Chapter 6

Alternatives Evaluation

This chapter evaluates how East Link would meet the project Purpose and Need, and analyzes the benefits, environmental impacts, and cost-effectiveness of the project as well as each segment alternative.

The Purpose and Need for the East Link Project, as discussed in Chapter 1, is to expand the Sound Transit Link light rail system from Seattle to Mercer Island, Bellevue, and Redmond via Interstate 90 (I-90) in order to provide a reliable and efficient alternative for moving people to the Eastside of Lake Washington and throughout the region. To meet this Purpose and Need, the East Link Project would be a composite of one alternative from each of the five geographic segments connecting Seattle with Mercer Island, Bellevue, Overlake, and Redmond.

In addition, the East Link Project is one of several proposed light rail expansions to Central Link, the north-south light rail project in Seattle, Tukwila, and SeaTac. Collectively, the system would have benefits greater than the individual projects. Several of these benefits are also described in this section.

6.1 Performance in Meeting Project Goals and Objectives

The goals and objectives for the East Link Project are described in Chapter 1 and form the basis for the evaluation of alternatives presented in this chapter. These goals and objectives include the following:

1. Transportation goal: Improve transit mobility in the East Link corridor
   a. Improve the quality of transit service
   b. Increase transit accessibility
   c. Maximize East Link ridership
2. Environmental goal: Preserve environmental quality in the corridor
   a. Minimize potential adverse operating impacts on the natural and built environments
   b. Minimize potential adverse construction impacts on the natural and built environments
3. Land use goal: Support regional and local land use goals and objectives
   a. Support adopted land use and transportation plans
4. Implementation goal: Minimize risk in the corridor
   a. Enhance stakeholder and community support
   b. Design system to reduce construction risk
5. Financial Goal: Provide a financially feasible solution
   a. Build a system within project budget
   b. Build a system that can be operated and maintained within available revenue
   c. Build a system that is cost-effective

This chapter evaluates the entire project and the individual alternatives related to each goal. The project's performance in meeting some project goals and objectives would be similar for all build alternatives. For example, any build alternative would enhance transit accessibility and provide transit quality in terms of comfort and reliability of service. The data used to assess how the East Link Project and the segment alternatives meet these goals are taken from earlier chapters of this Final Environmental Impact Statement (EIS), namely Chapter 2 for project cost information, Chapter 3 for transportation-related topics, and Chapter 4 for environmental and land use goals. The risk assessment discussed in this chapter is based on both cost and construction risks. The data are used in the following subsections to compare the various alternatives.

6.1.1 Transportation Goal: Improving Mobility

The East Link Project would improve mobility into and out of many of the urban centers with the highest populations and highest levels of employment in the Puget Sound region (Seattle, Bellevue, Overlake, and Redmond). East Link would provide easy access throughout the project area and other key regional urban centers through seamless extension of Central Link, which began operation in July 2009 in the greater Seattle area. This subsection describes how the project would accomplish the following:

- Improve the quality of transit service
- Increase transit accessibility
- Maximize East Link ridership

Table 6-1 summarizes the transportation characteristics of the project alternatives.

TABLE 6-1
Summary of East Link Alternatives

Segment	Alternative	No. of Stations	Segment Daily Boardings (2030) [a]	East Link Daily Ridership Totals (2030) [a]	Segment Travel Time (minutes)
A, Interstate 90	*Preferred I-90 Alternative (A1)*	2	5,000	49,500	11
B, South Bellevue	*Preferred 112th SE Modified Alternative (B2M)*	1 to 2	5,000	49,000	5
	Bellevue Way Alternative (B1)	1	4,500	52,500	5
	112th SE At-Grade Alternative (B2A)	2	5,000	49,000	5
	112th SE Elevated Alternative (B2E)	2	5,000	50,000	5
	112th SE Bypass Alternative (B3)[b]	1	4,500	49,500	5
	BNSF Alternative (B7)	1	1,500	48,000	5
C, Downtown Bellevue	*Preferred 108th NE At-Grade Alternative (C11A)*	3	8,000	49,000	10
	Preferred 110th NE Tunnel Alternative (C9T)	2 to 3	8,000	51,000	6
	Bellevue Way Tunnel Alternative (C1T)	3	9,000	52,500	5
	106th NE Tunnel Alternative (C2T)	2 to 3	8,500	52,000	5
	108th NE Tunnel Alternative (C3T)	2 to 3	9,000	52,500	4
	At-Grade Couplet Alternative (C4A)	2 to 3	8,000	49,500	11
	112th NE Elevated Alternative (C7E)	2 to 3	7,000	50,500	4
	110th NE Elevated Alternative (C8E)	2 to 3	8,000	51,500	4
	110th NE At-Grade Alternative (C9A)	2 to 3	7,500	48,500	9
	114th NE Elevated Alternative (C14E)	2	5,500	48,500	4
D, Bel-Red/ Overlake	*Preferred NE 16th At-Grade Alternative (D2A)*[c]	3 to 4	7,000 (7,000)	51,000 (49,500)	8 (10)
	NE 16th Elevated Alternative (D2E)	3 to 4	7,000	50,000	9
	NE 20th Alternative (D3)	3 to 4	6,500	49,000	10
	SR 520 Alternative (D5)	2	6,000	49,500	7
E, Downtown Redmond	*Preferred Marymoor Alternative (E2)*[d]	2 (3)	3,500 (4,000)	49,500 (50,000)	6
	Redmond Way Alternative (E1)	2	3,500	49,500	6
	Leary Way Alternative (E4)	2	3,500	50,000	6

[a] Ridership reported for each alternative is based on the representative East Link route (a combination of Alternatives *A1*, B3, C4A, *D2A*, and *E2)*. See Chapter 3, Transportation Environment and Consequences, for additional ridership information including the ridership exclusively prepared for the *Preferred Alternative* in each segment.

[b] Daily boardings, ridership, and travel time are the same with B3 – 114th Extension Design Option.

[c] Daily boardings, ridership, and travel time in parenthesis are for the D2A – NE 24th Design Option. The daily boarding, ridership, and travel time for the D2A – 120th Station Design Option would be similar to *Preferred Alternative D2A*.

[d] Daily boardings, ridership, and travel time in parenthesis are for the E2 - Redmond Transit Center Design Option.

6.1.1.1 Transit Quality

The East Link Project would provide a comfortable, high-capacity transit (HCT) service that would increase reliability of the regional transit system and result in substantial time savings for all travel modes. Current bus service reliability is poor and is projected to remain poor into the future in spite of infrastructure investments to improve high occupancy vehicle travel. This is because congestion on the arterial and highway systems will continue to influence transit service dependability. The East Link Project would improve transit quality in the region by providing frequent and reliable HCT service 20 hours each day in the Seattle, Mercer Island, and Bellevue to Redmond corridors (18 hours on Sundays). East Link passengers would benefit from a comfortable ride; high-person capacity;

efficient loading of multiple-car trains resulting in short in-station loading time; and dependable, on-time departures and arrival.

The project would use dedicated right-of-way, thus 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 7 minutes by 2030. The project is designed to operate up to four-car trains. Ultimately, the project could carry 600 persons per four-car train comfortably and 800 persons during crowded conditions with 4-minute headways; this would more than double the person-carrying capacity of I-90 because East Link could carry 18,000 to 24,000 people (9,000 to 12,000 per direction) during the peak period. This is the equivalent of about 7 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).

This capacity would provide a robust "backbone" of service feeding a network of bus distribution and feeder routes. As a dedicated right-of-way system, East Link would provide reliable, frequent service through highly congested roadways to feed multiple bus lines, thereby collectively reaching a broad range of destinations in a timelier manner than the No Build Alternative. 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, between 29 to 39 minutes, regardless of time of day or level of traffic congestion. This would be a savings of up to 25 minutes compared to an automobile currently traveling between these locations in the afternoon peak period. It can currently take up to 45 minutes to travel between Seattle and Bellevue (via I-90) and up to 55 minutes to travel between Seattle and Redmond (via SR 520) (Washington State Department of Transportation [WSDOT], 2011). These times are expected to continue to worsen, and therefore light rail would provide an even greater travel-time savings. Without the East Link Project, it is expected that bus reliability in the future would continue operating at a failing level. East Link Project reliability would provide the highest transit service level.

The Sound Transit Ridership Model was used to calculate the travel-time savings with transit trips in the afternoon (PM) travel period. Average transit travel time is the time it takes riders to travel from door to door (i.e., from the front door of their home to the front door of their work) by a composite of modes (i.e., auto, bus, bicycle, pedestrian, and light rail). Compared to the No Build Alternative, the average door-to-door peak-period transit travel time using light rail would be between 4 and 16 minutes faster to a given East Link destination. The results of the transit travel-time savings analysis for people who reside in the East Link study area are summarized in Table 6-2, which provides a range of minute savings by station.

6.1.1.2 Transit Accessibility

The East Link Project would enhance accessibility and integration of transportation modes by creating between 10 and 13 stations with connections to local bus systems and park-and-ride options. While the population in the project vicinity has increased substantially since the 2000 U.S. Census, 2000 Census data show that the project would enhance access for more than 5,000 low-income and more than 9,000 minority residents who live within one-half mile of proposed stations. The low-floor cars that would be used for East Link provide convenient loading for patrons with disabilities. Additionally, the East Link Project would extend transit connections for riders to and from Central Link destinations. Central Link connects Downtown Seattle to the Seattle-Tacoma International Airport, with extensions to the University of Washington by 2016, north to Northgate by 2020-2021, and south to South 200th between 2015 and 2020, depending on funding.

TABLE 6-2
Average 2030 Door-to-Door Peak-Period Transit Travel Time Savings with East Link Compared to No Build Alternative

Segment	Station	Average Minutes Saved
A, Interstate 90	Rainier	7
	Mercer Island	9
B, South Bellevue	South Bellevue	7
	118th	12
	SE 8th	11
C, Downtown Bellevue	East Main	12
	108th	10
	Old Bellevue	9
	Bellevue Transit Center	8
	Hospital	9
	Ashwood/Hospital	8
D, Bel-Red/ Overlake	120th	8
	130th	6
	Overlake Village	7
	Overlake Transit Center	4
E, Downtown Redmond	SE Redmond	16
	Downtown Redmond	13
	Redmond Town Center	14
	Redmond Transit Center	10

The East Link Operation Plan includes direct service north to the University of Washington and Northgate without requiring a change of trains.

6.1.1.3 Ridership

Ridership projections vary among the segment alternatives. As a project providing service from Seattle to Redmond, East Link is projected to contribute between 48,000 and 52,500 rider trips per day to the Sound Transit light rail system by 2030. Chapter 3, Transportation Environment and Consequences, describes ridership differences among the alternatives. The following subsections summarize the relative variations in ridership among the alternatives.

Segment A

There are between 5,000 daily boardings forecast for *Preferred Interstate 90 Alternative (A1)*. These boardings would be for Rainier and Mercer Island Stations only. The International District/Chinatown Station boardings are not included.

Segment B

Preferred 112th SE Modified Alternative (B2M) would attract 49,000 riders. Other Segment B alternatives would attract a similar number of daily segment and overall project ridership (4,500 to 5,000 segment and 49,000 to 52,500 overall), except for the BNSF Alternative (B7), which would attract a substantially lower number of segment boardings (1,500) and 48,000 overall riders per day.

Segment C

There would be a wider spread of influence on daily boardings among alternatives within Segment C than the alternatives in Segment B. *Preferred 108th NE At-Grade Alternative (C11A)* would be similar to *Preferred 110th NE Tunnel Alternative (C9T)* in that they would both provide a segment ridership of 8,000. Overall projectwide ridership with *Preferred Alternative C9T* would be 51,000 versus 49,000 with *Preferred Alternative C11A*. The Bellevue Way (C1T) and 108th NE Tunnel (C3T) Alternatives have the potential to attract the highest daily boardings (ranging up to 9,000) within Segment C; these alternatives also produce the highest daily ridership for Segment C alternatives with 52,500. The 110th NE At-Grade Alternative (C9A) would have the lowest overall ridership along with the 114th NE Elevated Alternative (C14E) with 48,500. Alternative C14E is projected to attract the least number of segment boardings (5,500).

Segment D

Segment D alternatives would attract similar ridership (approximately 6,000 to 7,000 segment boardings), including the SR 520 Alternative (D5), which has two fewer station stops. This shows that the Overlake Transit Center Station has a large ridership potential even without the other proposed stations at 120thand 130th Avenues. The ridership model demonstrates that Alternative D5, with a faster travel time than other Segment D alternatives, would result in higher boardings at nearby stations in adjacent segments, and therefore would have a similar influence in overall projectwide ridership as the other Segment D alternatives but would not serve City of Bellevue's planned high-density, transit-oriented land uses in the Bel-Red area.

*Preferred NE 16th At-Grade Alternative (*D2A) would provide the highest overall ridership (7,000 segment and 51,000 overall projectwide riders). However, D2A – NE 24th Design Option would have segment ridership of 7,000 segment riders and 49,500 overall projectwide riders. Alternative D3 would have the lowest number of projectwide riders, with 6,500 segment riders and 49,000 overall projectwide riders.

Both Bellevue and Redmond have adopted land use plans (in Bellevue for the Bel-Red area and Redmond for the Overlake Village area). These land use plans are assumed in the ridership model projections for Segment D. The projected land uses would consist of high-density residential and commercial mixed land uses concentrated around the proposed station locations (i.e., Ashwood/Hospital, 120th, 130th, and Overlake Village stations). The transportation model includes the proposed change in land uses.

Segment E

The ridership projections for Segment E do not reveal a strong difference in daily boardings among the alternatives. E2 - Redmond Transit Center Design Option, which would extend to the Redmond Transit Center, would provide one more station than the other alternatives and, therefore, more access but with only a slightly higher segment boardings (4,000) and similar overall projectwide ridership (50,000) as Leary Way Alternative (E4). *Preferred Marymoor Alternative (E2)* and Redmond Way Alternative (E1) provide 3,500 segment boardings and 49,500 overall projectwide riders.

6.1.2 Environmental Goal: Preserve Environmental Quality

The environmental goal is to preserve environmental quality in the project corridor. This goal would be met in the following ways:

- Minimize potential adverse operating impacts on the natural and built environments.

- Minimize potential adverse construction impacts on the natural and built environments.

6.1.2.1 Range of Impacts

All project alternatives would incorporate impact avoidance and minimization measures. Because of the highly urbanized nature of the project vicinity, most impacts would relate to the built environment. Impacts generally would concern transportation, property acquisition, visual and parks resources, and noise and vibration. Fewer impacts would affect natural resources, as demonstrated by the range of impacts summarized in Table 6-3. Most of the adverse impacts could be mitigated.

The East Link Project would also offer environmental improvements over the No Build Alternative. The project would result in net benefit to aquatic habitats and would remove contaminated soil along the project route. The construction process would bring economic benefit to the area by adding jobs and money spent in the region. After construction, the area surrounding several of the stations would be likely to attract transit-oriented development where additional capacity in land-use density is permitted. East Link would benefit the region by decreasing vehicle miles traveled (VMT) and vehicle hours traveled (VHT) by 0.2 percent, which would result in lower energy usage and would help reduce the overall volume of carbon dioxide emission into the region and, therefore, reduce greenhouse gas effects. Thus, the East Link Project is expected to preserve overall environmental quality.

Where applicable, Table 6-3 gives the range of the lowest and highest impacts for each impact category before mitigation measures are applied. As shown, many projectwide impacts before mitigation concern property acquisition, which is also reflected in relocating businesses and employees, removing parklands, and losing some wetlands. Operating East Link may also degrade some traffic intersections. After mitigation, only a few resources would be adversely affected by the project. Depending on the combination of alternatives, there may be some residual vibration impacts, visual quality reductions, and potentially permanent changes to McCormick Park.

Constructing the East Link Project would be about a 2- to 5-year process on a given portion of the route. During construction, traffic may be adversely affected, which can affect adjacent businesses. Construction could also result in dust, noise, and vibration, as well as lower visual quality around the construction site. There may be temporary impacts on wetlands and other habitats. Sound Transit is committed to replacing park lands, but during construction, park use would be limited in some construction areas. Construction of any of the alternatives could also result in increased employment and spending in the project vicinity during construction.

6.1.2.2 Environmental Impacts by Alternative

Table 6-4 summarizes the environmental impacts for each segment, focusing on the issues that differentiate alternatives within each segment. The categories may differ between segments because of the types of impacts occurring in each segment. A comparative description among alternatives within each segment follows for notable environmental impacts.

Segment A

Because *Preferred Alternative A1* is mostly located within the existing I-90 freeway, there would be few environmental impacts, which are summarized in Table 6-4. The primary impacts would be transportation-related. In comparison to the No Build Alternative (even with the implementation of the I-90 Two-Way High-Occupancy Vehicle [HOV] Transit and Operations Project), light rail would increase the total numbers of persons crossing I-90 during peak traffic hours. If the D2 Roadway (transit/ HOV access ramp from Seattle to I-90 center roadway) does not permit joint use of light rail and bus transit usage, then bus transit trips may lengthen by as much as 4 minutes. The project would result in increased congestion at up to three Mercer Island freeway ramps and worsen the operations at up to four arterial intersections, although these can be mitigated. Other environmental impacts include groundborne noise impacts on residential properties above the Mt. Baker Tunnel and the removal of landscaping where Sound Transit station entrances would be placed along Benvenuto Park in Seattle and in the Park-on-the-Lid in Mercer Island; both impacts would be mitigated.

Segment B

Table 6-4 summarizes Segment B impacts. All Segment B alternatives would cause impacts on the Mercer Slough Nature Park, but only the *Preferred Alternative B2M* would potentially impact the Winters House and temporarily close activities held at the Winters House and blueberry farm during construction. Alternative B7 would create a new crossing over the Mercer Slough Nature Park. *Preferred Alternative B2M* would require the most property acquisition in this park, specifically along its western edge. All Segment B Alternatives would result in long-term impacts on wetlands, although Alternative B7 would affect 1.9 acres and all other alternatives would affect substantially less than an acre. All impacts on Mercer Slough Nature Park and wetlands can be mitigated.

TABLE 6-3
Projectwide Range of Impacts by Impact Category

Impact Category		Low Potential Impact Range[a]	High Potential Impact Range[a]
Transportation	Number of intersections improved	2	6
	Number of intersections worsened (after mitigation)	9 (0)	20 (0)
	Number of parking spaces removed	288	1,439
Acquisitions, Relocations, and Displacements	Full property acquisitions	14	78
	Partial property acquisitions	84	236
	Total acres to be acquired	45.1	129.3
	Businesses displaced	54	156
	Residences displaced	2	229
Land Use	Consistent with relevant policies	Consistent	Not as consistent
	Potential to facilitate transit-oriented development	Low to moderate	Moderate to high
Economics	Employment displacements (estimated number of employees)	760	2,860
	Initial property tax impact (range of $ that would be removed from affected city property tax revenue)	$44,000	$252,000
Visual	Number of incidences where project may result in a decrease in visual quality	0	3
Air Quality and Greenhouse Gases	Savings in tons of carbon monoxide per year compared to the No Build Alternative (tons carbon monoxide/year)	1	3
	Hot spot analysis exceedances	0	0
	Greenhouse gas emissions annual decrease (carbon dioxide equivalent in metric tons)	18,980	25,915
	Greenhouse gas emissions during construction (carbon dioxide equivalent in metric tons)	94,893	173,197
Noise/Vibration	Traffic noise impacts (after mitigation)	0(0)	154 (0)
	Transit noise impacts (after mitigation)	203 (0)	943 (0)
	Vibration (after mitigation)	3(0)	11(3)
	Ground-borne noise (after mitigation)	25(0)	36 (0)
Ecosystems	Long-term impact on wetlands (acres)	0.3	2.6
	Impact on high-value (priority) habitat (acres)	1.7	6.0
	Impact on threatened/ endangered species	0	0
	Fish passage/habitat	No impact	Minor adverse impact
Water	Increase in impervious surface (acres)	16.2	34.9
	Floodplain impact	None	Minor
Energy	Savings in million British thermal units (MBtu)/year	907	1,217
Geology	Risk of causing a geologic hazard	Low risk	Medium risk
Hazardous Materials	Potential impacts on high-risk sites (number of sites)	8	19
Electromagnetic Field	Electromagnetic field interference	0	0
Utilities	Relocation	Low to high	Low to high
Historic Resources	Length of archaeological sensitive areas (miles of corridor)	4.5	13
	Potential to affect historical resources (number)	0	3
Parklands Impacts	Permanent	1.3	6.5
	Temporary	2.0	13.6
Construction Impacts	Noise, transportation delays and detours, economic impacts on businesses	Medium	High

Preferred Alternative B2M, Alternative B2E, and B3 - 114th Extension Design Option would result in only one residential displacement. Alternative B1 would result in the highest number of residential displacements, whereas Alternative B3 -114th Design Option would displace the highest number of employees. All Segment B alternatives (except *Preferred Alternative B2M*) traveling along Bellevue Way SE would lower the visual quality of the area due to long-term changes to the west hillside.

Alternatives B1, B2A, and B3 would affect traffic operations at the 112th Avenue SE and Bellevue Way SE intersection, but the impacts can be mitigated. Likewise, Alternative B7 would affect traffic operations at two intersections along 118th Avenue SE and Coal Creek Parkway, but both of these intersections can be mitigated. All noise and vibration impacts can be mitigated in Segment B.

All Segment B alternatives would likely involve the use of a temporary construction easement in the Mercer Slough Nature Park. Except for Alternative B7, these would be limited to the western park border, which may require trail and other access detours during construction. Except for *Preferred Alternative B2M,* construction of the at-grade alternatives (B1, B2A, and B3) would require widening Bellevue Way SE. Constructing elevated profiles may result in closing or narrowing travel lanes and the use of temporary easements. For Alternative B7, a raised platform could be built across the Mercer Slough to reach the construction site within the marshy areas.

Elevated portions of the guideway may require pile driving, and, therefore, would result in noise impacts during daytime construction hours. This may have temporary adverse effects on wildlife in the vicinity.

Segment C

A summary of Segment C impacts is provided in Table 6-4. Elevated alternatives east of the Downtown Bellevue business and commercial core (Alternatives C7E and C14E) would result in the fewest transportation impacts during operation but do not provide as direct access to the downtown core as other Segment C alternatives. *Preferred 110th NE At-Grade Alternative (C11A),* Couplet Alternative (C4A), and 108th NE At-Grade Alternative (C9A) would permanently remove up to two travel lanes on either 108th or 110th Avenues NE (although travel lanes on both streets would be removed with Alternative C4A).

While these at-grade alternatives would affect some north-south vehicle operations, overall downtown intersection operations are expected to experience minimal change compared to the 2020 and 2030 No Build Alternative. Operational traffic management strategies would be proposed at impacted intersections in lieu of roadway capacity improvements. Noise and vibration impacts of tunnels can be substantially mitigated, except for few instances of residual vibration impacts. All Segment C alternatives would result in noise impacts from light rail, whereas only Alternative C1T would result in noise impacts from increased traffic due to shift in Bellevue Way SE, all of which can be mitigated.

Many of the Segment C impacts would be caused during construction by lane closures, dislocating buses from the Bellevue Transit Center, utility relocation, noise, vibration, dust, truck traffic, and associated impacts on businesses. Tunnel construction would require longer construction periods than elevated and at-grade portions. Cut-and-cover construction might have greater impacts on nearby businesses resulting from reduced access and extended construction disturbances.

Preferred108th NE Tunnel Alternative (C9T) and the Bellevue Way (C1T) and 108th NE Tunnel (C2T) Alternatives would interface with hazardous material sites and have a high degree of utilities relocation. Alternative C1T would have the highest number of potential residential relocations of alternatives in Segment C and is the only corridor that has a relatively high risk of soil settlement that may be avoided through engineering and construction methods. Because of primarily bored tunnel construction, the 108th NE Tunnel Alternative (C3T) would result in less conflict with utilities and less disruption of traffic and businesses than *Preferred Alternative C9T* and Alternatives C1T and C2T.

These tunnel alternatives would involve large portions of cut-and-cover construction in high rise areas to avoid conflicts with the underground structural supports of the adjacent building foundations and underground parking structures. Like the cut-and-cover alternatives, *Preferred Alternative C11A* and Alternatives C4A and C9A would require relocation of utilities directly under and parallel to the route. Elevated alternatives—112th NE (C7E), 110th NE (C8E), and 114th NE (C14E)—would generally result in the fewest residential displacements and utilities impacts.

Alternatives C1T, and C14E would not impact any parks, whereas Alternatives C3T, C4A, and C8E would occupy a large portion of McCormick Park during construction. This park would be replaced to preconstruction size or larger, and the light rail would be located between the park and NE 12th Street, which

TABLE 6-4
Summary of Differentiating Environmental Impacts for East Link Build Alternatives

Segment A			
Differentiating Environmental Impacts			***A1***
Transportation impacts			Improved person throughput and capacity. Similar or improved vehicle and truck travel time. Depending on the design option selected, up to seven traffic intersection impacts that can be mitigated and slightly increased bus travel times with light-rail-only operational option on the D2 Roadway.
I-90 Total person throughput across Lake Washington	AM	Increase over No Build[a]	5,050
		Increase over No Build[b]	3,450
	PM	Increase over No Build[a]	5,550
		Increase over No Build[b]	1,850
Public services			Might increase emergency service response times
Permanent impacts on park: acres before mitigation			0.2 to 0.5 acre
No. of buildings with groundborne noise impacts (after mitigation)			25 (0)
Other construction impacts			I-90 access changes

Segment B									
Differentiating Environmental Impacts		***B2M* to *C11A***	***B2M* to *C9T***	**B1**	**B2A**	**B2E**	**B3**	**B3 – 114th Design Option**	**B7**
Residential displacements: no. of housing units		1	1	12	4	1	4	4	0
Business displacements (no. of employees)		0 (0)	0 (0)	2 (10)	0 (0)	0 (0)	0 (0)	14 (170)	6 (160)
Wetland Impact in acres: permanent/temporary		0.1/0.5	0.1/0.5	0.2/0.9	0.2/0.7	0.2/0.6	0.7/1.2	0.2/0.6	1.9/2.9
High-value habitat loss in acres		0.6	0.7	1.7	0.7	0.4	0.7	0.7	3.0
Decrease in visual quality?		No	No	Yes	Yes	Yes	Yes	Yes	No
Noise-impacted receptors: no. of living units (no. after mitigation)	Traffic-related	0	0	136 (0)	17 (0)	0	17 (0)	17 (0)	0
	Light rail-related	79 (0)	66 (0)	132 (0)	78(0)	106 (0)	83 (0)	77 (0)	176 (0)
Vibration-impacted buildings (no. after mitigation)		0	0 to 1 (0)	1(0)	0	0	0	0	0
Groundborne noise (after mitigation)		1(0)	1(0)	0	0	0	0	0	0
Park impacts: area in acres before mitigation)	Permanent	2.9	3.0	0.9	1.8	0.7	1.8	1.8	0.9
	Temporary	3.6	3.5	2.6	2.6	1.8	2.6	2.9	1.7
Intersections not meeting local standard and operating worse than No Build Alternative (No. after mitigation)		0 (0)	0 (0)	2(0)	1 (0)	1 (0)	1 (0)	1(0)	3 (0)
Historic property impact		1	1	0	0	0	0	0	0

TABLE 6-4 CONTINUED
Summary of Differentiating Environmental Impacts for East Link Build Alternatives

Segment C										
Differentiating Environmental Impacts		***C11A***	***C9T*** [c]	**C1T**	**C2T**	**C3T**	**C4A**	**C7E**	**C8E**	**C9A**	**C14E**
Residential displacements: no. of housing units		0 to 46	0 to 46	91	0-12	7-19	8	0	2	0 to 1	0
Business displacements (no. of employees)		39 to 40 (330 to 380)	17 to 18 (160 to 370)	21 (250)	13 to 20 (170 to 240)	15 to 22 (180 to 270)	36 to 37 (490 to 550)	29 to 30 (670 to 730)	33 (750)	17 to 18 (170 to 230)	24 (390)
Decrease in visual quality?		No	No	No	No	Yes	Yes	No	Yes	No to Yes	No
Hazardous material sites		2	2	7	3	2	2	0	0	2	1
Light rail noise-impacted receptors: no. of living units (no. after mitigation)		184 to 204 (0)	119 to 140 (0)	100 (0)	100 to 179 (0)	26 to 105 (0)	439 to 450 (0)	208 to 282 (0)	425 (0)	199 to 241 (0)	148 (0)
Traffic noise-impacted receptors: no. of living units (no. after mitigation)		0	0	18 (0)	0	0	0	0	0	0	0
Vibration-impacted receptors: no. of buildings (after mitigation)		6 (1)	3 to 8 (1)	2 (0)	0	0	7 (2)	0	6 (2)	6 (3)	3 (1)
Groundborne noise-impacted receptors: no. of buildings (no. after mitigation)		0	1(0)	1 (0)	0 to 1 (0)	1 to 12 (0)	0	0	0	0	0
Park impacts: area in acres before mitigation	Permanent	0 to 0.5	0.1 to 0.6	0	0 to less than 0.1	0.9	0.9 to 1.4	0 to 0.4	0.2	Less than 0.1	0
	Temporary	0 to 0.6	0.2 to 0.7	0	0 to 5.7	1.8 to 7.5	1.6 to 2.0	0 to 0.4	0.9	0.2	0
Utility relocation		High	High	High	High	Medium	High	Low	Low	High	Low
Intersections not meeting local standard and operating worse than no build alternative (no. after mitigation)		3 (0)	1 (0)	2 (0)	1 (0)	2 (0)	3 (0)	1 (0)	4 (0)	3 (0)	0 (0)

Segment D						
Differentiating Environmental Impacts	***D2A***	**D2A – 120th Station Design Option**	**D2A – NE 24th Design Option**	**D2E**	**D3**	**D5**
Business displacements (no. of employees)	34 (550)	34 (550)	69 (1,060)	42 (920)	74 (1,590)	79 (480)
Permanent wetland impact in acres	0.5	0.5	0.5	02. to 0.3	0.2	0.2 to 0.3
High-value habitat loss in acres	0.9	0.9	0.8	0.5	Less than 0.1 to 0.1	1.3 to 1.4
Hazardous material sites	2	2	3	3	4	3
Noise-impacted receptors: no. of living units (after mitigation)	0	0	0	1 to 2(0)	0 to 1(0)	10 to 11(0)
Stream crossings	2	2	2	2	3	1
Intersections not meeting local standard and operating worse than no build alternative (no. after mitigation)	1 (0)	2 (0)	1 (0)	2 (0)	1 (0)	1 (0)

TABLE 6-4 CONTINUED
Summary of Differentiating Environmental Impacts for East Link Build Alternatives

Segment E					
Differentiating Environmental Impacts		**E2**	**E2 - Redmond Transit Station Design Option**	**E1**	**E4**
Residential displacements – no. of housing units		2	126	2	2
Business displacements (no. of employees)		8 (290)	23 (350)	7 (210)	7 (120)
Decrease in visual quality?		No	No	Yes	Yes
High-value loss in acres		1.1	1.2	2.1	1.2
Stream crossings		2	2	2	2
Noise-impacted receptors – no. of living units (no. after mitigation)		181 (0)	181 (0)	317 (0)	98 (0)
Vibration-impacted receptors – no. of buildings (no. after mitigation)		3 (1)	3 (1)	3 (1)	3 (0)
Historic property impact		0	0	0	1
Park impacts (area in acres before mitigation)	Permanent	2.0	2.0	0.2	0.7
	Temporary	3.0	3.5	0.3	0.5
Intersections not meeting local standard and operating worse than no build alternative (no. after mitigation)		4(0)	5(0)	3(0)	3 (0)
Maintenance Facilities					
Differentiating Environmental Impacts		**MF1**	**MF2**	**MF3**	**MF5**
Business displacements (no. of employees)		77 to 82 (630to 890)	5 to 6 (450 to 850)	56 to 60 (840 to 890)	16 to 38 (310 to 410)
Acres converted to transportation use		20.1 to 24.1	23.1 to 23.8	19.7 to 25.6	17.7 to 20.4
Permanent wetland impact in acres		0 to 0.1	0.1	Less than 0.1	0
High-value loss in acres		0 to 0.1	0.1 to 0.2	0	0
Stream crossings		0	0	1	0
Change in impervious surface in acres		+2.5 to +3.7	–0.4 to –3.7	–1.0 to –1.7	+1.8 to +2.3
Construction risk		Low	Low	Low	Low

[a] Without HOV lanes in the outer roadways between Mercer Island and Rainier Avenue South (Stages 1 and 2 only of the I-90 Two-Way Transit and HOV Operations Project).
[b] With HOV lanes in the outer roadways (HOV lanes Stages 1 – 3 completed of the I-90 Two-Way Transit and HOV Operations Project)
[c] The C9T - East Main Station Design Option when connecting with *Preferred Alternative B2M* would not change any of the ranges presented for *Preferred Alternative C9T*.

would reduce the visual quality of the park for adjacent residents and park users. Also, both P*referred Alternatives C11A* and *C9T* connecting from *Preferred Alternative B2M* would permanently affect Surrey Downs Park, including changes in access. However, after construction, remaining land outside the light rail track along 112th Avenue NE would be available as landscaped extensions of Surrey Downs Park. Also, Alternatives C3T, C2T, C4A, C7E, and C9A when connecting from B2A would affect some portion of Surrey Downs Park. Alternatives C2T and C3T would not result in operational impacts on Surrey Downs Park. Alternatives C4A, C7E, and C8E would result in acquiring 0.5 acre or less of the street side landscaping and no recreational activity areas. *Preferred Alternative C9T,* Alternative C9A, and Alternative C4A would affect the NE 2nd Pocket Parks. All park impacts except long-term visual impacts on McCormick Park could be mitigated. The park impacts would occur primarily during construction.

Most of the staging areas would be available for redevelopment consistent with applicable zoning following construction. Construction of tunnels may require some periods of night work and have a longer construction duration and number of truck trips than surface alternatives. The construction of Alternatives C4A, C7E, and C8E would involve the fewer number of truck trips over tunnel alternatives and *Preferred Alternatives C11A* and *C9T.* The staging areas for *Preferred Alternative C11A* and Alternatives C2T, C3T, and C4A would be adjacent to contributing properties to the potential Surrey Downs historic district, whereas *Preferred Alternative C9T* and Alternative C9A staging areas are further away, thus buffering the potential Surrey Downs historic district from possible impacts during construction.

With the exception of Alternative C1T, there would be a range of impacts in Segment C alternatives from the variation in connections from Segment B. Different connectors would result in different areas needed as construction staging areas. Because of the high-density urban environment in Downtown Bellevue, staging areas that would be needed during construction have been identified. Variations in property acquisition, numbers of displaced employees, and temporary impacts on Sturtevant Creek would be due to the connections from Segment B. Connections from the 112th Avenue SE alternatives (P*referred Alternative B2M* and Alternatives B2E and B2A) would result in higher residential impacts except when Alternative B2A connects with tunnel alternatives (Alternatives C2T and C3T) or Alternatives C7 or C9A, which would result in no residential displacements. The connector between Alternative B2A and the Alternatives C2T or C3T tunnels would occupy the north part of Surrey Downs Park, including the King County District Courthouse, which is planned to be relocated in the development of Surrey Downs Park, whereas connections from Alternative B2A for other Segment C Alternatives would only affect the streetside landscaping. Construction impacts on Surrey Downs Park would also result from the *Preferred Alternative B2M* connection to *Preferred Alternatives C11A* or *C9T*, thus affecting landscaping and portions of the District Courthouse parking, but *Preferred Alternative C9T* would also affect a portion of the Courthouse building. After construction, the entire park would be restored and usable. The *Preferred Alternatives C11A* and *C9T* would acquire 46 residential units west of 112th Avenue SE if connecting to *Preferred Alternative B2M* (no difference with the East Main Station Design Option), and no residences if connecting to Alternatives B3 or B7. Connections from Alternatives B3 and B7 would result in ecosystem impacts and more employee displacement than other connectors.

Segment D

The Segment D alternatives would not vary greatly in their impacts, as shown in Table 6-4. The primary difference would be that the SR 520 Alternative (D5) could have up to two fewer stations in the Bel-Red subarea, which may influence redevelopment in this area and would provide fewer points of access to East Link. Because of this difference, Alternative D5 would require the fewest property displacements, lowest employee displacements, and least utility relocations. In contrast, Alternative D5 would result in the highest loss of high-value habitat and the highest number of business displacements. *Preferred NE 16th At-Grade Alternative (D2A)* would have lowest impacts on businesses, highest potential wetlands impacts (less than 1 acre), and second-highest impacts on high value habitat.

All alternatives except Alternative D5 would have station locations that would support transit-oriented development for both the Bel-Red subarea in Bellevue and the Overlake Village subarea in Redmond consistent with local land use plans. The NE 20th Alternative (D3) would involve building a retained cut in the median of NE 20th Street. This alternative could result in the highest employee displacement and would likely have the highest impact on access to adjacent businesses. Alternatives D3 and D5 could result in minor adverse impacts on fish-bearing streams, but this impact can be mitigated to a net benefit. Alternative D5 would result in the greatest noise impact during operation, which can be

mitigated. All intersections affected by the Segment D alternatives would be mitigated.

Construction impacts from the Segment D alternatives would involve traffic detour routes, truck trips, and possible pile-driving noise for elevated and retained-cut portions of the alternatives. Alternative D3 would result in a high number of truck trips and would potentially affect the largest number of businesses due to retained-cut construction along a major commercial corridor, NE 20th Avenue. *Preferred Alternative D2A* and Alternative D5 would have slightly fewer construction impacts than Alternatives D3 and D2E. The nonpreferred D2A design options would have similar to greater construction impacts than Alternatives D3, D5, and D2E.

The preferred storage tracks in the former BNSF Railway corridor north of the NE 12th Street Crossing in Segment D would have minimal environmental impacts—only partial property impacts and minor wetland impacts.

Segment E

The main environmental impact differences among alternatives in Segment E would involve park, historic resources, and visual impacts, as shown in Table 6-4. *Preferred Alternative Marymoor Alternative (E2)* and Redmond Way Alternative (E1) would have similar and lower environmental impacts than the Leary Way Alternative (E4) and Alternative E2 - Redmond Transit Center Station Design Option. Alternative E1 would have higher noise impacts, which all would be mitigated. *Preferred Alternative E2* and the Alternative E2 - Redmond Transit Center Design Option would have the greatest park impacts because of their route along Marymoor Park. The E2 - Redmond Transit Center Design Option would require the most residential displacements, which would not occur under P*referred Alternative E2* that terminates at the Redmond Downtown Station. Alternative E4 would result in minor impacts on park property, but it would change the visual quality along the Leary Way gateway to the Redmond City Center and require relocation of the Justice William White House, an eligible resource for the National Register of Historic Places. Transportation impacts would be generally similar among the Segment E alternatives, although *Preferred Alternative E2* and the E2 - Redmond Transit Center Design Option would have worse operations at a few additional intersections, although these would be mitigated.

Construction for the Segment E alternatives would require the temporary detour of the Sammamish River Trail, Bear Creek Trail, and the East Lake Sammamish Trail and possible pile driving along SR 520 and Lake Sammamish Parkway. E2 - Redmond Transit Center Design Option would also require the full closure of 161st Avenue NE during construction.

Maintenance Facilities

A summary of maintenance facility impacts is provided in Table 6-4. All the proposed maintenance facility alternatives are located in predominantly commercial/industrial areas that are compatible land use. The 116th Maintenance Facility (MF1) and the SR 520 Maintenance Facility (MF3) would displace substantially more businesses (up to 82 and 60, respectively) than the other potential maintenance facility locations. MF1 and MF3 would also have the most potential employee displacements—up to 890 employees each. The SE Redmond Maintenance Facility (MF5) would have the fewest employee displacements— 410 or fewer people. The fewest business displacements would occur under the BNSF Maintenance Facility (MF2), which would only displace five to six businesses, depending on the alternative connection. MF1, MF2, and MF3 would require wetlands or wetland buffers to be filled. In addition, MF3 would result in an increase of 42 linear feet of open stream channel by replacing two culverts with shorter ones on Goff Creek or culverts can be avoided by realigning the stream.

6.1.3 Land Use Goal: Support Regional and Local Land Use Goals and Objectives

6.1.3.1 Projectwide Support of Land Use Goals and Objectives

The East Link Project would support regional and local land use goals and objectives. East Link is a critical element in the region's long-term plan to manage growth. It would support the continued planned development of urban centers along the East Link corridor, including Downtown Bellevue and Overlake. As the Metropolitan Planning Organization (MPO) and Regional Transportation Planning Organization (RTPO) for the region, The Puget Sound Regional Council (PSRC) has adopted growth management plans to direct much of the expected growth in population and employment into the urban centers in the Puget Sound region, in large part to help reduce low-density development from expanding the urban edge and the related impacts of growth on the environment. This growth management plan needs transportation options that support such targeted growth.

East Link is consistent with the PSRC growth management strategy, *VISION 2040* (PSRC, 2008), which promotes the development of a coordinated

transportation system that is integrated with and builds upon local, countywide, regional, and state planning efforts. *VISION 2040's* focus is to contain growth, concentrate new employment into urban centers, and link urban centers with a high-quality multimodal transportation system.

The *VISION 2040* growth strategy is also designed to foster a greater mix of land uses and a more complete and efficient network of streets and other public rights-of-way, and to support an urban environment that is more amenable to walking, bicycling, and using transit. As the Regional Transit Authority (under Chapter 81.104 and 81.112 the Revised Code of Washington [RCW]), Sound Transit is responsible for regional HCT system planning in the context of *Transportation 2040*.

Sound Transit's Regional Transit Long-Range Plan, adopted in 2005, represents Sound Transit's goals, policies, and strategies for the long-term development of an HCT system within the central Puget Sound region. This long-range plan is the basis for Sound Transit 2: a Mass Transit Guide, the Regional Transit System Plan for Central Puget Sound (ST2). ST2 is also known as the Mass Transit Expansion proposal. The East Link Rail Transit Project is included in ST2, which was approved by the voters in November 2008.

The East Link Project would support jurisdictional efforts to implement regional policies related to HCT to fulfill plans and policies in those jurisdictions, especially those related to transit-oriented development. The success of such development depends to a considerable degree on supportive policies designed to make areas around transit stations more attractive for development than other areas.

East Link would promote this development by connecting four of the urban growth centers identified in *VISION 2040*, including Seattle, Bellevue, Overlake, and Redmond. East Link would provide direct transit access between these centers and other regional and local destinations. East Link would allow jurisdictions to better implement transit and pedestrian-oriented land use patterns where current zoning allows. Many of the local jurisdictions have also identified new opportunities for mixed-use development in addition to those that are classified as urban centers by the *VISION 2040* plan, such as Mercer Island's City Town Center, the City of Bellevue's Bel-Red area, and Redmond's Overlake Village.

Transportation 2040 is the transportation element of *VISION 2040* and the long-range plan for transportation in the central Puget Sound region through the year 2040 (PSRC, 2010). *Transportation 2040* aims to improve mobility, protect and enhance the environment, and identify sustainable funding. It supports a balanced, multimodal transportation system that provides options for users; the plan identifies both state and local roadway projects, transit and ferry projects, as well as bicycle and pedestrian projects. The East Link Project is one of the key components in *Transportation 2040* to develop a regional HCT system linking urban centers.

Issaquah, Kirkland, Renton, Bothell, and Woodinville are planned to be served by future HCT phases according to the Sound Transit Long-Range Plan. All alternatives of the East Link Project allow for future expansion to the east.

6.1.3.2 Segment-Specific Support of Land Use Goals and Objectives

Segment A

Segment A of the East Link Project would specifically meet the City of Seattle's goals to promote urban villages, link urban centers, and facilitate access to employment centers for Central Area residents with expanded access to the Eastside via the International District/Chinatown Station and new access via the Rainier Station. The City of Mercer Island also has goals to promote mixed-use development at regional transit facilities and to provide adequate transit opportunities, especially serving its city center of mixed-use development adjacent to the planned Mercer Island Station. The Rainier Station and Mercer Island Station would promote localized, mixed-use urban village development.

Segment B

In order to connect Seattle and Bellevue urban centers, light rail must travel through South Bellevue to and from the I-90 Lake Washington crossing. This area is primarily residential and low-density, and it has not been designated for higher-density development by the City of Bellevue. All the Segment B alternatives would serve either an expanded South Bellevue Park-and-Ride Lot or a new park-and-ride lot near 118th Avenue SE and SE 8th Street. *Preferred Alternative B2M to C9T* and Alternatives B2A and B2E would include another station at 112th Avenue SE and SE 8th Street, unless the East Main Station Design Option was selected for *C9T*. East Link would increase park-and-ride capacity and travel options for residents in South Bellevue neighborhoods and new transit access for employees in business parks located east of 112th Avenue SE, consistent with City of Bellevue transportation goals.

Segment C

Segment C is located within Downtown Bellevue, which has been designated an urban center by PSRC

and is the focus of Bellevue's efforts to increase residential and employment density. The *City of Bellevue Downtown Implementation Plan* also identifies HCT as an important element of the downtown transportation plan (City of Bellevue, 2003). The City of Bellevue has adopted a goal of a non-single-occupant-vehicle commute of 40 percent as part of its Growth Efficiency Transportation Center Policy. Segment C alternatives feature up to three stations serving Downtown Bellevue. The Segment C alternatives would all access the Bellevue Transit Center and Overlake/Group Health Hospital Medical Center. For Alternatives C7E and C14E, the Bellevue Transit Center Station would be located on an elevated platform approximately 800 and 1,300 feet away, respectively, from the transit center. These alternatives include a level pedestrian bridge to connect riders to the transit center.

To serve the southern portion of Downtown Bellevue, *Preferred Alternative C11A* would provide a station at 108th Avenue NE and Main Street if connecting from *Preferred Alternative B2M* or the station at East Main if connecting from via Alternatives B3 or B7. Alternative C1T would provide an additional station at Main Street in Old Town Bellevue, an established residential and retail district that has ongoing projects to increase density. *Preferred Alternative C9T*, and those alternatives (except *C11A*) that connect to Segment B via Alternatives B3 or B7 would have an additional station at 112th Avenue SE and Main Street. And if connecting from *B2M, C9T* also includes the East Main Station Design Option, where ridership would be similar to the B3 and B7 East Main Station ridership.

Segment D

Segment D is located within the Bel-Red/Overlake sub-areas, which are planned for substantial redevelopment in coming years. The *Bel-Red Subarea Plan* (City of Bellevue, 2007) promotes transitioning this corridor from primarily light industrial land uses to denser mixed-use land uses, with retail, office, residential, and open space developed around transportation nodes, which are planned at the proposed 120th and 130th stations. One of the stations may be deferred, but both are planned to be constructed. An additional 4.5 million square feet of commercial and office space and an additional 5,000 residential units are forecast for the area by 2020. *Preferred Alternative D2A* and Alternatives D2E and D3 would best facilitate this plan through the placement of stations at approximately 120th Avenue NE and/or 130th Avenue NE. If only one of the stations were built for *Preferred Alternative D2A*, Alternative D2E, or Alternative D3, the station development might influence the timing and specific location of planned transit-oriented development within the corridor. However, these alternatives would still be more consistent with land use goals for transit-oriented development and planned density when compared to Alternative D5, which would bypass these first two station sites and thereby limit the ability of the East Link Project to facilitate transit-oriented development and increased density in this corridor.

The far eastern portion of Segment D is referred to as Overlake Village neighborhood, which is a subarea in the Overlake neighborhood and is also identified by PSRC as a growth center. Redmond's Overlake neighborhood has been designated as an urban center. Redmond's *Overlake Neighborhood Plan* supports transit-oriented development in the area around 152nd Street and NE 24th streets through its land use and transportation goals and policies. This is the Overlake Village neighborhood, which is planned to accommodate an additional 5,800 residential units by 2030. The entire Overlake neighborhood is planned to accommodate an additional 4.5 million square feet of commercial development by 2030. The Overlake Village stations with *Preferred Alternative D2A* and Alternatives D2E and D3 would best meet Redmond transit-oriented development planning objectives.

Preferred Alternative D2A and Alternative D5 would provide a station in the Overlake Village area adjacent to SR 520, adjacent to the planned high-density, mixed-use center. All alternatives would serve the Overlake Transit Center.

Segment E

The Segment E alternatives would serve the Downtown Redmond urban center and SE Redmond, two areas the City of Redmond seeks to connect using rapid transit to support continued mixed-use redevelopment goals. The land uses in Downtown Redmond are generally mixed with multifamily residential, commercial retail shopping, and mid-rise office complexes. Redevelopment is occurring within the northwest portion of Downtown Redmond around the Redmond City Hall and the Redmond Transit Center. Southeast of Downtown Redmond, the land uses change considerably. South of the SR 202 and SR 520 interchange, land uses include light industrial/manufacturing.

All Segment E alternatives would equally serve Downtown Redmond, thus equally meeting the plan and policy goals to support redevelopment; however, if extended beyond Redmond Town Center, E2 – Redmond Transit Center Design Option would provide closer access to the Redmond Transit Center, which is across NE 83rd Street from the site of a relocated park-and-ride lot in conjunction with transit-

oriented development. *Preferred Alternative E2* includes the Downtown Redmond Station, which is equidistant to the transit center, Redmond City Hall, and Redmond City Center shopping area.

Maintenance Facilities

As stated above under Segments D and E, the existing land uses around all the proposed maintenance facilities are generally light industrial or commercial, which are compatible with maintenance facility operations. The Bel-Red area is no longer zoned for industrial uses; however, the subarea plan identifies the area as a potential location of a maintenance facility and that Bellevue would work with Sound Transit on siting the maintenance facility if one was required for East Link. The least compatible maintenance facility with adjacent uses is MF1, which borders office and medical facilities to the south and west but otherwise is surrounded by light industrial uses and the former BNSF Railway corridor. MF1 would be cut into the hillside and therefore would be nearly 30 feet lower than the hospital site to the south and other sites to the west. Children's Hospital Bellevue Clinic and Surgery Center is newly built on the top of this ridge.

6.1.4 Implementation Goal: Minimize Risks

Sound Transit has a goal to minimize risks in the East Link corridor by enhancing stakeholder and community support and through recognizing and managing construction risks.

6.1.4.1 Enhance Stakeholder and Community Support

The objective of the community support goal is to involve the community in the project development and design process. The development of the East Link project has continued Sound Transit's commitment to involving the community at every step of the project. As described in Appendix B, Public Involvement and Agency Correspondence, the outreach effort in the East Link area began with the original project planning, design, environmental scoping, and development. In September 2006, the environmental scoping began for the East Link Draft EIS. Outreach activities have included hosting public open houses and workshops, offering information at local public meetings, making door-to-door visits, and ongoing agency coordination. In addition, Sound Transit's outreach staff has attended community events, posted regular project updates on the Sound Transit website, and mailed fact sheets and project announcements throughout the project corridor.

The Sound Transit Board identified the alternatives to be evaluated in the Draft EIS at its December 14, 2006, meeting. The Draft EIS alternatives were the result of several workshops with community members and key stakeholders. The Draft EIS public review period was a total of 75 days, which resulted in four public hearings, and more than 700 submitted comment letters, which have all been reviewed and responded to in this Final EIS (see Chapter 7 and Appendix J). In response to comments received during the Draft EIS, Sound Transit engaged the City of Bellevue and Redmond in additional exploration of alternatives development.

In December 2009 through January 2010, Sound Transit and City of Bellevue collaborated in producing the *Downtown Bellevue Concept Design Report* that evaluated six alternatives in detail. Following the downtown study, the *Hospital Station and the 112th Avenue Light Rail Options* were explored with extensive public involvement from the community and interested stakeholders. This process looked at four locations for the Hospital Station relative to NE 8th Street and at optional access points to the hospital district. Along 112th Avenue SE, Sound Transit held a series of four public workshops that examined at-grade and retained-cut profiles traveling in the center and on the east and west sides of 112th Avenue SE. Based on input from the community, the Sound Transit Board identified the *Preferred Alternative* for a west side-running alignment along 112th Avenue SE north of SE 6th Street. All new alternatives and modifications to existing alternatives were studied and released for public review in the Supplemental Draft EIS in November 2010. The public comment period closed 45 days later, on January 10, 2011. All comments received during this period are also addressed in this Final EIS, summarized in Chapter 7 and presented as individual responses in Appendix I.

Throughout the process, Sound Transit has made it a priority to engage diverse populations early in the planning and development process by providing outreach information packets and making them available in multiple formats. Before scoping, Sound Transit identified minority and low-income populations based on U.S. Census data. Sound Transit literature has included a language block (i.e., text box on the literature) translated into Russian, Chinese, Spanish, Vietnamese, Farsi, and Tagalog regarding contacting and speaking with Sound Transit staff in those languages about the East Link Project. Also, Sound Transit identified and conducted targeted outreach to organizations that serve minority, non-English-speaking, and low-income populations within the East Link Project vicinity. These organizations

were sent notification postcard and received follow-up phone calls to find out whether the organizations needed additional information about the East Link Project, and they were reminded how they could submit public comments. Organizations were also asked if they would like project staff to sit down with members of their organization to review the environmental information.

The East Link Project has received considerable controversy from the communities in proximity to, and stakeholders with interests in, Segments B and C. None of the alternative in these segments have achieved consensus. East Link Project development has continued Sound Transit's commitment to involving the community at every step of the project.

6.1.4.2 Reduce Construction Risks

Sound Transit has evaluated possible construction risk issues for each alternative. At this early design stage, the construction risk analysis found that risks are generally highest with tunnel construction, retained cuts, or at-grade construction in dense environments. However, Sound Transit, with research from WSDOT experience on I-90, also found that crossing Mercer Slough Nature Park raises risk concerns as well. Table 6-5 summarizes the results of the analysis by alternative and identifies which alternatives are higher or lower than other alternative risks and a discussion of the higher risk construction methods are described below.

Tunnel Construction

Sound Transit concluded that the greatest construction risk would be associated with the Segment C tunnel alternatives (*Preferred Alternative C9T* as well as Alternatives C1T, C2T, and C3T). *Preferred Alternative C9T* and Alternatives C1T and C2T are primarily cut-and-cover tunnel excavation.

Most of Alternative C3T is bored and portions of C2T are proposed to be bored, but cut-and-cover is necessary to avoid impacting soil nails, which are large underground braces holding adjacent property foundations. Generally, more tunnel construction results in increased risk reflected in costs and safety issues. Tunnel construction would generate a large amount of excavated material that would need to be moved to a staging area and ultimately to a disposal site.

Limitations on haul truck movements and location of actual disposal sites would have cost impacts on the construction. However, there are some differences in risk, depending on whether the tunnel is created by boring, using a cut-and-cover method, or by sequential excavation mining construction methods.

TABLE 6-5
Level of Construction Risk by Alternative[a]

Segment	Alternative	Risk
A, Interstate 90	*Preferred Interstate 90 Alternative (A1)*	Lower
B, South Bellevue	*Preferred 112th SE Modified Alternative (B2M)*	Moderate
	Bellevue Way Alternative (B1)	Lower
	112th SE At-Grade Alternative (B2A)	Lower
	112th SE Elevated Alternative (B2E)	Lower
	112th SE Bypass Alternative (B3)	Lower
	BNSF Alternative (B7)	Moderate
C, Downtown Bellevue	*Preferred 108th NE At-Grade Alternative (C11A)*	Moderate
	Preferred 110th NE Tunnel Alternative (C9T)	Higher
	Bellevue Way Tunnel Alternative (C1T)	Higher
	106th NE Tunnel Alternative (C2T)	Higher
	108th NE Tunnel Alternative (C3T)	Higher
	At-Grade Couplet Alternative (C4A)	Moderate
	112th NE Elevated Alternative (C7E)	Lower
	110th NE Elevated Alternative (C8E)	Lower
	110th NE At-Grade Alternative (C9A)	Moderate
	114th NE Elevated Alternative (C14E)	Lower
D, Bel-Red/Overlake	*Preferred NE 16th At-Grade Alternative (D2A)*	Lower
	NE 16th Elevated Alternative (D2E)	Lower
	NE 20th Alternative (D3)	Moderate
	SR 520 Alternative (D5)	Lower
E, Downtown Redmond	*Preferred Marymoor Alternative (E2)*	Lower
	Redmond Way (E1)	Lower
	Leary Way (E4)	Lower
Maintenance Facilities	116th Maintenance Facility (MF1)	Lower
	BNSF Maintenance Facility (MF2)	Lower
	SR 520 Maintenance Facility (MF3)	Lower
	SE Redmond Maintenance Facility (MF5)	Lower

[a] The risk was assessed for the whole alternative, and therefore design options are assumed to have the same associated risk.

Bored Tunnels (portions of Alternative C2T and most of Alternative C3T) would pass through glacial till in Downtown Bellevue and may encounter boulders and building tie-backs. Bored tunnels have a high degree of risk as a result of the uncertainty associated with below-grade soils.

Cut-and-Cover Tunnels (*Preferred Alternative C9T* and Alternatives C1T and C2T) would require larger amounts of soil excavation and replacement than the

bored tunnels. Because construction access is from the surface, cut-and-cover may involve permanent relocation of existing utilities in otherwise dense utility corridors. Sometimes utilities can be held in place, but maneuvering around utilities is a risk. Also, cut-and-cover tunnel construction results in considerable traffic management issues caused by lane closures, detours, and signal modification. Therefore *Preferred Alternative C9T,* Alternative C1T, and Alternative C2T would have a higher risk than Alternative C3T, which is best suited for the bored tunnel method. However, among these cut-and-cover tunnels, *Preferred Alternative C9T* is the shortest, thus limiting the length of risk areas under construction. In addition, all tunnel alternatives would include cut-and-cover station construction; Alternative C1T would have two cut-and-cover stations, whereas Alternatives C2T and C3T have only one, the Bellevue Transit Center Station.

Sequential Excavation Mining is the most risky form of tunnel construction. The process is slower and more expensive and may involve higher safety risks over other tunnel construction methods. This method is only employed when neither bored nor cut-and-cover methods are practical. This method would only occur under the Bellevue Arts Museum for Alternative C1T.

Retained-Cut Construction

Like cut-and-cover, a retained-cut construction requires large amounts of soil excavation and utility relocation. Retained-cut construction would occur in portions of Alternative C1T and *Preferred Alternatives B2M* and *C11A* (albeit minor distance and depth), D2A - 120th Station Design Option and Overlake Transit Center Station, portions of Alternatives D3 and D5, and in all Segment E alternatives adjacent to SR 520. The risk occurs most strongly in urban corridors (Alternatives C1T and D3), where there is limited area to relocate utilities and high conflicts with traffic during construction.

At-Grade in Dense Urban Environment

Constructing at-grade alternatives in dense, urban environments can result in moderate risks. A constrained right-of-way makes construction more difficult and more costly. For long-term reliability in service, all utilities parallel to and located underneath an at-grade route would need to be relocated and crossings would need to be encased such that utility access can be obtained without affecting light rail operations. This would increase the risk on the construction of *Preferred Alternative C11A* and Alternatives C4A and C9A and would present a risk due to the number of potential utility conflicts located along 108th Avenue NE and 110th Avenue NE. The design of these alternatives would account for utility relocation, and accurate utility surveying and pothole data would be paramount in reducing risk.

Mercer Slough Crossing Construction

WSDOT has found soft clays and peat soils at the center of the Mercer Slough Nature Park that, in addition to being soft and settlement prone, move horizontally as the level of Lake Washington changes, resulting in large soil loading to the existing I-90 structures that cross the slough. The slough crossing for Alternative B7 would have to be designed and constructed to accommodate these soil conditions resulting in higher risk than for other elevated profiles and an overall moderate risk for Alternative B7.

6.1.5 Financial Goal: Achieve Financial Feasibility

Sound Transit is committed to implementing a light rail system that not only meets regional transportation needs but also meets the following financial goals:

- Build a system within project budget.
- Build a system that can be operated and maintained within available revenue.
- Build a system that is cost-effective.

6.1.5.1 Building the Project within Budget

The ST2 approved by voters in November 2008 would fund the construction portion of the East Link Project from Seattle to the Overlake Transit Center Station. ST2 provides funding for an at-grade or elevated alternative through Downtown Bellevue. If the Sound Transit Board selects a tunnel alternative in this segment, additional funding sources would be required. Environmental review and preliminary engineering are funded by ST2 for the segment from Overlake Transit Center Station to Downtown Redmond. However, the overall project cost would vary depending on which alternatives are selected and which stations and other elements are included in the project.

The cost of the East Link Project from Seattle to the Overlake Transit Center is estimated to range between $2.0 and $3.7 billion. If the project were only built to the Hospital Station (east end of Segment C), the high-cost project would be just under $3 billion, whereas the low-cost project would be just under $2 billion. Many factors weigh into the difference in cost beyond just the length of the project, such as number of stations, profile of the route, and varying costs for property acquisition. The high project cost estimate includes a tunnel alternative in Segment C, Downtown Bellevue, and the low-cost includes an elevated alternative in Downtown Bellevue. The overall project cost range to complete the East Link Project to its

terminus in Downtown Redmond is currently estimated to fall between $2.4 and $4.5 billion. Table 6-6 summarizes the estimated cost for each alternative by segment. The range in costs is due to design options or variations in the connectors between segments as well as cost estimates with and without project reserve.

There is only a slightly higher cost consideration for *Preferred Alternative A1* for the potential accommodation of joint bus and light rail use of the D2 Roadway. In Segment B, however, the range of costs varies by the length of elevated or retained-cut profile versus at-grade and the amount of property acquisition required for each alternative. The cost of Segment B alternatives range from approximately $370 million to $590 million with and without project reserve. *Preferred Alternative B2M* includes the cost of preserving both HOV access ramps from I-90 to Bellevue Way SE as required by WSDOT. While Alternative B1 remains the lowest cost overall, Alternative B2A is the second lowest with a range of $430 to $505 million and *Preferred Alternative B2M* is third least costly.

Preferred Alternative B2M would result in lower costs in Segment C with *Preferred Alternatives C11A* or *C9T* than with Alternatives B3 or B7 because the route continuing north along 112th Avenue SE into downtown has less elevated structure than with Alternatives B3 and B7. While the East Main Station Design Option would add cost to *C9T*, it would be offset from the removal of a station on B2M at SE 8th Street. In contrast, Alternative B1 combined with Alternative C1T results in the highest cost combination. The tunnel alternatives in Segment C are the most costly, and the at-grade or elevated profiles result in lower, but comparable, costs.

Preferred Alternative C11A and Alternative C4A are comparable with the elevated alternatives because of higher utility relocations and more property acquisition. Alternative D5 is the least costly among Segment D alternatives because it has fewer stations and fewer large-business displacements. Of the remaining Segment D alternatives, *Preferred Alternative D2A* is the least costly, but the D2A - NE 24th Design Option makes this alternative similar in cost to Alternatives D2E and D3.

TABLE 6-6
Estimated Cost by Alternative

Alternative	Estimated Cost (millions, 2007$)
Segment A, Interstate 90	
A1, I-90 Alternative	$635 to $750
Segment B, South Bellevue	
Preferred 112th SE Modified Alternative (B2M) to *C11A*	$470 to $540
Preferred 112th SE Modified Alternative (B2M) to *C9T*	$480 to $550
Bellevue Way Alternative (B1)	$355 to $405
112th SE At-Grade Alternative (B2A)	$390 to $450
112th SE Elevated Alternative (B2E)	$445 to $510
112th SE Bypass Alternative (B3)	$430 to $490
B3 – 114th Extension Design Option	$500 to $575
BNSF Alternative (B7)	$515 to $590
Segment C, Downtown Bellevue	
Preferred 108th NE At-Grade Alternative (C11A)	$555 to $690
Preferred 110th NE Tunnel Alternative (C9T)[a]	$790 to $1,025
Bellevue Way Tunnel Alternative (C1T)	$1,405 to $1,615
106th NE Tunnel Alternative (C2T)	$1,115 to $1,365
108th NE Tunnel Alternative (C3T)	$975 to $1,260
At-Grade Couplet Alternative (C4A)	$535 to $705
112th NE Elevated Alternative (C7E)	$435 to $600
110th NE Elevated Alternative (C8E)	$615 to $705
110th NE At-Grade Alternative (C9A)	$465 to $645
114th NE Elevated Alternative (C14E)	$495 to $575
Segment D, Bel-Red/Overlake	
Preferred NE 16th At-Grade Alternative (D2A)[b]	$670 to $765
D2A – NE 24th Design Option	$710 to $820
NE 16th Elevated Alternative (D2E)	$695 to $840
NE 20th Alternative (D3)	$735 to $875
SR 520 Alternative (D5)	$470 to $580
Segment E, Downtown Redmond	
Preferred Marymoor Alternative (E2)	$555 to $635
E2 – Redmond Transit Center Design Option	$690 to $795
Redmond Way (E1)	$595 to $685
Leary Way (E4)	$505 to $580
Maintenance Facilities	
116th Maintenance Facility (MF1)	$430 to $465
BNSF Maintenance Facility (MF2)	$310 to $315
SR 520 Maintenance Facility (MF3)	$365 to $385
SE Redmond Maintenance Facility (MF5)	$240 to $280

Otherwise, as in Segment B, the Segment D alternative costs vary by the profile and the right-of-way costs, with Alternative D3 being the highest cost because it has both elevated and retained-cut profiles. Finally, in Segment E, the *Preferred Alternative E2* is the second least expensive when not including the E2 - Redmond Transit Center Design Option. The shortest alternative, Alternative E4, is the least costly.

6.1.5.2 Build a System That Can Be Operated and Maintained Within Available Revenue

Annual operating costs for the East Link Project would vary by profile type and number of stations. The ST2 funds operation of the portion of the East Link Project from Seattle to Overlake Transit Center Station. The major determinants of operating costs for the project are service levels, running time, and trackway profile. The more frequent the service and the longer the line, the more vehicles it takes to maintain equivalent headways. Shorter alternatives with fewer stations have lower operating costs. In terms of line and station maintenance, at-grade is the lowest cost, elevated the next highest, and tunnel is the highest cost. The primary difference in cost lies in whether the project includes a tunnel through Downtown Bellevue. Operations for tunnels are more costly to maintain because of additional infrastructure components, such as stairwells, escalators, elevators, vent shafts, and station walls. In addition, tunnel stations require unique security and lighting considerations.

6.1.5.3 Cost-Effectiveness of Project and Alternatives

Cost-effectiveness was measured consistent with FTA methods as the project's annualized cost divided by the projected number of riders that the project would attract each year, for a cost-per-rider estimate. Annualized costs are the project's construction costs averaged over the years of operation. Costs are presented and discussed in detail in Chapter 2, Alternatives Considered, of this Final EIS. These cost-effectiveness estimates offer decision-makers a point of comparison among the alternatives.

Within the estimated cost range for the East Link Project, from the low-cost ($2,435 million without project reserve and $2,940 million with project reserve) that combines *Preferred Alternative A1*, Alternative B2A, Alternative C7E, Alternative D5, and Alternative E4, to high-cost ($3,835 million without project reserve and $4,435 million with project reserve) for the combination of *Preferred Alternative A1*, Alternative B1, Alternative C1T, Alternative D3, and *Preferred Alternative E2* with the E2 - Redmond Transit Center Design Option, there is a range in cost-effectiveness, depending on which segment alternatives are combined (Exhibit 6-1). The low-cost project would be the most cost-effective. The high-cost project would be the least cost-effective but would offer roughly 7 percent greater ridership than the low-cost project. The *Preferred Alternatives* (at-grade or tunnel) in Downtown Bellevue are $7.50 and $7.95 annualized cost per rider, respectively. While the project with the tunnel is more costly, the time savings results in higher ridership and therefore similar overall cost-effectiveness.

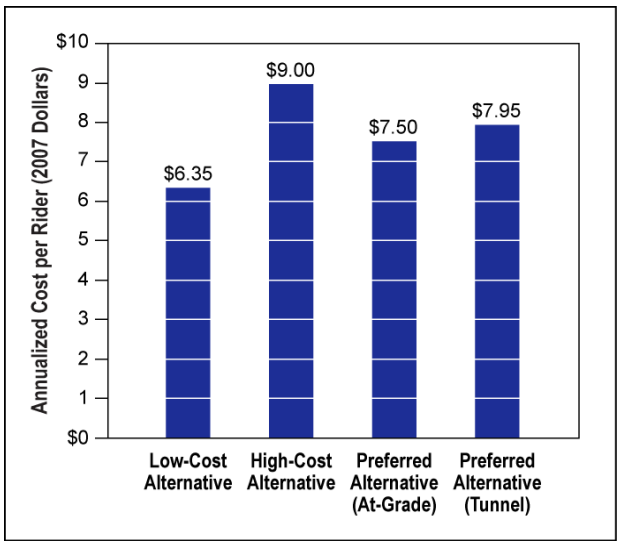

EXHIBIT 6-1
Cost-Effectiveness of Low-Cost and High-Cost Projects

The total project cost-effectiveness would be affected by the cost-effectiveness of each segment; therefore, cost-effectiveness (cost per rider) was calculated for each alternative. However, because this cost per rider does not include the effect of travel time on riders not originating in or destined for stations within a segment, it understates the benefit that faster alternatives offer to through-riders. For this reason, the project appears to be more cost-effective than the individual alternatives. Exhibit 6-2 shows the range of cost-effectiveness for each alternative. In general, comparisons should only be drawn between alternatives within the same segment. Also each alternative contains a range in the cost-effectiveness calculation (in Exhibit 6-2, dark blue shows low range and green shows high range) due in part to the variation in cost and ridership dependent upon the connections from the alternatives in the adjacent segments or various design options within the alternative. For some alternatives, the range is so small that the rounding to the nearest five cents per rider removes the appearance of a range.

Segment A

The only alternative within Segment A, *Preferred Alternative A1,* has two options on the D2 Roadway— light rail only or joint operation with bus traffic. The cost-effectiveness is estimated to be $12.20 per rider for light rail only and $12.60 with joint operations. The additional cost of the D2 Roadway joint operation design option would slightly reduce the cost-effectiveness of *Preferred Alternative A1*. There would be no additional light rail riders due to this design option; however, it would offer some bus travel-time savings.

Segment B

In Segment B, *Preferred Alternative B2M* is in the median range of cost-effectiveness, at $8.80 per rider for *Preferred Alternative B2M* to *C11A* and $8.20 per rider for *Preferred Alternative B2M* to *C9T*. Alternative B7 is the least cost-effective; at $30.35 per rider, Alternative B7 is about four times higher than the other alternatives in this segment. This is primarily a result of the lower segment ridership as compared to the other alternatives. Alternative B7 would have roughly one-quarter of the segment riders than the other alternatives within Segment B, which are reasonably comparable to one another in cost-effectiveness. While Alternative B1 appears to be to most cost-effective at $7.00 per rider, its combination with Alternative C1T does not support this conclusion. Therefore Alternative B2A remains the most cost-effective at $7.30 per rider.

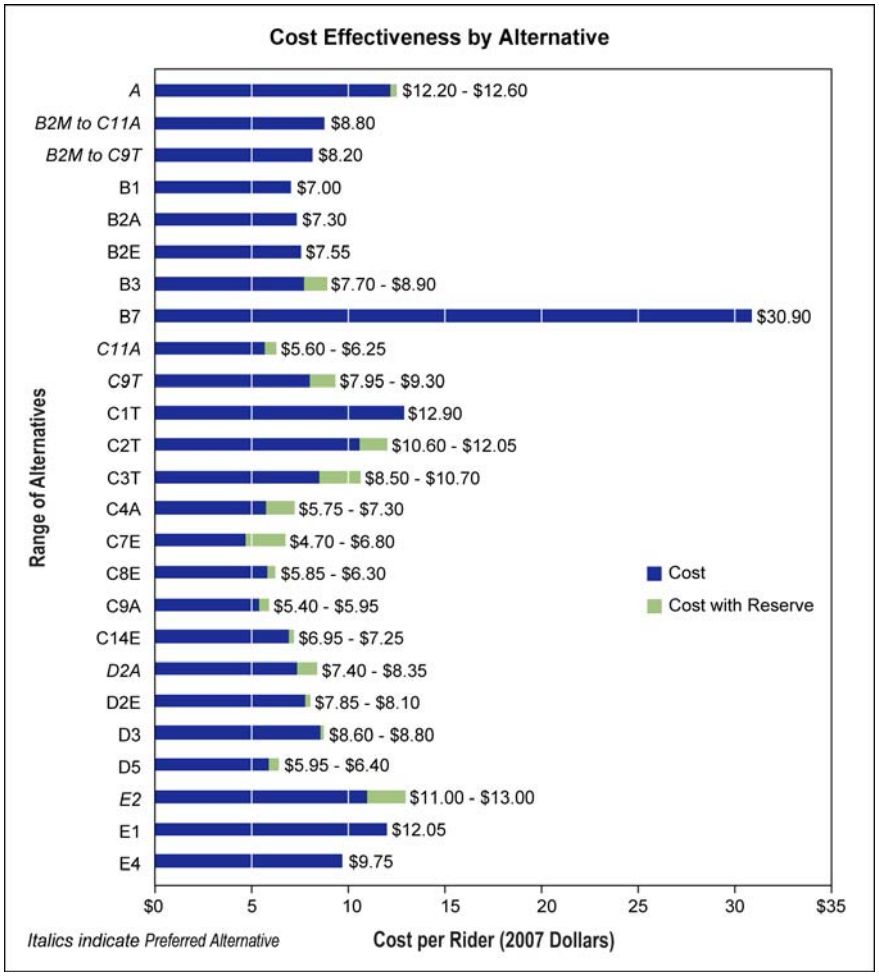

EXHIBIT 6-2
Cost-Effectiveness by Alternative

Segment C

In Segment C, P*referred Alternative C11A* and Alternatives C4A, C7E, and C9A are the most cost-effective alternatives because they are relatively low cost with high ridership. Alternatives C8E and C14E fall in the middle of cost-effectiveness. The at-grade and elevated alternatives are almost one-half the cost of the highest-cost alternative—Alternative C1T. Tunnel alternatives generally have higher costs per rider than at-grade or elevated alternatives. Tunnels are inherently costlier, and therefore, unless they provide substantially higher ridership, they would have a high cost per rider. *Preferred Alternative C9T* is the most cost-effective tunnel alternative when combined with a connection from 112th Avenue SE (*B2M*, B2A, or B2E). The bored tunnel connection from Alternative B2A (via Surrey Downs Park) for Alternatives C2T and C3T adds cost and is therefore less cost-effective than the B2E connection. However, connecting from Alternative B7 is still the least cost-effective connection for these alternatives, as represented in Exhibit 6-2. For Alternatives C4A and C7E, the connection from Alternative B2E provides the best cost-effectiveness per rider, as shown by the top of the blue bar, and Alternative B2A proves to be the least cost-effective for these alternatives.

Segment D

The Segment D alternatives have similar cost-effectiveness because each has similar ridership and costs, except for Alternative D5, which is the most cost-effective. *Preferred Alternative D2A* and Alternative D2E are the next most cost-effective. The D2A - 120th and NE 24th Design Options result in nearly $1 more per rider over *Preferred Alternative D2A*. However, even with the design option, it remains more cost-effective than Alternative D3.

Only a slight difference is attributed to the connection from Segment C alternatives, either passing via NE

12th Street or from the former BNSF Railway corridor. The NE 12th Street connection is more cost-effective for all Segment D alternatives (as illustrated by the top of the blue bar), except for Alternative D5, where the connection via the former BNSF railway is the most cost-effective. The cost-effectiveness as illustrated in Exhibit 6-2 does reflect the potential for increased ridership in Segment D attributed to the Bel-Red corridor by the Cities of Bellevue and Redmond land use plans.

Segment E

Ridership in this segment would be similar for all alternatives, so cost-effectiveness is directly correlated to cost. Alternative E4 is the most cost-effective, with *Preferred Alternative E2* second (as shown in Exhibit 6-2), mostly because Alternative E4 has slightly higher ridership over *Preferred Alternative E2*. However, the E2 - Redmond Transit Center Station Design Option with *Preferred Alternative E2* is the least cost-effective because it is the highest-cost alternative with an extra station and high property acquisition costs.

6.2 Comparison of Benefits and Environmental Impacts

The East Link Project as a whole would improve transit quality in the region by providing frequent and reliable HCT service 20 hours each day in the Seattle, Mercer Island, and Bellevue to Redmond corridors. East Link passengers would receive a comfortable ride; high-person capacity; efficient loading of multiple-car trains resulting in short in-station loading time; and dependable, on-time departures and arrival. This increase in reliability between major transit centers would enhance the network of bus distribution and feeder routes, thereby enhancing the ability of transit riders to reach a broader range of destinations in less time than they can now. The East Link Project would be made up of a selection of one alternative from each segment. This section describes the trade-offs among the benefits, impacts, and cost-effectiveness of the alternatives.

Segment A does not have multiple build alternatives, but the design option of shared use of the D2 Roadway has higher cost trade-offs against somewhat worse bus transit performance if shared use is not accommodated.

In Segment B, the 112th SE alternatives (*Preferred Alternative B2M* and Alternatives B2A and B2E) offer the highest ridership levels and cost-effectiveness with relatively low environmental impacts and construction risk. Construction may result in potential impacts on the Winters House under *Preferred Alternative B2M*; however, mitigation measures would protect and preserve the house. All Segment B alternatives would affect Mercer Slough Nature Park. The Bellevue Way Alternative (B1) would have the most residential property acquisitions, whereas the BNSF Alternative (B7) is the longest alternative, and would result in the highest level of wetland impacts and most expensive. All Segment B alternatives would result in traffic and noise impact, as well as a loss in some high-value habitat. However, these impacts can be mitigated. All Segment B alternatives that follow Bellevue Way SE, except *Preferred Alternative B2M,* would result in visual impacts from the removal of mature vegetation and retaining wall on the west side of the roadway. Except for B7, which is substantially worse, cost-effectiveness is generally similar among these alternatives.

In Segment C, the tunnel alternatives would generally provide the highest ridership but also have a higher construction risk and worse cost-effectiveness than the at-grade and elevated alternatives. Because they are underground, tunnel alternatives avoid interactions with traffic and decrease noise that the at-grade and elevated alternatives might have during operation. However, tunnel alternatives would have considerably longer construction periods and extensive soil excavation and removal. At-grade alternatives also attract high ridership, but the travel time may be compromised unless signal priority can help facilitate traffic movements through Downtown Bellevue. Alternatives C4A, C3T, C8E would result in a long-term visual effect on McCormick Park, and if connected with B2A, Alternative C9A would result in visual impact on 112th Avenue SE. All alternatives in Segment C, except C7E or C14E, would affect parks. Both *Preferred Alternatives C11A* and *C9T*, as well as other at-grade and cut-and-cover tunnel alternatives would have a high degree of utility relocation within constrained right-of-way, but the cut-and-cover tunnel alternatives would require a construction period at least one year longer, with associated transportation impacts. While P*referred Alternative C11A* and Alternative C9A are the most cost-effective, *Preferred Alternative C9T* would avoid interacting with automobile circulation in Downtown Bellevue. Connecting from *Preferred Alternative B2M* would require relocating several residences but remain less costly than connections from Alternatives B3 or B7 that would result in higher ecosystem impacts.

The primary impacts of the Segment D alternatives would be on businesses and land uses. Although all Segment D alternatives would cross several streams, impacts on habitat would be minimal and in some cases beneficial with mitigation. Alternative D3 would displace the most businesses and employees and have

the greatest estimated cost. It would also have slightly lower ridership than the NE 16th alternatives (*Preferred Alternative D2A* and Alternative D2E). Alternative D5 has the lowest estimated cost but because of its location adjacent to SR 520, it would have the fewest stations and the least influence on transit-oriented development opportunities in the Bel-Red Subarea. The *Preferred Storage Track connection from D2A* would not result in any relocations nor would it contribute notable environmental impacts.

The Segment E alternatives would not substantially differ in ridership. *Preferred Alternative E2* is the second most cost-effective, after the shortest alternative (Alternative E4). Alternative E4 would result in visual impacts on the entry to Redmond Town Center, and the residents over Sammamish Way Boulevard would experience a change in their viewshed from the only alternative that would require relocation of a historic structure. The E2- Redmond Transit Center Design Option would provide an additional station when extended to the Redmond Transit Center, it would also have the greatest impact in many categories: the highest estimated capital cost, the most business and employee displacements, and the highest impact on parks. Alternative E1 would have the highest habitat impacts but the lowest impact on parks.

MF5 would be the maintenance facility most compatible with adjacent land uses because it is located in an area planned to remain industrial in the future. Near the areas of MF1, MF2, MF3, the land uses will eventually shift away from industrial uses to more mixed residential and commercial uses. MF1 and MF3 would also be more expensive to construct and would displace substantially more businesses than the other potential maintenance facility locations. In addition, MF1 would be located adjacent to medical offices and the new Children's Hospital Bellevue Clinic and Surgery Center, which are more sensitive to noise and vibration than industrial uses. The greater cost for MF1 and MF2 would be related to greater amounts of excavation and grading required to make these sites level. MF1 and MF3 would have the most potential employee displacements, with over 900, while MF5 would be the least costly maintenance facility and could have the fewest employee displacements, with as few as 320. The fewest business displacements would occur under MF2, which would displace three to six businesses, depending on which alternative it connects from.

6.3 Areas of Controversy and Issues to be Resolved

Sound Transit would continue to coordinate with appropriate federal, state, and local agencies and jurisdictions to resolve issues as the project advances. East Link project areas of controversy and issues that remain to be resolved include the following:

- Choosing between the alternatives that follow the former BNSF Railway corridor and alternatives along Bellevue Way SE. The City of Bellevue has indicated a preference for a modified version of Alternative B7 and C9T, referred to as the B7R (described in Chapter 2), and the Sound Transit Board's *Preferred Alternative B2M* follows Bellevue Way SE and 112th Avenue SE.
- In Segment C the City of Bellevue and Sound Transit are coordinating to find funding to build the higher-cost *Preferred Tunnel Alternative* (*Preferred Alternative C9T*) instead of the lower cost at-grade *Preferred Alternative* (*Preferred Alternative C11A*).
- Since publication of the 2008 Draft EIS, a lawsuit was filed challenging the State of Washington's constitutional authority to approve transition of the I-90 floating bridge center roadway to light rail transit use. In April 2011 the Washington State Supreme Court denied the petitioner's request to prohibit the State from authorizing this transition. Following the Supreme Court's decision, the petitioner filed a similar challenge in Kittitas County Superior Court.
- The alignment of *Preferred Alternative E2* in Downtown Redmond as shown in Appendix G1 (Conceptual Design Drawings) and the City of Redmond's *Central Connector Master Plan* adopted in June 2011 are not entirely consistent primarily because of city plans for utility upgrades and the regional trail extension in the former BNSF Railway corridor and NE 76th Street rights-of-way. Sound Transit has obtained real property and easements for the right to operate light rail in the former BNSF Railway corridor from the Port of Seattle and the City of Redmond, which guarantees Sound Transit access to the Downtown Redmond segment of the corridor for light rail. When funding is available to advance Segment E, Sound Transit will coordinate with the City of Redmond to resolve design issues in this corridor. Solutions may include acquisition of additional property, relocation of utilities, modifications to NE 76th Street, and/or modifying the light rail alignment in Downtown Redmond.