

Chapter 11 Socioeconomics

This chapter describes socioeconomic conditions and resources in the project area, and how the project alternatives could affect these conditions and resources. Related information can be found in Chapter 1, Purpose and Need; Chapter 5, Land; Chapter 6, Recreation; Chapter 7, Visual Resources; Chapter 8, EMF; and Appendix H, Environmental Justice Tables.

Words in **bold** and acronyms are defined in Chapter 32, Glossary and Acronyms.

11.1 Affected Environment

Socioeconomic conditions and resources include population and housing, employment and income, public services, utilities and infrastructure, government revenue, property values, and land-generated income such as agricultural production and private timber production. In addition, existing quality of life and other values important to individuals who live or visit the project area are considered.

11.1.1 Population and Housing

About 1.26 million people live in Cowlitz, Clark, and Multnomah counties, in communities ranging from concentrated urbanized areas to sparsely populated rural areas. The population of the cities and towns in the project area range from about 1,500 in Yacolt to about 162,000 in Vancouver (see Table 11-1).

Table 11-1 Populations of Counties, Cities, and Towns, 2010

Geographic Area	Population
Cowlitz County	102,410
Castle Rock	1,982
Kelso	11,925
Longview	36,648
Clark County	425,363
Amboy	1,608
Battle Ground	17,571
Brush Prairie	2,652
Camas	19,355
Hockinson	4,771
Vancouver	161,791
Yacolt	1,566
Multnomah County	735,334
Fairview	8,920
Troutdale	15,962
Total	1,263,107
Source: U.S. Census Bureau 2011	

In 2010, in Cowlitz County about 58 percent lived in the incorporated cities of Castle Rock, Kelso, Longview, Kalama, and Woodland (OFM 2011). The population of these cities ranged from about 1,982 (Castle Rock) to 36,648 (Longview) (see Table 11-1). For Cowlitz County, about 43 percent of the people lived in rural, unincorporated communities such as Yale, Lexington, Ariel, or Cougar, or in rural county areas (Washington State Office of Financial Management (OFM) 2011; Cowlitz County 2010a).

In 2010, half of the people in Clark County lived in the incorporated cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, Woodland, and Yaoclt (OFM 2011). The largest city in Clark County is Vancouver, with about 162,000 people (see Table 11-1). In 2010, about half of the people in Clark County lived in rural, unincorporated areas, such as Amboy, Brush Prairie, Chelatchie Prairie, Fargher Lake, Hockinson, and Meadow Glade (OFM 2011).

The current populations of Clark (over 400,000) and Cowlitz (over 100,000) counties are expected to increase by over 30 percent between 2010 and 2030 (OFM 2007). This would be a population increase of more than 120,000 for Clark County and 30,000 for Cowlitz County. The current population of Multnomah County (over 700,000) is expected to increase by about 12 percent between 2010 and 2030 (Oregon Office of Economic Analysis 2004).

Temporary housing in Cowlitz, Clark, and Multnomah counties includes rental housing, hotel/motel accommodations, and campgrounds and RV parks. The 2009 vacancy rate in the Portland-Vancouver-Beaverton Metropolitan Statistical Area for rental housing was about 4 percent (U.S. Census Bureau 2009a). At this rate, there likely were about 8,700 housing units available for rent in 2009 (U.S. Census Bureau 2010). Temporary accommodations are plentiful in the Portland-Vancouver metropolitan area and in Kelso and Longview, Washington, but are more limited in the communities in the eastern portions of the project area. Cowlitz County offers more than 1,000 hotel and motel rooms. Clark County offers more than 2,500 hotel and motel rooms, and Multnomah County more than 15,000. Availability fluctuates throughout the year, with more demand for temporary lodging in the outlying areas during the summer. Permanent housing availability per county is not discussed due to the short-term nature of construction employment, although many thousands of homes are available in all three counties.

11.1.2 Employment and Income

In 2008, about 3.7 million people age 16 and over were employed in the Seattle-Tacoma-Olympia and Portland-Vancouver-Beaverton economic areas (U.S. Bureau of Economic Analysis 2010a). Employment in this regional labor market is well-distributed across a variety of industries. The largest shares of employment in individual sectors are in government and wholesale and retail trade, at 14 percent each. Health care services and manufacturing each employ 9 percent of the region's labor. Professional services, construction, and accommodation and food sectors each employ 7 percent. Real estate, finance and insurance; arts, entertainment, and recreation; and farm sectors each represent 5 percent or less of overall employment (U.S. Bureau of Economic Analysis 2010a). The annual unemployment rate in the combined economic areas was about 9 percent in 2009 (U.S. Bureau of Economic Analysis 2010a), representing about 300,000 people. Economists expect the unemployment rate in the region to fall gradually in the coming years (Williams 2011). The Congressional Budget Office projects the unemployment rate could fall to nearly 5 percent in 2016 (Elmendorf 2011).

The average total compensation per worker is about \$80,000 for local-government workers in Cowlitz County, \$87,000 in Clark County, and \$97,000 in Multnomah County. These amounts include both the average wage and the costs of benefits (U.S. Department of Labor, Bureau of Labor Statistics, 2010 and 2012).

In 2008, the average per-capita income in the combined economic areas was about \$43,000, and the total personal income was about \$333 million (U.S. Bureau of Economic Analysis 2010b). Average per capita income in 2009 in Clark County was about \$36,000 and in Cowlitz County was about \$30,000.

11.1.3 Public Services and Infrastructure

Fire protection in the cities and towns is provided by municipal fire departments in Vancouver, Camas, and Longview, Washington, and Gresham, Oregon (also serves Troutdale and Fairview); the remaining towns rely on rural fire districts. All districts have mutual aid agreements with surrounding departments and districts, and, in the event of a large or unusual emergency, a district would likely call in additional personnel and equipment from neighboring districts. WDNR provides fire protection for more than 12 million acres of state lands. WDNR has mutual aid agreements with most county fire districts, local departments, and other state agencies.

Municipal police departments are located in Castle Rock, Kelso, Longview, Battle Ground, Camas, and Vancouver, Washington, and Fairview and Troutdale, Oregon, and each county has a sheriff's office. The Washington State Patrol has law-enforcement authority throughout the state of Washington, and the Oregon State Police has authority throughout Oregon. In Oregon, the Multnomah County Sheriff's Office would coordinate with the U.S. Coast Guard and the Portland Harbor Master as appropriate for incidents involving the Columbia River. If a large disaster or other event exceeding the resources of any affected department occurred, neighboring departments would share and coordinate resources. Many departments have experienced budget cuts in recent years, and have lost staff or have limited capacity to investigate and respond to incidents in some areas, especially those far from administrative centers or requiring specialized equipment or vehicles.

Water and wastewater services are provided by city and county utilities and local water and sewer utility districts. Water in rural areas or outside of various utility districts is provided by private wells and well systems, sometimes serving multiple users. Wastewater control in areas without sewer districts is provided by septic tanks, drain fields, and holding tanks.

Please see Chapter 5, Land, for a discussion of schools in the project area.

11.1.4 Government Revenue

State, county, and local governments rely on a variety of taxes and revenue sources to fund public services and programs.

11.1.4.1 Tax Revenue

Different forms of tax revenue include the following:

Sales and Use Tax

Washington's principal source of tax revenue is the retail sales and use tax, which yielded almost \$7 billion in fiscal year 2010. The sales tax is paid for goods and services purchased within Washington. The use tax is paid when goods and services are purchased outside of Washington, but used within the state. Sales tax rates vary throughout the project area since counties and cities can add to the base state tax rate of 6.5 percent (1.1 to 1.9 percent additional tax depending on location in Clark or Cowlitz counties). The yield of the retail sales tax to city and county governments in Clark and Cowlitz counties was about \$100 million in 2010 (Washington Department of Revenue 2010a). Oregon does not charge a sales tax.

Income Tax

Washington has state and local business and occupation (B&O) taxes in lieu of an income tax. The cities of Longview and Kelso also assess B&O taxes at a rate of 0.1 percent of gross operating revenue for most businesses. In Oregon, businesses and corporations pay income taxes at the state, and in some cases, the local level. The state assesses personal income taxes based on a rate that varies depending on filing status and level of income, but ranges from 5 to 11 percent of taxable income (Oregon Department of Revenue 2009). Corporations doing business in Oregon pay an excise tax on net income. Corporations not doing business in Oregon, but with income from an Oregon source, also pay income tax. Multnomah County assesses a tax rate of 1.45 percent on the net income of firms doing business in the county (City of Portland 2011). Employers within the Tri-Met District Boundary (which includes most of Multnomah County) pay a 0.69 percent payroll tax on the wages of their workers (Tri-Met 2011). BPA, as a federal agency, is exempt from paying Washington's B&O tax and Oregon's income tax.

Lodging Tax

Washington and Oregon charge lodging taxes, such as the 2-3 percent charges in Cowlitz and Clark counties, and up to 13.5 percent in Multnomah County.

Timber Harvest Tax

In Washington, timberland owners pay a 5 percent excise tax on the stumpage value when timber is harvested. The revenue is split, with 4 percent going to the county where harvest occurs and 1 percent to the state general fund. Distributions of the timber excise tax in 2010 produced about \$1 million for Cowlitz County and about \$423,000 for Clark County (Washington Department of Revenue 2010a).

Property Tax

Real and personal property are subject to property tax in Oregon and Washington. Real property includes land and any improvements, such as buildings attached to the land. Personal property is not affixed to the land. In Washington, local governments administer the property tax. Property tax collections in calendar year 2009 in Cowlitz County were about \$94 million and in Clark County about \$471 million (Washington Department of Revenue 2010a). Property tax collections in fiscal year 2008-2009 in Multnomah County were about \$1 billion (Oregon Department of Revenue 2009).

Other Taxes

Other taxes include fuel taxes, license taxes, and real estate excise taxes.

11.1.4.2 Revenue from Washington State Trust Lands

Land within the project area held in trust by the State of Washington (WDNR) provides revenue for separate trusts managed for various public services, such as public schools, the capitol campus, and other state institutions. The revenue generated for each of those trusts from timber harvested statewide ranged from \$4 million to \$65 million in fiscal year 2009 (see Table 11-2). With the exception of the State Forest Land Trust, revenue generated from trees harvested in a particular county would not necessarily benefit the services in that county. A portion of the revenue from timber harvests on land in the State Forest Land Trust (the last row in Table 11-2) is distributed back to counties where timber harvests occur.

Table 11-2 Washington State Trust Land Beneficiaries, Acres, and Timber Sales Statewide, 2009

Trust ¹	Beneficiaries	Acres ²	Timber Sales ² (\$ millions)
Capitol Building Trust	State Capitol Campus	110,000	8
Charitable, Educational, Penal, and Reformatory Institutions Trust	WA State Institutions	69,000	4
Common School Trust	Public Schools (K-12)	1,800,000	34
Agricultural School Trust and Scientific School Trust	WA State University	84,000	4
State Forest Lands	County, State General Fund, WDNR	625,000	65
Total		2,688,000	115
Notes:			
1. Includes only trusts with land in the project area.			
2. Statewide amounts; data specific to Cowlitz and Clark counties is not available.			
Sources: WDNR 2009a, 2009b			

The county-level distributions vary from year to year, depending on harvest levels, prices, and other factors. In recent years, distributions from the State Forest Land Trust to counties have averaged around 70 percent of total county-level timber-harvest revenues (Saunders 2010, 2012). Of the State Forest Lands Trust's fiscal year 2009 revenues, about \$700,000 went to Clark County and about \$1.7 million went to Cowlitz County.

11.1.5 Property Value

The value of property can be measured in several ways. The price at which property is bought and sold under competitive conditions determines the market price. County assessors assess the value of real property for tax-collection purposes. Assessors estimate the value of residential properties based on the recent sale price of nearby, similar properties. They estimate the value of most commercial and industrial properties based on the potential use or revenue-generating potential of the property (Washington Department of Revenue 2005). The assessed value of real property in 2009 was about \$8 billion in Cowlitz County, \$40 billion in

Clark County, and \$59 billion in Multnomah County (Washington Department of Revenue 2010c; Oregon Department of Revenue 2009). Due to market adjustments from the recent recession, the market value of property has generally trended downward because of foreclosures, financing difficulties, unemployment, sluggish economic conditions, reduced demand, and excess housing supply. Homeowners have often found themselves with mortgage balances higher than the value of their home.

In addition to fee-owned property, BPA has existing easements in the project area that were obtained when the existing transmission lines were built. These easements, depending on the original agreement, allow BPA to use but not own the land, and restrict the types of activities and uses allowed in the right-of-way. Each transmission line easement specifies the present and future right of BPA to clear the easement area (both on and off the right-of-way) of all types of trees, shrubs, brush, and other vegetation. In many cases, the landowner has been able to reserve the right to grow and maintain non-woody, low-growing plants, such as agricultural crops or vegetative cover that do not require structural support. The transmission line easement also specifies the present and future right to clear the right-of-way of any and all structures, above and below ground improvements or infrastructure, and fire and electrical hazards. BPA has compensated landowners for such easement rights.

Building BPA's existing transmission lines may have changed other uses of some properties depending on a line's location and the shape and size of, and improvements on the property. If the easement effectively severed an area (stranded use) from the remaining property, then payment was made for that damage at the time the easement was secured (severance damage). This and other factors were considered to determine the loss in value within and outside of a specific easement area.

11.1.6 Agricultural Production

Agricultural land makes up about 9 percent of the total land area in Cowlitz, Clark, and Multnomah counties: about 4 percent (30,700 acres) in Cowlitz County, about 20 percent (78,360 acres) in Clark County, and about 10 percent (28,510 acres) in Multnomah County. Of the total land in agriculture about 35 percent is harvested cropland (U.S. Department of Agriculture 2009a, 2009b). The amount of land in agriculture has decreased in these counties over the past two decades by about 17 percent. The 2007 Census of Agriculture identified 3,145 farms which, on average, are about 50 acres each (U.S. Department of Agriculture 2009a, 2009b). Crops grown in the project area include forage for livestock such as hay, nursery stock, grapes, berries, and Christmas trees. Livestock production within the project area includes poultry and cattle (Washington State Department of Agriculture 2009) (see Chapter 5, Land).

In 2007, crops in Cowlitz, Clark, and Multnomah counties produced about \$157 million (in 2010 dollars) in revenues. Although the total value of agricultural production was positive in each of these counties, the number of farms with net losses exceeded the number of farms with net gains in each county. Besides generating revenue from production directly, agricultural lands and farms contribute to the region's economy by providing open space and other valuable amenities that contribute to the quality of life for residents and visitors.

11.1.7 Private Timber Production

Lands used for private timber production make up about 47 percent of the land area in Cowlitz, Clark, and Multnomah counties: 64 percent (477,600 acres) in Cowlitz County (Cowlitz County

Planning Division 1976), 38 percent (159,500 acres) in Clark County (Clark County Community Planning Office 2010) and 15 percent (45,400 acres) in Multnomah County (Multnomah County 2007).

Private timberland owners harvested about 114 million board feet of timber from about 4,500 acres in Cowlitz, Clark, and Multnomah counties in 2009, about 62 percent of the total timber harvest in these counties (WDNR 2009b; Oregon Department of Forestry 2009). About 86 percent of this timber was harvested in Cowlitz County. Stumpage values for softwood timber in the Pacific Northwest in 2008 to 2009 averaged about \$200 per thousand board feet (Haynes et al. 2007).

11.1.8 Community Values

This section discusses existing values important to the community that were identified by members of the public in EIS scoping comments. Included in this discussion are community values such as quality of life, property-related amenities, recreation and tourism, the natural environment, transmission system reliability, and public health and safety.

11.1.8.1 Quality of Life

Many people who live in the project area have identified the rural character of the landscape, deeply-rooted history, small, close-knit communities, high-quality public services, and distance from industrial development and “the tell-tale signs of civilization” as defining the quality of life they enjoy. These attributes are recognized by economists as being important to a person’s quality of life. Economists identify different categories of goods and services that increase personal well-being in different ways, both directly and indirectly as inputs to the production of other valuable goods and services. Common categories include human capital (e.g., knowledge and skills), human-built capital (e.g., roads, buildings, utilities), social capital (e.g., laws, cultural norms, relationships), and natural capital (e.g., rivers, forests, soil, and air) (O’Sullivan and Sheffrin 2001; Case and Fair 2004).

The region’s stock of natural capital—its natural environment—produces many types of goods and services that contribute to the quality of life of residents and visitors. These goods and services, such as scenic views, open space, and opportunities for solitude, quiet, and recreation, directly improve the well-being of people who enjoy them as they live, work, and visit nearby. The region’s stock of social capital also influences the quality of life. Social scientists define social capital as the network of connections that individuals build within a community that creates reciprocity with, and trust in, members of that community and institutions that represent their interests (Ritchie and Gill 2004). Events or issues that could generate change in communities can affect their stock of social capital and the quality of life of their residents.

Changes that highlight value differences within communities about economic development, environmental quality, and perceptions of risks and benefits can generate corrosive community reactions that may strain existing interpersonal relationships and erode existing stocks of social capital (Marshall et al. 2004; Freudenburg 1997). Changes that adversely affect social capital may reduce a community’s ability and capacity to work efficiently to address a wide range of challenges and disruptions, reducing quality of life in the community.

11.1.8.2 Property-Related Amenities

Individuals enjoy benefits from amenities in the natural environment surrounding their homes, such as scenic views, solitude and quiet, a sense of safety, and a sense of privacy. Visitors also enjoy these benefits. Some of the value of these amenities is included in the market price of property. In some cases, however, the market price may not fully account for the value people derive from property-related amenities. The characteristics of the property-related amenities vary considerably throughout the area, from property to property, and from individual to individual. This variation makes the property-related amenities difficult to describe in detail. A particular amenity, e.g., sense of privacy, may be important to one property owner, but not to their neighbor, or may make an important contribution to the market price of one property but not to others nearby. In general, natural and landscaped amenities are important to property owners in rural, urban and suburban areas, and may contribute to the value people derive from their property.

11.1.8.3 Recreation and Tourism

Economists estimate the value of recreational services by looking at two factors: the amount of money people spend to participate in a recreational activity, and the difference (called consumer surplus) between what they are willing to spend and what they actually spend. The recreational goods people purchase include everything from permits and equipment, such as hunting rifles and fishing rods, to the gas, food, and lodging purchased during a recreational trip. Travel-related spending in the three counties in 2008, in 2010 dollars, ranged from about \$430 million in Cowlitz County to about \$2.6 billion in Multnomah County (Washington Department of Commerce 2009; Oregon Tourism Commission 2010). Consumer surplus is important because it registers improvements in economic well-being: if someone can pay just a little to enjoy fishing, boating, or some other activity that is of high value to them, then he or she is economically better off.

The average consumer surplus per person per day for common recreational activities in the project area ranges from \$26 for hiking to \$83 for wildlife watching (Loomis 2005, adjusted to 2010 dollars). The economic importance of recreation is increasing in importance overall: more people are recreating more often, and willing to pay greater amounts to do so. In recent years the amount people are willing to pay per person for a day of outdoor recreation has grown faster than inflation, about \$1 per year (Rosenberger and Loomis 2001). Expenditures are important because they generate jobs and income in the communities where they occur. The opportunity to enjoy large increases in consumer surplus can influence some households to locate near the area's recreational resources, with indirect effects on the area's labor and consumer-spending markets.

11.1.8.4 Natural Environment

Visual resources, water resources, wetlands, vegetation, wildlife, and fish are present in the project area (see Chapters 7, Visual; 15, Water; 16, Wetlands; 17, Vegetation; 18, Wildlife; and 19, Fish). These resources contribute to personal well-being in several ways, including the following:

- Knowing that they exist
- Having the option to enjoy them directly

- Ensuring that their children enjoy them in the future
- Engaging in recreation, subsistence hunting, sightseeing, or some other direct use

Some of the species found in the area, including the Northern spotted owl and several species of Pacific salmon, have received federal threatened or endangered status. Many people place a considerable value on the continued survival of such species. The value placed by residents on protecting threatened, endangered, and rare species similar to those that might be found in the area ranges from \$42 to \$333 per year per household, depending on the species (Richardson and Loomis 2009). Research suggests that a household's willingness to pay to protect sensitive plant species generally is lower than the willingness to pay for mammals and birds, but likely higher than their willingness to pay for insects or reptiles (Martin-Lopez et al. 2007).

11.1.8.5 Transmission System Reliability

A reliable supply of electricity is an important contributor to the quality of life of the region's residents and the stability of its economy. The Pacific Northwest currently enjoys a reliable supply of electricity at rates lower than those paid in many parts of the country. Considerable uncertainty surrounds the specific value of reliable electricity and the costs of unreliable electricity, especially at a local level (Eto et al. 2001). National estimates suggest that the annual cost of power interruptions in the U.S. is around \$80 billion per year, with most of the cost concentrated in the commercial and industrial sectors. The cost to the Pacific Northwest is estimated at about \$3 billion per year (LaCommare and Eto 2004).

The cost of power interruptions manifests in different ways across commercial, industrial, municipal, and residential customers, and the public that depends on the goods and services electric power sustains. Commercial, industrial and municipal customers may experience costs when infrastructure, such as machinery, computers, and networks, stops functioning. Commercial and industrial customers may lose revenues and incur unexpected labor and material costs. Some revenues lost during an outage may be partially or wholly offset if, for example, workers work overtime after an outage to meet deadlines, or customers delay rather than cancel purchases. Residential customers may incur direct costs for items such as batteries, eating out, and food spoilage, and intangible costs such as the time required to reset appliances, disruptions in plans, and anxiety about power outages. The public may experience costs when traffic lights, elevators, and other public infrastructure fails, causing delays and increasing the risk of accidents. The average cost a U.S. residential electricity customer incurs from a power outage ranges from about \$2.60 for momentary disruptions to \$3.60 for sustained interruptions, per outage, in 2010 dollars. The average cost per outage for a commercial customer ranges from \$726 to \$1,280, and the average cost to an industrial customer ranges from \$2,272 to \$5,072, in 2010 dollars (LaCommare and Eto 2004).

11.1.8.6 Public Health and Safety

Between 2003 and 2007, annual fatality rates among workers who installed and repaired transmission lines in the U.S. fluctuated between 11 and 20 per 100,000 workers. During this period, these workers experienced injuries at a rate of between 4 and 5 per 100 workers per year, and job-related illnesses at a rate between 0.4 and 1 per 100 workers per year. The most common causes of injury or illness were overexertion, contact with equipment and other objects, and falls (U.S. Department of Labor, Bureau of Labor Statistics 2009).

Transmission lines and electrical substations generate EMF, which many people perceive as risks to their personal health and well-being, or they are concerned about radio and TV interference. The perceived health implications of EMF often generate controversy among people living or working near transmission lines. Most people in the U.S. are continually exposed to EMF, which are present wherever electricity flows. Many studies have investigated the possibility of health risks from exposure to EMF, but few have found conclusive evidence that any exist (von Winterfeldt et al. 2004; Florig 1992) (see Chapter 8, EMF and Appendices F and G).

11.1.9 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations states that each federal agency shall identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low income populations. The Order further stipulates that the agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color, or national origin.

Evaluating whether a proposed action could have disproportionately high and adverse impacts on minority or low income populations typically involves: 1) identifying any potential high and adverse environmental or human health impacts, 2) identifying any minority or low income communities within the potential high and adverse impact areas, and 3) examining the spatial distribution of any minority or low income communities to determine if they would be disproportionately affected by these impacts.

Guidelines provided by the Council on Environmental Quality (CEQ) (1997) and the EPA (1998) indicate that a minority community may be defined where either 1) the minority population comprises more than 50 percent of the total population, or 2) the minority population of the affected area is meaningfully greater than the minority population in the general population of an appropriate benchmark region used for comparison. Minority communities may consist of a group of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who experience common conditions of environmental effect. Further, a minority population exists if there is “more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds” (CEQ 1997).

The CEQ and EPA guidelines indicate that low income populations should be identified based on the annual statistical poverty thresholds established by the U.S. Census Bureau. Like minority populations, low income communities may consist of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who would be similarly affected by the proposed action or program. The U.S. Census Bureau defines a poverty area as a census tract or other area where at least 20 percent of residents are below the poverty level (U.S. Census Bureau 2009b).

Both the CEQ and EPA guidelines note that larger and more populated geographic areas may have the effect of “masking” or “diluting” the presence of concentrations of minority and low income populations (CEQ 1997, EPA 1998). The three potentially affected counties (Cowlitz, Clark, and Multnomah) encompass large areas, ranging in size from 466 to 1,166 square miles. The potential existence of “high concentration pockets” of minority and low income

communities in the vicinity of the alternatives was evaluated by reviewing 2000 Census data at the census tract block group level. A block group is a smaller geographic subdivision of a census tract and typically contain between 3,000 and 6,000 people. Analysis at this level allows a review of the characteristics of surrounding populations at a finer geographic resolution than analysis at the census tract level.

11.1.9.1 Minority Populations

As reported in 2000, the state of Washington had a minority population of about 21 percent, with 79 percent identifying as White alone, 8 percent identifying as Hispanic or Latino, 6 percent identifying as Asian or Pacific Islander, 3 percent identifying as Black or African American, and 1 percent identifying as Native American or Alaskan Native (see Table 11-3). The remaining percentage identified as some other race alone or of two or more races. Overall, the state is more diverse than counties in the project area. Cowlitz County's minority population was about 10 percent with a Hispanic population of 5 percent. Clark County's minority population was about 13 percent with a 5 percent Hispanic population (U.S. Census Bureau 2000a).

Block groups crossed by the project were aggregated by their representative counties (see Table 11-3; individual block group data is in Appendix H). The Cowlitz County aggregate had a minority population of 7 percent, the Clark County aggregate had a minority population of 10 percent, and the Multnomah County aggregate had a minority population of 15 percent. For all sets of aggregate data, minority population percentages were less than their representative counties and the state.

Table 11-3 Race and Ethnicity by Block Group,¹ County, and State

Geographic Area ²	Total Population	Percent of Total Population						
		White	American Indian or Alaskan Native	Asian or Pacific Islander	Black or African American	Hispanic or Latino	Some Other Race Alone	Two or More Races
Washington State	5,894,121	78.9	1.4	5.8	3.1	7.5	0.2	3
Cowlitz County	92,948	89.9	1.4	1.4	0.5	4.6	0.1	2.2
Aggregated Block Groups	26,695	93.3	1.1	0.7	0.3	2.4	0.1	2.2
Clark County	345,238	86.6	0.7	3.5	1.6	4.7	0.1	2.6
Aggregated Block Groups	70,843	90.4	0.7	2.4	1.1	3.1	0.1	2.2
Oregon State	3,421,399	83.5	1.2	3.1	1.6	8	0.1	2.4
Multnomah County	660,486	76.5	0.9	6	5.5	7.5	0.2	3.4
Block Group 1, Census Tract 102	2,927	85.3	1.2	4.3	1.6	4	0.5	3.1

Notes:

1. Data compiled as part of the 2000 Census are the most recent available data at the census block group level.

2. There are 71 block groups crossed by the I-5 Project. Block groups were aggregated at the county level. See Appendix H for specific block-level data.

Source: U.S. Census Bureau 2000a

11.1.9.2 Low-Income Populations

Washington had a median household income of \$45,776 in 1999 with about 10 percent of its population below the poverty level. Median household income in Cowlitz County was lower than the state average at \$39,797 with a higher poverty level at 14 percent. Median household income in Clark County was somewhat higher than the state at \$48,376 with a comparable poverty level to that of the state at 9 percent. Block groups crossed by the project were aggregated by their representative counties (see Table 11-4 and Appendix H for individual block group data).

Table 11-4 Low-Income Populations¹ by Block Group,² County, and State

Geographic Area ³	Total Population	Median Household Income (\$)	Total Population below the Poverty Level	Percent of Population below the Poverty Level (%)
Washington State	5,765,201	45,776	612,370	10.6
Cowlitz County	91,364	39,797	12,765	14
Aggregate Block Group	26,098	45,722	2,245	8.6
Clark County	341,464	48,376	31,027	9.1
Aggregate Block Group	70,389	55,114	4,985	7.1
Oregon State	3,347,667	40,916	388,740	11.6
Multnomah County	645,584	41,278	81,711	12.7
Block Group 1, Census Tract 102	2,902	54,875	344	11.9

Notes:

1. Low-income populations are identified if the percent of the population below the poverty level is equal to or greater than 20 percent of the total population.
2. Data compiled as part of the 2000 Census are the most recent available data at the census block group level. The total population in this table is based on Summary File 3, which is a sample of the population, and is less than the total population presented in Table 11-3.
3. There are 71 block groups crossed by the I-5 Project. Block groups were aggregated at the county level. See Appendix H for specific block-level data.

Sources: U.S. Census Bureau 2000b, 2000c

The Cowlitz County aggregate had a median household income of \$45,722, which was comparable to state income levels. The poverty level for the Cowlitz County aggregate was about 9 percent. The Clark County aggregate median household income was \$55,114 with 7 percent poverty level. Overall, the aggregated block groups had median incomes comparable to or higher than their representative counties and the state, and much lower poverty levels.

Block Group 1 in Census Tract 410.02 in Clark County may be a low-income area, based on the most recent available data (1999). Block Group 1 in Census Tract 410.02 had about 23 percent of the population below the poverty level and median household income equivalent to just 50 percent of the Washington State median (see Appendix H for individual block group data).

Oregon had a median household income of \$40,916 in 1999 with 11 percent of its population below the poverty level. Median household income in Multnomah County was slightly higher than the state median at \$41,278. Multnomah County had a slightly greater percentage (12.7 percent) of its population below the poverty level than the state. There is only one block group within Multnomah County in the project area. This block group had a median household

income higher than the state median at \$54,875, with a comparable poverty level of 12 percent. None of the other block groups or the counties within the project area had 20 percent or more of residents below the poverty level (see Table 11-4).

11.2 Environmental Consequences

General impacts that would occur for the action alternatives are discussed below, followed by impacts unique to each alternative.

11.2.1 Impact Levels

Impacts would be **high** where project activities would cause the following:

- A reduction in the supply of housing or the capacity of public services, utilities, or infrastructure required to satisfy demand
- A reduced level of government revenues by an amount sufficient to reduce the capacity of public services or infrastructure
- A change to the market price of agricultural products or timber at the regional or national level
- A permanent impact to a disproportionate low income or minority population
- A full percentage point of change to the rate of unemployment

Impacts would be **moderate** where project activities would cause the following:

- A substantially increased level of use of existing stocks of housing, utilities, and public services and infrastructure
- A measurably reduced level of government revenues, but by an amount that does not degrade the capacity of public services and infrastructure
- A change to the market price of agricultural products or timber at the local level
- An impact during construction to a disproportionate low income or minority population
- A half percentage-point change to the rate of unemployment

Impacts would be **low** where project activities would cause the following:

- Little effect on the supply of or level of use of housing or utilities, public services and infrastructure, government revenues, or the market prices of agricultural products or timber
- A 1/10 of 1 percent change in the unemployment rate

No impact would occur where project activities would have no effect on the supply of or level of use of housing or public services and infrastructure, government revenues, or the market prices of agricultural products or timber; no effect to a disproportionate low income or minority population; and an imperceptible change to the unemployment rate.

11.2.2 Impacts Common to Action Alternatives

11.2.2.1 Population and Housing

At the peak of construction, the project would employ about 200 construction workers, about 150 of whom would be from outside the local area. These non-local workers would temporarily increase local populations by about 180 persons (assuming some non-local workers would be accompanied by their families). Many of the construction workers would provide their own housing, such as campers or trailers, but require a place to park them; others would require motel rooms, rentals and other temporary housing. There would be a short-term increase in the demand for temporary housing in the project area, but existing temporary housing near the project (see Section 11.1.1, Population and Housing) would be sufficient to accommodate non-local workers and their families without creating a discernable change in availability, a **no-to-low** impact on housing during construction. Existing BPA staff would operate and maintain the new transmission line and associated facilities, so there would be no long-term impact on the population and the demand for housing.

11.2.2.2 Employment and Income

Construction activities would create a short-term increase in employment; at the peak of construction, the project would directly provide about 200 jobs. Indirect impacts would also occur as construction-related workers and suppliers spend their earnings on goods and services in the area, generating additional demand for labor, but these effects likely would be too small to be discernible relative to the size of the regional economy. If construction occurs during a period with low unemployment (not the current condition), workers would likely come from other projects and the net impact on local employment would be near zero. If construction occurs during a period of high unemployment, local, skilled workers could be hired, and the net impact on regional employment would be about 200 jobs (about 0.005 percent of the labor force in the region). Based on the current rate of unemployment in the economic area (approximately 300,000 unemployed), the jobs provided by the project would not cause a perceptible change in this rate. This change would be imperceptible even if all jobs were new jobs; in the case of this project, some of the workers will already be employed, so the project would have no impact on unemployment.

Construction activities would cause a short-term increase in income through construction-related spending on labor, materials, and land. The project would involve increased expenditures of about \$24 million for existing BPA contractors and staff, and \$88 million on wages and benefits for non-BPA contract workers, of which about \$22 million would go to workers from within the area and \$66 million would go to workers from elsewhere. Additional direct income would be generated for business owners, landowners, and workers from expenditures of about \$89 million for construction materials and about \$77 million for land and easement acquisitions. The overall, direct impact on income, for the entire construction period, would be equivalent to about 0.01 percent of total personal income in the area in 2009, which is barely measureable and a **low** impact. Indirect increases in income would occur as those receiving income spend it locally on goods and services. The indirect impact likely would be smaller than the direct impact on income.

During operation and maintenance, the project would have no long-term direct impact on employment and no impact on private income, as BPA plans to operate and maintain the new

transmission line with existing staff. The project could have long-term, indirect effects on employment, such as effects on the flow of goods and services, such as timber from the lands occupied or affected by the right-of-way, substations, and access roads. However, these changes would likely be too small to be discernable relative to the size of the regional economy. Also, by improving the reliability of electricity delivery in the region, the project would encourage businesses who need high-quality power to locate and invest in the area, which could provide jobs. Improved reliability would allow commercial, industrial, and residential consumers to avoid costs from power interruptions.

11.2.2.3 Public Services and Infrastructure

Given the nature of the project, overall long-term impacts on most, if not all, public service and infrastructure providers from the project likely would be too small to be discernible. Because the project would not permanently increase employment or population in the area, no overall impact to schools, police, fire, or medical services would occur. However, during project construction activities, there could be temporary and periodic higher demand for some public services.

Serious construction-related accidents would increase the demand for emergency medical, police, and fire services. This could cause short-term, localized decreases in the ability of these service providers to meet existing demands if such demands exceeded current capacity. Similarly, during operation and maintenance activities, any project-related accidents that occur could temporarily increase demand for emergency medical, police, and fire services in remote locations, again resulting in short-term, localized decreases in the ability of service providers to meet existing demand if such demands exceeded current capacity. However, most of the time there would be no impacts.

During construction, water would be used as the main method of dust control on access roads, and at tower and substation sites. Water is mixed with backfill to bring the soil to the right moisture content for compaction. Water is also used for fire prevention in areas where dry grasses create a fire hazard. Water would be taken from a permitted local source, either from landowners or municipalities, to minimize haul distance and costs. Because a permit is required, a local municipality can evaluate in advance whether they can meet this added demand and would not likely approve the permit if the supply was not available.

The Castle Rock substation sites would not have water or sewage utilities so no wastewater would be generated. The Sundial substation site would require water and sewage supply and treatment and these facilities would be designed and coordinated with the local municipality, Troutdale.

Impacts on public services and infrastructure that do materialize likely would be **low**, as they would not diminish the supply of services and infrastructure for other purposes.

11.2.2.4 Government Revenue

Short-term increases in government revenue would result from taxes on direct and indirect project-related spending during construction, and from the harvest of the existing stock of privately owned timber in and near the existing and new right-of-way, substations, and access roads. Additional short-term increases in revenue to state trusts would occur if the project results in the harvest of timber from trust lands that otherwise would not be harvested until

later. Some of the timber-related increase would be offset if state and private timberland managers decided to reduce harvest on other lands.

The project would cause long-term decreases in government revenue by diminishing the base value of property subject to property taxation, reducing future timber-related revenue from state trust lands, and decreasing future revenue from taxes on private timber harvests and some agricultural products.

Tax Revenue from Project-Related Spending

As a federal government agency, BPA is exempt from taxes on project-related expenditures. Its contractors are not exempt, and would pay applicable taxes on project-related purchases. These direct expenditures and subsequent spending of project-related earnings by workers and contractors would create short-term, indirect increases in revenue for Oregon, Washington, and the counties and local jurisdictions in the project area, from several sources: sales and use taxes (in Washington), income taxes (in Oregon), lodging tax, timber harvest tax, property tax, fuel tax, and real estate excise tax.

Sales and Use Tax

Washington would assess sales or use taxes on materials purchased for the project. Whether it assesses sales or use tax would depend on where the materials are purchased (in Washington or another state), who purchases them (BPA on behalf of a project contractor, or directly by project contractors), and where the materials are installed (in Washington or Oregon). Assuming sales or use taxes are paid on the full cost of the project's materials, which BPA currently estimates at about \$100 million, Washington would collect sales and use taxes on project materials of about \$8 million. This amounts to about 0.1 percent of the total sales and use tax collections in Washington in 2010.

Workers who spend personal income earned from the project on goods and services they purchase in Washington would also pay sales taxes. BPA expects to spend about \$88 million on wages and benefits for contract workers. Assuming that most of the workers on the project from within the region come from Washington and spend all of their income in Washington, and workers from outside the region spend half of their income in Washington, sales tax collections directly stemming from workers' spending would be about \$4.3 million over the life of the project. This amounts to about 0.06 percent of the total sales and use tax collections in Washington in 2010.

The project would preclude the production of some agricultural crops, such as nursery stock and Christmas trees, which are subject to sales and use tax if sold retail in Washington. If all these crops are sold in Washington and none are exported, the value of retail sales tax that would have been collected except for this project (using the West Alternative, where the largest impact would occur), would be about \$590,000, or about 0.008 percent of total sales and use tax collections in Washington (using 2010 tax rates). If 10 percent of Christmas trees are sold in Washington (Pacific Northwest Christmas Tree Association 2012), actual lost sales tax revenue for trees would be about \$41,000. Adding this amount to lost tax revenue from nursery stock (assuming all stock is sold locally which is unlikely) would be about \$216,000. Of this amount, for the West Alternative, about \$31,000 would be lost tax revenue to local governments (about \$1,300 for the Central and Crossover alternatives, and \$0 for the East Alternative) and the rest to the state. Other crops affected by the project, regardless of the action alternative, such as

strawberries and blueberries, are food crops (including hay used as animal feed) meant for human consumption, and are not subject to the sales and use tax.

Income Tax

Workers living in Oregon and non-residents working in Oregon who meet minimum Oregon-earned income thresholds would pay Oregon income taxes. The amount of income tax collected from this project would depend on the number of workers from Oregon and the amount of project-related labor income earned in Oregon. Assuming all workers from the region were from Oregon and 25 percent of the non-resident workers' income was earned and taxable in Oregon, the project would cause \$3.2 million in income tax for Oregon over the life of the project. This amounts to about 0.03 percent of the total personal income-tax collections expected in the 2009 to 2011 biennium. To the extent that corporations working on the project pay income taxes in Oregon and business and occupation (B&O) taxes in Washington, the amount of tax collections would be somewhat higher, although the amount of corporate income or gross receipts that would be attributable to the project is difficult to determine, given available information. Businesses in Washington involved in retailing, wholesaling, or manufacturing agricultural products may pay less B&O tax each year if the reduction in crop production reduces their gross receipts. Similarly, businesses involved in retailing, wholesaling, or manufacturing timber products may pay more or less B&O tax if the project increases or decreases their gross receipts.

Lodging Tax

Workers who stay in temporary lodging in Oregon or Washington would pay lodging taxes. Assuming all non-resident workers seek temporary housing in hotels in Cowlitz and Clark counties during the work week (5 days) for the duration of the project (18 months), and the average rate paid is \$50 per night, about \$67,500 in lodging tax would be collected over the life of the project. This amounts to about 7 percent of the total lodging tax collected in Clark and Cowlitz counties in 2010.

Timber Harvest Tax

The project may cause a short-term, direct increase in the timber-harvest tax revenue of affected counties and the state government in Washington by triggering harvest of the existing mature timber stock on private lands in and near the new right-of-way, and for the substations and access roads. Depending on economic feasibility, either the grower/landowner would harvest the timber themselves, or, BPA would harvest the timber after an appraisal is completed and an easement is negotiated and secured. Harvest of existing mature timber stock on existing BPA right-of-way would likely not contribute to an increase in tax revenue as this timber may be owned outright by BPA through fee-owned title or owned by BPA as reflected in existing easement language. As a federal agency, BPA does not pay taxes and there would be no timber-harvest tax revenue generated in these cases.

Any increases in revenue would be offset if, because of the unplanned harvest on the cleared lands, landowners decide not to harvest trees on other lands. The project would create a long-term decrease in timber-harvest tax revenue by precluding future timber production on these lands. The short-term, direct increase and the long-term direct decrease in tax revenue for each action alternative are presented in Sections 11.2.3 through 11.2.7.

Property Tax

BPA would acquire land rights (easements) from private property owners for constructing, operating, and maintaining the transmission line and access roads. The property owner would retain ownership of the property and continue to pay property tax on the entire parcel, including the land within BPA's easement. BPA would purchase property for its substations (and possibly substation access roads) in Cowlitz and Multnomah counties. Because BPA is a federal agency and exempt from paying local property taxes, the counties would not collect property taxes on the property acquired in fee for the substation and substation access roads.

Direct decreases in property taxes would occur for properties BPA acquires and removes from the tax rolls. The value of property tax collections to Cowlitz County for the Baxter Creek substation site was \$1,168 in 2009. The value of collections to Cowlitz County for the Monahan Creek substation site (both parcels combined) was \$1,596 in 2009. Additional decreases may occur for those properties on which it secures an easement that constrains use of the property (severance, loss of use, etc.) and reduces assessed value, but data are insufficient to quantify these decreases. Increases or decreases may occur if land in agricultural production, currently assessed under Washington's Current Use Special Valuation (CUSV) program, is reassessed as non-agricultural land. Data are not sufficient to determine how much property may be subject to this type of reassessment, or what the net effect on property tax collections would be. Indirect decreases in property taxes could occur for nearby residential properties if the project reduces the quality of amenities, or commercial properties if the project affects the income-generating potential of the site. BPA has not been presented with any evidence on previous projects that this has occurred. Available data are insufficient to fully quantify the impacts, but the project's overall impact on property tax revenues likely would be too small to have a discernible effect, relative to the influence of other factors, such as population and economic growth, and new development, and given that the area directly affected by the project is small compared to the total area of the affected counties (for more discussion of the project's potential impact on property values, see Section 11.2.2.5, Property Values).

Fuel Tax

Undoubtedly some amount of tax would be collected from fuel consumption. The amount attributable to the project would depend on consumption and future fuel prices at the time of consumption; the actual amount cannot be reliably estimated from the data that is currently available.

Real-Estate Excise Tax

The value of compensation paid to private landowners in Washington for easements and land purchased for the project would be subject to Washington's real estate excise tax (WAC 458-61A-111) unless the property is taken under condemnation or the imminent threat of condemnation. The amount of tax collected would vary depending on the amount of compensation negotiated for land and easements and their location.

Overall, the project's direct spending during construction and maintenance likely would have no adverse impact on tax revenue for Cowlitz, Clark, and Multnomah counties. The long-term decrease in timber-harvest tax revenue during operation may, in some years, exceed either Cowlitz or Clark county's average compensation cost per employee and have a **high** impact on the two counties.

Revenue from Washington State Trust Lands

WDNR manages state trust lands to provide revenue for several trusts, primarily by producing timber. The project may create a short-term increase in the trusts' revenue from these lands by triggering the harvest of existing mature timber stock in and adjacent to new right-of-way and on any lands that would be occupied by a substation or access roads. Harvest of existing timber stock on existing right-of-way would likely not contribute to an increase in revenue for WDNR because this timber may be owned outright by BPA through fee-owned title or owned by BPA as reflected in the existing easement language.

The value of short-term increases in government revenue for each action alternative and substation site is quantified in Sections 11.2.3 through 11.2.7. In some cases, additional trees would be cut adjacent to the right-of-way for safety purposes, which would increase short-term revenue beyond the values reported in Sections 11.2.3 through 11.2.7. The potential additional revenue increase is reported separately as a percentage applied to the calculated revenue from harvests within the right-of-way, and varies by alternative and option depending on the location of the new right-of-way relative to existing rights-of-way (e.g., if the new right-of-way is adjacent to an existing right-of-way on one side, additional trees would be harvested outside the right-of-way on only one side). Any increase in revenue would be offset if WDNR decided to reduce harvest on other lands but the extent of the offset is unknown. Additional revenue would come from BPA's payment of compensation for any state trust lands acquired for the project or for the easements themselves on trust lands. The appraisal process would also consider whether the transmission facilities would diminish the utility of a portion of the timberland property if the line effectively severs this area from the remaining property (severance damage).

The project would create long-term decreases in government revenue generated from state trust lands in three ways:

- Elimination or reduction of timber production on private timberlands that would be cleared in or next to the new right-of-way or for the substations and access roads
- Increase in the costs of managing private timberland near the new right-of-way, resulting, for example, from project-related restrictions on timber-harvest techniques, such as cable logging, or increases in risks to safety from logging near the right-of-way
- Reduction in the ability of private landowners to generate additional types of revenue, such as from growing trees to sequester carbon, on the cleared lands

The long-term decreases in government revenue for each action alternative, related to the impacts described in the first bullet above, are quantified in Sections 11.2.4 through 11.2.7. Measuring the impact entails converting the future impacts on timber-harvest revenue to an equivalent, single number, called the present value, using a discount rate of 4 percent per year (Row Kaiser and Sessions 1981). The decrease in revenue is reported for the acres of trees within right-of-way newly acquired for this project. For existing right-of-way, BPA likely has already negotiated compensation for forgone future revenue from timber production. Data are unavailable to quantify the decrease in government revenue from the impacts described in the second and third bullet points above. To the extent that each of these impacts occurs, potential mitigation for the decrease in government revenue is discussed in Section 11.2.8, Recommended Mitigation Measures.

The decrease in revenue during operation may, in some years, exceed either Cowlitz or Clark county's average compensation cost per employee and have a **high** impact on the two counties.

11.2.2.5 Property Values

The proposed transmission line is not expected to have long-term impacts on property values in the area for a variety of reasons. Whenever land uses change, the concern is often raised about the effect the change may have on property values nearby. Zoning and permits are the primary means by which most local governments protect property values. By restricting some uses, or permitting them only under certain conditions, conflicting uses are avoided. Some residents consider transmission lines to be an incompatible use adjacent to residential areas. Nonetheless, the presence of transmission lines in residential areas is fairly common.

Appraisals conducted by licensed appraisers are the mechanism used to estimate property values. Factors such as size, amenities, condition and the selling price of comparable properties are generally used for such appraisals.

The question of whether nearby transmission lines can affect residential property values has been studied many times in the United States and Canada over the last 20 years or so, with mixed results. In the 1990s, BPA contributed to the research when it looked at the sale of 296 pairs of residential properties in the Portland, Oregon and Vancouver, Washington, metropolitan areas and in King County, Washington. The study evaluated properties adjoining 16 BPA high-voltage transmission lines (subjects) and compared them with similar property sales located away from transmission lines (comparable sales). All sales were in 1990 and 1991. Study results showed that the subjects in King County were worth about 1 percent less than their matched comparable sales, and the Portland/Vancouver area subjects were worth almost 1.5 percent more (Cowger and Bottemiller 1996).

BPA updated this study in 2000 using 1994 to 1995 sales data, reviewing the sales of 260 pairs of residential properties in the King County and Portland/Vancouver metropolitan areas. The residential sales analysis identified a small but negative impact of from 0 to 2 percent for those properties adjacent to the transmission lines as compared to those where no transmission lines were present. Although this study identified a negative effect, the results are similar to the earlier study and the differences are relatively small (Bottemiller et al. 2000). In 2003, the Appraisal Journal published a BPA article titled, "Further Analysis of Transmission Line Impact on Residential Property Values" (Wolverton and Bottemiller 2003). This article concluded that the data did not support a finding of a price effect on properties abutting high voltage transmission line rights-of-way.

Other studies include "High-Voltage Transmission Lines: Proximity, Visibility, and Encumbrances Effects," by James Chalmers and Frank Voorvaart, published in The Appraisal Journal in 2009. This article concluded that half of the major studies evaluating property value effects from high voltage lines found no effect; the other half found property value declines of 3 to 6 percent, generally not beyond 200 to 300 feet from the lines, with declines dissipating over time.

BPA has initiated new studies to re-examine the potential impact of transmission lines on residential property values in urban areas. Based on a study of home sales between 2005 to 2007 (on homes sold adjacent to high voltage lines and comparable homes sold away from lines), the soon to be finalized findings for the new study in the Portland area (including Clark County, Washington, and Clackamas and Washington counties, Oregon) indicate declines in the

overall average residential property values of 1.65 percent. The Seattle metro area (King County, Washington) in the new study indicated a decline of 2.43 percent in the overall average priced home. However, homes in the Seattle study with average selling prices of \$996,775 indicated a decline of 11.23 percent (Bottemiller 2012).

For rural areas, a 2010 study involved several hundred sales of rural land in various locations across central Wisconsin that considered the placement of the easement across the tract (Jackson 2010). Four location categories were used: middle, edge, clipping, and diagonal. The results indicated that property sales diminished by about 4 percent for the middle pattern and 2 percent for the diagonal pattern. No diminished property value was observed for either the edge or clipping pattern sales. An Appraisal Journal article in the Winter 2012 edition entitled "High-voltage Transmission Lines and Rural, Western Real Estate Values," authored by James A. Chalmers, concluded "The research reported here is certainly consistent with the findings in the published literature that property value effects cannot be presumed and are generally infrequent."

Studies of impacts during periods of physical change, such as new transmission line construction, generally have revealed greater short-term than long-term impacts. However, most studies have concluded that other factors, such as general location, size of property, improvements, condition, amenities, and supply and demand factors in a specific market area are far more important criteria than the presence or absence of transmission lines in determining the value of residential real estate.

The new transmission line would cross over or near current and potential future residential areas depending on the alternative (see Chapter 5, Land). A temporary decrease in property values (and salability) might occur on an individual basis as a result of the new transmission line for these and potentially for nearby properties along the action alternatives. However, these decreases would be highly variable, individualized, and unpredictable. Constructing the transmission line is expected to have no appreciably measurable impact on long-term residential property values along the action alternatives or in the general vicinity. Non-project impacts, along with other general market factors, are already reflected in the market value of properties in the area. These conditions are not expected to change appreciably.

Timberlands cleared in or near the right-of-way that remain cleared and unable to produce timber would decrease in value because growing timber for production and revenue would be prohibited. In addition, if the right-of-way crossed in an orientation that separates a portion of a parcel from another and cannot be used as before (i.e., a "stranded [or severed] use"), the value of the whole parcel could be diminished. BPA would provide compensation to the owners of property BPA acquires or for which it secures an easement, or for other properties where the project would impair the owner's reasonable use of the property. BPA would pay market value to nonfederal landowners established through the appraisal process for any new land rights required for this project. The appraisal process takes all factors affecting value into consideration, including the impact of transmission lines on property value. The appraisals may reference studies conducted on similar properties to support their conclusions. The strength of any appraisal depends on the individual analysis of the property, using neighborhood-specific market data to determine market value. Current sales at the time of appraisal reflecting economic conditions present in the market place at that time would be used, creating an appraisal that reflects appropriate value trends. Compensation for removing vegetation for new rights-of-way would be determined through the appraisal process for the new easement. For existing BPA rights-of-way, BPA would not pay for trees if they are already owned by BPA either

through fee-owned title or through the existing easement. Payment for trees off the existing right-of-way, for example, danger trees, would depend on the terms of the existing easement.

Where BPA needs to acquire easements for additional access roads, and the landowner is the only other user, market compensation is generally 50 percent of the roads full fee value. If other landowners share the access road, compensation is usually something less than 50 percent. For fully improved roads, the appraiser prepares an appraisal of the easement reflecting the current improved condition of the road together with the land value beneath the road. If BPA acquires an easement for the right to construct a new access road and the landowner has equal benefit and need of the access road, market compensation is generally 50 percent of full fee value of the land; if the landowner has little or no use for the new access road to be constructed, market compensation for the easement is generally close to full fee value of the land.

BPA projects rarely require relocating residents, businesses, or farm operations. Occasionally, personal property such as farm equipment or stored materials must be moved. Reasonable and necessary expenses for relocation of these items are fully reimbursable, unless the appraiser deems these items to be realty and compensated for in the property appraisal. BPA ensures that the landowner is fully informed of the relocation process if it appears that relocation would be necessary. The Federal Highway Administration's brochure entitled "Your Rights and Benefits as a Displaced Person," is available at the following website:
<http://www.fhwa.dot.gov/realestate/rights/>.

The Uniform Relocation Assistance and Real Property Acquisition Policies Act calls for fair and equitable treatment of those whose real property would be acquired or who would be displaced as a result of the project. In general, the act limits BPA to paying compensation equal to the fair market value of land purchased for the project or for the diminution in fair market value resulting from an easement or impairment of use. BPA may pay more than fair market value for a residential property if its current market value is less than the sum of mortgage and related debt the owner owes on it. That is, BPA would take into consideration current economic conditions. BPA would not pay compensation to owners of other property, such as residences outside but near the right-of-way, if they should experience a decline in market value.

BPA considers condemnation (exercising the power of eminent domain) as a last resort, and avoids using it as much as possible. BPA's standard practice is to negotiate a mutually acceptable purchase agreement for new easements from landowners for the land rights needed for the transmission lines, access roads, and substations. If, after good faith negotiations, BPA and a landowner are unable to agree on terms of a purchase, BPA would ask the U.S. Department of Justice to begin condemnation proceedings in the U.S. District Court on its behalf. A landowner may request that the condemnation process be used if they are unwilling to negotiate. In very limited cases, adjustments to right-of-way location may be made or feasible alternative means of access may be found.

11.2.2.6 Agricultural Production

The project would create short-term and long-term decreases in revenue farmers earn from agricultural production on lands directly affected by the project, if such production were prohibited. The decrease may be offset if a farmer is allowed to grow a substitute, less-profitable crop, but insufficient information exists to determine the size of this offset.

Construction of towers and access roads would permanently remove land from agricultural production. Operation of the new line may permanently remove the ability of landowners to grow certain crops on the right-of-way. For agricultural land within existing BPA easements, the landowners may be able to reserve the right to grow and maintain non-woody, low-growing plants, such as agricultural crops or vegetative cover with a mature height not to exceed 4 feet and that do not require structural support. For the purpose of this analysis, production of hay and silage, strawberries, and some nursery crops would be allowed within the right-of-way. Blueberries, grapes, and Christmas trees would not be allowed. If landowners desire to grow woody plants, structure-supported crops, or vegetation exceeding 4 feet on an existing BPA right-of-way, they would need to contact BPA and secure a written agreement allowing such use if BPA determines that such use is safe and does not, or would not, cause any interference with the safe operation of the lines. The landowner would be restricted from planting any agricultural crops or vegetative cover including trees, shrubs, brush, or other vegetation covered by the reservation or written agreement within a 50-foot radius of all poles or towers.

Construction and maintenance of the project could cause crop damage, a temporary impact. BPA would assess and pay for the damage caused. Typically there is little decrease in productivity or increase in management costs on agricultural land next to towers and access roads, or within the right-of-way for crops that are allowed to remain. If it is necessary to modify an irrigation system due to the construction of the transmission facilities, the appraisal process would include an estimate of the cost. If the landowner has reserved rights or entered into an agreement with BPA to grow crops within the right-of-way, the landowner would be responsible for the control of weeds within the right-of-way if weeds were not introduced by project construction. BPA does not conduct aerial spraying of herbicides, so drift is not an issue for agricultural production on land next to the right-of-way.

The project likely would have no impact on the overall demand, supply, or price of crops in the regional agricultural markets, although noticeable, but **low** impacts may occur if the affected lands would have produced solely for a niche market, such as locally grown, organic produce. These farmers, individually or collectively, may feel that the impact on their operations is larger, relative to the scale of their operations, than the overall market impact.

The short-term losses of production during construction activities and long-term decreases in revenue from agricultural land permanently removed from production for each action alternative are quantified in Sections 11.2.4 through 11.2.7. The analysis of long-term losses assumes that the crop currently grown in the right-of-way would have been grown in perpetuity, and annual revenues are discounted at an annual rate of about 2 percent (U.S. Office of Management and Budget 2011). Potential tax impacts from revenue changes are discussed in Section 11.2.2.4, Government Revenue.

11.2.2.7 Private Timber Production

The project may create short-term increases and long-term decreases in the revenue derived from timber production on private land. The short-term increase may occur if existing mature timber that otherwise would continue to grow would, instead, be harvested on lands that would be cleared in or adjacent to new right-of-way or for the substations and access roads. This would likely be the case where it is economically feasible for large commercial growers to harvest the timber themselves. For growers with smaller holdings, it may not be feasible to harvest the timber themselves; in this case, BPA would harvest the timber after an appraisal is

completed and an easement is negotiated and secured. Harvest of existing timber stock on existing right-of-way would likely not contribute to an increase in revenue for the landowner because this timber may be owned outright by BPA through fee-owned title or owned by BPA as reflected in existing easement language. Any short-term increases in revenue could be offset if, because of the unplanned harvest on the cleared lands, landowners decide not to harvest trees on other lands. The short-term increases in revenue for each action alternative and substation site are quantified in Sections 11.2.3 through 11.2.7.

In some cases, trees would be cut adjacent to the right-of-way for safety purposes. This additional harvest would increase short-term revenue beyond the values reported in Sections 11.2.3 through 11.2.7. The value of the potential increase varies by alternative and option, and depends on the amount of timber adjacent to the new right-of-way and its ownership.

The long-term decreases in revenue derived from timber production would occur in three ways:

- Elimination or reduction of timber production on private timberlands lands that would be cleared in or next to the new right-of-way or for the substations and access roads
- Increased costs of managing private timberland near the new right-of-way, resulting, for example, from project-related restrictions on timber-harvest techniques, such as cable logging, or greater risks to safety from logging near the right-of-way
- Elimination or reduction of the potential to generate non-harvest related revenue (e.g., payments for ecosystem services, such as carbon sequestration or habitat protection) on private timberlands that would be cleared in or next to the new right-of-way or for the substations and access roads

The long-term decreases in revenue for each action alternative and substation site, related to the impacts described in the first bullet above, are quantified in Sections 11.2.3 through 11.2.7. Measuring the impact entails converting the future impacts on timber-harvest revenue to an equivalent, single number, called the present value, using a discount rate of 4 percent per year (Row Kaiser and Sessions 1981). The decrease in revenue is reported for the acres of trees within right-of-way newly acquired for this project. For existing right-of-way, BPA likely has already negotiated compensation for forgone future revenue from timber production. Data are unavailable to quantify the decrease in revenue resulting from the impacts described in the second and third bullet points above. To the extent that each of these impacts occurs, potential mitigation for the decrease in government revenue is discussed in Section 11.2.8, Recommended Mitigation Measures. The expected changes in the value of private timber production for each action alternative are quantified in Sections 11.2.4 through 11.2.7.

The project likely would have no impact on the price of private timber in regional markets, although it may decrease the price at the local level during construction (a **low** impact). The actual impact would depend not just on the project's direct impact on the timber-harvest level, but also on the extent to which forest landowners adjust harvest on other lands in response.

11.2.2.8 Community Values

BPA received many comments about the potential effects the project could have on existing quality of life and other values. The following sections evaluate how the alternatives could generally affect people who hold these values.

Quality of Life

The project could affect the well-being of residents by altering the supply of amenities, such as cohesive neighborhoods and the natural environment, that reflect the area's social capital (productive relationships among individuals and entities) and natural capital (the natural environment). The project, itself a form of human-built capital, could directly affect the level of social capital and natural capital in the project area. The project could create long-term increases in well-being, for example, if it increases the value of amenities, such as by promoting greater goodwill among citizens having an interest in the project. It could cause long-term decreases in well-being, for example, if it generates discord between individuals with different views about the project's desirability.

Property-Related Amenities

The project would cause short-term decreases in the value of amenities, such as peace and quiet, for residents that would be affected by increased noise, traffic, and other aspects of construction. It would cause long-term decreases in the value of amenities, such as being close to forested open space and far from industrialized lands, for residents of properties near the transmission line, substations, and access roads.

Public Health and Safety

The project could create a short-term decrease in the economic well-being of workers or others who experience a project-related illness or accident during the construction period. Fatalities or chronic conditions from project-related illnesses and accidents could cause long-term decreases in well-being for construction workers and their families. Industry-wide illness and fatality rates suggest workers could experience about nine injuries, one illness, and a small chance of a fatality during the year with the peak level of activity, with lower levels during periods with less intense activity (U.S. Department of Labor, Bureau of Labor Statistics 2009). The public could experience accidental injuries or deaths during construction and operation of the transmission line and substations. The economic costs of injuries, illnesses, and deaths could be large to individuals and their families, but likely would not have a discernible effect on the overall value of safety and health for the public.

The project would create a long-term decrease in the well-being of landowners, residents, workers, and visitors who perceive that the project would expose them to higher risks from EMF, electrocution, and project-related accidents.

Recreation and Tourism

The project would cause a short-term, temporary decrease in the value of recreational activities on affected lands and waters as construction displaces or interferes with recreation. It would cause a long-term, permanent increase in the value some people derive from recreational activities where new or improved access roads enhance accessibility or other qualities people desire (e.g., improved visibility or hunting quality from clearings). The project would cause a long-term permanent decrease in the value some people derive from recreational activities if the project diminished accessibility, visual aesthetics, sense of solitude, or other characteristics people desire or currently enjoy (see Chapter 6, Recreation).

Changes in the value of recreational opportunities resulting from the project would affect the behavior of recreationists, who likely would make fewer visits to areas with diminished value and more visits to areas with higher value. Where the right-of-way and access roads would cross forest habitat, for example, wildlife watchers may make fewer trips to see species that depend on unfragmented forest and more trips to see those that prefer forest edges. The changes in behavior may occur entirely within the project area or they may extend beyond its boundaries. In response to any reduction in the value of hiking opportunities in the area, for example, some hikers might decide to go hiking on other unaffected trails within the project area, or choose to travel to trails outside of the project area. To the extent that the project's effects on recreation resources lead recreationists to alter their spending patterns, it would affect levels of sales, employment, and earnings in related businesses.

Natural Environment

The project would cause long-term decreases in the value of the benefit some people enjoy from the existence of the plants, animals, and other resources that the project would affect. Some impacts would occur through the reduced value of recreation and tourism, as described above. Additional decreases in value would occur from and via increased costs for taxpayers, landowners, and others to anticipate, monitor, and respond to impacts to the natural environment.

Transmission System Reliability

The project would create long-term increases in the contribution of BPA's transmission system to the economic well-being of electricity consumers. The project would allow BPA to meet its obligations to provide firm transmission service to its customers. By improving the reliability of electricity delivery in the region, the project would encourage businesses who need high-quality power to locate and invest in the area, which could provide jobs. Improved reliability would allow commercial, industrial, and residential consumers to avoid costs from power interruptions, such as a business losing revenues when it must cease production, residents losing food to spoilage, or police responding to accidents when traffic controls fail.

11.2.2.9 Environmental Justice

None of the action alternatives would affect minority populations disproportionately. The minority populations in the cities, counties and census tracts evaluated are not of sufficient size to be a disproportionate population under CEQ guidelines for Environmental Justice.

The West Alternative would include an area (Census Tract 410.02, Block Group 1) with a low-income population that is disproportionate to populations living elsewhere in the alternative's affected counties (see Table 11-4 and Appendix H for individual block group data). However, effects to residents in that census tract are the same in range and extent as to all other census tracts and populations along the West Alternative, and to the other alternatives which do not contain any low-income populations. Therefore, the West Alternative does not affect this population any differently than other populations along the alternative route. The impacts from this project on low-income or minority populations would not be disproportionate and none would fall under the goals and procedures of EO 12898. Accordingly, there would be no disproportionate impacts to these groups.

BPA has considered all input from persons or groups regardless of race, income status, or other social and economic characteristics. Public scoping was held for the project and included an extended public comment period. Interested parties were encouraged to provide written input via the project website, U.S. mail, or fax, as well as by telephone. All comments received as part of the scoping process were posted on the project website: <http://www.bpa.gov/go/i-5>. Comments will continue to be accepted throughout the NEPA process for the project (see Section 1.6, Public Involvement and Major Issues).

11.2.2.10 Sundial Substation

BPA would purchase 40 acres for the substation and access road from the Port of Portland. The location of the substation, access road, and transmission lines could affect all or portions of lots 8, 9, or 11 within the Troutdale Reynolds Industrial Park, depending on the final design and location of proposed facilities. The Port is preparing to make land available within the industrial park for commercial and industrial uses in a phased development. Phase I is underway. Phase II is expected to include the development of Lot 11, which could be available from 2012 to 2015. Phase III is expected to include the development of Lots 8 and 9, which could be available from 2015 to 2017 (Port of Portland 2011). The Port expects to sell future lots for around \$6 per square foot. The actual sale price likely will vary depending on site characteristics and market conditions at the time of sale. The Port sold one lot from the Phase I development in 2008 for \$5 per square foot (Multnomah County 2011).

BPA would purchase about 25 to 50 acres for each of the proposed substations and substation access roads, with exact acreage depending on the parcel selected and the final substation and access road design.

For purposes of this analysis, 40 acres was assumed as a reasonable amount of land to purchase for the substation sites.

If BPA purchases property in the industrial park for Sundial Substation and the substation access road, the Port of Portland would be unable to sell or lease this property for other commercial or industrial uses. BPA would pay market value to nonfederal landowners established through the appraisal process for any new land rights required for this project (see Section 11.2.2.5, Property Values). If, by purchasing the land for the substation, the project reduces the price the Port can receive for nearby lots or changes the configuration of the development in a way that reduces the potential value of the remaining lots, the project could cause a decrease in revenue for the Port of Portland. If it has the reverse effect, it would increase revenue. If BPA displaces a private landowner who otherwise would pay property taxes on the land, it could create a long-term decrease in revenue for Multnomah County, a **moderate** impact, although it likely would not diminish the county's workforce and infrastructure.

11.2.3 Castle Rock Substation Sites

11.2.3.1 Casey Road

BPA would purchase the property for the Casey Road site and access road from WDNR. WDNR uses the property for timber harvest and it also is classified as farmland of statewide importance. Portions of the property have been recently logged. Timber harvested from the site during construction would create a short-term increase of about \$158,900 in timber-harvest revenue from state trust lands (see Section 11.2.2.4, Government Revenue, for assumptions). Logging

Impacts common to action alternatives are in Section 11.2.2. The remaining sections discuss impacts unique to each alternative, and recommended mitigation measures.

this timber would produce revenues for the Agricultural and Scientific Schools Trust and State Forest Lands. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. Converting this property from state trust land to a substation site would cause a long-term decrease in state revenue from forgone future harvests with a total present value of \$124,100 (see Section 11.2.2.4 for assumptions). The revenue reduction likely would have a **moderate** impact on Cowlitz County's ability to meet all demands for public services, although it would not diminish the county's workforce and infrastructure.

11.2.3.2 Baxter Road

BPA would purchase the property for the substation site and access road from Sierra Pacific Industries. The property is classified as farmland of statewide importance and is used for timber harvest. Sierra Pacific Industries paid \$1,168 in property taxes for the parcel to Cowlitz County in 2009. This represented about 0.001 percent of total property tax collections in Cowlitz County in 2009. The project would cause a long-term decrease in annual property tax collections in Cowlitz County.

During construction, timber harvests from clearing the site would increase timber-harvest tax revenue by about \$2,900 for Cowlitz County and about \$700 in state revenue. Precluding future timber harvests on the site during operation would cause a long-term decrease in state and county timber-harvest taxes, with a total present value of about \$7,900 for Cowlitz County and about \$2,000 for the state.

Timber harvests from clearing the site would also cause a short-term increase about \$71,300 in the revenue derived from timber production on private land (see Section 11.2.2.7, Private Timber Production, for assumptions). Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. Converting the land from private timber production would cause a long-term decrease in revenue for Sierra Pacific Industries, with a present value of about \$198,000 from forgone future timber harvests (see Section 11.2.2.7 for assumptions).

The revenue reduction likely would have a **moderate** impact on Cowlitz County's ability to meet all demands for public services, although it would not diminish the county's workforce and infrastructure. The change in timber production likely would have no impact on market prices for timber.

11.2.3.3 Monahan Creek

BPA would purchase the property for the substation and access road. The property is classified as farmland of statewide importance and prime farmland. Trees cover portions of the property; other portions are used for grazing. The landowners paid \$1,596 in property taxes to Cowlitz County in 2009. This amount represented about 0.001 percent of total property tax collections in Cowlitz County in 2009. Because BPA would not pay property taxes once it acquires the property, the project would create a long-term decrease in annual property tax collections in Cowlitz County.

During construction, timber harvest from clearing the site would increase timber-harvest tax revenue by about \$1,200 for Cowlitz County and about \$300 in state revenue. Operation would preclude future timber harvests on the site and would cause a long-term decrease in state and

county timber-harvest taxes, with a total present value of about \$3,400 for Cowlitz County and about \$900 for the state.

Timber harvests from clearing the site would also cause a short-term increase of about \$30,900 in the revenue derived from timber production on private land (see Section 11.2.2.7, Private Timber Production, for assumptions). Converting the land from private timber production, assuming the landowner otherwise would use it for timber harvest, would cause a long-term decrease of about \$85,800 in revenue for the private landowner from forgone future timber harvests on the cleared land (see Section 11.2.2.7 for assumptions).

The revenue reduction likely would have a **moderate** impact on Cowlitz County's ability to meet all demands for public services, although it would not diminish the county's workforce and infrastructure. The change in timber production likely would have no impact on market prices for timber.

11.2.4 West Alternative and Options

The only socioeconomic factors that would vary under the West Alternative and its options are government revenue, agricultural production, and private timber production. This is also true of the other three alternatives and their options. Accordingly, the following discussions of the action alternatives focus on these three socioeconomic factors.



11.2.4.1 Government Revenue

The West Alternative would affect government revenue in Washington from state trust lands and from timber-harvest taxes.

Washington State Trust Land Revenue

During construction, the West Alternative would cause an increase of about \$2,390 in timber-harvest revenue from state trust lands by triggering harvest of existing mature timber stock on lands cleared for the project (see Table 11-5).



Greater increases during construction would occur for West Options 2 and 3. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. If the value of the trees outside of the right-of-way that may be harvested because they could interfere with construction or operation of the line is included in the total, the increase would be about 21 percent greater than shown in Table 11-5 for West Option 2 and about 15 percent greater for West Option 3 (see Section 11.2.2.4, Government Revenue, for assumptions). The increase for each individual landowner could be greater or less than the total increase. The short-term increase in revenue during construction represents a small change (a fraction of a

percent) compared to the annual statewide revenue for the trusts, which was \$115 million in 2009.

Table 11-5 Value of Timber Cleared From State Trust Lands (in 2011 dollars)^{1,2,3}

Alternatives and Options	Trust							Total
	Capitol Building	Insti-tutions ⁴	Common School	Agri-cultural	Scientific School	State Forest Lands ⁵		
						Clark	Cowlitz	
West Alternative	\$0	\$0	\$2,390	\$0	\$0	\$0	\$0	\$2,390
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	+\$52,410	N/C	N/C	N/C	N/C	+\$52,410
West Option 3	N/C	N/C	+\$36,650	N/C	N/C	N/C	N/C	+\$36,650
Central Alternative	\$167,100	\$157,600	\$753,400	\$3,640	\$110,600	\$950,900	\$132,700	\$2,276,000
Central Option 1	N/C	N/C	+\$12,490	N/C	+\$74,850	N/C	+\$168,300	+\$255,600
Central Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 3	N/C	N/C	-\$76,590	N/C	N/C	-\$355,360	N/C	-\$431,950
East Alternative	\$48,540	\$0	\$493,600	\$0	\$25,920	\$388,600	\$308,700	\$1,265,400
East Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 2	+\$53,590	N/C	-\$11,750	N/C	-\$25,920	+\$244,100	N/C	+\$260,000
East Option 3	N/C	N/C	+\$66,260	N/C	N/C	+\$104,600	N/C	+\$170,900
Crossover Alternative	\$48,540	\$0	\$650,400	\$0	\$79,220	\$706,800	\$132,700	\$1,618,000
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Notes:

N/C – No net change from the action alternative

- The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.
- Calculated for timber that would be cleared from the right-of-way, substations, and access roads.
- Totals may not sum due to rounding. See Section 11.2.2.4, Government Revenue, for assumptions used to quantify these values.
- Includes charitable, educational, penal, and reformatory institutions.
- Represents the revenue from timber harvest in Clark and Cowlitz counties; actual revenue impacts to the counties would vary depending on a variety of factors which are adjusted annually. In recent years, counties received about 70 percent of total harvest revenue from State Forest Lands.

Sources: Herrera 2010, Warren 2009, WDNR 2010c

Over the life of the project, the West Alternative would decrease revenue from future timber harvests that would have occurred on land required for the project, with a net present value of about \$1,860 (see Table 11-6). Greater decreases would occur with West Options 2 and 3. On an annualized basis, the long-term decrease likely would be small, relative to the annual statewide timber sales for each trust.

The revenue reduction likely would have a **moderate** impact on Cowlitz County's ability to meet all demands for public services, although it would not diminish the county's workforce and infrastructure.

Table 11-6 Net Present Value of Revenue from Future Timber Harvests that Would Have Occurred on State Trust Lands but for the Project (in 2011 dollars)^{1,2,3,4}

Alternatives and Options	Trust							Total
	Capitol Building	Insti-tutions ⁵	Common School	Agri-cultural	Scientific School	State Forest Lands ⁶		
						Clark	Cowlitz	
West Alternative	\$0	\$0	\$1,860	\$0	\$0	\$0	\$0	\$1,860
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	+\$40,950	N/C	N/C	N/C	N/C	+\$40,950
West Option 3	N/C	N/C	+\$28,630	N/C	N/C	N/C	N/C	+\$28,630
Central Alternative	\$130,500	\$123,100	\$588,600	\$2,850	\$86,390	\$742,900	\$103,700	\$1,778,000
Central Option 1	N/C	N/C	+\$9,760	N/C	+\$58,470	N/C	+\$131,500	+\$199,700
Central Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 3	N/C	N/C	-\$59,830	N/C	N/C	-\$277,620	N/C	-\$337,450
East Alternative	\$37,920	\$0	\$385,600	\$0	\$20,250	\$264,500	\$241,200	\$949,500
East Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 2	+\$41,870	N/C	-\$9,180	N/C	-\$20,250	+\$190,700	N/C	+\$203,100
East Option 3	N/C	N/C	+\$51,770	N/C	N/C	+\$81,730	N/C	+\$133,500
Crossover Alternative	\$37,920	\$0	\$508,100	\$0	\$61,890	\$552,200	\$103,700	\$1,264,000
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for timber that would be cleared from the right-of-way, substations, and access roads.

3. Totals may not sum due to rounding. See Section 11.2.2.4, Government Revenue, for assumptions used to quantify these values.

4. Calculated in perpetuity.

5. Includes charitable, educational, penal, and reformatory institutions.

6. Represents the revenue from forgone timber harvest in Clark and Cowlitz counties; actual revenue impacts to the counties would vary depending on a variety of factors which are adjusted annually. In recent years, counties received about 70 percent of total harvest revenue from State Forest Lands.

Sources: Herrera 2010, Warren 2009, WDNR 2010c

Tax Revenue from Private Timber Harvest

During construction, the West Alternative would cause an increase of about \$940 (see Table 11-7) in the timber-harvest tax revenue of affected counties and the state government in Washington by triggering harvest of existing mature timber stock on private lands cleared for the project. This near-term increase would be the same with West Options 1 and 2, but larger with West Option 3. The West Alternative also would cause a long-term decrease in timber-harvest tax revenue during operation, by precluding future timber production on the cleared lands, with a total net present value of about \$2,610 (see Table 11-8). This long-term

decrease would be the same with West Options 1 and 2, but larger with West Option 3. The short-term increase and long-term decrease in timber-tax revenue would represent small changes compared to the annual tax-revenue collections from harvests in Clark and Cowlitz counties.

The revenue reduction likely would have a **moderate** impact on Cowlitz County's ability to meet all demands for public services, although it would not diminish the county's workforce and infrastructure. The change in timber production likely would have no impact on market prices for timber.

Table 11-7 Value of Tax Revenue from Timber Cleared from Private Lands (in 2011 dollars)^{1,2,3}

Alternatives and Options	Tax Revenue Recipient			Total
	Cowlitz County	Clark County	State of Washington	
West Alternative	\$750	\$0	\$190	\$940
West Option 1	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	N/C
West Option 3	N/C	+\$1,630	+\$410	+\$2,040
Central Alternative	\$38,370	\$14,390	\$13,190	\$65,950
Central Option 1	-\$890	N/C	-\$220	-\$1,110
Central Option 2	-\$9,080	N/C	-\$2,270	-\$11,350
Central Option 3	-\$360	-\$7,640	-\$2,000	-\$10,000
East Alternative	\$49,640	\$25,830	\$18,870	\$94,340
East Option 1	-\$7,520	N/C	-\$1,880	-\$9,400
East Option 2	N/C	-\$6,720	-\$1,680	-\$8,400
East Option 3	N/C	-\$910	-\$230	-\$1,140
Crossover Alternative	\$1,890	\$27,950	\$7,460	\$37,300
Crossover Option 1	N/C	N/C	N/C	N/C
Crossover Option 2	\$3,220	N/C	+\$810	+\$4,020
Crossover Option 3	\$4,490	N/C	+\$1,120	+\$5,610

Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for timber that would be cleared from the right-of-way and access roads.

3. Totals may not sum due to rounding.

Sources: Herrera 2010, Warren 2009, WDNR 2010c

Table 11-8 Net Present Value of Tax Revenue From Future Timber Harvests that Would Have Occurred on Private Lands but for the Project (in 2011 dollars)^{1,2,3,4}

Alternatives and Options	Tax Revenue Recipient			Total
	Cowlitz County	Clark County	State of Washington	
West Alternative	\$2,090	\$0	\$520	\$2,610
West Option 1	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	N/C
West Option 3	N/C	+\$4,530	+\$1,130	+\$5,670
Central Alternative	\$106,600	\$39,960	\$36,640	\$183,200
Central Option 1	-\$2,470	N/C	-\$620	-\$3,090
Central Option 2	-\$25,220	N/C	-\$6,310	-\$31,530
Central Option 3	-\$1,000	-\$21,220	-\$5,560	-\$27,780
East Alternative	\$137,900	\$71,750	\$52,410	\$262,100
East Option 1	-\$20,890	N/C	-\$5,220	-\$26,110
East Option 2	N/C	-\$18,660	-\$4,660	-\$23,320
East Option 3	N/C	-\$2,530	-\$630	-\$3,160
Crossover Alternative	\$5,260	\$77,640	\$20,730	\$103,600
Crossover Option 1	N/C	N/C	N/C	N/C
Crossover Option 2	\$8,940	N/C	+\$2,240	+\$11,170
Crossover Option 3	\$12,480	N/C	+\$3,120	+\$15,600

Notes:
N/C – No net change from the action alternative
1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.
2. Calculated for timber that would be cleared from the right-of-way and access roads.
3. Totals may not sum due to rounding.
4. Calculated in perpetuity.
Sources: Herrera 2010, Warren 2009, WDNR 2010c

11.2.4.2 Agricultural Production

During construction, the West Alternative would cause a decrease in revenue of about \$820,000 by removing crops both inside and outside of the right-of-way (see Table 11-9). Some of this removal would be temporary; for example, crops removed for a temporary access road across an agricultural field needed for access to the right-of-way. The decrease would be larger with West Options 2 and 3. This represents a small proportion of the annual agricultural production revenues in Cowlitz, Clark, and Multnomah counties (about 0.5 percent of the revenue generated in 2007, in 2010 dollars). The decrease could be a greater proportion of agricultural revenue for individual landowners.

Over the life of the project, operation of the West Alternative would cause a decrease in revenue, with a net present value of about \$5,100,000, by permanently eliminating landowners' ability to produce crops within the tower footprints (see Table 11-10). This long-term decrease

would be larger with West Options 2 and 3. Landowners may not grow crops over 4 feet or crops requiring support structures within the entire right-of-way. Assuming landowners stop growing these crops in the right-of-way, the West Alternative would cause an additional long-term decrease in revenue, with a net present value of about \$7,200,000 (see Table 11-10). The decrease would be the same under all options. The long-term decrease would be small, relative to the annual value of agricultural production in Cowlitz, Clark, and Multnomah counties. The decrease could be proportionally more significant for an individual landowner.

The change in agricultural production likely would have no impact on regional prices for agricultural products. At the local level, impacts could be **low-to-moderate** if local prices for a particular product are affected by limited supply.

Table 11-9 Value of Crops Removed from Production During Construction (in 2011 dollars)^{1,2,3,4}

Alternatives and Options	Type of Crop						Total
	Blue-berries	Christmas Trees	Grapes ⁵	Hay/Silage	Nursery Stock	Strawberries	
West Alternative	\$0	\$130,000	\$94,000	\$2,400	\$290,000	\$310,000	\$820,000
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	+\$650	N/C	N/C	+\$650
West Option 3	N/C	N/C	N/C	+\$790	N/C	N/C	+\$790
Central Alternative	\$0	\$2,800	\$0	\$160	\$0	\$0	\$3,000
Central Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 2	N/C	N/C	N/C	-\$160	N/C	N/C	-\$160
Central Option 3	+\$35,000	N/C	N/C	N/C	N/C	N/C	+\$35,000
East Alternative	\$0	\$0	\$0	\$160	\$0	\$0	\$160
East Option 1	N/C	N/C	N/C	-\$160	N/C	N/C	-\$160
East Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Alternative	\$0	\$2,800	\$0	\$0	\$0	\$0	\$2,800
Crossover Option 1	N/C	N/C	N/C	+\$650	N/C	N/C	+\$650
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for crops that would be cleared from the right-of-way and access roads.

3. Totals may not sum due to rounding.

4. Calculated in perpetuity.

5. Grapes are the crop produced on land the Washington State Department of Agriculture data classifies as a vineyard.

Sources: Cross et al. 1991; Julian et al. 2011; USDA NASS 2009a, 2009b; Washington Department of Agriculture, 2009.

Table 11-10 Net Present Value of Revenue from Crops that Farmers Would Have Grown but for the Project (in 2011 dollars)^{1,2,3}

Alternatives and Options	Type of Crop						Total
	Blue-berries	Christmas Trees	Grapes ⁴	Hay/Silage	Nursery Stock	Straw-berries	
Crops on Land that Would be Occupied by Tower Footprints and Access Roads within and outside Right-of-Way							
West Alternative	\$0	\$830,000	\$710,000	\$14,000	\$1,900,000	\$1,600,000	\$5,100,000
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	+\$4,700	N/C	N/C	+\$4,700
West Option 3	N/C	N/C	N/C	+\$4,300	N/C	N/C	+\$4,300
Central Alternative	\$0	\$110,000	\$0	\$5,100	\$0	\$0	\$120,000
Central Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 2	N/C	N/C	N/C	-\$5,100	N/C	N/C	-\$5,100
Central Option 3	+\$400,000	N/C	N/C	N/C	N/C	N/C	+\$400,000
East Alternative	\$0	\$0	\$0	\$5,300	\$0	\$0	\$5,300
East Option 1	N/C	N/C	N/C	-\$5,100	N/C	N/C	-\$5,100
East Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Alternative	\$0	\$110,000	\$0	\$0	\$0	\$0	\$110,000
Crossover Option 1	N/C	N/C	N/C	+\$3,700	N/C	N/C	+\$3,700
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crops not Allowed in the Right-of-Way⁵							
West Alternative	\$0	\$4,200,000	\$2,900,000	\$0	\$0	\$0	\$7,200,000
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Alternative	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Central Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 3	+\$970,000	N/C	N/C	N/C	N/C	N/C	+\$970,000
East Alternative	\$0	\$0	\$0	\$0	\$0	\$0	\$0
East Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Alternatives and Options	Type of Crop						Total
	Blue-berries	Christmas Trees	Grapes ⁴	Hay/Silage	Nursery Stock	Straw-berries	
East Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Alternative	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Totals may not sum due to rounding.

3. Calculated in perpetuity.

4. Grapes are the crop produced on land the Washington State Department of Agriculture data classifies as a vineyard.

5. Calculated in perpetuity.

Sources: Cross et al. 1991; Julian et al. 2011; USDA NASS 2009a, 2009b; Washington Department of Agriculture, 2009.

11.2.4.3 Private Timber Production

Construction of the West Alternative would cause an increase of about \$18,810 (see Table 11-11) in the revenue derived from timber production of large commercial growers by triggering harvest of existing mature timber stock on lands that would be cleared for the project. This short-term increase would be the same with West Options 1 and 2, and larger with West Option 3. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. If the value of the trees that may be harvested because they could interfere with construction or operation outside of the right-of-way is included in the total, the increase would be about 7 percent greater than shown in Table 11-11 for the West Alternative and options (see Section 11.2.2.7, Private Timber Production, for assumptions). The increase for each individual landowner could be greater or less than the total increase.

Over the life of the project, the West Alternative would cause a long-term decrease in revenue, with a net present value of about \$52,260 (see Table 11-12), from timber harvests that would have occurred, but for the project, on private timberlands. The increase would be the same with West Options 1 and 2, and larger with West Option 3.

The decrease in timber production likely would have no impact on market prices for timber.

Table 11-11 Value of Timber Cleared from Private Lands (in 2011 Dollars)^{1,2,3,4}

Alternatives and Options	Longview Timberlands LLC	PacifiCorp⁵	Sierra Pacific Industries	Weyerhaeuser Company	Other Private⁶	Total
West Alternative	\$12,470	\$0	\$0	\$6,340	\$0	\$18,810
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	N/C	N/C	N/C
West Option 3	+\$40,810	N/C	N/C	N/C	N/C	+\$40,810
Central Alternative	\$502,200	\$35,960	\$108,300	\$672,600	\$0	\$1,319,000
Central Option 1	N/C	N/C	-\$22,230	N/C	N/C	-\$22,230
Central Option 2	-\$112,630	N/C	-\$108,280	-\$6,120	N/C	-\$227,030
Central Option 3	+\$44,690	-\$30,220	N/C	-\$214,480	N/C	-\$200,010
East Alternative	\$500,000	\$38,500	\$108,300	\$1,240,000	\$0	\$1,887,000
East Option 1	-\$142,890	N/C	-\$108,280	+\$63,150	N/C	-\$188,030
East Option 2	-\$41,290	N/C	N/C	-\$126,640	N/C	-\$167,930
East Option 3	-\$22,740	N/C	N/C	N/C	N/C	-\$22,740
Crossover Alternative	\$191,500	\$82,650	\$0	\$472,000	\$0	\$746,200
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	+\$80,460	N/C	N/C	+\$80,460
Crossover Option 3	N/C	N/C	+\$101,700	+\$10,670	N/C	+\$112,400

Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for timber that would be cleared from the right-of-way and access roads.

3. Totals may not sum due to rounding.

4. See Section 11.2.2.7, Private Timber Production, for assumptions used to quantify these values.

5. PacifiCorp harvests timber for wildlife habitat on its mitigation lands.

6. Assumes \$0: BPA acquires timber through easement negotiations because it is not cost-effective for small private landowners to harvest themselves.

Sources: Herrera 2010, Warren 2009

Table 11-12 Net Present Value of Revenue from Future Timber Harvests that Would Have Occurred on Private Lands but for the Project (in 2011 dollars)^{1,2,3,4,5}

Alternatives and Options	Longview Timberlands LLC	PacifiCorp ⁶	Sierra Pacific Industries	Weyerhaeuser Company	Other Private ⁷	Total
West Alternative	\$34,640	\$0	\$0	\$17,620	\$0	\$52,260
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	N/C	N/C	N/C
West Option 3	+\$113,300	N/C	N/C	N/C	N/C	+\$113,300
Central Alternative	\$1,395,000	\$99,880	\$300,800	\$1,868,000	\$0	\$3,664,000
Central Option 1	N/C	N/C	-\$61,750	N/C	N/C	-\$61,750
Central Option 2	-\$312,820	N/C	-\$300,760	-\$16,990	N/C	-\$630,570
Central Option 3	+\$124,100	-\$83,930	N/C	-\$595,730	N/C	-\$555,550
East Alternative	\$1,389,000	\$106,900	\$300,800	\$3,444,000	\$0	\$5,241,000
East Option 1	-\$396,880	N/C	-\$300,760	+\$175,400	N/C	-\$522,240
East Option 2	-\$114,670	N/C	N/C	-\$351,740	N/C	-\$466,410
East Option 3	-\$63,150	N/C	N/C	N/C	N/C	-\$63,150
Crossover Alternative	\$531,900	\$229,600	\$0	\$1,311,000	\$0	\$2,073,000
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	+\$223,500	N/C	N/C	+\$223,500
Crossover Option 3	N/C	N/C	+\$282,400	+\$29,630	N/C	+\$312,000

Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for timber that would be cleared from the right-of-way and access roads.

3. Totals may not sum due to rounding.

4. See Section 11.2.2.7, Private Timber Production, for assumptions used to quantify these values.

5. Calculated in perpetuity.

6. PacifiCorp harvests timber for wildlife habitat on its mitigation lands.

7. Assumes \$0: BPA acquires timber through easement negotiations because it is not cost-effective for small private landowners to harvest themselves.

Sources: Herrera 2010, Warren 2009

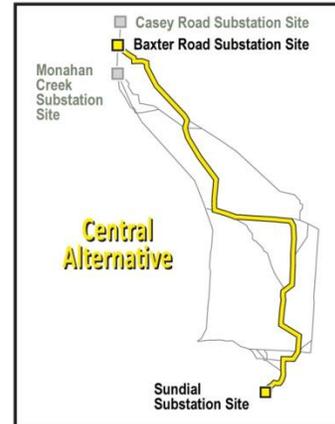
11.2.5 Central Alternative and Options

11.2.5.1 Government Revenue

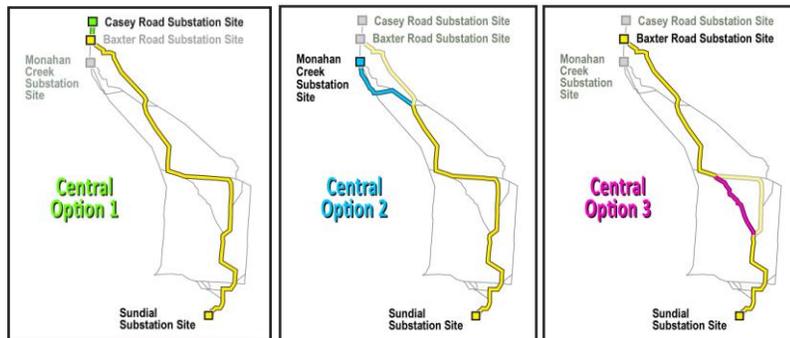
The Central Alternative would affect government revenue in Washington from state trust lands and from timber-harvest taxes.

Washington State Trust Lands Revenue

During construction, the Central Alternative would cause an increase of about \$2,276,000 (see Table 11-5) in timber-harvest revenue from state trust lands by triggering harvest of mature timber stock on lands cleared for the project. This short-term increase in revenue represents a small change (about 2 percent) compared to the annual revenue from timber sales for the trusts statewide, which was \$115 million in 2009. Trees harvested on State Forest Lands Trust land would increase near-term revenue for the state, as well as Clark and Cowlitz counties, which are beneficiaries of this trust.



Larger increases during construction would occur for Central Option 1, but smaller increases for Central Option 3 (there would be no change for Central Option 2). Some of the increase would be offset if timberland managers decide to



reduce harvest on other lands. If the value of the trees that may be harvested because they could interfere with construction or operation outside of the right-of-way is included in the total, the increase would be about 29 percent greater than shown in Table 11-5 for the Central Alternative and Central Option 2, and about 27 percent greater for Central Option 1 and Central Option 3 (see Section 11.2.2.4, Government Revenue, for assumptions). The increase for each individual landowner could be greater or less than the total increase.

Over the life of the project, the Central Alternative would create a long-term decrease in revenue, with a net present value of about \$1,778,000 (see Table 11-6) from forgone future harvests on the cleared lands. Greater decreases would occur for Central Option 1, but smaller decreases for Central Option 3. On an annualized basis, the long-term decrease likely would be small, relative to the annual statewide timber sales for each trust. The decrease in annual revenue would have a **high** impact on Cowlitz County or Clark County if it exceeds the average compensation cost per worker and triggers a reduction in workforce or infrastructure available for providing public services.

Tax Revenue from Private Timber Harvest

Construction of the Central Alternative would cause a short-term increase of about \$65,950 (see Table 11-7) in the timber-harvest tax revenue of affected counties and the state government in

Washington, by triggering harvest of existing mature timber stock on private lands cleared for the project. The increase would be smaller with Central Options 1, 2, and 3. The Central Alternative would cause a long-term decrease in timber-harvest tax revenue during operation, by precluding future timber production on the cleared lands, with a total net present value of about \$183,200 (see Table 11-8). The decrease would be smaller with the central options. The short-term increase and long-term decrease in timber tax revenue would represent small changes compared to the annual tax-revenue collections from harvests in Cowlitz and Clark counties. The decrease in annual revenue would have a **high** impact on Cowlitz County or Clark County if it exceeds the average compensation cost per worker and triggers a reduction in workforce or infrastructure available for providing public services.

11.2.5.2 Agricultural Production

Construction of the Central Alternative would cause a short-term decrease in revenue of about \$3,000 by removing crops both inside and outside of the right-of-way (see Table 11-9). Some of this removal would be temporary; for example, crops removed for a temporary access road across an agricultural field needed for access to the right-of-way. The decrease would be smaller with Central Option 2, but larger with Central Option 3. This represents a small proportion of the annual agricultural production revenues in Cowlitz, Clark, and Multnomah counties (about 0.005 percent of the revenue generated in 2007, in 2010 dollars, a level unlikely to be discernable in the regional economy). The decrease could be a greater proportion of agricultural revenue for individual landowners.

Operation of the Central Alternative would cause a long-term decrease in revenue, with a present value of about \$120,000, by permanently eliminating landowners' ability to produce crops within the tower footprints (see Table 11-10). The decrease would be smaller with Central Option 2, but larger with Central Option 3. Landowners may not grow crops over 4 feet or crops requiring support structures within the entire right-of-way. Assuming landowners stop growing these crops in the right-of-way, the Central Option 3 would cause an additional long-term decrease in revenue, with a present value of about \$970,000 (see Table 11-10). The long-term decrease would be small, relative to the annual value of agricultural production in Cowlitz, Clark, and Multnomah counties. The decrease could be proportionally more significant for an individual landowner. The change in agricultural production likely would have no impact on regional prices for agricultural products. At the local level, impacts could be **low-to-moderate** if local prices for a particular product are affected by limited supply.

11.2.5.3 Private Timber Production

Construction of the Central Alternative would cause a short-term increase of about \$1,319,000 (see Table 11-11) in the revenue derived from timber production on private land by triggering harvest of existing mature timber stock on lands that would be cleared for the project. The increase would be smaller under Central Options 1, 2, and 3. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. If the value of the trees that may be harvested because they could interfere with construction or operation outside of the right-of-way is included in the total, the increase would be about 17 percent greater than shown in Table 11-11 for the Central Alternative and options (see Section 11.2.2.7, Private Timber Production, for assumptions). The increase for individual landowners could be greater or less than the total increase. Over the life of the project, operation of the Central Alternative would cause a long-term decrease in revenue, with a net present value of about \$3,664,000 (see Table 11-12), from forgone future timber harvests on the cleared lands. The decrease would be

greater under Central Options 1, 2, and 3. The change in timber production likely would have no impact on market prices for timber.

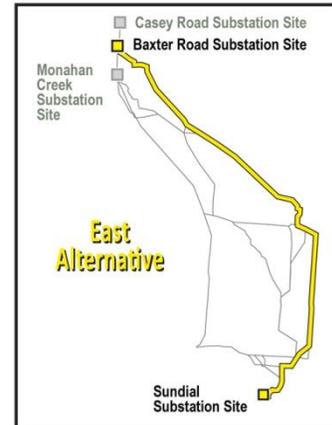
11.2.6 East Alternative and Options

11.2.6.1 Government Revenue

The East Alternative would affect government revenue in Washington from state trust lands and from timber-harvest taxes.

Washington State Trust Land Revenue

Construction of the East Alternative would cause a short-term increase of about \$1,215,000 (see Table 11-5) in timber-harvest revenue from state trust lands by triggering harvest of existing mature timber stock on lands cleared for the project. This increase in revenue represents a small change (about 1 percent), compared to the annual revenue from timber sales for the trusts statewide, which was \$115 million in 2009. Trees harvested on State Forest Lands Trust land would increase near-term revenue for the state, as well as Clark and Cowlitz counties, which are beneficiaries of this trust.



The increase would be larger under East Options 2 and 3. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. If the value of the trees that may be harvested because they could interfere with construction or operation outside of the right-of-way is included in the total, the increase would be about



26 percent greater than shown in Table 11-5 for the East Alternative and East Option 1, about 31 percent greater for East Option 2 and about 27 percent greater for East Option 3 (see Section 11.2.2.4, Government Revenue, for assumptions). The increase for each individual landowner could be greater or less than the total increase.

Over the life of the project, operation of the East Alternative would cause a long-term decrease in revenue, with a net present value of about \$949,500 (see Table 11-6) from forgone future harvests on the cleared lands. The decrease would be larger under East Options 2 and 3. On an annualized basis, the long-term decrease likely would be small, relative to the annual statewide timber sales for each trust.

The revenue reduction likely would have a **moderate** impact on the ability of Cowlitz County, Clark County, or both to meet all demands for public services, although it would not diminish either county's workforce and infrastructure.

Tax Revenue from Private Timber Harvest

Construction of the East Alternative would cause a short-term increase of about \$94,340 (see Table 11-7) in the timber-harvest tax revenue of affected counties and the state government in Washington, by triggering harvest of existing mature timber stock on private lands cleared for the project. Over the life of the project, the East Alternative would cause a long-term decrease in timber-harvest tax revenue during operation, by precluding future timber production on the cleared lands, with a total net present value of about \$262,100 (see Table 11-8). Both the short-term increase and the long-term decrease would be smaller under each of the options. The short-term increase and long-term decrease in timber-tax revenue would represent small changes compared to the annual tax-revenue collections from harvests in Cowlitz and Clark counties.

The revenue reduction likely would have a **moderate** impact on the ability of Cowlitz County, Clark County, or both to meet all demands for public services, although it would not diminish either county's workforce and infrastructure.

11.2.6.2 Agricultural Production

There is essentially no agricultural impact from the East Alternative during construction and operation, except for the tower footprints themselves, which would cause a long-term decrease in revenue (under all but East Option 1), with a present value of about \$5,300, by permanently eliminating landowners' ability to produce crops within the tower footprints (see Table 11-10). The long-term decrease would be small, relative to the annual value of agricultural production in Cowlitz, Clark, and Multnomah counties. The decrease could be proportionally more significant for an individual landowner. The change in agricultural production likely would have no impact on regional prices for agricultural products. At the local level, impacts could be **low-to-moderate** if local prices for a particular product are affected by limited supply.

11.2.6.3 Private Timber Production

During construction, the East Alternative would cause a short-term increase of about \$1,887,000 (see Table 11-11) in revenue derived from timber production on private land by triggering harvest of existing mature timber stock on lands that would be cleared for the project. The increase would be smaller under each of the options. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. If the value of the trees that may be harvested because they could interfere with construction or operation outside of the right-of-way is included in the total, the increase would be about 17 percent greater than shown in Table 11-11 for the East Alternative and options (see Section 11.2.2.7, Private Timber Production, for assumptions). Over the life of the project, the increase for each individual landowner could be greater or less than the total increase. The East Alternative would cause a long-term decrease in revenue, with a net present value of about \$5,241,000 (see Table 11-12), from forgone future timber harvests on the cleared lands. The decrease would be smaller under each of the options. The change in timber production likely would have no impact on market prices for timber.

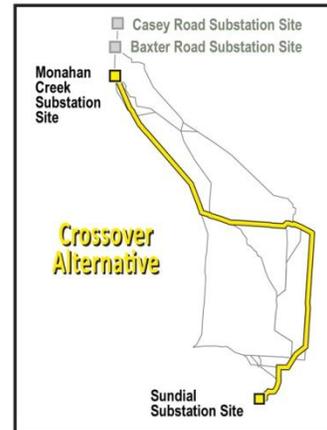
11.2.7 Crossover Alternative and Options

11.2.7.1 Government Revenue

The Crossover Alternative would affect government revenue in Washington from state trust lands and from timber-harvest taxes.

Washington State Trust Lands Revenue

During construction, the Crossover Alternative would cause an increase of about \$1,618,000 (see Table 11-5) in timber-harvest revenue from state trust lands by triggering harvest of existing mature timber stock on lands cleared for the project. This short-term increase in revenue represents a small change (about 1.5 percent) compared to the annual revenue from timber sales for each trust statewide, which was \$115 million in 2009. Trees harvested on State Forest Lands Trust land would increase near-term revenue for the state, as well as Clark and Cowlitz counties, which are beneficiaries of this trust.



The increase would be the same under each of the options. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. If the value of the trees that may be harvested because they could interfere with construction or operation outside of the right-of-way is included in the total, the increase would be about



26 percent greater than shown in Table 11-5 for the Crossover Alternative and its options (see Section 11.2.2.4, Government Revenue, for assumptions). The increase for each individual landowner could be greater or less than the total increase.

Over the life of the project, the Crossover Alternative would cause a decrease in revenue, with a net present value of about \$1,264,000 (see Table 11-6) from forgone future harvests on the cleared lands. This long-term decrease would be the same under each of the options. On an annualized basis, the long-term decrease likely would be small, relative to the annual statewide timber sales for each trust.

The revenue reduction likely would have a **moderate** impact on the ability of Cowlitz County, Clark County, or both to meet all demands for public services, although it would not diminish either county's workforce and infrastructure.

Tax Revenue from Private Timber Harvest

During construction, the Crossover Alternative would cause an increase of about \$37,300 (see Table 11-7) in the timber-harvest tax revenue of affected counties and the state government in Washington, by triggering harvest of existing mature timber stock on private lands cleared for

the project. The Crossover Alternative would cause a long-term decrease in timber-harvest tax revenue during operation, by precluding future timber production on the cleared lands, with a total net present value of about \$103,600 (see Table 11-8). Both the short-term increase and the long-term decrease would be larger under Crossover Options 2 and 3. Increases and decreases in timber-tax revenue would represent small changes relative to annual tax revenue collections from harvests in Cowlitz and Clark counties.

The revenue reduction likely would have a **moderate** impact on the ability of Cowlitz County, Clark County, or both to meet all demands for public services, although it would not diminish either county's workforce and infrastructure.

11.2.7.2 Agricultural Production

During construction, the Crossover Alternative would cause a decrease in agriculture crop revenue of about \$2,800 by removing crops both inside and outside of the right-of-way (see Table 11-9). Some of this removal would be temporary; for example, crops removed for a temporary access road across an agricultural field needed for access to the right-of-way. The decrease would be larger with Crossover Option 1. This represents a small proportion of the annual agricultural production revenues in Cowlitz, Clark, and Multnomah counties (about 0.005 percent of the revenue generated in 2007, in 2010 dollars, a level unlikely to be discernable in the regional economy). The decrease could be a greater proportion of agricultural revenue for individual landowners.

Over the life of the project, the Crossover Alternative would cause a decrease in revenue, with a present value of about \$110,000, by permanently eliminating landowners' ability to produce crops within the tower footprints (see Table 11-10). This long-term decrease would be larger with Crossover Option 1. Landowners may not grow crops over 4 feet or crops requiring support structures within the entire right-of-way. Assuming landowners stop growing these crops in the right-of-way, the Crossover Alternative would cause no additional long-term decrease in revenue. The long-term decrease would be small, relative to the annual value of agricultural production in Cowlitz, Clark, and Multnomah counties. The decrease could be proportionally more significant for an individual landowner, although landowners who grow new crops less than 4 feet high can make up for a part of that revenue. The change in agricultural production likely would have no impact on regional prices for agricultural products. At the local level, impacts could be **low-to-moderate** if local prices for a particular product are affected by limited supply.

11.2.7.3 Private Timber Production

During construction, the Crossover Alternative would cause an increase of about \$746,200 (see Table 11-11) in the revenue derived from timber production on private land by triggering harvest of existing mature timber stock on lands cleared for the project. The increase would be larger under Crossover Options 1 and 2. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands in response to project-induced timber harvest. If the value of the trees that may be harvested because they could interfere with construction or operation outside of the right-of-way is included in the total, the increase would be about 14 percent greater than shown in Table 11-11 for the Crossover Alternative and its options (see Section 11.2.2.7, Private Timber Production, for assumptions). The increase for each individual landowner could be greater or less than the total increase.

Over the life of the project, the Crossover Alternative would cause a long-term decrease in revenue, with a present value of about \$2,073,000 (see Table 11-12), from forgone future timber harvests on the cleared lands. The decrease would be larger under Crossover Options 2 and 3. The change in timber production likely would have no impact on market prices for timber.

11.2.8 Recommended Mitigation Measures

Mitigation measures included as part of the project are identified in Table 3 2. The following additional mitigation measures have been identified to further reduce or eliminate adverse socioeconomic impacts by the action alternatives. If implemented, these measures would be completed before, during, or immediately after project construction unless otherwise noted.

- Where appropriate, site transmission facilities to avoid WDNR lands planned for wind farms or other income generating opportunities.
- Use the Federal Highway Administration's Temporary Waiver to address relocations where landowners may owe more money than their house is worth, and BPA requires them to sell and relocate. The purpose of the temporary waiver is to make the landowner whole so that they can move into comparable housing. The temporary waiver is in effect until December 31, 2012. BPA could make the decision to continue to use this process even if the Federal Highway Administration decides not to extend it after 2012.
- Compensate the state trusts, using the appraisal process, to establish market value for state timber trust lands within the right-of-way and for access roads. Alternately, consider purchasing and donating similar timberlands elsewhere that would provide the same unencumbered market value as the affected lands.
- Compensate owners, using the appraisal process, to establish market value for private timberlands lands within the right-of-way and for access roads. Alternately, consider purchasing and donating similar timberlands elsewhere that would provide the same unencumbered market value as the affected lands.
- Compensate owners using the appraisal process to establish market value for agricultural related lands within the right-of-way and for access roads. Alternately, consider purchasing and donating similar agricultural lands elsewhere that would provide the same unencumbered market value as the affected lands.
- Compensate landowners using the appraisal process to establish the market value for any demonstrated increases in management costs related to the project right-of-way, substations, access roads, and other project-related factors.
- Minimize construction, operation, and maintenance activities around agricultural land or timberland during active production or harvest periods.

11.2.9 Unavoidable Impacts

After appropriate mitigation actions have been taken, assuming they would be implemented in full, the project could still produce several unavoidable impacts. The project could decrease human health and safety because of the risks of accidents for workers and the public. The project also could decrease the perceived value of some elements of natural and social capital

that contribute to the social and economic well-being of some households, businesses, communities, or groups. If mitigation does not fully address other direct and indirect costs of the project (e.g., future earnings from displaced activities, such as timber harvest or agricultural production), these unaddressed costs would become unavoidable impacts.

11.2.10 No Action Alternative

Without the project, the changes to revenues and expenditures, and the resulting socioeconomic impacts discussed in this chapter, would not occur. Trees inside and next to the project's right-of-way and access roads in forest lands would likely eventually be harvested, providing revenue for state trusts and private producers, and tax revenue for states and counties. Agricultural land inside and next to the project's right-of-way and access roads could eventually be developed for residential or commercial purposes, or used to grow trees or crops as they are today. New development, changes in land use, wildfire, or other natural or human-induced events may affect the views, sense of solitude, or other amenities current property owners or others within the project area enjoy. The specific timing, nature, or characteristics of these and other changes are impossible to predict.

Without the project, in the short-term, increased congestion on the region's transmission grid could directly increase the costs of using the existing transmission system (see Chapter 1, Purpose and Need). In the long-term, increased congestion would likely generate direct and indirect costs to electricity consumers by reducing transmission-system reliability in parts of Washington and Oregon. The costs of electricity outages to residential, commercial, and industrial customers are described in Section 11.1.8.5, Transmission System Reliability. Reduced reliability could contribute to some firms' decisions to relocate from Washington and Oregon to other states, resulting in fewer employment opportunities and reduced income for workers in Washington and Oregon. It also could cause companies that may be considering investing or locating in the region to make investments elsewhere, reducing the potential for long-term economic growth.

Increased incidence of brownouts could cause some residential and commercial property owners to invest in back-up electricity generators, incurring costs they otherwise would avoid. These investments, however, could increase the employment opportunities and incomes for workers and business owners who specialize in the sale and installation of such equipment, potentially offsetting some of the adverse employment-and income-related consequences of not investing in the project. Increased frequency of major disruptions in electricity service could also increase response times and reduce the availability of law-enforcement and fire-protection services for handling routine emergencies. These effects could diminish the quality of life for residents in the region.