3.10 ECONOMICS

This section provides a project-level analysis of potential impacts to economics.

The analysis addresses the following three topics:

1. Potential loss of property tax revenue, especially to the smallest affected city (Newcastle), due to reduced property values.
2. Potential cost to the community requesting the placement of the 230 kV transmission lines underground as mitigation.
3. Monetary value of lost *ecosystem services* due to reduced tree cover.

Economic analysis is not a required element for a SEPA EIS; however, SEPA provides discretion to agencies to include economic information in an EIS that could be beneficial to decision makers, such as information related to environmental concerns that may not be readily available elsewhere. The analyses of property tax effects on the City of Newcastle and the value of lost ecosystem services due to reduced tree cover were conducted in response to comments received during the public comment periods for the Phase 1 Draft EIS and the scoping period for the Phase 2 Draft EIS. The analysis of the costs of under-grounding was developed because it was recognized in Phase 1 that the cost of undergrounding the entire line might be prohibitively high, but that undergrounding might be viable as mitigation in some areas. The analysis is intended to assist decision makers considering whether to require undergrounding as a mitigation measure to offset environmental impacts.

Study areas vary for these three topics. The Newcastle analysis focuses on the city limits of Newcastle. The analysis of costs of undergrounding does not focus on a specific geography because it is not known where specifically this might be applied as mitigation, or what area would be involved in paying for mitigation. The City of Newcastle was selected for the worst-case scenario because it has the smallest population (and therefore fewest property taxpayers and/or rate payers) of the Partner Cities. The assessment of ecosystem services includes the study area used by The Watershed Company (2016a) to survey existing trees in the existing and new transmission line corridors.

Methods for Studying the Affected Environment

The major revenue sources for the Partner Cities were identified based on budget information provided by the City Clerk's offices. Assessed value of property was compiled from Comprehensive Annual Financial Reports, City Budgets, State Audit Reports.

The cost of undergrounding a transmission line was based on generic construction and operation estimates provided by PSE. Cost of financing was estimated assuming that public bonds would be issued to pay the costs.

For the ecosystem services analysis, trees within each segment or option of the study area were inventoried by The Watershed Company between March 2015 and July 2016 (The Watershed Company, 2016b). Data collected during the inventory included the tree species, trunk diameter at breast height, tree height, and health condition. These data were used to model the current ecosystem services value of the trees in each segment/option using United States Forest Service (USFS) i-Tree Eco software (USFS, 2016), a peer-reviewed software program that provides urban and rural forestry analysis and benefits assessment tools.

Ecosystem services are the benefits that the ecosystem provides to humankind. In some cases, these services can be assigned an economic value.

3.10.1 Major Revenue Sources for the City of Newcastle

The EIS Consultant Team performed an analysis of the revenue sources including property tax revenues for the City of Bellevue, the largest of the Partner Cities, as a part of the Phase 1 Draft EIS analysis. This analysis was included because studies have shown that the presence of a transmission line can adversely affect the value of properties adjacent to the transmission line. The land use and housing analysis in the Phase 1 Draft EIS addresses this issue in greater detail.

Property taxes are **ad valorem taxes,** that is, taxes levied based on the determined value of the item being taxed.

The **assessed value** of the property is used to compute a tax annually levied on the property owner by a municipality or other government entity.

The **total assessed value** of a municipality is the sum of all property values in that jurisdiction.

In general, studies have found that the effects on property values are highest for properties nearest the lines, and tend to diminish over time after the project is constructed. A study published in 2016 found similar results except that it found the effects to vary over time (rather than steadily diminishing) and to be more pronounced for some facilities. The results over the entire 2001–2014 sample period indicate both practically and statistically significant effects from 138 kV and 69 kV lines but no negative effects from 345 kV lines. In fact, a slight positive effect was noted for properties within 50 meters of 345 kV lines (Tatos et al., 2016). For the Energize Eastside project, which would replace 115 kV lines with higher voltage 230 kV lines over the majority of the segments and options, including the Newcastle Segment, the findings of this recent study generally reinforce the conclusion of the Phase 1 Draft EIS that a small, negative effect is expected from the presence of transmission lines, but does not suggest that the replacement of lower voltage with higher voltage lines would result in a greater negative effect than the existing lines have at present.

The analysis conducted for Phase 2 includes an analysis of revenue sources including property taxes for the City of Newcastle, the smallest of the Partner Cities jurisdictions in both population and property tax base (FCS Group, 2016). Table 3.10-1 shows the total assessed value (AV) of real estate in each of the Partner Cities, along with the rate of taxation for City Government in each city (mil rate). Among the Partner Cities, the City of Newcastle exhibits the greatest sensitivity to a shift in assessed value and, therefore, is considered a representation of worst-case in terms of susceptibility to economic impacts from changes in AV.

The City of Newcastle relies on various taxes to cover the cost of governing, including public safety, community development, transportation projects and parks. The City of Newcastle's taxes generated $5.7 million in revenues in 2015, which equates to 75 percent of general fund revenues. These tax revenues consist primarily of real and personal property taxes, sales and excise taxes, real estate transfer fees, and state pass-through taxes.

Of the taxes mentioned above, property taxes make up the majority of Newcastle's revenues. Property taxes are a function of ad valorem real and personal property assessments in the City, and current mil rates. A preliminary estimate of 2015 tax rates based on $1.93 billion in assessed real estate values and a 1.98883 tax rate, results in $3.8 million in 2015 annual property tax revenues for the City of Newcastle (see Table 3.10-2). This amount of tax revenue equates to 50.2 percent of the City's general fund revenues.

Table 3.10-1. Existing Assessed Valuation (AV) Conditions

Jurisdiction	2015 AV	City Government Mil Rate $ Per $1,000 AV (2015)
Bellevue	$40,703,000,000[1]	0.98085
Kirkland	$20,253,626,993	1.50229
Newcastle	$1,933,663,273	1.98883
Redmond	$15,887,420,578	1.48849
Renton	$12,936,757,619	2.83283

[1] Estimated value at the time of report. Certified Assessed Value for Bellevue in 2016 was $41,314,916,618, approximately 1.5% higher than estimated.
Source: City 2015 Comprehensive Annual Financial Reports, City Budgets, State Audit Reports; Compiled by FCS Group (2016).

Table 3.10-2. Newcastle Property Tax Rates (2015)

Tax Recipient	Mil Rate	Annual Revenue (est.)
City of Newcastle	1.98883	$3,845,728
King County	1.34522	$2,601,203
School District	4.59301	$8,881,335
Library	0.50276	$972,169
EMS	0.30217	$584,295
Flood	0.13860	$268,006
State School Fund	2.28514	$4,418,691
Port of Seattle	0.18885	$365,172
Total Property Tax Rate	**11.34458**	**$21,936,598**

Source: King County Assessor; Compiled by FCS Group (2016).

3.10.2 Cost of Undergrounding a Transmission Line

PSE estimates that the cost differential between overhead transmission lines and undergrounding transmission lines is between $16 and $25 million/mile (PSE, 2016). While the cost of the new transmission line would be paid for by all of PSE's customers, PSE has stated that its position is that any cities and/or property owners requesting underground alignments would be required to pay for undergrounding the lines. PSE's position is based on their utility rate tariff rule, which they have interpreted to require the parties requesting the undergrounding, or the "requesting party," to pay for the marginal or additional cost above what it would have cost for overhead lines (PSE, 2016).

3.10.3 Tree Cover Along Transmission Line Corridor

Individual trees as well as groups of trees provide ecological benefits and environmental values. Trees improve air quality by absorbing CO_2 and potentially harmful gases, such as sulfur dioxide and carbon monoxide, from the air, and releasing oxygen. Trees also store carbon, reduce soil erosion, remove pollutants, and provide food and habitat for birds and other wildlife. The amount of carbon stored in a tree increases as it grows, as does the tree's environmental value. Carbon is stored in the leaves, stems, roots, and other parts of a tree when they absorb CO_2 from the atmosphere and use it to grow. Trees are important for carbon sequestration, because they live a long time and can store their carbon for many years. Each year, an acre of trees absorbs the amount of carbon produced by driving a car for 26,000 miles, and an individual urban tree contains about four times more carbon than individual trees in forests. Some tree species hold higher value than others based on the magnitude of the ecological functions performed; and groups of trees have a higher ecological value than a series of isolated trees, because of the environmental benefits indicated above (ACTrees, 2011).

To determine the ecosystem services provided by the trees currently in the study area, a statistical model was run for trees surveyed along the existing and new corridors.

In total, approximately 9,400 trees were inventoried in the study area in 2015 and 2016 and used in the i-Tree model (The Watershed Company, 2016b). The model identifies the current amount of carbon stored in the trees (based on tree species, diameter of trunk at breast height, and tree height), and the cost of replacing the tree with a similar tree (called the "structural value"). The total *fixed value* of the "forest" (structural value + carbon storage value) within the study area is nearly $19 million. This represents the ecosystem services provided by the "forest" at a fixed point in time. Removing all of the study area trees would incur this one-time cost of $18.6 million. The model also identifies the amount of avoided runoff, pollution removal, and gross carbon sequestration on an annual basis using the following methods (USFS, 2016; i-Tree, 2016):

- Annual avoided surface runoff is calculated based on rainfall interception by vegetation, specifically the difference between annual runoff with and without vegetation. The model only accounts for the precipitation intercepted by leaves in this analysis. The value of avoided runoff is based on estimated local values from the U.S. Forest Service Community Tree Guide Series (as cited in i-Tree, 2016).
- Pollution removal is calculated for ozone, sulfur dioxide, carbon monoxide, and particulate matter less than 2.5 microns in diameter. Air pollution removal estimates are derived from calculated hourly tree-canopy resistances for ozone, and sulfur and nitrogen dioxides based on a hybrid of big-leaf and multi-layer canopy deposition models. The air pollution removal value is calculated based on local incidence of adverse health effects and national median externality costs.
- Annual carbon sequestration is estimated using the current tree condition and the average diameter growth added to the existing tree diameter to predict the tree diameter and amount of carbon that will be sequestered in the next year. The value is based on estimated carbon values from the U.S. Environmental Protection Agency (2015) and the Interagency Working Group on Social Cost of Carbon (2015).

The total *services value* provided by the "forest" per year (gross carbon sequestration value + avoided runoff value + pollution removal value) is $37,850. The total services value represents ecosystem services calculated on an annual basis and would fluctuate over time, based on tree health, tree mortality, and the planting of replacement trees.

The highest number of tree loss would occur in the Bellevue Central Segment, which includes three route options. The fixed values and services value/year is also the highest for the Bellevue Central Segment. The Bellevue Central Segment has 38 percent of all of the trees surveyed, but due to the make-up of tree species, the route has nearly 50 percent of the carbon storage value and 44 percent of the structural value. A summary of the current ecological value of the trees within each segment and option is provided in Table 3.10-3.

3.10.4 Long-term Impacts from Operation of the Project

The methods for analyzing property tax impacts, the cost of undergrounding, and ecosystem services are as follows:

- **Property Tax:** The EIS Consultant Team evaluated the potential impact on the City of Newcastle's total revenue based on a hypothetical $10 million decrease in assessed values on property tax rates and property tax revenues. This hypothetical change in assessed value is not an estimate of the actual reduction in value that Newcastle is expected to experience, but is provided as a generic degree of impact, as described in the Phase 1 Draft EIS (see Section 15.6, *How Could Operation of the Project Affect Public Services?).*
- **Cost of Undergrounding:** The EIS Consultant Team determined that the cost to a community for undergrounding the 230 kV transmission lines could be paid with a bond by the requesting party, and that the bond could then be paid off by a group of payees over either a 20- or 40-year period. Two scenarios were assumed for the bond's interest rate: current rates typical of bonds issued by the Partner Cities, and one that assumes a 2 percent increase over current rates. The 2 percent increase was included to account for possible market fluctuations or other factors that could affect the actual rates paid. The group of payees was assumed to include the following sizes: 100 payees, 10,000 payees, and 100,000 payees. The impact on the City of Newcastle's total revenue and the cost to a community for undergrounding the transmission line were based on a report prepared by FCS Group, an economic firm that is part of the EIS Consultant Team.
- **Ecosystem Services:** For this analysis, the following ecosystem services associated with tree cover in the project corridor were assigned an economic value (as described below under Ecosystem Services Methods): sequestration (storage) of carbon dioxide, the principal atmospheric greenhouse gas; absorption of air pollutants; and reduction in stormwater runoff and required infrastructure.

Methods for Analyzing Long-term Impacts

The EIS Consultant Team evaluated impacts to property tax, cost of undergrounding, and ecosystem services. The City of Newcastle was determined to be the most sensitive to potential changes to property tax revenues.

Table 3.10-3. Current Ecological Value of Trees in Each Segment

Segment	Acres	No. of Trees	Carbon Storage		Structural Value	Total Fixed Value	Gross Carbon Sequestration		Avoided Runoff		Pollution Removal		Total Services Value/ Year
			Ton	$			Ton/yr	$/yr	ft3/yr	$/yr	Ton/yr	$/yr	
Richards Creek Substation	7.8	429	148	19,596	1,088,805	**$1,108,401**	4.0	522	10,607	709	0.08	531	**$1,762**
Redmond	45.3	776	142	18,780	1,587,880	**$1,606,660**	4.7	623	21,791	1,457	0.14	1,372	**$3,452**
Bellevue North	59.6	733	63	8,363	824,729	**$833,092**	2.7	355	10,386	695	0.07	654	**$1,704**
Bellevue Central (including all options)	94.3	3,759	1,010	134,336	8,440,413	**$8,574,749**	30.8	4,090	96,933	6,480	0.63	6,100	**$16,670**
Bellevue South (including all options)	159.1	3,287	582	77,308	5,722,189	**$5,799,497**	19.0	2,523	72,811	4,868	0.47	4,582	**$11,973**
Newcastle	48.7	370	28	3,727	308,160	**$311,887**	1.5	188	4,399	295	0.03	277	**$760**
Renton	110.8	499	68	8,949	709,364	**$718,313**	2.8	364	9,030	604	0.06	569	**$1,537**
Total	**525.6**	**9,852**	**2,041**	**271,059**	**18,681,540**	**$18,952,599**	**65.5**	**8,665**	**225,957**	**15,108**	**1.48**	**14,085**	**$37,858**

The magnitude of the operation-related economic impacts evaluated was classified as being either less-than-significant or significant as follows:

Less-than-Significant – The hypothetical property tax revenue impacts would be considered less-than-significant if the City of Newcastle could maintain their current level of service for police, fire, and government services without additional revenue, or a minor change in the mil rate.

Significant – The hypothetical property tax revenue impacts would be considered significant if the City of Newcastle would not be able to maintain their current level of service for police, fire, and government services without a major change in the mil rate for all taxpayers or other additional revenue.

No threshold of significance was set for the costs of undergrounding a portion of the transmission line, or for the cost of ecosystem services. Undergrounding the transmission line is a proposed mitigation measure that could be applied by decision makers anywhere along the corridor, and the exact group of payees that might be selected is unknown. Decision makers would need to consider the economic status of any payees selected to pay for this type of mitigation, recognizing that for lower income households, even a relatively small monthly cost could be significant, while for higher income households, the same cost would not be significant. With regard to ecosystem services, the costs of such services are spread widely, including costs for energy, health care, and stormwater management, and not all such costs are borne locally. Cumulative ecosystem service impacts from this and other projects could be significant, but mitigation measures are available to offset or mitigate such impacts.

Ecosystem Services Methods: To estimate the loss of ecological services from tree removal proposed by the project, the i-Tree model was run a second time, but with the trees proposed for removal deleted from the data set. The number of trees that could be removed along the corridor is based on a tree database prepared by The Watershed Company for PSE for the Energize Eastside project (The Watershed Company, 2016b). To present the information as one system of trees throughout the entire corridor (existing and new), a total of 12 project scenario combinations were identified. All of the project scenario combinations include Richards Creek substation and the same alignment for the Redmond, Bellevue North, Newcastle, and Renton Segments. The Bellevue Central Segment has three option alignments, and the Bellevue South Segment has four option alignments, yielding a total of 12 project scenario combinations:

1. Existing Corridor Option + Willow 1 Option
2. Existing Corridor Option + Willow 2 Option
3. Existing Corridor Option + Oak 1 Option
4. Existing Corridor Option + Oak 2 Option
5. Bypass Option 1 + Willow 1 Option
6. Bypass Option 1 + Willow 2 Option
7. Bypass Option 1 + Oak 1 Option
8. Bypass Option 1 + Oak 2 Option
9. Bypass Option 2 + Willow 1 Option
10. Bypass Option 2 + Willow 2 Option
11. Bypass Option 2 + Oak 1 Option
12. Bypass Option 2 + Oak 2 Option

3.10.4.1 Potential Loss of Property Tax Revenue for the City of Newcastle

If Energize Eastside project construction results in a decrease in the amount of AV in the city, the City would either collect less local property tax revenue or would need to make a corresponding change to the city mil rate to maintain existing revenue levels. For this analysis, it was assumed that, if the project did result in a decrease in AV, existing revenue levels would be maintained and the mil rate would be increased.

As described in the Phase 1 Draft EIS (Chapter 10), transmission lines have been shown to adversely affect property values. The degree of effect varies widely, and in some cases the effects diminish with time (Mullins et al., 2003). As a result, the amount of any shift in value due to the project is difficult to predict. To understand the possible effect this could have on property taxes, the EIS Consultant Team evaluated the effect of a $10 million shift in assessed value. The choice of this level of change was selected for sensitivity analysis only, and does not represent an estimate of the effects that are expected to occur in Newcastle or any other affected city. It is an arbitrary round number that allows an understanding of how a shift of this magnitude might affect taxes in a jurisdiction. As an example, in Newcastle, there are 86 adjacent single-family residences along the existing corridor. For a cumulative decline of $10 million in AV affecting these homes, property values would have to decline an average of approximately $116,000 per residence.

To determine the potential impact a $10 million shift in AV would have on each city, the EIS Consultant Team examined property tax incomes gained or lost in comparison with each of the Partner Cities' general fund. Of the five cities analyzed, Newcastle is the most sensitive to a potential shift in assessed valuation, with a $10 million shift in AV representing 0.26 percent of the general fund. The other four cities are fairly equal in their relative sensitivity to shifting AV with the same shift representing between 0.01 percent and 0.03 percent of the general fund budget.

The implications of shifting assessed valuation are complex and would not necessarily result in a direct change in property tax incomes for a jurisdiction. Building the Energize Eastside overhead transmission line could lead to at least three outcomes: (1) a decrease in AV due to reduced property value, such as from the lines obstructing views, which could consequently result in an increase in local mil rates; (2) an increase in AV if views are improved in some locations due to higher lines, which could consequently result in an increase in local property tax revenues (or a decrease in the mil rate); and (3) an increase in utility asset AV due to investment in transmission and capacity, which may or may not result in an increase in local property tax revenues. This analysis focuses on decreases in AV, while recognizing that other increases would also occur.

Property taxes are levied by action of a city council, up to a statutory maximum rate and subject to a 101 percent lid on property tax increases (not counting new construction, improvements to property, state assessed utility value increases, and wind turbines, solar, biomass, and geothermal facilities). By November 30 of each year, the amount of taxes to be levied by taxing districts are certified by the county assessor who computes the levy rate necessary to raise that amount of revenue required and calculates the levy mil rate necessary by dividing the total levy amount by the assessed value of taxable property in the district[1]. The implications of a $10 million decrease

[1] See "Property Tax Within Washington State" http://mrsc.org/Home/Explore-Topics/Finance/Revenues/The-Property-Tax-in-Washington-State.aspx). Referendum 747, approved by voters limits property tax increases to 1% in taxing districts of less than 10,000 people, and the lesser of 1% or the rate of inflation, in other taxing districts. The voters of any taxing district, excluding the state, may approve an increase of greater than 1% using a levy lid lift.

in AV in each of the Partner Cities are displayed in Table 3.10-4. This table uses the 2014 median home value because it was the latest available from the U.S. Census.

Table 3.10-4. City Property Tax Implications if Assessed Value Decreases by $10 Million

Jurisdiction	2014 Median Home Value	2015 City Mil Rate	Annual Property Tax Paid by Home of Median Value (city levy)	Resulting Mil Rate if AV Decreased by $10 Million	Resulting Increase in Tax Bill for Median Home
Bellevue	$538,300	0.98085	$528	0.98109	$0.13
Kirkland	$424,700	1.50229	$638	1.50303	$0.32
Newcastle	$509,300	1.98883	$1,013	1.99917	$5.27
Redmond	$462,200	1.48849	$688	1.48943	$0.43
Renton	$282,400	2.83283	$800	2.83502	$0.62

Source: City 2015 Comprehensive Annual Financial Reports, City Budgets, Sate Audit Reports, 2010-2014 U.S. Census American Community Survey; Compiled by FCS Group (2016).

A $10 million decrease in AV in Newcastle could result in a mil rate increase and corresponding tax expenditure increase for the average (median) Newcastle homeowner of approximately $5.27 annually. For context, Newcastle has a median household income of approximately $110,000 (U.S. Census, 2016), so this represents a very small fraction of median household income. If the City Council did not want the mil rate to increase, the City would need to reduce its budget (for items covered by property tax) by approximately $20,000. Based on this analysis, a project with a $10 million AV decrease is likely to have a less-than-significant impact on property tax revenues for the City of Newcastle, and would not affect the ability of the City to provide services.

Other potential fiscal impacts of the Energize Eastside project on Newcastle that have not been quantified could include changes in AV of the PSE utility line, real estate transfer tax revenues, and other miscellaneous fees and development charges that would add to City tax collections.

3.10.4.2 Potential Cost to the Community for Undergrounding Transmission Line

The sensitivity analysis of the distribution of increased marginal costs illustrates the potential financial costs for those customers that make up the "requesting party" for undergrounding 1 mile of transmission line. The concept behind using the 1-mile increment is that it could be used to calculate the approximate cost that would be applied for any given portion of the transmission line by multiplying the costs shown in this analysis by the length of the proposed underground segment.

Because costs must be paid up front by a requesting party, it is assumed that a bond would be used to pay the costs, and that the bond would then be paid off by a group of payees over a period of time. PSE typically amortizes its costs for this type of capital improvements over a 40-year period, but a requesting party might choose a shorter timeframe.

The analysis looks at the lower end of the cost range and the higher end in order to show the potential range of costs. The lower end of the cost range is for construction in an existing corridor, while the higher range is more typical of costs for construction in a street right-of-way. Due to the presence of the Olympic Pipeline, there could be construction constraints that would not allow for the transmission line to be built in the existing corridor.

Table 3.10-5 summarizes the monthly customer costs associated with the per mile costs of undergrounding; it includes the $16 million/mile scenario and a 20-year and 40-year amortization schedule (bond term), along with a range in the number of payees, while Table 3.10-6 includes the $25 million/mile scenario.

Table 3.10-5. Sensitivity Analysis: $16 million in "Undergrounding Costs" (Average monthly cost per payee)

	20-Year Financing		40-Year Financing	
# of payees	"A" Rated Bond*	"A" Rated Bond (plus 2%)**	"A" Rated Bond*	"A" Rated Bond (plus 2%)**
100 payees	$896	$1,073	$601	$810
1,000 payees	$90	$107	$60	$81
10,000 payees	$9	$11	$6	$8
100,000 payees	$0.90	$1.07	$0.60	$0.81

* Assumes "A" rated municipal bond rates = 2.47% yield for 20-year bond, and 2.95% for 40-year bond; and 5% collection charge.

** Assumes "A" rated municipal bond rates (see above) plus 2% (200 basis points); and 5% collection charge.

Source: analysis by FCS GROUP using trade weighted curve bond yields as of 8/30/2016; costs are in 2016 dollars.

Table 3.10-6. Sensitivity Analysis: $25 million in "Undergrounding Costs" (Average monthly cost per payee)

	20-Year Financing		40-Year Financing	
# of payees	"A" Rated Bond*	"A" Rated Bond (plus 2%)**	"A" Rated Bond*	"A" Rated Bond (plus 2%)**
100 payees	$1,399	$1,677	$939	$1,266
1,000 payees	$140	$168	$94	$127
10,000 payees	$14	$17	$9	$13
100,000 payees	$1.40	$1.68	$0.94	$1.27

* assumes "A" rated municipal bond rates = 2.47% yield for 20-year bond, and 2.95% for 40-year bond; and 5% collection charge.

** assumes "A" rated municipal bond rates (see above) plus 2% (200 basis points); and 5% collection charge.

Source: analysis by FCS GROUP using trade weighted curve bond yields as of 8/30/2016; costs are in 2016 dollars.

This analysis of the costs of undergrounding is not intended to indicate what would or would not be a significant impact, as there is no policy basis or context to make that assessment. As is clear from the analysis, the burden on a very small number of payees would be considerable, while the cost for a single mile when shared among 100,000 payees could be on the order of $20 per year or less.

3.10.4.3 Tree Cover Along Transmission Line Corridor

Alternative 1 would require tree removal along the existing corridor and new corridor. The loss of tree cover means the natural environment of the study area would be less able to reduce air pollutants, reduce stormwater runoff, and sequester carbon dioxide. The loss of tree cover varies by scenario and is presented in Table 3.10-7. Bypass Option 1 would result in the largest losses in ecosystem services.

- The project corridor would lose 140–800 tons of carbon stored in trees, and a loss of 13–30 tons of carbon sequestered per year (depending on the scenario).
- The project corridor would lose its ability to remove less than 1 ton of air pollutants annually, valued at $4,000 to $7,500 per year (depending on the scenario).
- Without tree canopy to reduce stormwater runoff volume, the municipalities within the study area must manage an additional 55,000–117,000 cubic feet of stormwater per year, valued at $3,900–$7,800 (depending on the scenario).

The City of Bellevue conducted an ecosystem services analysis city-wide based on 2007 tree canopy information (American Forests, 2008). In 2007, the City of Bellevue had an overall tree canopy of 36 percent. The ecosystem services provided by Bellevue's tree canopy in 2007 is summarized below to provide context by which to measure the scale of the impact to ecosystem services under Alternative 1:

- Bellevue's tree canopy stored 332,000 tons of carbon in trees, and sequestered 2,582 tons of carbon per year.
- Bellevue's tree canopy removed 344 tons of pollutants annually at a value of $1.55 million per year.
- Bellevue's tree canopy provided 62 million cubic feet in stormwater detention services per year, valued at $123 million.

The total ecosystem services lost as a result of Alternative 1, when compared to Bellevue alone would constitute less than 0.2 percent of the services provided by urban tree cover, which is not considered to be a large amount.

Table 3.10-7. Loss of Ecological Value by Scenario

Scenario	# of Trees Removed	Loss of Carbon Storage		Loss of Structural Value ($)	Total Loss of Fixed Value ($)	Loss of Gross Carbon Sequestration		Loss of Avoided Runoff		Loss of Pollution Removal		Total Loss of Services Value/ Year ($)
		Ton	$			Ton/ yr	$/yr	ft/yr	$/yr	Ton/ yr	$/yr	
Ex. Corridor – Willow 1	4,016	540	71,391	5,539,226	5,610,617	20.4	2,668	76,390	5,109	0.5	4,904	12,681
Ex. Corridor – Willow 2	4,626	666	88,130	6,803,428	6,891,558	24.6	3,219	93,127	6,228	0.61	5,989	15,436
Ex. Corridor – Oak 1	4,021	633	83,709	6,153,578	6,237,287	22.4	2,936	84,124	5,626	0.55	5,364	13,926
Ex. Corridor – Oak 2	4,588	696	92,182	6,922,824	7,015,006	25	3,277	96,427	6,448	0.63	6,216	15,941
Bypass 1 – Willow 1	5,203	1,037	137,462	9,338,116	9,475,578	33.9	4,463	115,264	7,708	0.77	7,035	19,206
Bypass 1 – Willow 2	5,813	1,162	154,202	10,602,517	10,756,719	38.1	5,014	131,925	8,821	0.87	8,138	21,973
Bypass 1 – Oak 1	5,208	1,129	149,780	9,952,467	10,102,247	35.9	4,731	123,064	8,229	0.82	7,494	20,454
Bypass 1 – Oak 2	5,775	1,193	158,254	10,721,713	10,879,967	38.5	5,072	135,194	9,040	0.89	8,362	22,474
Bypass 2 – Willow 1	4,656	916	121,387	8,462,290	8,583,677	29.8	3,919	103,679	6,933	0.69	6,382	17,234
Bypass 2 - Willow 2	5,266	1,042	138,127	9,726,691	9,864,818	34	4,470	120,356	8,049	0.79	7,485	20,004
Bypass 2 – Oak 1	4,661	1,008	133,705	9,076,641	9,210,346	31.9	4,188	111,433	7,453	0.74	6,839	18,480
Bypass 2 – Oak 2	5,228	1,072	142,179	9,845,887	9,988,066	34.4	4,529	123,634	8,268	0.81	7,708	20,505

3.10.5 Summary

For the scenarios evaluated, impacts to property taxes associated with reduced property values is expected to be a less-than-significant impact.

The cost of undergrounding, using a worst-case scenario, could be a significant impact if a relatively small number of property owners/payees share the cost. The cost would likely be less than significant if a large number of property owners share the cost.

Ecosystem Services are not expected to be significantly impacted by the project, even for the option that results in the highest number of trees being removed.

3.10.6 Mitigation Measures

Mitigation for economic impacts from a project is not required under SEPA; however, potential impacts to City revenues due to decreased assessed value for property could be mitigated by an adjustment to the mil rate for all taxpayers or a reduction in expenditures to match the reduced revenues.