ESTIMATED TOTAL PROJECT COST (in millions) (includes transmission lines and substations)	Cost estimates include survey, design, materials and construction for line, substations, and roads, line and road right of way acquisition, substation land acquisition, permits and mitigation, environmental clearance, communications, and project management. Direct costs only.

TRANSMISSION LINE RIGHT-OF-WAY (R/W) (excludes access roads)	**DATA SOURCES AND ASSUMPTIONS**
1. MILES OF NEW R/W NEEDED FOR THE NEW LINE	Transmission line and proposed R/W data from BPA's November 2010 Geographic Information System (GIS) database. Existing R/W data updated per David Evans and Associates' (DEA) survey Feb-May, 2011. BPA's GIS R/W was used in some cases where DEA did not have a complete survey. Transmission lines were coded based on R/W classifications (proposed and existing) and summed by segment to get the mile totals reported in the master spreadsheet.
2. MILES OF EXISTING R/W BE USED BY THE NEW LINE	
3. MILES OF NEW 500 KILOVOLT (KV) LINE (total of 1 and 2)	
4. MILES OF NEW R/W PARALLELING EXISTING LINES	Based on information from Line Item #1 (Transmission), segments paralleling existing lines (BPA and foreign utilities) were totaled based on November 2010 transmission line design models.
5. NUMBER OF HOUSES WITHIN 500' OF EDGE OF R/W (assumes 150' wide R/W)	Transmission line data from BPA's November 2010 GIS database. Housing data from HDR Engineering, Inc.'s (HDR) analysis using GIS and Computer-Aided Design (CAD) (see process stated below), National Agriculture Imagery Program (NAIP) 2009 aerial imagery, 2011 project specific Light Detection and Ranging (LiDAR) imagery where available, Clark and Cowlitz county parcel data provided by BPA, and Clark and Cowlitz county online mapping services. For a portion of the segments using GIS, an 1150' buffer off the proposed centerlines was created, 575' on each side. Clark and Cowlitz county parcels were selected based on the buffer to create a subset of parcels pertaining to the analysis area. Using the counties' use description codes, residential and other applicable values were selected to target parcels potentially containing habitable structures. Points were added to the centers of these polygons to create a starting point for the analysis. Each segment was then closely reviewed using the GIS data and the imagery. In cases where points were not on top of the homes, they were moved. In cases where there were no structures they were deleted. In many cases new points were added where habitable structures were observed based on the imagery. Clark and Cowlitz county online mapping services, which provide maps and assessors information, were used to supplement decision making in areas where habitable structures were questionable. This data underwent a final quality control (QC) review and structures were moved to the closest building corner in relation to the R/W. Once the data was QC reviewed and finalized, an assumed 150' R/W was created by buffering the planned transmission lines and homes were selected based on the distance criteria; 500', 300', 100', and 50' off edge of R/W. These numbers were summed by segment to get the totals reported in the master spreadsheet.
6. NUMBER OF HOUSES WITHIN 300' OF EDGE OF R/W (assumes 150' wide R/W)	
7. NUMBER OF HOUSES WITHIN 100' OF EDGE OF R/W (assumes 150' wide R/W)	
8. NUMBER OF HOUSES WITHIN 50' OF EDGE OF R/W (assumes 150' wide R/W)	
9. NUMBER OF HOUSES PARTIALLY WITHIN NEW R/W (*avoided w/reroute)	Proposed R/W data from BPA's November 2010 GIS database. Existing R/W data updated per DEA's survey Feb-May, 2011. BPA's GIS R/W was used in some cases where DEA did not have a complete survey. Housing data from HDR's analysis using GIS, same data as 5-8 (see process description stated above). The habitable structures were coded based on R/W classifications, proposed and existing analyzed based on a 500' buffer off an assumed 150' foot R/W for all segments.
10. NUMBER OF HOUSES PARTIALLY WITHIN EXISTING R/W (more study needed)	

TRANSMISSION LINE RIGHT-OF-WAY (R/W) (excludes access roads)	DATA SOURCES AND ASSUMPTIONS
11. NUMBER OF NON-HOME STRUCTURES PARTIALLY WITHIN NEW R/W (substantial structures including barns, garages, out buildings, etc.)	Proposed R/W data from BPA's November 2010 GIS database. Existing R/W data updated per DEA's survey Feb-May, 2011. BPA's GIS R/W was used in some cases where DEA did not have a complete survey. Non-home structure data from HDR's analysis using GIS and CAD (see process stated below), NAIP 2009 aerial imagery, 2011 project-specific LiDAR imagery where available, Clark and Cowlitz county parcel data provided by BPA, and Clark and Cowlitz county online mapping services. In GIS and CAD, each segment was reviewed closely and any structures that appeared to be non-home structures were digitized into a GIS or a CAD file. The data was coded based on whether the point fell into the existing or proposed R/W. These numbers were then totaled and reported in the master spreadsheet.
12. NUMBER OF NON-HOME STRUCTURES PARTIALLY WITHIN EXISTING R/W (substantial structures including barns, garages, out buildings, etc.)	
13. NUMBER OF SCHOOLS W/BUILDINGS W/K-12-AGED CHILDREN WITHIN 500' OF EDGE OF R/W (assumes 150' wide R/W)	School parcel locations were mapped by HDR during a prior analysis in October 2010 using Clark and Cowlitz county GIS data. This information was supplemented with internet research. The school parcels were analyzed based on a 500' buffer off of an assumed 150' foot R/W for all segments. These numbers were then totaled and reported in the master spreadsheet.
14. NUMBER OF DAYCARE FACILITIES WITHIN 500' OF EDGE OF R/W (assumes 150' wide R/W)	All of the segments were analyzed based on a 500' buffer off of an assumed 150' foot R/W for all of the segments using licensed daycare location data provided by Washington Educational Services District 112. Internet research was also done on daycare locations.
15. CIRCUIT MILES OF EXISTING LINES REBUILT	Circuit miles were totaled based on stationing of towers in the November 2010 transmission line design models. This number is not based on the actual length of conductor.
16. CIRCUIT MILES OF EXISTING LINES REMOVED	
17. ACRES OF TIMBER LAND PERMANENTLY IMPACTED (new R/W)	HDR performed GIS analysis using data provided by BPA and developed by Golder Associates. This sums the total acreage of forest production lands that would be permanently impacted by new R/W. GIS analysis totaled the intersection of proposed new R/W and tracts coded forest production in the land use data layer. Forest Production lands include lands owned exclusively by Longview Timberlands LLC, Weyerhaeuser Company, Sierra Pacific Industries, PacifiCorp, and the Washington Department of Natural Resources (WDNR). Impacted lands include all forest production lands, whether the land currently has trees on it or not, because the proposed transmission line would permanently take those lands out of production.
18. ACRES OF TIMBER LAND CLEARED (new R/W)	BPA Foresters examined the proposed and existing transmission line R/W using aerial photography to determine these quantities. Cleared land refers to the construction work necessary to remove all trees and shrubs from both the proposed and existing R/W to construct the new transmission line.
19. ACRES OF TIMBER LAND CLEARED (existing R/W)	
20. ACRES OF DANGER TREES CLEARED	Data was provided by BPA Foresters. A **danger tree** is a tree that occurs adjacent to the cleared right-of-way and is hazardous to the transmission line. These trees are removed to prevent any such tree from falling on to or otherwise interfering with a conductor. A tree would be identified as a danger tree if it could fall into, bend into, or grow into the conductor or close enough to cause a "flashover" of current from the conductor. Further, a swing-into danger tree is one that is likely to experience contact or "flashover" from the swing displacement of the conductor
21. NUMBER OF PRIVATE PARCELS WITH ORNAMENTAL TREES OFF R/W TRIMMED OR REMOVED	Data was provided by BPA Foresters.

TRANSMISSION LINE RIGHT-OF-WAY (R/W) (excludes access roads)	DATA SOURCES AND ASSUMPTIONS
22. MILES OF NEW R/W ON PUBLIC LAND	Proposed R/W data from BPA's November 2010 GIS database. Existing R/W data updated per DEA's survey Feb-May, 2011. BPA's GIS R/W was used in some cases where DEA did not have a complete survey. BPA provided landownership data from various sources, with the exception of the Port of Portland parcels, which were obtained by HDR. BPA obtained ownership data directly from WDNR and Longview Timberlands LLC. The remaining landowner parcels were queried from the Clark and Cowlitz county parcel GIS datasets. Public, federal, state, and park lands were included in BPA's landownership feature class from GIS. Using the output from Line Item 1 where transmission lines were coded based on R/W classifications; proposed new R/W segments were intersected with the landownership data. The output line segment lengths were recalculated and summed by segment based on landowner to get mile totals. Final conclusions based on the output indicate there are no occurrences of Tribal land, park land, or state land outside of WDNR property. Park land includes all designated park lands (WDNR, county, and municipal parks) and golf courses. WDNR lands were further analyzed to determine the length of miles of new line that would be on WDNR land and running along the edge of WDNR parcels as well as the length of new line that would traverse across WDNR parcels.
23. MILES OF NEW R/W ON FEDERAL LAND	
24. MILES OF NEW R/W ON STATE LAND (including WDNR)	
25. MILES OF NEW R/W ON WDNR LAND (total of 26 and 27)	
26. MILES OF NEW R/W ON WDNR LAND (on property edge)	
27. MILES OF NEW R/W ON WDNR LAND (not on property edge)	
28. MILES OF NEW R/W ON PRIVATE LAND	
29. MILES OF NEW R/W ON WEYERHAEUSER COPMPANY LAND	
30. MILES OF NEW R/W ON SIERRA PACIFIC INDUSTRIES LAND	
31. MILES OF NEW R/W ON LONGVIEW TIMBERLANDS LLC LAND	
32. MILES OF NEW R/W ON TRIBAL LAND AND ALLOTMENTS	
33. MILES OF NEW R/W ON PACIFICORP LAND	
34. MILES OF NEW R/W ON PORT OF PORTLAND LAND	
35. MILES OF NEW R/W ON PARK LAND	
36. MILES OF NEW R/W ON SMALLER PRIVATE TREE FARMS	Proposed R/W data from BPA's November 2010 GIS database. Clark and Cowlitz county parcel data was used to determine private tree farms by querying use codes classified as Forestry. Weyerhaeuser Company, Sierra Pacific Industries, Longview Timberlands LLC, PacifiCorp, and public land parcels were then removed from this query to isolate what is believed to be smaller private tree farms and these parcels were exported to the landownership geodatabase. Using the Line Item 1 output where transmission lines were coded by R/W classification; proposed new R/W segments were intersected with the small private tree farms output. The output line segment lengths were recalculated and summed to get mile totals.
37. MILES OF NEW R/W ZONED RESIDENTIAL	This data was taken from Table 6 of the Summary of Zoning and Population Data in Support of the I-5 Corridor Reinforcement Project Report (March 18, 2011) prepared by Golder Associates and provided to HDR. For segments with both existing and new right-of-way, the data was prorated based on the length of right-of-way (existing or new) and a percentage assigned to each zoning type using Figures 2A and 2B from the Golder report. The Open Space Zoning category includes lands that are zoned as Rural Undeveloped, Urban Reserve, and Preserved Open Space districts.
38. MILES OF EXISTING R/W ZONED RESIDENTIAL	
39. MILES OF NEW R/W ZONED COMMERCIAL/MIXED USE	
40. MILES OF EXISTING R/W ZONED COMMERCIAL/MIXED USE	
41. MILES OF NEW R/W ZONED INDUSTRIAL	
42. MILES OF EXISTING R/W ZONED INDUSTRIAL	
43. MILES OF NEW R/W ZONED FOREST AND AGRICULTURE	
44. MILES OF EXISTING R/W ZONED FOREST AND AGRICULTURE	
45. MILES OF NEW R/W ZONED OPEN SPACE	

TRANSMISSION LINE RIGHT-OF-WAY (R/W) (excludes access roads)	DATA SOURCES AND ASSUMPTIONS
46. MILES OF EXISTING R/W ZONED OPEN SPACE	
47. ACRES OF WETLANDS POTENTIALLY IMPACTED (to be cleared)	Wetland data was provided by Herrera Environmental Consultants, and wetland clearing values were calculated by Golder Associates. Values represent acres of palustrine forested wetlands and palustrine scrub-shrub wetlands that will be cleared within the 150-foot R/W corridor. It does not include acres that will be cleared within substations, roads, or towers that occur outside the 150-foot R/W corridor.
48. ACRES OF WETLANDS POTENTIALLY FILLED (for towers and roads on the R/W)	Wetland data was provided by Herrera Environmental Consultants, and wetland fill values were calculated by Golder Associates. Values represent acres of palustrine forested wetland, palustrine scrub-shrub wetland, palustrine emergent wetland, palustrine aquatic bed wetland, and palustrine open water wetland that will be filled for construction of towers and on R/W roads. Improved roads were assumed to have a 20-foot corridor of potential fill and new roads were assumed to have a 30-foot corridor of potential fill. Tower footings were assumed to create 0.065 acre of potential fill per tower.
49. NUMBER OF RIVER CROSSINGS (new and existing R/W)	Analysis was performed by Golder Associates using the WDNR Watercourse Hydrography dataset. Rivers were differentiated from streams by the name of the watercourse. Watercourses including the name “river” were considered rivers, and all other features were considered streams.
50. NUMBER OF STREAM CROSSINGS (new and existing R/W)	
51. NUMBER OF STREAM CROSSINGS w/SPECIAL STATUS SPECIES (new and existing R/W)	Data from Washington Department of Fish and Wildlife’s (WDFW) fish distribution GIS dataset where presence of special status species crosses project segments.
52. MILES OF POTENTIALLY SUITABLE HABITAT FOR SPOTTED OWL	Data provided by US Fish and Wildlife Service (USFWS) 2003 data that indicates timbered areas that contain potential spotted owl habitat.
53. NUMBER OF SPOTTED OWL NESTS IN PROPOSED R/W AND DANGER TREE AREA	Point data from WDFW
54. MILES OF BALD EAGLE NESTING TERRITORY	Data from WDFW. Eagle nesting territory is a buffer of nesting sites, though no nests were found in the analysis.
55. MILES OF BALD EAGLE ROOSTING TERRITORY	Data from WDFW. Roosting territory may include both habitat and nesting territories.
56. MILES OF POTENTIALLY SUITABLE HABITAT FOR BALD EAGLE	Data from WDFW. This includes all bald eagle-related datasets, so it includes all nesting and roosting territories.
57. NUMBER OF BALD EAGLE NESTS IN PROPOSED R/W AND DANGER TREE AREA	Data from the Washington Natural Heritage Program (WNHP).
58. MILES OF SPECIAL-STATUS PLANT SPECIES	Plant data from WNHP, which includes and listed and non-listed plant species.
59. NUMBER OF CULTURAL RESOURCE AREAS - ARCHAEOLOGICAL SITES	Data provided by Washington Department of Archaeology and Historic Preservation (DAHP) GIS database.
60. NUMBER OF CULTURAL RESOURCE AREAS - HISTORIC PROPERTIES	
61. NUMBER OF CULTURAL RESOURCE AREAS - NATIONAL REGISTER SITES	
62. NUMBER OF CULTURAL RESOURCE AREAS BEING REVIEWED (cultural resources to which potential effects are considered difficult or impossible to avoid)	Data provided by Archaeological Investigations Northwest Inc. (AINW). Background research and predictive analysis done for all segments and alternatives.

TRANSMISSION LINE RIGHT-OF-WAY (R/W) (excludes access roads)	DATA SOURCES AND ASSUMPTIONS
63. NUMBER OF TOWERS WITHIN LANDSLIDE AREAS	Landslide GIS data was provided by GeoEngineers Inc., who compiled WDNR and United States Geologic Survey (USGS) landslide mapping information in addition to reviewing aerial photographs and percent slope maps.
64. NUMBER OF TOWERS WITHIN HIGH EROSION AREAS	Erosion GIS data was provided by GeoEngineers Inc. and counts structures within both the Severe and Very Severe categories.
65. MILES WITH SLOPES GREATER THAN 35 PERCENT	Steep slope GIS data was provided by GeoEngineers Inc. and compiled from 10-meter Digital Elevation Model data.

ACCESS ROADS	DATA SOURCES AND ASSUMPTIONS
1. MILES OF ACCESS ROAD RIGHTS ACQUIRED	This analyzed the length of road centerline needing rights acquisition using Clark and Cowlitz county road ownership classifications.
2. MILES OF ROADS NEWLY CONSTRUCTED (on transmission line R/W)	Data is based on preliminary access road design performed by HDR. The road centerlines were classified by type of construction and brought into GIS and analyzed based on the length that intersected with existing and proposed transmission right-of-way classifications.
3. MILES OF ROADS NEWLY CONSTRUCTED (off transmission line R/W - public)	
4. MILES OF ROADS NEWLY CONSTRUCTED (off transmission line R/W - private)	
5. MILES OF EXISTING ROADS IMPROVED (on transmission line R/W)	
6. MILES OF EXISTING ROADS IMPROVED (off transmission line R/W - public)	
7. MILES OF EXISTING ROADS IMPROVED (off transmission line R/W - private)	
8. MILES OF EXISTING ROADS W/NO CHANGE (on transmission line R/W)	
9. MILES OF EXISTING ROADS W/NO CHANGE (off transmission line R/W - public)	
10. MILES OF EXISTING ROADS W/NO CHANGE (off transmission line R/W - private)	
11. NUMBER OF NEW STREAM CROSSINGS (new roads on transmission line R/W)	Analysis was performed by Golder Associates using the WDNR Watercourse Hydrography dataset. Rivers were differentiated from streams by the name of the watercourse. Watercourses including the name “river” were considered rivers, and all other features were considered streams.
12. NUMBER OF NEW STREAM CROSSINGS (new roads off transmission line R/W)	
13. NUMBER OF STREAM CROSSINGS w/SPECIAL STATUS SPECIES (new roads off transmission line R/W)	Data from WDFW fish distribution GIS dataset where presence of special status species crosses access roads.

ACCESS ROADS		DATA SOURCES AND ASSUMPTIONS
14.	ACRES OF TIMBER LAND PERMANENTLY IMPACTED (off transmission line R/W)	HDR performed GIS analysis using data provided by BPA and developed by Golder Associates. This sums the total acreage of forest production lands that would be permanently impacted by roads. GIS analysis used a buffer of 30 feet for new construction and 20 feet for reconstruction (buffer widths were provided by BPA) intersected with forest production classifications in the land use data layer.
15.	ACRES OF TIMBER CLEARED (off transmission line R/W)	Assumed 100% of the Permanent Impact Area for new construction roads will need to be cleared and 10% for improved roads based on information from BPA.
16.	MILES OF LANDSLIDE AREAS (new roads on and off transmission line R/W)	Landslide GIS data was provided by GeoEngineers Inc., who compiled WDNR and USGS landslide mapping information in addition to reviewing aerial photographs and percent slope maps.
17.	MILES OF HIGH EROSION AREAS (new roads on and off transmission line R/W)	Erosion GIS data was provided by GeoEngineers Inc. and counts structures within the Severe and Very Severe categories.
18.	ACRES OF WETLANDS POTENTIALLY FILLED (new roads off transmission line R/W)	Wetland data was provided by Herrera Environmental Consultants, and wetland fill values were calculated by Golder Associates. Values represent acres of palustrine forested wetland, palustrine scrub-shrub wetland, palustrine emergent wetland, palustrine aquatic bed wetland, and palustrine open water wetland that will be filled for construction of new and improved roads off R/W. Improved roads were assumed to have a 20-foot corridor of potential fill and new roads were assumed to have a 30-foot corridor of potential fill.
19.	MILES OF POTENTIALLY SUITABLE HABITAT FOR SPOTTED OWL (new roads off transmission line R/W)	Potentially suitable Northern spotted owl derived from a merge and dissolve of 2 GIS datasets: 1) USFWS Spotted owl habitat (2003) and 2) WDFW's Northern spotted owl management circles of established sites.
20.	NUMBER OF SPOTTED OWL NESTS IN PROPOSED CLEARING AREA (new roads off transmission line R/W)	Point data from WDFW.
21.	MILES OF BALD EAGLE NESTING TERRITORY (new roads off transmission line R/W)	Data from WDFW. Eagle nesting territory is a buffer of nesting sites, though no nests were found in the analysis.
22.	MILES OF BALD EAGLE ROOSTING TERRITORY (new roads off transmission line R/W)	Data from WDFW. Roosting territory may include both habitat and nesting territories.
23.	MILES OF POTENTIALLY SUITABLE HABITAT FOR BALD EAGLE (new roads off transmission line R/W)	Data from WDFW. This includes all bald eagle-related datasets, so it includes all nesting and roosting territories.
24.	NUMBER OF BALD EAGLE NESTS IN PROPOSED CLEARING AREA (new roads off transmission line R/W)	Data from WDFW.
25.	MILES OF SPECIAL-STATUS PLANT SPECIES (off transmission line R/W)	Plant data from the WNHP, which includes and listed and non-listed plant species.
26.	NUMBER OF CULTURAL RESOURCE AREAS - ARCHAEOLOGICAL SITES	Data provided by Washington DAHP GIS database.
27.	NUMBER OF CULTURAL RESOURCE AREAS - HISTORIC PROPERTIES	
28.	NUMBER OF CULTURAL RESOURCE AREAS - NATIONAL REGISTER SITES	