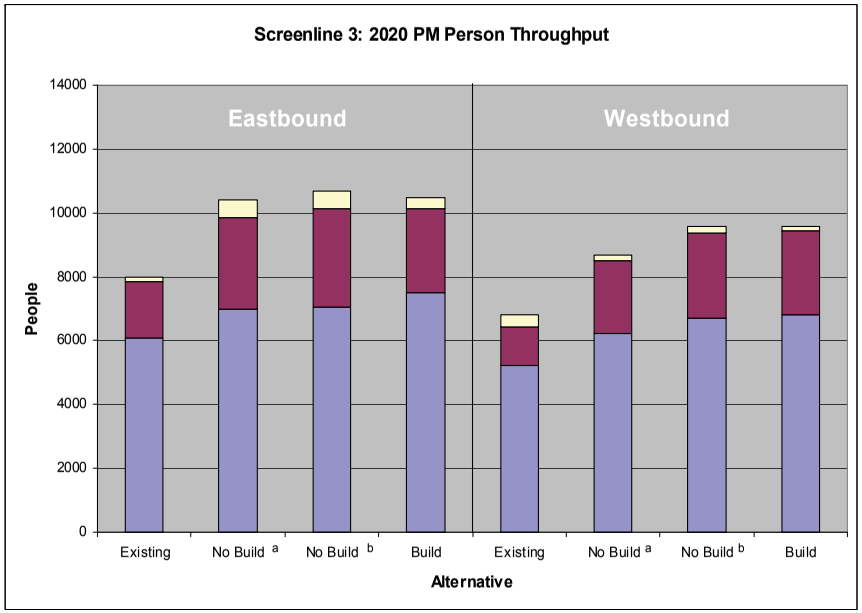
Under the No Build Alternative in 2020 and 2030, travel times would continue to become longer as congestion worsens. It is expected that, by 2030, SOV travel time from I-405 to Seattle in the AM peak period could more than double and take up to 32 minutes. In the opposite (eastbound) direction, single-occupant vehicle travel time could increase by approximately 70 percent, so that a trip that now takes an average of 14 minutes would be close to 25 minutes by 2030. In the PM peak period, a similar increase in travel time is expected. In the westbound direction, to go from I-405 to Seattle, the trip may take close to 30 minutes; an increase of over 60 percent from existing conditions. In the eastbound direction, a single-occupant vehicles going from Seattle to I-405 could take 20 minutes. Table 3-21 lists year 2020 and 2030 AM and PM peak period travel times for single-occupant vehicles, HOV, and transit between Seattle and I-405. The following subsections provide travel time comparisons for each of the three modes (single-occupant vehicle, HOV and transit) between the no-build conditions and the East Link Project.

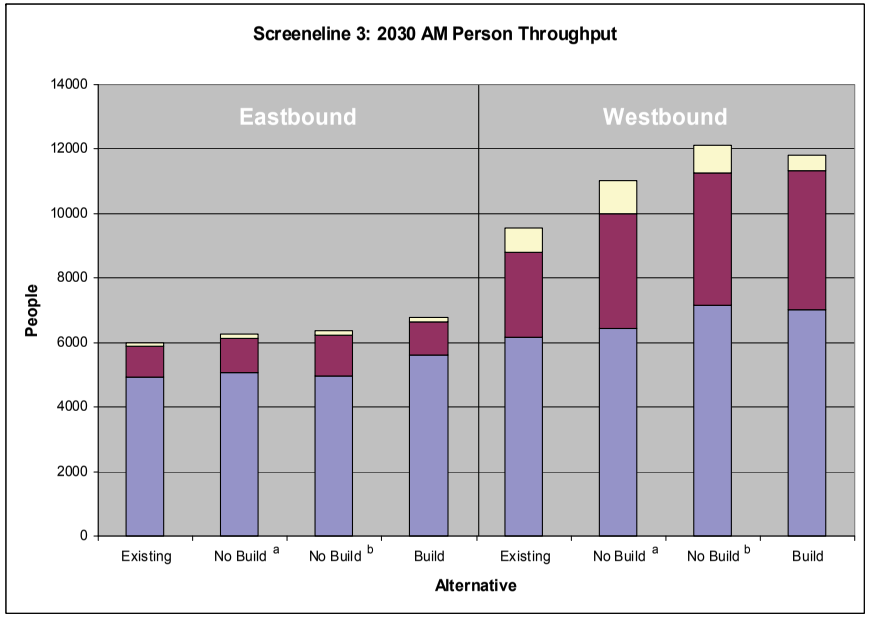
Single-Occupant Vehicle

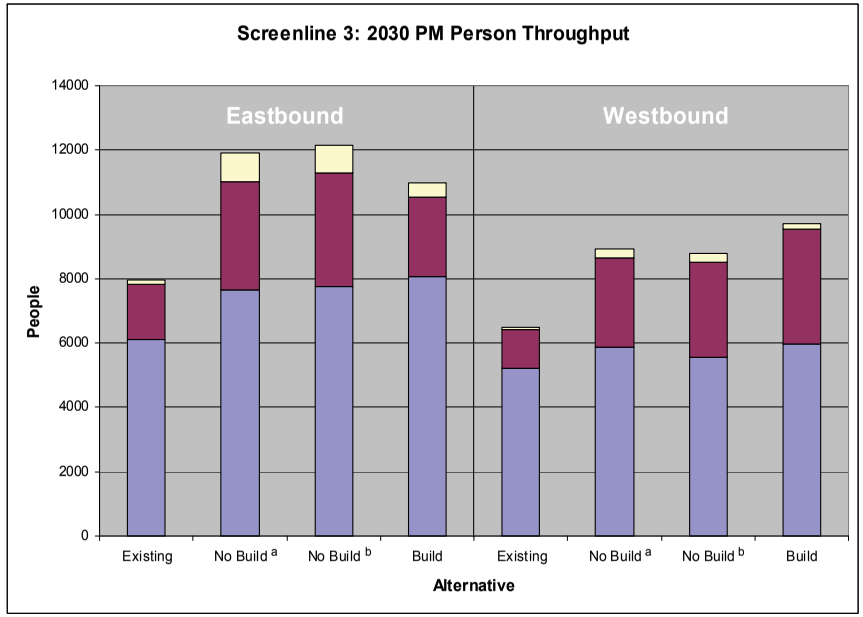
With light rail in 2020, single-occupant vehicle travel times are expected to stay relatively similar to the No Build Alternative (with Stages 1 and 2 of the I-90 Two Way Transit and HOV Project) in the AM peak period. In the PM peak period, single-occupant vehicle travel times would improve compared to the No Build Alternative with Stages 1 and 2 of the I-90 Two Way Transit and HOV Project. Approximately a 25 percent improvement in single-occupant vehicle travel time is expected in the PM peak period. This is expected to result in approximately a 4- to 5-minute travel time savings with the project. By 2030, larger travel time improvements are expected as congestion will worsen in the no-build conditions. Single-occupant vehicles in the AM peak period are expected to have better travel times compared to the No Build Alternative with the I-90 Two Way Transit and HOV Project Stages 1 and 2. It is expected that up to 9 minutes of savings would be experienced in the westbound direction and about 3 minutes of savings in the eastbound direction. In the PM peak period, single-occupant vehicle travel times with East Link would improve by 1 minute in the westbound direction and 5 minutes in the eastbound direction compared to the No Build Alternative with the I-90 Two Way Transit and HOV Project Stages 1 and 2. Improvements in travel time from the No Build Alternative (with the I-90 Two Way Transit and HOV Project Stages 1 and 2) to East Link can be attributed to a shift from people driving their autos to using light rail and the additional capacity provided with the outer roadway HOV lanes.

In year 2020, East Link single-occupant vehicle travel times compared to the No Build Alternative that assumes the I-90 Two Way Transit and HOV Project Stages 1 through 3 are completed, are similar to the previous paragraph's comparison as travel times in the AM peak period stay relatively similar and travel times in the PM peak period are improved. By 2030, single-occupant vehicle AM peak period travel time with light rail would get slightly worse in the westbound direction (by 1 minute) and better in the eastbound direction (about 6 minutes of savings). The travel time savings is expected in the eastbound direction because, with the No Build Alternative, only westbound travel in the reversible center roadway is allowed in the AM peak period and a shift to light rail would reduces congestion, contributing to travel time savings. In the PM peak period, westbound travel times with light rail are expected to improve by as









[a] With Stages 1 and 2 of the I-90 Two Way Transit and HOV Operations Project
[b] With Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project

SOV HOV Transit

EXHIBIT 3-18
2020 and 2030 I-90 Peak-Hour Person Throughput by Mode at Mercer Slough (Screenline 3)

TABLE 3-21
2020 and 2030 Travel Times on I-90 between Seattle and I-405 by Mode for No Build Alternative and Light Rail (minutes)

Travel Time Path Endpoint			AM Peak Period									PM Peak Period								
			SOV			HOV			Transit[d]			SOV			HOV			Transit[d]		
Year	Beginning Point	Ending Point	NB[a]	NB[b]	Bld[c]	NB[a]	NB[b]	Bld[c]	NB[a]	NB[b]	Bld[c]	NB[a]	NB[b]	Bld[c]	NB[a]	NB[b]	Bld[c]	NB[a]	NB[b]	Bld[c]
Westbound Outer Roadway																				
2020	I-405	I-5 to Downtown Seattle	22	21	22	12	13	11	- / -	- / -	15/11	22	20	17	14	11	11	18/16	15/11	- /11
2030	I-405	I-5 to Downtown Seattle	32	22	23	14	12	11	- / -	- / -	15/11	28	31	27	15	12	13	20/16	18/13	- /12
Reversible Center Roadway[e]																				
2020	I-405	Seattle (5th Avenue S)[f]	N/A	N/A	N/A	10	11	N/A	12/10	14/12	12[g] / -	N/A	N/A	N/A	10	10	N/A	13/11	13/11	12[g] / -
2030	I-405	Seattle (5th Avenue S)[f]	N/A	N/A	N/A	12	11	N/A	14/12	13/12	12[g] / -	N/A	N/A	N/A	10	10	N/A	13/11	13/11	12[g] / -
Eastbound Outer Roadway																				
2020	I-5 from Downtown Seattle	I-405	15	12	13	16	11	10	16/15	13/12	- /10	17	18	13	14	11	11	- / -	- / -	12/11
2030	I-5 from Downtown Seattle	I-405	22	25	19	20	15	13	18/19	14/17	- /11	20	20	15	17	12	13	- / -	- / -	12/11

[a] With Stages 1 and 2 of the I-90 Two Way Transit and HOV Operations Project.
[b] With Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project.
[c] "Bld" represents East Link with westbound Bellevue Way HOV on-ramp.
[d] Transit routes with stops on Mercer Island / Transit routes with no stops on Mercer Island.
[e] Reversible center roadway operates westbound in the AM peak and eastbound in the PM peak for the No Build alternative. It would be used by light rail with the project.
[f] Travel time is to/from 5th Avenue S via the I-90 D2 Roadway.
[g] Light rail travel time between International District/Chinatown Station and South Bellevue Station.
Note: Travel times are rounded to the nearest minute.

N/A = not applicable because the mode is not eligible to travel this path or the path is not prohibited.

SOV = single-occupant vehicle.

- Buses that do not travel on this roadway during this period and/or do not travel between these points.

much as 4 minutes, which is approximately 15 percent travel time savings. This is expected for reasons similar to those stated above in the AM peak period for the eastbound direction. In the eastbound direction, PM peak period travel times are expected to be slightly better than with the No Build Alternative, although less vehicle throughput is expected, as described previously.

Single-occupant vehicle travel times between Seattle and Mercer Island would remain similar or improve by as much as 3 minutes with East Link compared to the No Build Alternative, except in the PM eastbound direction. In this direction, travel from Seattle to Mercer Island would take between 7 (using the reversible roadway) and 14 (using the eastbound mainline roadway) minutes with the No Build Alternative but would take 10 minutes with East Link. For trucks, a similar travel time comparison between the no-build conditions and the East Link Project would be expected because they also travel in the general-purpose lanes.

Light rail travel between Seattle and Mercer Island and between Seattle and Bellevue Way would take 8 and 12 minutes, respectively. This would be a substantial improvement compared to a single-occupant vehicle trip that could take up to 16 minutes between Seattle and Mercer Island and up to 27 minutes between Seattle and Bellevue Way.

HOV and Transit

HOV and bus travel times on I-90 in years 2020 and 2030 under the No Build Alternative (with only the I-90 Two Way Transit and HOV Operations Project Stages 1 and 2) would stay similar or get longer than existing conditions as congestion would increase in the future.

HOV and bus travel times would be similar in the peak direction and improve in the reverse-peak direction for East Link and the No Build Alternative that assumes the I-90 Two Way Transit and HOV Project is completed (Stages 1 through 3) compared to existing conditions. In the AM and PM peak periods, it could take between 14 and 20 minutes for an HOV to travel between Seattle and I-405 for the No Build Alternative (with only Stages 1 and 2). For the No Build Alternative (Stages 1 through 3), HOV travel between Seattle and I-405 could take between 12 and 15 minutes. With East Link, it would take between 11 and 14 minutes. Buses traveling along I-90 in the reverse-peak direction are expected to have improved travel times because the outer HOV lane would provide buses with a faster lane than the general-purpose lanes they are restricted to use when the reversible center roadway is operating in the opposite direction.

The I-90 eastbound direct-access HOV off-ramp to Bellevue Way would be closed for Alternative B1 and would have the option to either be closed or open for B2A, B2E, B3, and B7. HOVs using this ramp in the No Build Alternative would use the general-purpose Bellevue Way off-ramp with the project. Closing the eastbound HOV ramp would not impact HOV or single-occupant vehicle travel times to Bellevue Way. For instance in the PM peak period, HOV and single-occupant vehicle travel times would remain slightly over 11 and 13 minutes, respectively, to travel from Seattle to Bellevue Way. This is because of the low level of congestion between Mercer Island and the Bellevue Way interchange that would result from the I-90 Two Way Transit and HOV Operations Project improvements, which include an auxiliary lane between East Mercer Way and I-405 ramps. In both the AM and PM peak hours, this modification would affect at most 100 HOVs.

For Alternative B1, which would also close the westbound direct-access HOV on-ramp from Bellevue Way, HOVs traveling between Bellevue and Seattle would use the general-purpose Bellevue Way on-ramp and weave across the general-purpose lanes to enter the HOV lane. This maneuver would increase the westbound HOV travel time from Bellevue Way to Seattle by approximately 10 to 12 minutes depending on the peak period. In the AM peak hour, about 200 HOVs are expected to use this ramp and fewer than 100 in the PM peak hour.

For the option that has exclusive light rail use in the D2 roadway, buses would be rerouted to other roadways to access I-90 from South Seattle (such as 4th Avenue S via SR 519), the bus travel time would increase substantially. In the year 2030 PM peak period, up to 13 additional minutes could be experienced by buses in the eastbound direction and 7 minutes in the westbound direction if buses are required to alter their service to the I-90/SR 519 interchange along South Atlantic Street.

With Alternative B1 or the exclusive light rail use in the D2 roadway option, the travel times for the other vehicles on I-90 are not expected to change from the travel times already described.

The *Transportation Technical Report* (Appendix H1) provides further descriptions and comparisons of the travel times.

Level of Service

Exhibit 3-19 provides congestion maps that indicate year 2030 vehicle travel speeds over time (vertical axis) and distance (horizontal axis). The time indicated on these maps is for a 2-1/2 hour duration in both the AM (6:30 to 9:00 AM) and PM (3:30 to 6:00 PM) peak periods. The distance covers I-90 from west of I-5 to east of the I-405 interchange. On the map, areas with yellow, red and black are generally considered LOS E/F conditions, with vehicle speeds typically at or below 55 mph, while green areas generally indicate LOS D or better conditions with vehicle speeds over 55 mph. This section focuses on year 2030 conditions, as the comparison between no-build and build conditions in year 2020 is similar.

Without light rail, increased congestion on I-90 is expected with congestion (red and black areas on Exhibit 3-19) occurring for longer distances and longer periods of each day. More congestion and longer travel times would make travel more difficult between two of the key employment and population centers of Puget Sound. Congestion and resulting vehicle hours of travel are expected to extend to longer periods, exceeding 3 hours for each peak period. Without light rail's ability to move more people, an imbalance in vehicle capacity across I-90 would reduce efficient and reliable transit service to the growing residential and commercial areas on the Eastside. The LOS of the freeway would continue to degrade and generally operate at LOS E or F conditions throughout the peak period. The center roadway would continue to be underutilized as access to the center roadway is constrained by congested roadways and traffic signals. These constraints reduce the ability to move high volumes of people to and from key urban centers across the lake.

In the AM peak period, congestion in the westbound direction would improve under the No Build Alternative if the I-90 HOV lanes are completed by the I-90 Two Way Transit and HOV Operations Project (Stages 1 through 3). With East Link, congestion in the westbound direction would have traits similar to those of the No Build Alternative with the I-90 Two Way Transit and HOV Project Stages 1 and 2. In the eastbound direction with East Link operating, there would be less AM peak congestion as people shift modes and use light rail.

In the PM peak period, the westbound direction would have a reduction in congestion with East Link compared to the two variations in the No Build Alternative, especially the No Build Alternative with only the I-90 Two Way Transit and HOV Project Stages 1 and 2 completed. This would be caused by more people shifting to use transit with the introduction of light rail in the corridor. In the eastbound direction, congestion would be heavier in the Rainier Avenue S/Mount Baker Tunnel area with East Link because the reversible center roadway would be closed, but there would be less congestion east of this area, near Mercer Island, because slightly less vehicle throughput could occur at the Rainier Avenue S/Mount Baker Tunnel area.

In addition to the general I-90 operating conditions, the performance of the HOV lane was evaluated to identify where it fails to meet WSDOT's HOV policy of a vehicle able to travel at least 45 mph during the peak commuting hour 90 percent of the time. In the No Build Alternative, Mercer Island single-occupant vehicles are not allowed in the outer roadway HOV lanes; however, they would have access to the center roadway. With East Link, vehicles to and from Mercer Island would be allowed to use the outer roadway HOV lanes as long as the lanes meet performance standards or until such time as they are managed differently based on the WSDOT and the Mercer Island Access Plan.

During the AM peak period in 2030 with the No Build Alternative, the westbound HOV lane would not operate acceptably near Rainier Avenue S as the lane transitions from an HOV lane to a general-purpose lane. With East Link, this HOV lane would continue to operate unacceptably near Rainier Avenue S and would additionally fail to meet the HOV performance threshold near Island Crest Way. In the eastbound HOV lane, both the No Build Alternative and East Link would operate acceptably at all locations except Rainier Avenue S where the general-purpose lane transitions to an HOV lane. In the option where the westbound HOV direct-access on-ramp from Bellevue Way is closed (Alternative B1), HOVs would use the general-purpose on-ramp and weave across the general-purpose lanes to enter the HOV lane. This would likely occur near Island Crest Way and degrade the HOV lane performance at this location as vehicles travel at slow speeds.

During the PM peak period in 2030, for the No Build Alternative, the westbound HOV lane would not perform acceptably from Island Crest Way to Rainier Avenue S. With East Link, the westbound HOV lane would operate acceptably at all locations except near Rainier Avenue S. In the eastbound direction of the No Build Alternative, the HOV lane would operate acceptably, except near Rainier Avenue S, where the general-purpose lane transitions to an HOV lane. With East Link, the eastbound HOV lane would, overall, perform similarly to the No Build Alternative, except

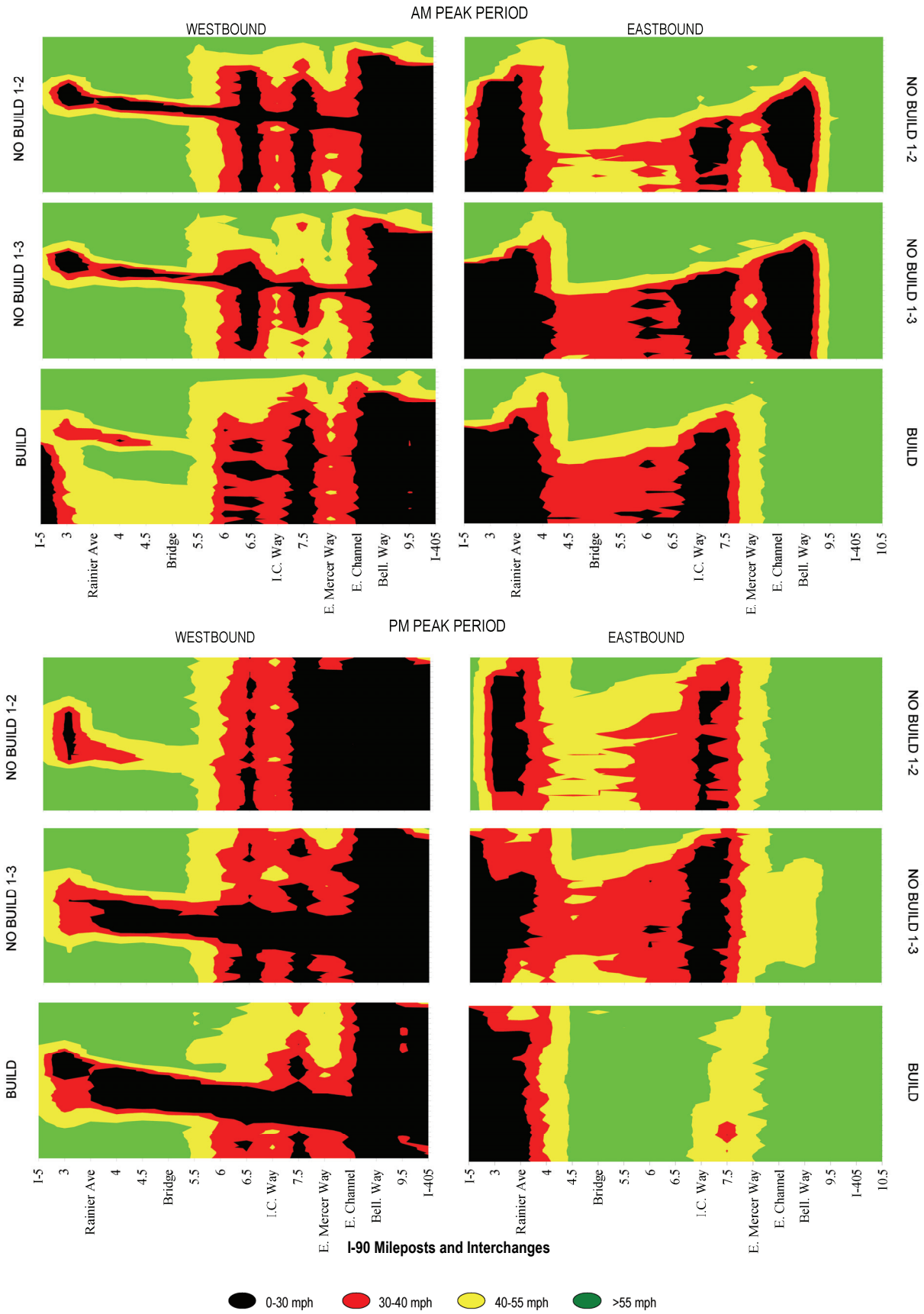


EXHIBIT 3-19

I-90 Year 2030 AM and PM Peak-Period Vehicle Speeds in General-Purpose Lanes

it would operate worse at the transition to an HOV lane near Rainier Avenue S.

Safety

Implementing the East Link Project would not increase the number of accidents in the corridor. Overall, with more people moving across Lake Washington with East Link and a similar number of accidents, the overall safety on I-90 would improve with the project.

The methodology used to predict future accident frequency for the I-90 roadways began with recognizing that accident rates for this high-volume freeway facility are not uniform throughout the day. It is known that, as volumes increase and congestion worsens, the accident frequency increases, resulting in higher peak-period accident rates. Based on the I-90 patterns observed, existing accident rates (using 2004-2006 accident data) were calculated for four time periods: morning, afternoon, midday, and evening plus early morning periods.

It was estimated that, in 2030, East Link would have no effect on the total number of crashes in the I-90 corridor—westbound outer roadway, eastbound outer roadway, and reversible facility combined. Because East Link would replace the reversible facility, the six to seven annual accidents predicted in the reversible lanes would be eliminated. This matches the expected increase in the outer mainline roadways as East Link shifts traffic to the outer roadways. When East Link is constructed, the higher VMT in the outer mainline roadway can result in a 1.9 percent increase (a potential for 7 additional accidents per year) in crashes when compared to the No Build Alternative with the I-90 Two Way Transit and HOV Project Stages 1 through 3. The reduction in reversible center roadway accidents with the project would offset the predicted accident frequency increase in the eastbound and westbound mainline roadways.

Relating the accident prediction in terms of how many people are moved across the lake is another method for assessing safety with the development of the light rail system. Because more people would travel through the corridor with the East Link Project and the expected accident frequency is expected to be similar to the No Build Alternative, the accident frequency on I-90 in terms of moving people would be lower. Overall, the East Link Project would eliminate the potential vehicle conflicts for all modes in the center roadway, improving traveler safety.

Specific to the D2 Roadway operations with light rail, if designated for joint use with buses, there would be about 30 vehicles (including light rail) per hour during the peak periods, or a vehicle every 1.5 to 2 minutes using this roadway. This number of light rail and bus vehicles would be substantially less than the number of vehicles for safe operations that was determined for Central Link and the bus/light rail joint operations in the Downtown Seattle Transit Tunnel. The findings from the *Central Link Initial Segment Environmental Assessment* (Sound Transit, 2002) established that 60 buses and up to 10 trains per hour would operate jointly. To further provide safe vehicle separation and management of bus and light rail vehicle movements on the D2 Roadway, a vehicle identification and signal system would be installed. In addition, bus on-ramps to the D2 Roadway would be equipped with gates to prevent auto/truck traffic from entering this roadway. These gates would be raised when buses entering the D2 Roadway are detected.

3.5.3.4 Construction Impacts

This section discusses potential impacts on I-90 and on other regional freeways.

Interstate 90

The impacts due to construction of the light rail infrastructure along I-90 were analyzed assuming a 2020 construction year. Prior to the construction of light rail on I-90, the I-90 Two Way Transit and HOV Project would be completed and the reversible center roadway would be closed for the construction of light rail. As a result, all bus routes, HOVs, and Mercer Island drivers would be rerouted to the outer roadway HOV lanes.

The amount of automobile congestion on the outer roadways during the East Link construction period would be similar to East Link operations because the reversible center roadway would be removed in both of these conditions. Therefore, the vehicle travel times during the construction period would be similar to the travel times during East Link operations. Although the number of autos that use I-90 would be similar in both of these conditions, the auto demand to use the outer roadway would be greater in the construction period because light rail would not be operating. Even though vehicle travel times would be similar for these two conditions, the person throughput would be less in the construction period because the reversible center roadway would not be operational for autos or light rail and hence fewer people would cross Lake Washington.

Compared to the No Build Alternative with only Stages 1 and 2 of the I-90 Two Way Transit and HOV Project completed, the single-occupant travel times in the construction period would generally be similar or better because the outer roadway HOV lanes would be constructed prior to the construction period. Vehicle

and person throughput during the construction period compared to the No Build Alternative with only Stages 1 and 2 of the I-90 Two Way Transit and HOV Project would be similar in the peak directions and higher in the reverse-peak directions because of the completion of the outer roadway HOV lanes.

Compared to the No Build Alternative when all three stages of the I-90 Two Way Transit and HOV Project are completed, the single-occupant travel times would be similar during the construction period in both the westbound and eastbound directions for the AM peak period and in the westbound direction in the PM peak period. In the eastbound PM direction, the travel times during the construction period would be shorter as less lane changing would occur between I-5 and the Mount Baker Tunnel with the closure of the center roadway ramp. While travel times would be improved, fewer vehicles would cross Lake Washington in the eastbound direction as the center roadway would be closed.

In the reverse-peak directions (eastbound in the AM period and westbound in the PM period), person throughput at Screenline 2 (I-90 Bridge) would be slightly higher during the East Link construction period than for the No Build Alternative when all three stages of the I-90 Two Way Transit and HOV Project are completed, because Mercer Island drivers would be able to use the outer roadway HOV lanes. Permitting Mercer Island drivers into the outer roadway HOV lanes would allow more vehicles to use the general-purpose lanes. In the peak directions (westbound in the AM period and eastbound in the PM period), person throughput is expected to be slightly higher in the No Build Alternative when all three stages of the I-90 Two Way Transit and HOV Project are completed than in the East Link construction period due to the capacity of the center roadway available in the No Build Alternative. Even though more people would cross Lake Washington in the No Build Alternative, the outer roadway HOV lanes, during construction, would accommodate a substantial portion of traffic displaced from the center roadway, as the center roadway is underutilized due to poor connections that do not provide enough capacity to effectively use the two lanes in the center roadway.

Travel time results by mode and segment for the two no-build conditions and for the East Link construction period are provided in the *Transportation Technical Report* (Appendix H1).

Within Segment A, the D2 Roadway would also require full closure. Buses would be detoured to adjacent I-90 accesses, either the SR 519/S Atlantic Street or Rainier Avenue S interchanges. The westbound mainline of I-90 would experience short-term partial nighttime closures near Bellevue Way for construction of the elevated structures for Alternatives B2A, B2E, B3, and B7. B1 would not require these closures because it would be at-grade underneath the mainline roadway. Also, I-90 ramps to and from Bellevue Way would experience short-term potential nighttime closures for the construction of the light rail elevated structures.

Other Regional Freeways

Short-term impacts on I-405 and SR 520 with the light rail construction are expected. All Segment C alternatives would close each direction (not concurrently) of I-405 at night during the construction of the elevated structure over I-405 causing drivers to detour and take alternative routes. I-405 impacts due to the Bellevue Way Tunnel (C1T) and 106th NE Tunnel (C2T) alternatives would occur adjacent to the NE 6th Street direct-access ramps, and impacts associated with the Couplet (C4A), 112th NE Elevated (C7E), and 110th NE Elevated (C8E) alternatives would occur just north of the NE 12th Street overpass across I-405.

Along the SR 520 mainline, impacts would be limited to short-term shoulder or lane closures. SR 520 eastbound on- and off-ramps from 148th Avenue NE to West Lake Sammamish Parkway would experience shoulder or lane closures and temporary lane shifts for all Segment D and E alternatives except when the elevated portions of E1 and E4 cross SR 520 near the Lake Sammamish Parkway interchange and the elevated portion of E1 crosses SR 520 near the SR 202 interchange. These elevated crossings would result in each direction of SR 520 being closed at night causing drivers to detour and take alternative routes. The westbound on-ramp and eastbound off-ramp at the SR 520 and SR 202 intersection would be reconstructed to provide clearance for the light rail structure that would be constructed for E2 and E4 alternatives.

3.5.4 Potential Mitigation

No mitigation would be necessary along the I-90 mainline with this project because the project would have either similar or improved vehicle travel times and increased person throughput across Lake Washington in both the AM and PM peak periods compared to the No Build Alternative. In addition, prior to the construction of the East Link Project, the I-90 Two Way Transit and HOV Project would be completed to provide HOV lanes on I-90 west to

Seattle that replace the reversible center roadway used by East Link.

For potential mitigation regarding transit on I-90, including mitigation for transit when the D2 Roadway is closed, refer to Section 3.4. For potential mitigation regarding freight on I-90, refer to Section 3.8. For potential intersection mitigation at or near I-90 ramp terminals refer to section 3.6.5.

3.6 Arterials and Local Streets

3.6.1 Methodology

This section describes the methodology applied to the analysis of existing conditions and environmental impacts on arterial and local street transportation elements, including roadway characteristics, intersection levels of service, safety, and parking.

3.6.1.1 Operations and Level of Service

Existing intersection vehicle movement counts were collected for the daily and AM and PM peak periods from local and state agencies (WSDOT, City of Seattle, City of Mercer Island, City of Bellevue, and City of Redmond). When study intersection count data were not available, new counts were acquired for the project. Additional information that was used in the intersection analysis includes lane geometry, existing traffic signal timing, truck percentages, on-street parking, proximity to bus stops, and speed limits.

The quality of roadway traffic operations is described in terms of LOS. LOS grades range from LOS A to F, where LOS A represents the best operation (most vehicles do not stop at all) and LOS F the poorest operation (most of the drivers stop and will wait more than a minute until proceeding through the intersection). Traffic volumes were analyzed using Highway Capacity Manual methodology, and LOS was calculated at signalized and unsignalized intersections (Transportation Research Board [TRB], 2000). A more detailed discussion on the intersection analysis, results, and LOS descriptions is provided in the *Transportation Technical Report*.

3.6.1.2 Traffic Safety

Accident data for arterial intersections were collected from each jurisdiction and reviewed within the study area. Existing accident rates were calculated as the number of accidents per million entering vehicles (MEV). An assessment of the potential for accidents to occur with each alternative is provided based on existing accident patterns and how the track profile aligns with roadway operations.

3.6.1.3 Parking

The analysis for parking supply and usage and for potential parking impacts from the East Link Project focused on areas with the greatest potential impact, within an approximately 0.25-mile radius of stations. Parking supply and demand data were collected during spring 2007 for the area surrounding each proposed station. The survey included a space occupancy count, taken once during the morning and afternoon on a weekday. The time of the count was outside the peak periods to reflect longer duration parking. The time periods selected represent "typical" conditions for parking demand based on the type of land use surrounding each station. Parking supply and demand were inventoried for two types of on-street parking: unrestricted and restricted. Restricted on-street parking includes all on-street parking that is restricted by meters, time limit signs, parking zones, or other restrictions.

3.6.2 Affected Environment

3.6.2.1 Intersection Operations and Level of Service

Intersections were analyzed to understand whether they are operating acceptably or failing. Intersections are considered failing when they do not operate at or better than the agency's intersection LOS standard. Intersections that fail typically mean that vehicles incur substantial delay and queuing. Table 3-22 lists the LOS standards for each of the jurisdictions in the East Link study area. These standards were compared to the existing and future intersection LOS results to indicate when an intersection is operating acceptably or failing.

TABLE 3-22
Intersection Level Of Service Standards

Jurisdiction	LOS Standard
Seattle	LOS D
WSDOT	LOS E
Mercer Island	LOS C
Bellevue – Segment B	LOS D
Bellevue – Segment C	LOS E
Bellevue – Segment D	LOS E
Redmond – Segments D and E	LOS E

The following subsections summarize existing LOS conditions in existing AM and PM peak hours at the study area intersections that were analyzed.

Segment A

In Segment A, 11 intersections in Seattle and 20 intersections on Mercer Island were analyzed for existing AM and PM peak-hour conditions. Five of the intersections in Seattle are within WSDOT's jurisdiction because the intersection is at the ramp end or located near a ramp.

Six intersections in Segment A currently fail to meet the LOS standards in the existing condition: five in the PM peak hour and one in the AM peak hour. Out of all the intersections that fail, most operate at LOS E or F except for the 77th Avenue SE and North Mercer Way intersection on Mercer Island (LOS D in AM peak hour). Other failing intersections are at or near I-90 ramps: I-90 at 4th Avenue S in Seattle (western terminus of I-90) and East Mercer Way at the I-90 westbound off-ramp in the PM peak hour. The three other failing intersections in the PM peak hour are at S Dearborn Street and Rainier Avenue S, S Royal Brougham Way and 4th Avenue S, and 77th Avenue SE and SE 27th Street.

Segment B

In Segment B, 11 intersections in Bellevue and 3 intersections in WSDOT's jurisdiction were analyzed for existing PM peak-hour conditions. Three intersections—118th Avenue SE and SE 8th Street, Bellevue Way SE and SE 30th Street, and Bellevue Way SE and South Bellevue Park-and-Ride Lot—currently operate at LOS F in the PM peak hour. All three intersections are close to interstate facilities and movements toward or away from the interstates operate poorly. All other intersections within Segment B operate at LOS D or better.

Segment C

In Segment C, 30 intersections in Bellevue and 7 intersections in WSDOT's jurisdiction were analyzed. Of the 37 study intersections in Segment C, only the intersection at NE 8th Street at 112th Avenue NE operates at LOS F in the PM peak hour. Ten intersections operate at LOS D or E, which indicates that these intersections are operating near or at capacity.

Segment D

In Segment D, 12 intersections in Bellevue and 16 intersections in Redmond were analyzed. Of the 26 intersections studied in Segment D, 5 are in WSDOT's jurisdiction. None of the intersections in Segment D currently operate at LOS F. Three intersections along 148th Avenue NE operate at LOS E: SR 520 westbound ramp, NE 24th Street, and 20th Avenue NE. All other intersections operate at LOS D or better. Generally, the worst operating intersections are located along the highest-volume and most congested arterials: 140th Avenue NE, 148th Avenue NE, 20th Avenue, and 156th Avenue NE.

Segment E

In Segment E, 22 intersections are in Redmond and 3 are in WSDOT's jurisdiction. The intersections of NE Leary Way and West Lake Sammamish Parkway, Avondale Road NE and NE Union Hill Road, and SR 202 and East Lake Sammamish Parkway operate at LOS F in the PM peak hour. The intersection of SR 202 and SR 520 westbound ramps operates at LOS E, while all other intersections in Segment E operate at or better than LOS D.

3.6.2.2 Traffic Safety

None of the study area intersections in Seattle have yearly accident totals higher than the city's standard 10 or more accidents per year at a signalized intersection and 5 or more accidents at an unsignalized intersection. Of the study intersections, Rainier Avenue S and S Massachusetts Street has the highest number of accidents, with seven accidents per year. The highest intersection accident rate on Mercer Island is at Island Crest Way and the I-90 eastbound off-ramp, with a rate of 0.75 accidents per million entering vehicles (MEV).

The intersection with the highest accident rate in Segment B is at 118th Avenue SE and SE 8th Street, with a rate of 0.27 accidents per MEV. In Segment C, two intersections have accident rates near or above 1.00 accident per MEV: 112th Avenue NE at NE 8th Street/I-405, and 110th Avenue NE at NE 10th Street. The highest accident rate in Segment D is at 130th Avenue NE and NE 20th Street, with an accident rate of 0.72 accidents per MEV. In Segment E, two intersections have intersection accidents rates over 1.00 accident per MEV: 164th Avenue NE and NE 76th Street and at 166th Avenue NE and SR 202, which have accident rates of 1.51 and 1.32 accidents per MEV, respectively.

3.6.2.3 Parking

Areas surrounding the proposed light rail stations have an on-street parking utilization rate of 72 percent or less, indicating that there is available on-street parking. Over half of the areas surrounding stations have a parking utilization of 50 percent or less. Table 3-23 lists the existing on-street parking utilization and supply information near the proposed stations. Restricted parking is not as likely to be used by light rail riders. Parking impacts identified due to the East Link Project are primarily unrestricted parking near light rail stations, as discussed in the following Impacts Section.

TABLE 3-23
Existing On-Street Parking Supply and Utilization in Study Area

Station	AM Period			PM Period		
	Supply[a]	Utilization	% Utilization	Supply[a]	Utilization	% Utilization
Segment A, Interstate 90						
Rainier	879	363	41%	879	335	38%
Mercer Island	108	73	88%	108	67	81%
Segment B, South Bellevue						
South Bellevue	438	51	12%	438	31	7%
SE 8th	301	24	8%	301	27	9%
118th	127	5	4%	127	5	4%
Segment C, Downtown Bellevue						
Old Bellevue	38	22	58%	38	20	53%
Bellevue Transit Center	–	–	–	–	–	–
East Main	50	5	10%	50	4	8%
Ashwood/Hospital	–	–	–	–	–	–
Hospital	26	8	31%	26	8	31%
Segment D, Bel-Red/Overlake						
124th	177	44	25%	177	55	31%
130th	152	63	41%	152	59	39%
Overlake Village	42	21	50%	42	18	43%
Overlake Transit Center	21	14	67%	21	14	67%
Segment E, Downtown Redmond						
Redmond Town Center	393	162	41%	393	175	45%
SE Redmond	41	29	71%	41	29	71%
Redmond Transit Center	485	303	62%	485	303	62%

[a] Total on-street unrestricted parking.

Notes:
Parking supply and demand data were collected in spring 2007 on all roads within a 0.25-mile radius of the stations.

Parking near the Mercer Island Station was collected in spring 2008 on all roads within a 0.25-mile radius of the station because the park-and-ride lot was closed during spring 2007.

In Segment A, 26 time-restricted on-street parking stalls with a utilization of 23 spaces were identified on Mercer Island. The parking survey on Mercer Island had the highest utilization rate in the study area at 72 percent. The parking located in the residential neighborhoods north of I-90 surrounding the Mercer Island Park-and-Ride Lot is restricted through a residential parking zone (RPZ) to reduce the impacts of park-and-ride spillover. The Mercer Island Park-and-Ride Lot has 447 parking spaces, of which 435 are currently used each weekday (King County Metro, 2008). On-street parking surrounding the Rainier Station is unrestricted and has a utilization of approximately 40 percent.

Private parking garages in the Seattle neighborhoods serve a majority of the parking demand within Segment A. Much of the private parking surrounding the Rainier Station is located on commercial and light industrial properties along Rainier Avenue S. Private off-street parking garages are located throughout the Mercer Island Town Center, and private off-street parking is within moderate walking distance of the Mercer Island Station. Regulations for private parking are enforced by the private property owners at their discretion.

In Segment B, on-street parking utilization rates were the lowest of any segment, with utilization rates around 10 percent. The on-street parking supply near the South Bellevue Station extended into the Enatai Neighborhood, while a majority of the parking supply on 118th Avenue SE was east of I-405. No restricted on-street parking exists in any of the areas surrounding the stations in Segment B. The two park-and-ride lots in the South Bellevue segment, South Bellevue Park-and-Ride and the Wilburton Park-and-Ride, are both currently used at or near capacity on weekdays (King County Metro, 2007). Private parking within Segment B includes private garages in Downtown Bellevue.

In Segment C, the majority of on-street parking in Downtown Bellevue is restricted; therefore, the parking utilization rates were generally low, with the

majority of the surveys calculating between 20 and 60 percent utilization. The on-street parking surrounding the Bellevue Transit Center had the highest utilization rate in Segment C, with percentages between 43 and 62 percent. There is no unrestricted on-street parking available in the areas around the Bellevue Transit Center and Ashwood/Hospital stations.

Private off-street parking within Segment C is located at major commercial and employment centers in Downtown Bellevue and the Ashwood/Hospital area. Demand for private parking is highest during the day consistent with traditional business hours.

All of the on-street parking surveyed in Segment D is considered unrestricted, with all of the surrounding areas near stations having parking utilization rates lower than 70 percent. The areas near the Overlake Village and Overlake Transit Center have the highest parking utilization rates (between 43 and 67 percent) but also have the lowest supply. The Overlake Village Park-and-Ride Lot has 203 spaces, of which 33 percent are used each weekday. The Overlake Transit Center has 170 parking spaces, of which are fully used each weekday (King County Metro, 2007). Segment D off-street private parking is located at Overlake Hospital and other commercial businesses along the Bel-Red corridor.

In Segment E, parking utilization rates varied between 42 percent near the Redmond Town Center Station and 71 percent near the SE Redmond Station. Of the 377 parking spaces at the Redmond Transit Center, 80 percent are used each weekday. The Bear Creek Park- and-Ride Lot, located about one mile east of the Redmond Transit Center, has 273 parking spaces, of which over 100 percent are used each weekday (King County Metro, 2007). Private off-street parking is located at major employment and commercial centers within Segment E. Free parking is located at the Redmond Town Center.

3.6.3 Environmental Impacts

This section forecasts future vehicular traffic and trips associated with the stations from the East Link Project. Potential impacts on the arterial and local street operations (including property access and circulation patterns), traffic safety, and parking are assessed. A major component of the impact analysis for arterial and local street operations is the intersection LOS analysis for years future 2020 and 2030. A detailed discussion of the roadway and intersection impact analysis assumptions is presented in the *Transportation Technical Report*.

The intersection LOS analysis compared the 2020 and 2030 years for the East Link Project and the No Build Alternative in each segment study area. In general, the analysis predicted that, for light rail along at-grade profiles or elevated within the roadway right-of-way, intersections generally would operate at an LOS similar to that of the No Build Alternative, although a few intersections in the study area may degrade depending on the alternative and intersection movements. The similarity occurs partly because a similar roadway capacity is provided in most cases with East Link, but also because light rail trains, operating in at-grade profiles, are generally able to safely travel through intersections without substantial signal timing adjustments. At-grade alternatives outside of Downtown Bellevue would receive priority at the traffic signals. Although changes to the signal coordination are expected to be minimal because the traffic signal's detection of an approaching light rail train may occur up to one minute prior to the train arriving. Within Downtown Bellevue, at-grade alternatives would receive some priority and traffic signal coordination would be maintained. For alternatives with either elevated or tunneled sections, intersections, in general, are expected to have operations similar to the No Build Alternative because these profiles are generally outside the roadway right-of-way.

Individual station impacts are described in each of the following segment discussions, but, overall, intersections near potential stations are expected to operate in most cases at an LOS similar to the No Build Alternative. Stations that include park-and-ride facilities are expected to generate more auto trips than other stations. Therefore, at these locations, the intersections immediately adjacent to the stations may operate worse with the East Link Project than under the No Build Alternative because of a potential for increased traffic at these intersections.

3.6.3.1 Traffic Forecasts and Station Trips

To evaluate impacts of the No Build Alternative and East Link Project on arterials and local streets, safety, and parking facilities, traffic was forecasted to determine the number of vehicles that would be on these facilities in the years 2020 and 2030. The analysis in this section builds on the regional traffic forecasts presented in Section 3.3.3 and the ridership estimates presented in Section 3.4.3.6.

Overall, the annual auto growth rate is expected to be between 1 and 2 percent per year within each segment for the No Build Alternative. With East Link, however, the study area is expected to experience slight changes in travel patterns as people adjust their mode of

transportation and shift to light rail, thereby avoiding vehicle congestion and improving their travel time. This is further discussed in Section 3.3, Regional Travel. Additional information on the traffic forecasts is provided in the *Transportation Technical Report* in Appendix H1.

Park-and-ride and passenger drop-off/pick-up auto trips generated by the proposed East Link stations were calculated for each station. The number of person trips were calculated based on the alternative that generates the highest PM peak-period (3-hour) ridership forecasts for each station and PM peak bus service levels provided by Metro and Sound Transit as part of the transit integration plan prepared for this project (Sound Transit, 2007). Year 2020 and 2030 daily and PM peak-period ridership for the highest ridership alternatives at each station are summarized by total auto and person trips in Table 3-24.

Within the study area, five of the proposed park-and-ride stations already exist as park-and-ride facilities. These are at Mercer Island, South Bellevue, Overlake Transit Center, Overlake Village, and Redmond

TABLE 3-24
2020 and 2030 PM Peak-Period (3-Hour) and Daily Station Ridership

Station	Alternative	2020			2030		
		Daily Station Light Rail Boardings[a]	PM Peak Auto Trips[b]	PM Peak Person Trips[c]	Daily Station Boardings[a]	PM Peak AutoTrips[b]	PM Peak Person Trips[c]
Segment A, Interstate 90							
Rainier	A1	2,500	180	1,210	3,500	210	1,440
Mercer Island	A1	2,000	360 (520)	920	2,500	380 (520)	1,040
Segment B, South Bellevue							
South Bellevue	B1, B2A, B2E, B3	3,000	1,440 (1,660)	1,930	4,000	1,910 (1,750)	2,700
SE 8th	B2A, B2E	500	40	250	500	50	350
118th	B7	1,000	480 (1,090)	630	1,000	560 (1,100)	780
Segment C, Downtown Bellevue							
Old Bellevue	C1	1,500	120	850	2,000	210	1,410
Bellevue Transit Center	All Segment C Alternatives	4,500	400	4,820	7,500	600	7,320
East Main	Segment C Alternatives from B3, B7	2,000	160	1,100	3,500	270	1,860
Ashwood/ Hospital	C3T, C4A, C7E, C8E	500	50	330	1,000	150	990
Hospital	C1T, C2T	500	50	320	500	70	480
Segment D, Bel-Red/Overlake							
124th	D2A, D2E, D3	<250	20	90	500	20	140
130th	D2A, D2E, D3	1,000	300 (350)	550	1,000	350 (360)	710
Overlake Village	All Segment D Alternatives	1,000	340 (270)	670	1,500	600 (310)	1,320
Overlake Transit Center	All Segment D Alternatives	3,000	520 (410)	1,990	4,500	690 (450)	2,970
Segment E, Downtown Redmond							
Redmond Town Center	All Segment E Alternatives	1,500	140	980	1,500	160	1,100
SE Redmond	All Segment E Alternatives	1,000	910 (1,560)	880	1,500	1,210 (1,620)	1,170
Redmond Transit Center	E2	500	170 (410)	340	500	240 (420)	430

[a] The highest alternative ridership data are shown for each station.

[b] The PM peak auto trips include drop-off/pick-up and park and ride (if applicable) trips. At stations with a park and ride, the auto trips outside the parenthesis are forecasts from the Sound Transit ridership model while the auto trips in parentheses are the trips used in the traffic analysis. These values can differ if the demand is different than the capacity of the park-and-ride lot and if the park-and-ride currently exists, because only the difference between the existing and the planned capacity is used in the traffic analysis.

[C] PM peak person trips include all people boarding and alighting bus and light rail.

Note: Due to rounding, ridership may not sum exactly to totals.

Transit Center stations. With the light rail project, the total number of parking stalls at the South Bellevue and Overlake Transit Center stations would increase. The 118th, 130th, and SE Redmond stations are proposed to be new park-and-ride facilities with this project. The number of parking stalls at the Mercer Island, Overlake Village, and Redmond Transit Center stations would not be increased with this project. For the traffic analysis, these park-and-ride lots were assumed to be at full capacity. Section 3.6.3.4 identifies the existing and proposed parking stalls at park-and-ride station and the number of autos expected to park there.

For the interim terminus ridership forecasts, only two stations are predicted to have a noticeable increase in daily boardings: Overlake Village Station and Overlake Transit Center Station. These increases are largely due to the changes in bus service that would be planned to serve these stations if they are interim termini. Therefore, the increase in boardings is mainly due to people transferring to and from bus service and would not be expected to have a noticeable impact on roadway operations. Table 3-25 provides daily ridership information at each potential interim terminus station.

3.6.3.2 Arterial and Local Street Operations

This section provides information by segment for arterial and local street operations. This includes impacts on intersection LOS and operations and on property access and circulation for the project alternatives, interim terminus stations, and maintenance facilities. Traffic safety on the arterial and local streets is addressed in Section 3.6.3.3, and parking impacts are discussed in Section 3.6.3.4. The *Transportation Technical Report* provides the complete list of roadway and intersection projects assumed in 2020 and 2030 in each project segment. Exhibits 3-20 through 3-25 provide year 2030 intersection operations with and without the project. For the year 2020 intersection exhibits, refer to the *Transportation Technical Report*.

Segment A

In Segment A, arterial and local streets are within the cities of Seattle and Mercer Island. With the No Build Alternative, local roadway access on Mercer Island to the I-90 outer roadway HOV lanes would be provided by direct access ramps as part of the I-90 Two Way Transit and HOV Operations Project. With East Link, the I-90 reversible center roadway would be converted for exclusive light rail use, as discussed in Section 3.5.

TABLE 3-25
2020 and 2030 PM Peak-Period (3-Hour) and Daily Interim Terminus Station Ridership

Interim Terminus Station	2020						2030					
	Daily Station Boardings[a]	Increase in Daily Boardings[b]	PM-Peak Auto Trips[c]	Increase in Auto Trips[bc]	PM-Peak Person Trips	Increase in Person Trips[b]	Daily Station Boardings[a]	Increase in Daily Boardings[b]	PM-Peak Auto Trips[c]	Increase in Auto Trips[bc]	PM-Peak Person Trips	Increase in Person Trips[b]
Ashwood/ Hospital[d]	500	0	40	0	260	-70	1,000	0	80	0	540	-450
124th	500	<250	60	50	430	340	1,000	500	90	70	600	460
130th	1,000	0	380 (370)	90 (20)	630	80	1,000	0	460 (380)	110 (20)	810	100
Overlake Village	3,000	2,000	290 (260)	0 (0)	1,740	1,070	4,000	2,500	360 (270)	0 (0)	2,490	1,170
Overlake Transit Center	4,000	1,000	410 (390)	0 (0)	2,710	710	6,000	1,500	550 (420)	0 (0)	3,810	840
SE Redmond	1,500	500	1,010 (1,580)	100(20)	1,140	260	2,000	500	1,350 (1,640)	140 (30)	1,500	330
Redmond Town Center	1,500	0	150	10	1,060	80	2,000	500	200	40	1,370	270

[a] The highest ridership alternative is shown for each interim terminus station.

[b] Increase from Table 3-24.

[c] The PM peak auto trips include drop-off/pick-up and park and ride (if applicable) trips. At stations with a park and ride, the auto trips outside the parenthesis are forecasts from the Sound Transit ridership model while the auto trips in parentheses are the trips used in the traffic analysis. These values can differ if the demand is different than the capacity of the park-and-ride lot and if the park-and-ride currently exists, because only the difference between the existing and the planned capacity is used in the traffic analysis.

[d] Hospital interim terminus station ridership would be similar to ridership for Ashwood/Hospital Station.

The 77th Avenue SE and Island Crest Way reversible center roadway accesses would be eliminated and vehicles would use other I-90 access points. These access points could include the West Mercer Way, 76th Avenue SE, 77th Avenue SE, and Island Crest Way interchanges.

Operations and Level of Service. Throughout the entirety of Segment A, the light rail profile is in an exclusive right-of-way separated from vehicle traffic, except if bus/rail joint use is implemented in the D2 Roadway. Because light rail would operate in an exclusive right-of-way, there would be minimal direct impact on the local streets. Year 2030 intersection operations in Segment A for the No Build Alternative and East Link are depicted in Exhibits 3-20 and 3-21.

With East Link the following intersections would not meet agency standards and operate worse than in the no-build condition:

- West Mercer Way and 24th Avenue SE
- 80th Avenue SE and SE 27th Street
- 77th Avenue SE and Sunset Highway
- 77th Avenue SE and the I-90 eastbound HOV off-ramp
- 77th Avenue SE and N Mercer Way
- 77th Avenue SE and SE 27th Street
- 76th Avenue SE/N Mercer Way and I-90 westbound on-ramp

The following provides further description of intersection operations with East Link.

During the AM and PM peak hours, intersection operations in Seattle with East Link would vary only slightly when compared to the No Build Alternative. In the AM peak hour, intersection operations would generally stay the same or improve in Seattle, especially along Airport Way S and S Dearborn Street, because HOV access from the I-90 D2 Roadway would be restricted. HOVs would likely shift to the I-90 western terminus at S Atlantic Street/SR 519 and could lead to slightly worse intersection operations in this area.

During the PM peak hour, intersection operations in Seattle would vary slightly when comparing the East Link Project to the No Build Alternative. At the I-90 D2 Roadway terminus at 5th Avenue S and Airport Way S/S Dearborn Street, intersection operations again are expected to improve because the HOV access to the D2 Roadway would not be permitted. If the D2 Roadway is not operated under joint-use conditions, AM and PM peak hour intersection operations would further improve at the D2 Roadway terminus and slightly degrade at the I-90 terminus.

On Mercer Island, some intersections that provide access to or are adjacent to I-90 may experience some degradation in operations with East Link compared to the No Build Alternative due to the changes in I-90 access. With these access changes and an LOS C standard for Mercer Island, four intersections in the 2020 AM peak hour are expected to not meet agency standards and operate worse than in the no-build condition. These four intersections are W Mercer Way and 24th Avenue SE, 77th Avenue SE and Sunset Highway, 77th Avenue SE and N Mercer Way, and 77th Avenue SE and SE 27th Street.

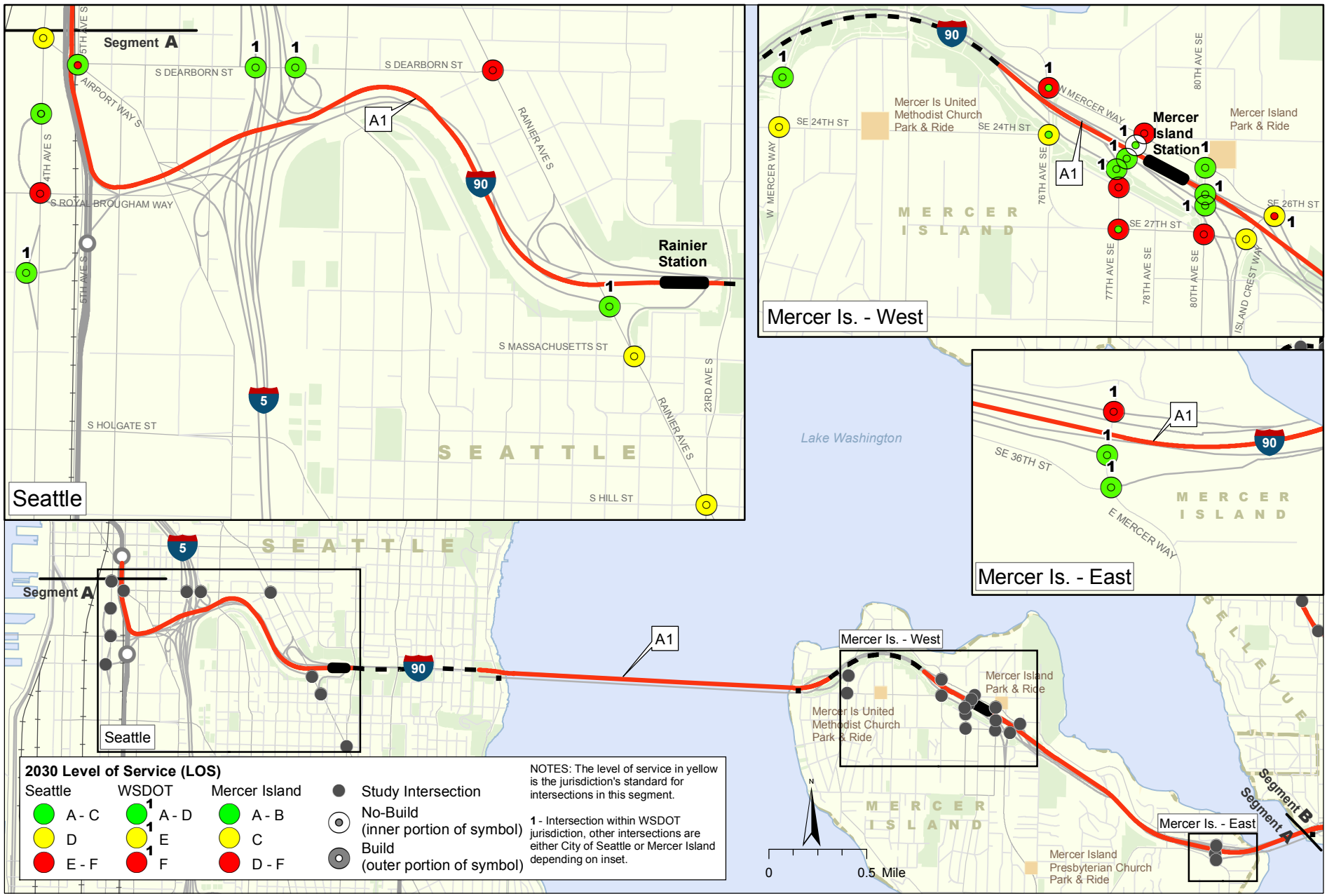
By 2030, the 76th Avenue SE/North Mercer Way at I-90 westbound on-ramp and 80th Avenue SE at SE 27th Street intersections would not meet agency standards and operate worse than in the no-build condition. The intersection of W Mercer Way and 24th Avenue SE would meet agency standards.

Similar to the AM peak hour, intersections on Mercer Island that provide access to or are adjacent to I-90 with East Link may experience some degradation in operations during the PM peak hour due to changes in access. With these access changes and an LOS C standard for Mercer Island, six intersections in the 2020 PM peak hour are expected to not meet agency standards and operate worse than in the no-build condition. These intersections are W Mercer Way and 24th Avenue SE, 80th Avenue SE and SE 27th Street, 77th Avenue SE and Sunset Highway, 77th Avenue SE and I-90 eastbound HOV off-ramp, 77th Avenue SE and N Mercer Way, and 76th Avenue SE/North Mercer Way By 2030 the same intersections would continue to not meet agency standards and operate worse than in the no-build condition with the exception of 77th Avenue SE and I-90 eastbound HOV off-ramp.

Property Access and Circulation. Within Segment A, East Link is not expected to affect property access or vehicular circulation on arterial streets because the proposed stations would be located at existing transit stations and Alternative A1 is located on I-90 and does not travel along arterial or local streets.

Segment B

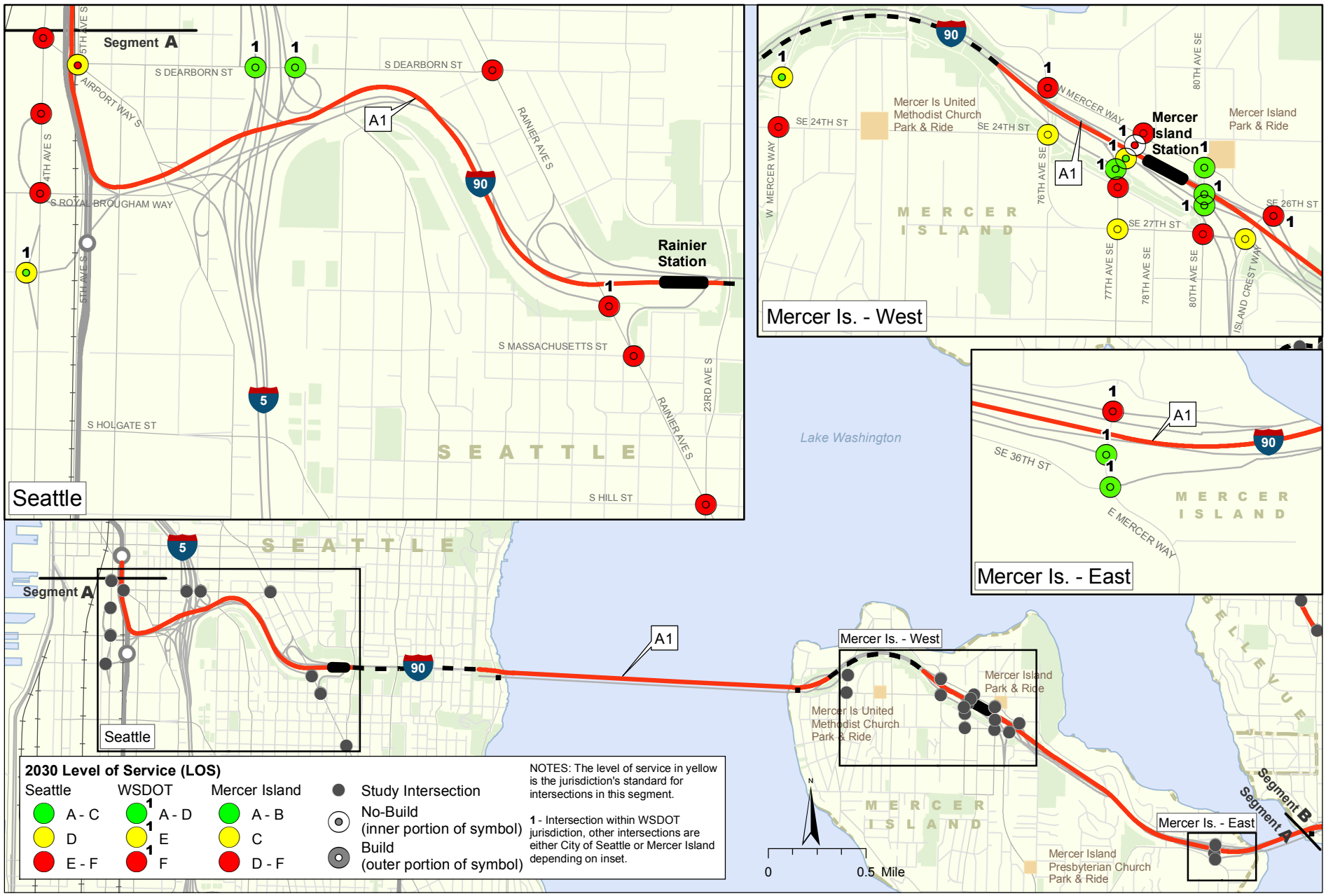
With the No Build Alternative, the physical characteristics of the arterials and local roadways in 2020 and 2030 would remain the same as in existing conditions for all major roadways within this segment.



Source: Data from King County (2006) modified by CH2M HILL.

NOTE: The level of service in white indicates that this intersection does not exist for the build condition.

Exhibit 3-20 **2030 AM No Build and Build Level of Service at Intersections Segment A**
East Link Project



Source: Data from King County (2006) modified by CH2M HILL.

NOTE: The level of service in white indicates that this intersection does not exist for the build condition.

Exhibit 3-21 **2030 PM No Build and Build Level of Service at Intersections Segment A**
East Link Project

With East Link, local access changes related to the I-90 reversible center roadway closure would occur from removing the I-90 eastbound HOV direct-access off-ramp to Bellevue at Bellevue Way. If the Bellevue Way Alternative (B1) is selected, both eastbound and westbound HOV direct-access ramps at this interchange would be removed because of the at-grade connection.

Operations and Level of Service. Year 2030 intersection operations in Segment B for the No Build Alternative and East Link are shown in Exhibit 3-22.

Under the No Build Alternative, intersection LOS in 2020 and 2030 is expected to degrade as traffic volumes increase on the roadways. Four intersections are expected to operate at LOS F in year 2020.

- SE 30th Street and SE Bellevue Way
- 112th Ave SE and Bellevue Way (South Bellevue Park-and-Ride Lot entrance)
- SE 8th Street and 118th Avenue SE
- SE 6th Street and 114th Avenue SE

By 2030, with the planned projects along I-405 in Bellevue, the 114th Avenue SE and SE 6th Street intersection would be modified and operate at an acceptable LOS. The other three intersections are expected to continue operating at LOS F in the 2030 No Build Alternative:

- SE 30th Street and SE Bellevue Way
- 112th Ave SE and Bellevue Way (South Bellevue Park-and-Ride Lot entrance)
- SE 8th Street and 118th Avenue SE

The following intersections would not meet agency standards with East Link and operate worse than in the no-build condition in 2020 and 2030.

- 112th Avenue SE and Bellevue Way SE (B1, B2A, B3)
- 118th Avenue SE and SE 8th Street (B7)

The following paragraphs provide further description of intersection operations with East Link.

The Bellevue Way Alternative (B1) is an at-grade profile from I-90 to the South Bellevue Station, and the 112th SE At-Grade Alternative (B2A) and the 112th SE Bypass Alternative (B3) are at-grade profiles from the South Bellevue Station to the northern border of Segment B. These at-grade profiles would degrade intersection operations on Bellevue Way SE at the South Bellevue Station entrance on Bellevue Way and the Bellevue Way SE and 112th Avenue SE intersection because of increased traffic associated with the expanded park-and-ride lot. B2A and B3 are not expected to have any other intersection impacts. Under B1, the Bellevue Way SE at SE 30th Street intersection would become signalized, which would improve the intersection operations and access to the Enatai Neighborhood. No other intersections along Bellevue Way, where light rail operates at-grade, are expected to experience worse intersection operations.

Because the 112th SE Elevated Alternative (B2E) is elevated throughout Segment B, intersection operations would not degrade due to route modifications. Only one intersection, Bellevue Way SE at the South Bellevue Station entrance, would degrade noticeably in this alternative. This is due to the increased traffic associated with this station.

At the 118th Avenue SE and SE 8th Street intersection, LOS F would occur with all B alternatives; although in Alternative B7, this intersection would operate with a higher delay. This degradation would be due to the increased vehicle traffic accessing the new park-and-ride lot at the 118th Station.

None of the at-grade sections of the Segment B alternatives would have gated light rail crossings.

Property Access and Circulation. The location of vehicular driveway access at the South Bellevue Station would remain unchanged; therefore, the alternatives that include this park-and-ride facility are not expected to affect traffic or transit circulation exiting or entering the station. Alternatives B1, B2E, B2A, and B3 would install a traffic signal at the northern access location to facilitate transit bus movements across the at-grade light rail track.

Alternative B1 would restrict property access along Bellevue Way north of the 112th Avenue SE intersection to right-turn-in, right-turn-out because of the at-grade median profile. South of the 112th Avenue SE intersection where there is already an existing median in place, no change in access to adjacent properties would occur for this section of the alternative. U-turn movements would be provided at signalized intersections along Bellevue Way north of 112th Avenue SE to minimize the circulation impacts.

South of the 112th Avenue SE intersection, B2A and B3 would have minimal impacts along Bellevue Way, similar to those of Alternative B1. North of this intersection, these two alternatives proceed along 112th Avenue SE until approximately SE 8th Street and would restrict access to the Bellefield Office Park to the east and the residential properties to the west,

allowing only right-turn-in, right-turn-out movements.

Alternatives B2E and B7 would have minimal impacts on property access and/or traffic circulation because the majority of the length of these two alternatives is either elevated or outside the roadway rights-of-way.

Segment C

Multiple projects are planned by the City of Bellevue and WSDOT within Segment C that will change the physical characteristics of major roadways from their existing condition, with or without the East Link Project. These include the following:

- 108th Avenue NE and 106th Avenue NE will be converted to a one-way traffic couplet between Main Street and NE 12th Street.
- NE 10th Street and NE 2nd Street will both be extended over I- 405 between 112th Avenue NE and 116th Avenue NE. The NE 10th Street extension will include access to SR 520, and the NE 2nd Street extension will include I-405 access to and from the south.
- 110th Avenue NE will be widened from a three- and four-lane cross section to a five-lane cross section between NE 4th Street and NE 8th Street.
- By 2030, NE 2nd Street will be widened from three lanes with on-street parking to five lanes between 112th Avenue NE and Bellevue Way NE.

Operations and Level of Service. Year 2030 No Build Alternative and East Link intersection operations in Segment C are shown in Exhibit 3-23.

Under the No Build Alternative in 2020, the intersections are expected to operate fairly well in Downtown Bellevue as roadway projects are completed in the area. The couplet project on 106th Avenue NE and 108th Avenue NE is expected to improve intersection operations, and no intersections on these two streets are predicted to operate at LOS F. Three intersections in the study area are expected to operate at LOS F under the No Build Alternative in 2020. By the year 2030, two additional intersections are expected to operate at LOS F, giving a total five intersections in year 2030 that are expected to operate at LOS F with the No Build Alternative. These five intersections are as follows:

- Bellevue Way and Main Street
- 112th Avenue NE and NE 8th Street (I-405 southbound off-ramp)
- 112th Avenue NE and Main Street110th Avenue NE and NE 8th Street
- 112th Avenue NE and NE 12th Street

Intersections along the 106th and 108th avenues NE are expected to continue to meet the intersection LOS standards in the year 2030.

With East Link, most intersections in Segment C are expected to operate similarly to the No Build Alternative. This is due to the roadway modifications incorporated into each alternative and modified travel patterns related to a shift to transit. The following intersections would not meet agency standards and operate worse than in the no-build condition in 2020 and 2030.

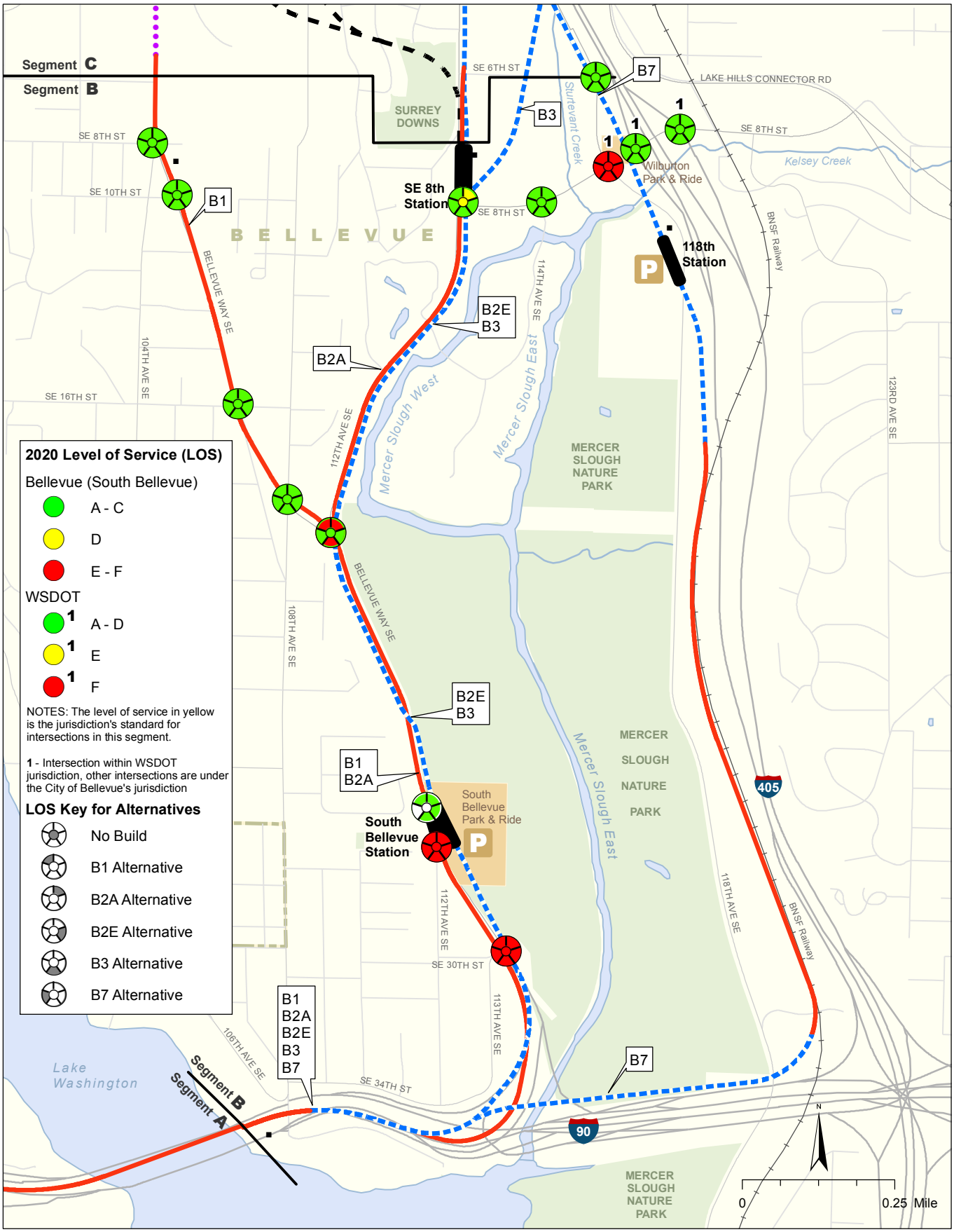
- 110th Avenue NE and NE 8th Street (C8E)
- 110th Avenue NE and NE 6th Street (C8E)

The following provides further description of intersection operations with East Link.

The Bellevue Way Tunnel Alternative (C1T) is tunneled throughout most of Segment C except on Bellevue Way SE south of Kilmarnock Street where the profile transitions into a tunnel and on NE 6th Street between 110th Avenue NE and 112th Avenue NE, where the profile is elevated to cross over I-405. The Bellevue Way and Main Street intersection operations in both 2020 and 2030 are expected to get slightly worse from the traffic associated with the Old Bellevue Station. Overall, however, Alternative C1T is expected to cause little to no impact on the intersection LOS compared to the 2020 and 2030 No Build Alternative.

The 106th NE Tunnel (C2T) and 108th Avenue NE Tunnel (C3T) alternatives are tunneled throughout most of the Segment C. The intersection operations for both of these alternatives are expected to experience little to no change in LOS compared to the 2020 and 2030 No Build Alternative.

The Couplet Alternative (C4A) is an at-grade profile throughout Segment C except for the elevated connection to Segment B alternatives south of Main Street. C4A operates as a light rail track couplet along 110th Avenue NE and 108th Avenue NE. Light rail would operate northbound along the east side of 110th Avenue NE and southbound along the west side of 108th Avenue NE between Main Street and NE 12th Street. Along 110th Avenue NE, southbound left turn lanes would be provided at each intersection. To improve safety while crossing the light rail tracks, auto traffic on 110th Avenue NE would be limited to the southbound direction. Along 108th Avenue NE, C4A would provide northbound left-turn lanes at each

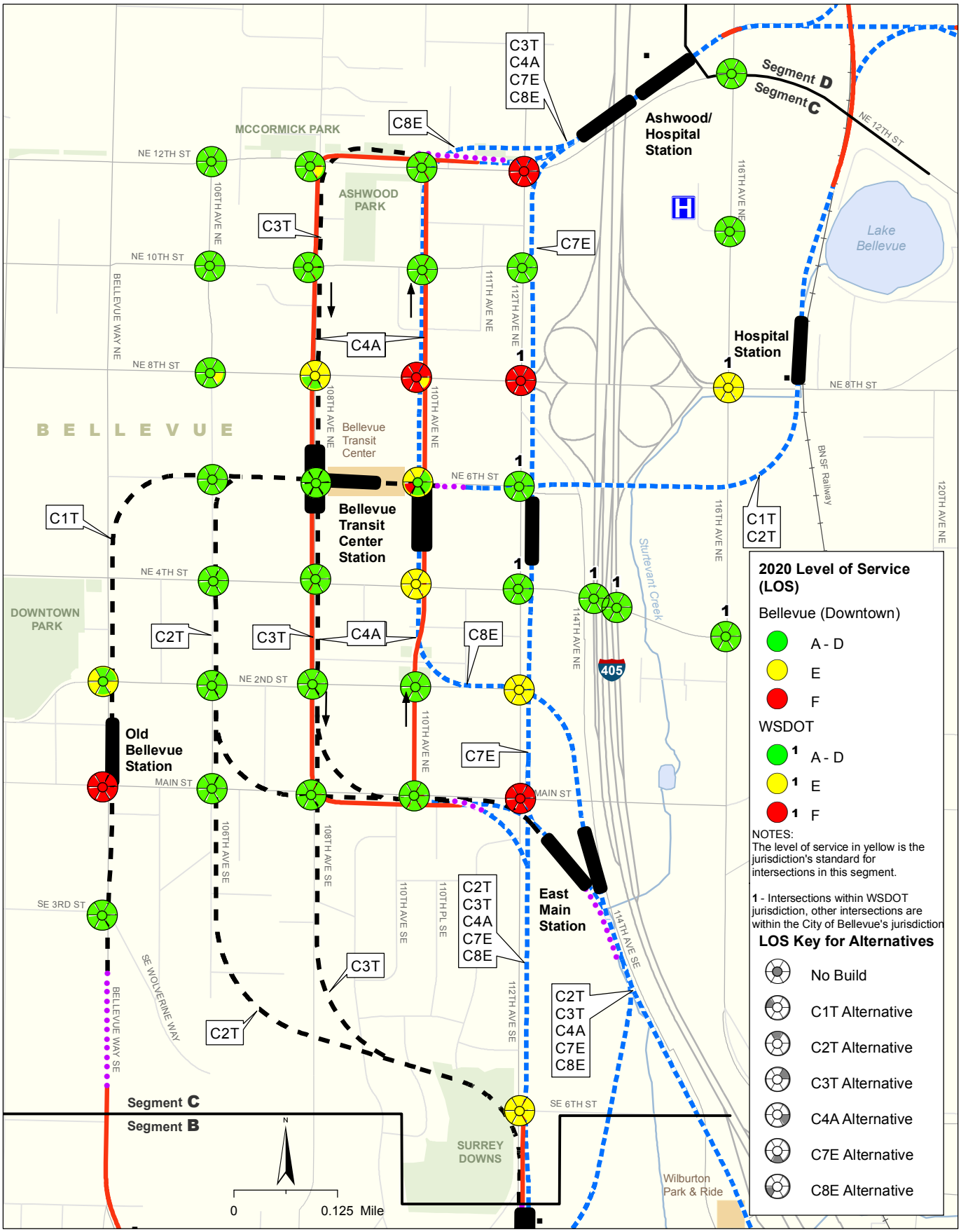


Source: Data from King County (2006) modified by CH2M HILL.

At-Grade Route
Elevated Route
Retained-Cut Route
Tunnel Route
Traction Power Substation
Proposed Station
P New and/or Expanded Park-and-Ride Lot

NOTE: The level of service in white indicates that this intersection does not exist for this alternative.

Exhibit 3-22 **2030 PM No Build and Build Level of Service at Intersections Segment B**
East Link Project



Source: Data from City of Bellevue (2005) and King County (2006) modified by CH2M HILL.

At-Grade Route
Elevated Route
Retained-Cut Route
Tunnel Route
Traction Power Substation
Proposed Station
New and/or Expanded Park-and-Ride Lot

Exhibit 3-23 **2030 PM No Build and Build Level of Service at Intersections Segment C**
East Link Project

intersection. To improve safety while crossing the light rail tracks, auto traffic on 108th Avenue NE would be limited to the northbound direction. 106th Avenue NE would be modified to two-way vehicle operations, similar to existing conditions. Light rail gates would only be required at two intersections, at 111th Avenue NE, north of NE 12th Street and on 110th Avenue SE, south of Main Street for the westbound light rail track.

East-west signal coordination would be maintained at all intersections. In general, light rail operations would affect some north-south vehicles operations, and there may be an impact on light rail travel time because full signal priority is not proposed for the light rail train with this alternative. Intersection operations with the C4A Alternative are expected to experience little to no change compared to the 2020 and 2030 No Build Alternative. The lone exception is at 110th Avenue NE and NE 8th Street, which operates at an acceptable LOS with the C4A alternative compared to failing with the No Build Alternative. This is due to vehicle patterns changing with the northbound auto couplet.

The 112th NE Elevated (C7E) and 110th NE Elevated (C8E) alternatives are elevated throughout Segment C. With C7E, the Bellevue Transit Center Station would be located on 112th Avenue NE between NE 4th Street and NE 6th Street. The resulting shift in passenger drop-off/pick-up traffic is not expected to create additional intersection delay at the intersections near this station. In C8E, between NE 4th Street and NE 12th Street, the number of lanes in this section of 110th Ave NE would be reduced from a three- to five-lane section planned by the City of Bellevue for the No Build Alternative to a two- to four-lane section with the East Link Project due to right-of-way constraints. This would degrade the intersection operations at NE 6th Street and NE 8th Street along 110th Avenue NE. Otherwise, both of these alternatives are expected to cause little to no change in intersection LOS compared to the No Build Alternative.

Property Access and Circulation. The majority of the Segment C alternatives would have minimal property access impacts.

The tunnel alternatives (C1T, C2T, and C3T) would have minimal property access and circulation impacts because they mainly operate underground and would not affect vehicle circulation. C1T would restrict driveway access on Bellevue Way between the short section of SE 6th Street and SE Kilmarnock Street by allowing only right-turn-in, right-turn-out movements as it transitions to below grade. C1T and C2T would also restrict the driveway movements on NE 6th Street, between 110th Avenue NE and 112th Avenue NE, by allowing right-turn-in, right-turn out movements. This would affect Meydenbauer Center and the Bellevue City Hall. U-turn movements on the east leg of the 110th Avenue NE and NE 6th Street intersection would be allowed so as to minimize the impact on exiting vehicles from Meydenbauer Center. There are no access impacts on 112th Avenue NE. C3T would require three road modifications north of NE 12th Street to serve Northtowne residential properties whose access from NE 12th Street would be removed as this alternative transitions from a tunnel to an elevated profile.

Alternative C4A would result in impacts on traffic circulation along 110th Avenue NE and some impacts on circulation on 108th Avenue NE in Downtown Bellevue. The intersection at Main Street and 110th Avenue NE would be reconfigured to accommodate the realignment of 110th Avenue SE and 110th Place SE so that 110th Avenue south of Main Street would be realigned to match 110th Avenue north of Main Street. Along 108th Avenue NE, property access with C4A would remain similar to the No Build Alternative. To accommodate light rail operation on 108th Avenue NE, auto traffic would be reversed from the No Build Alternative to head northbound. This would modify the auto couplet operations to become two-way vehicle flow on 106th Avenue NE, northbound vehicle flow on 108th Avenue NE, and southbound vehicle flow on 110th Avenue NE. Along 110th Avenue NE, property access with Alternative C4A would change to one-way operations from the two-way operations associated with the No Build Alternative. Station location would require closure of the City Hall driveway on 110th Avenue NE. Parking access would be re-routed to the NE 6th Street access. To provide a northbound light rail along 110th Avenue NE, vehicle traffic would operate in the southbound direction. Additionally, driveway locations on 108th Avenue NE and 110th Avenue NE where vehicles would cross light rail tracks would be closed if access is available at another driveway location.

Minor impacts on traffic circulation at the NE 12th Street and 110th Avenue NE intersection are expected with Alternative C4A as a result of realigning 111th Avenue NE to connect to 110th Avenue NE. This would require reorientation of 111th Avenue NE to connect to the existing intersection at 110th Avenue NE. Private driveway access from existing properties on NE 11th Street would be maintained, and impacts on circulation are expected to be minimal.

If C4A connects with the 112th SE At-Grade Alternative (B2A), there would be some additional

property access and circulation impacts between SE 6th Street and just south of Main Street because the profile is at-grade in the median. Therefore, turning movements into and out of driveways would be restricted to allow only right-turn-in and right-turn-out movements. U-turn movements would be provided at the SE 6th Street and Main Street intersections along 112th Avenue NE to minimize any impacts.

The 112th NE Elevated Alternative (C7E) is elevated along the east side of 112th Avenue NE. Many driveways on 112th Avenue NE are already right-in/right-out access; additional individual driveways would potentially be converted to right-in/right-out access depending on column placement. This configuration would have minimal property access and circulation impacts. The 110th NE Elevated Alternative (C8E) is expected to have minimal impact on access and circulation, except for when the route travels along 110th Avenue NE, which occurs between NE 4th Street and NE 12th Street. Along 110th Avenue NE, the profile is elevated in the median, which would restrict turning movements into and out of driveways to be only right-turn in and right-turn out. To minimize circulation issues, U-turn movements at signalized intersections along this roadway section would be provided only when left-turn movements are allowed. Due to right-of-way constraints along 110th Avenue NE, northbound left turns at NE 8th Street would be prohibited and vehicles in this direction would have to turn left at either NE 4th Street or NE 10th Street.

Both with and without the East Link Project, 108th Avenue NE between NE 4th Street and NE 8th Street would include a transit counter-flow lane to maintain convenient transit bus connections to the Bellevue Transit Center and minimize transit travel delays. For C4A, the transit counter-flow lane would be shared with the light rail track for joint use operations within this four-block section on 108th Avenue NE and 110th Avenue NE. Less than 30 buses per hour are expected to travel in the joint-use lane on 108th Avenue NE and less than 10 buses per hour would travel in the joint-use lane on 110th Avenue NE. Conflicts with buses should be minimal due to light rail train headways of 9 minutes and signal phasing on NE 4th Street and NE 8th Street.

Interim Terminus Stations. The Ashwood/Hospital and Hospital stations are potential interim termini. These two stations operating as interim termini are not expected to generate a substantial number of additional auto trips (see Table 3-25) or have any additional transportation impacts.

Segment D

Within Segment D, the following three roadway projects planned by the City of Bellevue will change the physical characteristics of major roadways from their existing condition, both with and without the East Link Project:

- 130th Avenue NE is planned to be widened to provide a center two-way left-turn lane.
- Northup Way between 120th Avenue NE and 124th Avenue NE will be widened to accommodate an additional eastbound lane.
- An improvement will be made to the 140th Avenue NE and NE 20th Street intersection to provide an additional left-turn pocket in both eastbound and westbound directions.

Potential additional projects are not included in the list of future projects due to lack of clear implementation plans, such as the NE 16th Street extension.

With the East Link Project, for all alternatives connecting from NE 12th Street, gates would be required at the 116th Avenue NE crossing. For the NE 16th At-Grade (D2A) and NE 20th (D3) alternatives, light rail crossing signals and gates would be provided for protected safe rail crossings near the 1600 block along 124th Avenue NE, 130th Avenue NE, and 132nd Avenue NE. Also with D2A and D3, NE 16th Street between 132nd Avenue NE and 136th Avenue NE and 136th Avenue NE between NE 16th Street and NE 20th Street would be widened to accommodate light rail, but the number of lanes would be maintained. An exclusive left-turn lane would be provided on the southbound approach at the NE 16th Street and 136th Avenue NE intersection.

Alternative D3 east of 136th Avenue NE would be in a retained cut in the median along NE 20th Street, which would require widening the signalized intersections at 136th Avenue NE and 140th Avenue NE and in the 14300 block of 140th Avenue NE, which aligns with the driveway access to numerous commercial properties. At the 148th Avenue NE and 152nd Avenue NE intersections along NE 20th Street, a covered lid would be provided to maintain existing intersection channelization without widening the intersection. On 152nd Avenue NE between NE 20th Street and Microsoft Road, D3 rises to be at-grade in the median of the road, with the number of lanes on this road maintained. Exclusive northbound and southbound left-turn pockets would be provided at the intersection of NE 24th Street and 152nd Avenue NE.

The SR 520 Alternative (D5) route lies entirely outside of arterial roadway right-of-way and would not affect the travel lanes of any arterial or local roadways in Segment D.

Operations and Level of Service. Year 2030 intersection operations in Segment D for the No Build Alternative and East Link are shown in Exhibit 3-24.

Intersection operations under the No Build Alternative in Segment D are expected to worsen as traffic volumes increase on the roadways. Two intersections in year 2020 are expected to operate at LOS F. By year 2030, the following four intersections (including the two intersections from year 2020) are expected to operate at LOS F:

- NE 24th Street and 148th Avenue NE
- NE 40th Street and 156th Avenue NE
- NE 40th Street and 148th Avenue NE
- NE 20th Street and 140th Avenue NE

With East Link the following intersections would not meet agency standards and operate worse than in the no-build condition in 2020 and 2030:

- 151st Avenue NE and NE 24th Street (D2A, D2E)
- 152nd Avenue NE and NE 24th Street (D2A, D2E)

With East Link the following intersection would not meet agency standards and operate worse than in the no-build condition in 2030 only:

- 148th Avenue NE and NE 20th Street (D3)

The following paragraphs provide further description of intersection operations with East Link.

Even though the NE 16th At-Grade Alternative (D2A) would operate at-grade throughout the majority of Segment D, the intersection LOS would not noticeably change because the roadway would be widened to maintain the same number of lanes, and the light rail train would be able to safely travel through the intersections within the traffic signal phasing for vehicles. In addition, light rail train detection by signals would occur prior to the train arriving, minimizing disturbance to signal timing. Along NE 24th Street at 151st Avenue NE and 152nd Avenue NE, intersection operations would degrade noticeably due to delay caused by the light rail train as it travels through this short block. The cause of this impact is the signal phasing required to clear any vehicles along NE 24th Street between 151st Avenue NE and 152nd Avenue NE. Even with this situation, only the NE 24th Street and 151st Avenue NE intersection is expected to fall below the LOS standard. Because the NE 16th Elevated Alternative (D2E) generally shares the same route as D2A, the intersection results are similar. Again, intersection operations would degrade only at the intersections of NE 24th Street and 151st Avenue NE and NE 24th Street and 152nd Avenue NE, for the same reason provided earlier.

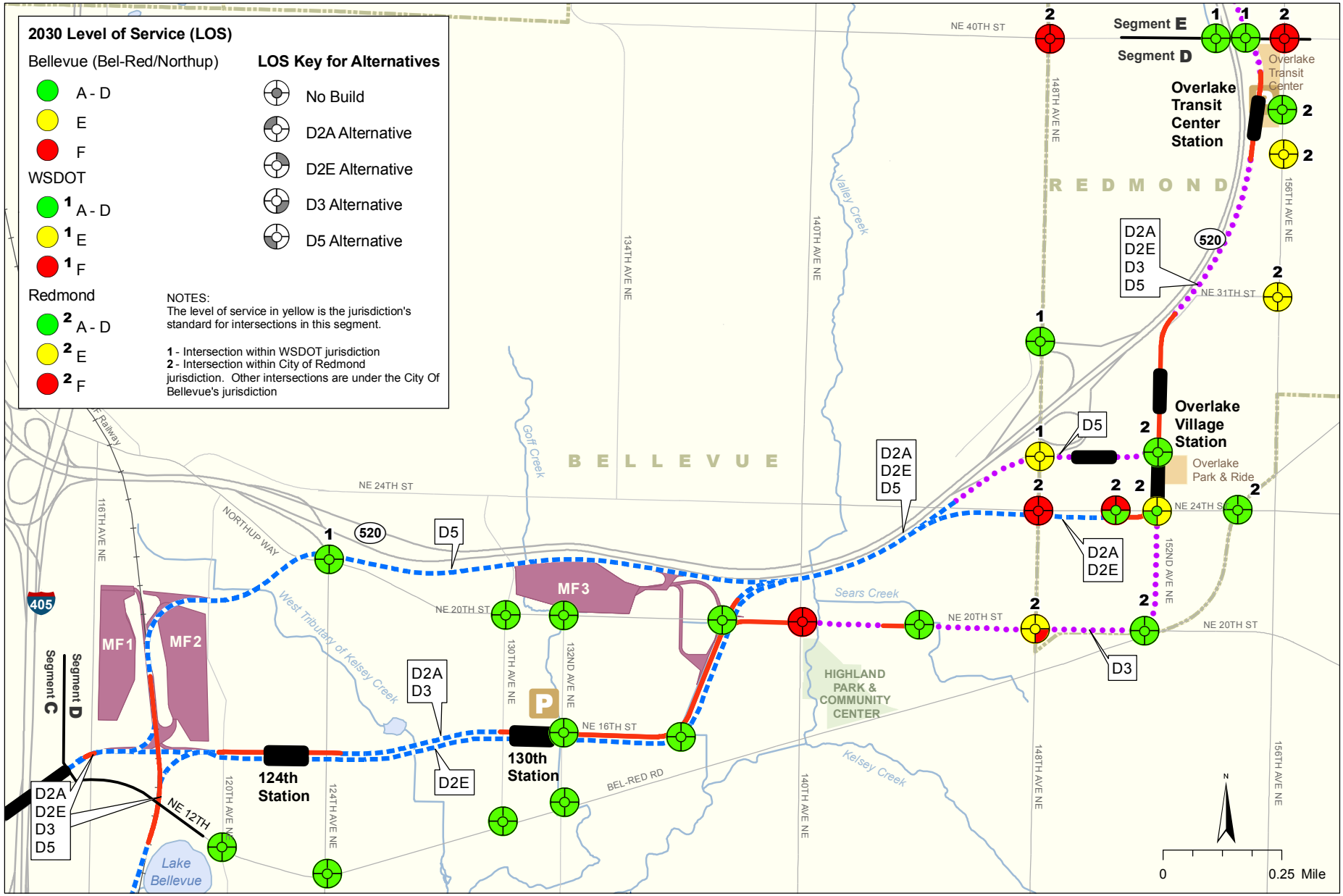
The NE 20th Alternative (D3) is at-grade or in a trench throughout the majority of Segment D. Along 152nd Avenue NE, D3 would operate at-grade in the median until it becomes aligned with the west side of the road north of Microsoft Road. By operating in the median on 152nd Avenue NE, light rail trains would be able to travel with the north-south through traffic, thereby minimizing the impact at this intersection. Otherwise, there would be little difference in intersection operations from the No Build Alternative. Because the SR 520 Alternative (D5) is primarily elevated or within SR 520 right-of-way, there would be little difference in intersection operations from the No Build Alternative.

With any of the Segment D alternative connections with the C3T, C4A, C7E and C8E alternatives, the gated crossing of 116th Avenue NE would be coordinated with the traffic signal at NE 12th Street and 116th Avenue NE to allow for clearance of southbound vehicle queued between NE 12th Street and the gated crossing. Intersection operations are not expected to degrade with this coordination.

As indicated in the light rail ridership discussion (Section 3.4.3.6), the cities of Bellevue and Redmond have identified long-range plans that would increase the residential density and employment in Segment D. Much of these land-use changes would include transit-oriented development around light rail stations that would encourage Bel-Red and Overlake residents, workers, and shoppers to access the stations by walking, bicycling, or taking transit. Even with these land-use changes, the number of vehicle trips generated by the project is expected to be similar, because the park-and-ride lots at the East Link stations are assumed to be full. Therefore, comparisons between the no-build and build conditions with these land-use changes would result in similar outcomes.

Property Access and Circulation. Impacts on property access and circulation in Segment D are expected to be focused along 136th Avenue NE, NE 16th Street, NE 20th Street, and 152nd Avenue NE. Substantial sections of the track for each of the alternatives are outside the roadway right-of-way within Segment D.

D2A and D2E would have similar access and circulation impacts, except along NE 16th Street and 136th Avenue NE. With D2A, the track on these two short street segments would be at-grade in the median; therefore, driveway movements would be



Source: Data from City of Bellevue (2005), City of Redmond (2005), and King County (2006) modified by CH2M HILL.

At-Grade Route
Elevated Route
Retained-Cut Route
Tunnel Route

Traction Power Substation
Proposed Station
Maintenance Facility and Access Track
New and/or Expanded Park-and-Ride Lot

Exhibit 3-24 **2030 PM No Build and Build Level of Service at Intersections Segment D**
East Link Project

restricted to only allow right-turn-in, right-turn-out movements. To minimize access and circulation impacts, U-turn movements would be provided at three nearby signalized intersections: 132nd Avenue NE and NE 16th Street, 136th Avenue NE and NE 16th Street, and 136th Avenue NE and NE 20th Street. In D2E, the route is elevated along the side of NE 16th Street and 136th Avenue NE, minimizing impacts on property access and circulation.

In both of these alternatives, driveway access on the south side of NE 24th Street between 148th Avenue NE and 151st Place NE would be removed to prevent vehicles from crossing the at-grade track. Internal circulation within the properties would be modified to allow access via 148th Avenue NE and/or 151st Place NE. Similarly, western access to and from the business park along 152nd Avenue NE between NE 24th Street and NE 28th Street would be closed, and vehicle circulation would be rerouted to 151st Place NE.

D3 would have the most property access and circulation issues because it would operate in the median along NE 20th Street, prohibiting all mid-block left-turn movements along this arterial between 136th Avenue NE and 152nd Avenue NE. D3 would also have access and circulation impacts along NE 16th Street and 136th Avenue NE similar to those of D2A. Drivers would either reroute to the nearest signalized intersections (140th Avenue NE, Ross Plaza [approximately 143rd Avenue NE], or 148th Avenue NE) and perform a U-turn movement, or they would readjust the travel patterns to use the surrounding street system. North of NE 20th Street, D3 proceeds along 152nd Avenue NE as a median at-grade profile. This would prohibit mid-block left-turn movements and potentially create U-turn movements at the signalized intersections of NE 24th Street and NE 26th Street. Unlike D2A and D2E, the western property access along 152nd Avenue NE between NE 24th Street and NE 28th Street would remain, but only right-turns in and right-turns out of the driveways would be allowed.

D5 would have the fewest property access and circulation impacts because the majority of the route is outside of arterial right-of-way. Similar to D2A and D2E, the western driveway access along 152nd Avenue NE between NE 24th Street and NE 28th Street would be closed, and vehicle circulation would be rerouted to 151st Place NE.

With any of the Segment D connections with C3T, C4A, C7E, and C8E, the gated crossing of 116th Avenue NE is not anticipated to create substantial auto queues; however, driveways adjacent to the track crossing may require turn restrictions. Auto forecasts indicate adequate spacing between the gated crossing and NE 12th Street for northbound vehicle storage. In the southbound direction the auto forecasts are higher than in the northbound direction, but substantial queuing is not anticipated when considering the time for the train to safely cross the street.

For all alternatives, internal vehicle circulation at the Overlake Transit Center would be reconfigured to maintain access to the Overlake Transit Center, as a result of a new internal road that separates vehicles from the light rail station platform.

Interim Terminus Stations. The 124th, 130th, Overlake Village, and Overlake Transit Center stations are potential interim termini. Most of the interim terminus stations would not have a substantial increase in ridership, and further traffic analysis is not warranted. The *Transportation Technical Report* discusses each station's PM peak-hour interim terminus trip generation.

Although the Overlake Transit Center and Overlake Village Stations both show increases in ridership (see Table 3-15), only the Overlake Village Station is expected to generate trips to warrant further impact analysis. At both stations, auto trips did not show substantial increases. Increased bus service to the Overlake Village Station as an interim terminus would be substantial (see table 3-25 for increases in daily ridership). Because the additional ridership at the Overlake Village Station would be largely composed of people using bus service, the impact on vehicle operations would be minimal. Therefore, increases in vehicle delay under interim terminus conditions when compared to the alternative routes would be negligible, and no change in intersection LOS is expected. The increase in bus service at Overlake Village Station would be mainly routes to and from the north along 156th Avenue NE.

Segment E

Within Segment E, in Downtown Redmond, Cleveland Street and Redmond Way currently operate as a one-way couplet with traffic operating eastbound and westbound, respectively. In the future, these two streets are planned to be converted to two-way operations with Redmond Way providing one through lane and one left-turn pocket in both eastbound and westbound directions at intersections and Cleveland Street providing one lane in the eastbound and westbound directions. In addition, right-turn pockets will be provided for the eastbound and westbound approach at the intersection of Redmond Way and 164th Avenue NE. Bear Creek Parkway and 161st

Avenue NE will also be extended to intersect south of the BNSF Railway right-of-way.

With the East Link Project, along 161st Avenue NE, between Cleveland Street and NE 85th Street, the Marymoor Alternative (E2) would be at-grade with the track in the roadway median. The through lanes on 161st Avenue NE would be maintained with the E2 alternative. At the intersections of 161st Avenue NE and Redmond Way and NE 83rd Street, the northbound left-turn movement would not be provided because of right-of-way and station constraints. Northbound vehicles on 161st Avenue NE desiring to perform a left-turn movement would reroute their travel pattern or travel north to NE 85th Street. Left-turn lanes on the southbound approach at both intersections would be maintained. If E2 terminates at the Redmond Town Center Station, the roadway channelization on 161st Avenue NE would not be affected. The Redmond Way (E1) and Leary Way (E4) alternatives would not affect the roadway channelization in Segment E.

Operations and Level of Service. Year 2030 intersections operations in Segment E for the No Build Alternative and East Link are shown in Exhibit 3-25.

As traffic volumes increase in 2020 and 2030, the intersection LOS results for the No Build Alternative would worsen from existing conditions. In the year 2020, four intersections are expected to operate at LOS F. By year 2030, 2 additional intersections for a total of six intersections are expected to operate at LOS F:

- NE Leary Way and West lake Sammamish Parkway
- NE 76th Street and Bear Creek Parkway
- Avondale Road NE and Union Hill Road
- SR 202 and East Lake Sammamish Parkway (180th Avenue NE)
- SR 202 and SR 520 eastbound off-ramp
- NE 85th Street and 164th Avenue NE

With East Link, the following intersections would not meet agency standards and operate worse than in the no-build condition in 2020 and 2030:

- Redmond Way and 161st Avenue NE (E2)
- NE 70th Street and 176th Avenue NE (E4)

With East Link the following intersections would not meet agency standards and operate worse than in the no-build condition in 2030 only:

- Redmond Way and 161st Avenue NE (E1, E4)
- NE Leary Way and Bear Creek Parkway (E4)
- 83rd Street and 161st Avenue NE (E2)
- SR 202 and NE 70th Street (E1, E2, E4)
- NE 70th Street and 176th Avenue NE (E1, E2)

The following paragraphs provide further description of intersection operations with East Link.

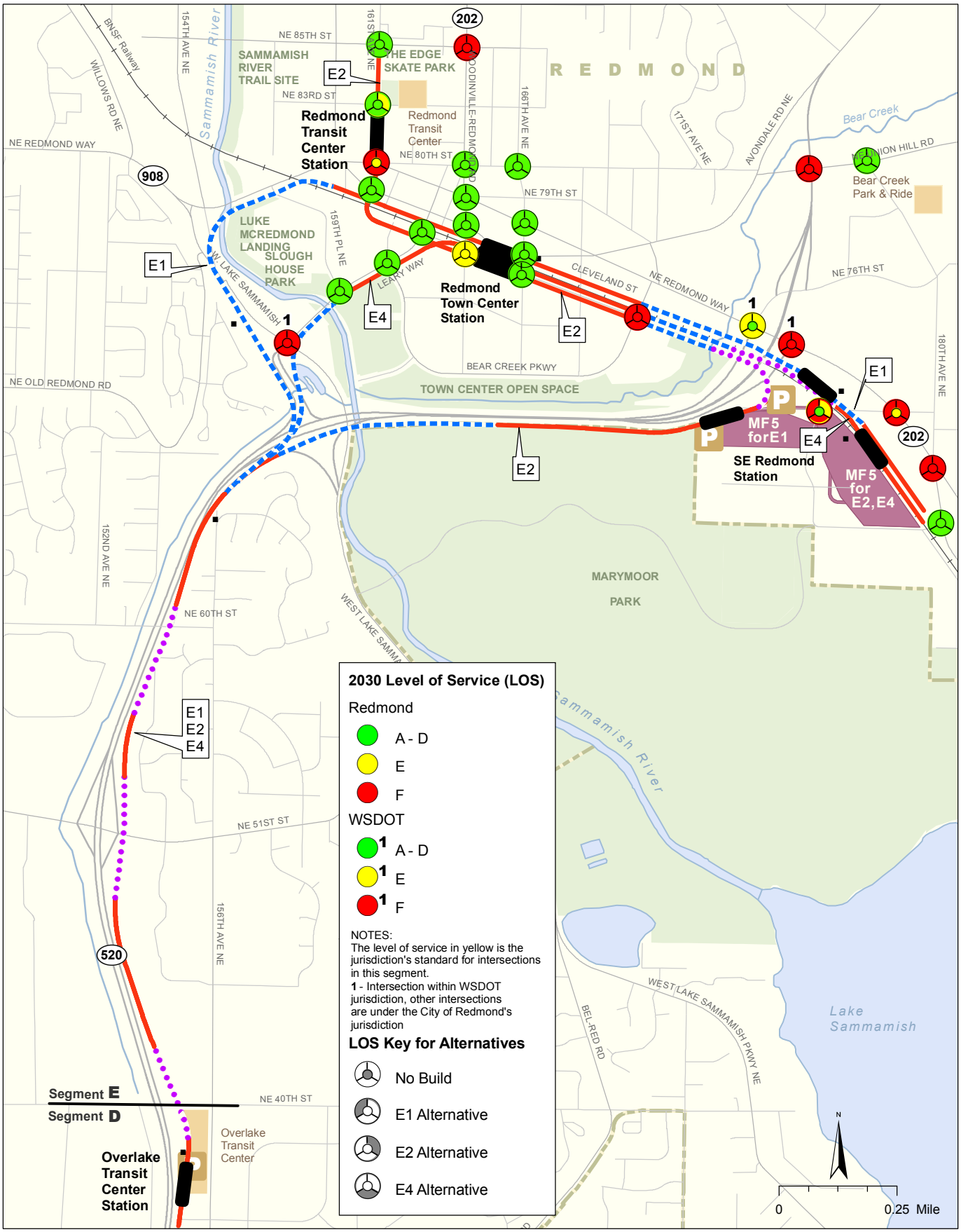
The Redmond Way Alternative (E1) has at-grade gated crossings at 161st Avenue NE, NE Leary Way, 164th Avenue NE, 166th Avenue NE, and 170th Avenue NE. Otherwise, this alternative would operate independent of vehicle traffic. In 2020, intersection operations would be similar to the No Build Alternative. In 2030, intersection operations would be similar to the No Build Alternative except that the intersections of 161st Avenue NE and Redmond Way, SR 202 and NE 70th Street, and NE 70th Street and 176th Avenue NE would operate below intersection LOS standards due to the increase in traffic associated with the SE Redmond Station.

The Marymoor Alternative (E2) has at-grade gated crossings at 161st Avenue NE, NE Leary Way, 164th Avenue NE, 166th Avenue NE, and 170th Avenue NE. Otherwise, this alternative would operate independent of vehicle traffic. In 2020, intersection operations would be similar to the No Build Alternative with the exception of 161st Avenue NE and Redmond Way, which would operate at LOS F. In 2030, intersection operations would be similar to the No Build Alternative except that the intersections of 161st Avenue NE and Redmond Way, SR 202 and NE 70th Street, and NE 70th Street and 176th Avenue NE would operate below the intersection LOS standards due to the increase in traffic associated with the SE Redmond Station. If E2 terminates at Redmond Town Center station, intersection operations would be similar to Alternative E1

The Leary Way Alternative (E4) has at-grade gated crossings at 164th Avenue NE, 166th Avenue NE, 170th Avenue NE, and Bear Creek Parkway. Intersection operations in this alternative would be similar to those of E1 in 2020 and 2030.

In all Segment E alternatives, intersection LOS results are expected to improve near the Beak Creek Park-and-Ride Lot because a substantial number of transit users would relocate to the SE Redmond Station and use light rail service.

Property Access and Circulation. The alternatives in Segment E follow a general route that parallels SR 520



Source: Data from City of Redmond (2005) and King County (2006) modified by CH2M HILL.

- Traction Power Substation
- At-Grade Route
- Elevated Route
- Retained-Cut Route
- Tunnel Route
- Proposed Station
- Maintenance Facility and Access Track
- New and/or Expanded Park-and-Ride Lot

Exhibit 3-25 **2030 PM No Build and Build Level of Service at Intersections Segment E**
East Link Project

for a large portion of the segment length and use a substantial portion of existing BNSF Railway right-of-way parallel to NE Redmond Way, so property access and circulation issues would generally be minimal.

With Alternative E1, properties with access on the south side of Redmond Way near the 159th Place NE intersection may have their access altered to accommodate the light rail track. West Lake Sammamish Parkway and the BNSF Railway right-of-way would be modified to accommodate the tracks along the road. Alternative E2 would have slightly more impact on property access and circulation because this alternative is at-grade in the median of 161st Avenue NE between Cleveland Street and NE 85th Street. Mid-block property access would be restricted to only allow right turns in and out of the driveways. To minimize vehicle recirculation, the NE 83rd Street and 161st Avenue NE intersection would be signalized, and northbound U-turn movements would be allowed at the intersection of NE 85th Street. If E2 terminates at the Redmond Town Center station, property access and circulation impacts would not occur along 161st Avenue NE. With Alternative E4, access to a residential property along the south side of Leary Way, just west of the Sammamish River, could potentially be modified to accommodate the light rail tracks along the road.

A service access road would be constructed near the SR 520 eastbound on-ramp and West Lake Sammamish Parkway to allow access to a traction power substation. However, this access point would be used by service vehicles only, and it is not expected to affect circulation or property access near the on-ramp.

Interim Terminus Stations. The SE Redmond and Redmond Town Center stations are potential interim termini. At both of these stations, an interim terminus is not expected to generate enough auto trips beyond the full-length alternative analysis to warrant further station impact analysis. With an interim terminus at Redmond Town Center, operational and access and circulation impacts, described in Alternative E2, would be avoided on 161st Avenue NE. Table 3-25 provides ridership information for interim terminus stations. The *Transportation Technical Report* provides a detailed station trip generation discussion at each of these potential interim termini.

Maintenance Facilities

The potential maintenance facility sites in segments D and E are not expected to adversely affect intersection operations, property access, or traffic circulation. The *Transportation Technical Report* provides a detailed discussion of the traffic circulation at each of these potential maintenance facilities.

All maintenance facility alternatives would have approximately 60 parking stalls for employees and visitors. Maintenance facility staff shift hours would be similar to Central Link operation and maintenance facilities—6:00 AM to 2:00 PM and 2:00 PM to 10:00 PM. These shift hours occur outside the peak periods, so little shift traffic is expected to occur during the peak hour. Fewer than 10 vehicle trips would occur to and from the maintenance facilities in peak periods. These trips would include visitors and deliveries to and from the maintenance facilities.

3.6.3.3 Traffic Safety

This section provides a safety impact assessment of each alternative. The safety impact assessments are based upon *Integration of Light Rail Transit into City Streets* (Korve, et al., 1996) and *Light Rail Service, Vehicular and Pedestrian Safety* (TRB, 1999). The *Transportation Technical Report* provides further discussion of safety impacts. No substantial change from the existing accident conditions is expected with the No Build Alternative in any segment. Overall, the project-generated trips created by the East Link alternatives are not expected to increase the accident rates for automobiles, because the roadway conditions would remain similar to or improve compared to the No Build Alternative.

Segment A

The proposed alternative in Segment A consists of an at-grade profile located on I-90. Impacts on traffic safety on arterial and local streets are not expected because the proposed alternative would not operate on or require any right-of-way from local streets in the City of Seattle or the City of Mercer Island.

Segment B

The BNSF Alternative (B7) and the 112th SE Elevated Alternative (B2E) are expected to have no or minimal impacts on the number of accidents because the light rail profile is separate from other travel modes. The 112th SE At-Grade (B2A) and the 112th SE Bypass (B3) alternatives have some sections with an at-grade median design, which would have a greater potential for vehicle-train accidents than routes outside the roadway right-of-way (but typically less severe accidents because light rail in these configurations generally travels at lower speeds than other route types). However, potential safety benefits related to the elimination of mid-block turning accidents could lead to an overall reduction in the accident rate. The Bellevue Way Alternative (B1) has the greatest length of median at-grade design, but there still would be the

potential for an overall decrease in the accident rate through the elimination of mid-block turning accidents and protecting all left-turn movements on Bellevue Way.

Segment C

The Couplet Alternative (C4A) is expected to have minimal impacts on safety because the design minimizes the interaction between an at-grade light rail and vehicles. Converting both 108th and 110th avenues NE to one-way vehicle streets would reduce the number of locations where vehicles interact with light rail by removing possible movements that would cross the light rail tracks. To avoid accidents at intersections, only protected movements facing the direction of the light rail train would be allowed to cross the light rail tracks. Business driveways that cross the light rail track would be closed if an alternate access to the business is available. The Bellevue Way Tunnel (C1T), 106th NE Tunnel (C2T), 108th NE Tunnel (C3T), and the 110th NE Elevated (C8E) alternatives are either tunnel or elevated alternatives mainly outside the roadway right-of-way. The biggest safety issue expected would be placing columns in side-elevated designs to avoid blocking driver visibility at intersections and driveways. For elevated sections in medians, column placement is not expected to create driver visibility issues because left turns between the columns would be prohibited and left turns at intersections would include protected signal phasing.

Segment D

The NE 16th Elevated (D2E) and SR 520 (D5) alternatives mostly operate outside of roadway right-of-way; consequently, no substantial changes are expected in the accident frequency. With D2E, the placement of columns in the elevated sections would be located so as not to obstruct driver visibility at driveways and intersections. The NE 16th At-Grade (D2A) and NE 20th (D3) alternatives include segments within the roadway right-of-way. The D2A Alternative operates in the median on NE 16th Street and 136th Place NE and on as a side alignment on NE 24th Street and 152nd Street NE. The at-grade crossing of 151st Avenue NE and 152nd Avenue NE would be gated and signalized for the D2A and D2E alternatives. The D3 Alternative operates in the median on NE 16th Street, 136th Place NE, and 152nd Avenue NE. The D3 Alternative operates in a retained cut on NE 20th Street and 152nd Avenue NE. Some at-grade crossings would also be gated. Providing traffic signals and gates at crossings minimizes the risk of increasing the accident frequency.

Spillover Parking. Transit riders that park on-street near park-and-ride lots due to the lot being full.

Hide-and-Ride Parking. Transit riders who park on-street near a transit stop and board transit.

Segment E

The Redmond Way (E1) and Leary Way (E4) alternatives mostly operate outside the roadway right-of-way, and, combined with the use of gated crossings, the risk of increasing the accidents frequency would be minimal. Therefore, it is expected that no substantial change in the number of accidents would occur. Although much of the Marymoor Alternative (E2) operates outside the roadway right-of-way as well, a portion of the alternative is within the 161st Avenue NE right-of-way. It is expected, however, that the accident frequency would not substantially change, and any increased accidents that occur in the median at-grade section would likely be relatively minor accidents due to the low speed of the light rail vehicle as it is entering/exiting the station. If Alternative E2 terminates at the Redmond Town Center Station, this alternative would have similar roadway safety conditions as alternatives E1 and E4.

Maintenance Facilities

No substantial changes are expected in the accident frequency along the roadways surrounding the maintenance facilities. The only maintenance facilities that would have track crossing roadways are Maintenance Facility 3 (MF3), where track access spurs off the main light rail track and crosses NE 20th Street, and the SE Redmond Maintenance Facility (MF5), where track access crosses NE 70th Street. Light rail vehicles would not cross these roads frequently and they would be protected with gates, so there would be no change in roadway safety conditions.

3.6.3.4 Parking

This section describes the key impacts on parking due to light rail within each segment, including on- and off- street parking removal and the potential for hide-and-ride and spillover parking impacts. Table 3-26 lists the parking impacts from each alternative. These are briefly discussed in the following subsections.

This parking assessment is based on the current level of design completed for each alternative. In subsequent design refinements, the on- and off-street parking impacts may be adjusted. Impacts for each alternative are discussed in further detail in the *Transportation Technical Report* (Appendix H1).

Table 3-27 lists the existing and proposed park-and-ride stalls and the forecasted PM peak-period (3-hour) vehicle usage at station park-and-ride facilities for years 2020 and 2030.

Segment A

There would be no direct on-street or off-street parking impacts associated with the I-90 Alternative (A1) in Segment A. The potential for hide-and-ride parking impacts at the Rainier Station is expected to be high because there is a substantial amount of surrounding on-street parking available to accommodate riders.

At the Mercer Island Station, there is a low potential for hide-and-ride impacts with alternatives that include the South Bellevue Station (alternatives B1, B2A, B2E, and B3). The location of the South Bellevue Station, which is proposed to provide over 1,400 stalls, provides riders with a higher capacity option for parking along I-90. In addition, although the current demand for the Mercer Island Park-and-Ride Lot is near its parking capacity, there is minimal parking spillover into the surrounding areas due to the restricted parking, which indicates that the future level for hide-and-ride impacts is low.

For Alternative B7, there is a high potential for hide-and-ride parking at the Mercer Island Station because the forecasted auto usage is higher than the Mercer Island Park-and-Ride capacity. The park-and-ride lot is currently almost fully used and this alternative does not include a nearby light rail station with a park-and-ride lot, there is a likely potential for parking spillover in the unoccupied on-street parking spaces (see Table 3-23). In the future, the City of Mercer Island plans to implement restricted (time-limited) parking in select parking areas surrounding the Town Center. This would limit hide-and-ride activity. Section 3.6.5 discusses possible parking mitigation strategies to reduce the hide-and-ride potential.

Segment B

The Bellevue Way Alternative (B1) is expected to require removing the most parking spaces of the five alternatives proposed in Segment B. Most of these spaces are located in commercial properties along both sides of Bellevue Way SE between 112th Avenue SE and SE 6th Street. Among the alternatives in Segment B, the 112th SE Elevated Alternative (B3) would require removal of the fewest parking spaces, which are located in the Mercer Slough Park. Overall,

none of the alternatives in Segment B are expected to remove any on-street parking. No on- or off-street spaces would be removed for the proposed stations.

There is a low potential for parking spillover to occur at the South Bellevue Station in year 2020, but there is a higher potential for parking spillover at this station in year 2030 when the expected 1,570 autos exceeds the proposed parking (1,455-1,476 stalls). Even though

TABLE 3-26
Parking Impacts Summary by Alternative

Alternative	Parking Spaces Removed	
	On-Street	Off-Street
Segment A		
A1, I-90	10	0
Segment B		
B1, Bellevue Way	0	57
B2A, 112th SE At-Grade	0	7
B2E, 112th SE Elevated	0	18
B3, 112th SE Bypass	0	3
B7, BNSF	0	18
Segment C[a,b]		
C1T, Bellevue Way Tunnel	0	158
C2T, 106th NE Tunnel	0	82-172
C3T, 108th NE Tunnel	0	2-82
C4A, Couplet	11	39-94
C7E, 112th NE Elevated	0	198-226
C8E, 110th NE Elevated	0	92-125
Segment D[a]		
D2A, NE 16th At-Grade	30	376-382
D2E, NE 16th Elevated	0	348-356
D3, NE 20th	30	808-816
D5, SR 520	0	239
Segment E[b]		
E1, Redmond Way	0	37
E2, Marymoor	16	94
E4, Northeast Leary Way	0	45

[a] The range of off-street parking removal is due to connectors with Segment B and C.

[b] Segment C and E on-street parking is the total of unrestricted and restricted on-street parking. Restricted parking includes all parking spaces with special-use restrictions, such as drop-off/loading zones.

Notes: Indicated parking impacts are permanent displacements. Parking losses associated with construction are not included in this summary.

by 2030 there could be a potential for spillover, it is still expected that this would not be substantial. The park-and-ride lot is currently at capacity and there is minimal parking spillover in the residential areas. This is illustrated by the low on-street parking utilization in the Enatai Neighborhood (Table 3-27) as most of the parking in the area is not easily identifiable and/or accessible from Bellevue Way. In addition, the City of Bellevue constructed a sidewalk and eliminated on-street parking on 112th Avenue SE, south of the South Bellevue park-and-ride, to remove the potential for hide-and-ride parking near the station.

At the SE 8th Station, there would be some potential for hide-and-ride parking because there is available

TABLE 3-27
Existing and Proposed Park-and-Ride Parking Stalls and Forecasted Auto Use

Station	Alternative	Total Existing Parking Stalls	Total Proposed Parking Stalls	2020 Park-and-Ride Auto Demand[a]	2030 Park-and-Ride Auto Demand[a]
Mercer Island[b]	A1	447	447	300 (380)	310 (500)
South Bellevue	B1, B2A, B2E, B3	519	1,455-1,476[c]	1,180	1,570
118th	B7	-	1,030	390	460
130th	D2A, D2E, D3	-	300	240	290
Overlake Village	All D Alternatives	203	203	280	490
Overlake Transit Center	All D Alternatives	170	320	430	570
SE Redmond	All E Alts.	-	1,400	750	990
Redmond Transit Center	E2	377	377	140	200

[a] 3-hour PM peak-period park-and-ride auto demand from Sound Transit's transit ridership model. 3-hour PM peak-period is a close representation of daily park-and-ride demand.

[b] The value in parentheses is the park-and-ride auto forecasts with Alternative B7.

[c] With Alternative B1, 1,455 parking stalls are proposed at the South Bellevue Station. For alternatives B2A, B2E, and B3, 1,476 parking stalls are proposed.

parking surrounding the station (less than a 10 percent current utilization rate). This available parking is located in the Surrey Downs Neighborhood, but is not easily accessible to the SE 8th Station. At the 118th Station, there is a low potential for hide-and-ride impacts because the park-and-ride lot is expected to accommodate year 2020 and 2030 traffic predictions.

Segment C

The parking impacts associated with each alternative in Segment C are dependent on which transition option is used to connect to the alternative in Segment B. The 110th NE Elevated Alternative (C7E) would remove the most off-street stalls of any Segment C alternative. The property with the most stalls removed is a commercial property in the northeast corner of 112th Avenue NE and Main Street. Depending on its connection to Segment B, the 108 NE Tunnel Alternative (C3T) would remove the fewest off-street stalls of any Segment C alternative. The Couplet Alternative (C4A), depending on its connection to Segment B, may also remove the fewest off-street stalls. Only Alternative C4A would result in the removal of on-street parking. Seven unrestricted on-street spaces and four on-street spaces that have been designated as short-term loading zones would be removed.

The design of the Bellevue Transit Center Station with the C3T would require the removal of off-street parking spaces in a private parking lot on the northeast corner of the intersection of NE 6th Street and 108th Avenue NE. For Alternative C7E, this station is expected to require the removal of parking spaces on the southeast corner of the intersection of NE 6th Street and 112th Avenue NE.

No impacts on parking spaces are expected with the construction of the Old Bellevue, East Main, or Ashwood/Hospital stations for any of the alternatives in Segment C.

At Old Bellevue, Ashwood/Hospital, and Bellevue Transit Center stations, there is some available on-street parking; however, there is low potential for hide-and-ride parking at these stations because most of the on-street parking provided in this area is either restricted or private lots that are monitored. There is low potential for hide-and-ride parking at the East Main and Hospital stations because there is a minimal amount of available on-street parking surrounding the station areas. Most of the stations in Segment C are designed for bus and pedestrian access and would not be attractive stations for auto access due to the surrounding congestion and restricted public parking opportunities.

Segment D

The NE 20th Alternative (D3) would remove a relatively high number of off-street parking spaces, the largest being associated with a commercial space on the northwest corner of the intersection of NE 20th Street and 152nd Avenue NE. At an adjacent shopping center on the northeast corner of the intersection of NE 20th Street and 148th Avenue NE, parking spaces would be removed by Alternative D3. D3 would also require the removal of off-street parking spaces on multiple properties located along 152nd Avenue NE between NE 20th Street and NE 24th Street.

The NE 16th At-Grade Alternative (D2A), the NE 16th Elevated Alternative (D2E), and D3 would affect the parking at light industrial properties at the southwest end of Segment D near 120th Avenue NE between NE 14th Street and NE 15th Street. D2A and D3 are expected to require the removal of on-street parking spaces located on the north side of NE 16th Street between 132nd Avenue NE and 134th Avenue NE and on the east side of 136th Avenue NE between NE 16th

Street and NE 20th Street. D5 would remove the fewest off-street stalls of the Segment D alternatives.

Several areas where parking would be removed are near the 130th Station and the Overlake Village Station. Parking spaces near the 130th Station would be removed if designed for alternatives D2A, D2E, and D3. The design associated with D2E would require the removal of additional parking spaces. All of these affected parking spaces are located within private off-street parking lots between 130th Avenue NE and 132nd Avenue NE, near NE 16th Street.

For alternatives D2A and D2E, the design of the Overlake Village Station would require the removal of parking spaces located in private off-street parking lots on the northwest corner of the intersection of NE 24th Street and 152nd Avenue NE. Alternative D5 would affect the same private parking lots, but the number of affected parking spaces would vary depending on which of the two potential station locations is chosen. The design of the Overlake Village Station associated with Alternative D3 requires the removal of parking spaces located in private lots along 152nd Avenue NE, north of NE 24th Street.

At the Overlake Village and Overlake Transit Center stations, there is the potential for parking spillover because the future parking forecast is higher than the station's parking capacity. The Overlake Village Park-and-Ride Lot is not planned to be expanded with the East Link Project and currently accommodates slightly over 200 vehicles. The Overlake Transit Center lot would be expanded to accommodate approximately 320 stalls. Both of these stations are expected to have at least 100 more autos trying to use these lots than can be accommodated. By 2030, the Overlake Transit Center is expecting to have additional autos trying to use this lot that could further increase the potential for spillover. However, because there is a minimal amount of available on-street parking surrounding these stations, there is a low potential for hide-and-ride impacts. At the Overlake Transit Center, while the potential spillover could infringe on nearby private businesses, they are currently already monitored; therefore, hide-and-ride activity is again expected to be low.

At the 124th Station, there is available on-street parking surrounding the station, indicating a high potential for hide-and-ride impacts.

The park-and-ride capacity at the 130th Station in years 2020 and 2030 is not forecast to be fully utilized; therefore, there is a low potential for parking spillover to occur. In addition, there is a minimal amount of available on-street parking available for hide and ride to occur.

In Segment D, because there are numerous private parking lots surrounding the stations, measures such as security enforcement or time-limited parking by private owners would minimize the potential for hide-and-ride activities.

Segment E

The Marymoor Alternative (E2) would have the greatest parking impact of the three Segment E alternatives, and would be the only Segment E alternative to remove on-street parking. For public parking, all of the removed on-street spaces would be located along 161st Avenue NE between NE 83rd Street and NE 85th Street. If Alternative E2 terminates at Redmond Town Center Station, these on-street parking spaces would not be removed. All three alternatives would require the removal of parking spaces located in a private parking lot on the southwest corner of the intersection of NE 40th Street and 156th Avenue NE. The Redmond Transit Center Station, which is associated only with Alternative E2, would require the removal of off-street parking spaces in lots located along the west side of 161st Avenue NE between NE 80th Street and NE 83rd Street. If Alternative E2 terminates at the Redmond Town Center Station, the off-street parking spaces removed with the Redmond Transit Center Station would not occur. The Redmond Way Alternative (E1) would remove the fewest off-street stalls of the Segment E alternatives.

At the two stations with park-and-ride lots, Redmond Transit Center and SE Redmond, the expected auto forecasts would be less than the available parking capacity; therefore, there is a low potential for parking spillover to occur. In addition, with the low amount of on-street parking available near the SE Redmond Station, there would not likely be hide-and-ride impact at this station even if the parking usage exceeded the park-and-ride capacity.

At the Redmond Town Center Station, with no proposed park-and-ride lot and with a substantial amount of available on-street parking surrounding the station, high potential for hide-and-ride impacts could occur. However, the City of Redmond is planning to implement a restricted (time-limited) parking policy in the future in their downtown area. This would limit hide-and-ride activity. Hide-and-ride parking could also occur in the neighboring retail center. Currently implemented security enforcement and planned time-limited parking would minimize the potential for hide-and-ride activities in this development.

3.6.4 Construction Impacts

Construction of the project alternatives would result in temporary impacts on arterials, local streets, and parking within the construction areas. Construction activities expected to result in impacts include light rail construction, truck hauling, and construction staging. The impacts from truck hauling were evaluated based on the number of truck trips and potential haul routes as discussed in the following subsection. For discussion of construction impacts on I-90, I-405, and SR 520, refer to Section 3.5; for construction impacts on transit, refer to Section 3.4. The *Transportation Technical Report* provides further discussion of the roadway impacts, including haul routes and truck trips, associated with the construction of each alternative.

3.6.4.1 Truck Volumes and Haul Routes

The exact number of construction truck trips that would be needed for the construction of each alternative is dependent on many variables that cannot be fully determined or finalized at this time, but an estimate was prepared to understand potential East Link Project construction impacts on the local and regional transportation system. A range of truck trips is provided in Table 3-28, based on estimated quantities for the main trip generation activities including imported fill material, concrete, asphalt concrete pavement, and excavated material that would be generated for the construction of each alternative. Truck trips associated with activities such as miscellaneous deliveries have not yet been quantified and are excluded from this estimate. Established truck routes were identified using the classified truck routes from WSDOT, King County, and the cities of Seattle, Bellevue, and Redmond and are shown in Appendix G1. Final truck routes would be determined in conjunction with local jurisdictions through the permitting processes. The truck routes for each alternative were split into several sections based on the access to and from the alternative and classified truck routes.

TABLE 3-28
Average Truck Trips for Construction of Alternatives

Alternative	Average Truck Trips To/From Location[a]	
	Per Day	Per Hour[b]
Segment A		
A1, I-90	12-14	1
Segment B		
B1, Bellevue Way	54-66	5-7
B2A, 112th SE At-Grade	35-42	3-4
B2E, 112th SE Elevated	18-23	2
B3, 112th SE Bypass	26-32	3
B7, BNSF	24-30	2-3
Segment C		
C1T, Bellevue Way Tunnel	169-206	17-21
C2T[c], 106th NE Tunnel	100-150	10-15
C3T[c], 108th NE Tunnel	154-211	15-21
C4A[c], Couplet	112-149	11-15
C7E[c], 112th NE Elevated	14-32	1-3
C8E[c], 110th NE Elevated	106-143	11-14
Segment D		
D2A[c], NE 16th At-Grade	32-40	3-4
D2E[c], NE 16th Elevated	27-33	3
D3[c], NE 20th	61-75	6-7
D5[c], SR 520	26-33	3
Segment E		
E1, Redmond Way	59-72	6-7
E2, Marymoor	71-87	7-9
E4, Northeast Leary Way	71-87	7-9

[a] A range of truck trips has been provided in this table, based on a low and high factor of the known quantities of imported fill, material, concrete, asphalt concrete pavement, and excavated waste material that would be needed for the construction of each alternative.

[b] Assuming a minimum of 10 construction hours per day.

[c] Truck trips are summarized for each segment alternative; refer to *Transportation Technical Report* for the truck trips for each alternative connection combination.

Note: For haul origin/destination and suggested haul route for each alternative, refer to the *Transportation Technical Report* and the conceptual design drawings in Appendix G1

In Segment A, a relatively low amount of truck activity (less than 20 trucks per day) is expected because the alternative requires minimal excavation and import of loose materials. Trucks would access and use I-90 as a haul route. In Segment A, the most intensive period of truck trips would last approximately 2 years.

Of the alternatives in Segment B, the Bellevue Way Alternative (B1) is predicted to require the most truck trips due to the relatively high amount of excavation and paving required. With this alternative, up to 70 truck trips per day would need to access Bellevue Way SE, NE 8th Street, and 112th Avenue SE from I-90 and I-405. For all of the Segment B alternatives, trucks would access construction areas from these same streets. In Segment B, the most intensive period of truck trips would last approximately 2 to 3 years.

In Segment C, the 108th NE Tunnel Alternative (C3T) connecting with the 112th SE At-Grade Alternative (B2A) is expected to result in the greatest number of truck trips per day of the alternatives in Segment C.

Up to 210 haul truck trips per day would be required to access 112th Avenue NE between SE 8th Street and NE 12th Street. The Segment C tunnel alternatives are expected to generate a large number of trucks for excavating material, while the 112th NE Elevated Alternative (C7E) is expected to generate a relatively small number of trucks because the alternative does not require an extensive amount of excavation. In Segment C, the most intensive period of truck trips would last up to approximately 3 years for surface and elevated alternatives and approximately 4 years for tunneled alternatives. Generally, truck trips would access Segment C construction areas from I-405 via SE 8th, NE 4th, and NE 8th streets.

Of the alternatives in Segment D, the NE 20th Alternative (D3) would require the most truck trips, up to 75 per day, because of excavation of materials. The suggested truck routes for this alternative would use Bel-Red Road, 152nd Avenue NE, 156th Avenue NE, and arterials along the route. In Segment D, the most intensive period of truck trips would last approximately 3 to 4 years. Generally, truck trips would access Segment D construction areas from SR 520 via 124th, 140th, and 148th avenues NE.

In Segment E, the Marymoor Alternative (E2) and the Leary Way Alternative (E4) would require up to 90 trips per day. These trips would be likely routed on a frontage road along SR 520 and along SR 202, and West Lake Sammamish Parkway NE. In Segment E, the most intensive period of truck trips would last approximately 2 to 3 years. Generally, truck trips would access the Segment E construction areas from West Lake Sammamish Parkway and SR 202.

For the proposed maintenance facilities in Segment D, the 116th Maintenance Facility (MF1) is expected to have the greatest number of truck trips, up to 140 per day. MF1 is located between 116th Avenue NE and the BNSF Railway and has auto access to 120th Avenue NE. Truck trips were assumed to use the SR 520 interchange with 124th Avenue NE to deliver and haul materials. In Segment E, the SE Redmond Maintenance Facility (MF 5) would require about 25 trips per day. The suggested truck route for this facility would use the SR 520 interchange with SR 202. The most intensive period of truck trips would last approximately 2 years.

3.6.4.2 Roadway and Parking Impacts

The construction impacts by segment are detailed in Table 3-29. This section discusses potential impacts for each segment and the maintenance facilities. For the discussion of the construction impacts to transit service and transit facilities, and to regional highways (I-90, I-405, SR 520), refer to section 3.4.4 and 3.5.3.4, respectively.

Within Segment A, short term roadway shoulder and/or lane closures may occur on Rainier Avenue S, 77th Avenue SE and 80th Avenue SE for station area construction.

Within Segment B, primarily principal arterials would be affected by construction, mostly by partial road closures for long-term durations during construction. Under the B1 Alternative, construction impacts would be along Bellevue Way SE. Under the B2A, B2E, and B3 alternatives, construction impacts would be along Bellevue Way SE south of 112th Avenue SE and along 112th Avenue SE north of Bellevue Way. The B2A Alternative would have more impacts along Bellevue Way than the B2E and B3 alternatives. The B7 Alternative would only affect 118th Avenue SE.

Detour routes would be available with the exception of Bellevue Way SE south of 112th Avenue SE, where only partial closures would occur so that a detour would not be needed. The potential for traffic to detour into residential neighborhoods would be minimal because of limited north-south connections with the possible exception of Bellevue Way SE north of 112th Avenue SE, and 112th Avenue NE north of Bellevue Way SE. Vehicles could adjust and use 108th Avenue SE, but, with the current traffic calming devices installed on this road, the probability of traffic detouring through this area is low.

Within Segment C, local, minor, and principal arterials would be affected by construction. Road closures would range from none at staging areas and partial road closures for short-term durations to full road closures for long- term durations. Tunnel alternative impacts are the result of cut and cover tunnel construction. The C1T Alternative would affect Bellevue Way and NE 6th Street. The 106th, 108th, 110th Avenue NE cross-streets would be at least partially closed for short durations with the cut-and-cover construction. The C2T Alternative would have impacts along 112th Avenue SE, 106th Avenue NE and NE 6th between 110th Avenue NE and I-405. Cross-streets would be at least partially closed along the cut-and-cover construction between Main Street and 110th Avenue NE.

The C3T Alternative would have impacts along 112th Avenue SE and 108th Avenue NE. NE 6th Street and NE 12th Street cross-street would at least be partially closed during the cut-and-cover construction. The C4A Alternative would have impacts along 112th Avenue SE, Main Street, 108th Avenue NE, 110th Avenue NE and NE 12th Street. The C7E Alternative would have

TABLE 3-29
Construction Impacts by Segment

Segment/Location	Alternative	Roadway Classification	Construction Truck Traffic[a]	Road Closure[b]	Detour of Traffic		On-Street Parking Loss?[c]	Bus Route Impact?
					Detour Route Available?	Neighborhood Traffic Intrusion		
Segment A, Interstate 90								
Rainier Avenue S	A1	Principal Arterial	Low	Partial, short term	Yes	Low	No	Yes
77th Avenue SE	A1	Collector Arterial	Low	Partial, short term	Yes	Low	No	Yes
80th Avenue SE	A1	Collector Arterial	Low	Partial, short term	Yes	Low	No	Yes
Refer to Section 3.5.3.4 for I-90 mainline construction impacts								
Segment B, South Bellevue								
Bellevue Way south of 112th Avenue SE	B1	Principal Arterial	Moderate	Partial, long term	No	Moderate	No	Yes
	B2A	Principal Arterial	Low	Partial, long term Full, short term	No	Moderate	No	Yes
	B2E	Principal Arterial	Low	Partial, long term	No	Moderate	No	Yes
	B3	Principal Arterial	Low	Partial, long term	No	Moderate	No	Yes
Bellevue Way north of 112th Avenue SE	B1	Principal Arterial		Partial, long term	Yes	Moderate	No	Yes
112th Avenue SE	B2A	Principal Arterial	Low	Partial, long term	Yes	Moderate	No	Yes
	B2E	Principal Arterial	Low	Partial, short term	Yes	Moderate	No	Yes
	B3	Principal Arterial	Low	Partial, long term	Yes	Moderate	No	Yes
118th Avenue SE	B7	Collector Arterial	Low	Partial, long term	Yes	Low	No	No
Segment C, Downtown Bellevue								
Bellevue Way	C1T	Principal Arterial	High	Partial, long term Full, short term	Yes	Moderate	No	Yes
106th Avenue NE	C2T	Local Arterial	Moderate	Partial, long term	Yes	Low	No	Yes
106th Avenue NE (Main Street to NE 12th Street)	C4A	Local Arterial	None	None	Yes, but limited for commercial access on the street	Low	No	Yes
108th Avenue NE	C3T	Minor Arterial	High	Partial, short term Full, short term	Yes	Low	No	No
108th Avenue NE (Main Street to NE 12th Street)	C4A	Minor Arterial	High	Partial, long term Full, short term	Yes, but limited for commercial access on the street	Low	No	No

TABLE 3-29
Construction Impacts by Segment

Segment/Location	Alternative	Roadway Classification	Construction Truck Traffic[a]	Road Closure[b]	Detour of Traffic		On-Street Parking Loss?[c]	Bus Route Impact?
					Detour Route Available?	Neighborhood Traffic Intrusion		
110th Avenue NE (Main Street to NE 12th Street)	C4A	Minor Arterial	High	Partial, long term Full, short term	Yes, but limited for commercial access on the street	Low	No	Yes
	C8E	Minor Arterial	Low	Partial, long term	Yes	Low	No	Yes
112th Avenue NE south of Main Street	C2T, C3T, C4A, C7E, C8E (with B3 or B7	Principal Arterial	Moderate	Partial, short term	Yes, but limited for commercial access on the street	Low	No	No
112th Avenue NE south of Main Street	C2T, C3T, C4A, C7E (with B2A or B2E	Principal Arterial	Moderate	Partial, long term	Yes, but limited for commercial access on the street	Low	No	Yes
112th Avenue NE north of Main Street	C7E	Principal Arterial	Low	Partial, short term	Yes	Low	No	No
Main Street	C4A	Minor Arterial	High	Partial, long term	Yes, but limited for commercial access on the street	Low	No	Yes
NE 12th Street	C4A, C3T, C8E	Principal Arterial	High	Partial, short term	Yes, but limited for commercial access on the street	Low	No	No
NE 6th Street, between Bellevue Way and 106th Avenue NE	C1T	Local Arterial	High	Full, long term	Yes	Low	No	Yes
NE 6th Street, between 110th Avenue NE and 405	C1T, C2T	Minor Arterial	Moderate	Partial, long term Full, short term	Yes	Low	No	Yes
Main Street (staging areas)	All C Alts	Minor Arterial	Moderate	None	Yes		No	No
NE 12th Street (staging areas)	All C Alts	Principal Arterial	Moderate	None	Yes		No	No
Segment D, Bel-Red/Overlake								
116th Ave NE crossing	All D Alts	Principal Arterial	Low	Partial, short term	Yes	Low	Yes	No
120th Ave NE crossing	D2A, D3	Collector Arterial	Low	Partial, short term	Yes	Low	Yes	No
124th Ave NE crossing	D2A, D3	Minor Arterial	Low	Partial, short term	Yes	Low	Yes	No
130th Ave NE crossing	D2A, D3	Collector Arterial	Low	Partial, short term	Yes	Low	Yes	No
NE 16th Street/between 132nd Avenue NE and 136th Ave NE	D2A, D3	Local Arterial	Low	Full, long term	Yes	Low	Yes	Yes

TABLE 3-29
Construction Impacts by Segment

Segment/Location	Alternative	Roadway Classification	Construction Truck Traffic[a]	Road Closure[b]	Detour of Traffic		On-Street Parking Loss?[c]	Bus Route Impact?
					Detour Route Available?	Neighborhood Traffic Intrusion		
136th Ave NE/between NE16th Ave St and NE 20th St	D2A, D3	Collector Arterial	Low	Full, long term with Partial, short term	Yes	Low	Yes	Yes
	D2E				Yes	Low	Yes	Yes
NE 20th Street/between 136th St Ave and 152nd Ave NE	D3	Minor Arterial	Moderate	Partial, long term	Yes	Moderate	No	Yes
NE 24th Street, between 151st PL NE and 152nd Ave. NE	D2A, D2E, D5	Minor Arterial	Low	Partial, long term	No	Low	No	Yes
NE 151st PL NE at NE 24th St	All D Alts	Minor Arterial	Low	Full, short term	Yes	Low	No	No
152nd Avenue NE north of NE 24th Street	D2A, D2E, D5	Local Arterial	Low	Partial, long term	No	Low	No	Yes
152nd Ave NE/between NE 20th St and SR520	D3	Local Arterial	Moderate	Partial, long term	No	Low	No	Yes
Microsoft Road	All D Alts	Local Arterial	Low	Partial, short term	Yes	Low	No	No
Segment E, Downtown Redmond								
NE 40th St, NE 51st St, and NE 60th St	All E Alts	Collector Arterial	Moderate	Partial, short term	No	Moderate	No	No
161St Ave NE, 166th Ave NE, 170th Ave NE	E1, E4	Local Arterials	Moderate	Partial, short term	Yes	Low	No	Yes
NE Leary Way	E4	Principal Arterial	Moderate	Partial, long term	Yes	Low	No	Yes
NE 70th Street	E1, E4	Local Arterial	Moderate	Full, short term	Yes	Low	Yes	Yes
161st Avenue NE, between Redmond Way and NE 85th Street[d]	E2	Collector Arterial	Moderate	Full, long term	Yes	Moderate	Yes	Yes
Leary Way at Bear Creek Parkway (future by others)	E4	N/A		Partial, long term	Yes	Low	No	No
SR 520 on- and off-ramps at SR 202	E2, E4	State Highway	Moderate	Partial, long term	No	Low	No	No

[a] Low truck traffic is associated with routes that would have minimal fill, excavation, and concrete work, while high truck traffic is associated with major fill, excavation, and concrete work. Moderate is between these two boundaries.

[b] Partial road closure assumes some lanes are open to traffic. Short- and long-term duration was determined to be less or more than one year. Full short-term closures would be required for specific activities like station construction, retained cut and fill construction, column drilling or girder placement, and so forth, and can be as short as one night/day closure to less than one year.

[c] On-street parking loss is characterized for street parking only and does not consider that some off-street parking might be lost due to the location of construction and staging areas.

[d] If Alternative E2 terminates at the Redmond Town Center Station, this roadway construction would not occur.

impacts along 112th Avenue SE and 112th Avenue NE. The C8E Alternative would have impacts along 112th Avenue SE and 110th Avenue NE.

Detour routes are available in the central business district, but commercial vehicles would have limited access in some cases. Construction vehicle traffic would range from low to high, and neighborhood traffic intrusion would range from low to moderate. NE 6th Street between Bellevue Way and 106th Avenue NE is the only road expected to have a long-term full closure for the construction of C2T, but it has a low volume of traffic. Short-term full closures are expected for Bellevue Way for C1T, 108th Avenue NE for C3T, 108th and 110th avenues NE to convert the roadways to one-way traffic operations for C4A, and NE 6th Street between 110th and I-405 for C1T and C2T.

Within Segment D, collector, local, minor, and principal arterials would be affected by construction. Road closures range from partial road closures for short-term durations to full road closures for long-term durations. The D2A Alternative would have impacts along NE 16th Street, 136th Avenue NE, NE 24th Street, 152nd Avenue NE and Microsoft Road with crossings at 116th Avenue NE, 120th Avenue NE, 124th Avenue NE and 130th Avenue NE. The D2E Alternative would have impacts along 136th Avenue NE, NE 24th Street, 152nd Avenue NE and Microsoft Road with a crossing at 116th Avenue NE. The D3 Alternative would have impacts along NE 16th Street, 136th Avenue NE, NE 20th Street, 152nd Avenue NE and Microsoft Road with crossings at 116th Avenue NE, 120th Avenue NE, 124th Avenue NE and 130th Avenue NE. The D5 Alternative would have impacts along NE 24th Street, 152nd Avenue NE and Microsoft Road with a crossing at 116th Avenue NE. Full closures are expected only on NE 16th Street, 136th Avenue NE and 151st Avenue NE.

Detours would be available through commercial areas. The potential for detoured traffic and construction vehicles to affect neighborhood areas would be low because there is not a substantial amount of residential development in the area and the construction would occur on or near designated truck routes. There would be some on-street parking loss associated with construction impacts within Segment D.

Within Segment E, local and collector arterials would be affected by construction. Road closures would range from partial closures for short-term durations to full closures for long-term durations. The E1 Alternative would have impacts along 161st Avenue NE, 166th Avenue NE, 170th Avenue NE and NE 70th Street. The E2 Alternative would have impacts along 161st Avenue NE between Redmond Way and NE 85th Street and SR 520 on- and off-ramps at SR 202. If Alternative E2 terminates at the Redmond Town Center, construction impacts along 161st Avenue NE would not occur. The E4 Alternative would have impacts along 161st Avenue NE, 166th Avenue NE, 170th Avenue NE, NE 70th Street, SR 520 on- and off-ramps at SR 202, along Leary Way and a crossing at Bear Creek parkway. All Segment E alternatives would have crossings at NE 40th Street, NE 51st Street and NE 60th Street. The roadways with full closures are NE 70th Street for a short duration (E1 and E4 Alternatives) and 161st Avenue NE, between Redmond Way and NE 85th Street (E2 only), for a long duration while the potential station and track are being constructed. Detours would be available through commercial areas. Construction vehicle traffic would be moderate, and the potential for traffic to detour through residential neighborhoods is low. There would be some on-street parking loss associated with construction impacts within Segment E.

In all segments, cross streets that intersect the alternatives would be closed for short durations to construct the track or other associated features through the intersection. These closures would most likely occur during off-peak hours to avoid traffic disruptions and would generally occur for less than a week. Likewise, temporary full closures of private driveways and any roads that need to be paved would also occur.

A relatively high number of construction workers (traffic and parking) are expected to construct the project. The largest number of employees at any given site is anticipated during two periods: excavation for tunnel or retained-cut activities, and construction of the guideway and stations, especially if grade separated. Contractors and construction workers parking near designated construction staging areas could affect area parking supply during heavy construction periods by using unrestricted on-street parking in residential or other areas near the construction site. The contractor is generally responsible for providing parking for construction workers where necessary. It is expected that some worker parking could be accommodated at the staging areas and along track routes. Sound Transit or its contractors may lease parking for construction workers near construction sites. Sound Transit may acquire additional properties for temporary use for contractor parking.

Construction of the maintenance facilities for alternatives D2A, D2E, and E1 would require the intersecting streets to be closed for short durations to

construct the track across the street. These closures would most likely occur during off-peak hours to avoid traffic disruptions and would generally last for less than a week. Temporary full closures of private driveways and any roads that need to be paved could also occur. Otherwise, there would be no impacts from construction of the maintenance facilities.

3.6.5 Potential Mitigation

This section discusses mitigation for impacts on intersection LOS and parking during project operation, and mitigation for impacts during project construction.

3.6.5.1 Intersection Level of Service

Arterial and local street mitigation is potentially required at intersections where the intersection LOS with the East Link Project would degrade to levels that do not meet the LOS standards of the jurisdiction. The intersections that are potentially affected and their related improvements are discussed in the following subsections.

Segment A

In Segment A, no mitigation is required in the City of Seattle. However, seven intersections on Mercer Island may require potential turn pocket or traffic signal improvements. These intersections are:

- West Mercer Way and 24th Avenue SE,
- 80th Avenue SE and SE 27th Street,
- 77th Avenue SE and Sunset Highway,
- 77th Avenue SE and I-90 eastbound HOV off-ramp,
- 77th Avenue SE and North Mercer Way,
- 77th Avenue SE and SE 27th Street, and
- 76th Avenue/North Mercer Way and I-90 westbound on-ramp.

All of these improvements would improve the intersection LOS to the same or better than the No Build Alternative. Sound Transit would contribute its proportionate share of costs to improve these intersections. Sound Transit's contribution would be determined by the project's ratio of trips at the intersection or another equitable method.

Segment B

Two intersections, Bellevue Way at 112th Avenue SE and 118th Avenue SE and SE 8th Street, may require potential intersection improvements. The Bellevue Way at 112th Avenue SE intersection (South Bellevue Park-and-Ride Lot entrance), associated with the Bellevue Way (B1), 112th SE At-Grade (B2A), and 112th SE Bypass (B3) alternatives, would improve with the proposed northbound right-turn pocket, improving intersection conditions to LOS C. The 118th Avenue SE and SE 8th Street intersection, associated with the B7 Alternative, would improve operations with the proposed eastbound right turn pocket. In both 2020 and 2030, the intersection would still operate at LOS F.

Segment C

In Segment C, two intersections may require mitigation. These are associated with the 110th NE Elevated Alternative (C8E). At the intersection of 110th Avenue NE and NE 8th Street, a northbound right turn pocket is proposed, and at 110th Avenue NE and NE 6th Street, a northbound right-turn pocket and modified signal phasing is proposed. These intersections would continue to operate at LOS F, but only 110th Avenue NE at NE 6th Street intersection would operate worse than the No Build Alternative.

Segment D

Segment D has three intersections that may require mitigation. These are associated with the NE 16 At-Grade (D2A), NE 16th Elevated (D2E), and NE 20th (D3) alternatives. D2A and D2E may require mitigation at the intersections of 151st Avenue NE and 152nd Avenue NE on NE 24th Street. An increased delay is due to the intersection phasing and timing needed so that the light rail train can safely travel across NE 24th Street between these two intersections. Prior to the light rail train arriving at this street crossing, both of the adjacent traffic signals would only serve the westbound approach at 151st Avenue NE and the eastbound approach at 152nd avenues NE to release any stopped or queued vehicles in this section of roadway. Once the section is clear, the light rail train could then proceed. While the traffic signal timing may not create substantial delay for the light rail train, it may create unacceptable vehicle operations on NE 24th Street. An alternative route could be further explored that aligns the track through either intersection, thus removing the need to provide a vehicle clearance phase prior to the train arriving.

D3 may require mitigation at the intersection of 148th Avenue NE and NE 20th Street in years 2020 and 2030. The impact with light rail would be relatively minor, but potential mitigation may include providing a southbound right-turn lane.

Segment E

In Segment E, five intersections may require mitigation. Two intersections are associated with all the Segment E alternatives, two intersections are associated only with the Marymoor Alternative (E2), and one intersection is associated only with

Alternative (E4). At the intersection of NE Leary Way and Bear Creek Parkway, proposed mitigation includes an eastbound right-turn pocket (E4 only). At Redmond Way and 161st Avenue NE, a westbound right-turn pocket is proposed (E2 only; may be included in city's future roadway improvements). At NE 83rd Street and 161st Avenue NE, the proposed improvement is a northbound right-turn pocket (E2 only). The intersection of SR 202 and NE 70th Street would be improved with an eastbound (SR 202) right-turn pocket (all Segment E alternatives). At intersection NE 70th Street and 176th Avenue NE, installation of a traffic signal would improve intersection operations for all Segment E alternatives.

For potential mitigation measures in the City of Redmond, Sound Transit and the City would continue to coordinate so that the city's long-range plans are considered along with intersection operations.

3.6.5.2 Parking

Mitigation may be required where there are potential impacts on parking around stations. The potential for hide-and-ride activities near stations and the best ways to mitigate such activities is specific to each area surrounding a station. Stations that may generate hide-and-ride users are locations where the auto forecast is higher than the available parking at the station and there is a substantial amount of on-street unrestricted parking available surrounding the station. Locations where this could occur are the Rainier Station, Mercer Island Station (with Alternative B7), 124th Station, and the Redmond Town Center Station. Prior to implementing any parking mitigation measures, Sound Transit would inventory on-street parking around each of these stations up to one year prior to the start of light rail revenue service. These inventories would document the current on-street parking supply within a one-quarter mile radius of the stations. Based on the inventory results, Sound Transit and the local jurisdiction would work with the affected stakeholders to identify and implement appropriate mitigation measures.

Parking control measures could consist of parking meters, restricted parking signage, passenger and truck load zones, and RPZ signage. Other parking mitigation strategies could include promotion of alternative transportation services (e.g., encourage the use of vanpool or carpool services, walking, or bicycle riding).

If the City of Mercer Island and the City of Redmond do not implement their planned time-limited parking, parking control measures such as restricted parking could be implemented to mitigate hide-and-ride activity at the Mercer Island and Redmond Town Center stations. For parking controls agreed to with the local jurisdiction and community, Sound Transit would be responsible for the cost of installing the signage or other parking controls and any expansion of the parking controls for one year after opening the light rail system. The local jurisdictions would be responsible for monitoring the parking controls and providing all enforcement and maintenance of the parking controls. The local residents would be responsible for any RPZ-related costs imposed by the local jurisdiction.

Surrounding the Mercer Island Station, mitigation measures may include time-limit signs and RPZs to minimize potential impacts on the residential streets and Town Center area. Spill-over parking would be controlled similarly to Mercer Island's enforcement of the RPZ that already surrounds the site. This zone limits on-street parking to residents only, as indicated by a sticker placed in the resident's vehicle.

3.6.5.3 Construction Mitigation

All mitigation measures associated with the construction of the East Link Project would comply with local regulations governing construction traffic control and construction truck routing. Sound Transit would finalize detailed construction mitigation plans in coordination with local jurisdictions, WSDOT, Metro, and other affected agencies and organizations. Mitigation measures for traffic impacts due to light rail construction could include the following:

- Follow standard construction safety measures, such as installation of advance warning signs, highly visible construction barriers, and the use of flaggers.
- Post advance notice signs prior to construction in areas where surface construction activities would affect access to surrounding businesses.
- Provide regular, written updates to assist public school officials in providing notice to students and parents concerning construction activity near schools.
- Use lighted or reflective signage to direct drivers to truck haul routes and enhance visibility during nighttime work hours.
- Use temporary reflective truck prohibition signs on streets with a high likelihood of cut-through truck traffic.
- Schedule traffic lane closures and high volumes of construction traffic during off-peak hours to minimize delays during periods of higher traffic volumes as much as possible.

- Provide public information through tools such as print, radio, posted signs, and electronic web pages to provide information regarding street closures, hours of construction, business access, and parking impacts.
- Where construction worker parking could adversely affect on-street parking in adjacent neighborhoods, restrict the contractor from using on-street parking. Where necessary, the contractor could also be responsible for providing parking areas for construction workers.

For potential transit (and associated park-and-ride) and regional highway (I-90, I-405, and SR 520) mitigation during East Link Project construction, refer to Sections 3.4 and 3.5, respectively.

3.7 Nonmotorized Facilities

3.7.1 Methodology

Within the study area, Sound Transit inventoried existing nonmotorized facilities consisting of sidewalks, designated bicycle routes, marked bicycle lanes, and regional multi-use trails. Sidewalks were inventoried within an area one-half mile from potential stations, and bicycle routes were inventoried within an area one mile from stations. Missing sidewalk areas were identified on either one or both sides of the street in consideration of local agency comprehensive plan and transportation element policies.

Pedestrian Level of Service

A measure of the walking conditions on a sidewalk, route, or path. LOS A represents ample spacing between pedestrians on a sidewalk or path, allowing for free-flow walk speeds. LOS F represents unavoidable crowding between pedestrians on a sidewalk or path, preventing free-flow walking speed and movement.

Regional multi-use trails as well as local agency-recommended school walk routes were also identified and analyzed for any potential impacts based on their proximity to stations. Pedestrian LOS was also analyzed within 300 feet of station entrances using the methodology from the Highway Capacity Manual (TRB, 2000) and the *Transit Capacity and Quality of Service Manual* (Transit Cooperative Research Program, 2003). For a more in depth discussion on nonmotorized facilities refer to the Section 7 in the *Transportation Technical Report* (Appendix H1).

3.7.2 Affected Environment

3.7.2.1 Pedestrian Activity, Sidewalks, and School Walk Routes

Sidewalks are available along most arterial streets within the study area, providing sufficient pedestrian connections. Generally, there are only a few sections that are missing sidewalk on one or both sides of the street. Exhibits 7-1 though 7-3 and Tables 7-1 through 7-5 in the *Transportation Technical Report* (Appendix H1) provide further detail on the sidewalks and trails in the study area. Streets that lack sidewalks are typically in residential neighborhoods, on local access streets, or on streets with low pedestrian volumes. The following subsections describe the pedestrian activity, sidewalks, and crosswalks in each segment.

Segment A

The Rainier Station in Segment A is located between the Central Area and North Rainier Valley neighborhoods in Seattle. Pedestrians using bus facilities in this area mostly originate from or are destined to the surrounding neighborhoods, including the International District. A few small segments with missing sidewalks, less than one quarter of a mile, were identified along Rainier Avenue S. Crosswalks are present at most arterial intersections in this area. Sidewalks are present along both sides of Rainier Avenue S, south of I-90. North of I-90, sidewalks are present along the western side of Rainier Avenue S. On the east side of Rainier Avenue S, under I-90, the sidewalk terminates and connects to a paved trail that continues into Judkins Park and Playfield. The crosswalk and sidewalk configuration in this area is discontinuous and creates slightly longer walking distances for pedestrians to navigate through. Additionally, there is a midblock crossing on 23rd Avenue S connecting S Day Street to the western portion of the I-90 Lid Park and Rainier Station.

On Mercer Island, a more walkable area has been created in the northern part of the island as a result of recent mixed-use developments at the Mercer Island Town Center, completion of the new Mercer Island Park-and-Ride Lot, and improvements in pedestrian connectivity between the Town Center and North Mercer Island. Nearly all of the commercial activity in Mercer Island is centralized at the Mercer Island Town Center, making it a common destination for residents and pedestrians. The Mercer Island I-90 Lid Park provides multiple connection points across I-90 between North Mercer Island and the Town Center. Specifically, sidewalks located along 76th Avenue SE, 77th Avenue SE, and 80th Avenue SE provide pedestrian and bicycle connectivity across I-90. Crosswalks and wider sidewalks are present throughout most of the commercial area on Mercer Island in addition to some pedestrian-friendly roadway elements such as bulb-outs and street trees.

School walk routes are not present on arterial streets within Segment A.

Segment B

The South Bellevue Park-and-Ride Lot is the primary transit facility serving the South Bellevue neighborhoods. Pedestrian activity in this area is not as high as in other areas in the study area. Crosswalks are located at the signalized intersections nearest to the park-and-ride lot. There is no sidewalk along the western side of Bellevue Way SE, south of 112th Avenue SE, due to right-of-way constraints associated with the topography. Common walking origins or destinations in this area include the Enatai Neighborhood, nearby office parks, and the Mercer Slough recreational area.

The existing sidewalks surrounding the proposed 118th and SE 8th stations are generally present along arterial streets in this area although sidewalks are absent on the east side of 114th Avenue NE (along I-405) and 118th Avenue SE due to right-of-way constraints. At the interchange of SE 8th Street and I-405, crosswalks are marked along the north side of SE 8th Street although they are absent along the south side of SE 8th Street.

In Segment B, a missing sidewalk was also identified on SE 25th Street, which serves the school walk route for Enatai Elementary School. Most of the school walk routes for this school are located on collector and local residential streets.

Segment C

The highest pedestrian activity in Segment C and in the study area is focused around the Bellevue Transit Center in Downtown Bellevue. Currently, almost 700 pedestrians during the PM peak hour use the large pedestrian crosswalk at the intersection of 108th Avenue NE and NE 6th Street (adjacent to the Bellevue Transit Center). Many pedestrians using this station originate from or are destined to nearby employers throughout downtown. An east-west pedestrian pathway provides connectivity between the Bellevue Transit Center and the Bellevue Square Mall and surrounding retail uses. Sidewalks are available on both sides of all arterials immediately surrounding this station. Within Segment C, there is one mid-block crosswalk on NE 10th Street between 110th Avenue NE and 108th Avenue NE providing connectivity between the King County Library and nearby apartment buildings.

Segment C has missing sidewalk on portions of 108th Avenue SE, which serves a school walk route. These missing sidewalk areas are within a one-half mile walking distance from proposed stations; however, they are not located immediately adjacent to the station sites. Sidewalks are also provided on the arterials that connect Downtown Bellevue with Segment B and D.

Similar to the other segments, much of the school walk routes are located on collector and local streets.

Segment D

Pedestrian activity in Segment D mostly occurs near the Overlake Hospital and the area surrounding Overlake Village. A mid-block crosswalk across 116th Avenue NE allows for pedestrian access to smaller retail areas across from the hospital. Minimal pedestrian activity north of Bel-Red Road is composed of employees and patrons using on- and off-street parking near the commercial and light warehouse land uses. Generally, pedestrian activity in Segment D is not as substantial as it is in other segments. Large portions of missing sidewalk facilities on north-south arterial streets and long walking distances between Bel-Red Road and NE 20th Street can discourage pedestrian activity in this area. Crosswalks are located at all signalized intersections in Segment D. Pedestrians accessing the Overlake Transit Center are typically transferring from bus to another mode, thus high volumes of pedestrian activity outside the transit center is uncommon.

School walk routes are not present on arterial streets within segment D.

Segment E

Pedestrian activity is more common within the Redmond Town Center and Marymoor Park because sidewalks, bicycle lanes, and recreational facilities have contributed to a more walkable area near the Town Center. Sidewalks are generally present within Segment E, although there are some sidewalks gaps on Bear Creek Parkway and 166th Avenue NE between Redmond Town Center and Downtown Redmond. Although the Redmond Town Center and Marymoor Park are popular pedestrian destinations, they are separated by SR 520, which presents a barrier for pedestrians wishing to cross between the two areas. Crosswalks are present at all signalized intersections in Segment E with the exception of the SR 520 entrance/exit ramps along NE 76th St and NE Redmond Way.

A school walk route for the Redmond Elementary School is located within a one-half-mile radius of the Redmond Town Center Station.

3.7.2.2 Bicycle Routes, Lanes and Multi-Use Trails

Trails used only for recreation are not addressed in this section (see Section 4.17, Parkland and Open Space).

Within the East Link corridor, biking activity tends to occur most commonly along the regional multi-use trails. This is largely due to these facilities being separated from the arterial street network, allowing bicyclists to avoid travel on arterial streets with high traffic volumes.

Bicycle lanes are present on some arterials throughout the study area, and designated and signed bicycle routes are located on the majority of arterial or collector streets throughout the corridor. Some arterials in the study area also have a wide shoulder allowing for bicycle activity. Designated bicycle routes, marked bicycle lanes, and regional multi-use trails include 12th Avenue S in Seattle; I-90 trail (includes North Mercer Way); Bellevue Way, 112th Avenue, 118th Avenue, Bel-Red Road, NE 20th and 24th Streets and 140th and 148th avenues NE in Bellevue; and 156th Avenue, West and East Lake Sammamish Parkway, and SR 202/Redmond Way in Redmond.

Regional multi-use trails provide regional mobility for nonmotorized users. There are several regional multi-use trails within the study area, and some of the accesses to these trails are located within close walking or bicycle distance to the stations, providing transit commuters with a location to easily transfer to and from nonmotorized modes. Regional multi-use trails located in the project vicinity include the I-90 Multi-Use Regional Trail (Mountains to Sound Greenway), Mercer Slough Nature Park and Multi-Use trails, SR 520 Regional Trail, Bridle Crest Trail, Sammamish River Trail, East Lake Sammamish River Trail, and Bear Creek Trail. These trails are connected to one another by local designated bicycle routes. Trail access to the SR 520 Regional Trail is limited to recreational parks that are not within direct walking distance of the stations in Segment D or Segment E. One proposed facility, the BNSF Railway Trail, is anticipated to be developed as a multi-use trail. This trail would follow the existing BNSF Railway corridor located along the easternmost boundary of Segment B, proceed through segments C and D, and terminate in Segment E where it would connect with the East Lake Sammamish Trail. Sound Transit is currently coordinating with the Port of Seattle and King County to cooperatively plan the future trail, possibly including passenger rail and light rail in the same right-of-way while maintaining the ability to provide future freight use.

3.7.3 Environmental Impacts

The East Link Project would create a substantial increase in pedestrian trips in and around the stations. The project proposes a number of improvements in and around stations to minimize impacts on pedestrian and bicycle circulation, both during construction and after light rail is operational.

Transit facility designs would be flexible, allowing each station to reflect and fit into the community it serves while providing standard features to facilitate smooth and accessible transfers for transit customers from one type of public transportation to another. Standard design features would include the following:

- Security and safety design standards
- Easy-to-read and consistent signs
- Pedestrian-friendly design and full access for people with disabilities
- Bicycle access and storage
- Provide sidewalks immediately adjacent to stations as shown on the conceptual design drawings in Appendix G1.

Proposed bicycle facilities at the light rail stations include bicycle racks for 20 to 30 bicycles and lockers for up to 10 bicycles. Station area plans include room to accommodate additional racks. Due to the proximity of some stations to existing regional trails such as the I-90 Regional Trail, BNSF trail, and East Lake Sammamish Trail, these stations would include wayfinding signage for nearby regional trails and other local destinations.

Estimates of PM peak period pedestrian and bicycle trips generated by each station, as shown in Table 3-30, were used to qualitatively assess the degree of nonmotorized user activity in station areas. As expected, the stations with the highest number of pedestrian and bicycle trips—East Main, Old Bellevue, Bellevue Transit Center and Overlake Transit Center—are located near major employment and residential areas (Downtown Bellevue and Overlake).

Throughout the study area, sidewalks and intersection crosswalks were shown to operate at pedestrian LOS C or better with both the No Build Alternative and East Link. This indicates that there is enough spacing between pedestrians on the sidewalk so that they are able to walk freely at their own speed, with an ability to cross paths without potential collisions with other pedestrians. The only pedestrian location in the study area that is expected to operate at LOS C is the 108th Avenue NE and NE 6th Street intersection near the Bellevue Transit Center. Otherwise, the pedestrian

LOS at all other locations is expected to operate at LOS B or better.

The following subsections describe the impacts during East Link operation, by segment, on pedestrian and bicycle circulation within the segment study area. Impacts during construction are also addressed.

3.7.3.1 Segment A

Pedestrian Circulation

With light rail, during the PM peak period, approximately half of the trips at the Rainier Station would be people transferring between bus and light rail. A majority of these trips are likely to be destined for the surrounding residential neighborhoods during the PM peak period. Some trips may also be destined for the surrounding commercial land uses along Rainier Avenue S. The mid-block crosswalk on 23rd Avenue S would be maintained so pedestrians and bicyclists could continue to access the I-90 Lid Park and I-90 Trail from the Rainier Station. Other existing pedestrian access points to the I-90 Regional Trail from S Irving Street would not be impacted. Crosswalks at the Rainier Station and the I-90 exit/entrance ramp areas would be maintained and walking distances surrounding the station would not change from existing conditions. The addition of pedestrian wayfinding signage along Rainier Avenue S would help pedestrians navigate through the I-90 ramp area more quickly. Nearby school walk routes along local and collector streets would not likely be affected because bus transit routes serving the Rainier Station would not use these residential local and collector streets.

At the Mercer Island Station, many of the trips during the PM peak period would likely be people destined for the surrounding residential and commercial land uses at Mercer Island Town Center, which is within close walking distance, immediately south of the station. Overall, during the PM peak period, pedestrian circulation at the Mercer Island Station would be consistent with transit commuting patterns where transit users would transfer modes to finish their commute or end their commute at surrounding neighborhoods and commercial center(s).

The access to the Mercer Island Station would be located along 80th Avenue SE. If the passenger drop-off/pick-up area is located along 77th Avenue SE, station access would also be provided along this street. If the passenger drop-off/pick-up area is not located along 77th Avenue SE, then it would remain in the Mercer Island Park-and-Ride Lot. An additional station access is being evaluated that would provide a pedestrian bridge extending over eastbound I-90. This bridge would accommodate about 25 percent (or approximately 250) of the riders at the station during the 3-hour peak period. Because Alternative A1 is located on I-90, walking distances, sidewalks, and crosswalks on the arterial streets are expected to remain similar to no-build conditions.

School walk routes are not present within walking distance of the Mercer Island Station.

TABLE 3-30
PM Peak Period Pedestrian and Bicycle Trips Generated at Stations

Station	2020 Pedestrian and Bicycle Trips[a,b]	2030 Pedestrian and Bicycle Trips[a,b]
Segment A		
Rainier Station (A1)	510	620
Mercer Island Station (A1)	240	270
Segment B		
South Bellevue (B1, B2A, B2E, B3)	80	110
SE 8th (B2A, B2E, B3)	200	270
118th (B7)	170	230
Segment C		
East Main (C2T, C3T, C4A, C7E, C8E)	610	1,050
Old Bellevue (C1T)	710	1,200
Bellevue Transit Center (C1T, C2T, C3T, C4A, C7E, C8E)	2,950	4,900
Ashwood/Hospital (C3T, C4A, C7E, C8E)	250	710
Hospital (C1T, C2T)	230	330
Segment D		
124th (D2A, D2E, D3)	40	70
130th (D2A, D2E, D3)	280	390
Overlake Village (D2A, D2E, D3, D5)	270	600
Overlake Transit Center (D2A, D2E, D3, D5)	710	1,000
Segment E		
Redmond Town Center (E1, E2, E4)	370	390
SE Redmond (E1, E2, E4)	40	60
Redmond Transit Center (E2)	120	140

[a] Pedestrian and bicycle trips reported for the alternative with the highest ridership.

[b] Trips include both boarding and alighting.

Bicycle Circulation

The future bicycle circulation on arterial streets surrounding the Rainier and Mercer Island stations

would remain similar to existing conditions with and without the project. On Mercer Island, locally designated bicycle routes are present on N Mercer Way, 77th Avenue SE, and 80th Avenue SE.

There is no expected change in bicycle circulation along I-90 with the East Link Project, although an increased number of bicycle commuters transferring to and from light rail can be expected as both stations are also conveniently located close to the I-90 Multi-Use Regional Trail. Bicycle connection to the I-90 Regional Trail from the Rainier Station would be located at the 23rd Avenue S station entrance where bicyclists can access the I-90 Lid Park and follow the I-90 Multi-Use Regional Trail to the Mt. Baker bicycle and pedestrian tunnel.

3.7.3.2 Segment B

Pedestrian Circulation

With light rail, most trips at the South Bellevue Station would consist of people making transfers among different modes. Most pedestrian activity at the South Bellevue Station would not occur beyond the station and park-and-ride lot. Because much of the land use surrounding the station is residential, some transit users are expected to come from or go to the surrounding neighborhoods. However, the pedestrian circulation between the South Bellevue Station and the surrounding neighborhoods is disconnected due to the terrain north and west of the station.

At the SE 8th and 118th stations, the PM peak-period pedestrian circulation would be primarily light rail users originating from the surrounding office park and commercial areas. At the 118th Station, a majority of the transit users would consist of riders transferring between light rail and autos, so that most of the pedestrian circulation would occur within the station area. Circulation surrounding the SE 8th and 118th SE Stations would improve with sidewalk improvements on SE 8th Street, 114th Avenue SE, and 118th Avenue SE at locations immediately surrounding the stations.

The at-grade and elevated profiles associated with Alternatives B1, B2A, B2E, and B3 would result in slightly increased walking distances at crosswalks due to the roadway widening at the intersections of SE Bellevue Way and South Bellevue Park-and-Ride (B1), SE Bellevue Way and 112th Avenue SE (B1, B2A, B3), and 112th Avenue SE and SE 8th Street (B2A). Slightly increased walking distances at crosswalk on Bellevue Way, north of 112th Avenue SE, would also occur for the Alternative B1. However, any increases in walking distances at these crosswalks would be accommodated by increasing the pedestrian signal crossing times for safe pedestrian crossings. Alternative B7 would not have any impact to pedestrian crossings as the majority of this alternative is outside the roadway right-of-way. Overall, the existing crosswalk locations also would not change with any of these alternatives. The South Bellevue Station in Alternative B1 would be accessed by the crosswalks at the two signalized intersections that provide access to the park-and-ride lot. The SE 8th Street Station in Alternative B2A would be accessed by the crosswalk on the north leg of SE 8th Street. All other stations in Segment B (B2A, B2E, B3 and B7) would be accessed via elevator and escalator facilities because they have elevated platforms.

East Link is not expected to affect the Enatai Elementary School walk route.

Bicycle Circulation

With East Link, bicycle circulation within Segment B is likely to remain similar to the No Build Alternative. In the future, bicycle improvements initiated by the City of Bellevue are planned to occur on 108th Avenue SE south of Bellevue Way under the No Build Alternative, resulting in safer connectivity between the stations and the I-90 trail with the provision of sidewalks and bicycle lanes along this segment of 108th Avenue SE. This street is a regularly used bicycle route connecting with the I-90 Regional Trail. Designated bicycle routes are located on 112th Avenue SE and Bellevue Way and are expected to remain designated routes in the future. All stations in Segment B are close to the I-90 and 118th Avenue Regional Multi-Use trails, and increased volumes on these trails are likely to occur.

Direct operational impacts on trails in Segment B would include the acquiring right-of-way along 112th Avenue SE for Alternatives B1, B2A, B2E, and B3. These alternatives would require use of narrow portions of the Mercer Slough Park's western boundary, necessitating relocation of a portion of the Heritage Farm Trail that is within the Mercer Slough trail network. Alternative B7 would provide new access to the east end of the Mercer Slough Nature Park and would not require relocations of the Mercer Slough trail network or I-90 Regional Trail. Impacts on the I-90 Regional Trail at the I-405 interchange are not expected.

3.7.3.3 Segment C

Pedestrian Circulation

Downtown Bellevue is one of the primary destinations to be served by the East Link Project because it is one of the major central business districts in the Puget Sound region. To provide adequate sidewalk circulation in the future, development projects or planned city capital improvements are expected to fill

in the identified missing sidewalk segments within the downtown area.

With East Link, riders at the Bellevue Transit Center Station would be centralized within the downtown area and primarily consist of walk-on/off trips reflecting the dense pedestrian circulation at the Bellevue Transit Center and on surrounding sidewalks. This level of activity would be consistent with an urban downtown environment that is expected to become denser and continue to grow in the future.

As shown in Exhibit 3-26, among the proposed stations in Segment C, the light rail stations located closer to the existing Bellevue Transit Center would be expected to attract more riders because those stations would better serve Downtown Bellevue as a result of their proximity to denser employment and residential areas. The farther east the stations are located from Downtown Bellevue, the less pedestrian activity would be generated. These trends are indicated in Section 3.4.3.6, Light Rail Ridership.

Much of the pedestrian activity at the Old Bellevue Station would be a result of neighboring commercial and residential land uses surrounding the station. The location of this station is expected to capture a portion of pedestrian activity on the fringe of Downtown Bellevue that would otherwise require farther walking distance to the Bellevue Transit Center.

A little over half the trips at the East Main Station are expected to be pedestrians or bicyclists. Similar to the Old Bellevue Station, the level of pedestrian activity immediately near the East Main Station indicates that a number of pedestrians requiring a farther walking distance to the Bellevue Transit Center would be captured by the East Main Station.

At the Ashwood/Hospital and Hospital stations, pedestrian activity is expected to be driven primarily by commercial and hospital users and the surrounding Ashwood Neighborhood. As shown in Exhibit 3-26, because the Ashwood/Hospital Station is within walking distance from Overlake Hospital and Downtown Bellevue, the Ashwood/Hospital Station would have a greater amount of pedestrians by 2030 than the Hospital Station because the Hospital Station is farther away from Downtown Bellevue.

Alternatives C4A and C8E and would not result in increased walking distances at the crosswalks because roadway widening is not proposed. Crossing times across or under these routes would be incorporated into the signal phasing so that pedestrians are given adequate time to safely cross the streets. Crosswalk locations along 108th and 110th avenues NE would not be affected by the Couplet Alternative (C4A) but would require signal adjustments to coordinate safe east-west pedestrian crossings. Impacts to crosswalks are not expected with the tunnel alternatives (C1T, C2T, C3T) through most of Segment C because the routes are mainly underground. Alternatives C1T and C2T become elevated on NE 6th Street, east of 110th Avenue NE, but similar to the other Segment C alternatives, roadway widening is not proposed. Alternative C7E would not have any impact to pedestrian crossings because most of this alternative is outside the roadway right-of-way. Elevator and escalator facilities would provide access to the elevated or underground station platforms with the elevated and tunnel profiles (C1T, C2T, C3T, C7E and C8E).

The school walk route along 108th Avenue SE is not expected to be affected by any of the Segment C alternatives because it is located south of Main Street.

Bicycle Circulation

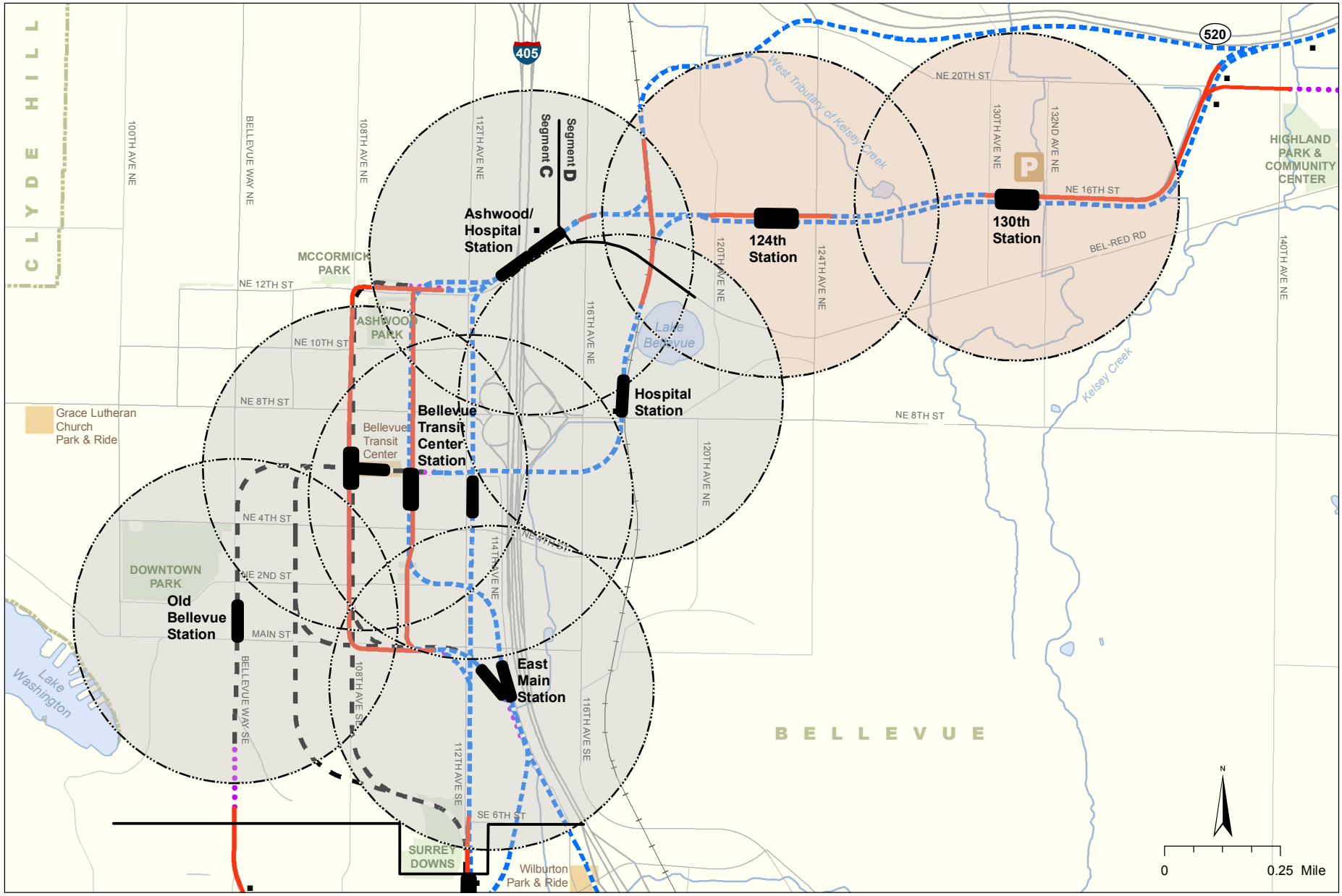
Bicycle circulation through Downtown Bellevue would remain similar to the No Build Alternative because nearly all arterial streets in the downtown area are designated bicycle routes. The City of Bellevue plans to provide bicycle improvements along 112th Avenue NE north of NE 12th Street, along 108th Avenue NE north of NE 12th Street, and on 108th Avenue NE as part of the couplet project described in Section 3.6.3. Alternative C4A would change circulation patterns for bicyclists traveling on 108th Avenue NE and 110th Avenue NE because the one-way couplet would allow bicycle movements in only one direction. The side-track alignment creates the potential for bicyclists to turn across the light rail tracks. The remaining Segment C alternatives are mainly elevated and tunnel profiles that would have minimal impacts on downtown bicycle circulation. Crosswalk access for bicyclists would operate under the same pedestrian access conditions previously described.

3.7.3.4 Segment D

Pedestrian Circulation

With light rail, about half the transit users at the 124th Station would consist of pedestrians entering and exiting the station. This indicates that many of the trips would likely originate in or are destined for the surrounding commercial land uses.

At the 130th Station, most of the trips would consist of people transferring among other modes. During the PM peak period, many of the light rail boardings would likely originate from nearby commercial office parks, and light rail alighting trips would likely be



Source: Data from City of Bellevue (2005), City of Redmond (2005), and King County (2006).

- Pedestrian Walking Area Segment C (0.35 mile)
- Pedestrian Walking Area Segment D (0.35 mile)
- At-Grade Route
- Elevated Route
- Retained-Cut Route
- Tunnel Route
- Traction Power Substation
- Proposed Station
- Maintenance Facility and Access Track
- New and/or Expanded Park-and-Ride Lot

NOTE: To account for a street grid system, a radius of 0.35 mile was used in place of a radius of 0.50 mile.

Exhibit 3-26 **Pedestrian Walking Areas by Stations in Downtown Bellevue and Bel-Red Area Segments C and D**
East Link Project

destined for nearby residential neighborhoods south of the station.

The 124th Station and 130th Station are within moderately close walking distance of each other, as illustrated in Exhibit 3-26. Pedestrians would access the station that is closer to their walk route. The western edge of the 124th Station service area is also constrained by terrain and presents a barrier to effectively connect with this station.

The future PM peak volumes of pedestrians at the Overlake Village Station would primarily consist of riders transferring between light rail and other modes. Many of the pedestrian trips would be coming from nearby office park campus, commercial, and mixed land uses.

At the Overlake Transit Center Station, about half the transit riders would transfer among modes and the other half would be destined to land uses surrounding the station. Much of the pedestrian activity at this station is expected to be composed of commuters coming from large employment centers near the station. Some pedestrian trips may be destined to nearby commercial areas, although nearby arterials with higher traffic volumes and speeds may present barriers to pedestrians destined to those retail areas.

Currently, there are limited sidewalks and crosswalks along NE 16th Street and 136th Place NE near the 130th Station. Sidewalks would be provided on both streets, and crosswalks would be located at the NE 16th Street and 132nd Avenue NE and at the NE 16th Street and 136th Place NE intersections as part of the D2A and D3 alternatives. In terms of pedestrian crosswalk conditions, increases in walking times across arterials are expected where roadway widening occurs to accommodate the light rail tracks. Increases in the pedestrian crossing times at the signalized intersections along NE 16th Street and 136th Avenue NE (associated with Alternatives D2A and D3) and along NE 20th Street between 136th Avenue NE and 152nd Avenue NE and at 152nd Avenue NE and NE 24th Street intersection (Alternative D3 only) are provided to ensure safe crossing times. Pedestrian circulation to and from the private properties west of 152nd Avenue NE, near the Overlake Village Station, would be modified with Alternatives D2A, D2E, and D5 to prohibit pedestrians from crossing the tracks. This could create some out-of-direction travel for pedestrians. Alternative D3 would provide an additional crosswalk north of the Overlake Village Station at NE 26th Street to accommodate pedestrian movements to and from the station platform. Elevator and escalator facilities would be provided for the 124th and 130th stations (for Alternative D2E) to provide access to the elevated station platforms.

There would be no impacts on any school walk routes in this segment.

Bicycle Circulation

The stations in Segment D would have few or no impacts on existing bicycle circulation. All arterial streets are part of a designated bicycle route system; however, bicycle circulation is limited because designated bicycle lanes are not present on arterial streets. Bicycle circulation in Segment D is also limited by the presence of higher traffic volumes arterials such as Bel-Red Road and NE 20th Street. The 124th and 130th stations are located close to the SR 520 Multi-Use Regional Trail; however, trail access is limited, and direct access from arterial streets would be constrained by the terrain and property access. Bicycle circulation conditions near the Overlake Village Station and Overlake Transit Center Station would be similar to existing conditions. These two stations are also located close to the SR 520 Regional Multi-Use Trail.

3.7.3.5 Segment E

Pedestrian Circulation

Redmond Town Center is a major commercial destination within the East Link Project corridor and generates the highest pedestrian activity among the proposed Segment E stations. The majority of light rail riders at the Redmond Town Center Station are expected to make bus transfers or walk to and from the surrounding commercial and retail areas. Pedestrians that end their commute at the station would likely be destined for surrounding mixed uses and Redmond Town Center.

The pedestrian activity at the Redmond Transit Center Station would occur between the station and the park-and-ride lot, as many riders would be transferring between modes. This indicates a lower degree of circulation extending beyond the station area to the residential and commercial areas. High park-and-ride usage indicates that many riders' commutes would continue beyond the station. If Alternative E2 is truncated at the Redmond Town Center, the Redmond Transit Center Station would be eliminated.

At the SE Redmond Station, pedestrian activity would primarily occur at the park-and-ride lot as a result of many people transferring between light rail and auto. A minimal number of pedestrian trips are expected in the future due to the surrounding land uses, nearby arterials with high traffic volumes, and the proximity to SR 520, which is a physical barrier to and from Downtown Redmond.

In terms of pedestrian crosswalk conditions, increases in walking times across arterials are expected only with Alternative E2 across the tracks on 161st Avenue NE, from Cleveland Street to NE 85th Street. Increases in the pedestrian crossing times would be incorporated into the signal phasing to provide safe crossing times for pedestrians. If Alternative E2 is truncated at the Redmond Town Center station, the 161st Avenue NE roadway widening and associated increases in the pedestrian crossing times would not occur. With the exception of the Redmond Transit Center Station, stations along the proposed alternatives in Segment E would use the existing BNSF rail tracks. The future BNSF regional multi-use trail would provide pedestrian access to and from the stations. Crossings at 161st, 164th, 166th, 170th avenues NE and NE Leary Way would be maintained with all Segment E alternatives. At the Redmond Transit Center, the existing crosswalks would be maintained and pedestrian access to the station platform would occur at the crosswalks at NE 80th and 83rd streets.

The recommended school walk route for Redmond Elementary School consists of collector and local streets in residential areas of Segment E, and impacts on the walk route are not expected.

Bicycle Circulation

With the East Link Project, circulation for bicyclists in Segment E may not differ greatly from the No Build Alternative. Future bicycle improvement projects would enhance bicycle circulation by improving access to Marymoor Park and the Sammamish Regional Multi-Use Trail system. These bicycle facilities are close to the proposed stations; however, direct access to them would be hindered by SR 520, especially from Redmond Town Center. Bicycle lanes are present on some arterial streets near the Redmond Transit Center, reflecting bicycle usage and allowing for nonmotorized connectivity between the Redmond Transit Center and the nearby Sammamish Regional Multi-Use Trail.

The potential development of a multi-use trail located along the BNSF Railway tracks parallel to alternatives E1, E2, and E4 was accounted for in the Segment E conceptual design. Development of a multi-use trail in this corridor would extend pedestrian and bicycle circulation from the southern portion of the SR 520 trail to Lake Sammamish. The trail would be directly accessible from the SE Redmond Station and allow nonmotorized commuters to transfer to light rail.

3.7.3.6 Construction Impacts

Potential construction impacts for pedestrian and bicycle circulation could occur along streets with partial or full closures because these types of construction areas may restrict or provide detour routes for pedestrians and/or bicyclists. Section 3.6.4.2 and Table 3-29 provide a discussion and a list of the streets with expected closures during construction. Sound Transit would minimize disruptions to the sidewalk or bicycle network and provide detours as practical during construction.

Regional multi-use trails may experience some temporary construction impacts due to their proximity to the alternatives. The portion of the I-90 Multi-Use Regional Trail on the I-90 bridge, in Segment A, would not be affected because light rail is proposed in the reversible center roadway and therefore would not cross the I-90 Regional Trail north of I-90. However, near Bellevue Way, the I-90 Regional Trail could be temporarily affected by construction associated with the Segment B alternatives. Construction impacts on the I-90 trail near this area may include temporary closures or detouring portions of the trail that are close to the I-90 and Bellevue Way ramps, and near the western boundary of the Mercer Slough Nature Park.

In Segment B, the 118th Avenue Regional Multi-Use Trail could be temporarily affected near I-90 by construction associated with Alternative B7. Impacts on the trail network within the Mercer Slough Nature Park are not expected. No regional multi-use trails are located in Segment C. Bicycle facilities in Segment C are bicycle lanes and routes along arterial streets, which would experience construction impacts similar to those discussed in Section 3.6. The SR 520 Multi-Use Regional Trail in Segment D is located along the north side of SR 520, and construction impacts are not foreseen because the alternatives in Segment D are located on the south side of SR 520.

In Segment D, bicycle lanes and routes located on arterial streets would experience construction impacts similar to those discussed in Section 3.6. Construction impacts on the SR 520 trail are not expected because the East Link Project does not require widening or realignment of SR 520 and does not require relocation of the trail.

In Segment E, the potential multi-use trail along the BNSF Railway would be affected if constructed prior to East Link. The elevated alternatives in Segment E would cross the Sammamish River Trail, resulting in minor short-term trail detours. Alternative E1 would cross the Bridle Crest Trail and the Bear Creek Trail. Alternative E1 would require minor realignment of the East Lake Sammamish Trail in the area along the BNSF Railway.

3.7.4 Potential Mitigation

No mitigation is necessary beyond the design improvements that Sound Transit would provide immediately adjacent to East Link stations. Sound Transit would work with the local agencies regarding alternatives and stations that are located within the median of roadways so that the most appropriate treatments are provided for safe and effective pedestrian crossings and access. This could include painted crosswalks or signals, street lighting, warning lights, or signage.

Sound Transit would minimize potential construction impacts on pedestrian and bicycle facilities by providing detours within construction areas.

Multi-use trails that may be affected by construction would generally be kept open for use, but detours would be provided when trails are closed, unless they are closed for short durations or in areas where a detour option is not feasible. Any closures to regional multi-use trails would be temporary. Public notification efforts would be conducted for temporary trail closures during construction.

3.8 Freight Mobility and Access

3.8.1 Methodology

Truck routes within the study area were identified and analyzed to compare potential impacts on freight movement from the No Build Alternative and the East Link Project. Freight movements were analyzed along I-90, on arterial and local routes, and on railways. Additional truck data and analysis are provided in the *Transportation Technical Report*.

3.8.2 Affected Environment

Truck mobility within the Puget Sound region is largely supported by a network of designated truck routes consisting of freeways and arterial streets that connect major freight destinations. WSDOT has adopted the Freight Goods Transportation System (FGTS), which classifies roadways according to the amount of annual tonnage transported along these roads. All interstates and state routes are designated as truck routes, and each jurisdiction locally determines its designated truck route network on arterial streets according to the FGTS classification. Within the study area I-90 and I-405 are designated as T-1 freight routes which indicate that over 10,000,000 gross tons of freight goods are moved every year. SR 520 is classified as a T-2 freight route indicating between 4,000,000 to 10,000,000 gross tons of freight goods are moved yearly.

Within the study area, there are key freight corridors that serve not only the Puget Sound region but also national and international markets, such as I-90 and I-405. There also are many local truck routes that facilitate the flow of deliveries to local businesses. These transportation corridors are vital to the movement of freight and goods among major transportation hubs such as the Port of Seattle, the Seattle-Tacoma International Airport (Sea-Tac Airport), and other business and consumer destinations. Within the East Link study area, freight goods and services are transported on only roadways, although a percentage of freight on I-90 and the other highways (I-405 and SR 520) in the study area is associated with marine facilities such as the ports of Tacoma and Seattle.

3.8.2.1 Regional Highways

In Segment A (Exhibit 3-1), I-90 is a key east-west truck route within the study area, connecting local, interstate, and regional freight with the Ports of Seattle and Tacoma and surrounding industrial areas. Following I-5, I-90 is the second most heavily used for truck movements in Washington (WSDOT, 2005). In the last 10 years (1994 to 2003), I-90 truck traffic has grown by over 97 percent in the eastbound direction and 52 percent in the westbound direction.

Overall, about 6,300 trucks travel on I-90 across Lake Washington each day. This is about 4.5 percent of the approximately 140,000 vehicles that travel on the I-90 Floating Bridge every day. About half the trucks are considered small-sized, which include vehicles such as delivery and recreational vehicles. Approximately 12 percent of the total trucks crossing I-90 are large-sized tractor-trailer trucks. Trucks over 10,000 pounds (e.g. tractor-trailers) only travel on the outer I-90 mainline roadways because vehicles over 10,000 pounds are prohibited from using the reversible center lanes. Trucks under 10,000 pounds (e.g. delivery and recreation vehicles) are allowed to use the center roadway if they are either a high-occupant vehicle or heading to/from Mercer Island. Therefore, there are only a small percentage of trucks in the reversible center roadway compared to the outer roadways in the study area. Throughout the day, slightly over 100 small-sized trucks use the center roadway. This is slightly over one percent of all the vehicles in this roadway.

About two-thirds of the trucks on I-90 travel during nonpeak hours, indicating that much truck travel avoids the more heavily congested times of the day. The highest amount of truck activity on I-90 crossing Lake Washington occurs during the late morning through mid-day. During the early afternoon, truck

volumes dramatically decrease indicating that they avoid the heaviest congestion during the afternoon peak period. Only about 3 percent of total traffic during the PM peak period is trucks. Exhibit 3-27 shows hourly truck volumes throughout the day.

During the AM peak period about 40 percent of the trucks crossing Lake Washington on I-90 are heading to or from east of I-405; likely over Snoqualmie Pass. Overall, about 800 trucks travel on the I-90 mainline during the AM 2-hour peak period. This percentage of trucks continuing east on I-90 increases in the PM peak period to just over 50 percent, but, as described in the previous paragraph, the total number of trucks decreases dramatically in this period to about half, because approximately 400 trucks travel on I-90 during the PM 2-hour peak period.

3.8.2.2 Arterials and Local Streets

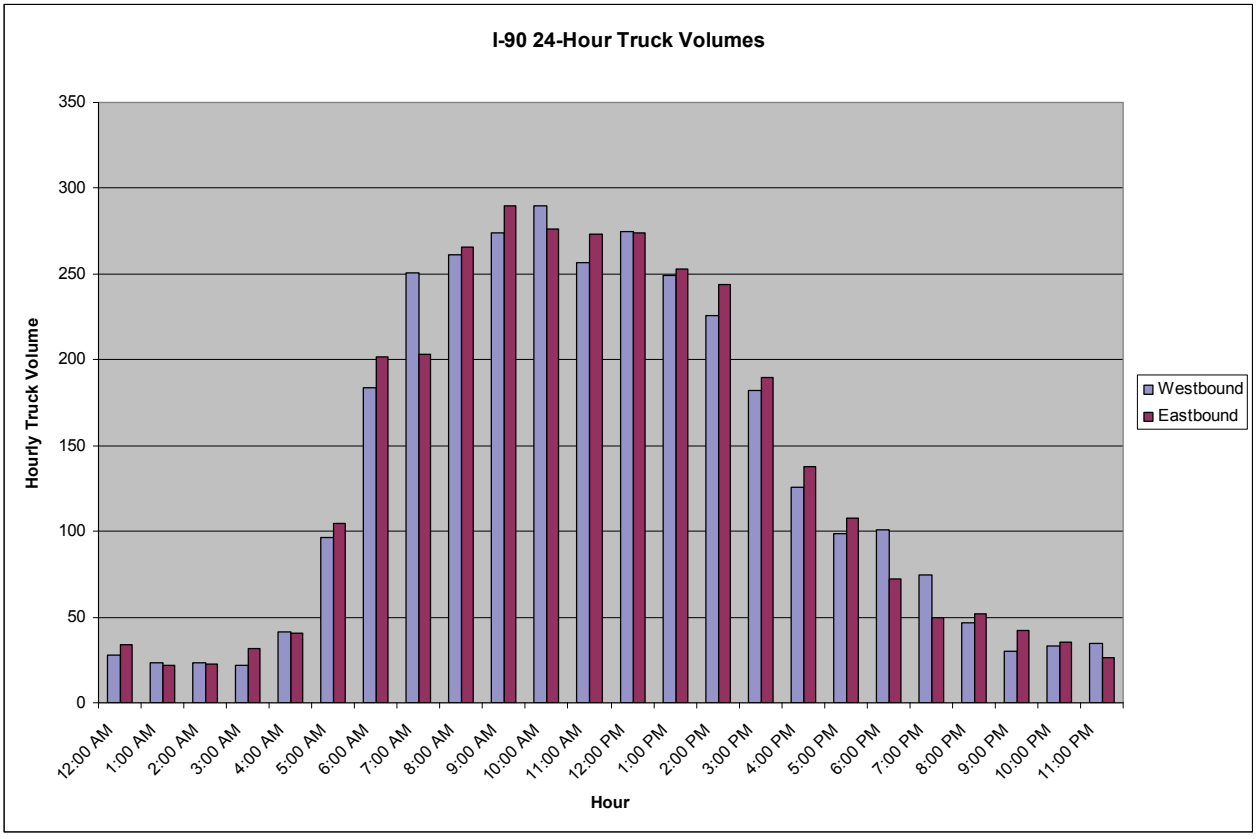
In the City of Seattle, most of the arterial streets within the study area (such as Rainier Avenue S, 4th Avenue S, and S Dearborn Street) are designated as Major Truck Streets where standards for design provide for higher volume truck travel. On Mercer Island, no roadways are identified as truck routes.

Many of the arterial roadways in Segments B and C that have access to and from either I-90 or I-405 are designated trucks routes, including Bellevue Way SE, 112th Avenue SE, SE 8th Street, NE 4th Street, and NE 8th Street. In addition, NE 12th Street is a truck route connecting Bellevue Way, 112th Avenue NE, and 116th Avenue NE, which are also designated as truck routes in the City of Bellevue. Within Segment C, trucks mainly serve the commercial, office, and retail areas for delivery trips.

Within Segment D, Bel-Red Road is identified as a truck route. Other truck routes that access the commercial and industrial land uses along the Bel-Red corridor are 116th Avenue NE, 120th Avenue NE, 124th Avenue NE, and 148th Avenue NE. 148th Avenue NE, with access to SR 520, is also a designated truck route within Segment E. Also in Segment E, 148th Avenue NE and a small section of NE 51st Street are designated as truck routes in the City of Redmond. Near Downtown Redmond, West Lake Sammamish Parkway and SR 202 are designated truck routes that serve the commercial, retail, and office land uses.

3.8.2.3 Rail Freight

Within the study area, the only rail-line is the BNSF Railway that travels through Segments B, C, and D. There are no rail freight operations within Segments A and E. The Port of Seattle is in the process of acquiring



Source: Sound Transit, 2007
Note: I-90 total daily volume is approximately 140,000

EXHIBIT 3-27
I-90 Existing 24-Hour Truck Volumes

the BNSF right-of-way from Snohomish to north Renton, including a spur from Woodinville to Redmond. The acquisition process is anticipated to be complete by late 2008. The Port of Seattle intends to secure the corridor for potential future freight rail use, and is also interested in optimizing the use of this corridor for other transportation modes compatible with freight rail (Port of Seattle, 2008). In the near term the BNSF Railway will no longer be used for freight movements as the Wilburton Tunnel that crosses over southbound I-405 was removed in August 2008, and the rail corridor is no longer continuous.

3.8.3 Environmental Impacts

3.8.3.1 Impacts During Operation

Regional Highways

As described below, the East Link Project would have an overall beneficial impact on trucks traveling on I-90. As more people choose to use light rail, truck travel times during peak hours would improve overall and the ability for trucks to cross Lake Washington on I-90 would be maintained.

Future traffic forecasts indicate that the average annual truck growth on I-90 in the study area will slow by 2030 during the AM and PM peak periods. This is because, by 2030, traffic congestion on I-90 will be much worse than it is today, and, therefore, a higher percentage of trucks are expected to cross Lake Washington during off-peak times. Subsequently with more congestion in the future, there will be fewer uncongested off-peak hours available for truck travel in the no-build condition. Overall, less than a 2 percent annual growth rate is expected in the AM peak period and slightly over a 2 percent annual growth rate is expected in the PM peak period for trucks. The truck forecasts between the No Build Alternative and the East Link Project are similar.

Future truck travel was evaluated as part of the I-90 traffic analysis to understand future conditions with and without the project on I-90. This analysis provided 2-hour peak truck travel time data that's presented in Table 3-31. With either No Build Alternative, afternoon and morning truck travel times in 2030 are expected to take 35 to 115 percent longer than at present due to increasing congestion in the future. An average (combined westbound and eastbound) truck travel time between I-405 and I-5 with Stages 1 and 2 of the I-90 Two Way Transit and HOV Operations Project and Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project would take 30 and 25 minutes in the morning peak, and 27 and 29 minutes in the afternoon peak, respectively.

With the East Link Project, trucks would continue to use the eastbound and westbound outer roadways similar to the No Build Alternative. Truck access to and from these roadways would be unchanged because none of the general-purpose ramps to and from I-90 would be modified with the project. Truck travel times with East Link are expected to either remain similar or improve compared to the No Build Alternative. Travel times would be reduced in all but the AM westbound direction, where there would be a one minute increase. With the project, the average truck travel time in the morning and afternoon peak periods would be between 23 and 24 minutes between I-405 and I-5, compared to 25 to 30 minutes in the morning peak and 27 to 29 minutes in the afternoon peak with either of the No Build Alternative (see Table 3-31). This is a 2- to 7-minute travel time savings in the morning peak and a 3- to 5-minute travel time savings in the afternoon peak. The majority of this travel time improvement is in the reverse-peak direction (eastbound in the morning and westbound in the afternoon). The improved travel times are due to people shifting to light rail as their transportation mode, combined with the fact that truck access and circulation on the outer roadways would not be

TABLE 3-31
2030 2-Hour Peak Period Truck Volumes and Travel Times on I-90 Between Seattle and I-405

Period	Direction	No Build Alternative[a]		No Build Alternative[b]		East Link	
		Number of Trucks[c]	Travel Time (min)	Number of Trucks[c]	Travel Time (min)	Number of Trucks[c]	Travel Time (min)
AM Peak	Westbound	480	35	520	24	500	25
	Eastbound	540	25	540	26	650	21
AM Peak Total		**1,020**	**30**	**1,060**	**25**	**1,150**	**23**
PM Peak	Westbound	360	31	440	33	490	29
	Eastbound	420	24	440	24	310	16
PM Peak Total		**780**	**27**	**880**	**29**	**800**	**24**

[a] With Stages 1 and 2 I-90 Two Way Transit and HOV Operations Project.

[b] With Stages 1 through 3 of the I-90 Two Way Transit and HOV Operations Project.

[c] Based on I-90 throughput data from the VISSIM analysis at the Lake Washington bridge.

affected by East Link.

In addition to truck travel times, Table 3-31 also provides information on how many trucks travel on I-90 during the year 2030 peak periods. This table indicates that fewer trucks would travel cross Lake Washington on I-90 in the peak directions with the closure of the reversible center roadway as part of the East Link Project compared to the No Build Alternative. In the reverse-peak direction (eastbound morning and westbound afternoon), a shift by people to use light rail would provide the opportunity for more trucks to cross Lake Washington than in the No Build Alternative. Overall, the number of trucks traveling on I-90 in the morning and afternoon periods is similar for the No Build Alternative and East Link.

During nonpeak periods, auto congestion on I-90 is substantially reduced, even though truck traffic is at much higher levels. As congestion is less during these periods, the project, compared to the no-build condition, is not expected to have an impact on truck travel times during these periods. Thus the bulk of the truck traffic would remain unaffected by the project.

The closure of the eastbound HOV direct access off-ramp to Bellevue Way and the potential closure of the westbound HOV direct access on-ramp from Bellevue Way (for Alternative B1) with East Link are not expected to cause impacts or circulation changes for trucks because these ramps are restricted to HOV usage. Similarly, the closure of the Mercer Island ramps to and from the reversible center roadway is not expected to cause truck circulation impacts because similar access would be provided on the outer roadways.

Arterials and Local Streets

The alternatives in the East Link Project are not anticipated to negatively affect truck circulation or routes on the local street network. In some locations, local designated truck routes would cross or travel alongside of light rail at-grade profiles. At these locations, intersection conditions with East Link would be similar to or better than the No Build Alternative. Some intersection operations may improve through mitigation for the East Link Project. Additionally, many of the at-grade profiles that travel through intersections will be accommodated within an existing signal phase. Therefore, disturbances caused by signal pre-emption would be minimized, although slight delays could occur on the side-streets when light rail travels through the intersection.

Rail Freight

Within Segment A, no rail freight impacts are expected. Within segments B, C, and D, rail freight along the BNSF Railway is not anticipated to occur in the near-term future due to the I-405 expansion in August 2008 that removed a segment of rail line. There are no rail freight operations within Segment E.

3.8.3.2 Impacts During Construction

This section discusses activities that could occur during construction and the associated impacts on freight. Construction impacts on trucks could include changes in travel time, truck routes, or business access.

Interstate 90

In Segment A, the I-90 Two Way Transit and HOV Project would be completed before the construction of East Link on I-90 and Mercer Island drivers would be permitted in the HOV lanes to compensate for the closure of the reversible center roadway. Because of these changes to the I-90 operations, truck travel times during the East Link construction period for the AM and PM peak periods would be similar or less than the truck travel times compared to the No Build Alternative when only Stages 1 and 2 of the I-90 Two Way Transit and HOV Project are completed.

Comparing the East Link construction period to the No Build Alternative when Stages 1 through 3 are completed of the I-90 Two Way Transit and HOV Project, truck travel times during East Link construction would be similar or improved in the reverse-peak directions (eastbound in the AM period and westbound in the PM period). In the westbound direction during the AM peak period, truck travel times slightly increase (by 3 minutes) as the vehicle capacity in this direction is reduced with the center roadway closure. In the eastbound PM peak direction, the truck travel times during East Link construction are improved as less lane changing would occur between I-5 and the Mount Baker Tunnel with the closure of the center roadway ramp. Overall, a similar number of trucks cross Lake Washington during East Link construction compared to the No Build Alternative.

The majority of truck trips cross I-90 during nonpeak periods, when congestion is substantially reduced. As congestion is less during these periods, project construction is not expected to have an impact on travel times during these periods for the bulk of the truck traffic.

The D2 Roadway would also be closed for light rail construction. This closure would not cause impacts to trucks as they are prohibited from using the D2 Roadway. The I-90 westbound mainline would experience short-term partial nighttime closures for construction of the elevated structures for alternatives B2A, B2E, B3, and B7. The Bellevue Way Alternative

(B1) would not require these closures because it is at-grade underneath the mainline roadway. I-90 ramps to and from Bellevue Way would experience short-term potential nighttime closures for construction of the elevated light rail structures. These closures are not expected to cause impacts on trucks because alternative routes are available and truck traffic using these ramps is low.

Other Regional Freeways

Elevated portions of the alternatives in Segment C over I-405 would likely result in each direction (not concurrently) of I-405 being closed at night, causing trucks to detour with potentially added delay. Likewise elevated portions of E1 and E4 that would cross over SR 520 near the Lake Sammamish Parkway interchange and the elevated portion of E1 that would cross SR 520 near the SR 202 interchange would result in each direction of SR 520 being closed at night, causing trucks to detour with potentially added delay.

Arterials and Local Streets

Construction of all Segment B alternatives except the BNSF Alternative (B7) would temporarily cause detours and lane closures on arterials and local streets, which would cause delays to truck traffic on Bellevue Way and 112th Avenue NE.

Segment C alternatives that require cut-and-cover tunnel construction would result in the most truck impacts because this type of construction typically requires access restrictions in the vicinity of the construction until covers can be installed over the construction area. Construction for the Bellevue Way Tunnel Alternative (C1T) along Bellevue Way and NE 6th Street, and the 106th NE Tunnel Alternative (C2T) along Main Street, 106th Avenue NE, and NE 6th Street would require the largest amount of cut-and-cover tunnel construction.

Along elevated routes in Segment C some impacts are anticipated as a result of lane closures and access restrictions needed for elevated structure construction. The at-grade portion of the Couplet Alternative (C4A) would have a shorter construction period, and truck impacts would likely be less than those for other sections and other alternatives. Conversion of 108th and 110th avenues NE to one-way couplets would require short-term traffic detours/lane closures that may affect trucks.

In Segment D, loss of parking, construction traffic, and lane closures could affect trucks along portions of NE 16th Street, 136th Place NE, NE 20th Street, 152nd Avenue NE, and NE 24th Street. Each alternative within Segment D would cause temporary detours and lane closures, but for relatively short periods of time, except for the NE 20th Alternative (D3). Because D3 includes retained-cut construction in the median of NE 20th Street, construction could cause longer impacts on trucks than the other alternatives.

In Segment E, the potential loss of lanes on Leary Way with Alternative E4 and 161st Avenue NE between Redmond Way and NE 85th Street with Alternative E2 could have a slight impact on trucks.

Even with potential roadway closures/detours and/or lane closures, the impacts of maintenance facilities on trucks are considered minimal because the construction activities that could potentially affect trucks are expected to be about 1 year or less.

Rail Freight

Rail freight would not be affected in any segment during construction because the only rail line near East Link construction—the BNSF Railway line in segments B, C, and D—has been closed for the near-term future.

3.8.4 Potential Mitigation

The East Link Project is not expected to require mitigation during operation to improve freight mobility and access because truck routes would be maintained and mobility would be improved with the project.

During East Link construction, adverse truck impacts would likely be associated with business deliveries on arterials and local streets near surface construction activities. The cut-and-cover tunnels and stations in Segment C would likely have the greatest impact on nearby businesses in terms of restricted access. To minimize or limit these impacts, Sound Transit would work specifically with affected businesses throughout construction to maintain access as much as possible to each business and coordinate with businesses during times of limited access. Sound Transit and WSDOT would coordinate with freight stakeholder groups during project development. Additional information on major truck generators and origin and destination patterns would be collected by Sound Transit and WSDOT in the general study area.

During East Link construction associated with I-90, SR 520, or I-405, Sound Transit would provide construction information to WSDOT for use in the state's freight notification system in a format required by WSDOT and compensate WSDOT for any direct costs associated with use of the freight notification system for East Link construction.

3.9 Navigable Waterways

3.9.1 Affected Environment

Lake Washington is the largest navigable waterway in the study area and Segment A. Navigability on Lake Washington is restricted to recreational users, and commercial activity is prohibited. However, the Muckleshoot Tribe, as part of the tribe's Usual and Accustomed Treaty Rights, conducts a fishing event in July after consultation with the Washington Department of Fish and Wildlife (WDFW). Boaters can cross under I-90 at two locations on Lake Washington: the east side of the I-90 Floating Bridge between Seattle and Mercer Island, and at the East Channel Bridge between Mercer Island and Bellevue.

Other water bodies located in the study area include smaller lakes, streams, and river bodies. These include Mercer Slough, Mercer Slough East Creek, East Lake Bellevue, Sturtevant Creek, Kelsey Creek, Goff Creek, Sears Creek, Bear Creek, and the Sammamish River. Mercer Slough and The Sammamish River are navigable to nonmotorized boating types; the other water bodies are not navigable.

3.9.2 Environmental Impacts

3.9.2.1 Operational Impacts

Both with and without the East Link Project, the changes that would occur to the portion of I-90 that crosses Lake Washington would not affect navigability on Lake Washington.

Impacts on navigability in Segment B are not anticipated with alternatives B1, B2A, B2E, and B3, because they are located outside the navigable waterways of the Mercer Slough Nature Park. The elevated profile of Alternative B7, adjacent to the I-90 overpass, would cross Mercer Slough East; however, recreational navigability on the Mercer Slough under I-90 would not be blocked by this alternative.

The project alternatives in Segments D and E are not expected to affect navigability of water bodies crossed by these alternatives because most these water bodies are not navigable. Alternatives crossing the Sammamish River would be elevated crossings, thus maintaining recreational navigability.

3.9.2.2 Construction Impacts

Some in-water work is anticipated to occur in Lake Washington along I-90, and there is a possibility of construction work from a barge. Neither of these activities would affect navigability of the lake.

Over-water construction of the BNSF Alternative (B7) may result in short durations of restricting recreational boating inside Mercer Slough near and under the B7 crossing.

Similarly, the construction of the Redmond Way (E1), Marymoor (E2), and Leary Way (E4) alternatives may restrict nonmotorized boating on Sammamish River crossings.

A tribal fishery event occurs in July, and if any barging of equipment or materials is required, Sound Transit would consult with the Muckleshoot Tribe to avoid conflict with a tribal fishing event.

3.9.3 Potential Mitigation

During the operation of East Link, no mitigation of navigable waterways would be required.

Construction at the Mercer Slough (Alternative B7) and Sammamish River (all Segment E alternatives) crossings would remain consistent with Washington State Department of Ecology (Ecology) regulations and practices. Appropriate construction methods would be employed to maintain minimal impacts on navigability during construction.