

4.3 Economics

4.3.1 Introduction to Resources and Regulatory Requirements

Transit projects such as the East Link Project can change patterns of regional and local mobility and access, which in turn may affect aspects of the regional or local economies such as development patterns, employment opportunities, business accessibility, and/or retail sales. Prior to construction, most of the project alternatives would require the relocation of businesses and the displacement of employees. Potential relocation of residences and displacement of residents associated with the East Link Project is addressed in Section 4.1, Acquisitions, Displacements, and Relocations. The East Link Project also might have economic impacts on cities and counties in the area.

The purpose of this economic impacts analysis is to identify the potential adverse and beneficial impacts of the East Link Project on the local and regional economies. Sound Transit evaluated economic impacts in a study area consisting of three different scales:

- **Regional:** Economic impacts on the regional economy (such as effects on employment, traffic mobility, and congestion) were analyzed for a study area consisting of the four counties in the Puget Sound region: King, Kitsap, Pierce, and Snohomish counties.
- **City level:** Effects of the project on the tax revenue for cities with property acquisition (Bellevue and Redmond) were assessed.
- **Site specific:** Site-specific impacts were evaluated for a study area of one-half mile around the light rail route and stations.

This analysis summarizes the anticipated direct and indirect impacts of the No Build Alternative and the East Link Project from business displacements, changes in tax revenue, and regional transportation of goods and services during operation and construction.

4.3.2 Affected Environment

4.3.2.1 Regional Demographic and Economic Trends

This section provides demographic and economic regional forecasts for the four-county Puget Sound Region.

Population

The historical and forecast population data for the region and for King, Kitsap, Pierce, and Snohomish

counties individually show that the region will grow by over 1.2 million inhabitants by 2030 to 4.5 million inhabitants (see Appendix F4.3, Table F4.3-1). Between 2000 and 2030, population in the region is expected to increase at an average annual growth rate of 1.1 percent. The greatest average annual growth is forecast to occur in Snohomish County, at approximately 1.6 percent, followed by Pierce, Kitsap, and King Counties at 1.2, 1.2, and 0.8 percent, respectively.

Households

The historical and forecast household data for the region and for King, Kitsap, Pierce, and Snohomish counties individually shows that between 2000 and 2030, the number of households in the region is expected to increase at an average annual growth rate of 1.4 percent (see Appendix F4.3, Table F4.3-2). Like the population growth forecast, the most rapid annual rate of household formation, at 1.9 percent, is expected to occur in Snohomish County. Pierce, Kitsap, and King Counties are forecast to have average annual growth rates of 1.5, 1.5, and 1.1 percent, respectively.

Between 2000 and 2030, the growth rate for new household formation is forecast to exceed the growth rate for population in each of the four counties. This implies that the average number of persons per household will decline. This is relevant because travel demand typically correlates more closely to household formation than to population.

Regionally, the mix of households is expected to change between 2000 and 2030, as shown in Appendix F4.3, Table F4.3-2. The percentage of multifamily households is forecast to increase from 31 percent in 2000 to 35 percent in 2030, while the percentage of single-family households is expected to decline from 69 percent in 2000 to 65 percent in 2030. This trend to multifamily households is forecast to occur in all four Puget Sound counties.

Income

Median household income in King, Kitsap, Pierce, and Snohomish counties is higher than the state average. According to the U.S. Census Bureau, King County had the highest median household income in the region at approximately \$63,489 in 2006, which is an increase of 16 percent from 1999. In 2006, median household income was \$55,257 in Kitsap County, \$53,923 in Pierce County, and \$60,002 in Snohomish County. Income levels in Kitsap, Pierce, and Snohomish counties have increased by 15, 16, and 12 percent, respectively, when compared to 1999 U.S. Census levels.

Employment

Between 2000 and 2030, employment in the region is expected to grow at an average annual rate of 1.2 percent. Snohomish County is expected to experience the highest rate of increase in job growth, at an average annual rate of 1.6 percent (see Appendix F4.3, Table F4.3-3). Pierce, King, and Kitsap counties follow with average annual growth rates of 1.1, 1.1, and 1.0 percent, respectively. Snohomish County’s relative share of regional employees is forecast to increase from 12 percent in 2000 to 14 percent in 2030, while the relative shares of King, Kitsap, and Pierce counties are expected to decline slightly.

Table F4.3-4 in Appendix F4.3 presents historical and forecast employment by sector, in total, and on a percentage basis, for the region and King, Kitsap, Pierce, and Snohomish counties. Regionally, the finance, insurance, real estate, and services sector (FIRES) of the economy is forecast to grow the most rapidly. This is also true for King, Pierce, and Snohomish counties. In Kitsap County, the wholesale trade, transportation services, communication, and utilities sector (WTCU) is forecast to grow most rapidly.

Unemployment

As shown in Exhibit 4.3-1, which shows unemployment rate trends for the region, Washington, and the United States, the region’s unemployment rate was lower than that of the state and of the nation from

1997 to 1998. However, between 1999 and 2005, it was higher than the nation but lower than the state. Since 2005, the region’s unemployment rate has tended to be lower than the state and similar to the nation.

4.3.2.2 Demographic and Economic Trends in Study Area

Table 4.3-1 shows the population, household, and employment trends for each segment. The same data for each alternative is available in Appendix F4.3, Table F4.3-5.

The tables in Appendix F4.3 provide estimates for 2000 and 2030 forecasts. The estimates for Segment A are based on Seattle Transportation Analysis Zone projections from the City of Seattle; for the remaining segments, the estimates are based on Transportation Analysis Zone projections from the Puget Sound Regional Council (PSRC).

As shown in Table 4.3-1, by 2030, Segment C is forecast to have the largest population (52,170) and most households (18,120) and employees (97,330) of the five project segments. Segment C is also forecast to experience the most rapid growth in population, households, and employment, both in total and as a percentage.

Local Revenue Sources

The cities within the study area – Seattle, Mercer Island, Bellevue, and Redmond – rely heavily on property tax and sales tax revenues to fund general

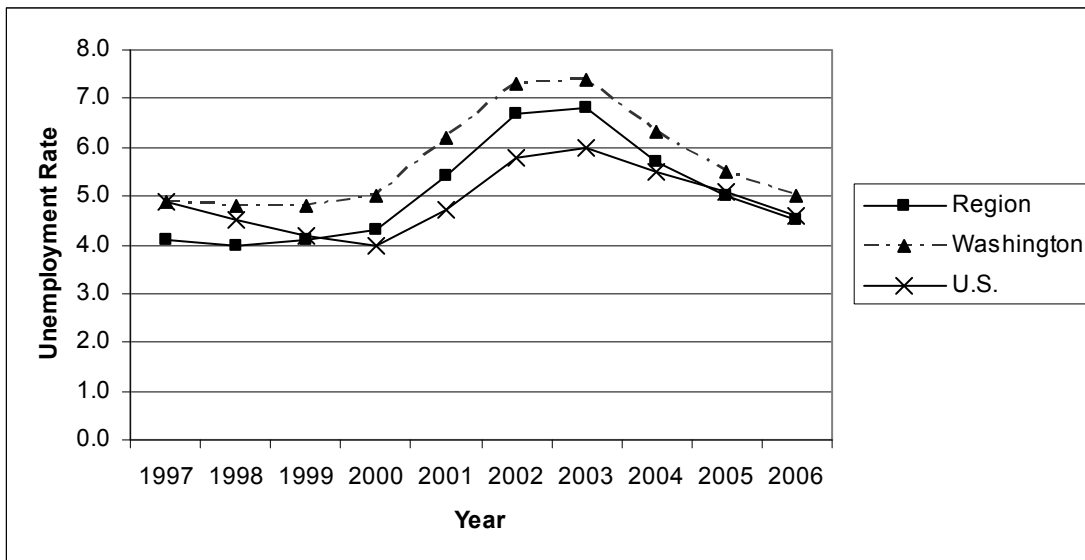


EXHIBIT 4.3-1
Unemployment Rates, 1997-2006

Note: Regional unemployment was calculated using an employee-weighted average of the Seattle-Tacoma-Bellevue, Washington, Metropolitan Statistical Area (includes King, Snohomish, and Pierce counties) and the Bremerton-Silverdale, Washington, Metropolitan Statistical Area (includes Kitsap County) annual unemployment rates.

Source: Bureau of Labor Statistics, 2007.

TABLE 4.3-1
Population, Household, and Employment Forecasts by Segment

Segment	2000 ^a	2030 ^a	Average Annual Growth Rate 2000-2030
Segment A, Interstate 90			
Population	9,240	13,350	1.2%
Housing Units	3,520	4,930	1.1%
Employment	12,550	17,450	1.1%
Segment B, South Bellevue			
Population	10,490	13,400	0.8%
Housing Units	4,110	5,170	0.8%
Employment	7,000	9,430	1.0%
Segment C, Downtown Bellevue			
Population	15,970	52,170	4.0%
Housing Units	5,740	18,120	3.9%
Employment	51,080	97,330	2.2%
Segment D, Bel-Red/Overlake			
Population	16,710	22,270	1.0%
Housing Units	5,930	7,860	0.9%
Employment	64,000	97,260	1.4%
Segment E, Downtown Redmond			
Population	19,120	32,550	1.8%
Housing Units	6,860	11,490	1.7%
Employment	23,090	37,020	1.6%

^a Estimates rounded to the nearest 10.

Note: 2030 population, household, and employment forecasts in Segment D may be higher than shown because of planned future development in the Bel-Red Corridor and the Overlake Village areas that are not reflected in these forecasts.

Source: King County Department of Assessments, 2007; City of Seattle, 2007a; PSRC, 2006. Note: Data were tabulated to fit the study area.

services to their respective jurisdictions. Revenues collected by each city, other than taxes, consist of funding from state and local sources, internal transfers, and various types of fees collected from government-operated facilities and from issuing licenses and permits. In addition to funding city programs, property tax levies also provide funds for county programs, fire prevention, libraries, schools, and other governmental services.

Table 4.3-2 presents a breakdown of funding sources for each city in the study area. Property tax revenues for the cities of Mercer Island and Redmond represent 45 percent of total revenues in those cities. The City of Bellevue is the only city in the project vicinity that collects more in sales tax revenue than property tax revenue, and sales tax is its largest single revenue source.

TABLE 4.3-2
Revenue Sources—Percent of Total Revenues by City

City (Budget Year)	Property Tax	Sales Tax	Other Sources
Seattle (2007-2008)	24.7%	19.2%	56.1%
Mercer Island (2008)	44.9%	12.8%	42.3%
Bellevue (2008)	18.5%	26.1%	55.4%
Redmond (2007-2008)	44.9%	12.8%	42.3%

Source: City of Seattle, 2007b.; City of Mercer Island, 2007; City of Bellevue, 2007a; City of Redmond, 2007a.

4.3.2.3 Regional Transportation of Goods and Services

In Segment A, I-90 is an important link for regional and interstate commerce. This section describes existing truck trips on I-90 and its current and future importance to the region’s economy.

A recent study (Sommers, 2007) notes that future growth in the region forecasted by PSRC will be based mainly on the expansion of technology industries and the accompanying expansion of financial and service industries. Long-term growth in King County is projected to be concentrated in the two downtown centers (Seattle and Bellevue) to a much greater extent than in the rest of King County. The growth of the technology sector in Seattle will likely enhance economic linkages across Lake Washington to Bellevue and other Eastside communities, where these industries are also well established. The technology and the financial and service industries have a tendency to cluster in downtown areas and dense office parks; they have strong mutual business linkages and tend to locate near each other. These industries will require expansion of both transportation systems and electronic communications infrastructure to carry out their work, suggesting a need for expanded road, transit, and communications capacity between Downtown Bellevue and Downtown Seattle.

Another recent study (WSDOT, 2007) provides insight into how congestion is constraining economic development in the region. Longer travel times, increased costs, and less reliable pickup and delivery times for truck operators could result in businesses being forced to move all or part of their business to less congested regions or avoid the Puget Sound region altogether. In an effort to avoid moving away from the region, some transport companies are working with their customers to arrange deliveries in nonpeak hours; however, many smaller customers do not find it cost-effective to extend their hours of operation. Congestion also limits access to labor and

affects location decisions; as a result, companies may look to less congested parts of the metropolitan region or to other cities entirely for future expansion. The results of a recent Washington State freight movement study (WSDOT, 2005) indicate the following:

- \$14 billion in state-originated exports pass through Puget Sound ports, equating to 63 million metric tons of cargo.
- Freight volumes in Washington are growing twice as fast as the state's population and are expected to continue growing rapidly in the future.
- On an average weekday in 2000, congestion in the Puget Sound region resulted in more than 45,000 hours of truck delay.

These results indicate that roadway congestion increases the cost of doing business in the region, particularly for businesses and industries highly dependent on the shipment of goods.

In the Puget Sound region, I-90 is the main highway route for east-west commerce and the second most heavily used highway for truck movements in Washington (WSDOT, 2005) after I-5, with over 5,000 truck trips per day, many of which travel over the I-90 bridge en-route to the Port of Seattle or other destinations. According to a study of freight movement on Washington state highways (Peterson, et al. 2006), five industries make up more than half of the freight traffic on I-90: food and related products, crops, lumber and wood products, mixed freight, and transportation equipment. These five industries are particularly vulnerable to delay and unreliable travel times.

PSRC forecasts show that the average annual growth of freight traffic on the I-90 bridge will slow by 2030 during AM and PM peak periods (Table F4.3-6 in Appendix F4.3). (Peak travel time for this analysis is for all vehicles traveling between 7 and 9 a.m. and between 4 and 6 p.m.) This is because, by 2030, traffic congestion on I-90 will be much worse than it is today, and a higher percentage of freight is expected to cross the bridge during off-peak times (peak travel times for freight are generally between the hours of 9 a.m. and 1 p.m.). However, as shown in Appendix F4.3, Table F4.3-6, overall freight movement in the I-90 corridor is still expected to grow annually 1.5 percent in the AM peak hour and 2.3 percent in the PM peak hour, which is greater than the region's expected annual population growth rate of 1.1 percent.

4.3.3 Environmental Impacts

A new light rail system such as East Link can cause changes in the local business environment and surrounding neighborhoods. These changes, in turn, may change the success of existing businesses and influence future economic opportunity in the area. Direct economic impacts of each alternative could include business and employee displacements and the corresponding potential tax impacts, potential changes in development patterns regional freight mobility, and potential impacts on businesses and property in the vicinity of the routes and stations. Indirect impacts could result from proximity impacts, including changes in parking availability, noise, visual effects, and access. This section provides an evaluation of these impacts for each of the alternatives and stations.

4.3.3.1 No Build Alternative

The No Build Alternative consists primarily of funded or committed roadway and transit actions by the state and by regional and local agencies. It includes other projects that are considered likely to be implemented. Under the No Build Alternative, it is likely that future economic development or redevelopment may not be the same as it would be with the East Link Project. Under the No Build Alternative, planned land use changes in the Bel-Red and Overlake neighborhoods could occur more slowly or may not reach the full density permitted under the zoning regulation. It is also likely that congestion would worsen and there would be fewer alternatives to single occupancy vehicle travel, which may impact future economic development.

4.3.3.2 Impacts During Operation

This section addresses the direct and indirect impacts of the East Link Project alternatives on economic activity during operation

Direct Impacts

The following subsections discuss direct impacts related to the displacement of businesses and employees, and initial impacts on the local tax base for each alternative and maintenance facility.

Displacements. Table 4.3-3 provides estimates of the number of businesses located at properties that would be partially or fully acquired by the East Link alternatives, and lists the estimated number of employees at those businesses. The estimates were prepared based on field verification of business names and information included the Section 4.1, Acquisitions, Displacements, and Relocations. PSRC employment data and square foot per employee estimates (Pflum, et al. 2004) were used to estimate the number of

employees displaced within each alternative, based on the type of business: civic and quasi public, commercial, industrial, office, and retail.

To provide a perspective on the relative magnitude of the business displacement impact, Table 4.3-4 compares the number of employees estimated to be displaced with the total forecast average annual growth in employment in each segment. Total employment estimates are not available at the alternative level; therefore, segment-level data were used. As shown for the high estimates, in all segments except Segment C, the project would displace more jobs than are added annually in a typical year; however, for the low estimates, the project would displace fewer jobs than are displaced in a typical year. More jobs would be added in Segment C annually than are displaced by the project. Table 4.3-3 also shows the alternatives for which there would be many employees displaced with few property acquisitions. However, in each segment, the number of employees displaced would be less than 1 percent of total employment for that segment. The BNSF Alternative (B7) would affect the most employees in Segment B, while the Couplet Alternative (C4A) would affect the most employees in Segment C. The NE 16th At-Grade (D2A) would affect the most employees in Segment D, and the Marymoor Alternative (E2) would affect the most employees in Segment E. However, Sound Transit is considering ending E2 at the Redmond Town Center Station, which would reduce these impacts to levels similar to

the Redmond Way Alternative (E1) and the Leary Way Alternative (E4).

The number of affected employees does not necessarily mean jobs that would be lost, because Sound Transit would provide relocation assistance to displaced businesses. Therefore, it is likely that many of the displaced jobs would be relocated, not lost. However, some displaced businesses and jobs, particularly industrial businesses in the Bel-Red Corridor, would probably relocate outside the City of Bellevue because of the land use and zoning changes planned for that area.

The SR 520 Maintenance Facility (MF3), with access from the NE 16th At-Grade and Elevated alternatives (D2A and D2E), has the most full property acquisitions; it would relocate 96 businesses and 940 employees from 10 properties. The SE Redmond Maintenance Facility (MF5), along the Marymoor Park (E2) and Leary Way (E4) alternatives, would displace the fewest number of employees (i.e., 320 employees from 20 businesses located on 7 properties). Although these employees would be displaced through these property acquisitions, Sound Transit estimates that 115 to 144 new jobs, including operators and maintenance staff, would be created at the maintenance facility. As noted above, the number of affected employees does not necessarily mean jobs that would be lost because Sound Transit would provide relocation assistance to displaced businesses. Thus, it is likely that many of the displaced jobs would be relocated, not lost.

TABLE 4.3-3
Property Acquisition Impacts on Businesses and Employees

Alternative	Full Displacements		Commercial, Public, and Institutional Property Acquisitions	
	Business	Employees	Partial	Full
Segment A, Interstate 90				
A1, I-90	0	0	0	0
Segment B, South Bellevue				
B1, Bellevue Way	2	20	16	4
B2A, 112th NE At-Grade	0	0	11	0
B2E, 112th NE Elevated	0	0	10	0
B3, 112th NE Bypass	0	0	10	0
B7, BNSF	4	130	7	6
Segment C, Downtown Bellevue				
C1T, Bellevue Way Tunnel	18	300	27	9
C2T, 106th NE Tunnel	8 to 16	210 to 290	15 to 18	9 to 15
C3T, 108th NE Tunnel	51 to 57	680 to 770	9 to 12	12 to 17
C4A, Couplet	59 to 61	670 to 830	15 to 17	18 to 21
C7E, 112th NE Elevated	44 to 45	530 to 570	14 to 15	3 to 4
C8E, 110th NE Elevated	48	590	16	6

TABLE 4.3-3
Property Acquisition Impacts on Businesses and Employees

Alternative	Full Displacements		Commercial, Public, and Institutional Property Acquisitions	
	Business	Employees	Partial	Full
Segment D, Bel-Red/Overlake				
D2A, NE 16th At-Grade	41 to 49	1,270 to 1,480	46 to 49	12 to 13
D2E, NE 16th Elevated	43 to 46	960 to 1,180	29 to 30	15 to 16
D3, NE 20th	64 to 72	1,260 to 1,480	85 to 87	17 to 18
D5, SR 520	43 to 52	430 to 570	35 to 36	2
Segment E, Downtown Redmond				
E1, Redmond Way	7	210	20	5
E2, Marymoor	24	380	25	11
E4, Leary Way	7	120	19	3
Maintenance Facilities				
MF1, 116th				
D2A, NE 16th At-Grade D2E, NE 16th Elevated D3, NE 20th	86	940	4	12
D5, SR 520	93	750	2	15
MF2, BNSF				
D2A, NE 16th At-Grade D2E, NE 16th Elevated D3, NE 20th	6	470	4	3
D5, SR 520	3	880	5	2
MF3, SR 520				
D2A, NE 16th At-Grade D2E, NE 16th Elevated	96	940	5	10
D3, NE 20th	93	890	8	8
D5, SR 520	94	890	0	9
MF5, SE Redmond				
E1, Redmond Way	50	600	6	11
E2, Marymoor Park	20	320	2	7
E4, Leary Way	20	320	5	7

Note: Estimates rounded to the nearest 10.

Source: CH2M HILL, 2007a.

TABLE 4.3-4
Comparison of Annual Average Employment Growth and Total Employees Displaced, by Segment

Segment	Employment		Average Annual Growth		Employment Displacements (Total)	
	2000	2030	Percent	New Jobs	Low	High
A, Interstate 90	No business displacements					
B, South Bellevue	7,002	9,431	1.0%	70	20	130
C, Downtown Bellevue	51,079	97,330	2.2%	1,110	210	830
D, Bel-Red/Overlake	63,996	97,264	1.4%	899	430	1,480
E, Downtown Redmond	23,087	37,016	1.6%	366	120	400

Note: Excludes displacements from Maintenance Facilities.

Source: Employment forecasts from PSRC (2006); employment displacements from Table 4.3-3.

Impacts of Displacements on Tax Base of Cities. In each alternative other than the I-90 Alternative (A1), Sound Transit would acquire residential and commercial properties. Table 4.3-5 presents the 2007 initial property tax impacts on cities resulting from property acquisitions and includes potential impacts from partial and full acquisitions. The property tax impacts are annual estimates based on 2005 levy rates and 2006 assessed values. The City of Bellevue would be affected by alternatives in segments B, C, and D, and the City of Redmond would be affected by alternatives in segments D and E. When referring to the property tax impacts of acquisitions, the term “initial property tax impacts” is used because the extent of the long-term fiscal impact of the system is uncertain. Initially, property taxes would no longer be collected from full acquisitions along the route. As a result, the rates charged to remaining taxpayers could increase slightly to recover budgeted funds, or budgets for essential government services could be reduced accordingly.

In the long run, it is likely that some of the excess land purchased by Sound Transit for system construction would be released for development once the project is built: this is particularly likely for the staging areas in Segment C. Between 23 and 45 percent of the property tax impacts in Segment C result from the purchase of land for staging areas that would likely become available for redevelopment after the project is built. Further, some displaced businesses are likely to rebuild at a new location elsewhere within the jurisdiction’s boundary. Thus, the long-run property tax impacts are highly likely to be less than the initial impacts once existing businesses are reestablished, staging areas are released for development, and new development consistent with this project occurs. For example, new development is expected to occur in Segment D where both Bellevue and Redmond have adopted new land use plans to increase density and promote mixed use development. These positive impacts could be offset somewhat by the absence of new construction that might have occurred on properties acquired and retained by Sound Transit. Thus, the long-term property tax impacts are uncertain but are highly likely to be less than the initial property tax impacts.

As shown in Table 4.3-5, Sound Transit would not require the acquisition of any private property for Segment A; therefore, there would not be any initial property tax impacts in Segment A. The initial property tax impacts of all alternatives within Segment B are small (less than \$10,000), because only a

TABLE 4.3-5
Initial Property Tax Impacts on Cities by Alternative

Alternative	Annual Initial Property Tax Impact		% of Budgeted City 2007-2008 Property Tax Revenues	
	Low	High	Low	High
Segment A, Interstate 90				
A-1, I-90	0		0.00%	
Segment B, South Bellevue				
B-1, Bellevue Way	\$8,100		0.02%	
B2A, 112th SE At-Grade	\$1,800		<0.01%	
B2E, 112th SE Elevated	\$1,900		<0.01%	
B3, 112th SE Bypass	\$3,600		0.01%	
B7, BNSF	\$7,500		0.01%	
Segment C, Downtown Bellevue				
C1T, Bellevue Way Tunnel	\$111,100		0.20%	
C2T, 106th NE Tunnel	\$45,900	\$70,600	0.09%	0.14%
C3T, 108th NE Tunnel	\$61,400	\$84,400	0.12%	0.17%
C4A, Couplet	\$69,200	\$87,000	0.14%	0.17%
C7E, 112th NE Elevated	\$27,000	\$43,600	0.05%	0.09%
C8E, 110th NE Elevated	\$84,900	\$86,100	0.17%	0.17%
Segment D, Bel-Red/Overlake				
D2A, NE 16th At-Grade	\$31,000	\$32,400	0.09%	0.09%
D2E, NE 16th Elevated	\$31,500	\$33,200	0.09%	0.09%
D3, NE 20th	\$32,900	\$34,200	0.08%	0.09%
D5, SR 520	\$9,900	\$11,800	0.03%	0.04%
Segment E, Downtown Redmond				
E1, Redmond Way	\$14,500		0.06%	
E2, Marymoor (E2), to Redmond Transit Center Station	\$31,400		0.13%	
E2, Marymoor (E2) to Redmond Town Center Station	\$13,600		0.01%	
E4, Leary Way (E4)	\$10,900		0.04%	
Maintenance Facilities				
MF1, 116 th	\$11,700 - \$12,500		0.03%	
MF2, BNSF	\$12,700 - \$15,600		0.03%	
MF3, SR 520	\$17,100 - \$18,900		0.03%-0.04%	
MF5, SE Redmond	\$12,000 - \$14,100		0.05% -0.06%	

Source: King County Department of Assessments, 2007; City of Bellevue, 2007; City of Redmond, 2007.

small amount of property would be acquired. In Segment C, the lowest initial property tax impacts would be experienced under the 112th NE Elevated Alternative (C7E) and the highest would be experienced under the Bellevue Way Tunnel Alternative (C1T) because the taxable land value is larger under C1T compared to other Segment C alternatives. In Segment D, the NE 16th At-Grade Alternative (D2A), the NE 16th Elevated Alternative (D2E), and the NE 20th Alternative (D3) would have similar initial property tax impacts, removing more than \$30,000 in tax revenue, while the SR 520 Alternative (D5) would have an impact between \$9,000 and \$12,000. In Segment E, the largest initial property tax impacts would be experienced under the Marymoor Alternative (E2) (\$31,400) and the lowest would be experienced under the Leary Way Alternative (E4) (\$10,500). However, Sound Transit is considering ending E2 at the Redmond Town Center Station, which would decrease property tax impacts to \$13,600, within the range of impacts of E1 and E4. For all alternatives, the initial property tax impacts from acquisitions would be less than one percent of the total property tax revenues collected by the taxing city. Similar to property tax impacts, the long-run tax impacts from other taxes are uncertain. There may be some lost sales taxes or revenue from other taxes and fees if displaced businesses do not relocate within the same city. These types of losses would be offset to the extent that existing businesses relocate and business activity increases and/or new businesses are attracted to the area. Local jurisdictions are likely to receive some sales tax revenues from purchases related to project construction.

Impacts on Regional Transportation of Goods and Services

This section discusses the impacts of this project on the regional transportation of goods and services. The main impacts would result from changes in freight mobility on the I-90 bridge.

Volume-Weighted Travel Time

Volume-weighted travel time takes into account the number of trucks traveling at one time in each direction during the peak period. As an example, if there are seven trucks westbound that take 10 minutes each and five trucks eastbound that take 8 minutes each, the volume-weighted travel time would be 9.2 minutes $(7*10 + 5*8)/12$.

Compared to the No Build Alternative, the East Link Project is expected to allow greater total 2030 peak-period freight volumes on I-90 across Lake Washington and improved total 2030 peak-period travel times. However, most trucks do not use I-90 during peak hours, and the travel time during off-peak hours would remain unaffected. An improvement in truck travel times would lower the cost of shipping goods and services across I-90. Thus, the proposed project is expected to be beneficial for regional freight mobility, with associated benefits for the regional economy. Support for this conclusion is presented in Table 4.3-6, where AM total (volume-weighted) travel times between 7 and 9 a.m. are expected to be on average 2 minutes faster under the project by 2030 and PM total travel times (volume-weighted) between 4 and 6 p.m. are expected to be on average 5 minutes faster under the project by 2030. Volume-weighted travel times during the sum of the AM and PM periods are expected to average approximately 4 minutes faster than under the No Build Alternative. This is mainly because there would be less travel by commuters on I-90 with the project because many commuters are expected to use light rail as an alternative transportation mode. A full description of I-90 transportation impacts is provided in Chapter 3, Transportation Environment and Consequences.

TABLE 4.3-6
Current and Peak-Period Forecast Freight Truck Volumes and Travel Times Across the I-90 Bridge

Period	Direction	Base Year		2030 No Build		2030 Build	
		Number of Trucks	Travel Time (minutes)	Number of Trucks	Travel Time (minutes)	Number of Trucks	Travel Time (minutes)
AM	Westbound	480	13	520	24	500	25
	Eastbound	470	16	540	26	650	21
AM Total^a		950	14	1,060	25	1,150	23
PM	Westbound	430	20	440	33	490	29
	Eastbound	360	19	440	24	310	16
PM Total^a		790	20	880	29	800	24
Daily Total^a		1,740	17	1,940	27	1,950	23

^aAM, PM, and daily total travel times are volume-weighted travel times.

Note: The AM travel times are between the hours of 7 and 9 a.m., and the PM travel times are between the hours of 4 and 6 p.m.

Indirect Impacts

The evaluation of the potential for indirect economic impacts of the alternatives is based on field observations of each alternative, on the number of housing units and employees to be served by the stations (see Table F4.3-5 in Appendix F4.3), and on information presented in Chapter 3, Transportation Environment and Consequences.; Section 4.2, Land Use, Section 4.5, Visual and Aesthetic Resources; and Section 4.7, Noise and Vibration.

Both positive and negative indirect economic impacts can result from East Link Project operation. Positive indirect economic effects from light rail projects can result in increased development and redevelopment potential adjacent to stations. Negative indirect economic effects on business are disturbances that may change access, traffic flow, business sales, or value of adjacent property. Local negative indirect effects include access restrictions, decreased parking availability, noise, and visual impacts on land uses. The following subsections analyze these impacts.

Positive Indirect Impacts. The availability of light rail increases transit access and pedestrian activity, especially in areas surrounding the stations. Improved transit access can improve the convenience, visibility, and desirability of surrounding residential and commercial properties. Increased pedestrian activity can increase the patronage of adjacent retail uses. This may result in the synergy of business and employee interest in locating where there is convenient access to the light rail line, leading to more dense land uses around stations and therefore resulting in increased economic activity at stations. This pattern is referred to as transit-oriented development and is addressed further in the Section 4.2, Land Use. The economic impacts are summarized here.

Recent studies indicate that residential and commercial property values near light-rail transit stations typically increase and are valued higher than similar properties not in the vicinity of transit stations. However, the payoffs are not automatic, and property-value increases generally require a strong demand for real estate, locations in neighborhoods free from signs of stagnation and distress, and public policies such as zoning bonuses that further leverage the transit-oriented development and transit system expansion that produces the spillover benefits of a highly integrated transportation network. In addition, because transit-oriented development takes time to evolve, property value benefits will also take time to accrue (Cervero, 2004). While this effect is likely to occur in all segments, the benefits may be most realized in Segment D, where both Bellevue and

Redmond have adopted supportive plans for transit-oriented development and market conditions appear strong. Each alternative in Segment D except the SR 520 Alternative (D5) is anticipated to cause positive indirect impacts on adjacent economic activity. The length of D5 adjacent to SR 520 includes fewer stations near planned intensification of land uses.

Negative Indirect Impacts. Studies have found property value impacts from light-rail transit are usually positive, although some studies have documented decreased property values, particularly along a light rail route rather than in the vicinity of stations (Cervero, 2004). Disruptive noise levels; light, shadow, and view impacts; and reductions in vehicle access and parking can affect property values and sales for businesses that depend on vehicular access. Negative impacts on property values are most likely to occur when the light rail project results in noise or visual impacts noticeably greater than what currently exists. They are more often associated with elevated, and to a lesser degree, at-grade alternatives, and are generally negligible for tunnel alternatives. Most of the East Link alternatives are at-grade or elevated.

Section 4.5, Visual and Aesthetic Resources, and Section 4.7, Noise and Vibration, suggest that there is relatively little potential for these impacts to be of a sufficient magnitude to result in negative property value impacts. The visual quality analysis (Section 4.5) indicates that residential properties in some alternatives would experience impacts on currently high-quality views, resulting in a permanent change in visual quality. This impact would occur in one or more locations in the following alternatives: Bellevue Way (B1), 112th SE At-Grade (B2A), 112th SE Elevated (B2E), 112th SE Bypass (B3), and Leary Way (E4). Of these alternatives, the 112th SE Elevated Alternative (B2E) would have the most potential for impacts. Those impacts may occur at a few residential properties, located along Bellevue Way between the park-and-ride lot and the intersection with 112th Avenue SE, having views that would be directly affected. However, in all of these alternatives, there would be no sensitive views blocked, no solar access impacts, and no light and glare impacts.

Noise and vibration impacts on residential and commercial properties would potentially occur in a number of alternatives. Noise impacts would be mitigated (see section 4.7 Noise and Vibration), thus reducing substantially the likelihood that noise or vibration would contribute to negative property value effects. Some residual vibration impacts would occur that may not be mitigated in the following alternatives:

- One commercial location each for the 106th NE Tunnel (C2T), 108th NE Tunnel (C3T), Couplet (C4A), 112th NE Elevated (C7E) and 110th NE Elevated (C8E) alternatives when connecting to the 112th SE Bypass (B3) or BNSF (B7) alternatives in Segment B
- One multifamily residential and one single-family residential location for the 110th NE Elevated Alternative (C8E)
- Two multifamily locations for the Couplet Alternative (C4A)
- One single-family residence each for both the Redmond Way (E1) and Marymoor (E2) alternatives
- One multifamily location for the Leary Way Alternative (E4)

Displaced off-street parking due to partial property acquisitions may reduce business opportunities. The value of displaced parking depends on the quantity of spaces lost and the business type. In Segment A, there would be no negative indirect vehicle access or off-street parking impacts. In Segment B, access would be maintained at intersections and major ingress and egresses. The Bellevue Way Alternative (B1) would reduce the ability to make left-hand turns in the median, affecting some businesses. This change and reduced parking would have a minimal impact on the operation of these businesses. No other alternatives in Segment B would change business access.

In Segment C, most of each alternative is grade separated – tunneled or elevated – with the exceptions of the at-grade Couplet Alternative (C4A) and some short, retained-cut portions of the Bellevue Way Tunnel Alternative (C1T). Therefore, for most of the Segment C alternatives, there are not likely to be adverse economic impacts related to access, off-street customer parking, or traffic circulation. C4A would remove on-street parking and limit left turn access to some office complexes, residences, and retail businesses. This could potentially result in an economic impact on the retail businesses that profit from some convenient on-street parking. However, these roadways are dominated by high-rise buildings that contain underground parking; therefore, this impact is limited to few businesses. Some of this adverse impact would be offset by improved visibility of some businesses by transit riders.

In Segment D, the SR 520 Alternative (D5) would have the least adverse economic impact when compared to the other alternatives in Segment D. Reduced off-street parking stalls and left-turn access restrictions because

of the at-grade route of the NE 16th At-Grade Alternative (D2A) and portions of the NE 16th Elevated Alternative (D2E) and the NE 20th Alternative (D3) could cause some adverse economic impact. However, the locations of these conflicts are not along business frontages except for fairly short distances, because only a short portion of the NE 16th corridor currently exists. The restaurants and retail businesses along NE 20th Street would experience a greater impact from D3. The Segment E alternatives would not be likely to result in adverse economic impacts during operation because the majority of each alternative is either adjacent to SR 520 or along the BNSF Railway right-of-way. However, some restaurants and retail businesses along 161st Avenue NE would experience reduced left-turn access because of the Marymoor Alternative (E2), which could result in reduced economic activity for these businesses.

4.3.3.3 Impacts During Construction

This section considers the positive and negative economic impacts that may occur during the construction of the project. Construction brings money into the economy with construction jobs, purchasing of local goods and services for construction and the money spent by construction crews in the community where construction occurs. On the negative side, construction of any alternative has the potential to cause economic impacts by blocking visibility and access to businesses, causing traffic delays, and rerouting traffic on detours that increase travel times and make access to some locations difficult.

Potential Positive Economic Impacts from Construction

Construction of any of the alternatives would result in increased employment and spending in the project vicinity during construction. The extent of these impacts depends on the source of project funding and the makeup of work crews used during project construction.

In economic impact analysis, typically only inflows of funds from outside a region are considered “new money” that will lead to new employment and income in that region. Funds from local or regional sources are transfers that could be spent by residents and businesses on other economic activities. Excepting an estimated \$93 million of federal grant funds, the funds required for project construction are anticipated to be raised in the communities benefiting from the project (Sound Transit, 2007), which seems to imply that there would be relatively little “new money” available for spin-off economic benefits to the region.

However, project construction would lead to positive economic effects beyond just the federal grants. Sound Transit would issue bonds to pay for project construction, and this money would go primarily to businesses located within the region within a relatively short period of time. Principal and interest on the bonds would be repaid over many years using a variety of funding mechanisms. Some of the future repayments are likely to be made in the form of taxes on visitors to the region, which represent additional inflows of funds to the region. Thus there would be a temporal impact because bonded funds would be spent over approximately 8 years stimulating direct and indirect construction spending in the region. This would be offset in the long run by a negative impact on economic activity from added taxes to pay for the project, but some of the negative impact would be offset by taxes on visitors to the region.

Thus, quantifying the economic impacts from project construction is complex, but some indication of the magnitude of the economic stimulus that would result from the project is shown in Table 4.3-7. This table provides an estimate range of the direct expenditures and the proportion of project employment that would be hired from the three-county region as a result of the low- or high-cost projects. As shown, the project would result in approximately \$1.38 billion to \$2.27 billion of spending in the region, and an average of nearly 2,000 direct jobs per year in the region over an assumed 8-year period for project design and construction.

In addition to these direct effects, additional indirect benefits would occur when the output of firms in other industries increases to supply the demand for inputs to the construction industry. Wages paid to workers in construction trades or supporting industries would be spent on other goods and services; these are referred to as induced impacts. Direct, indirect, and induced impacts would occur in the region from construction of the project. The indirect and induced impacts are often called “multiplier” impacts. Multiplier estimates for the three-county region (Minnesota Implan Group, Inc. 2007) suggest that an additional 46 percent of value added (i.e., payments made by industry to workers, interest, profits, and indirect business taxes) would result from new direct construction spending in the region, and an additional 1.56 new jobs would be created for every direct job associated with the project, increasing the potential number of jobs generated in the region to approximately 30,500 to 52,000. Although the typical methodology for economic impact analysis would count only the \$93 million of federal grant funding as new spending for the purposes of

determining economic impacts, the actual benefits would be greater and are difficult to determine precisely. Regardless of the specific method used to quantify economic impacts, it is clear that the project would result in substantial short-term economic activity in the region during construction.

Potential Negative Economic Impacts from Construction

The following subsections document the types of activities that could potentially occur during the various phases of construction and their relative impacts on local businesses within each segment. Construction activity can result in impacts on local businesses because of the associated changes in traffic circulation, access, parking, noise, and visual effects. Along any given area of the project, civil construction is anticipated to last approximately 3 to 5 years.

Segment A. In Segment A, the I-90 Alternative (A1) would use existing right-of-way with an at-grade trackway throughout the segment. Temporary construction along 5th Avenue South and 23rd Avenue South in Seattle would affect circulation with minimal impact on parking garages, office, or retail businesses. This would not likely result in a substantial adverse economic impact. No short-term construction impacts are expected on Mercer Island because local traffic circulation would not substantially change in the short term.

Segment B. Segment B Alternatives have combinations of elevated and at-grade profiles, except the Bellevue Way Alternative (B1), which would be constructed entirely at-grade. Other than construction of the BNSF Alternative (B7) along BNSF right-of-way, Segment B alternatives would temporarily cause detours and lane closures, which would increase congestion on Bellevue Way and 112th Avenue SE. The majority of businesses along each alternative are professional offices that do not rely heavily on drive-by traffic to attract customers; however, along B1 there are a few retail businesses that would be likely to suffer adverse impacts during construction.

Segment C. Alternatives that require cut-and-cover tunnel construction would result in the most substantial adverse economic impacts on local businesses because this construction method requires relatively deep excavation of streets and typically results in access restrictions to businesses in the vicinity of the construction until covers can be installed over the construction area. The Bellevue Way Tunnel (C1T) and 106th NE Tunnel (C2T) alternatives would require the largest amount of cut-and-cover tunnel construction along Bellevue Way and NE 6th Street and along commercial areas of Main Street,

TABLE 4.3-7
Direct Expenditures and Direct Employment in Three-County Region from East Link Construction

	Project Construction	Right-of-Way	Total
High-Cost Estimate			
Direct Expenditures			
Total Direct Expenditures (million 2006 \$) ^a	\$3,762	\$197	\$3,959
% in Three-County Region ^b	55%	100%	N/A
Three-County Direct Expenditures (million 2006 \$)	\$2,069	\$197	\$2,266
Direct Employment			
Total Direct Employment ^b	27,776	883	28,659
% in Three-County Region ^b	70%	100%	N/A
Three-County Direct Employment	19,443	883	20,326
Annual Direct Employment	2,430	110	2,541
Low-Cost Estimate			
Direct Expenditures			
Total Direct Expenditures (million 2006 \$) ^a	\$2,137	\$197	\$2,334
% in Three-County Region ^b	55%	100%	N/A
Three-County Direct Expenditures (million 2006 \$)	\$1,176	\$197	\$1,372
Direct Employment			
Total Direct Employment ^b	15,780	883	16,663
% in Three-County Region ^b	70%	100%	N/A
Three-County Direct Employment	11,046	883	11,929
Annual Direct Employment	1,381	110	1,491

^a Sound Transit, 2007.

^b CH2M HILL, 2007b.

106th Ave NE, and NE 6th Street respectively. Bored tunnels would also have impacts although they would be smaller than the cut-and-cover alternatives. Because it is mostly a bored tunnel, the 108th NE Tunnel Alternative (C3T) could likely have fewer adverse business impacts because surface disruptions on traffic, utilities, and buildings would be minimized during boring; however, construction would result in high noise impacts, truck congestion, and traffic lane closures at tunnel access portals. Types of businesses located along the three tunnel alternatives include offices, retail, and restaurants. Those businesses that rely on drive-by traffic to attract customers would be adversely affected.

Along elevated routes in Segment C, the majority of businesses along each alternative are professional offices that do not rely heavily on drive-by traffic to attract customers; however, there are a few retail businesses that may be adversely affected during

construction. For the 110th Elevated Alternative (C8E), there are a number of retail and restaurant businesses between NE 2nd Street and NE 12th Street. These businesses would likely experience more pronounced impacts than would be expected for businesses along the elevated sections of the other alternatives. Businesses along the at-grade portion of the Couplet Alternative (C4A) would experience a shorter construction period, with fewer disruptions; therefore, impacts on these businesses would likely be less than those of any other section of the alternatives.

Segment D. Noise, vibration, vegetation removal, dust, loss of parking, construction traffic, and lane closures would temporarily affect businesses along portions of NE 16th Street, 136th Place NE, NE 20th Street, 152nd Avenue NE, and NE 24th Street for the NE 16th At-Grade (D2A), the NE 16th Elevated (D2E) and the NE 20th (D3) alternatives. Each alternative within Segment D would cause temporary detours

and lane closures, but for relatively short periods of time, except the NE 20th Alternative (D3). Alternative D3 travels in the median of NE 20th Street, both at-grade and retained cut, causing longer impacts on more businesses than the other alternatives. The businesses that would most likely experience a decline in sales during construction are those that rely heavily on drive-by traffic to attract customers, such as fast food restaurants and other retail businesses. The SR 520 Alternative (D5) would be constructed adjacent to SR 520 and behind retail businesses; therefore, the impacts on access, parking, and circulation would probably be minor when compared to the other Segment D alternatives.

Segment E. From the Overlake Transit Center to the West Lake Sammamish Parkway NE interchange, alternatives in Segment E travel between businesses and SR 520 but would not affect access or parking. However, there may be minor dust, noise, and congestion impacts along side streets.

Elevated portions of the alternatives over the West Lake Sammamish Parkway NE interchange may result in night closures of SR 520 or short-term detours without causing an adverse impact on traffic. Construction equipment may affect parking and business activity for businesses north of SR 520 for the Redmond Way (E1) and Leary Way (E4) alternatives.

The at-grade portions of all alternatives travels along BNSF right-of-way. The Marymoor Alternative (E2) travels adjacent to Marymoor Park and along 161st Avenue NE. Other than minor impacts from noise and dust, there are not likely to be any substantial impacts on businesses when an alternative is adjacent to the BNSF Railway right-of-way or Marymoor Park. Along 161st Avenue NE some businesses could experience reduced access and parking during construction of the Marymoor Alternative. There are a few retail businesses in the area that would be likely to experience negative impacts from reduced access and increased noise, dust, and congestion. These impacts would largely be avoided with a terminus at the Redmond Town Center Station.

Maintenance Facilities. Each maintenance facility is located within existing industrial areas of segments D and E that support a number of warehousing, industrial, and transportation facilities, except for the SR 520 Maintenance Facility (MF3), which is located on a mix of retail and industrial property north of Northup Way. Businesses in the area require good vehicular, truck, and/or rail freight access. The levels

of business and transportation activity, and the likely adverse construction economic impacts, would be greatest for maintenance facilities in Segment D because they are located along already congested streets. The SE Redmond Maintenance Facility (MF5) would probably have the lowest traffic-related construction economic impacts of the four sites because of the presence of fewer nonindustrial businesses and transportation facilities.

4.3.4 Potential Mitigation Measures

Adverse impacts are more likely to occur for businesses near surface construction activities. The cut-and-cover tunnels and stations in Segment C would likely have the greatest impact on nearby businesses in terms of noise, dust, and restricted access. Noise and vibration mitigation is provided in Section 4.7, Noise and Vibration. Mitigation for displaced businesses is discussed in Section 4.1, Acquisition, Relocations, and Displacements. As described in Section 4.3.3.3, construction may cause adverse impacts on businesses due to reduced access or general construction activity. Transportation mitigation is provided in Chapter 3, Transportation Environment and Consequences.

To minimize or limit impacts, Sound Transit would dedicate staff to work specifically with affected businesses throughout construction to minimize the associated impacts. Construction mitigation plans would be developed to address the needs of businesses during construction and could include, but are not limited to, the following elements:

- Provide a 24-hour construction telephone hotline.
- Provide business cleaning services on a case by case basis.
- Provide detour, open for business, and other signage as appropriate.
- Establish effective communications with the public through measures such as meetings and construction updates, alerts, and schedules.
- Promotion and marketing measures to help affected businesses to maintain their customer base during construction.
- Maintaining access as much as possible to each business and coordinate with businesses during times of limited access.
- Provide a community ombudsman.