
Bonneville Power Administration
Transmission Services

2015 BPA PLAN



December 2015

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Introduction

Purpose

The purpose of this document is to provide a ten year plan for reinforcements to BPA's transmission system, hereafter called the **BPA Plan**. The BPA Plan provides a narrative description of the transmission needs identified through the transmission planning process, the preferred alternative, an estimated cost, and estimated schedule for completion of the preferred alternative. The BPA Plan also reflects any plans for facilities needed to provide requested interconnection or long-term firm transmission service on the Transmission Provider's system. This BPA Plan is provided in accordance with Attachment K of the Bonneville Power Administration Open Access Transmission Tariff (OATT).

Description of the BPA Transmission System

The role of BPA's Transmission Services is to provide reliable open access transmission service for customers, utilities, generators, and power marketers consistent with applicable regulatory and statutory requirements. Transmission Services also provides asset management services for BPA's transmission assets including transmission system planning, design, construction, operations and maintenance.

BPA operates and maintains about 75% of the high-voltage transmission network in its service territory. BPA's service territory is approximately 300,000 square miles and includes Idaho, Oregon, Washington, western Montana and small parts of eastern Montana, California, Nevada, Utah, and Wyoming. BPA's transmission system includes more than 15,000 circuit miles of transmission lines and over 260 substations. The transmission system serves many sectors of the Northwest including publicly owned and investor owned utilities, independent power producers and direct service industries.

Acronyms

AVA – Avista Corp
BCTC – British Columbia Transmission Corporation
BPA – Bonneville Power Administration
CEC – Central Electric Cooperative
COI – California Oregon Intertie
FCRPS – Federal Columbia River Power System
FCRTS – Federal Columbia River Transmission System
FEC – Flathead Electric Cooperative
FERC – Federal Energy Regulatory Commission
GI – Generator Interconnection
HVDC – High Voltage Direct Current
IPC – Idaho Power Company
LADWP – Los Angeles Department of Water and Power
LGI – Large Generator Interconnection
LGIA – Large Generator Interconnection Agreement
LLI – Line and/or Load Interconnection
LVE – Lower Valley Energy
MEC – Midstate Electric Cooperative
NEPA – National Environmental Policy Act
NERC – North American Electric Reliability Corporation
NLI – Northern Lights, Inc.
NOS – Network Open Season

NWE – Northwestern Energy
OATT – Open Access Transmission Tariff
PAC - PacifiCorp
PGE – Portland General Electric
PSE – Puget Sound Energy
PTC – Production Tax Credit
RAS – Remedial Action Scheme
RRO – Regional Reliability Organization
SGI – Small Generator Interconnection
SOA – South of Allston
SOB – South of Boundary
SVEC – Surprise Valley Electrification Corporation
TSR – Transmission Service Request
UEC – Umatilla Electric Co-op
USACE – U.S. Army Corps of Engineers
USBR – U.S. Bureau of Reclamation
WECC – Western Electricity Coordinating Council
WOH – West of Hatwai
WOLM – West of Lower Monumental

Standards and Requirements

BPA is a member of the Western Electricity Coordinating Council (WECC). WECC is the Regional Reliability Organization (RRO) for the North American Electric Reliability Corporation (NERC). BPA Transmission Services applies the NERC/WECC Planning Standards to ensure reliability in planning the transmission system. Over the past several years, NERC has been revising the standards with the objective of making requirements clear and measurable. In many cases new requirements have been identified and some criteria are more stringent leading to new investments. Compliance with these standards is one of the driving factors behind capital investments on the transmission system.

Objective

The objective of the BPA Plan is to identify and describe reinforcement projects for the transmission system. The BPA Plan contains proposed projects identified to meet the forecast requirements of BPA and other customers over the 10-year planning horizon.

The Key Drivers for system expansion and reinforcement projects are described below.

Key Drivers

Reliability and Load Service

BPA plans the transmission system to serve expected loads and load growth based on forecasts. The forecast peak loads, plus long-term firm transmission service obligations, are used to determine the bulk system reinforcement requirements. BPA plans the system in accordance with the NERC WECC Planning Standards to maintain transmission system reliability.

Within the BPA service area, load growth occurs at different rates depending on the specific geographic area. BPA has divided its service area into 24 load service areas grouped by either electrical or geographical proximity. In the BPA Plan, the load areas are listed roughly in order from largest to smallest, based on the total estimated load served in each area.

Transmission Service

Qualified customers may request transmission service on BPA's transmission system. This service is requested through Transmission Service Requests (TSR) according to the terms of the BPA OATT. Transmission Service Requests are one of the drivers for system expansion projects.

Generator Interconnection Service

Qualified customers may request interconnection to BPA's system for interconnecting new generation. BPA receives Generator Interconnection (GI) Requests according to the Attachment L (Large Generator Interconnection Process) and Attachment N (Small Generator Interconnection Process) of the BPA OATT. The Generator Interconnection projects listed in the BPA Plan include projects over 20 MW (Large Generator Projects) which have an executed Large Generator Interconnection Agreement (LGIA) or construction agreement.

Line and Load Interconnection Service

Qualified customers may request new points of interconnection on BPA's transmission system. These Line or Load Interconnections (LLI) are typically for new load service or to allow the Customer to shift the delivery of service to different points on their system. This service is requested according to BPA's Line and Load Interconnection Procedures (version 2) Business Practice. Similar to the generator interconnection projects, only larger projects which have an executed interconnection or construction agreement are included in the BPA Plan.

BPA Plan Organization

The following sections of the BPA Plan describe the proposed new facilities organized by type of project. The types of projects include 1) Projects required to provide load service and meet Planning Reliability Standards, 2) Projects required to meet requests for transmission service, 3) Projects required to meet requests for Generator Interconnection service, and 4) Projects required to meet requests for Line and Load Interconnection service. Some projects may satisfy multiple criteria; however they will only be described once in the BPA Plan.

In addition to proposed projects, the 2015 BPA Plan includes a listing of "Recently Completed Projects" for each load area or path. This category includes projects which have been completed since the previous update to the BPA Plan (for 2014).

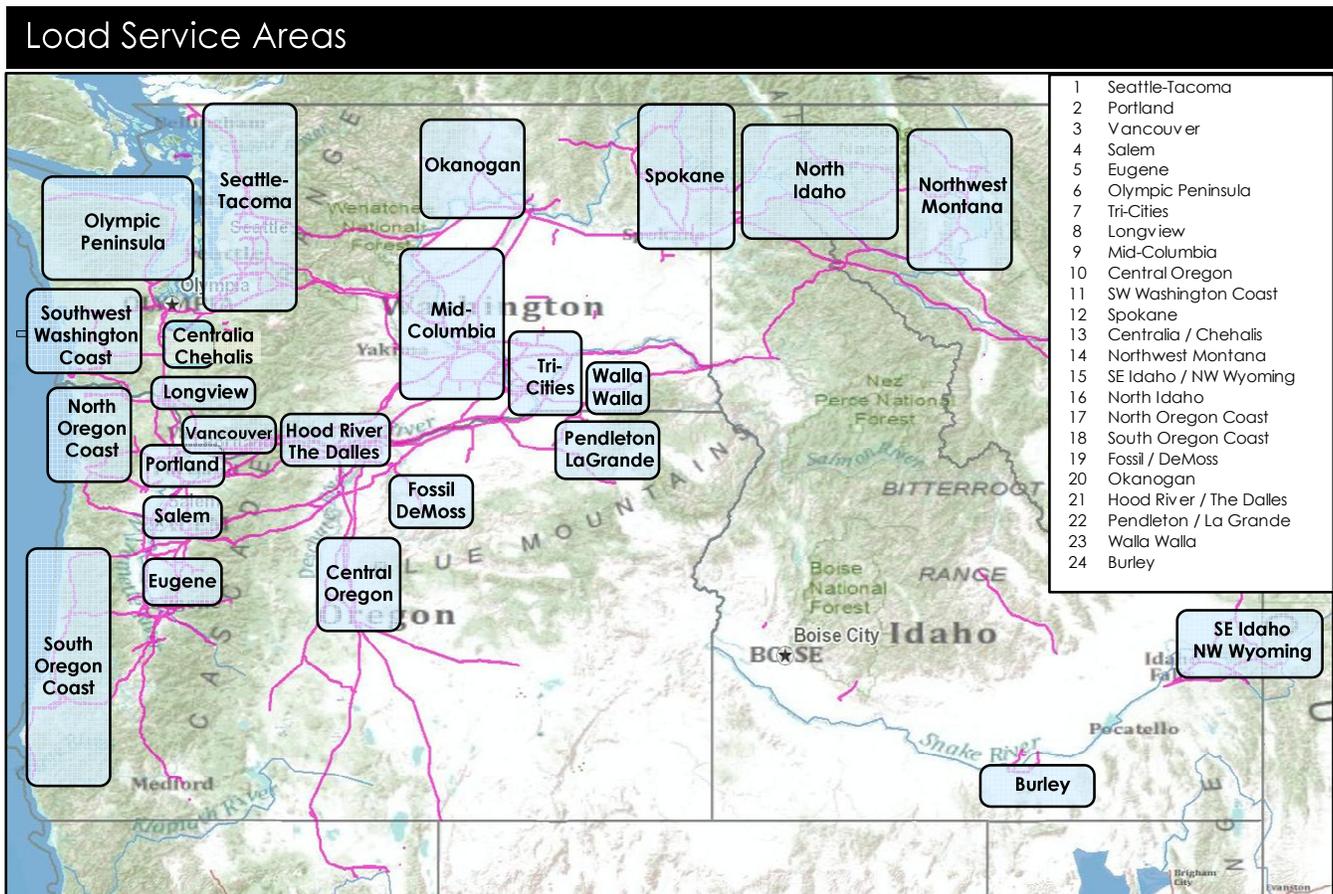
Where applicable, there is also a category called "Deferred Plans of Service". This consists of plans of service which have been mentioned in previous BPA Plans; however the present year's system assessment shows the need date has moved out in time. This is typically a result of reduced load growth resulting in changes to the load forecast for the particular area.

NOTES:

1. Estimated Project Costs are "direct" costs (overheads are not included)
2. Where official cost estimates have not been developed, the indicated project cost reflects the best information available, based on typical costs of similar projects.

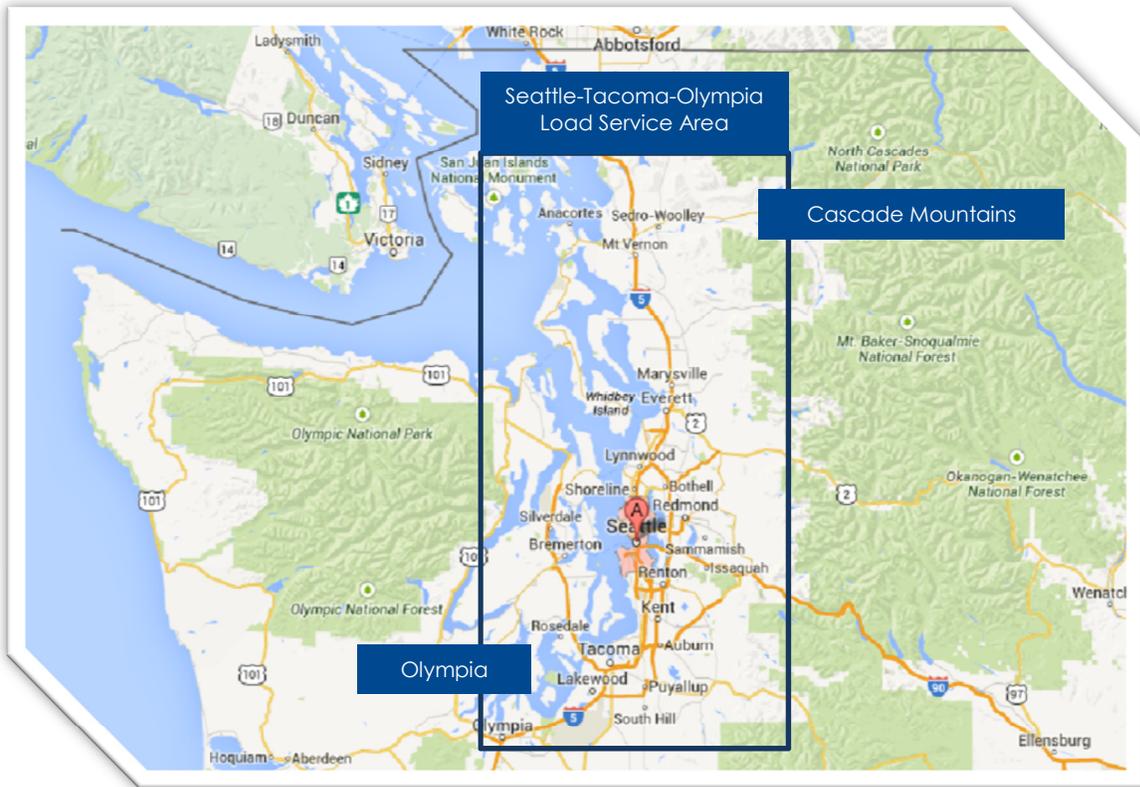
Load Service Areas

BPA's service territory is divided into 24 load service areas based on electrical or geographical proximity. The load areas range from major load centers such as Seattle-Tacoma and Portland, to smaller load areas like the DeMoss/Fossil load area. In the BPA Plan, the load areas are listed roughly in order from largest to smallest, based on the total estimated load served in each area.



1 Seattle/Tacoma/Olympia Area

The Seattle/Tacoma/Olympia area includes a large portion of northwestern Washington. It is bordered on the north by Canada and on the south by Olympia. It is bordered on the east by the Cascade Mountains and on the west by the Puget Sound. It includes Whatcom, Skagit, Snohomish, King, Pierce, Thurston, and north Lewis counties. It includes the greater Seattle area including Bellevue and Everett. To the north of the Seattle metropolitan area includes Blaine, Bellingham, Sedro Woolley and Mount Vernon and to the south of the Seattle metropolitan area includes Puyallup and Olympia.



The customers in this area include:

- Whatcom County PUD (WPUd)
- Puget Sound Energy (PSE)
- Seattle City Light (SCL)
- Snohomish County PUD (SPUD)
- Tacoma Public Utilities (TPU)
- Alder Mutual Light Co. (Mutual)
- City of Eatonville (Mutual)
- City of Milton (Mutual)
- City of Steilacoom (Mutual)
- Elmhurst Light and Power (Mutual)
- Lakeview Light and Power (Mutual)
- Ohop Mutual Light (Mutual)
- Parkland Light and Power (Mutual)
- Peninsula Light (Mutual)

The load area is served by the following major transmission paths or lines:

- From the north by the Northwest-British Columbia path (or Northern Intertie)
- From the east by the West of Cascades North (WOCN) path
- From the south by the Raver-Paul path
- From the west by the Satsop-Olympia 230 kV and Satsop-Paul 500 kV lines

Local Generation and Load

The Seattle/Bellingham area has over 2500 MW of local generation which consists primarily of hydro and thermal (coal and gas-fired) generators. The Tacoma/Olympia area has approximately 750 MW of local generation. The local generation includes:

Seattle/Bellingham Sub-Area	Max. MW	Owner
PSA Generators		
Enserch	185	PSE
Fredonia	320	PSE
Sawmill (Fredonia)	33	PSE
Komo (Baker)	13	PSE
Lower Baker	85	PSE
Upper Baker	105	PSE
March Point (Texaco)	150	PSE
Ferndale	280	PSE
Sumas	140	PSE
Whitehorn	180	PSE
Diablo	170	SCL
Gorge	180	SCL
Ross	450	SCL
Jackson	120	SNPD
Other Generators		
Cedar Falls	30	SCL
Tolt River	17	PSE
Twin Falls	25	PSE
Snoqualmie Falls	54	PSE
TOTAL	2,537	

Tacoma/Olympia Sub-Area	Max. MW	Owner
Alder	50	TPWR
Frederickson, LLP (230 kV)	270	BPA/PSE
Frederickson, PSE (115 kV)	160	PSE
Cushman	145	TPWR
LaGrande	69	TPWR
Simpson	64	TPWR
TOTAL	758	

Seattle and Tacoma Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020 Summer	2020 Winter	2024 Summer	2024 Winter
	Summer	Winter				
Seattle/Tacoma/Olympia	7285	10080	7057	9768	7328	9945

Proposed Plans of Service

Tacoma 230 kV Series Bus Sectionalizing Breaker

- Description: This project adds a 230 kV series bus sectionalizing breaker at Tacoma Substation.
- Purpose: This project mitigates issues caused by a 230 kV bus sectionalizing breaker failure at Tacoma Substation.
- Estimated Cost: \$800,000
- Energization: 2017

Tacoma 230 kV Bus Tie Breaker

- Description: This project adds a 230 kV bus tie breaker, and a 230 kV auxiliary bus sectionalizing disconnect switch at Tacoma Substation.
- Purpose: This project improves operations and maintenance flexibility at Tacoma Substation.
- Estimated Cost: \$1,500,000
- Energization: 2017

Silver Creek Substation Reinforcements

- Description: This project adds a 230 kV breaker to separate the east and west 230 kV buses and adds a 69 kV circuit breaker on the low side of the 230/69 kV transformer bank No.1.
- Purpose: This project improves the reliability and facilitates maintenance of the station since a fault on the 230 kV bus (with the existing configuration) currently drops both 230/69 kV transformer banks.
- Estimated Cost: \$4,100,000
- Energization: 2019

Paul 500 kV Shunt Reactor Addition

- Description: This project adds a shunt reactor (180 MVAR at 550 kV) at Paul Substation.
- Purpose: This project is required to maintain voltage schedules in the Puget Sound area during light load conditions.
- Estimated Cost: \$9,500,000
- Energization: 2016

Raver 500/230 kV Transformer

- Description: This project adds a 1300 MVA, 500/230 kV transformer at Raver Substation. This project is part of the overall Puget Sound Area/Northern Intertie (PSANI) Regional Reinforcement Plan. This is a joint project between participating utilities in the Puget Sound area.
- Purpose: This project is required to support load growth in the Puget Sound area.
- Estimated Cost: \$41,500,000
- Energization: 2016

Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

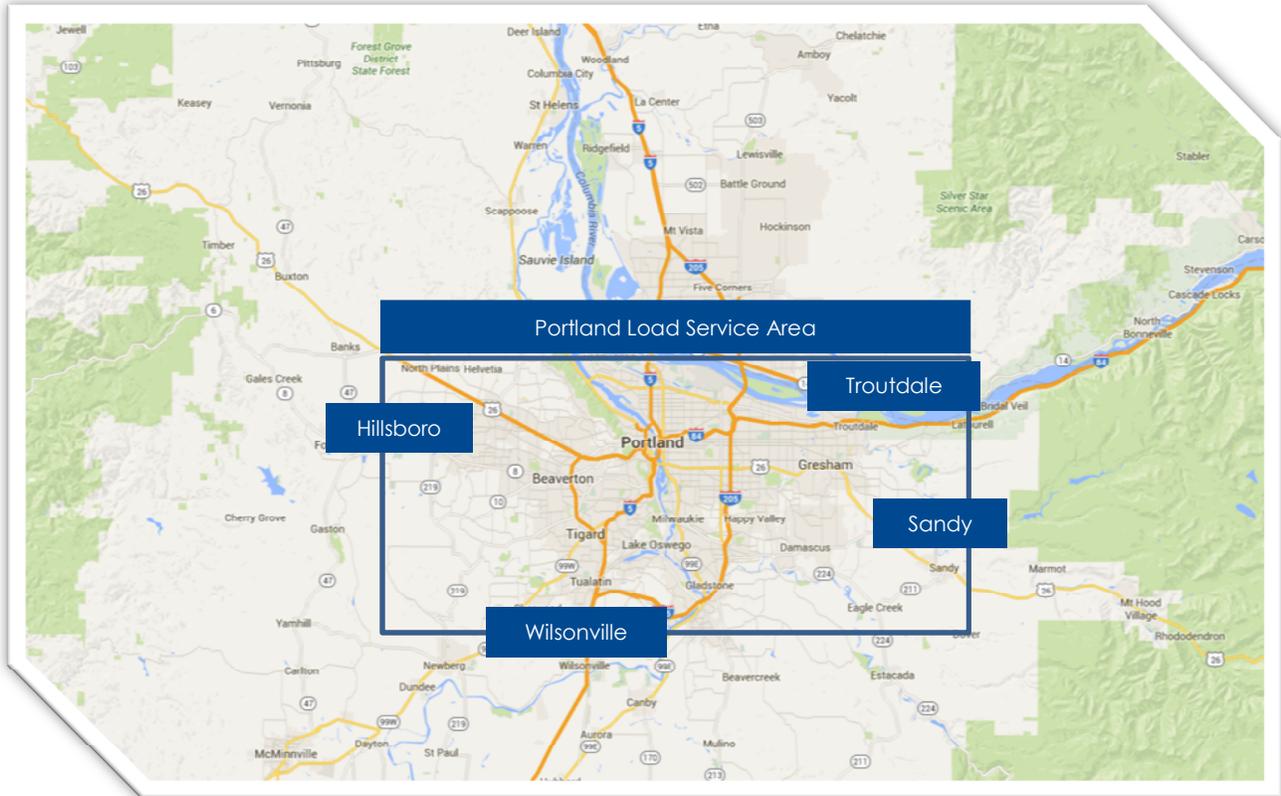
Deferred Plans of Service

Maple Valley 230 kV Series Bus Sectionalizing Breaker

- Description: This project adds a 230 kV series bus sectionalizing breaker at Maple Valley Substation.
- Purpose: This project mitigates a potential failure of the existing 230 kV bus sectionalizing breaker at Maple Valley Substation.
- Estimated Cost: \$2,000,000
- Energization: Beyond the planning horizon

2 Portland Area

The Portland load service area includes the greater Portland metropolitan area in Oregon and the surrounding communities of Troutdale, Gresham, Sandy, Beaverton, Hillsboro, Tigard, Tualatin and Wilsonville, Oregon. This area includes Multnomah, Washington, northeast Clackamas, and south Columbia counties.



The customers in this area include:

- Portland General Electric (PGE)
- PacifiCorp (PAC)
- City of Forest Grove
- Western Oregon Electric Coop.
- Columbia River PUD
- McMinnville Water and Light

The load area is served by the following major transmission paths or lines:

- From the north by the Paul-Allston path
- From the south by the Pearl-Ostrander and Pearl-Marion 500 kV lines
- From the east by the West of Cascades South (WOCS) path

Local Generation and Load

The Portland area has approximately 700 MW of local generation, including:

- (PGE) Beaver C.T. Generation (495 MW)
- (PGE) Bull Run Hydro #1 (21 MW)
- (City of Portland) Bull Run Hydro #2 (33 MW)
- (PGE) Faraday Hydro (33 MW)
- (PGE) North Folk Hydro (38 MW)
- (PGE) Oak Grove Hydro (50 MW)
- (PGE) River Mill Hydro (19 MW)
- (PGE) Sullivan Hydro (15 MW)

The Portland load service area is both summer and winter peaking with high levels of residential, commercial, and industrial loads. The peak summer loads are due to high levels of air conditioning load. The peak winter loads are due to high levels of base board electric heating load. The Portland area load forecast is:

Portland Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Portland	4012	4136	3883	4238	4058	4377

Proposed Plans of Service

Pearl 500 kV Upgrades

- Description: This project adds a 500 kV circuit breaker at Pearl Substation and re-terminates the Pearl 500/230 kV transformer No.2 into the new bay position.
- Purpose: This project will improve system reliability for the South of Allston path.
- Estimated Cost: \$2,100,000
- Energization: 2016

Keeler 500 kV 500/230 kV Transformer Re-termination

- Description: This re-terminates the Keeler 500/230 kV transformer from the west bus to the east bus.
- Purpose: This project will better balance the loads on the Keeler 230 kV bus.
- Estimated Cost: \$2,000,000
- Energization: 2017/18

Troutdale 230 kV Bus Sectionalizing Breaker Addition

- Description: This project adds a series 230 kV bus sectionalizing breaker at Troutdale Substation.
- Purpose: This project is required to maintain reliable load service to the Portland area.
- Estimated Cost: \$2,000,000
- Energization: 2018

I-5 Corridor Reinforcement Project

- Description: This proposed project includes a new 500 kV transmission line (approximately 79 miles) between a new substation in the vicinity of Castle Rock, Washington and a new substation in Troutdale, Oregon.
- Purpose: This project addresses the issue of providing reliable service to loads in southwest Washington and northwest Oregon. This project also meets the FERC Open Access requirements by building the necessary transmission facilities to accommodate requests for firm transmission service across BPA's network.
- This project was identified in the 2008 Network Open Season.
- Estimated Cost: \$720,000,000
- Energization: 2021

Carlton Upgrades

- Description: This project adds four additional circuit breakers at Carlton substation: two each at the 115 and 230 kV buses. Additionally, the Forest Grove–McMinnville 115kV line will be looped into the Carlton 115 kV bus, creating the Forest Grove–Carlton and Carlton–McMinnville 115kV lines.
- Purpose: This project improves operations and maintenance flexibility.
- Estimated Cost: \$3,800,000
- Energization: 2018

Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

Split Pearl-Sherwood 230 kV Lines and Re-terminate

- Description: This project splits the double circuit Pearl-Sherwood 230 kV #1 and #2 lines into separate circuits and develops the necessary 230 kV bay positions at Pearl and Sherwood.
- Purpose: This project is required to maintain reliable load service to the Portland area.
- Estimated Cost: \$1,500,000
- Energization: Beyond the planning horizon.

Split McLoughlin-Pearl-Sherwood 230 kV Lines and Re-terminate

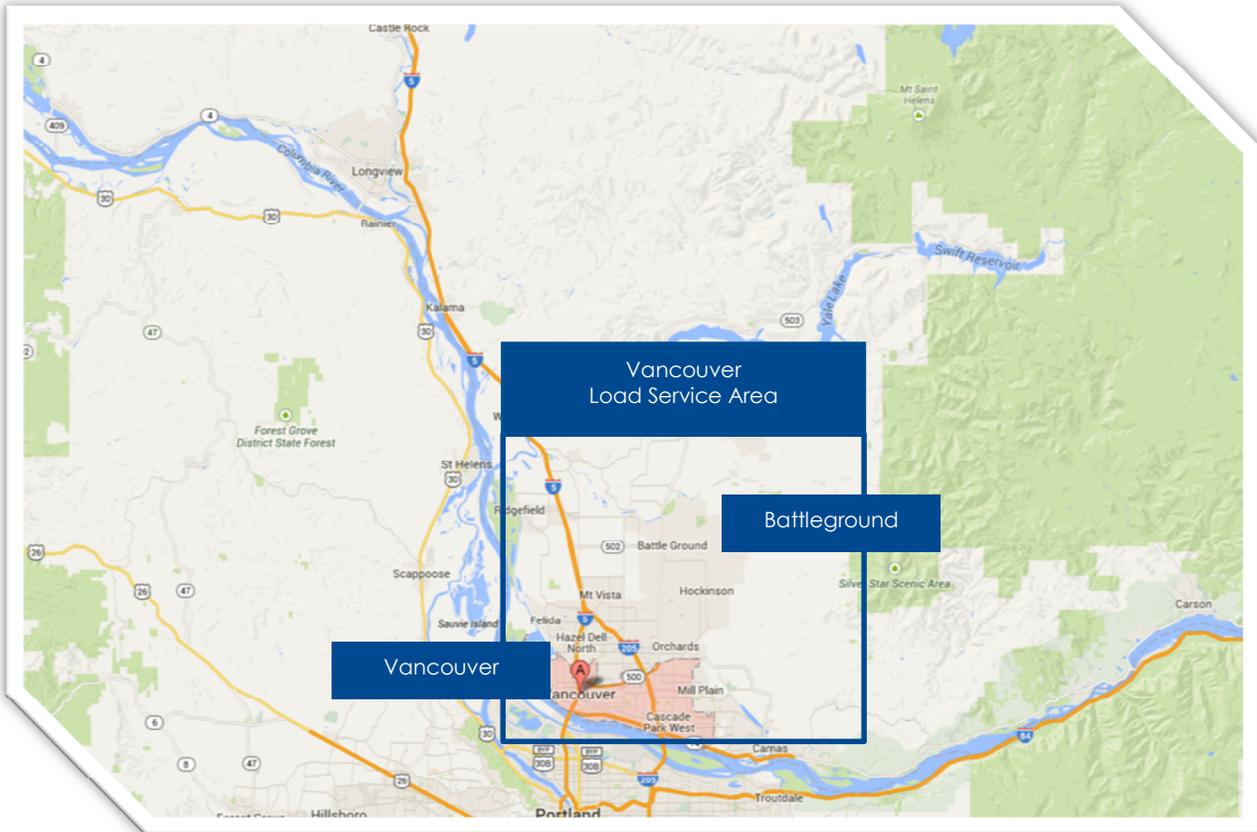
- Description: This project splits the double circuit portion of the McLoughlin-Pearl-Sherwood 230 kV line into separate circuits and develops the necessary 230 kV bay positions at Pearl and Sherwood.
- Purpose: This project is required to maintain reliable load service to the Portland area.
- Estimated Cost: \$1,500,000
- Energization: Beyond the planning horizon.

Pearl 230 kV Bus Sectionalizing Breaker Addition

- Description: This project adds a 230 kV bus sectionalizing breaker at Pearl Substation.
- Purpose: This project is required to provide reliable load service to the Portland area.
- Estimated Cost: \$2,000,000
- Energization: Beyond the planning horizon.

3 Vancouver Area

The Vancouver area is located in southwestern Washington State and encompasses Clark County. This area extends north to the border of the Longview load service area and east to the Cascade Mountain Range. It is bordered on the south and west by the Columbia River. This includes the greater Vancouver, Washington area and the communities of Washougal, Camas, Ridgefield, and Battleground.



The customers in this area include:

- Clark Public Utilities (Clark)

The load area is served by the following transmission facilities:

- North Bonneville-Ross 230-kV # 1
- North Bonneville-Ross 230-kV # 2
- McNary-Ross 345-kV
- Longview-Lexington-Ross 230-kV
- Bonneville-Alcoa 115 kV
- Bonneville-Sifton-Ross 115-kV
- (PAC) Merwin-Cherry Grove-Hazel Dell-St Johns 115-kV
- (PAC/Clark) Troutdale-Runyan-Sifton 115-kV

Local Generation and Load

The local generation that supports the area load includes:

- (Clark) River Road (250 MW)
- (PAC and Cowlitz PUD) Swift hydro (280 MW)
- (PAC) Merwin and Yale hydro (235 MW)
- (USACE) Bonneville Powerhouse #1 and #2 (1225 MW total)

Vancouver Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Vancouver	858	1143	752	972	781	1021

Proposed Plans of Service

North Bonneville-Troutdale 230 kV No.2 Line Re-termination

- Description: This project re-terminates the North Bonneville-Troutdale 230 kV line No.2 to the east bus section at North Bonneville Substation.
- Purpose: This project is required to support load service to the Vancouver area.
- Estimated Cost: \$2,400,000
- Energization: 2016

Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

Sifton Substation Upgrade

- Description: This project will add three 230 kV breakers and associated disconnect switches at Sifton Substation to create a ring bus. The taps to Sifton will be eliminated from the North Bonneville-Ross 230 kV lines No.1 and No.2. The North Bonneville-Ross 230 kV No.2 line will be looped into Sifton Substation.
- Purpose: This project will improve operations and maintenance flexibility.
- Estimated Cost: \$3,000,000
- Energization: On Hold/Deferred

Local Generation and Load

The local generation is mostly hydroelectric generation on the north and south forks of the Santiam River.

- (USACE) Foster Dam (22 MW)
- (USACE) Green Peter Dam (92 MW)
- (USACE) Detroit Dam (120 MW)
- (USACE) Big Cliff Dam (22 MW)
- (Consumer's Power, Inc.) Adair generation (5.6 MW)

Salem/Albany Area Peak Load Forecast (MW)						
Area (MW)	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Salem/Albany	907	1046	990	1122	1052	1184

Proposed Plans of Service

Salem-Albany No.1 and No. 2 115 kV line Upgrade

- Description: These 115 kV lines will be rebuilt with larger conductors as part of BPA's wood pole replacement program.
- Purpose: The system assessment did not show a need for the line upgrades within the 10-year planning horizon, but it will eventually be needed to maintain load service to the area. It is more efficient to complete the line upgrades at the same time as the wood pole replacement project.
- Estimated Cost: \$42,600,000
Included as part of the wood pole replacement program.
- Energization: 2016 (No.2 line) 2017 (No.1 line)

Santiam-Chemawa 230 kV Line Upgrade

- Description: This project upgrades the Santiam-Chemawa 230 kV line to a maximum operating temperature of 100 degrees C.
- Purpose: The system assessment showed a need for the line upgrade potentially beyond the 10-year planning horizon, but it will eventually be needed to maintain load service to the area. It is more efficient to complete the line upgrade at the same time as the steel pole replacement project for this line.
- Estimated Cost: Included as part of the steel pole replacement program.
- Energization: 2017/2018

Recently Completed Plans of Service

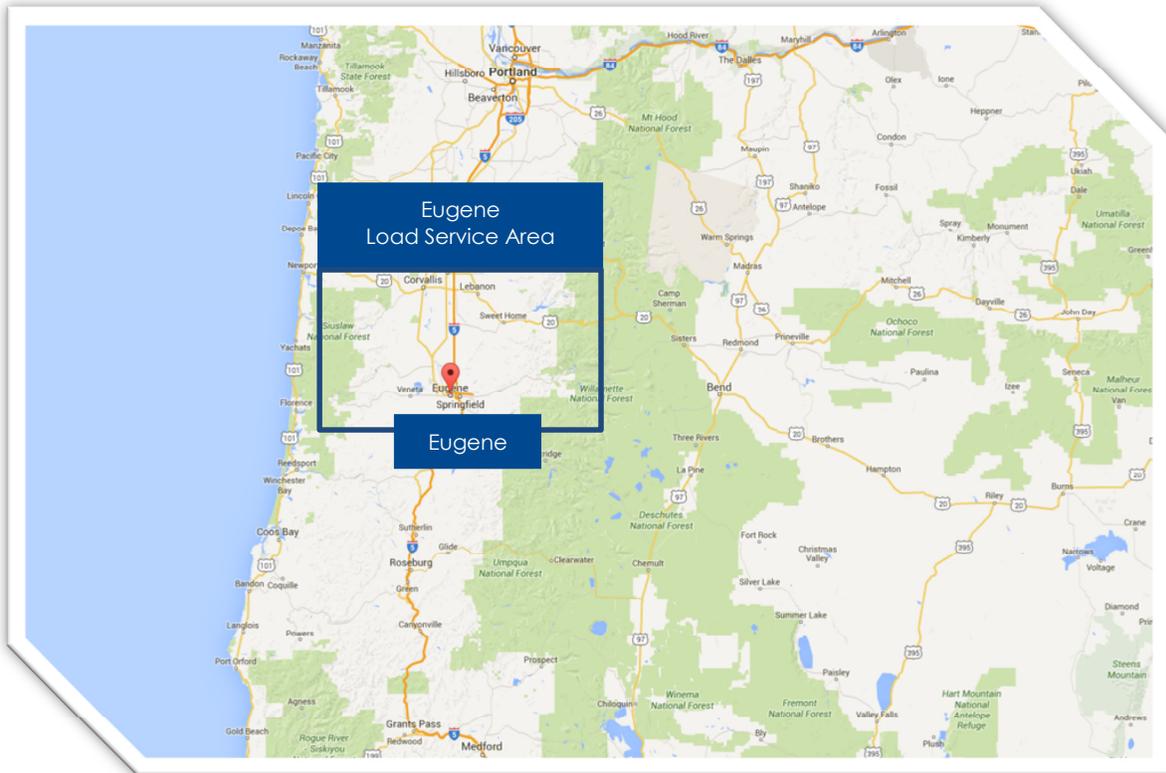
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

5 Eugene Area

This load area includes the western Central Willamette Valley in Oregon. It includes Polk, Benton, and Linn counties. It is bounded by Willamette National Forest on the east and the coast range on the west. It is bounded by the Salem/Albany load service area to the north and PacifiCorp's load service area south of Eugene. The major population areas include Eugene, Springfield, and Corvallis, and the communities of Harrisburg, Cottage Grove, and Drain.



The customers in this area include:

- PacifiCorp (PAC)
- Eugene Water and Electric Board (EWEB)
- Emerald PUD
- Several Electric Cooperatives: Blachley-Lane, Lane Electric, Douglas Electric, Coos-Curry, and Consumers Power, Inc. (serving rural areas)

The load area is served by the following major transmission paths or lines:

- From the east by the West of Cascades South (WOCS) path, the Big Eddy-Chemawa 230 kV line, and the Marion-Alvey 500 kV line
- From the south by the (PAC) Alvey-Dixonville 500 kV line

Local Generation and Load

The local generation in this area includes hydroelectric generation on the McKenzie River and other generation as follows:

- (EWEB) Carmen generation (94.5 MW)
- (USACE) Cougar generation (28 MW)
- (EWEB) Weyco generation (47 MW)
- (EWEB) Leaburgs generation (13.8 MW)
- (EWEB) Stone Creek generation (12.5 MW)
- (EWEB) Waltville generation (9.7 MW)
- (USACE) Hills Creek Green (34 MW)

Loads in this area are primarily residential and commercial, with a smaller industrial component. The Eugene area load forecast is:

Eugene Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Eugene	605	895	650	880	672	911

Proposed Plans of Service

Alvey 500 kV Shunt Reactor Addition

- Description: This project will add a new 500 kV Shunt Reactor (180 MVAR) at Alvey Substation.
- Purpose: This project is required to maintain voltage schedules during light load conditions in the Eugene area.
- Estimated Cost: \$10,300,000
- Energization: 2016

Alvey 115 kV Bus Sectionalizing Breaker Addition

- Description: This project will add a 115 kV bus sectionalizing breaker at Alvey Substation.
- Purpose: This project will improve operations and maintenance flexibility
- Estimated Cost: \$3,600,000
- Energization: 2020

Lane 230 kV Bus Sectionalizing Breaker Addition

- Description: This project will add a 230 kV bus sectionalizing breaker at Lane Substation.
- Purpose: This project is required to maintain reliable load service for the Eugene area.
- Estimated Cost: \$1,600,000
- Energization: 2016

Lane 230 kV Reactor Addition

- Description: This project will add a 230 kV reactor at Lane Substation.
- Purpose: This project is required to maintain voltage (180 MVARs) schedules during light load conditions in the Eugene area.
- Estimated Cost: \$2,800,000
- Energization: 2019

Recently Completed Plans of Service

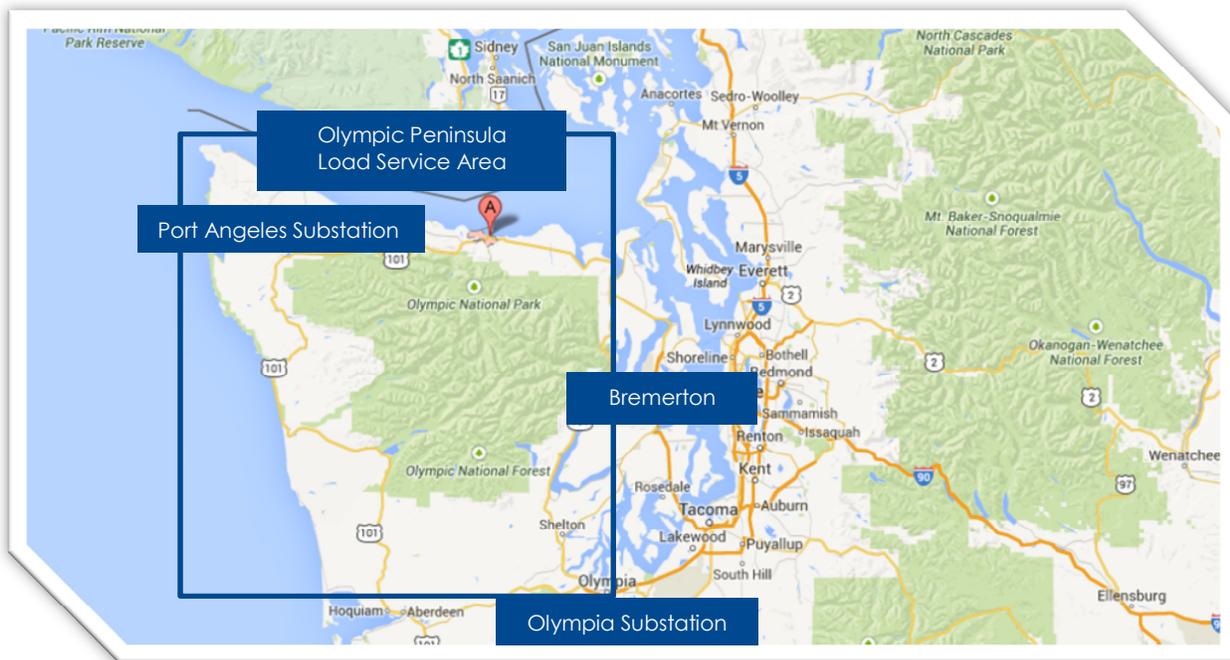
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

6 Olympic Peninsula Area

The Olympic Peninsula in Washington State is a long radial system extending about 110 miles from BPA's Olympia Substation northwest to BPA's Port Angeles substation. This area includes the Olympic Peninsula north and west of Olympia. Included within this area are Clallam, Mason, Kitsap and the western portion of Jefferson counties. The primary communities served include Shelton, Bremerton, and Port Angeles, as well as the US Navy in the Bremerton area. The smaller communities include Potlatch, Hoodspport, Quilcene, Fairmount, Duckabush, and Sequim.



The customers in this area include:

- Puget Sound Energy (PSE)
- City of Port Angeles (CPA)
- Clallam County PUD
- Mason PUD#1
- Mason PUD #3
- US Navy (USN)

The load area is served by the following major transmission paths or lines:

- Satsop-Shelton 230 kV line
- three Olympia-Shelton 230 kV lines
- two Olympia-Shelton 115 kV lines

Local Generation and Load

There is no generation connected directly to the load area, although there is some generation at Mason that serves the Tacoma area and the Grays Harbor plant located south of the load area.

Olympic Peninsula Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Olympic Peninsula	637	1245	787	1304	835	1326

Proposed Plans of Service

Sappho 69 kV Shunt Capacitor Addition

- Description: This project adds 69 kV shunt capacitors (7 MVAR) at Sappho Substation.
- Purpose: This project is required to maintain reliable load service to the Port Angeles area.
- Estimated Cost: \$1,900,000
- Energization: 2017

Kitsap 115 kV Shunt Capacitor Relocation

- Description: This project moves one group of 115 kV shunt capacitors from the south bus to the north bus at Kitsap Substation.
- Purpose: This project is required to maintain voltage schedules on the Kitsap Peninsula transmission system.
- Estimated Cost: \$1,400,000
- Energization: 2018

Fairmount 230 kV Reactor

- Description: This project will add a new 230 kV Shunt Reactor (40 MVAR) at Fairmount Substation.
- Purpose: This project is required to maintain voltage schedules during light load conditions in the Olympic Peninsula Load area.
- Estimated Cost: \$3,000,000
- Energization: 2017

Recently Completed Plans of Service

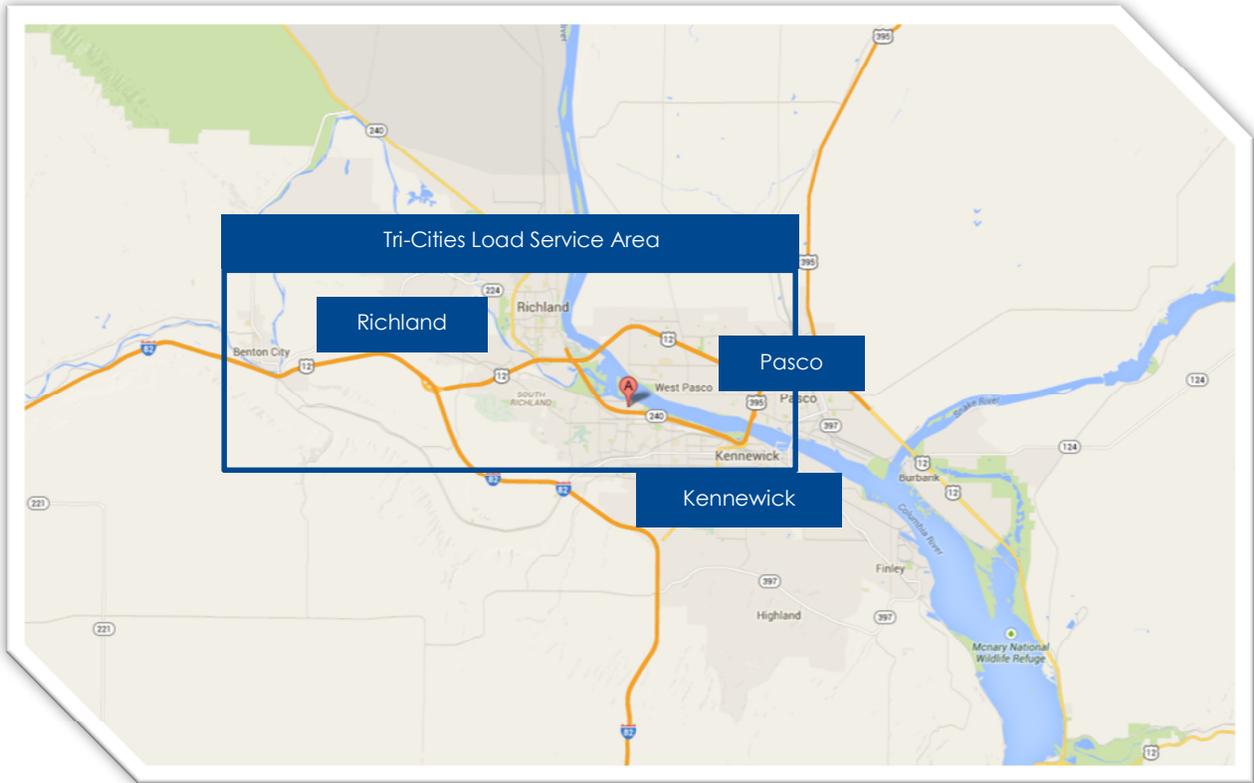
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

7 Tri-Cities Area

The Tri-Cities area is in South Central Washington and includes the three major communities of Pasco, Kennewick and Richland. This load area includes the irrigation loads of Big Bend Electric, Benton PUD, and Benton REA and many other communities near the Tri-Cities area such as West Richland and Benton City.



The customers in this area include:

- Franklin County PUD
- City of Richland
- Benton County PUD
- Benton REA
- Big Bend Electric Coop
- Columbia REA
- South Columbia Basin Irrigation District
- U.S. Bureau of Reclamation

The load area is served by the following major transmission paths or lines:

- From the east by the Lower Monumental-McNary 500 kV line which is tapped at Sacajawea with a 500/115 kV transformer
- From the north by the Midway-Benton 230 kV line and the Midway-White Bluffs 230 kV line
- From the south by the McNary-Franklin 230 kV line

Local Generation and Load

The local generation is mostly hydroelectric generation. The Columbia Generating Station (1100 MW) is physically located in the Tri-Cities area, but not electrically. Therefore it was not considered part of the local generation.

- (USACE) Ice Harbor hydro (700 MW)
- (USBR) Chandler hydro (12 MW)
- (USACE) McNary hydro (1200 MW)
- South Columbia Basin Irrigation District hydro (Scooteney, Glade & Ringold) (6 MW)
- (Florida Power) Nine Mile Wind (100 MW)
- (Energy NW) Nine Canyon Wind (90 MW)

Tri-Cities Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Tri-Cities	1050	943	1406	1135	1472	1166

Proposed Plans of Service

Badger Canyon 115 kV Bus Tie Addition

- Description: This project will add a 115 kV bus tie breaker at Badger Canyon Substation.
- Purpose: This project will improve operations and maintenance flexibility.
- Estimated Cost: \$1,100,000
- Energization: 2016

Grandview 115 kV Bus Tie Addition

- Description: This project will add a 115 kV bus tie breaker at Grandview Substation.
- Purpose: This project will improve operations and maintenance flexibility.
- Estimated Cost: \$1,800,000
- Energization: 2017

Midway-Grandview 115 kV Line Upgrade

- Description: Rebuild the 9 mile Midway – Blackrock 115 kV line section by summer 2016, and rebuild the 16 mile Blackrock – Grandview 115 kV line section by summer 2017.
- Purpose: This project is needed to provide adequate load service to the Tri-Cities area.
- Estimated Cost: \$15,300,000
- Energization: 2018

McNary 500/230 kV Transformer No.2

- Description: This project has two parts. The first part adds a 500/230 kV transformer (1428 MVA) at McNary Substation. The second part adds current limiting reactors (5 ohms) in series with the 230 kV bus sectionalizing breaker between bus sections one and two at McNary.
- Purpose: This project is required to reliably integrate generation in the McNary area.
- Estimated Cost: \$22,200,000
- Energization: 2017

Jones Canyon 230 kV Shunt Reactor Addition

- Description: This project adds a 230 kV shunt reactor (40 MVAR) at Jones Canyon Substation.
- Purpose: This project is required to maintain voltage schedules in the area during light load conditions.
- Estimated Cost: \$2,000,000
- Energization: 2017

Richland 115 kV Reconfiguration

- Description: This project adds a 115 kV load break disconnect switch at First Street Substation.
- Purpose: This project will allow load to be shifted in order to maintain reliable service and keep equipment loadings within rated limits.
- Estimated Cost: \$100,000
- Energization: 2016

White Bluffs 230/115 kV Low Side Disconnect Switches

- Description: This project increases the rating of the low side transformer disconnect switches at White Bluffs Substation.
- Purpose: This upgrade is needed to prevent equipment from exceeding rating limits.
- Estimated Cost: \$80,000
- Energization: 2017

Recently Completed Plans of Service

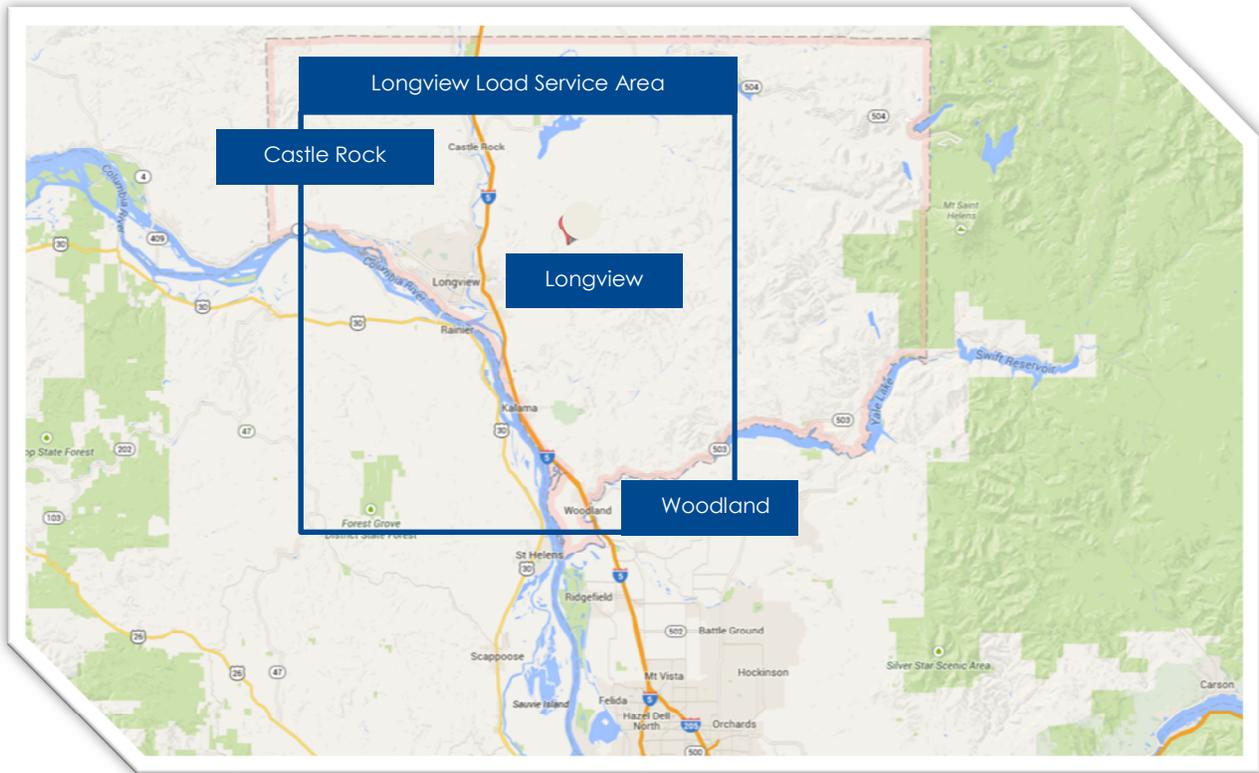
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

8 Longview Area

This area includes Cowlitz County in Washington State. The major population areas include Longview, Washington as well as the communities of Kelso, Kalama, Castle Rock, and Woodland, Washington.



The customers in this area include:

- Cowlitz PUD

The load area is served by the following major transmission paths or lines.

- Longview-Allston 230 kV #1 line
- Longview-Allston 230 kV #2 line
- Longview-Allston 230 kV #3 line
- Longview-Allston 115 kV #4 line
- Chehalis-Longview 230 kV #1 and #3 lines
- Ross-Lexington 230 kV line
- (PAC) Merwin-Cardwell 115 kV line

Local Generation and Load

The local generation that supports the area load includes:

- Mint Farm (270 MW)
- (PAC and Cowlitz PUD) Swift hydro (280 MW)
- (PAC) Merwin and Yale hydro (235 MW)
- Weyerhaeuser Company Generation (80MW)
- Longview Fiber Co-generation (55MW)

Longview Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Longview Area (Cowlitz PUD)	640	830	695	883	758	923

Proposed Plans of Service

Lexington 230 kV Bus Tie Breaker

- Description: This project adds a 230 kV bus tie breaker at Lexington Substation.
- Purpose: This project improves operations and maintenance flexibility.
- Estimated Cost: \$800,000
- Energization: 2016

Longview Area 230/115 kV Transformer Addition

- Description: This project adds a 230/115 kV transformer in the Longview area. It may be possible to accomplish this by re-strapping an existing 230/69 kV transformer bank to 230/115 kV operation.
- Purpose: This project is required to maintain reliable load service to the Longview area.
- Estimated Cost: \$8,000,000
- Energization: 2021

Recently Completed Plans of Service

Longview-Lexington 230 kV Line Re-termination

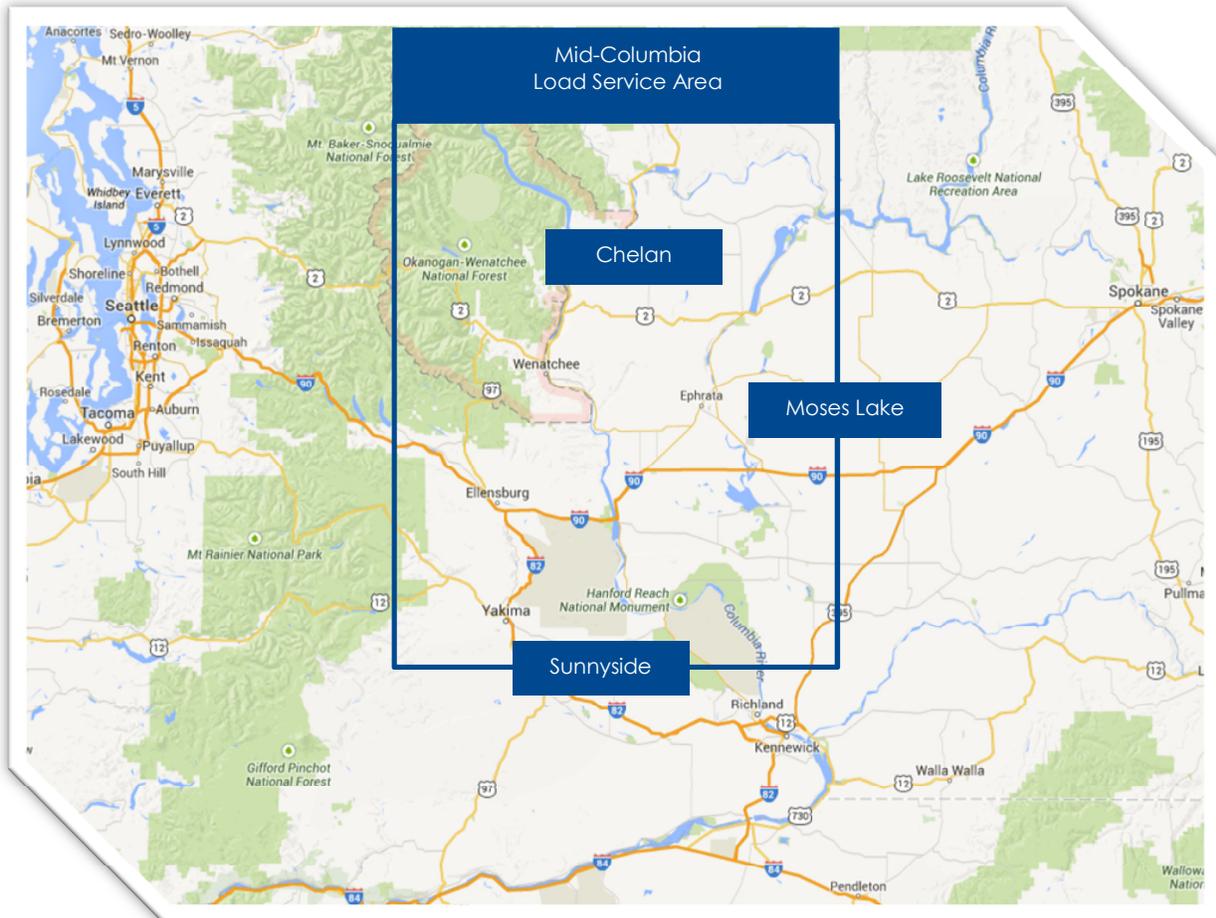
- Description: This project re-terminates the Longview-Lexington 230 kV line into the Longview 230 kV Annex Substation.
- Purpose: This project is required to maintain reliable load service to the Longview area.
- Estimated Cost: \$900,000
- Energization: 2015

Deferred Plans of Service

There are no deferred plans of service for this area.

9 Mid-Columbia Area

The Mid-Columbia (Mid-C) area includes the Columbia Basin area of central Washington, excluding the Tri-cities area (Kennewick, Pasco, and Richland), which is considered a separate load area. The Mid-C area extends from Moses Lake in Grant county, east to Leavenworth in Chelan county, Ellensburg in Kittitas county and Yakima in Yakima county to the west. It extends from Chelan and Douglas Counties to the north to Sunnyside in the south.



The customers in this area include:

- Chelan County PUD (Chelan)
- Douglas County PUD (Douglas)
- Kittitas County PUD (Kittitas)
- City of Ellensburg
- Benton REA (BREA)
- PacifiCorp (PAC)
- Benton County PUD (BPUD)
- Grant County PUD (Grant)

The load area is served by the following major BPA transmission branches:

- From the northeast by two Grand Coulee-Columbia 230 kV lines, a Grand Coulee-Rocky Ford 230 kV line and a Grand Coulee-Midway 230 kV line
- From the south by the Midway-Big Eddy and the Midway-North Bonneville 230 kV lines

Local Generation and Load

The local generation that supports the area load includes three classes:

Hydroelectric generation - There are 5 major hydroelectric plants on the Columbia River, including:

- (Douglas) Wells Dam (840 MW)
- (Chelan) Rocky Reach Dam (1287 MW)
- (Chelan) Rock Island Dam (660 MW)
- (Chelan) Wanapum Dam (1038 MW)
- (Grant) Priest Rapids Dam (955 MW)

Wind generation - There are 2 wind farms; these include:

- (PSE) Wild Horse (273 MW)
- (Horizon) Kittitas Valley Wind (101 MW)

Other Generation - The other local generation includes:

- (USBR) Roza Power Plant Yakima Project (13 MW)
- (Grant) Quincy Chute Hydroelectric (9.4 MW)
- (Grant) Potholes East Canal (6.5 MW)
- (Chelan) Chelan Falls Hydroelectric Project (59 MW)
- Summer Falls Power Plant (92 MW)

Mid-Columbia Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Mid-Columbia Load Area Total	2074	2321	2460	2741	2468	2785

Proposed Plans of Service

Columbia 230 kV Bus Tie and Bus Sectionalizing Breaker Addition

- Description: This project adds a new 230 kV bus tie breaker and 230 kV bus sectionalizing breaker at Columbia Substation.
- Purpose: This project improves operations and maintenance flexibility at the Columbia Substation.
- Estimated Cost: \$2,100,000
- Energization: 2016
(This project will be completed with the Northern Mid-Columbia Area Project, below).

Northern Mid-Columbia Area Project

- Description: This is a joint project between BPA, Grant PUD, Douglas PUD, and Chelan PUD. This project will result in a new Columbia-Rapids 230 kV line.
- Purpose: This project is required to maintain reliable load service to the Northern Mid-Columbia area.
- Estimated Cost: \$5,900,000 (the estimated cost is BPA's share of the total project cost).
- Energization: 2016

Moxee 115 kV Bus Tie Breaker Addition

- Description: This project will add a 115 kV bus tie breaker at Moxee Substation.
- Purpose: This project improves operations and maintenance flexibility.
- Estimated Cost: \$1,200,000
- Energization: 2017

Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

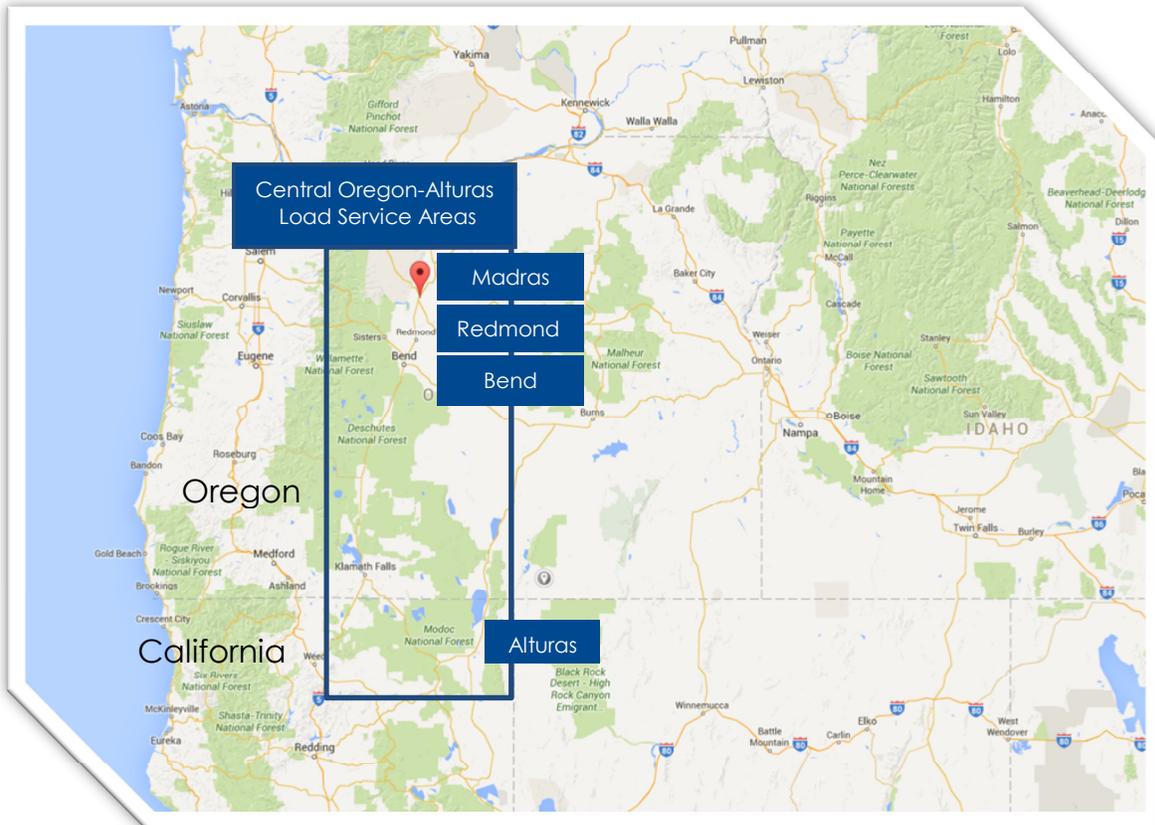
Deferred Plans of Service

There are no deferred plans of service for this area.

10 Central Oregon/Alturas Area

Central Oregon Area:

The Central Oregon area includes the communities of Madras to the north, the cities of Redmond and Bend to the west, the city of Prineville to the east and the city of La Pine and community of Sun River to the south. It includes Jefferson and Deschutes counties in Oregon.



The customers in the Central Oregon area include:

- PacifiCorp (PAC)
- Central Electric Cooperative (CEC)
- Midstate Electric Cooperative (MEC)

The Central Oregon load area is served by the following transmission facilities:

- Big Eddy-Redmond 230 kV line
- Round Butte-Redmond 230 kV line
- Ponderosa-Pilot Butte 230 kV line
- Ponderosa-Prineville 115 kV line

Alturas Area:

The Alturas area includes the northeast corner of Modoc County in northern California including the communities of Canby and Alturas.

The customers in the northern California area include:

- Surprise Valley Electrification Corporation (SVEC)
- PacifiCorp (PAC)

The Alturas load area is served by the following transmission facilities:

- Malin-Hilltop 230 kV line
- Hilltop-Warner 230 kV line terminated with a 230/115 kV transformer
- (PAC) Malin-Alturas 69 kV line
- (PAC) Chiloquin-Alturas 115 kV line

Local Generation and Load

The only significant local generation in the area is PGE's Pelton Round Butte Project. This is a hydroelectric project consisting of three hydroelectric plants: Round Butte Dam (338 MW), Pelton Dam (110 MW), and a reregulating dam (20 MW). The generation is interconnected at PGE's Round Butte Substation.

Central Oregon and Alturas Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Central Oregon Area	418	661	446	710	502	736
Alturas Area	113	85	110	81	118	87

Proposed Plans of Service

Ponderosa 230 kV Reactor

- Description: This project adds a 225 MVAR 241.5 kV shunt reactor at Ponderosa Substation.
- Purpose: This project is required to provide voltage control in the Central Oregon area.
- Estimated Cost: \$5,700,000
- Energization: 2018

Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

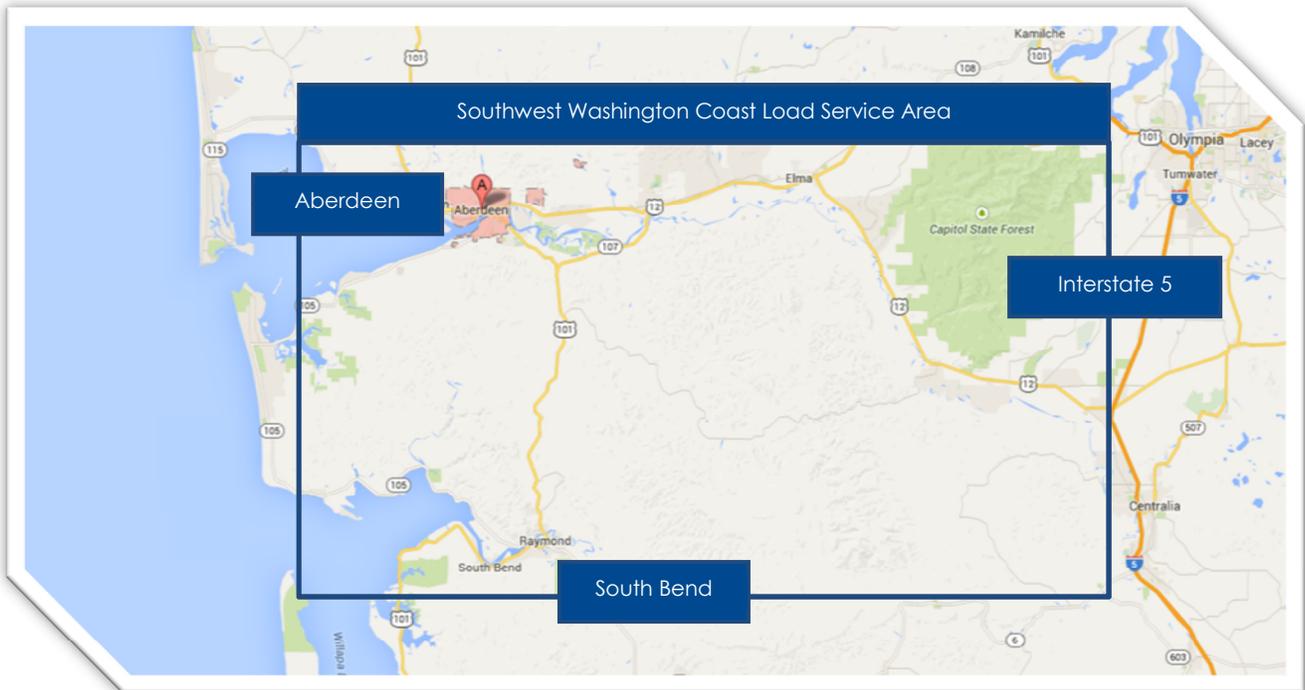
Deferred Plans of Service

LaPine 230 kV and 115 kV Circuit Breaker Additions

- Description: This project will add a 230 kV circuit breaker to the high side of the transformer bank No.2 at La Pine Substation. This will also add two 115 kV circuit breakers for the low side of the transformer banks No.1 and No.2 as well as a 115 kV bus tie breaker.
- Purpose: This project will improve operations and maintenance flexibility.
- Estimated Cost: \$6,000,000
- Energization: On Hold/Deferred

11 Southwest Washington Coast Area

The Southwest Washington Coast area is comprised of Wahkiakum county, Pacific county, western Lewis county, and southern Grays Harbor county in Washington. It is bordered on the east by Interstate 5 and the west by the Pacific Ocean. It is bordered on the north by the Olympic National Forest and on the south by the Columbia River. The main communities served include Aberdeen, the Raymond/South Bend area, and the communities on the Long Beach Peninsula.



The customers in this area include:

- Grays Harbor PUD (including some industrial load)
- Pacific County PUD #2
- Lewis County PUD

The load area is served by the following major transmission paths or lines:

- Aberdeen-Satsop 230 kV #2 line
- Aberdeen-Satsop 230 kV #3 line
- Olympia-South Elma 115 kV line
- Chehalis-Raymond 115 kV #1 line
- Naselle Tap to the Allston-Astoria 115 kV #1 line

Local Generation and Load

Local generation serving the load area includes:

- Wynooche generation (18.7 MW)
- Weyerhaeuser generation (15.8 MW)
- Sierra generation (7.9 MW)

Southwest Washington Coast Area Peak Load Forecast (MW)						
Area	Historical Peak Load Summer - Winter		2020 Summer	2020 Winter	2024 Summer	2024 Winter
Southwest Washington Coast	183	322	218	355	225	367

Proposed Plans of Service

Holcomb-Naselle 115 kV Line Upgrade

- Description: This line will be rebuilt with larger conductor as part of the wood pole replacement program.
- Purpose: This project is required to maintain reliable load service to the Southwest Washington Coast area.
- Estimated Cost: The cost of this project is included as part of BPA's overall wood pole replacement program.
- Energization: 2018

Recently Completed Plans of Service

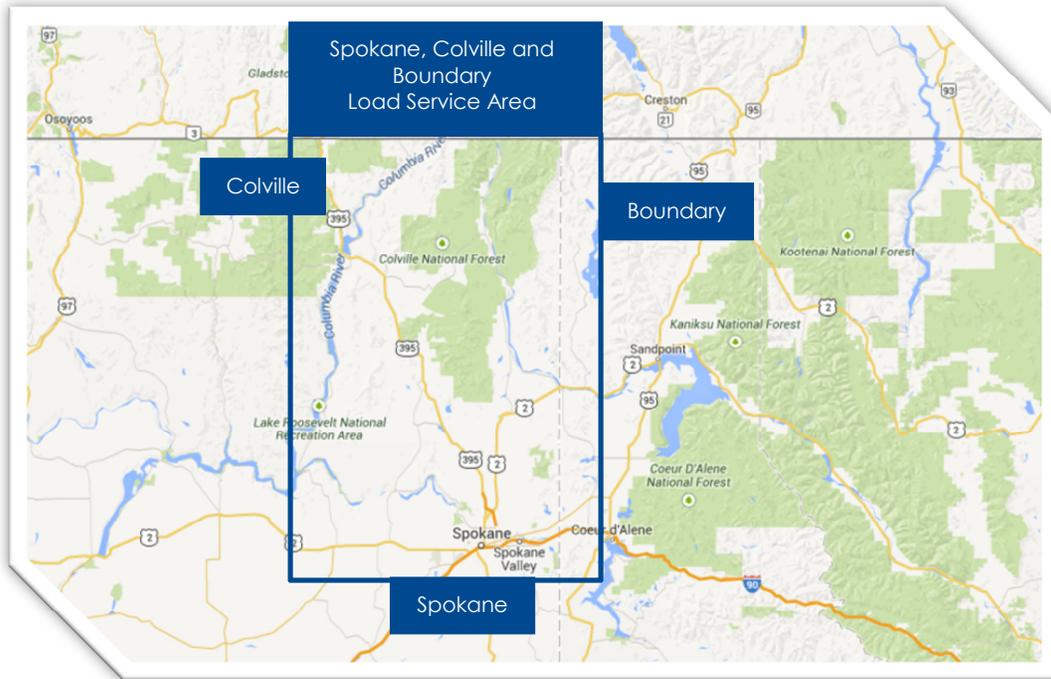
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

12 Spokane/Colville/Boundary Area

This area is located in northeastern Washington State. This load area includes the greater Spokane, Washington area as well as Colville Valley to the north including the communities of Colville and Chewelah. This area also includes Newport, Washington to the east, as well as Pend Oreille, Stevens and Spokane Counties.



The customers in this area include:

- Avista (AVA)
- Inland Power and Light
- West Kootenai Power and Light
- Pend Oreille PUD
- Ponderay Newsprint Company

The load area is served by the following major transmission paths or lines:

- Bell-Boundary 230 kV #1 line
- Bell-Boundary 230 kV #2 line
- Usk-Boundary 230 kV line
- Taft Bell 500-kV line
- Bell-Lancaster 230 kV line
- (AVA) Lancaster-Boulder 230 kV line
- (AVA) Benewah-Boulder 230 kV line
- (AVA) Rathdrum-Lancaster 230 kV line
- Grand Coulee-Bell 500 kV line
- Three Grand Coulee-Bell 230 kV lines
- Grand Coulee-Westside 230 kV line

Local Generation and Load

Local generation serving the load area includes:

- (Seattle City Light) Boundary generation (1040 MW)
- (Pend Oreille PUD) Box Canyon generation (66 MW)
- (USACE) Albeni Falls generation (48 MW)
- (AVA) Long Lake generation (88 MW)
- (AVA) Little Falls generation (32 MW)
- (USACE) Dworshak generation (458 MW)
- (AVA) Boulder generation (25 MW)
- (AVA) Post Street generation (10 MW)
- (AVA) Monroe generation (16 MW)
- (City of Spokane) Spokane Waste (22 MW)
- (AVA) Northeast generation (68 MW)
- (City of Spokane) Up River (18 MW)
- (AVA) Nine Mile generation (24 MW)
- (AVA) Post Falls (18 MW)
- (AVA) Kettle Falls generation (52 MW)

The Spokane Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Spokane	867	889	763	930	1059	1236

Proposed Plans of Service

Bell 230 kV Bus Sectionalizing Breaker Addition

- Description: This project adds a 230 kV bus sectionalizing breaker at Bell Substation which will split the existing bus section No.1 into two sections.
- Purpose: This project is required to maintain reliable load service to the Spokane area.
- Estimated Cost: \$1,600,000
- Energization: 2016

Recently Completed Plans of Service

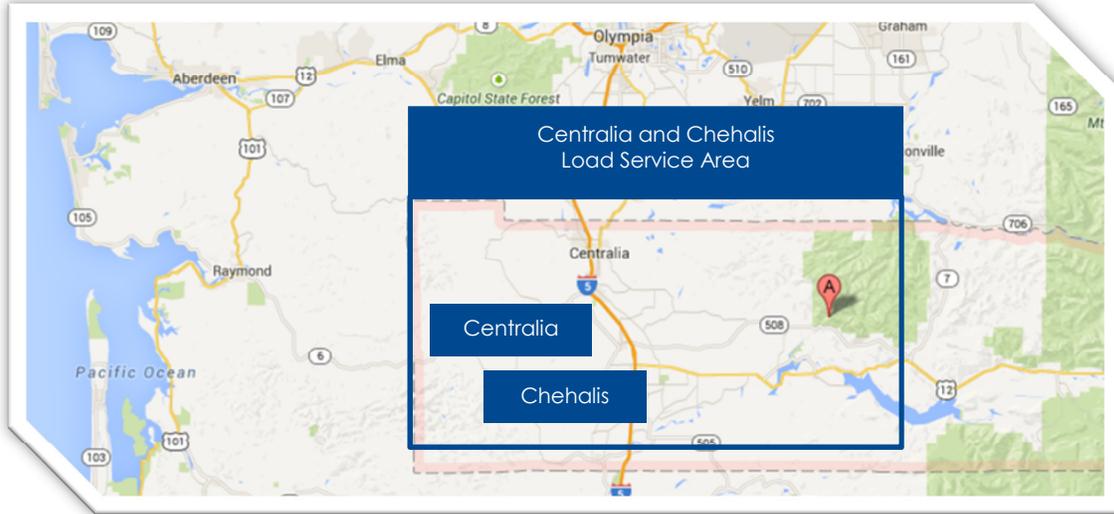
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

13 Centralia/Chehalis Area

The Centralia/Chehalis area includes the cities of Chehalis and Centralia, Washington and the communities within Lewis County in Washington. It consists of a 69 kV transmission loop served out of Chehalis Substation. Chehalis Substation also provides service to Lewis County PUD's Corkins 69 kV Substation and provides support to Raymond and Naselle Substations on the southwest Washington coast.



The customers in this area include:

- Centralia City Light
- City of Centralia
- Lewis County PUD

The load area is served by the following major transmission paths or lines:

- Chehalis- Olympia 230 kV # line
- Chehalis- Covington 230 kV #1 line
- Longview-Chehalis 230 kV #1 line
- Longview-Chehalis 230 kV #3 line
- Silver Creek-Chehalis 230 kV #1 line
- Chehalis-Mayfield 230 kV #1 line

Local Generation and Load

Local generation serving the load area includes:

- (Tacoma Power) Mossy Rock generation (334 MW)
- (Tacoma Power) Mayfield generation (135 MW)
- (Lewis County PUD) Cowlitz Falls generation (40 MW)
- (Energy Northwest) Glenoma generation (29 MW)
- (The City of Centralia) Yelm generation (10 MW)

Centralia / Chehalis Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Centralia/Chehalis	128	227	170	263	177	277

Proposed Plans of Service

There are no proposed projects for this area at this time.

Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

14 Northwest Montana Area

This includes the Flathead Valley area of northwest Montana including the communities of Kalispell and Columbia Falls.



The customers in this area include:

- Flathead Electric Cooperative (FEC)
- Northwestern Energy (NWE)
- Lincoln Electric Cooperative (LEC)

The Northwest Montana load area is served by the following major transmission paths or lines:

- Taft-Hot Springs 500 kV line
- Noxon-Hot Springs No.1 230 kV line
- Flathead-Hot Springs No.1 230 kV line
- Libby-Noxon No.1 230 kV line
- Libby-Conkelley No.1 230 kV line

Local Generation and Load

Local generation serving the load area includes:

- (AVA) Rathdrum generation (154 MW)
- (Cogentrix Energy) Lancaster generation (270 MW)
- (AVA) Cabinet Gorge generation (270 MW)
- (USACE) Noxon generation (567 MW)
- (USACE) Libby generation (605 MW)
- (USBR) Hungry Horse generation (430 MW)
- (PPL Global) Kerr generation (194 MW)
- (PPL Global) Colstrip generation (2306 MW)

Northwest Montana Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Northwest Montana	234	358	332	432	334	457

Proposed Plans of Service

There are no proposed projects for this area at this time.

Recently Completed Plans of Service

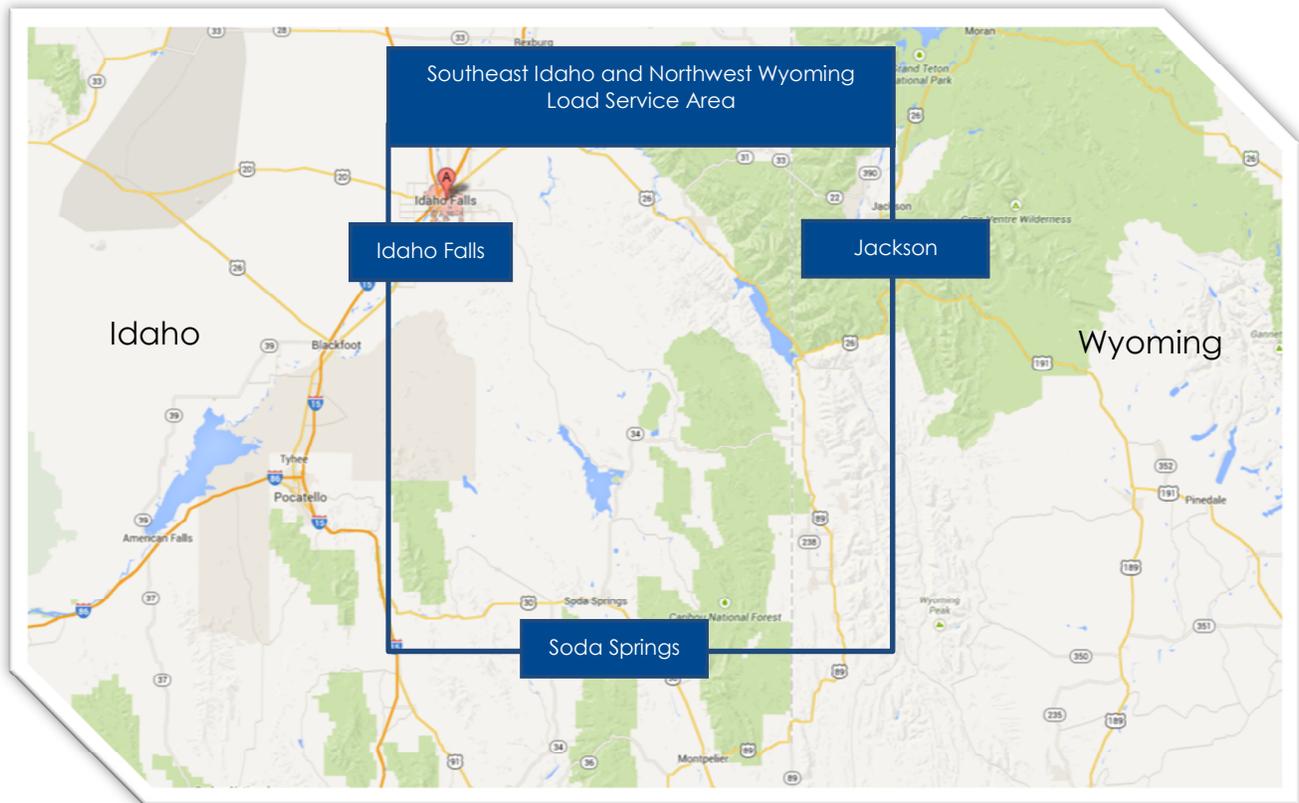
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

15 Southeast Idaho/Northwest Wyoming Area

This load area includes southeast Idaho from Idaho Falls south to Soda Springs and east to Jackson, Wyoming. This area is served by Lower Valley Energy. It also includes the area from West Yellowstone, Montana south to Afton, Wyoming which is served by Fall River Electric Cooperative. This area includes the communities of Jackson, Wyoming and Driggs, Idaho.



The customers in this area include:

- Lower Valley Energy (LVE)
- Fall River Electric Cooperative
- U.S. Bureau of Reclamation (USBR)

The load area is served by the following major transmission paths or lines:

- Goshen-Drummond 161 kV line
- Goshen-Swan Valley 161 kV line
- Goshen-Palisades 115 kV line

Local Generation and Load

Local generation serving the load area includes:

- USBR Palisades Dam (160 MW) (limited to about 8 MW in the winter)
- Horse Butte Wind Project (100 MW)

Southeast Idaho / Northwest Wyoming Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
SE Idaho / NW Wyoming Area	141	285	157	301	170	321

Proposed Plans of Service

Lower Valley Area Reinforcement Project

- Description: Construct a new 138/115 kV substation called Hooper Springs Substation and a new double circuit 115 kV line.
- Purpose: This project is required to provide reliable load service to Southeast Idaho.
- Estimated Cost: \$70,300,000
- Energization: 2018

Drummond Upgrade

- Description: This project will add 115 kV breakers and associated disconnect switches on the high side of the Drummond 115/46 kV No.1 and No.3 transformer banks. This project will also upgrade the station service at Drummond.
- Purpose: This project will improve operations and maintenance flexibility at Drummond.
- Estimated Cost: \$600,000
- Energization: 2018

Spar Canyon 230 kV Reactor Addition

- Description: This project will add a 230 kV shunt reactor (25 MVAR) at Spar Canyon Substation.
- Purpose: This project will improve the ability to maintain voltage schedules and improve operations and maintenance flexibility at Spar Canyon.
- Estimated Cost: \$3,000,000
- Energization: 2018

Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

Teton 115 kV Bus Tie Addition

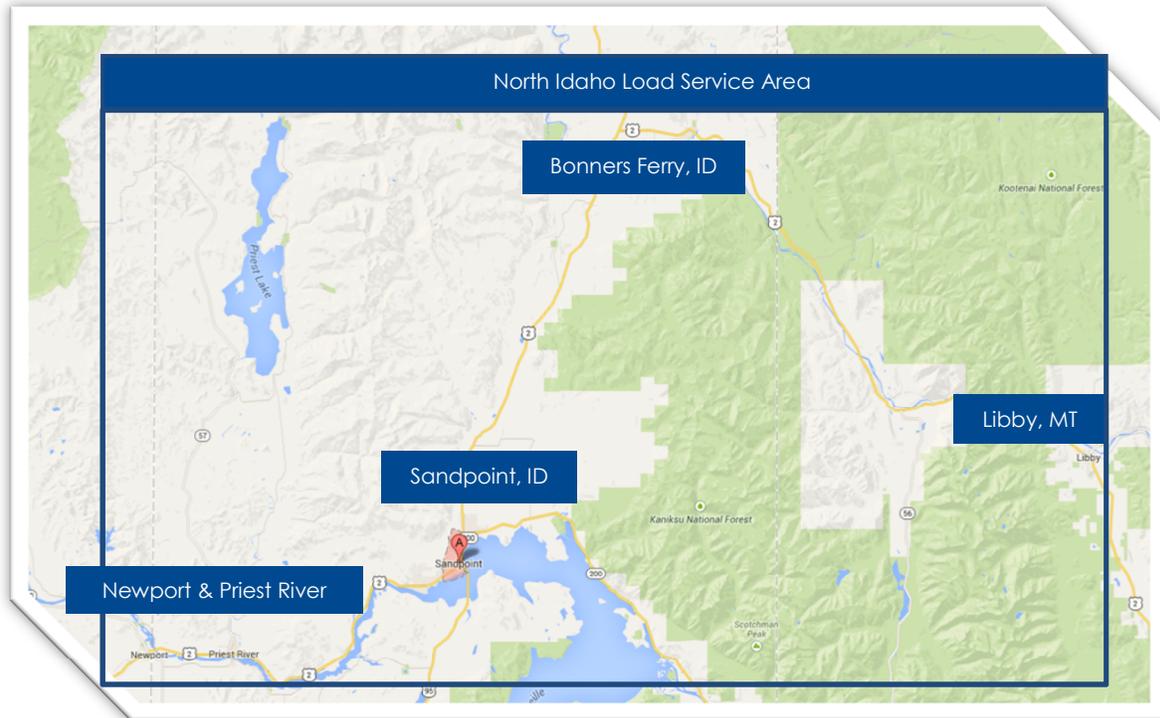
- Description: This project will add a 115 kV bus tie breaker at Teton Substation.
- Purpose: This project will improve operations and maintenance flexibility at Teton.
- Estimated Cost: \$1,100,000
- Energization: On Hold/Deferred

Lost River 230 kV Breaker Addition

- Description: This project will replace a 230 kV Load Breaker Disconnect (LBD) switch with a 230 kV circuit breaker at Lost River Substation.
- Purpose: This project will improve operations and maintenance flexibility.
- Estimated Cost: \$1,000,000
- Energization: On Hold/Deferred

16 North Idaho Area

The North Idaho area is composed of northeast Bonner County and Boundary County in Idaho and western Lincoln County in Montana. The main communities are in the Sandpoint, Idaho vicinity. This area includes Newport, Washington and Priest River, Idaho to the west, Bonners Ferry and Moyie Springs to the north, Troy and Libby, Montana to the east, and the communities along the Clark Fork River in Idaho to the south.



The customers in this area include:

- Avista (AVA)
- Northern Lights, Inc. (NLI)
- City of Bonners Ferry (CBF)
- City of Troy
- Flathead Electric Cooperative (FEC)

The load area is served by the following major transmission paths or lines:

- Libby-Bonners Ferry 115 kV #1 line
- Sand Creek-Bonners Ferry 115 kV #1 and #2 lines (currently operated as a single circuit)
- Albeni Falls-Sand Creek 115 kV #1 line
- (AVA) Cabinet Gorge-Bronx-Sand Creek 115 kV #1 line

Local Generation and Load

The local generation in the area includes

- (USACE) Libby (605MW)
- (AVA) Cabinet Gorge (287 MW)
- (AVA) Noxon (586 MW)
- (USACE) Albeni Falls (48 MW)
- (EWEB) Smith Falls (36 MW)
- (NLI) Lake Creek (3 MW)
- (CBF) Moyie (2 MW)
- (USBR) Hungry Horse (428 MW)

North Idaho Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
North Idaho Area	110	188	119	191	134	200

Proposed Plans of Service

Libby FEC 115 kV Shunt Capacitor Replacement or Restoration

- Description: This project adds a 115 kV shunt capacitor (12 MVAR) at Libby Substation.
- Purpose: This project is required to maintain adequate voltages in the area following contingencies that involve loss of the connection to the Libby 230 kV system.
- Estimated Cost: \$1,500,000
- Energization: 2023

Recently Completed Plans of Service

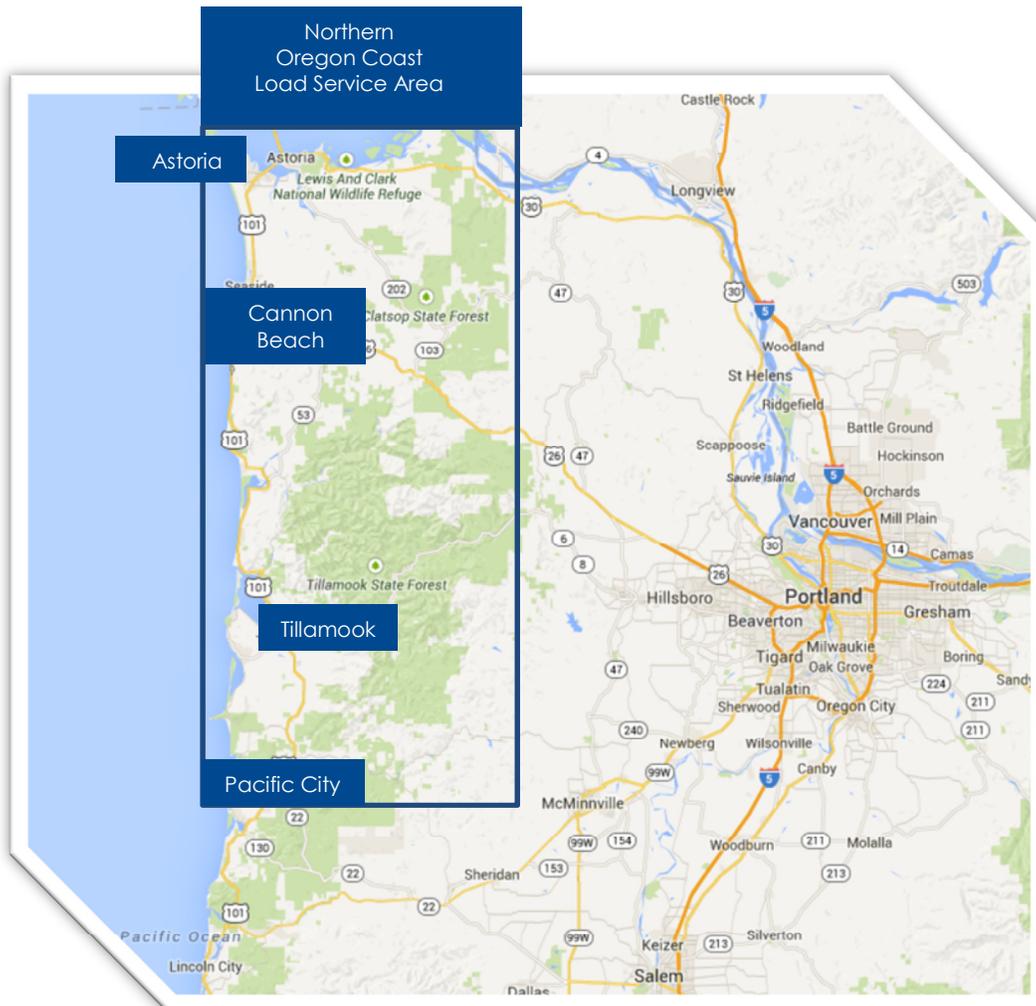
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

17 North Oregon Coast Area

The North Oregon Coast area includes Tillamook and Clatsop counties along the Oregon Coast. It is bounded by the Clatsop and Tillamook State Forests on the east and the Pacific Ocean on the west. It is bounded by the Columbia River to the north and Pacific City to the south. The population areas include Astoria, Seaside, Cannon Beach, Manzanita, Tillamook, Oceanside, Hebo, and Pacific City.



The customers in this area include:

- Consumer's Power, Inc. (CPI)
- PacifiCorp (PAC)
- Portland General Electric (PGE)
- Tillamook PUD

The load area is served by the following major transmission paths or lines:

- Allston-Clatsop 230 kV line
- Carlton-Tillamook 230 kV line
- Driscoll-Astoria 115 kV line
- Keeler-Tillamook 115 kV line
- Salem-Grand Ronde 115 kV line

Local Generation and Load

Local generation serving the load area includes:

- (Clatskanie PUD) Wauna generation at James River Mill (27 MW)
- Loki generation (gas turbine) (11MW).

North Oregon Coast Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
North Oregon Coast	137	270	166	291	172	300

Proposed Plans of Service

There are no proposed projects for this area at this time.

Recently Completed Plans of Service

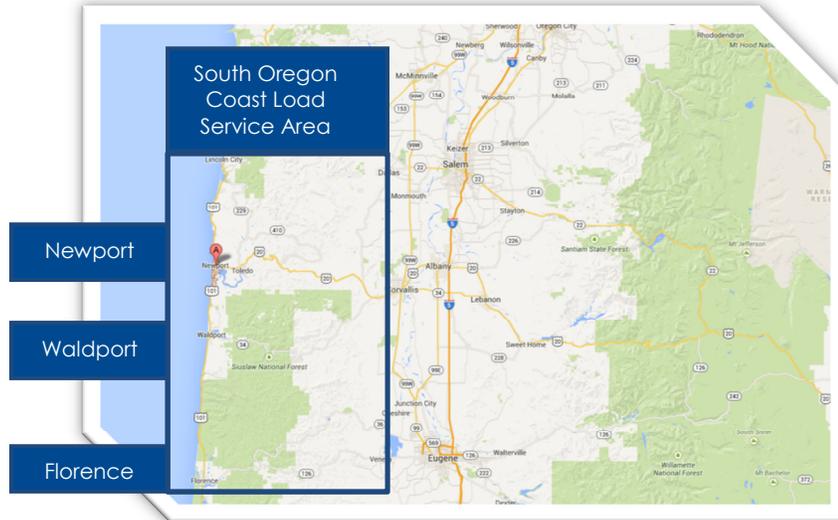
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

18 South Oregon Coast Area

The South Oregon Coast load area includes the communities of Newport, Waldport, Florence, Reedsport, Coos Bay, Coquille, Bandon, Myrtle Point, Gold Beach, Port Orford, and south to Brookings. The load area is bounded by the north Oregon Coast to the north and the Salem-Albany-Eugene load service area to the east.



The customers in this area include:

- PacifiCorp (PAC)
- Coos Curry Cooperative (Coos Curry)
- City of Bandon
- Douglas Electric Coop
- Central Lincoln PUD

The load area is served by the following major transmission paths or lines:

- Lane-Wendson 230 kV #2 line
- Alvey-Fairview 230 kV #1 line
- Reston-Fairview 230 kV #2 line
- Fairview-Rogue 230 kV #1 line
- (PAC) Fairview-Isthmus 230 kV #2 line
- Santiam-Toledo 230 KV #1 line

Local Generation and Load

There is no local generation in this area.

South Oregon Coast Area Peak Load Forecast (MW)						
Area	Historical Peak Load Summer - Winter		2020 Summer	2020 Winter	2024 Summer	2024 Winter
South Oregon Coast Area	200	440	217	404	226	425

Proposed Plans of Service

Fairview 115 kV Reactor Additions

- Description: This project adds two 115 kV shunt reactors (approximately 25 MVAR each) at Fairview Substation.
- Purpose: This project is required to improve system voltage schedules in the South Oregon Coast area.
- Estimated Cost: \$3,950,000
- Energization: 2018

Lane-Wendson 115 kV No.1 Line Upgrade

- Description: This 115 kV line will be rebuilt with higher capacity conductor as part of BPA's wood pole replacement program.
- Purpose: This project is needed to maintain reliable load service to the South Oregon Coast area.
- Estimated Cost: \$20,602,000
- Energization: 2016/17

Recently Completed Plans of Service

There are no recently completed projects in this area since the previous planning cycle.

Deferred Plans of Service

Toledo 69 kV and 230 kV Bus Tie Breaker Additions

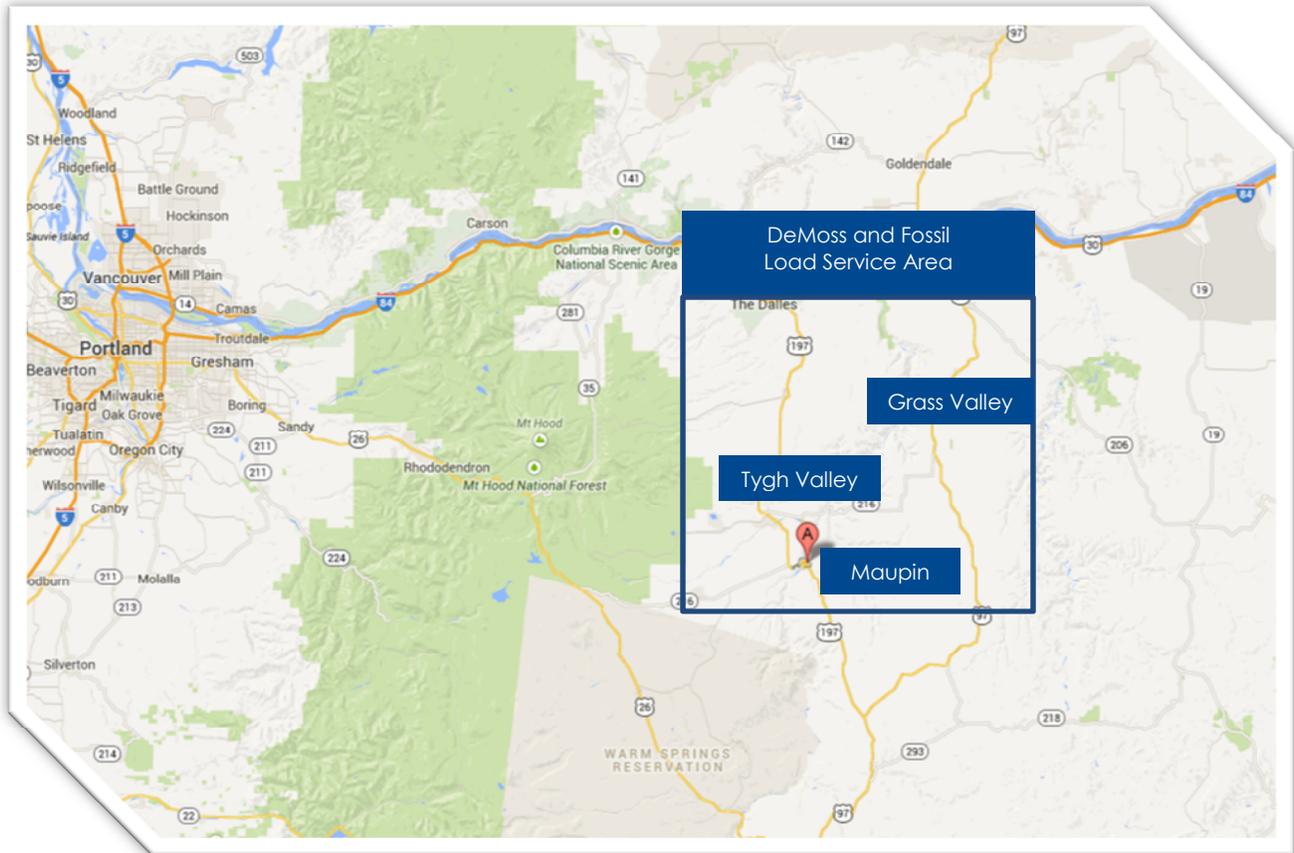
- Description: Add a 69 kV bus tie breaker and a 230 kV bus tie breaker at Toledo Substation.
- Purpose: This project will improve operations and maintenance flexibility.
- Estimated Cost: \$980,000
- Energization: On Hold/Deferred

Wendson 115 kV Bus Tie Addition

- Description: This project adds a 115 kV bus tie breaker at Wendson Substation.
- Purpose: This project will improve operations and maintenance flexibility.
- Estimated Cost: \$650,000
- Energization: On Hold/Deferred

19 DeMoss/Fossil Area

The DeMoss/Fossil load area spans a portion of north central Oregon, including the communities of Maupin, Tygh Valley, and Grass Valley. It encompasses Wasco and Sherman counties in Oregon.



The customers in this area include:

- Wasco Electric Cooperative (WEC)
- Columbia Basin Electric Cooperative (CBEC)
- Columbia Power Cooperative Association (CPCA)
- PacifiCorp (PAC)

The DeMoss/Fossil load area is served by the following major transmission paths or lines:

- From the north by the Big Eddy-DeMoss 115 kV line
- From the west by the Big Eddy-Redmond 230 kV line (via Wasco Electric Cooperative's Maupin-Fossil 69 kV line)

Local Generation and Load

The local generation includes the following:

- (USACE) The Dalles Dam (2080 MW)
- (Seawest) Condon Wind (50 MW)
- PaTu Wind (10 MW)

DeMoss and Fossil Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
DeMoss / Fossil Area	26	37	29	37	31	39

Proposed Plans of Service

DeMoss-Fossil Shunt Reactive Additions

- Description: This project adds a 69 kV shunt reactor (4 MVAR) at Fossil substation and a 69 kV shunt capacitor (3.5 MVAR) at DeMoss substation.
- Purpose: This project is required to maintain voltage schedules in the local area.
- Estimated Cost: \$2,500,000
- Energization: 2018

Recently Completed Plans of Service

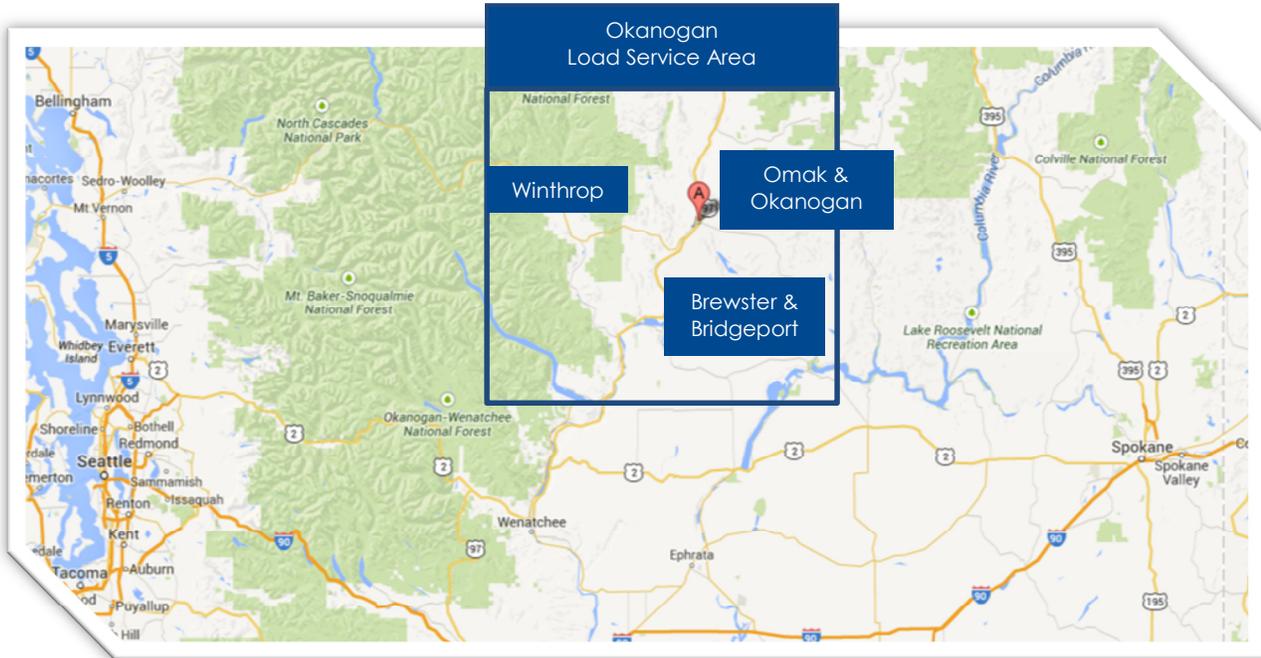
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

20 Okanogan Area

This area includes the Okanogan Valley area of north central Washington including the communities of Omak, Brewster, Bridgeport, Winthrop, Twisp, Pateros, Tonasket, and Okanogan.



The customers in this area include:

- Okanogan County PUD
- Okanogan Coop
- Douglas PUD

The load area is served by the following major transmission paths or lines:

- Chief Joseph-East Omak 230 kV line
- Grand Coulee-Okanogan 115 kV #2 line
- East Omak Tap to the Grand Coulee-Foster Creek 115 kV line
- (Douglas PUD) Wells-Foster Creek 115 kV line

Local Generation and Load

Generation serving this load area includes:

- (USACE) Chief Joseph Dam (2,614 MW)
- (USBR) Grand Coulee Dam (7,079 MW)
- (Douglas PUD) Wells Dam (851 MW)

Okanogan Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Okanogan	144	219	170	232	185	248

Proposed Plans of Service

There are no proposed projects for this area at this time.

Recently Completed Plans of Service

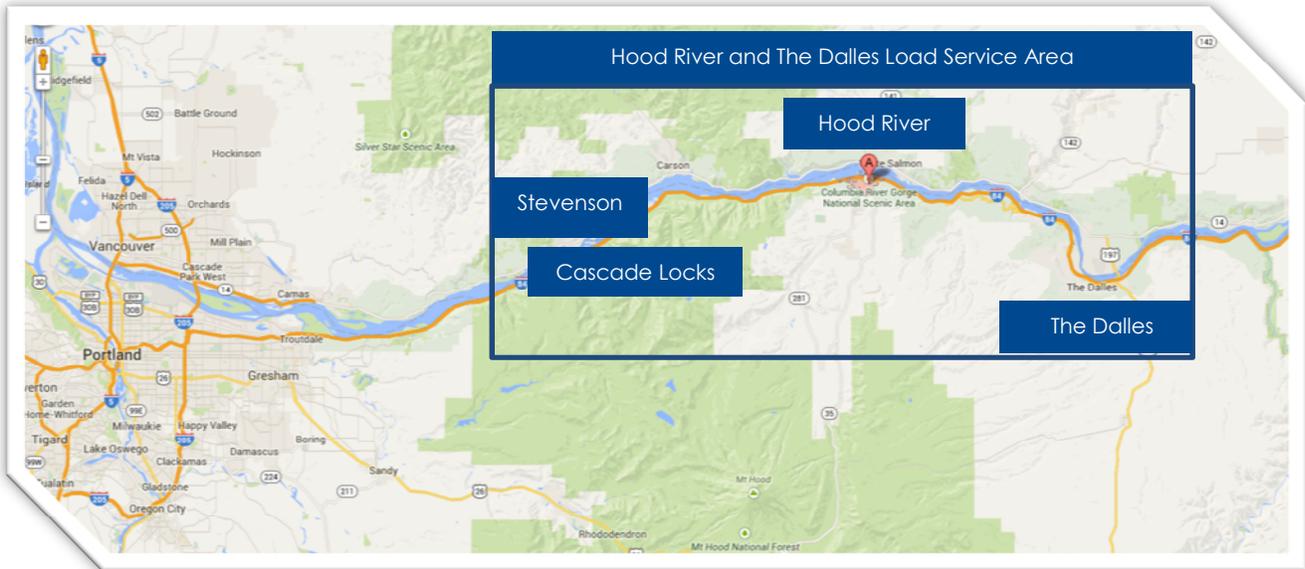
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

21 Hood River/The Dalles Area

The Hood River/The Dalles area includes portions of northern Oregon and southern Washington along the Columbia River Gorge. The area spans from Bonneville Dam to the west, to The Dalles Dam to the east. It includes the communities of Cascade Locks, Hood River and The Dalles in Oregon and Stevenson, Carson, White Salmon and Bingen in Washington.



The customers in this area (and the communities they serve) include:

- Klickitat County PUD (White Salmon and Bingen)
- Skamania County PUD (Stevenson and Carson)
- City of Cascade Locks (Cascade Locks)
- PacifiCorp (Hood River)
- Hood River Electric Coop (Hood River)
- Northern Wasco PUD (The Dalles)
- USBR (The Dalles)

The load area is served by the following major transmission paths or lines:

- Bonneville (PH No.1) - Alcoa 115 kV line
- Bonneville (PH No.1) - North Camas 115 kV line
- Bonneville (PH No.1) - Hood River 115 kV line
- Chenoweth 230/115 kV transformer
- Big Eddy-Chenoweth 115 kV line
- Big Eddy-The Dalles 115 kV line

Local Generation and Load

Generation (nameplate) serving this area includes:

- (USACE) Bonneville Powerhouse #1 and #2 (1225 MW total)
- (USACE) The Dalles Powerhouse (2080 MW total)
- SDS Lumber's generation (10 MW)
- Farmers Irrigation District Plant #2 (1.8 MW)

Hood River / The Dalles Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Hood River / The Dalles	211	274	227	286	232	295

Proposed Plans of Service

There are no proposed projects for this area at this time.

Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

22 Pendleton/LaGrande Area

This area includes the eastern Oregon communities of Pendleton and LaGrande.



The customers in this area include:

- Oregon Trail Electric Cooperative (OTEC)
- PacifiCorp (PAC)
- Umatilla Electric Cooperative (UEC)
- Columbia Basin Electric Cooperative (CBEC)

The load area is served by the following major transmission paths or lines:

- From the east by the LaGrande-(IPC) North Powder 230 kV line
- From the west by the McNary-Roundup 230 kV line

Local Generation and Load

The local generation in the area includes

- (Horizon) Elkhorn Valley Wind Project (101 MW)

Pendleton / La Grande Area Peak Load Forecast (MW)						
Area	Historical Peak Load Summer - Winter		2020 Summer	2020 Winter	2024 Summer	2024 Winter
Pendleton /La Grande	123	122	137	138	139	141

Proposed Plans of Service

There are no proposed projects for this area at this time.

Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

23 Walla Walla Area

This area includes the southeastern Washington city of Walla Walla and the southeastern Oregon community of Milton-Freewater to the south.



The customers in this area include:

- Columbia R.E.A (CREA)
- City of Milton-Freewater
- Umatilla Electric Cooperative (UEC)
- Clearwater Power Company
- Inland Power and Light
- PacifiCorp (PAC)

The load area is served by the following major transmission paths or lines:

- (PAC) Wanapum-Walla Walla 230 kV line
- (PAC) Wallula-Walla Walla 230 kV line
- (IPC) Walla Walla-Hurricane 230 kV line
- (PAC) Talbot-Walla Walla 230 kV line
- (BPA) Franklin-Walla Walla 115 kV line
- (BPA) Walla Walla-Tucannon River 115 kV line

Local Generation and Load

The local generation in this area includes:

- (NextEra Energy Resources) Stateline Wind (92 MW)
- (PSE) Hopkins Ridge Wind (157 MW)
- (Infigen) Combine Hills II Wind (63 MW)
- (NextEra Energy Resources) Vansycle Ridge Wind (25 MW)

Walla Walla Area Peak Load Forecast (MW)						
Area	Historical Peak Load Summer - Winter		2020 Summer	2020 Winter	2024 Summer	2024 Winter
Walla Walla (BPA only)	70	63	91	66	95	68

Proposed Plans of Service

There are no proposed projects for this area at this time.

Recently Completed Plans of Service

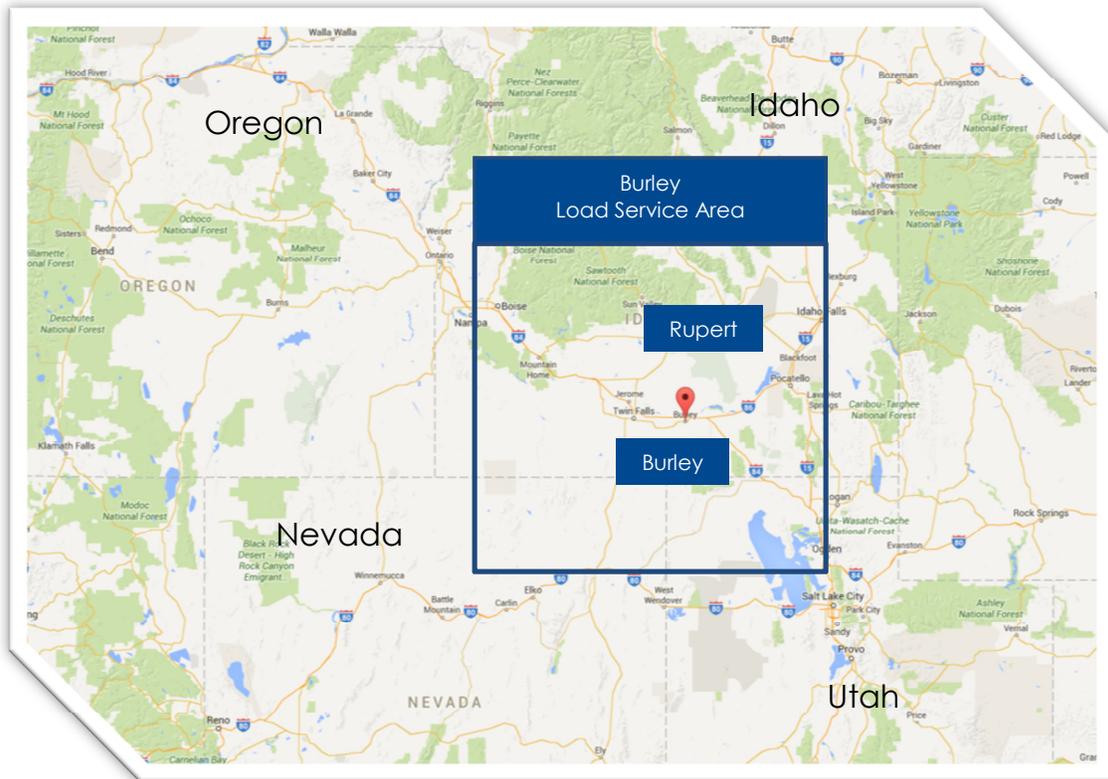
There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

There are no deferred plans of service for this area.

24 Burley Area (Southern Idaho)

The Burley area is located in Minidoka and Cassia counties in south central Idaho. This area includes the communities of Burley, West Burley, Riverton, Minidoka, Rupert, and Heyburn. The area load is mostly residential and irrigation. Loads peak during the summer due to the irrigation load component.



The customers in this area include:

- Idaho Power Company
- Raft River Electric Cooperative
- Riverside Electric Company
- South Side Electric
- United Electric Cooperative
- Wells Rural Electric
- U.S. Bureau of Reclamation
- Burley Irrigation District
- East End Mutual
- Farmers Electric
- The Cities of Albion, Burley, Declo, Heyburn, Rupert, and Minidoka

This load service area is served primarily by Idaho Power Company transmission facilities.

Local Generation and Load

Local generation in this load service area includes:

- Minidoka Power House (28 MW)
- Milner Power Plant (58 MW)
- Bridge Geothermal (13 MW)

Burley Area Peak Load Forecast (MW)						
Area	Historical Peak Load		2020	2020	2024	2024
	Summer	Winter	Summer	Winter	Summer	Winter
Burley	465	224	479	259	490	262

Proposed Plans of Service

There are no proposed projects for this area at this time.

Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

Deferred Plans of Service

Unity 138 kV Breaker Addition

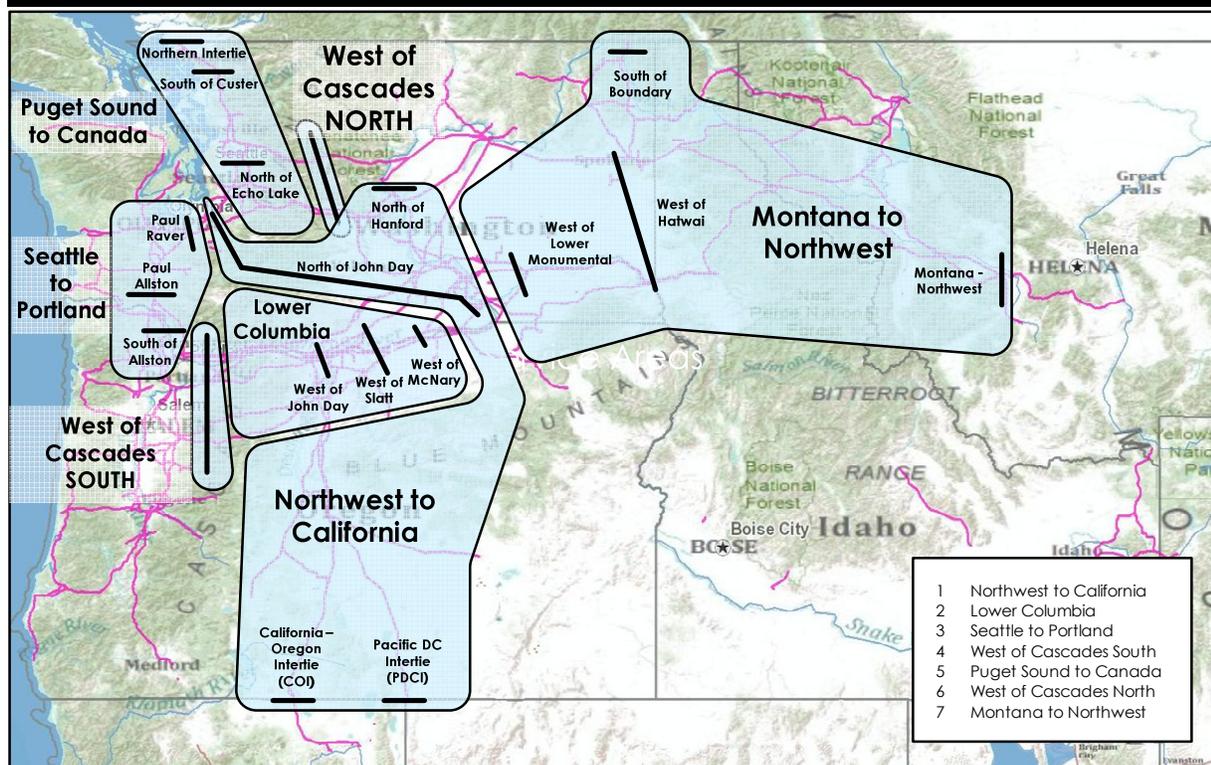
- Description: This project will replace a 138 kV Motor Operated Disconnect (MOD) switch with a 138 kV circuit breaker at Unity Substation.
- Purpose: This project will improve operations and maintenance flexibility.
- Estimated Cost: \$1,000,000
- Energization: On Hold/Deferred

Transfer Areas and Paths

BPA's service territory includes 5 inter-regional transmission paths (interties) and 14 monitored paths or flowgates within the region (intra-regional). These 19 paths are grouped into 7 Transfer Areas. The paths and transfer areas are listed in the table below.

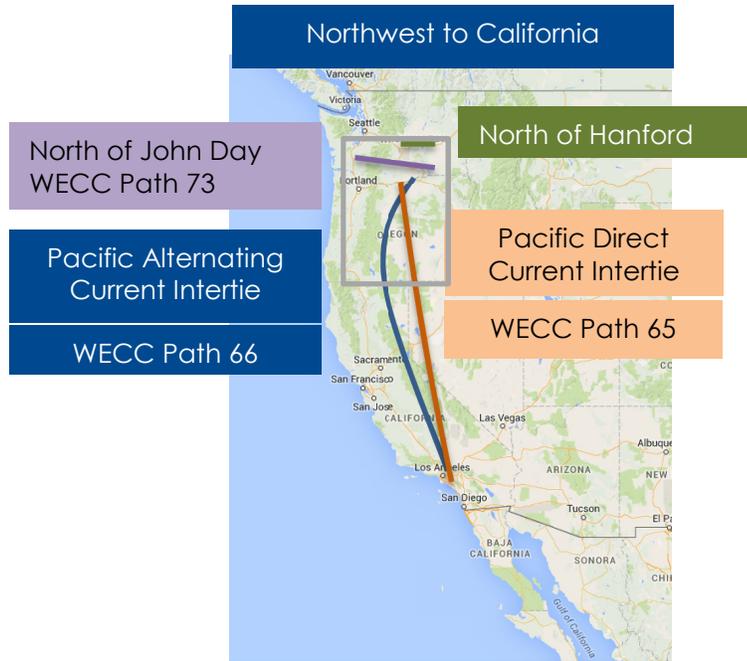
Transfer Areas	Paths/Flowgates
Northwest to California	California to Oregon Intertie
	Pacific DC Intertie
	North of John Day
	North of Hanford
Lower Columbia	West of McNary
	West of Slatt
	West of John Day
Seattle to Portland	Raver-Paul
	Paul-Allston
	South of Allston
West of Cascades South	West of Cascades South
	Puget Sound to Canada
West of Cascades North	Northwest to Canada
	North of Echo Lake
	South of Custer
Montana to Northwest	West of Cascades North
	Montana to Northwest
	West of Hatwai
	West of Lower Monumental
	South of Boundary

Transfer Areas with Associated Paths



1 Northwest to California Transfer Area

The Northwest to California (NW-CA) paths are the core main grid facilities that support the transfer of power between the Pacific Northwest and California. These paths are bi-directional and have multiple uses. However, the most prevalent use is to transfer power in the north to south direction.



California-Oregon AC Intertie WECC Path 66

Description

This path is the alternating current (AC) Intertie between Oregon and California. It is referred to as the California-Oregon Intertie (COI). The path is monitored at the Oregon-California border south of Malin and Captain Jack Substations.

The path includes the following lines:

- Malin-Round Mountain 500 kV No.1
- Malin-Round Mountain 500 kV No.2
- Captain Jack-Olinda 500 kV

Proposed Plans of Service

There are no proposed projects for this path at this time.

Pacific DC Intertie WECC Path 65

Description

This path is the direct current Intertie between Oregon and California and consists of a 500 kV high voltage direct current (HVDC) connection from BPA's Celilo Substation in Oregon to the Los Angeles Department of Water and Power's (LADWP) Sylmar Substation in California.

The path includes the following lines:

- 500 kV multi-terminal D.C. system between Celilo and Sylmar

Proposed Plans of Service

PDCI Uprate

- Description: This project replaces the converters at the Celilo HVDC terminal and re-conductors a section of the DC transmission line
- Purpose: This project will increase the capacity of the Pacific DC Intertie.
- Estimated Cost: \$362,000,000
- Energization: 2016 (Celilo DC upgrade only)

North of John Day WECC Path 73

Description

This path is located north of John Day Substation in Oregon. The path includes the following lines:

- Raver-Paul 500 kV
- Wautoma-Ostrander 500 kV
- Wautoma-Rock Creek 500 kV
- Ashe-Marion 500 kV No.2
- Ashe-Slatt 500 kV No.2
- Lower Monumental-McNary 500 kV

Proposed Plans of Service

There are no proposed projects for this path at this time.

Recently Completed Plans of Service

West of McNary Reinforcement Phase II - Refer to project description under Recently Completed Plans of Service for the West of McNary Path under the Lower Columbia Transfer Area section. This project was completed in 2015.

North of Hanford

Description

This path is located north of Hanford substation between Hanford and Grand Coulee. This path includes the following lines:

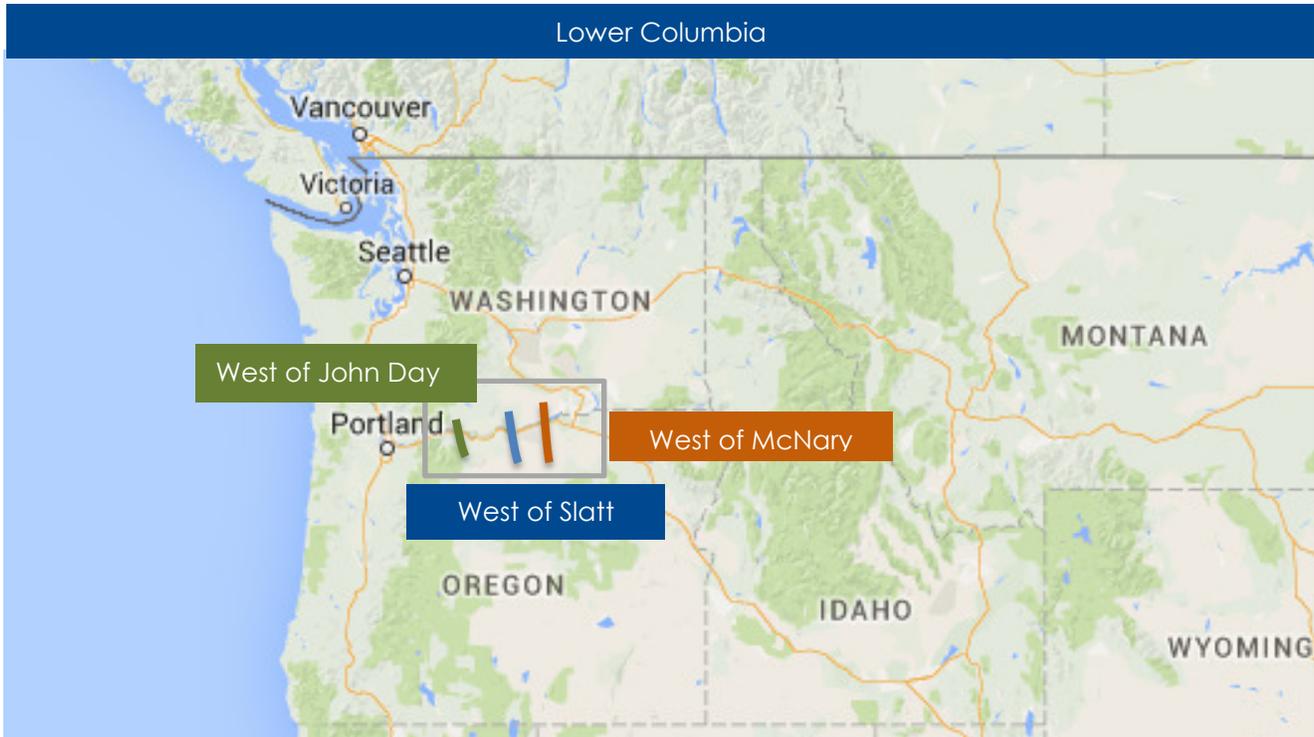
- Grand Coulee-Hanford 500 kV No.1
- Schultz-Wautoma 500 kV No.1
- Vantage-Hanford 500 kV No.1

Proposed Plans of Service

There are no proposed projects for this path at this time.

2 Lower Columbia Transfer Area

The Lower Columbia Transfer Area includes the area along the lower Columbia River east of Umatilla, Oregon and west to The Dalles, Oregon. It includes the West of McNary (WOM), West of Slatt (WOS) and West of John Day (WOJ) paths. All three paths peak during the spring and summer months with power flowing in the east to west direction. All three paths are in series, but do not necessarily peak simultaneously due to a unique geographic interconnection of generation in the Lower Columbia area. There are large generation hubs of hydro, wind and thermal plants between each path that can operate independently and create non-simultaneous peak flow conditions on each path.



West of McNary

Description

This path is located between McNary and Slatt substations in Oregon.

This path includes the following lines:

- McNary-John Day 500 kV No.2
- McNary-Ross 345 kV No.1
- Harvalum-Big Eddy 230 kV No.1
- Jones Canyon-Santiam 230 kV No.1
- Coyote Springs-Slatt 500 kV No.1

Proposed Plans of Service

There are no proposed projects for this path at this time.

Recently Completed Plans of Service

West of McNary Reinforcement Phase II

- Description: This project includes a new 500 kV transmission line (approximately 28 miles) between Big Eddy substation and a new 500 kV substation (Knight). Knight Substation is a new 500 kV substation near Goldendale, Washington, along the Wautoma-Ostrander 500 kV transmission line.
- Purpose: This project addresses the issue of meeting the FERC Open Access requirements by building the necessary transmission facilities to accommodate requests for firm transmission service across BPA's network. The project also addresses the issue of increased reliability to loads in the southwest Washington and Willamette Valley vicinity.
- This project was identified in the 2008 Network Open Season.
- Estimated Cost: \$201,000,000
- Energization: 2015

West of Slatt

Description

This path is located between Slatt and John Day Substations in Oregon.

This path includes the following lines:

- Slatt-John Day 500 kV No.1
- Slatt-Buckley 500 kV No.1

Proposed Plans of Service

There are no proposed projects for this path at this time.

Recently Completed Plans of Service

West of McNary Reinforcement Phase II - Refer to project description under Recently Completed Plans of Service for the West of McNary Path. This project was completed in 2015.

West of John Day

Description

This path is located between John Day Substation and The Dalles Substation in Oregon.

This path includes the following lines:

- John Day-Big Eddy 500 kV No.1
- John Day-Big Eddy 500 kV No.2
- John Day-Marion 500 kV No.1

Proposed Plans of Service

There are no proposed projects for this path at this time.

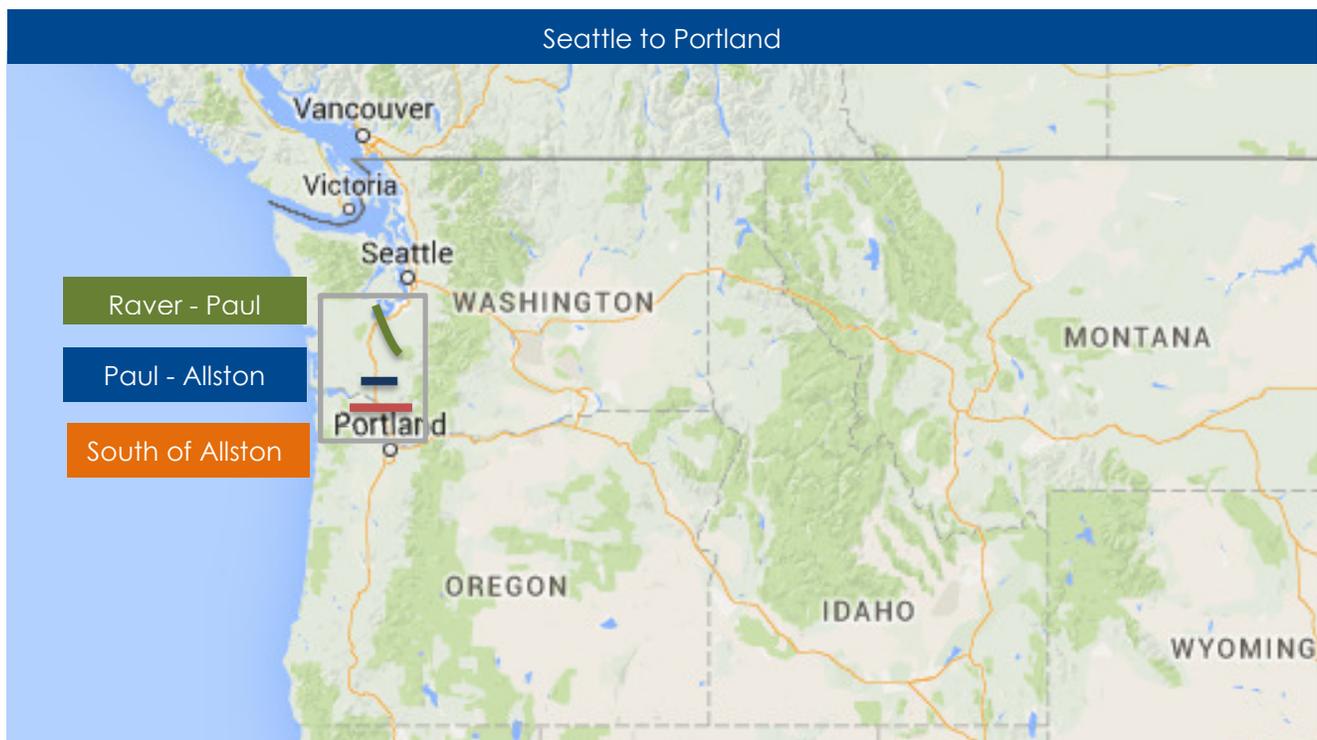
Recently Completed Plans of Service

West of McNary Reinforcement Phase II - Refer to project description under Recently Completed Plans of Service for the West of McNary Path. This project was completed in 2015.

3 Seattle to Portland Transfer Area

The Seattle to Portland Transfer Area is located west of the Cascade Mountains and roughly follows the I-5 Corridor. This Transfer Area includes the following paths: Raver-Paul (RP), Paul-Allston (PA), and South of Allston (SOA).

The Seattle to Portland Transfer Area is the primary transmission corridor between the two largest northwest load centers. Flows between Seattle and Portland are impacted not only by load service, but also by the schedules on the paths just to the north (Northern Intertie) and south (COI and PDCI). An adjacent path that also impacts this Transfer Area is the West of Cascades South path (WOCS).



Raver-Paul

Description

This path is located between Raver and Paul Substations in western Washington.

This path includes the following line:

- Raver-Paul 500 kV No.1 line

Proposed Plans of Service

There are no proposed projects for this path at this time.

Paul-Allston

Description

The I-5 Corridor transmission system extends from the Canadian border to the California border west of the Cascades Mountain Range. This portion of the path extends roughly from Chehalis, Washington to Rainier, Oregon. This path provides load service to the Willamette Valley. There are long-standing congestion issues with this path. The path includes the following lines:

- Paul-Allston 500 kV No.2 line
- Napavine-Allston 500 kV No.1 line

Proposed Plans of Service

I-5 Corridor Reinforcement Project - Refer to project description under Proposed Plans of Service for the South of Allston Path, below.

South of Allston WECC Path 71

Description

The I-5 Corridor transmission system extends from the Canadian border to the California border west of the Cascades Mountain Range. This portion of the path is located south of Allston Substation in Northwest Oregon. This path provides both load service to the Willamette Valley as well as accommodating transmission service requests.

There are long-standing congestion issues with this path. The path includes the following facilities:

- Allston-Keeler 500 kV line
- (PGE) Trojan-Rivergate 230 kV line
- (PGE) Trojan-St Marys 230 kV line
- Ross-Lexington 230 kV line
- St.Helens-Allston 115 kV line
- (PAC) Merwin-St.Johns 115 kV line
- (PAC) Astoria-Seaside 115 kV line
- Clatsop 230/115 kV transformer

Proposed Plans of Service

Pearl 500 kV Upgrades

- Description: This project adds a 500 kV circuit breaker at Pearl Substation and re-terminates the Pearl 500/230 kV transformer No. 2 into the new bay position.
- Purpose: This project will improve system reliability for the South of Allston path.
- Estimated Cost: \$2,100,000
- Energization: 2016

I-5 Corridor Reinforcement Project

- Description: This proposed project includes a new 500 kV transmission line (approximately 79 miles) between a new substation in the vicinity of Castle Rock, Washington and a new substation in Troutdale, Oregon.
- Purpose: This project addresses the issue of providing reliable service to loads in southwest Washington and northwest Oregon. This project also meets the FERC Open Access requirements by building the necessary transmission facilities to accommodate requests for firm transmission service across BPA's network.
- This project was identified in the 2008 Network Open Season.
- Estimated Cost: \$720,000,000
- Energization: 2021

4 West of Cascades South Transfer Area

The West of Cascades South Transfer Area includes only the West of Cascades south (WOCS) path. This is a load serving east to west path that transfers power across the Cascades Mountains from Central Washington and northern Oregon to southwest Washington, the Willamette Valley and the Oregon Coast load centers. The WOCS path flow is always in the east to west direction and primarily winter peaking. For spring and early summer operation, high flows on the WOCS path typically occur when there is surplus hydro and wind generation east of the Cascades and thermal generation in the Southwest Washington/Northwest Oregon area is off-line for maintenance or other reasons.



West-of-Cascades South WECC Path 5

Description

This path spans the southern portion of the Cascade Mountains between eastern and western Oregon. The path includes the following lines:

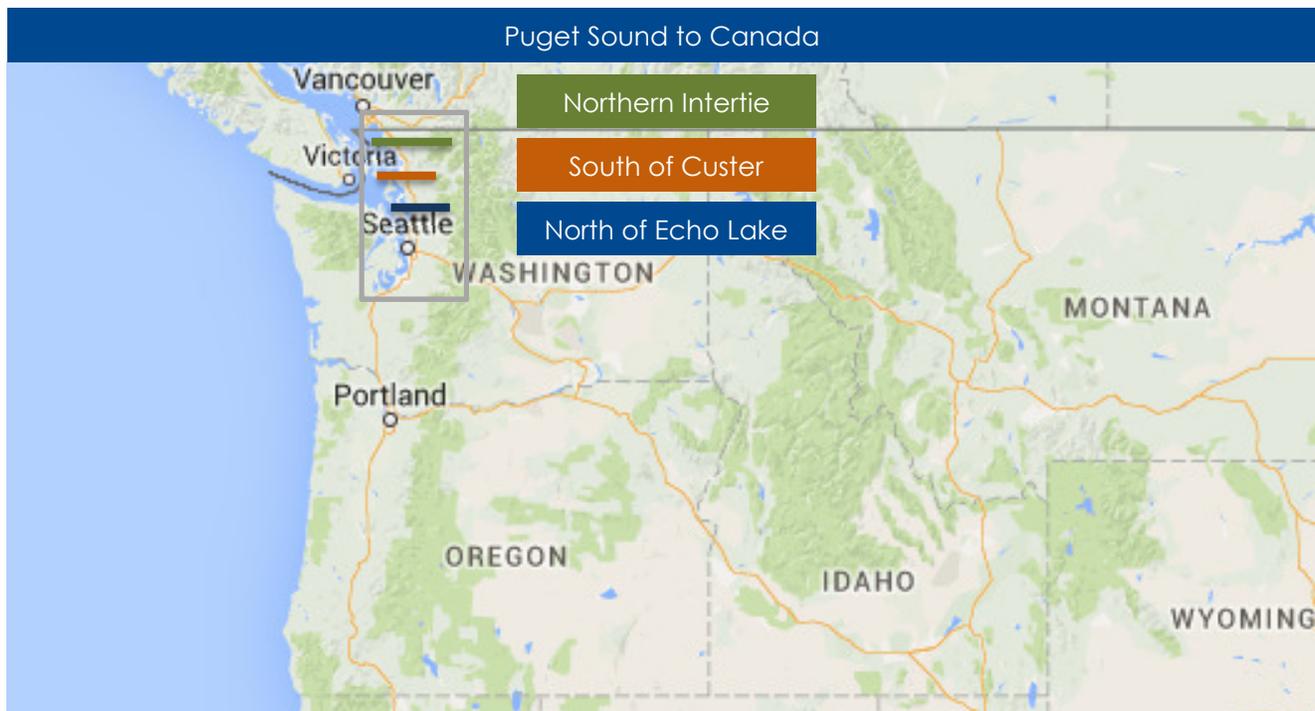
- Big Eddy-Ostrander 500 kV line
- Ashe-Marion 500 kV No.2 line
- Buckley-Marion 500 kV No.1 line
- Wautoma-Ostrander 500 kV line
- John Day-Marion 500 kV line
- McNary-Ross 345 kV (BPA) line
- Big Eddy-McLoughlin 230 kV line
- Big Eddy-Chemawa 230 kV line
- Midway-North Bonneville 230 kV line
- Jones Canyon-Santiam 230 kV line
- Big Eddy-Troutdale 230 kV line
- (PGE) Round Butte-Bethel 230 kV line

Proposed Plans of Service

There are no proposed projects for this path at this time.

5 Puget Sound to Canada Transfer Area

This transfer area includes paths between the Puget Sound area and Canada. Flows from the US to Canada are primarily captured by monitoring the main grid circuits from Northwestern Washington to the US-Canada border. These transfers are critical because they flow through and parallel to the local network of the largest load center in the Pacific Northwest, the Puget Sound. Adjacent paths not included in this transfer area that have direct or indirect impacts include West of Cascades North (WOCN) and Raver-Paul. WOCN can sometimes impose flow limitations. The Puget Sound to Canada Transfer Area includes the Northern Intertie (NI), North of Echo Lake (NOEL), and South of Custer (SOC) paths.



Northwest to British Columbia (Northern Intertie) WECC Path 3

Description

This path is the intertie between the United States and Canada. It has a western and an eastern component.

This path includes the following lines:

Western component:

- Custer (BPA)-Ingledow (BCTC) 500 kV No.1 line
- Custer (BPA)-Ingledow (BCTC) 500 kV No.2 line

Eastern Component:

- Boundary (BPA)-Waneta (Fortis-BC) 230 kV line
- Boundary (BPA)-Nelway (BCTC) 230 kV line

Proposed Plans of Service

Monroe 500 kV Line Re-terminations

- Description: This project reconfigures Monroe Substation by developing a new 500 kV bay and re-terminating the Custer and Chief Joseph 500 kV lines.
- Purpose: This project will increase reliability and capacity on the Northern Intertie.
- Estimated Cost: \$5,700,000
- Energization: 2018

North of Echo Lake

Description

This path is located north of Echo Lake Substation in the Puget Sound area of Washington. This path includes the following lines:

- Echo Lake-Maple Valley 500 kV No.1 and No.2 lines
- Echo Lake-Snoking-Monroe 500 kV line
- Covington-Maple Valley 230 kV No.2 line

Proposed Plans of Service

There are no proposed projects for this path at this time.

South of Custer

Description

This path is located south of Custer Substation in the Bellingham area of Washington State.

This path includes the following lines:

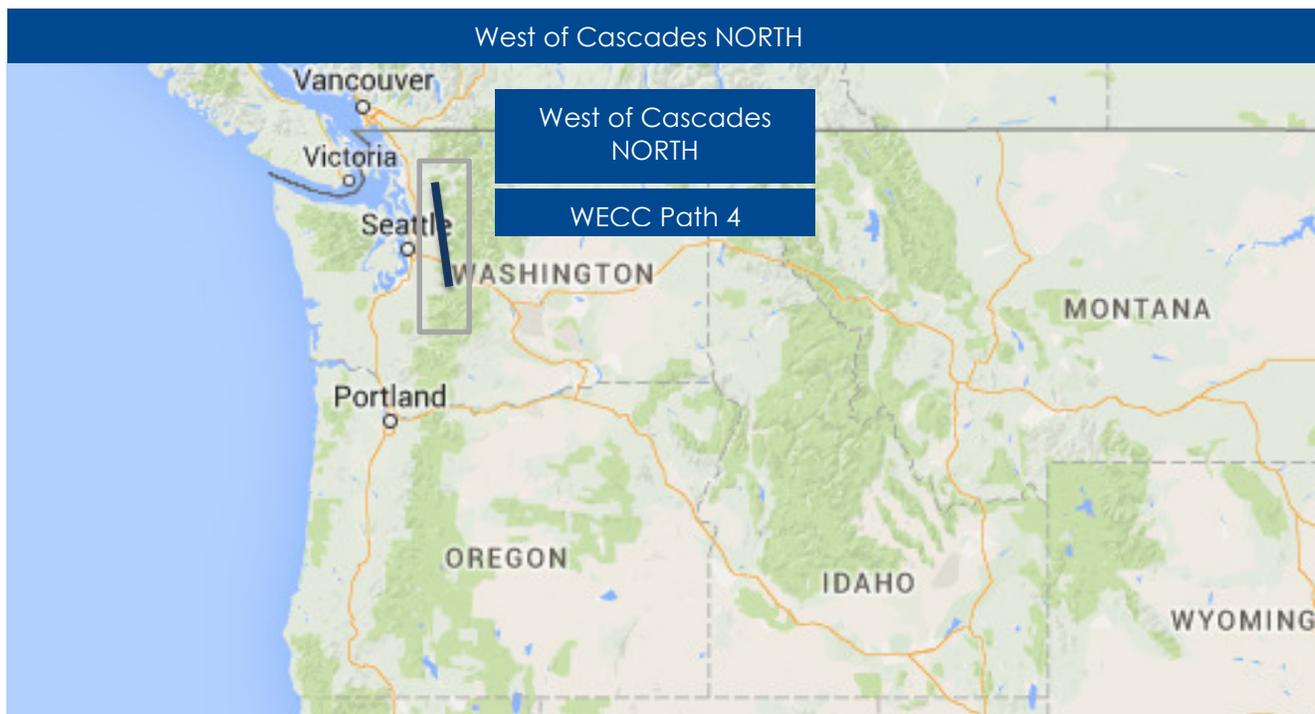
- Monroe-Custer 500 kV No.1 and No.2 lines
- Custer-Bellingham 230 kV No.1 line
- Custer-Murray 230 kV No.1 line

Proposed Plans of Service

There are no proposed projects for this path at this time.

6 West of Cascades North Transfer Area

The West of Cascades North Transfer Area includes the single West of Cascades North (WOCN) path. The path monitors east-to-west transfers that primarily serve load in Northwest Washington. These transfers are critical to reliable load service because the load centers in NW Washington and the Puget Sound are the largest in the entire Pacific Northwest. The path typically peaks during winter conditions when the load centers in NW Washington peak. High flows can also occur in the spring and summer months with surplus generation conditions east of the Cascades or with large amounts of generation offline in western Washington; however the flows are significantly less than the winter conditions. The large generation hubs in the east include Upper Columbia hydro generation, Mid-Columbia hydro, and eastern wind plants.



West of Cascades North WECC Path 4

Description

This path spans the northern portion of the Cascade Mountains between eastern and western Washington. The path includes the following lines:

- Chief Joseph-Monroe 500 kV line
- Schultz-Raver 500 kV No.1 line
- Schultz-Raver 500 kV No.3 line
- Schultz-Raver 500 kV No.4 line
- Schultz-Echo Lake 500 kV line
- Chief Joe-Snohomish 345 kV No.3 line
- Chief Joe-Snohomish 345 kV No.4 line
- Rocky Reach-Maple Valley 345 kV line
- Coulee-Olympia 300 kV line
- (PSE) Rocky Reach-Cascade 230 kV line
- Bettas Road-Columbia 230 kV No.1 line

Proposed Plans of Service

Schultz-Raver 500 kV No.3 & No.4 Series Capacitors

- Description: This project adds 500 kV series capacitors at Schultz substation on the Schultz-Raver 500 kV No.3 and No.4 lines.
- Purpose: This project is required to increase capacity on the West of Cascades North path.
- Estimated Cost: \$35,000,000
- Energization: beyond 2021

7 Montana to Northwest Transfer Area

Flows across the Montana to Northwest transfer area are captured by monitoring three paths, the Montana-Northwest path (MT-NW), West-of-Hatwai path (WOH), and the West-of-Lower Monumental path (WOLM). In addition, flows from Boundary to Bell substation that also flow across the WOH path are captured by monitoring the South-of-Boundary path (SOB). The MT-NW path is a multiple-owner path and includes facilities owned by BPA, NorthWestern Energy (NWE), and Avista (AVA). NorthWestern Energy is the path operator for the MT-NW path and therefore conducts assessments of the transfer capability limits for the path.



Montana to Northwest (MT-NW) WECC Path 8

Description

This path is the intertie between Montana and the Northwest.

This path includes the following facilities:

- (NWE) Broadview-(BPA) Garrison 500 kV #1 line
- (NWE) Broadview-(BPA) Garrison 500 kV #2 line
- (NWE) Mill Creek-(BPA) Garrison 230 kV line
- (NWE) Mill Creek-(BPA) Anaconda 230 kV line
- (NWE) Ovando-(BPA) Garrison 230 kV line
- (NWE) Placid Lake-(BPA) Hot Springs 230 kV line
- (NWE) Rattlesnake 230/161 kV transformer
- (NWE) Kerr-(BPA) Kalispell 115 kV line
- (NWE) Thompson Falls-(AVA) Burke 115 kV line
- (NWE) Crow Creek-(AVA) Burke 115 kV line

Proposed Plans of Service

There are no proposed projects for this path at this time.

Montana to Washington

The 2010 Network Open Season identified some reinforcements to the transmission system between Montana and Washington – referred to as the Montana to Washington project (M2W). This project consisted primarily of series and shunt compensation that would be needed to accommodate the transmission service requests from the Network Open Season. The M2W project was proposed to increase available transmission capacity from BPA's Garrison Substation in western Montana to power markets west of the Cascades.

In September 2014, BPA was informed that most of the transmission service requested by customers was no longer needed. This change in circumstances eliminated almost all of the demand to increase available transmission capacity on this part of the system and the need for the M2W Project. Accordingly, after a thorough examination of its obligations and fiscal responsibilities, BPA has decided to no longer pursue the proposed M2W Project. If in the future sufficient demand for transmission service between western Montana and power markets west of the Cascades emerges, BPA would reconsider system expansion at that time.

West of Hatwai (WOH) WECC Path 6

Description

This path is located between northern Idaho (Lewiston area) and eastern Washington.

The path includes the following facilities:

- Hatwai-Lower Granite 500 kV line
- Bell-Grand Coulee 230 kV No.3 line
- Bell-Grand Coulee 230 kV No.5 line
- Westside-Grand Coulee 230 kV line
- (PAC) Dry Creek-Talbot 230 kV line
- Bell-Creston 115 kV line
- North Lewiston-Tucannon River 115 kV line
- (AVA) Harrington-Odessa 115 kV line
- (AVA) Lind (AVA)-Roxboro (AVA) 115 kV line
- (AVA) Dry Gulch 115/69 kV transformer
- Bell- Grand Coulee 500kV line

Proposed Plans of Service

Refer to the project description for the Montana to Northwest Path above.

West of Lower Monumental (WOLM)

Description

This path is located between Lower Monumental and McNary Substations.

This path includes the following lines:

- Lower Monumental-Ashe 500 kV line
- Lower Monumental-Hanford 500 kV line
- Lower Monumental-McNary 500 kV line

Proposed Plans of Service

There are no proposed projects for this path at this time.

Recently Completed Plans of Service

Central Ferry-Lower Monumental 500 kV Line

- Description: This project includes a new 500 kV transmission line (approximately 40 miles) between a new Central Ferry Substation located southeast of Little Goose Dam and the existing Lower Monumental Substation.
- Purpose: This project is required to increase capacity from Central Ferry to Lower Monumental in order to accommodate transmission service requests associated with new wind generation.
- This project was identified in the 2008 Network Open Season.
- Estimated Cost: \$92,000,000
- Energization: 2015

South of Boundary (SOB)

Description

This path is south of Boundary Substation in northeastern Washington.

This path includes the following lines:

- Bell-Boundary 230 kV No.1 line
- Bell-Boundary 230 kV No.3 line
- Usk-Boundary 230 kV line
- Usk-Bell 230 kV line

Proposed Plans of Service

There are no proposed projects for this path at this time.

Generator Interconnections

The projects provided in this section include those that have a requested generator interconnection greater than 20 MW and have an executed Large Generator Interconnection Agreement (LGIA). These projects have a well-defined plan of service, and a reasonable estimate of cost and schedule.

Portland Area Generator Interconnections

Portland General Electric (PGE) Carty Combined-Cycle Combustion Turbine (CCCT) and Carty Incremental Generation Interconnection.

- Description: This project includes upgrades at BPA's Slatt Substation to accommodate PGE's proposed Carty generation interconnection. PGE submitted two requests for interconnection to the BPA transmission system. The first request (G0380) is for a maximum of 464 MW. The second request (G0457) is for 36 MW. The point of interconnection is at BPA's Slatt Substation on PGE's existing Slatt-Boardman 500 kV line. The Carty generating plant is located in Morrow County, Oregon about 17 miles east of Slatt Substation and about one mile west of PGE's Boardman plant. As part of the project, PGE has constructed a new 500 kV Substation named Grasslands. The Slatt-Boardman 500 kV line is looped into Grasslands Substation. The BPA portion of the project includes upgrades to controls and protection equipment at Slatt Substation.
- Purpose: Provide interconnection to the transmission system for PGE's Carty generating plant.
- Estimated Cost: \$1,000,000
- Energization: 2016



Line & Load Interconnections

The projects in this section include projects that have requested a line and/or load interconnection. Similar to the generator interconnections above, BPA has only included those line and load interconnections which have a significant impact to the BPA transmission system and for which there are executed construction agreements with the customer.

Proposed

(PacifiCorp) Canby Interconnection (L0349)

- Description: This project will add a new 69 kV bay at Canby Substation. This will accommodate two new 69 kV line positions.
- Purpose: Provide requested interconnection to the transmission customer.
- Estimated Cost and Energization: Contingent on customer agreements. The interconnection request (L0349) was withdrawn because BPA and PAC agreed to proceed with the interconnection as a joint project.

Recently Completed

La Pine-Benham Falls 115 kV Line Interconnection (L0296)

- Description: This project will add a new 115 kV bay at BPA's La Pine Substation to interconnect Mid-State Electric's new 115 kV line to Benham Falls. Reference L0296.
- Purpose: Provide requested interconnection to the transmission customer.
- Estimated Cost: \$1,341,886
- Energization: 2015 – BPA completed the substation.

Umatilla Electric Coop Line and Load Phase 1 (L0337, L0340, L0342, L0351, L0352)

- Description: This project constructs a new 230/115 kV substation called Morrow Flats about 1.3 miles east of BPA's existing Boardman Substation. This project loops in two 230 kV lines and adds one 230/115 kV transformer. This also includes a new 230/115 kV transformer at McNary and 230 kV line upgrades.
- Purpose: The project is necessary to accommodate load additions in the Boardman/Hermiston area.
- Estimated Cost: \$44,100,000
- Energization: 2015