PACIFIC POWER
A DIVISION OF PACIFICORP

825 NE Multnomah, Suite 2000
Portland, Oregon 97232

October 15, 2021

VIA ELECTRONIC FILING

Public Utility Commission of Oregon
201 High Street SE, Suite 100
Salem, OR 97301-3398

Attn: Filing Center

Re: UM 2198—PacifiCorp's Oregon Distribution System Plan Report – Part 1

PacifiCorp d/b/a Pacific Power (PacifiCorp) submits for filing with the Public Utility Commission of Oregon its Distribution System Plan Report – Part 1 in compliance with Order No. 20-485.

PacifiCorp respectfully requests that all communications related to this filing be addressed to:

Oregon Dockets
PacifiCorp
825 NE Multnomah Street, Suite 2000
Portland, OR 97232
oregondockets@pacificorp.com

Matt McVee
Chief Regulatory Counsel
Pacific Power
825 NE Multnomah Street, Suite 2000
Portland, OR 97232
matthew.mcvee@pacificorp.com

Additionally, PacifiCorp requests that all formal information requests regarding this matter be addressed to:

By email (preferred): datarequest@pacificorp.com

By regular mail: Data Request Response Center
PacifiCorp
825 NE Multnomah Street, Suite 2000
Portland, OR 97232

PacifiCorp appreciates the time and effort Oregon participants and stakeholders have dedicated to helping the Company develop its initial Distribution System Plan Report.

Informal inquiries may be directed to Cathie Allen, Regulatory Affairs Manager, at (503) 813-5934.

Sincerely,

Shelley McCoy

Shelley McCoy
Director, Regulation

Enclosure

cc: UM 2005 Service List

CERTIFICATE OF SERVICE

I certify that I served a true and correct copy of PacifiCorp's **Oregon Distribution System Plan Report – Part 1** on the parties listed below via electronic mail in compliance with OAR 860-001-0180.

Service List
UM 2005

TANYA BARHAM COMMUNITY ENERGY LABS 815 NE SCHEYLER STREET PORTLAND OR 97212 tanyab@communityenergylabs.com	AMY COLE STATESIDE ASSOCIATES 1101 WILSON BLVD 6TH FL ARLINGTON VA 22209 amc@stateside.com
ANGELA CROWLEY-KOCH OSSIA angela@oseia.org	ARIEL DREHOBL adrehobl@aceee.org
MARLA HARVEY MID-COLUMBIA ECONOMIC DEVELOPMENT DISTRICT 515 E 2ND ST THE DALLES OR 97058 marla@mcedd.org	LINDA IRVINE SPARK NORTHWEST 1819 SW 5TH AVE STE 210 PORTLAND OR 97201 linda@sparknorthwest.org
ALEXIA KELLY alexia@electric.capital	MATT KING WALLOWA RESOURCES COMMUNITY SOLUTIONS INC. matt@wallowaresources.org
MARLI TELAULKED KLASS NW ENERGY COALITION marli@nwenergy.org	CAROL FUJI KREIDER 60366 MARVIN RD LA GRANDE OR 97850 fkreider@campblackdog.org
JIM KREIDER 60366 MARVIN RD LA GRANDE OR 97850 jkreider@campblackdog.org	KEITH KUENY COMMUNITY ACTION PARTNERSHIP OF OREGON 350 MISSON ST SE, STE 201 SALEM OR 97301 keith@caporegon.org
AHAROWN LUKE aaronchristopherluke@riseup.net	ORIANA MAGNERA 6899 E COLUMBIA BLVD STE A PORTLAND OR 97218 orianamagnera@verdenw.org

LISA F RACKNER MCDOWELL RACKNER & GIBSON PC 419 SW 11TH AVE., SUITE 400 PORTLAND OR 97205 dockets@mrg-law.com	JOHANNA RIEMENSCHNEIDER PUC STAFF - DEPARTMENT OF JUSTICE BUSINESS ACTIVITIES SECTION 1162 COURT ST NE SALEM OR 97301-4796 johanna.riemenschneider@doj.state.or.us
JORDAN SCHOONOVER MCDOWELL, RACKNER, & GIBSON PC 419 SW 11TH AVE STE 400 PORTLAND OR 97205 jordan@mrg-law.com	JONI L SLIGER SANGER LAW PC 1041 SE 58TH PL PORTLAND OR 97215 joni@sanger-law.com
NATASCHA SMITH PUC STAFF - DEPARTMENT OF JUSTICE BUSINESS ACTIVITIES SECTION 1162 COURT ST NE SALEM OR 97301 natascha.b.smith@doj.state.or.us	SHANNON SOUZA OSSIA shannon@solcoast.com
JAIMES VALDEZ CITY OF PORTLAND 1900 SW 4TH AVE ROOM 7100 PORTLAND OR 97201 jaimes.valdez@portlandoregon.gov	JACK WISE PORTLAND GENERAL ELECTRIC 121 SW SALMON ST - 1WTC1711 PORTLAND OR 97204 jake.wise@pgn.com
CADEO	
JOSH KEELING CADEO 107 SE WASHINGTON STE 450 PORTLAND OR 97214 jkeeling@cadeogroup.com	
CASCADE NATURAL GAS CORPORATION	
BRIAN ROBERTSON CASCADE NATURAL GAS 8113 W GRANDRIDGE BLVD KENNEWICK WA 99336 brian.robertson@cngc.com	
CITY OF PORTLAND	
ANDRIA L JACOB CITY OF PORTLAND 1900 SW 4TH AVE, RM 7100 PORTLAND OR 97201 andria.jacob@portlandoregon.gov	SAUTER MATY CITY OF PORTLAND 1120J SW FIFTH AVENUE, ROOM 1204 PORTLAND OR 97204 maty.sauter@portlandoregon.gov

MELLISSA WALTON HENDRICKS CITY OF PORTLAND 1120 SW FIFTH AVENUE ROOM 1204 PORTLAND OR 97204 melissa.waltonhendricks@portlandoregon.gov	
ENERGY TRUST OF OREGON	
JENI HALL ENERGY TRUST OF OREGON 421 SW OAK ST STE 300 PORTLAND OR 97204 jeni.hall@energytrust.org	SPENCER MOERSFELDER ENERGY TRUST OF OREGON 421 SW OAK ST STE 300 PORTLAND OR 97214 spencer.moersfelder@energytrust.org
GINA SARASWATI ENERGY TRUST OF OREGON gina.saraswati@energytrust.org	
GRIDWORKS	
KATIE WU GRIDWORKS katiewu@gridworks.org	
IDAHO POWER	
MATT LARKIN IDAHO POWER COMPANY PO BOX 70 BOISE ID 83707-0070 mlarkin@idahopower.com	KELLEY NOE IDAHO POWER COMPANY PO BOX 70 BOISE ID 83707-0070 knoe@idahopower.com
LISA D NORDSTROM IDAHO POWER COMPANY PO BOX 70 BOISE ID 83707-0070 lnordstrom@idahopower.com; dockets@idahopower.com	
NATIONAL RENEWABLE ENERGY LABORATORY	
BENJAMIN SIGRIN NATIONAL RENEWABLE ENERGY LABORATORY benjamin.sigrin@nrel.gov	
NW ENERGY COALITION	
FRED HEUTTE NW ENERGY COALITION PO BOX 40308 PORTLAND OR 97240-0308 fred@nwenergy.org	

NW NATURAL	
RATES & REGULATORY AFFAIRS NORTHWEST NATURAL 250 SW TAYLOR ST PORTLAND OR 97204 efiling@nwnatural.com	
OREGON CITIZENS UTILITY BOARD	
OREGON CITIZENS' UTILITY BOARD 610 SW BROADWAY, STE 400 PORTLAND OR 97205 dockets@oregoncub.org	MICHAEL GOETZ OREGON CITIZENS' UTILITY BOARD 610 SW BROADWAY STE 400 PORTLAND OR 97205 mike@oregoncub.org
ROBERT JENKS OREGON CITIZENS' UTILITY BOARD 610 SW BROADWAY, STE 400 PORTLAND OR 97205 bob@oregoncub.org	
OREGON DEPARTMENT OF ENERGY	
JASON SIERMAN *OREGON DEPARTMENT OF ENERGY 550 CAPITOL STREET NE SALEM OR 97301 jason.sierman@oregon.gov	WENDY SIMONS OREGON DEPARTMENT OF ENERGY 550 CAPITOL ST NE 1ST FL SALEM OR 97301 wendy.simons@oregon.gov
REBECCA SMITH OREGON DEPARTMENT OF ENERGY 550 CAPITOL ST NE SALEM OR 97301 rebecca.smith@oregon.gov	
PACIFICORP	
PACIFICORP, DBA PACIFIC POWER 825 NE MULTNOMAH ST, STE 2000 PORTLAND OR 97232 oregondockets@pacificorp.com	MATTHEW MCVEE PACIFICORP 825 NE MULTNOMAH PORTLAND OR 97232 matthew.mcvee@pacificorp.com
PGE	
J RICHARD GEORGE PORTLAND GENERAL ELECTRIC COMPANY 121 SW SALMON ST 1WTC1301 PORTLAND OR 97204 richard.george@pgn.com	

PORTLAND GENERAL ELECTRIC	
QUISHA LIGHT PORTLAND GENERAL ELECTRIC 121 SW SALMON ST 3WTC0306 PORTLAND OR 97204 quisha.light@pgn.com	ROB MACFARLANE PORTLAND GENERAL ELECTRIC 121 SW SALMON ST, 1WTC0702 PORTLAND OR 97204 rob.macfarlane@pgn.com; pge.opucfilings@pgn.com
MCKENA MIYASHIRO PORTLAND GENERAL ELECTRIC 121 SW SALMON ST - 1WTC1711 PORTLAND OR 97204 mckena.miyashiro@pgn.com	JAY TINKER PORTLAND GENERAL ELECTRIC 121 SW SALMON ST 1WTC-0306 PORTLAND OR 97204 pge.opuc.filings@pgn.com
PORTLAND STATE UNIVERSITY	
HAL NELSON PORTLAND STATE UNIVERSITY hnelson@pdx.edu	
RENEWABLE NORTHWEST	
MAX GREENE RENEWABLE NORTHWEST 421 SW 6TH AVE STE 975 PORTLAND OR 97204 max@renewablenw.org	MICHA RAMSEY RENEWABLE NORTHWEST dr.micha.ramsey@gmail.com
STAFF	
CAROLINE MOORE PUBLIC UTILITY COMMISSION OF OREGON PO BOX 1088 SALEM OR 97308-1088 caroline.f.moore@puc.oregon.gov	
TEMIX	
STEPHEN MACDONALD TEMIX stephen.macdonald@temix.com	

Dated this 15th day of October, 2021.

Katie Savarin
Coordinator, Regulatory Operations

2021

Oregon Distribution System Plan

PACIFICORP

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Distribution System Plan (DSP)

Version: October 2021

Executive Summary

PacifiCorp supports Oregon's vision of a clean energy future that is safe, resilient, empowers customers and creates balanced outcomes for all participants. In the past we have shared this commitment in a variety of ways but due to the new audience that DSP is intended to connect with, and the importance of this message, we are restating that vision to ensure an understanding of our commitment and broad awareness of the underlying concepts. We strive to bring the best of the West to our customers' doors, by incorporating concepts that customers and stakeholders bring to reframe our vision, and leverage our experiences with innovation to continue to better our service for customers. Critical to this future is collaboration across a broader continuum of voices than ever previously integrated into our plans. The DSP plan is intended to create a framework for understanding that future and the building blocks, including the logical progression and costs to support this vision.

At PacifiCorp, we share a bold vision with our customers for a future where energy is delivered affordably, reliably and without greenhouse gas emissions. A future where our vast, modern energy grid connects local communities to the low-cost and reliable energy they need to innovate and achieve their goals. Like our customers, we believe that affordability and sustainability go hand in hand and together, they form the foundation for a reliable, resilient energy future—where regional and state economies benefit from investments in energy resources and infrastructure that help them pioneer new growth opportunities. It's an ambitious vision, and one that is achievable. By connecting the West's diverse resources to the vast reach of our transmission system and by investing in technology, partnerships and markets, we are creating the future we all want, together. We know it's possible because it's already happening.

In 2019, the Public Utility Commission of Oregon (OPUC), opened Docket UM 2005 to conduct an investigation of investor-owned utility's (IOU) DSP practices.[1] This investigation developed initial guidelines that accelerate Oregon's clean energy investments and transform how IOUs plan for the distribution system. These guidelineswere approved in OPUC Order No. 20-485 and set forth a "transparent, robust and holistic" distribution system planning process.[2]

This document lays out how PacifiCorp will transform the system to enable this clean energy future for all customers. It further outlines critical elements that must be in place, and tactically deployed to support this future state.

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[1] OPUC Distribution System Planning Initiative, https://www.oregon.gov/puc/utilities/Pages/Distribution-System-Planning.aspx

[2] In the Matter of Public Utility Commission of Oregon, Consideration for Adoption Staff Proposed Guidelines for Distribution System Planning, Docket UM 2005, Order No. 20-485 (Dec. 23, 2020) (available at https://apps.puc.state.or.us/orders/2020ords/20-485.pdf).

PacifiCorp Vision

When PacifiCorp joined Berkshire Hathaway Energy in 2006, we set out to be the best energy company in terms of service to our customers while delivering sustainable energy solutions. We saw the path forward as an invitation to reimagine not just how energy is produced but how it is dispatched and delivered. We knew our greatest opportunity would be discovered in understanding the needs and aspirations of our customers and communities. We saw the West itself, with its abundance of diverse natural resources, as a way to deliver greater value. And we believed that the greatest gains could be realized by building upon the more than 100 years of innovation that helped create our 10-state energy grid.

Knowing that if we tackled every challenge by drawing on our track record of partnership and technology-driven innovation, we could transform our expansive grid into an industry-leading, interconnected energy system—a system uniquely equipped to access the best energy resources the West has to offer and efficiently deliver those resources to our customers' door. We got to work bringing this vision to life. We've made a lot of progress over the past 13 years, becoming the largest regulated utility owner of wind power in the West. From 2018 to 2020, we have increased the percentage of zero-carbon energy resources in our portfolio by 70 percent. We made sure to do it all while capturing and returning savings to our customers. DSP leverages these concepts from the transmission and generation network and advances them into the framework of the distribution system and customer generators.

PacifiCorp envisions an energy future where our distribution network delivers value to the communities we serve, through efficient and valued movement of energy at a pace and in a manner that benefits our diverse mix of customers. PacifiCorp serves a broad continuum of communities and advances this plan to form the foundation of meeting them where they are, whether that is in a highly dynamic energy trading environment or in a manner more aligned with the legacy system. In order to accomplish this, the legacy construct of one-way generation and delivery of energy from the top-down approach must evolve into a near-frictionless environment in which crowd sourcing of resources and uses is conducted equitably. The system must then be highly intelligent (or have information and automation to support advanced operations) and must also be flexible as new needs, resources and scenarios evolve.

PacifiCorp has for more than a century delivered safe, reliable, cost-efficient power to its customers. As customers' needs have evolved, so has the system; further, as technology afforded better costs and more extensibility of the network, those features have been and will continue to be delivered to customers and communities.

Strategy: Reinventing the Future Through Collaboration

For more than a decade, PacifiCorp has successfully reduced our carbon emissions and improved reliability while simultaneously delivering energy cost savings to our customers. We've achieved these results by collaborating with others outside of our organization to create a more open and connected Western grid and through the visionary and collaborative efforts of our own generation, transmission, information technology and energy supply management teams.

In 2014, we pioneered the Western Energy Imbalance Market (EIM) in partnership with the California Independent System Operator. This innovative market allows utilities across the West to access the lowest-cost energy available in near real-time, making it easy for zero-fuel-cost renewable energy to go where it's needed. If excess solar energy in California, excess wind from Wyoming or hydropower from Washington and Oregon is available, we'll harness it and transport it instantly across our company's 16,500-mile grid. Similarly, as we digitalize the distribution network such equivalent efficiencies will be able to be harnessed within the local system; so, if a customer at one location is using less energy than their distributed generation resource, like a solar array, their neighbor can benefit from that resource by utilizing the interconnected distribution system.

PacifiCorp recognizes that effectively conducted distribution system planning will enable community involvement in prioritizing utility investments, be foundational in implementing new technologies, whether on the customer side of the meter or the company side of the meter, create a pathway for advancing clean energy goals and will support equitable resource allocation across the diverse territory served by the company.

DSP Core Principles

- **Transparent and comprehensive data sets** for customers, communities, regulators and stakeholders to evaluate and set priorities recognizing goals of the state in advancing a clean, equitable energy future;
- **Robust engagement** with communities, stakeholders and regulators to ensure access to new datasets and technologies are properly advanced through investments by PacifiCorp and partners;
- **Technology adoption** at a pace customers can afford and the company can perform;
- **Increasing resilience** in the face of climate change and customer expectations.

Regulatory Background

As informed by Oregon Senate Bill 978 (2017) and Governor Brown's Executive Order No. 20-04, these highlight the importance of exploring new expectations for the electric grid, the importance of clean energy, inclusivity, and customer options. As a result of the integrated resource planning process, the OPUC looked to broaden the planning process to include a more thoughtful consideration of the modernization of the electric utility grid and increase focus on the planning process for the distribution system. On February 19, 2019, Commission Staff released a whitepaper, "A Proposal for Electric Distribution Planning"[3] that outlined a proposal for an investigation into distribution planning. On March 22, 2019, the OPUC opened an investigation, docket UM 2005, to "develop a transparent, robust, holistic regulatory

[3] Staff Whitepaper: A Proposal for Electric Distribution System Planning, March 2019. https://edocs.puc.state.or.us/efdocs/HAU/um2005hau15477.pdf

planning process for electric utility distribution system operations and investments."[4] Staff developed guidelines through a series of stakeholder workshops and webinars that examined best practices and approaches to distribution system planning and was informed by an OPUC Special Public Meeting and public comment on the draft guidelines.

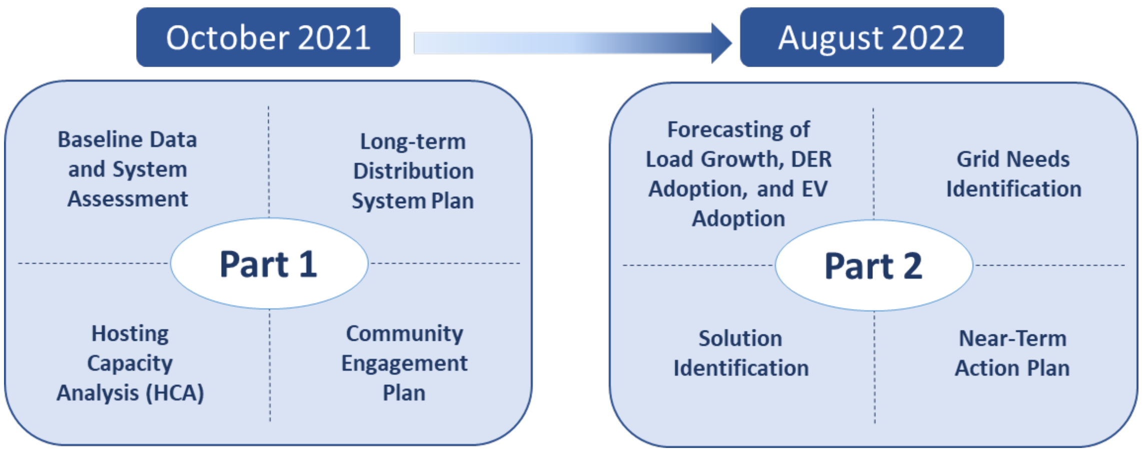


Figure 1: DSP Programs and Timeline

The DSP guidelines (Guidelines) for the utilities initial DSP plan are outlined below:

DSP Report Guidelines – Part 1 (October 2021)

- **Baseline Data and System Assessment** - Utilities will provide a fundamental understanding of the current physical status of the utility distribution systems, recent investment in those systems, and the level of distributed energy resources (DERs) currently integrated into those systems.
- **Hosting Capacity Analysis (HCA)** - Utilities will conduct system evaluations to identify generation constrained areas where it is difficult to interconnect DERs without system upgrades and present the results through a map on their websites. Utilities will prepare an analysis of options for investing in more sophisticated HCA capabilities in the near-term. The OPUC can consider the results of these analyses in adopting a path forward for HCA in Oregon.
- **Community Engagement Plan** - Utilities will develop a plan describing how they will engage community representatives in development of the pilot concept proposals required in Solution Identification, below.
- **Long-term Distribution System Plan** - Utilities will present their long-term (5-10 year) distribution system investment plans, and address broader goals related to maximizing reliability, customer benefits, and efficient operation of the distribution system.

DSP Report Guidelines – Part 2 (August 2022)

- **Forecasting of Load Growth, DER Adoption, and EV Adoption** - Utilities will build on their legacy load growth forecasting processes by forecasting DER and EV growth at the

[4] In the Matter of Public Utility Commission of Oregon, Investigation into Distribution System Planning, Docket UM 2005, Order No. 19-104 (Mar. 22, 2019)(available at https://apps.puc.state.or.us/orders/2019ords/19-104.pdf).

substation level.

- **Grid Needs Identification** - Utilities will present their methodology of comparing the current capabilities of a distribution system to the forecast demands on that system to meet future needs. This will include any resulting faults or constraints.
- **Solution Identification** - In addition to proposing the equipment, technology or programs needed to meet identified grid needs, utilities will develop two or more pilot concept proposals in which non-wire solutions will be used in place of traditional utility infrastructure investments. Utilities will develop pilot proposals collaboratively with community stakeholders in order to address community needs.
- **Near-Term Action Plan** - Utilities will present proposed solutions to address grid needs, and other investments in the distribution system, in the form of a 2-4 year Action Plan.

Appendix A lists the requirements for the DSP – Part 1 Report and where they are met within this report.

Chapter 1 – Current State

More than a Century of Service

Pacific Power, which is part of PacifiCorp along with Rocky Mountain Power, has provided safe, reliable, and affordable energy to customers in Oregon, Washington, and California for over 100 years. With respect to Oregon, Pacific Power has over 3,000 distribution line miles and 33,000 distribution utility poles that serves over 600,000 customers throughout the state. Figure 2; detailed baseline assets are outlined in the company's Baseline Data spreadsheet 4.1.b and in Table 8.

Figure 2: PacifiCorp's Oregon Service Territory

Pacific Power's service area is unique and diverse: while the company serves a portion of the Portland metropolitan area, the majority of customers live in smaller communities and rural areas, making Pacific Power the largest rural electricity provider in Oregon. For comparison, the two counties with the largest number of customers that Pacific Power serves are Multnomah County and Jackson County. Multnomah County has a population density of 1,700 residents per square mile while compared to the average population density of Jackson County is 73 residents per square mile[5]. The diverse nature of Pacific Power's service area means that the company plays an important role in modernizing the grid and engaging various

[5] U.S. Census Bureau, QuickFacts: Oregon, https://www.census.gov/quickfacts/fact/table/OR,US/PST045219 (last visited Sept 20, 2021).

stakeholders across Oregon for input on making investments that will aid in the delivery of safe, reliable and cost-effective electricity.

Pacific Power is privileged to serve customers across the state of Oregon. From Enterprise to Portland and Cannon Beach to Grants Pass and Klamath Falls, Bend and Hood River, and communities in between – the company is forging a path to a clean energy future. Pacific Power's customer composition is shown below in Figure 3:

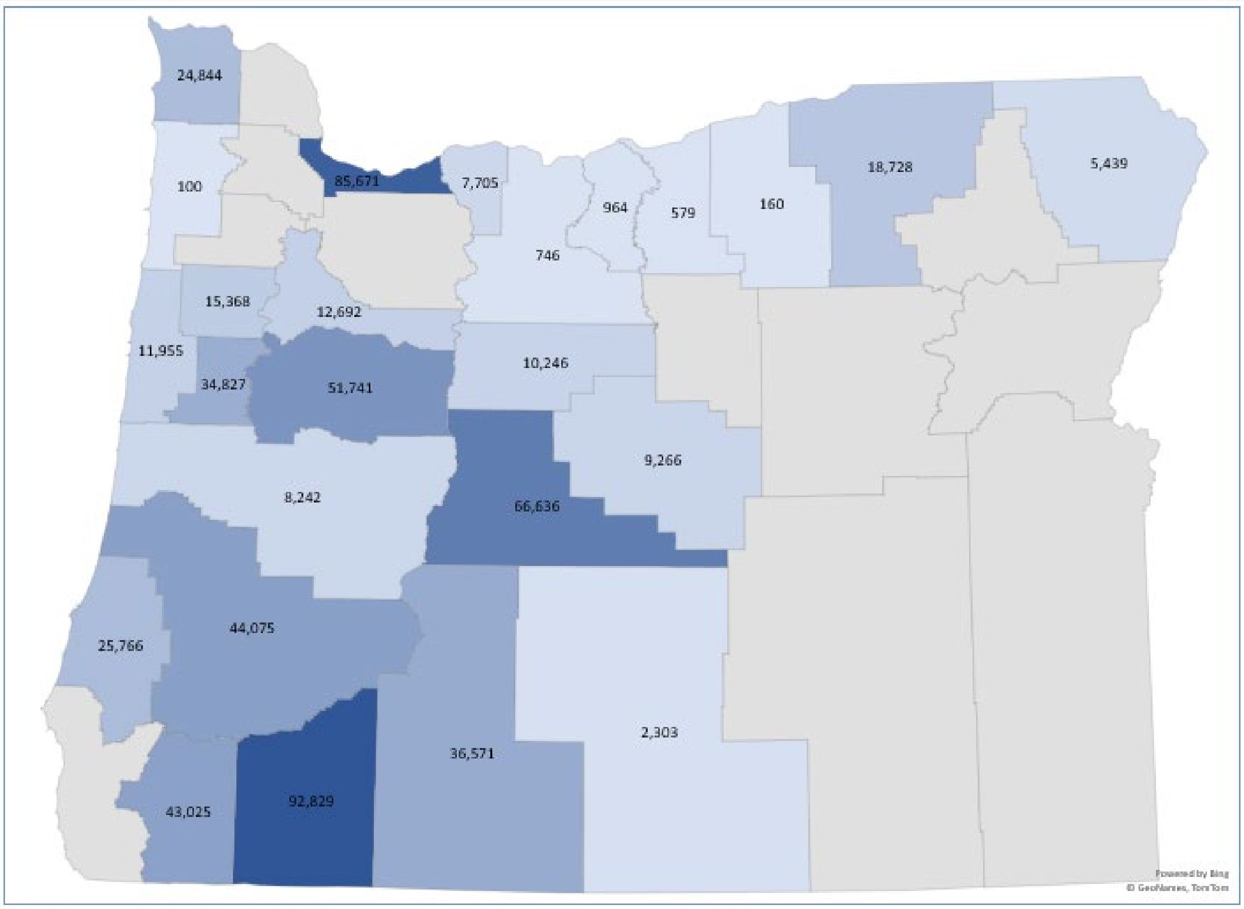


Figure 3: Pacific Power Customers by County, as of July 2021

Table 1: Pacific Power Customers per County, as of July 2021

Pacific Power Customers by County					
County	**Total**	**County**	**Total**	**County**	**Total**
Benton	34,827	Clatsop	24,844	Coos	25,766
Crook	9,266	Deschutes	66,636	Douglas	44,075
Gilliam	579	Hood River	7,705	Jackson	92,829
Jefferson	10,246	Josephine	43,025	Klamath	36,571
Lake	2,303	Lane	8,242	Lincoln	11,955
Linn	51,741	Marion	12,692	Morrow	160
Multnomah	85,671	Polk	15,368	Sherman	964
Tillamook	100	Umatilla	18,728	Wallowa	5,439
Wasco	746				
				TOTAL	**610,478**

Planning, Operations, Accounting, Rates and Energy Efficiency Policies

For over a century, the electric system has survived and thrived, forming an essential part of everyday life, and acting as a key element facilitating economic growth throughout the communities the company serves. Over this time a wide array of engineering, planning and operational practices have emerged which maintain reliability and economic efficiency. These systems began as isolated installations for small communities and over time became higher electrically interconnected, and as a result, standards which inform the fundamental principles for these connections were created.

These principles are guided through a variety of industry, regulatory and technical mechanisms, including engineering standards (such as established by the Institute of Electrical and Electronic Engineers), bulk electric system reliability standards (as overseen by the Federal Energy Regulatory Commission (FERC) and North American Electric Reliability Corporation (NERC)) and regulatory principles (such as those overseen through the OPUC). Additionally, many company-specific practices and standards also underpin the governance and operation for a specific company's system. PacifiCorp has developed a large body of work which supports the planning, engineering, operations and maintenance of its system, incorporating the legacy of its assets, the locations and environments which are unique to them and the historically established customer needs. In this chapter many of those core concepts will be explored, particularly to pave the path in outlining our long-term plan.

A legacy system graphic is shown below in Figure 4. Electricity is generated at the generation station (1) (such as hydroelectric dams or combustion engines) after which its voltage is transformed (2) to mesh with the voltage of the adjacent transmission assets (generally ranging from 69 kilovolts (kV) through 500 kV), into which the electrons are fed. The transmission system then facilitates the movement of that energy toward the "load" side of the system, or to the distribution network, via substations (3). Substations convert the "high side" or transmission voltages down to "low side" or distribution voltages, which range from 4 kilovolt to 34.5 kilovolt. The distribution network then, through the network of overhead and underground wires (4-8) connects with customers' points of attachment at meters (8-9), whereafter the electricity is delivered to the customer's appliance, via the house wiring.

The electric system can be thought of like a transportation network, where freeways (or transmission lines) can move large volumes of vehicles (or energy), but those same vehicles could move from the beginning of the route to their destination through any or all of the different types of roads within the transportation network, such as highways, arterials or local surface streets; since electricity follow the path of least resistance, how it gets from point A to point B is based upon what path is easiest for it to take, i.e. least resistance, which generally means the highest voltage, lowest impedance path.

Maintaining proper flow through these network elements historically relied upon deterministic based guidelines which were the result of experiences gained through loading events, assessing customers' energy usage and evaluating the system performance through a wide range of events. Limited real time data was used and readily available to make rapid adjustments to the system, so these guidelines formed the set of practices which kept the system functioning reliably through the range of load/weather/resource events.

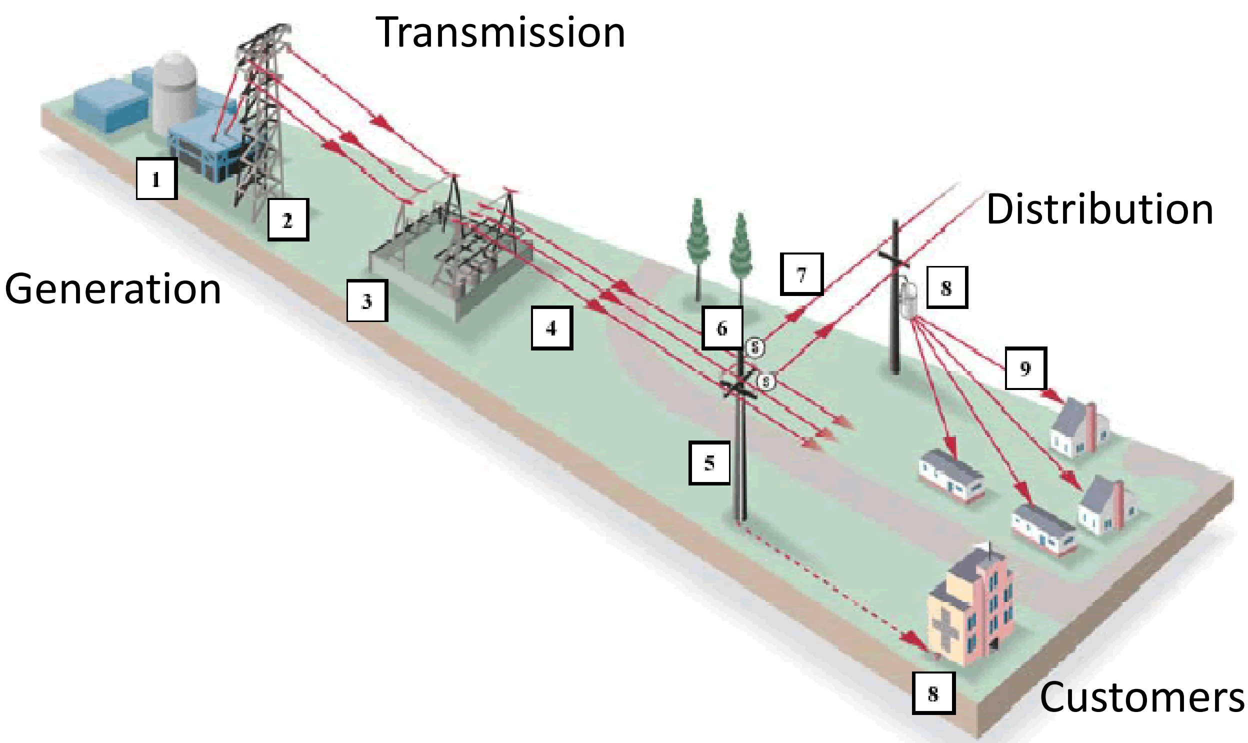


Figure 4: Legacy Electric System Diagram

Critical to this reliable, safe and economic operation are the processes which are required to recognize a variety of changes needed within the system, such as when reliability declines and targeted improvements are needed, when equipment has aged and no longer performs acceptably or when customers need additional supply for either new service or new uses. The company outlines in Figure 5 below the process it uses to maintain current and future planning triggers into its budgets and operational plans.

The top path in the flowchart identifies the input that occurs from a customer regarding their needs, such as when they add load to their premise. An assessment occurs and depending upon the capacity of the equipment serving them, modifications to the equipment or system equipment may be required. In the second path, area planning studies, new customer loads or new customer generation may result in specific studies being performed by engineers, which subsequently result in modifications to the equipment of the customer or system equipment. The third and fourth paths identify the process by which a community change may precipitate equipment changes, or a resource availability may create an opportunity to reconfigure the equipment. Each of the inputs of paths one through four results in either distribution or transmission planning engineers being required to assess the needs of the network to fulfill that condition. The final, or fifth path shows the process undertaken to incorporate targeted reliability improvements, modifications due to asset health or changes in response to mandates such as road relocations or reliability standards.

Each of these paths result in a consolidated project list which sets the basis for budget plans and prioritization, and based upon a variety of considerations (such as timing, scope and impact of an event if the project is not advanced) priorities for the project are established and an approved list advances toward engineering and construction. Historically, at this point, PacifiCorp would be able to share such information broadly, having high certainty that it can deliver on the plan as a commitment.

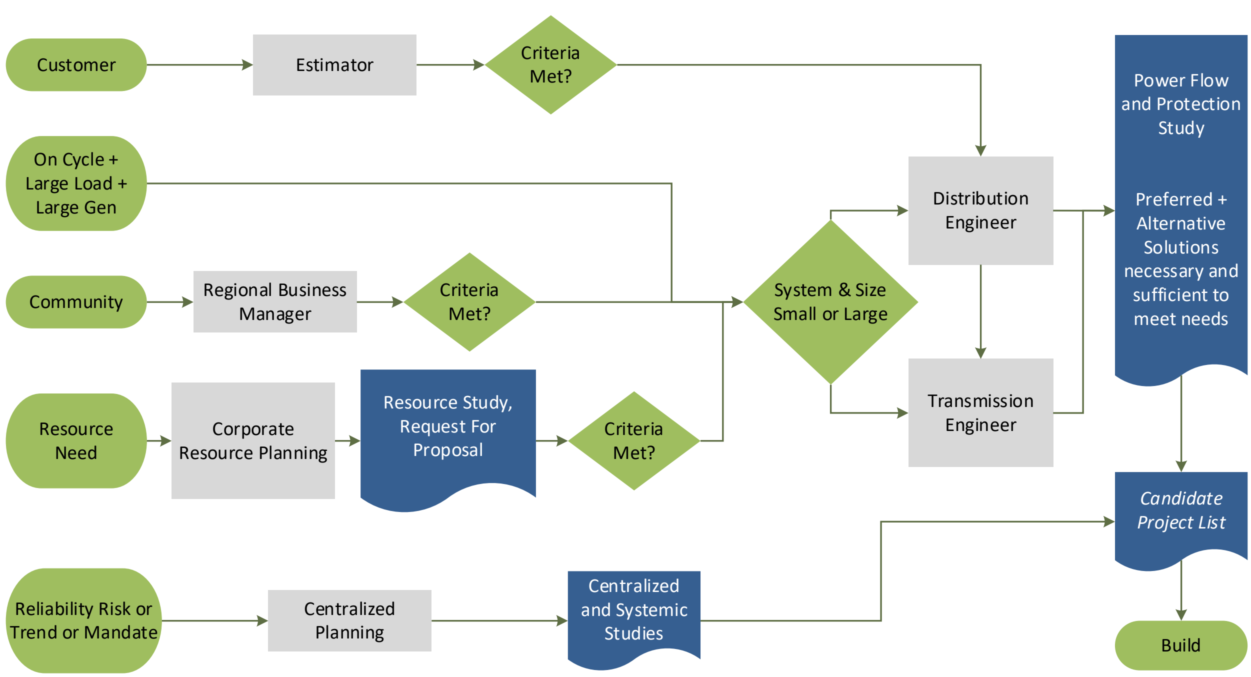


Figure 5: Planning Process

Thereafter, the work is constructed, funds are spent, customer and community needs evolve and equipment ages, all creating additional triggers to future plans, which are evaluated, consistent with the process above and the cycle restarts.

Planning studies (also referred to as load studies) are performed for a variety of reasons. First and foremost, a cyclic planning process allows area data to be refreshed and updated, incorporating the most recent customer loading into power flow simulation models to assess the performance of the network. Using this new data and updated models, loading conditions can be further refined as necessary to identify and propose projects or other mitigation measures. A breakdown of this planning process is described below.

Area data is refreshed by comparing records to known/found field conditions. Parameters which may be needed to be corrected include conductor phasing, conductor types and construction, specific equipment (such as transformer, fuse, recloser, regulator locations), connectivity issues, new projects and their status of construction. As discrepancies are discovered the as-is model is updated to reflect known/found conditions and pushed into the company's GIS, as well as the CYME FENIX application.[6]

Customer loading parameters are generally equivalently spread based on connected kVA, with known block load additions. Loading conditions are evaluated for the appropriate allocation and expectation under a variety of conditions. Expectations of weather-normalized and growth-integrated load is evaluated for several credible cases. First, five years of growth, based on a weather-normalized linear extrapolation is performed; base growth is augmented by known large block loads. Weather normalization is performed in a variety of ways, depending on the quantity of data supporting greater levels of sophistication. For circuit-based studies, such as those performed for relatively short planning durations, a temperature normalized load growth is advised. Where greater gaps exist in data, such as limited equipment loading values for specific weather events, realistic extreme weather cases or growth cases vary substantially, greater margins to compensate for the uncertainty may be warranted. Nonetheless, as of this writing the system is evaluated at either the most recent extreme for the last five years or at 104° F during summer evening peak and 32°F for winter morning peak.

After the growth percentage is established, these temperatures and growth cases are simulated using area models. Currently, models are executed at winter and summer loading conditions; additional loading cases are considered and executed for other time/weather parameters when deemed necessary. Both equipment loading and voltage performance are considered in the simulation. Any found issues are documented in the planning study along with proposed mitigation solutions and alternatives.

In proposing mitigations, the situation is addressed in a triage manner, in which the lowest

[6] This application contains attributes that aren't required for mapping but are required for engineering usage to calculate load flow, for example the configuration and spacing of conductors.

cost solution is the first proposal advanced. Thus, for conductor or equipment overloading beyond standard or emergency loading limits, measures taken could include phase balancing, then voltage regulation, conductor replacement or additions; at its most extreme substation changes might be appropriate (in progression based on complexity and cost). For out of voltage performance,[7] many of the mitigations are similar to overloads, such that phase balancing, line drop compensation and then more substantial reconductoring efforts might be undertaken.

In the current area planning process local generation is incorporated into these studies on a case specific basis. For large block sources, in a manner like large block loads, they may be separately applied and evaluated against a wide range of scenarios under which the most extreme cases will be further analyzed for any needed network changes. Due to uncertainty for individual performance, these resources are generally not used as an alternate to capacity within the network. However, demand side changes and net metering impacts are incorporated as a form of load attrition by evaluating recent peak trend events, such that if demand response or customer generation resulted in a slower growth trend for an area, that trajectory would result in a lower future demand curve.

While the prior discussion focused on cyclic planning processes, specific studies to support either block loads[8] or block resources also result in area plans being produced; both loads or resources are appraised similarly however resource requirements are applied consistent with Institute of Electrical and Electronics Engineers (IEEE) Standard 1547.[9] Such studies are conducted like the process above, and the resulting network changes are outlined. Costs for network changes are evaluated against allowable investment for the specific changes required for the customer, applying the appropriate tariff to establish cost responsibility.

In addition to capacity planning, network change planning is conducted for a variety of other reasons. These include asset replacement, response to jurisdictional projects, targeted reliability improvement planning as well as other mandated actions including compliance with relevant codes, such as the National Electric Safety Code (NESC), NERC reliability standards or state administrative rules. The company conducts each of these planning functions in a manner tuned to the triggers that align with the needed response, for instance as jurisdictions conduct public works projects such as road widening or realignments the companies pole line might require relocation to the new edge of travel-way; the timing is predicated on the jurisdictional schedule and the company's plan design to dovetail appropriately. Further activities might be the result of changes in reliability standards or other code driven changes.

As equipment ages or is found to not perform properly in certain locations environments and under certain conditions it may be deemed necessary to be replaced when this occurs the

[7] IEEE NESC ANSI Voltage Range A allows 5% variation from nominal voltage, i.e. 114-126 V for 120 V nominal and is an industry standard in the IEEE and NESC.
[8] Block loads are specifically modeled for those >1 MW, whether primary or secondary delivery points.
[9] IEEE Standard1547-2018: IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces

vintage location or other details are identified and based upon the expected performance through the equipment's end of life will result in prioritization for the replacement activity. Usually when reliability is found to be lacking in an area, targeted reliability improvements will be proposed and based upon expected improvement levels, projects will be prioritized. After the work is completed another assessment of the post improvement performance is undertaken. If the area still does not meet reliability targets additional projects may be proposed and advanced.

Each of these planning drivers has independent and varying inputs to performance. In order to create a common prioritization mechanism, the company undertakes an assessment of the benefits for that project, which could be an improvement in performance as measured by reliability metrics or the reduction of the risk of a specific event or the impact of non-performance for mandated work; projects and programs are then aligned with budget levels and approved projects delivered.

PacifiCorp's Maintenance Programs

PacifiCorp maintains its system and assets consistent with the Oregon Administrative Rules and other reliability standards through a range of inspection and maintenance programs. Generally, each program includes proactive inspections or maintenance activities tailored to identify and correct conditions that could result in premature equipment failure, including any situations in which the infrastructure may no longer be able to operate per code or engineering design, or may become susceptible to external factors, such as weather conditions. More specifically, these programs are designed to mitigate the risk associated with equipment mis-operation and failure as well as the susceptibility and vulnerability of the infrastructure to external factors. These programs align with the Oregon Administrative Rules and, in certain instances, exceed the regulatory requirements.

Asset Inspection

Pacific Power's asset inspection program involves three primary types of inspections: (1) visual assurance inspection; (2) detailed inspection, and (3) pole test and treat. Inspection cycles, which dictate the frequency of inspections, are set by Pacific Power asset management in accordance with relevant codes and industry standards, such as OAR 860-024-011. In general, visual assurance Inspections are conducted more frequently, to quickly identify any obvious damage or defects that could affect safety or reliability, and detailed inspections are performed less frequently, with a more detailed scope of work. The frequency of pole test and treat is based on the age of wood poles, and such inspections are typically scheduled in conjunction with certain detailed inspections. The inspector conducting the inspection will assign a condition code to any conditions found and the associated priority level in Pacific Power's facility point inspection (FPI) system. Corrections are then scheduled and completed within the correction timeframes established by Pacific Power asset management, as discussed below. While the same condition codes are used throughout Pacific Power's service territory, the timeframe for corrective action is different in different state jurisdictions. In all cases, the timeline for corrections takes into account the priority level of any identified condition. A priority A level condition is addressed on a much shorter timeframe than a priority B condition.

The diagram below outlines the general type of inspections, frequency, and qualitative comparison of correction time periods for conditions identified.

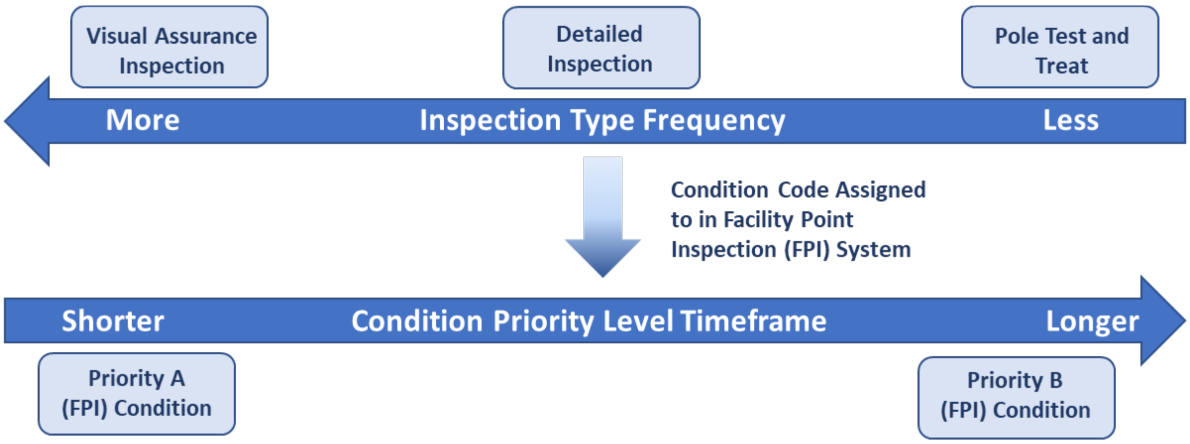


Figure 6: Inspection types and timelines

Inspection Frequency. Pacific Power's inspection frequencies for Oregon assets are summarized in the following table:

Table 2: Inspection Frequency for Distribution Facilities

Inspection Type	Current Inspection (Frequency in year)
Visual	2
Detailed	10
Pole Test & Treat	10

Correction Timeframe. Correction timeframes for observed condition priorities are summarized in the following table:

Table 3: Correction Timeframes for Conditions

Condition	Current Correction Timeframes
A – imminent	Immediately
A – non-imminent	30 days
B – non-imminent	24 months

One major function of inspections is to identify equipment that require maintenance or replacement, such as poles. Traditionally, overhead poles are replaced or reinforced within Pacific Power's service territory consistent with condition correction requirements detailed above. When a pole is identified for replacement, typically through routine inspections and testing, major weather events, or joint use accommodation projects, a new pole consistent with engineering specifications suitable for the intended use and design is installed in its place. Engineering specifications typically reflect the use of wooden poles which is consistent with prudent utility practice and considered safe and structurally sufficient to support overhead electrical facilities during standard operating conditions.

Additionally, inspections may identify conditions that require special coordination to complete, such as those that require permits, special access, or exist because of joint user actions on company equipment. In these instances, Pacific Power works to coordinate with either key agencies or joint users to facilitate corrective action, which often can be in the form of a notification to joint users.

Substation Inspections

PacifiCorp's preventative maintenance program includes the performance of substation inspections on a routine basis consistent with OAR 860-024-0011[10] requirements. As part of this program, qualified personnel inspect PacifiCorp substations in Oregon which includes the assessment of equipment status and condition as well as the overall security of the substation. Often, these inspections also include the use of additional technology such as Infrared to identify hot spots throughout the substation. Additionally, minor housekeeping and preventative maintenance, such as circuit breaker function testing, occur alongside these inspections to identify additional corrective maintenance or asset replacement required. For example, preventative maintenance on a circuit breaker or transformer may identify the need for near-term replacement and result in a project and funding to replace the equipment. Table 4 summarizes the types of inspections performed on distribution substations as a part of this program and planned frequency for each.

Table 4: Pacific Power's Programmatic Substation Inspection Cycles

Type of Inspection	Voltage Class	Frequency
Substation Inspection (including infrared)	Distribution	Bi-Annual (24 months)
Substation & Security Inspection[11]	Distribution	At least 8 times per year (4 major, 4 minor)

Vegetation Management

Another key component of the company's maintenance plan is its vegetation management program. It is generally one of the primary activities the company undertakes which may directly be observed by customers and the public. Vegetation management plans are prepared to align with administrative code requirements under OAR 860-024-011. These requirements specify minimum end of cycle clearance and while they identify exceptions for minimal

[10] Oregon Administrative Rule 860-024-0011(2)(d) electric companies "inspect electric supply stations on a 45-day maximum schedule".

[11] On average, substation and security inspections are typically performed on all substations on a monthly basis. However, internal policies require that inspections be performed at least 8 times per year consistent with the Oregon Administrative Rules.

incidental interference, are becoming ever more important as wildfire risk increases due to the changing environmental conditions within the state. Pacific Power's vegetation management program is described in detail in Pacific Power's Transmission & Distribution Vegetation Management Program Standard Operating Procedures ("Standard Operating Procedures"). The focus of Pacific Power's vegetation management efforts is different for distribution lines and transmission lines. In both cases, typical work functions include pruning and tree removals. Pacific Power prunes trees to maintain a safe distance between tree limbs and power lines. Pacific Power also removes trees that pose an elevated risk of falling into a power line. Pacific Power uses significantly more restrictive clearance protocols under transmission lines and typically has wider rights-of-way that allow it to remove vegetation. Similar to other utilities, Pacific Power contracts with vegetation management service providers to perform the pruning and tree removal work for both transmission and distribution lines.

Distribution – Cycle Maintenance

Vegetation management on distribution circuits is completed on a cycle basis every four years except for Portland, which is on a two-year cycle. All vegetation on a given circuit requiring work is pruned to comply with defined minimum clearance specifications. Because some trees grow faster than others, minimum clearance specifications vary depending on the type of tree being pruned. For example, faster growing trees need a greater minimum clearance to maintain clearance throughout cycle.

Pacific Power also integrates spatial concepts to distinguish between side clearances, under clearances, and overhang clearances. Recognizing that certain trees grow vertically faster than other trees, it is appropriate to use an increased clearance when moderate or fast-growing trees are under a conductor. Increasing overhang clearances also reduces the potential for any contacts due to falling overhang.

The duration of the work cycle also impacts what minimum clearance specification is needed. In general, distances must be greater when work is done on a four-year cycle versus a two-year cycle. Because of the amount of fast-growing trees in Oregon, the four year cycle may be supplemented with two year interim work (work conducted half-way through the four year cycle). When doing interim work, trees that are likely to exceed minimum clearance requirements prior to the next scheduled work are pruned so that clearances will be maintained through the full cycle.

The minimum clearance specifications are designed so that regulatory mandated clearance with primary lines will be maintained throughout the cycle.[12] The specific lengths for the minimum clearance specifications are set forth in Section 5.2 of the Standard Operating Procedures as follows:

[12] In Oregon, three feet of clearance is required at all times (unless a tree is readily climbable, in which case five feet is required).

Table 5: Distribution Minimum Vegetation Clearance Specifications for a Four-Year Cycle

Four-Year Cycle			
	Slow Growing (< 1 ft. /yr.)	**Moderate Growing (1-3 ft./yr.)**	**Fast Growing (>3 ft./yr.)**
Side Clearance	8 ft.	10 ft.	14 ft.
Under Clearance	10 ft.	14 ft.	16 ft.
Overhang Clearance	12 ft.	14 ft.	14 ft.

When a tree is pruned, natural target pruning techniques are used to protect the health of a tree. Natural targets are the final pruning cut location at a strong point in a tree's disease defense system, which are branch collars and proper laterals. Pruning at natural targets protects the joining trunk or limb.[13] Consequently, an actual cut is typically beyond the minimum clearance distance listed in the table above. In all cases, however, the cut is at least to the minimum clearance distance.

Pacific Power also removes high-risk trees as part of distribution cycle work, to minimize vegetation contact. High-risk trees are defined in the Standard Operating Procedures as "dead, dying, diseased, deformed, or unstable trees that have a high probability of falling and contacting a substation, distribution conductor, transmission conductor, structure, guys or other [Pacific Power] electric facility."[14] Inspections are performed on distribution lines in advance of distribution cycle maintenance work, to identify which trees will be worked in the cycle, including high-risk trees subject to removal. To identify hazard trees, Pacific Power uses the practices set forth in ANSI A300 (Part 9); Smiley, Matheny and Lilly (2011), Best Management Practices: Tree Risk Assessment, International Society of Arboriculture; and CALFIRE Power Line Fire Prevention Field Guide §§ 12-19.

In summary, Pacific Power uses an initial Level 1 assessment, as defined in ANSI A300 (Part 9), with particular attention to the prevailing winds and trees on any uphill slope. Suspect trees that require further inspection may be subjected to a Level 2 assessment, as outlined in ANSI A300 (Part 9), to further assess their condition. After the work is completed, Pacific Power conducts post-work inspections as part of an audit and quality review process.

Distribution cycle work also includes work designed to reduce future work volumes. In particular, volunteer saplings, small trees that were not intentionally planted, are typically removed if they could eventually grow into a power line. From a long-term perspective, this type of inventory reduction helps mitigate wildfire risk by eliminating a potential vegetation

[13]This technique is drawn from ISA Best Management Practices: Tree Pruning (Gilman and Lilly 2002) and A300 (ANSI 2008). (See also Miller, Randall H., 1998. Why Utilities "V-Out" Trees. Arborist News. 7(2):9-16.)
[14]See Table 2 of FAC-003-04, available at
https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-003-4.pdf

contact long before it could ever occur.

Transmission Line Vegetation Management

Vegetation management on transmission lines is also focused on maintaining clearances, but the clearance distances are greater. Because of the nature of transmission lines, wider rights-of-way generally allow Pacific Power to maintain clearances in excess of the required minimum clearances set forth in the Minimum Vegetation Clearance Distance (MVCD[15]). Accordingly, rather than scheduling vegetation management work for transmission lines on a fixed cycle timeframe, such work is scheduled on an as-needed basis, depending on the results of regular inspections and specific local conditions. To determine whether work is needed, an "Action Threshold" is applied, meaning that work is done if vegetation has grown within the action threshold distance. When work is completed, vegetation is cleared to the minimum clearance as specified in this table:

Table 6: Transmission Minimum Vegetation Clearance by Transmission Line Voltage

Transmission Clearance Requirements (in feet)								
	500 kV	**345 kV**	**230 kV**	**161 kV**	**138 kV**	**115 kV**	**69 kV**	**45 kV**
Minimum Vegetation Clearance Distance (MVCD)	8.5	5.3	5	3.4	2.9	2.4	1.4	N/A
Action Thresholds	18.5	15.5	15	13.5	13	12.5	10.5	5
Minimum Clearances Following Work	50	40	30	30	30	30	25	20

Taking advantage of greater legal rights to manage the vegetation in the right-of-way for transmission lines, PacifiCorp employs Integrated Vegetation Management (IVM) practices to prevent vegetation growth from violating clearances. Rather than depending on pruning in regular work cycles, IVM seeks to prevent clearance issues from emerging, by managing the species of trees and other vegetation growing in the right-of-way. Under such an approach, PacifiCorp removes tree species that could potentially threaten clearance requirements, while encouraging low growing cover vegetation, which would never implicate clearance issues.

Line Patrolmen inspect most transmission lines annually and notify the vegetation management department of any vegetation conditions. Regional foresters in the vegetation management department also conduct regular inspections of vegetation near transmission lines, including annual inspections of vegetation on all main grid transmission lines. Vegetation work is scheduled dependent on a number of local factors, which is consistent with industry standards and best management practices. Vegetation work on local transmission overbuild is completed on the distribution cycle schedule and inspected accordingly.

All of these strategies and techniques are described in much greater detail in the Standard

[15]See Table 2 of FAC-003-04, available at https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-003-4.pdf

Operating Procedures. The current form of the Standard Operating Procedures was first published in 2008, and periodic updates to content have been made. The most current version is Revision 07, dated May 13, 2019.

PacifiCorp's Targeted Reliability Improvement Programs

Reliability planning begins with analysis of outage data sets, which are aggregated to identify historic performance within particular portions of the electrical network. Outage history and the electronic record is fueled by the automated outage management process implemented by the company beginning in 2001. Customer trouble calls, including Advanced Metering Infrastructure (AMI) reports and SCADA events are interfaced with the Company's real-time network connectivity model, its CADOPS system (Computer Aided Distribution Operations System). By overlaying these events onto the network model, the program infers outages at the appropriate devices (such as a transformer, fuse or other interrupting device) for all customers downline of the interrupting device. The outage is then routed to appropriate field operations staff for restoration and the outage event is recorded in the company's Prosper/US outage repository. This outage data is collected as inherent processes through the completion of outage reporting, work organizing and trouble response.

In addition to this real-time model of the system's electrical flow, the company relies heavily upon the SCADA system it has in place (for about 41% of the circuits and about half the Oregon customer base) and is integrating other line sensing technologies as they are deployed into the network, as well as data captured in Dispatch Log System (an SQL database application) which serves to collect all events on SCADA-operable circuits; elements of SCADA and the Dispatch Log System are in transition as the company is in the final stages of implementing SunNet's iTOA system, which marries device information from SCADA into the transmission and substation records for operational performance. The company is reliant upon data assembled through its automated outage management system; a diagram of the data flow process is shown below.

Data Collected: Conventions, Indices and Certain Definitions

SAIDI, SAIFI, CAIDI and MAIFI are the most common indicators or indices used by utilities across the nation for measuring and reporting reliability. Along with other indices, they were first rigorously documented in IEEE Standard 1366-1998, and since modified in IEEE Standard 1366-2003/2012, IEEE Guide for Electric Power Distribution Reliability Indices. Each of these four common indicators measure different aspects for determining the reliability delivered to a customer.

The outage process and data flow begins with customer or device calls (either AMI or SCADA), into the automated outage management system. Equipment operating as part of the outage is then inferred. As restoration occurs, updates are made to systems. After outage restoration is completed it is interfaced into the company's outage database archive, which is the data source from which the company analyzes, improves on and reports about reliability.

The company uses industry definitions[16] to categorize, summarize and manage its reliability reporting process; The key definitions are below.

- SAIDI refers to the "System Average Interruption Duration Index". It is typically measured in minutes and is a calculation of the total minutes out experienced by each customer in a given area divided by the total number of customers served in the area. It is an indication of the average number of minutes a customer may expect to be out during an outage event in their area. For example, if a circuit serves 500 customers and 300 of these customers experience an outage lasting 120 minutes the SAIDI or average outage duration for these customers fed from this circuit for the specific event would be 72 minutes. ((300 customers x 120 minutes)/500 customers served).

$$\text{SAIDI} = \frac{\text{sum of all customer interruption durations}}{\text{total number of customers served}}$$

- SAIFI refers to the "System Average Interruption Frequency Index". It is measured by outage frequency and is a calculation of the total customers out in a given area divided by the total number of customers served in the given area. It is an indication of the average number of outage events a customer may expect to experience over a period of time in their area. Using the same example as above, if a circuit serves 500 customers and 300 of these customers experience an outage lasting 120 minutes the SAIFI or average outage event frequency for these customers fed from this circuit for the specific event would be 0.6 events. (300 customers/500 customers served).

$$\text{SAIFI} = \frac{\text{total number of customer interruptions}}{\text{total number of customers served}}$$

- MAIFI refers to the "Momentary Average Interruption Frequency Index". It is very similar to the SAIFI calculation however it measures momentary outage events. Momentary outages are outage events which last under five minutes. These events are often system self-correcting outages. For example, a tree branch falls and hits the line before falling to the ground, tripping out the circuit breaker, the breaker runs through a cycle and automatically restores power to the line. In these cases, the customer will likely only experience a small flicker of a power outage.

$$\text{MAIFI} = \frac{\text{total number of customer interruptions less than the defined time}}{\text{total number of customers served}}$$

- CAIDI refers to the "Customer Average Interruption Duration Index". It is a combined metric using SAIDI and SAIFI, to determine the average outage time for events. Because CAIDI is commonly used as a measure to determine the average duration of a single event it is best measured over the course of time, where several outage events are accounted for. For example, a circuit serving 500 customers experiences two outages a

[16] IEEE Standard 1366-2012: Guide for Electric Power Distribution Reliability Indices.

year. The first outage affects 300 customers for 120 minutes, while the second outage affect 150 customers for 60 minutes. The total circuit SAIDI is 90 minutes[17], SAIFI is 0.9[18], and CAIDI is 0.9.

$$\text{CAIDI} = \frac{\text{sum of all customer interruption durations}}{\text{total number of customer interruptions}} = \frac{\text{SAIDI}}{\text{SAIFI}}$$

To get a proper view of system performance it is important that these indices be measured over a period of time. Outages are random events and if one focuses in too small of an area or short of a time, they will likely not draw conclusions which have high confidence. For simplicity in understanding these metrics the above examples for each index targets just a single event, when in reality these metrics are most often applied to a series of events over a given period of time, typically a year. In addition, these metrics are reported based on larger area such as a reporting region or state performance. The company uses concepts for reliability analysis which are detailed in industry documents[19] and is an active leader in exploring how to better use this data to deliver improved performance while minimizing costs of that better performance.

Combined, these metrics calculated annually at a regional or state level can help provide the customer with understanding of company's reliability performance, with; SAIDI measuring the total minutes of outage time a customer may experience for the year, SAIFI measuring the average number of outage events experienced for the year, and CAIDI measuring of the average duration for each outage event over the year. In 2020, Oregon customers experienced an average of 111 SAIDI minutes without power, experiencing on average one SAIFI event. Therefore, the average duration of outage events for the year was 111 CAIDI minutes.

PacifiCorp recognizes two categories of performance: underlying performance (which is a measurement of typical reliability and events which occur throughout the year) and major events. Major events represent the atypical, with extraordinary numbers and durations for outages beyond the usual. Major events are often the result of extreme weather. A Major Event (ME) is defined as a 24-hour period where SAIDI exceeds a statistically derived threshold value (IEEE Standard 1366-2012) based on the 2.5 beta methodology. In Oregon, major event days are calculated at the state and regional level consistent with the requirements of OAR Chapter 860, Division 023. PacifiCorp then aggregates districts to establish reliability reporting regions, for which it verifies that it conforms to appropriate statistical tests to ensure proper application of IEEE Standard1366.

The below charts show the regional SAIDI, SAIFI, and CAIDI, performance from 2016 to 2020, broken into reporting regions and displayed at a state level. The data also shows the correlation with the two categories of performance; excludes ME, is the underlying performance that does not include major events, while the includes ME shows the

[17] ((300 customers x 120 minutest) + (150 customers x 60 minutes))/500 total customers served on the circuit
[18] (300 customers + 150 customers)/500 total customers served on the circuit.
[19] IEEE Standard 1782-2014 Guide for Collecting, Categorizing and Utilizing Information Related to Electric Power Distribution Interruption Events.

performance of underlying metrics with Major Events.

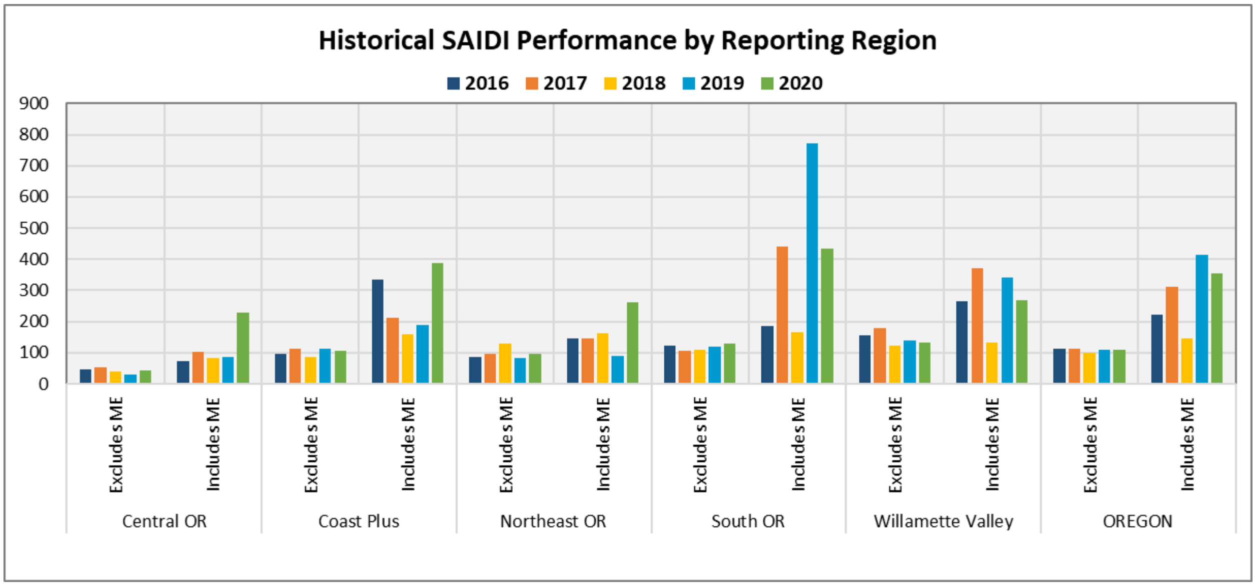


Figure 7: 2016-2020 annual SAIDI performance results by region & state, with & w/o major events.

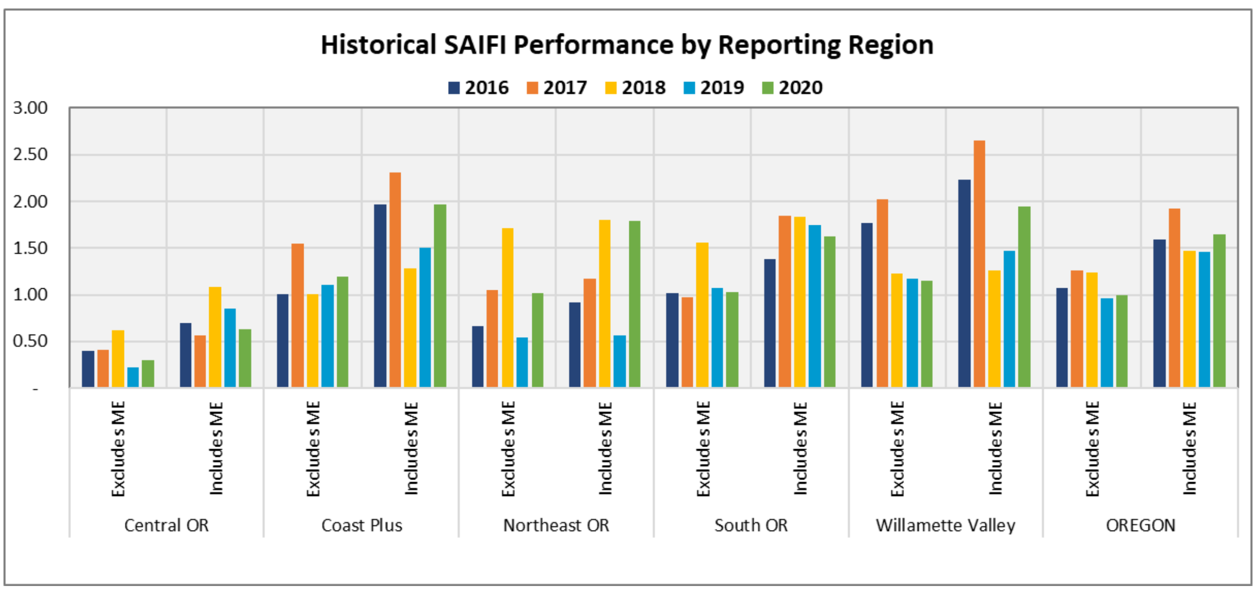


Figure 8: 2016-2020 annual SAIFI performance results by region & state, with & w/o major events.

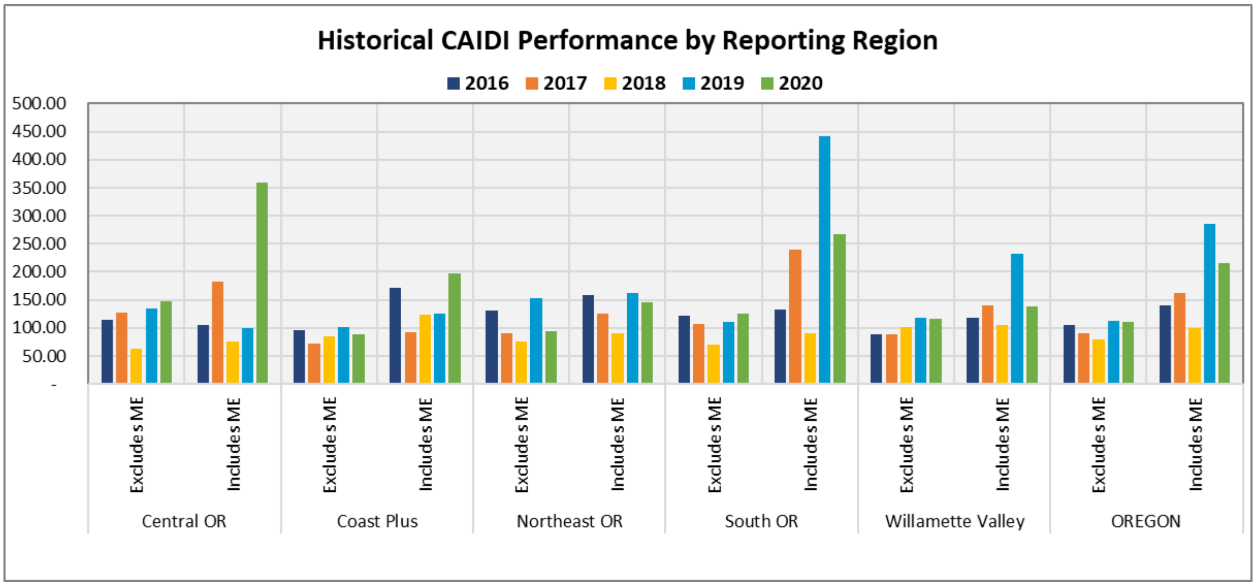


Figure 9: 2016-2020 annual CAIDI performance results by region & state, with & w/o major events.

It is important to note that while the company reports data based on the larger populations of customers served, when reviewing performance and system updates data is often evaluated by its circuit performance across a several year period. Doing this helps the company to identify key areas to be addressed. Reviewing the reliability indices defined above, in addition to specific details and identified causes of the outages events can help direct area engineers on the corrective action plans and the appropriate system updates to help address the specific reoccurring events. This is further addressed in the sections below.

PacifiCorp collects outage data on all outages on the source side of the electric meter. When it is required to interrupt power to perform work on the system, it records these outages with a separate designation to identify whether they were taken without notice, or whether the outages were pre-arranged or planned. For the purposes of the data provided in this report, Planned Outages are those in which either the customer or the Company made arrangements for the power interruption to occur. In certain situations, the notice may be very short, while generally two days' notice is the goal. Certain other outages may be performed intentionally by employees without notice (such as when a car strikes a utility pole and the crew replacing the damaged pole takes an operational outage), but since they happen precipitously, they are not classified as Planned Outages. The Company also collects information about outages that happen on equipment at voltages higher than distribution level, specifically the transmission or generation system; transmission voltages within PacifiCorp are those in excess of 34.5 kilovolt (kV). If an interruption occurs to distribution customers as a result of events at those facilities, PacifiCorp designates these outages as Loss of Supply outages.

Reliability Tools & Data Analysis

The Company continues to grow its ability to use reliability data strategically with the development and implementation of reliability-centered tools. It uses a web-based notification tool that alerts when interrupting devices (such as substation breakers, line reclosers or fuses) have exceeded specific performance thresholds. It then promptly investigates these situations, many of which result in localized improvements, such as can occur when a cable section is replaced or when a slack span is re-sagged. It has also overhauled its geospatial reliability analysis tool, augmenting its functionality to better distinguish circuit details in light of reliability events, particularly in the area of underground cable fault and replacement history. The use of these tools results in maximum improvement for the efforts expended, improving reliability to customers at the best possible costs.

Cost Effective Improvements

PacifiCorp uses its reliability data in a variety of ways that are designed to improve reliability to its customers. It has devised methods that are contained in the industry guide for electric reliability, IEEE Standard 1782-2014. Some of these analytical methods render the outage data in a tabular, graphical or geospatial manner. All of them serve as inputs to identify and develop projects that improve reliability using the Company's fuse coordination program (Fuse It or Lose It: FIOLI), its circuit-hardening program (Saving SAIDI), and its capital construction program (Network Initiatives). It evaluates the history of outages within a circuit and at specific devices (fuses, reclosers, circuit breakers) across the entire service area and determines the probability of avoiding outages of specific cause categories. The programs (FIOLI, Saving SAIDI and Network Initiatives) are evaluated for their forecast improvements to network reliability, as measured by the avoidance of customer interruptions, customer minutes interrupted and momentary customer interruptions. Each project has a value calculated for the cost of the project divided by the avoided interruptions. PacifiCorp uses this cost per avoided customer interruption and customer minute interrupted to identify cost-effective reliability improvement projects. It assembles each of these candidate projects and their cost to benefit value into a project priority listing, which rank-orders the projects and, based upon the best-cost projects, prepares a suite of projects that align with metric improvement and budget targets. As projects are completed, the list is re-evaluated to determine whether reliability performance or funding levels have changed and warrant modifications to the plan.

Improvement History

In general, the Company focuses on improved system hardening and enhanced system protection. Through targeted reliability projects, protective coordination has been improved by replacing hydraulic reclosers, installing new line reclosers, enhancing the existence of fuses that are able to reduce line and the number of customers exposed to those fault events and replacing substation relays. This new equipment has allowed for smaller and more coordinated protective operations to clear fault events. Additionally, the Company has continued reliability-centered hardening activities on circuits whose equipment may be performing in a way indicating a lack of resilience to fault events. Using the Company's proprietary analytical tools, portions of circuits are identified that warrant additional hardening activity, often comprised of crossarm or cut-out replacement. Along with circuit hardening and protection efforts, the Company reviews outage history and circuit topology to obtain better segmentation of circuits, as well as increasing feeder ties and replacing damaged cable. The Company continues to pilot installation of new technologies which augment its reliability-centered toolset.

Improvement Effectiveness

The Company further evaluates the effectiveness of the actions it has taken. It compares benchmark or pre-construction reliability performance against after improvement performance and uses this track record to establish future expectations, identify deficiencies or over-achievement compared to targets, and recognize areas in which additional work may need to take place.

Annually the company provides detailed information regarding reliability in response to Oregon Administrative Rules.

Advancing toward the future

Since 2013 PacifiCorp has prepared and filed a "SmartGrid" report[20] which was intended to capture, at a high level the advancements made toward the utility system of the future. Within those reports the company outlined a road map and conveyed progress toward its completion. That information is updated and refreshed to further convey advancements within the "as is" environment of today and connect it with the road map. In a very early version of the SmartGrid Report the company provided the graphic below in Figure 10 to identify its initial road map that was anticipated almost a decade ago. It outlined enabling technologies on which it has delivered over that time, including AMI, CYME and several other pivotal elements each of which positions us to advance the next generation road map in support of DSP. And while the company has made substantial progress on that vision, the pace and broadened goals associated with DSP and its incorporation of customer-focused energy goals will require substantial augmentation beyond the efforts taken to date.

[20] SmartGrid Reports were filed in response to Order No. 12-158 in docket UM 1460 and Order No. 15-050 in docket UM 1667 and the most recent filed Report is https://edocs.puc.state.or.us/efdocs/HAQ/um1667haq135238.pdf

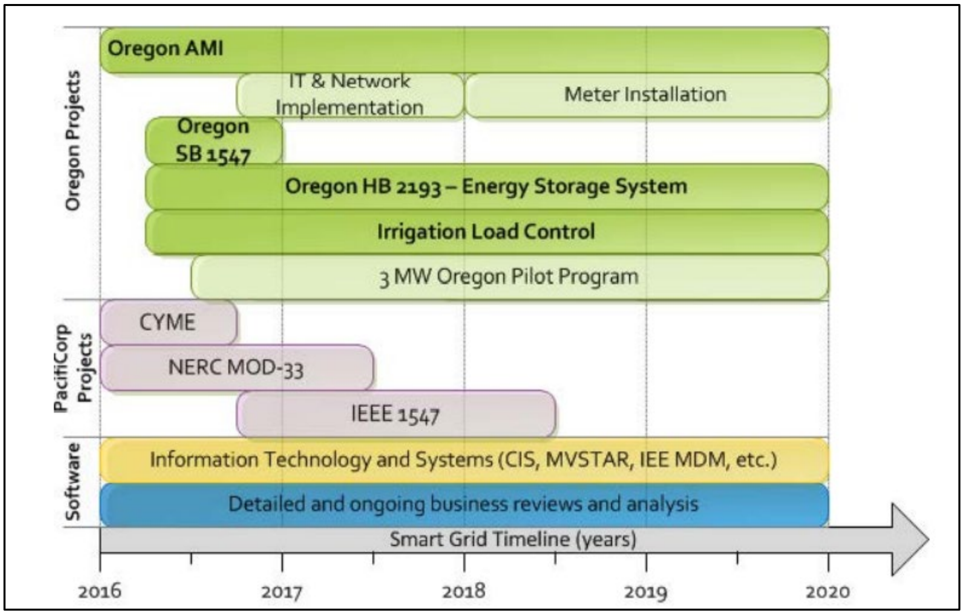


Figure 10: Grid Modernization Projects from PacifiCorp's 2017 SmartGrid Report

Grid Modernization Projects

More recently, the company provided Figure 11 in its 2019 SmartGrid Report to outline the wide variety of advanced technology efforts it was pursuing on behalf of its customers. Due to the wide diversity of service territory and the way it leverages advancements across the PacifiCorp and Berkshire Hathaway networks, the range and potential impacts are substantial. At the same time, however, they are measured advancements requiring thorough consideration for their placement in the roadmap of the future.

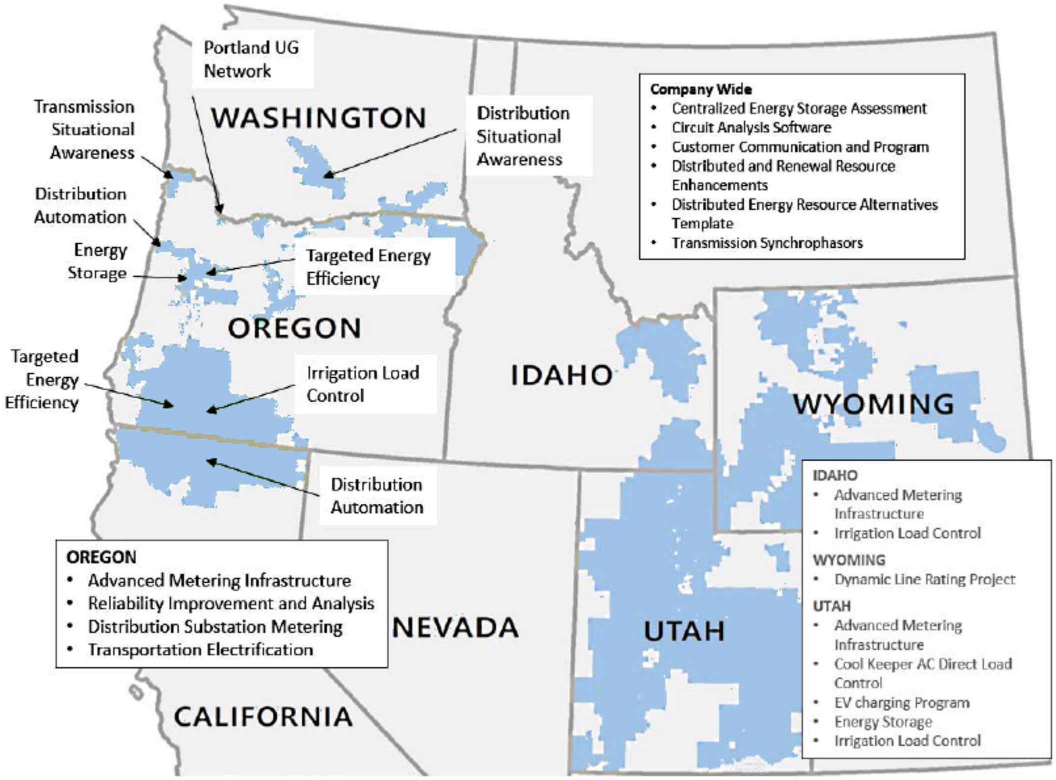


Figure 11: 2019 SmartGrid Report Projects across PacifiCorp

Historically the company has discussed, piloted, provided updates and incorporated a wide array of projects, including participation in advanced technology projects, like dynamic line rating and synchrophasor installation, assessment of impacts of conservation voltage reduction and consideration of additional devices to improve situational awareness and system control. Certain of these modernization projects warrant additional update since they play such a substantial role in the company's vision of the future and are discussed below.

AMI

In the 2017 SmartGrid Report the company outlined its plan for AMI deployment. In 2018 PacifiCorp began its Oregon AMI deployment. In its 2019 Smart Grid Report, the company conveyed that it was on track for completion by year-end, which was successfully accomplished. In Oregon, PacifiCorp installed over 600,000 smart meters, several hundred Field Area Network (FAN) components and a robust head-end system. Since that time, it has launched several AMI features including real-time outage notifications, network diagnostic capabilities and remote connection and disconnection of service. In addition to those features, PacifiCorp's customers benefit by having the ability to view and better understand their usage data on the company website. These features and benefits of AMI help improve customer service and provide a platform for future smart grid applications.

PacifiCorp's AMI meters can communicate outages to the head end system at the time of power loss. The system then checks certain criteria prior to routing an outage ticket to a system operator in the dispatch center. This AMI power outage notification feature enables PacifiCorp to quickly address power outages.

PacifiCorp's personnel have access to applications that enable real-time diagnostics. For instance, personnel can *ping* AMI meters. This feature is useful when identifying and troubleshooting power loss. In addition to the ping functionality, PacifiCorp personnel can perform a Power Quality Read. This type of read indicates helpful data such as the voltage, amperage as well as instantaneous demand.

PacifiCorp can remotely connect service upon customer request. When a customer requests power connection, the meter can be remotely connected within a few minutes. Service is also disconnected shortly after a customer closes their account to avoid unbilled energy usage.

With the addition of AMI data, customers have more insight into their own energy usage and are better equipped to make decisions about how they are using their electricity. By logging on to the company website, residential customers can view and export their hourly consumption data. Commercial customers can view and export their consumption data in fifteen-minute intervals. This is in addition to the available daily, weekly as well as yearly graphs, which can be easily toggled by the end user. For customers who utilize Green Button functionality, they will also be able to download the necessary file for their Green Button provider. All customers can export their consumption data via CSV file.

The future of AMI will bring additional customer and company benefits. One of these future enhancements includes *Meter to Transformer* mapping. AMI technology offers more insight into local distribution connectivity and will allow PacifiCorp to make needed improvements to our distribution mapping systems and network. In addition to leveraging connectivity data, PacifiCorp can also analyze meter data to identify potential power quality issues.

CYME load modeling

After more than 20 years of successful use of a legacy load modeling software, PacifiCorp began undertaking a transition to new modeling software. This transition occurred because the software was outdated and no longer being supported by the vendor. Notably future developments were not expected, particularly related to functionality to support the changing modeling environment within the distribution network such as the ability to model customer generation sources. The company evaluated a variety of options and based on testing and comparison against needed function began a multi-year project beginning in 2014, using Eaton's CYME modeling suite CYMDIST. Across the industry it is one of two major solutions for electrical system planning.

The CYME software suite includes a "gateway" used to interface data from key systems, including:

1. Customer service system: customer connectivity, energy consumption, rate class/schedule,

2. Geographic information system: locations and connectivity for conductor, devices and other line elements,
3. Engineering applications, including FENIX (which further details aspects of conductor construction) and AMPS (which establishes system study administration).

The capabilities of CYME include power flow and short circuit analyses. With regards to power flow analyses it can incorporate actual energy usage for specific periods and allocate them to service transformers, associate customer load profiles with specific customer rates, interpret results, model a wide array of alternative load and build out cases and evaluate a variety of network changes for each of those alternatives, registering them within a "solution project manager". The software also incorporates several "utility plug-ins" which relatively seamlessly integrate other utility tools, including spatial load/resource planning tools, such as Integral Analytics' LoadSEER. It also includes various options for modeling DERs such as the DER Impact Evaluation, and tools for determining wires options for distribution efficiency such as Volt/VAR optimization. Each of these tools play important roles in properly evaluating impacts of customer, resource and environmental changes in the safe, reliable and efficient operation of the electrical network.

Smart Devices

The company has had success with several different types of "smart" devices, including traditional SCADA systems. In Figure 12 below, it graphically and geospatially displays where in the Oregon network SCADA-enabled circuits exist, with the red color indicating a lack of circuit SCADA, while the blue shows circuits having SCADA.

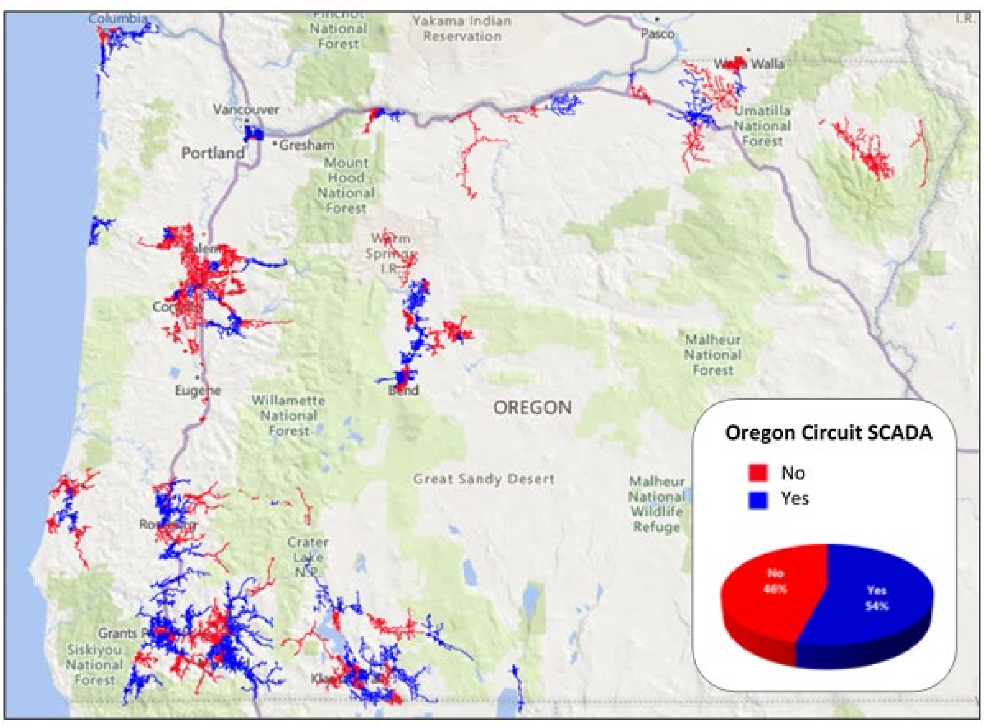


Figure 12: Oregon circuits with and without circuit SCADA

And while circuit and device level SCADA is the ideal method for obtaining and storing line data as well as controlling network devices, the company has discussed how it has complemented these approaches in its most recent SmartGrid report identifying a variety of information sources, including; distribution substation monitoring, piloting station meters yielding lower cost options (for data only using substation meters (Shark 250 meters), augmenting distribution network monitoring using Eaton's VaultGard system, shown in Figure 13 below, as well as collecting and integrating field recloser RTU data, such as displayed in Figure 14 below in which distance-to-fault data is communicated from reclosers through SCADA back to operations staff.

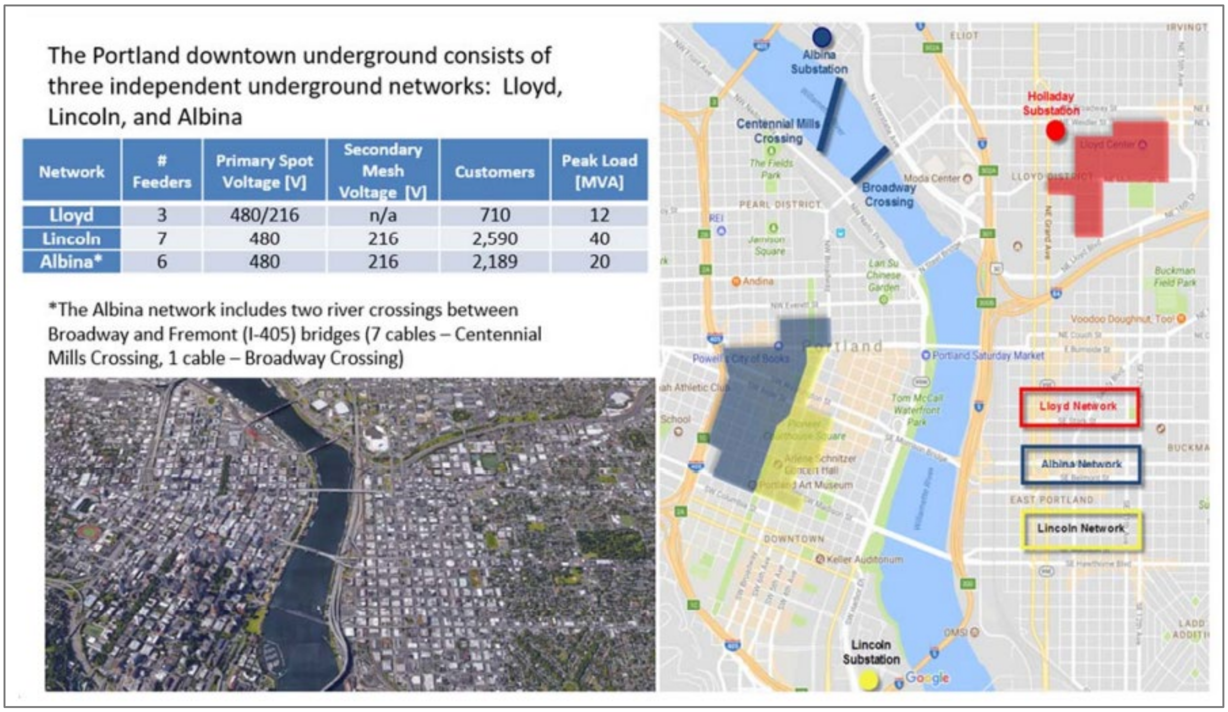


Figure 13: VaultGard Circuits Topology

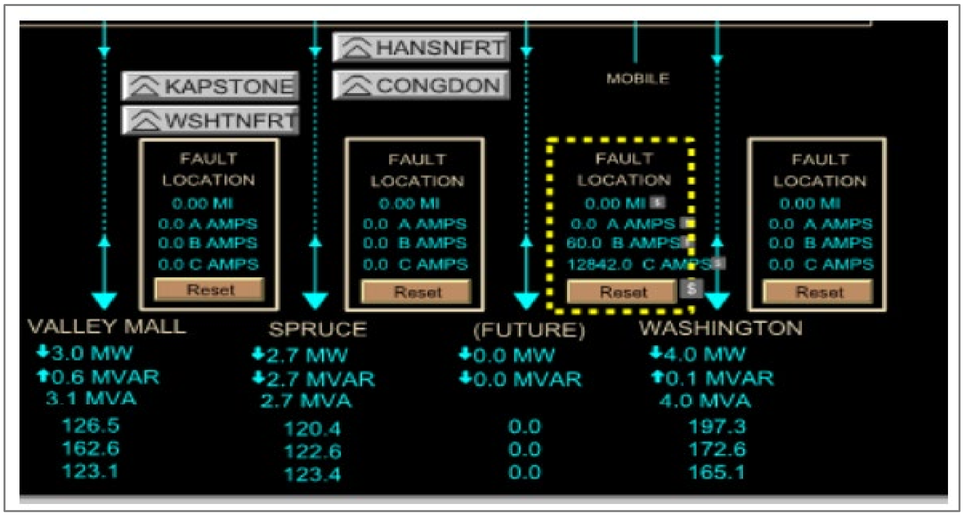


Figure 14: SCADA Display for Line Recloser Communications

Distribution automation (DA) of Fault Location, Isolation and Service Restoration (FLISR)

Throughout the year outage events are responded to by the company. In these situations, a fault current is detected by fuses, reclosers or circuit breakers and in order to ensure safety, limit equipment damage, and minimize the number of customers de-energized, the system is designed to isolate and de-energize the section in which the fault current was detected. In certain cases, such as with circuit breakers or reclosers, if the fault current was temporary (like occurs with an incidental contact or if lightning strikes) the recloser or breaker may be configured to restore after a short de-energize event. In that case the customers may see a short interruption (a momentary interruption) and power is restored automatically. In other situations, the event may require company response, such as if the fault were downstream of a fuse (which has no reclosing capability), or if permanent damage had occurred to the network. This general progression of events during faults is shown in Figure 15.

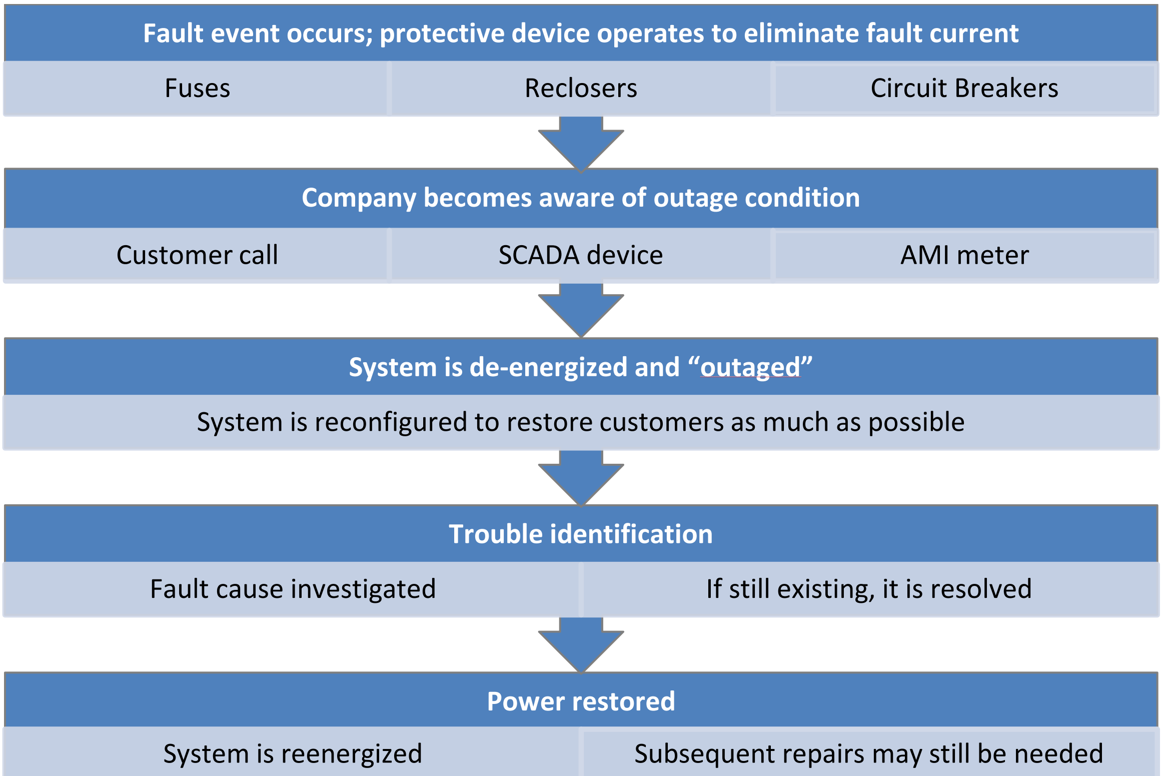
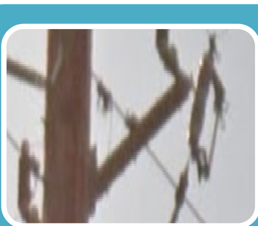


Figure 15: Outage Response

DA or fault location, isolation and service restoration (FLISR) functionality advances the "self-healing" that can be delivered by using "smart"[21] devices. DA functionality allows for "self-healing" or intelligently reconfigured network topology to limit the impact of fault events until repairs can be conducted. Comparisons between legacy, limited self-healing and fully automated distribution reconfiguration (DA) are shown below.

[21] National Institute of Standards and Technology NIST definition of "smart" devices includes an aspect of communications technology as detailed in this definition of the smartgrid; a modernized grid that enables bidirectional flows of energy and uses two-way communication and control capabilities that will lead to an array of new functionalities and applications.



Legacy system without reclosing technology

- About 45 minutes for responder to arrive
- 45 plus minutes for patrolling, correction and devices to be re-energized
- Minimum 2 hours average; increases dramatically during extreme weather

Reclosing technology deployed

- About 80% of faults cleared and power restored by automated devices (reclosers and circuit breakers/relays)
- Balance require field response to diagnose system issues, i.e. 20% remain
- Similar response times to above, however smaller exposure generally means less time for patrolling & restoration, i.e. average about 100 minutes

FLISR/DA technology deployed

- All faults within "looped" zone restored by automated devices, with only damaged sections remaining de-energized
- Usually the majority of customers are restored within about 10 minutes of fault event
- Remaining customers within damaged section should experience shorter duration since field investigation is more limited than otherwise

Figure 16: Evolution of Reclosing Equipment as Part of "Self-Healing"

In 2017 the company assessed locations to conduct a DA pilot to determine the benefits it could deliver to customers by use of such technology. The characteristics of a network that can benefit by DA/FLISR are:

1. "Low hanging" reliability improvements have already been performed (such as circuit hardening, coordinating protective devices and installing circuit protection equipment at key taps, reclosing equipment has been deployed where possible or economically reasonable),
2. Available adjacent circuits for redundant sources,
3. Existing circuit ties have sufficient capacity to pick up adjacent loads without substantial reconductoring costs,
4. Substation equipment is current or will benefit by replacement,
5. Communication infrastructure is reasonably cost-effective, and
6. Operational staff are familiar with the equipment.

As a result of evaluating approximately 35 possible locations within Oregon we initiated our first pilot activity in Lincoln City, Oregon beginning in 2018, shown in Figure 17 below, with network topology shown in Figure 18 below. During the project's implementation the company installed a mock system in a lab environment, in which it performed scenario testing, settings refinement and staff training. Thereafter, PacifiCorp deployed line equipment, modified substation equipment, performed system configuration and programming and trialdeployed a field area network and all associated equipment. As the company began performance testing prior to commissioning the self-healing elements it determined that the performance of the field area network was not able to meet service level agreements needed to advance system commissioning. As a result, the company has undertaken its next alternative, intended to be complete in early 2022, deploying a private fiber network, which was calculated to be the lowest long-term cost alternative.

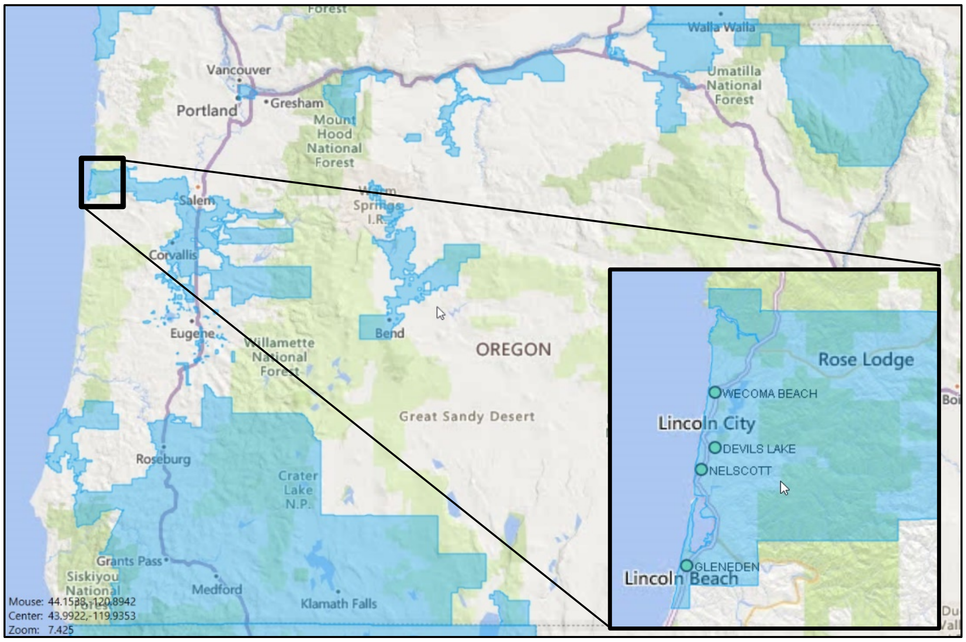


Figure 17: Lincoln City, Oregon

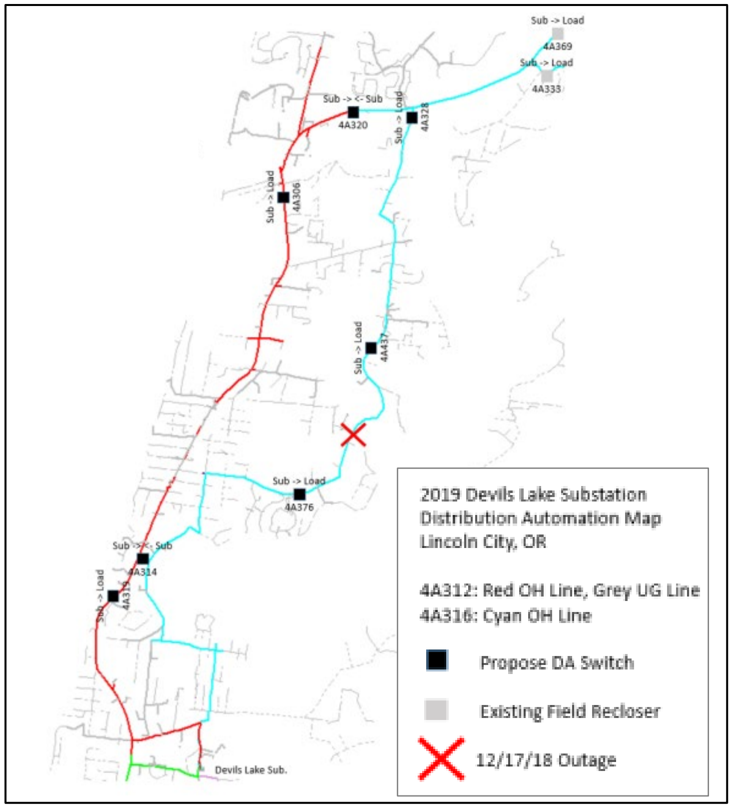


Figure 18: Lincoln City, Oregon Pilot - Topology

Simulations of actual extreme events the community has experienced have shown that after completion of the DA network, reliability impacts to the community should be limited by a substantial percentage. In the company's 2019 SmartGrid Report, in Figure 19 below, it provided calculations evidencing the manner in which the modified self-healing would occur and the company was able to mathematically simulate a recent winter storm, determining that the customer minutes interrupted would have been reduced from about 331,000 CMI (or an average duration of 42 minutes per customer) to approximately 139,000 (or an average duration of 18 minutes per customer); notably half of the served customers would have been restored in under 10 minutes, clearly improving resilience to the community. It is also important to point out that substantial targeted reliability had been done previously such that previous storm events impacted the community for much longer average durations.

Restoration Scenario	Step	Time Stamp	Outage (Min)	Customer Out (#)	Customer Restored (#)	CMI	Restoration Activity
Actual Event	1	12/17/2018 23:53	-	-	-	-	Tree hits mainline with Sub CB lockout.
Actual Event	2	12/18/2018 0:27	34.00	4,384	978	149,056	Wireman opened 4A376 switch. Sub re-energized to 4A376.
Actual Event	3	12/18/2018 0:42	15.00	3,406	3,252	51,090	Wireman Opens 4A437 switch and closes 4A320 tie. Critical hospital load restored.
Actual Event	4	12/18/2021 14:54	852.00		154	131,208	Crews remove tree, rebuild, and re-energize between 4A376 and 4A437.
					Total	**331,354**	

Restoration Scenario	Step	Time Stamp	Outage (Min)	Customer Out (#)	Customer Restored (#)	CMI	Restoration Activity
DA Estimate	1	12/17/2018 23:53	-	-	-	-	Tree hits mainline with Sub CB lockout.
DA Estimate	2	12/17/2018 23:53	0.03	4,384	4,384	-	Automatic fault location, isolation, and restoration.
DA Estimate	4	12/18/2021 14:54	900.97		154	138,749	Crews remove tree, rebuild, and re-energize between 4A376 and 4A437.
					Total	**138,749**	

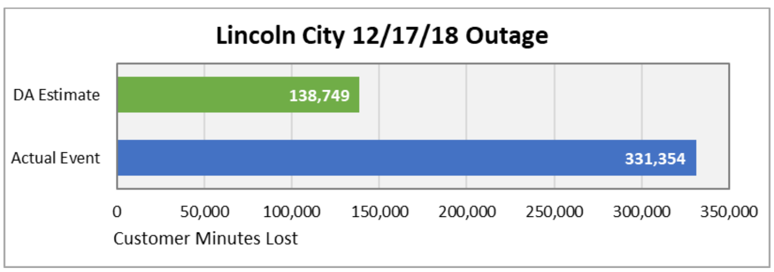


Figure 19: Lincoln City, Oregon Pilot - Metrics

Based on the early findings for this project the company is currently constructing two other distribution automation projects. One is in Portland, Oregon served from Russellville substation, while the other is in Medford, Oregon served from Belknap and Campbell substations. For both of these projects fiber routes for communications systems are part of the underlying strategy. They are both scheduled to be commissioned in mid- to late-2022.

Load Monitoring Data

The company currently utilizes PI Historian software as a repository for all SCADA and manual read historic load data. This data is crucial in development of load forecasts and is the core data used in the distribution planning study process. It also informs operational decisions when outages or power quality issues occur. Currently load data is collected via SCADA or manually at the circuit breaker and substation transformer level and is not collected at any other device on the distribution system[22]. This limits the scenarios that can be modeled and creates uncertainty as to how much load is on a line section or service transformer at any given time. Installation of SCADA on field devices can improve the certainty of the model and can be incorporated into PI Historian. However, PI Historian is only a data repository and provides no tools for load analysis and managing load data. Historically, all load data from PI Historian has been used manually to develop load forecasts and load profiles. This is a laborious process that involves reviewing the data and determining if the peak load is absent of events that can impact the data such as load transfers and faults (i.e. load swapping events that may have supported construction or other operational needs). Additionally, these forecasts have been based on system peaks (typically summer peak and winter peak), which may or may not be concurrent, and incorporated into company tools to determine growth rate over a specific study period (typically 5 years).

Distributed Generation (DG) readiness

As developers and customers have found benefits in siting distributed generation resources, important changes have been required to substation equipment to ensure the protection remains adequate for the distribution system. As a result of this historic experience and current inventory process, the company is developing plans as opportunities arise to proactively modify equipment within substations that do not have the required equipment for DG so that it can be completed in a cost-effective way. Specifically, these changes include installation of SCADA at the substation breaker so daytime minimum load values can be determined more accurately for use during DG interconnection review. Currently in substations without SCADA the daytime minimum load has been determined based on historical load data from other circuits of similar topology, area, and customer makeup. Additionally, the company will evaluate installing SCADA and additional protective equipment, such as deadline checking and transfer trip on field protective devices, to ensure the distribution system is protected with more distributed generation installed on the system. As such, the company defines a circuit protection as being “DG ready” if it is able to coordinate between the customer equipment and the circuit breaker, typically done by “dead-line” checking or transfer/trip functionality. This capability ensures that if the DG is producing more resource than the circuit requires it will not attempt to back feed into substation equipment. Also, should a fault occur anywhere within the connected circuit, the circuit protection will operate to rapidly clear the fault condition, avoiding damaging substation equipment. Also, the company outlines its method of determining available circuit capacity for DG. It is based on:

- Light loading conditions (called daytime minimum load),
- Current placed or in progress DG resources and
- Circuit capacity.

In the graphic below, Figure 20 the company designates the current “readiness” and capacity availability for distributed generation resources. It highlights circuit extents with the coloring

[22] This excepts the dozen reclosers located in Lincoln City at the Devils Lake FLISR/DA pilot location.

indicating how available the circuit is for additional resources to be placed on it. This data and its displays exceed the requirement of HCA Option 1, outlined in docket UM2005, and positions the company to continue to work with customers and developers to broaden the siting of distributed resources but do so expeditiously, cost efficiently, and fairly. The company is also making this and other DSP baseline information accessible on its DSP webpage at: https://www.pacificorp.com/energy/oregon-distribution-system-planning.html . As stakeholders and regulators provide guidance on other information that would serve DSP planning processes and open and transparent conversations about energy planning goals the company intends to augment this map display accordingly.

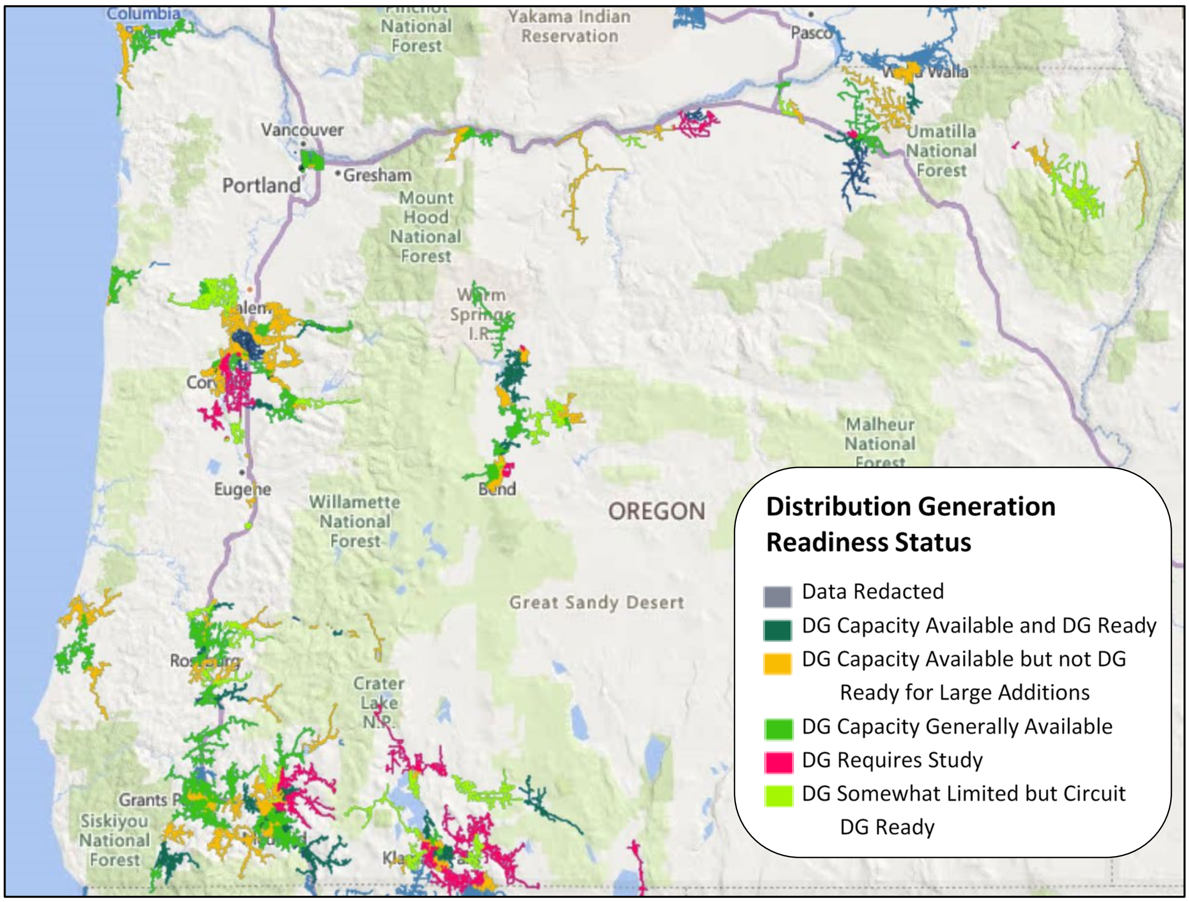


Figure 20: Distribution Generation Capacity Availability and Readiness Status

Baseline Data Elements

In OPUC Order No. 20-485 the OPUC outlined a variety of "baseline" elements intended to form the foundation for identifying the current state of each utility's practices. The baseline data elements are completed in its entirety and provided in a supporting workpaper that has been submitted with this report to Staff. However particular elements that are important for general understanding about the company's system are contained as text explanations or shown as tables. Where appropriate those references are shown in the table below.

Table 7: Baseline Data Elements Reference

Baseline Spreadsheet Reference	Table Number and Name or Page Reference	General Category
4.1.a	Pages 9-39,	A description of any currently used internal baseline and system assessment practices
4.1.b	Table 8	A summary of the utility's distribution system assets
4.1.c (SCADA)	Page 30, Figure 21	A discussion of distribution system monitoring and control capabilities
4.1.c (AMI)	Pages 28-29	A discussion of distribution system monitoring and control capabilities
4.1.d	Pages 30-38	A discussion of any advanced control and communication systems
4.1.e	Table 9	Historical distribution system spending for the past five years, in each category
4.1.f	Table 10	Net Metering and Small Generator information
4.1.f	https://www.pacificorp.com/energy/oregon-distribution-system-planning.html	DSP Generation and Interconnection Map/Tool
4.1.g	Table 11	Total number of electric vehicles (EVs) of various sizes served by the utility's system at time of filing
4.1.h	Table 12	Number of EVs added to the utility's system in each of the last five years
4.1.i	Page 43-46	Total number of charging stations on the utility's system, broken down by type, ownership, and feeder
4.1.j	Page 43-46	Total number of charging stations added to the utility's system in each of the last five years, broken down by type
4.1.l	Page 46, Table 13	A high-level summary of demand response (DR) pilot and/or program performance metrics for the past five years

In Table 8 below the Oregon Distribution Asset count and ages are shown. Ages are largely the result of various operating databases, while average service life is based on accounting studies.

Table 8: Summary of Oregon Distribution Assets

Distribution Assets Summary			
Asset Classes	**Number of Assets**	**Average age of Assets**	**Average Service Life[23]**
Substations	193	54.7	53 - 67 years
Capacitors	139	36.9	53 years
Circuit Breaker	812	33.0	53 years
Common	567	16.5	53 years
Regulator	183	32.3	53 years
Relay	4,322	15.5	53 years
Switch	360	26.4	53 years
Transformer	253	46.9	53 years
Underground: Pad Mounted	9,921	17.5	46 years
Underground: Sub Surface	551	22.0	46 years
Underground: Miscellaneous	51,062	17.1	60 - 75 years
Overhead: Overhead Distribution	378,427	41.5	58 - 65 years
Overhead: Distribution Underbuild	15,688	39.5	65 years
Overhead: Transformer	133,252		46 years

In Table 9 annual spending in the category structure outlined in UM2005 is shown. The company aggregated its historic spending classification to support this dataset, however the company doesn't generally separately track preventative maintenance spend; they are generally captured in age-related asset replacements and renewal categories.

Table 9: Oregon Distribution Expenditures 2016-2020

Distribution Expenditures					
	2016	**2017**	**2018**	**2019**	**2020**
Age-related replacements and asset renewal[24]	$39,122,734	$47,876,750	$52,563,797	$64,365,314	$184,802,037
System expansion or upgrades for capacity	$15,384,819	$19,310,164	$13,534,878	$17,178,752	$13,806,592
System expansion or upgrades for reliability and power quality	$1,762,629	$3,005,717	$3,887,425	$5,226,282	$8,718,064
New customer projects	$22,957,880	$28,596,079	$52,196,585	$51,478,406	$59,743,493
Grid modernization projects	$6,014,745	$28,147,971	$62,737,874	$37,497,389	$4,929,728
Metering	$1,368,192	$1,325,336	$614,372	$551,449	$1,514,376
Preventive maintenance[25]	$0	$688	$21,304	$8,476	$42,685
Grand Total	**$86,464,085**	**$128,262,705**	**$185,556,235**	**$176,306,068**	**$273,556,974**

[23] Average Service Life based on 2018 Depreciation Study for Oregon Distribution.
[24] In 2020 asset replacements increased to accommodate the impact of wildfire mitigation program spending.
[25] Between 2017 and 2019 grid modernization spend included AMI investments.

System Performance

System performance is shown graphically in Figure 21 below and is further discussed on pages 23-28.

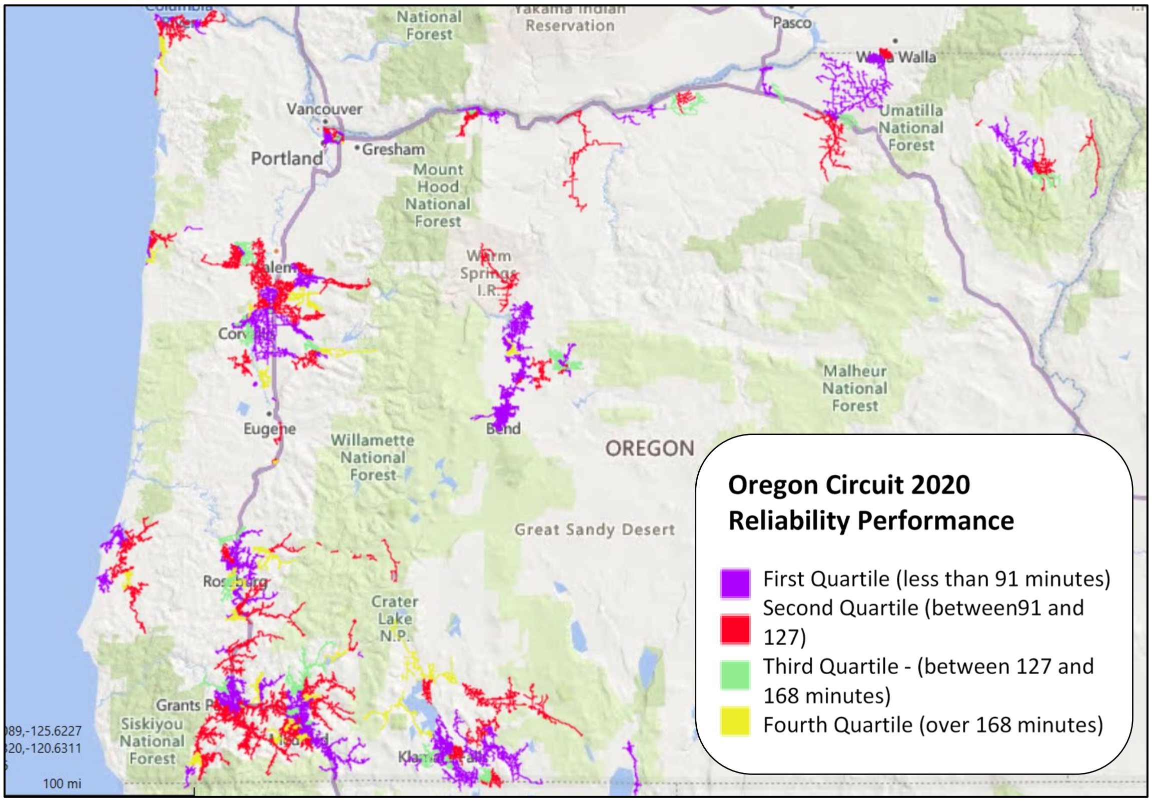


Figure 21: System Performance: Reliability Metrics Compared to IEEE Annual Benchmark Quartiles

Net Metering and Small Generator Information

The data included in the Baseline spreadsheets represents all projects that have interconnected to the PacifiCorp distribution system as of July 31, 2021. It also reflects all projects that had applied for, but not completed the interconnection process through the net metering, cluster, community solar and serial queues. This data is very fluid as projects continue to apply to interconnect and move through the process of completing the interconnection.

Table 10: Summary of Small Generation and Net Metering by Type

Summary of Small Generation and Net Metering by Type			
	Type	**Number of Facilities**	**Total Capacity (MW)**
Small Generation	Biomass	1	0.8
	Solar	38	186.7
	Solar+Battery	1	10
	Wind	5	46
	Total	**45**	**243.5**
Net Metering	Biomass	2	0.1
	Hydro	12	0.6
	Mixed	14	0.7
	Other	1	0.8
	Solar	9,486	98.6
	Solar+Battery	140	1.3
	Wind	20	0.1
	Total	**9,675**	**102.2**
Grand Total		**9,720**	**345.7**

Electric vehicle and Electric Vehicle Service Equipment Baseline Data

PacifiCorp contracted with Applied Energy Group (AEG) to compile and analyze available data both to comply with the Part 1 DSP requirements and to provide additional insights into transportation electrification in PacifiCorp's Oregon service territory. Further detail and data regarding transportation electrification can be found in the company's Baseline Spreadsheets. General methods for data collection and presentation are described below:

- Total number of electric vehicles (EVs) of various sizes served by the utility's system at time of filing
- Number of EVs added to the utility's system in each of the last five years

To identify the total number of EVs in PacifiCorp's service territory, AEG accessed the latest version of the Oregon Electric Vehicle Dashboard and filtered to those vehicles DEQ had identified as being in PacifiCorp's service territory. This filter is particularly important in cities such as Portland and Bend where PacifiCorp only serves part of the community and in areas such as Ashland that are served by a municipal utility, creating a gap that is not captured in PacifiCorp's GIS shapefile. For the purpose of this analysis, the data was further filtered to exclude motorcycles, mopeds, and low- and medium-speed vehicles, as these vehicles are unlikely to be used in the same manner as other light-duty passenger vehicles[26]. To provide insight into historical adoption trends, the date of first registration was used to identify the year that the vehicle came onto PacifiCorp's system. Table 11 and Table 12 summarize the

[26] Approximately 2% of all electric vehicles fell into these excluded categories.

results from analysis support requirement 4.1.h.

Table 11: Electric Vehicle and Plug-Hybrid Electric Vehicle Counts in Oregon

Oregon Electric Vehicle and Plug-Hybrid Electric Vehicle Counts	
Vehicle Type	**Vehicle Count**
EV	4,548
PHEV	3,003
Total	**7,551**

Table 12: Electric Vehicle and Plug-Hybrid Electric Vehicle Counts in Oregon from 2015-2021

Historical Oregon Electric Vehicle and Plug-Hybrid Electric Vehicle Counts	
Year	**Vehicle Count**
2015	304
2016	542
2017	833
2018	1,221
2019	1,580
2020	1,717
2021	691
Total	**6,888**

To summarize the findings for the total number of charging stations on and added the team used the U.S. Department of Energy's (DOE) Alternative Fueling Station Locator[27] to identify non-residential charging stations in Oregon service territory. Unlike the Oregon Electric Vehicle Dashboard, this dataset did not identify the utility serving the station; because EVs and charging stations could not be matched to individual customer meters, AEG developed a process to match each type of equipment to the feeder it was most likely served by:

- **EVs**: Because EV registrations were only available by Census Block, AEG mapped the centroid of each Census Block to the closest PacifiCorp meter, a process known as a Nearest Neighbor method. This process should produce reliable results in most cases but may be less reliable in dense urban areas where multiple feeds may serve the same community. Once the closest meter was identified, it was assumed that the feeder serving that meter was serving all EVs associated with that Census Block.
- **EV Charging Stations:** AEG applied the same Nearest Neighbor method for charging stations, however, because the actual GPS coordinates were available for each charging station (rather than simply the Census Block), this mapping should be more reliable than for EVs. Through this process, the team was also able to identify the charging stations served by PacifiCorp based on their physical location relative to PacifiCorp's service area boundaries. Charging stations identified as outside PacifiCorp's Oregon service area were removed from the analysis.

[27] https://afdc.energy.gov/stations/.

Once every EV and charging station had been mapped to a PacifiCorp feeder, individual units could then be aggregated to estimate the total number of each type of equipment present on each feeder. Figure 22 presents the mapping of electric vehicle registrations in PacifiCorp's service area by feeder overlayed with Urban/Rural/Frontier and Tribal Land Designations. Additional maps covering portions of PacifiCorp's Oregon service area can be found in the supporting workpapers for requirement 4.1.j.

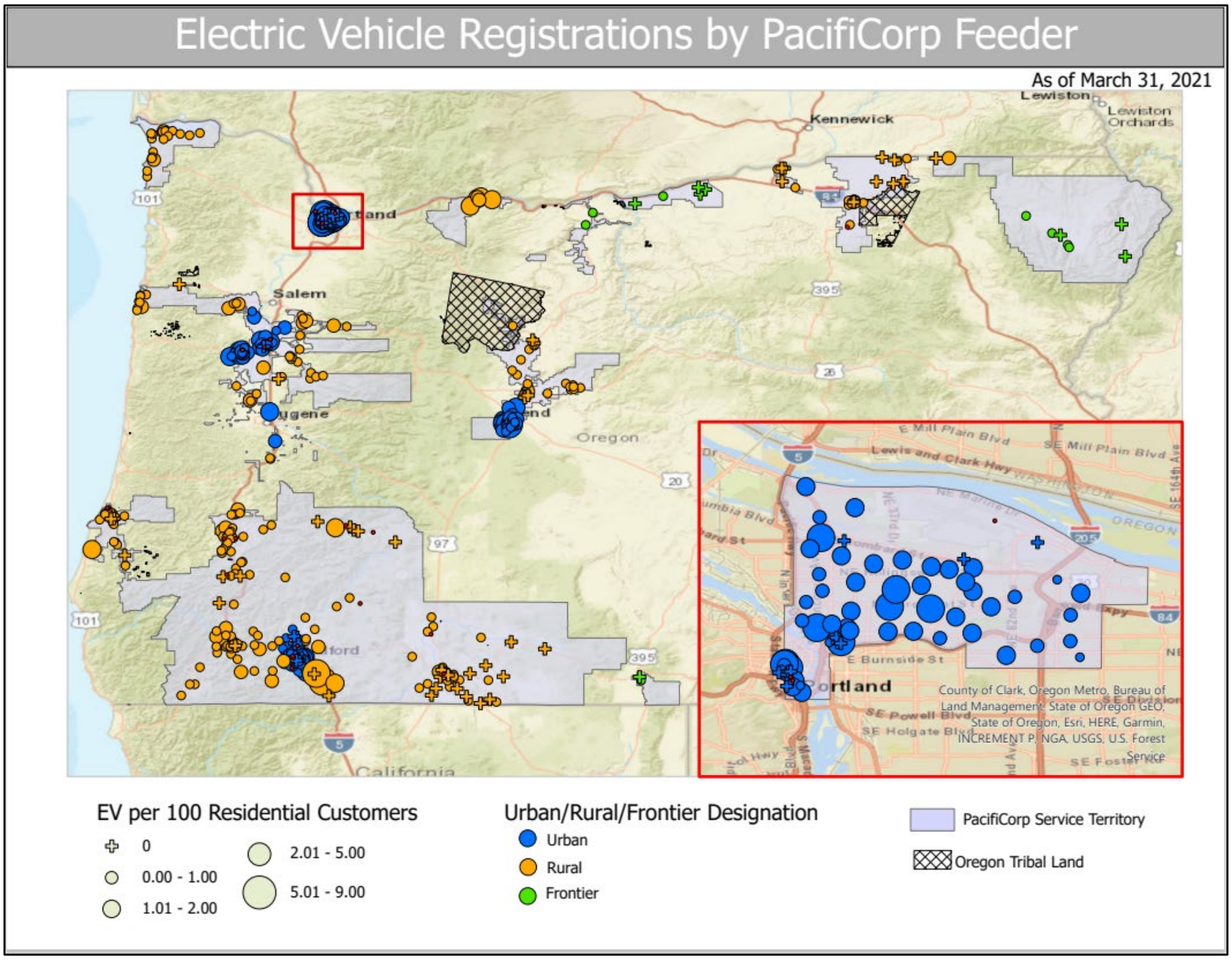


Figure 22: EV Registrations by PacifiCorp Feeder with Urban/Rural/Frontier & Tribal Land Designations

PacifiCorp and AEG reviewed multiple data sources to assess usage patterns of charging stations and the timing of charging impacts throughout the course of a year. Primary data was collected from data output from PacifiCorp's ChargePoint account representing a subset of chargers within our service area that are either PacifiCorp owned chargers or non-residential chargers that have received grant funding from PacifiCorp. Additionally, charging load shapes from the Regional Technical Forum were used to estimate charging impacts on PacifiCorp feeders in our Oregon service area. Load shapes and EV charging impacts can be found in the supporting workpapers for requirement 4.1.j.

Data on Current Demand Response Resources

PacifiCorp's only demand response resources currently come from an irrigation load control pilot program to selected customers, primarily in the Klamath Basin, through Oregon Schedule 105. The pilot is designed to reduce peak load during the summer months. Demand response summary data from 2016 when the pilot was launched to 2020[28] have been made available for reference. PacifiCorp expects to acquire additional demand response resources to be in place beginning in 2022 and will work to integrate program data into the distribution system plan as program become fully functional.

Table 13: Summary of Demand Response Pilots/Programs from 2016 - 2020

Historical Demand Response Pilots/Programs						
	Year	2016	2017	2018	2019	2020
# Customers participating in DR	Residential	N/A	N/A	N/A	N/A	N/A
	Non-Residential	3	3	3	5	5
	Total	**3**	**3**	**3**	**5**	**5**
Maximum available capacity of DR (MW)	Residential	N/A	N/A	N/A	N/A	N/A
	Non-Residential	0.565	0.546	0.563	0.945	0.969
	Total	**0.565**	**0.546**	**0.563**	**0.945**	**0.969**
Season Peak (MW)	Summer	**2462**	**2547**	**2526**	**2434**	**2463**
(% of season system peak)	Percent	0.02%	0.02%	0.02%	0.04%	0.04%

Current relationship between DSP and Integrated Resource Planning (IRP)

Discussion of utility investment and planning generally focuses on the system capacity and investment. Therefore, it is important to recognize how resources have historically been planned, valued and procured in the context of the integrated resource plan, and how it relates to distribution system planning. This relationship will become increasingly more important as the integrated resource planning process becomes more tightly integrated at a lower level within the electrical network.

IRP focuses on planning resources and transmission required to serve transmission constrained load pockets or 'Load Bubbles' across PacifiCorp's service territory. DSP is focused on the systems required to distribute load from the bulk transmission system within each Load Bubble to individual customers. Therefore, the interaction of IRP and DSP is the Load Bubble; the graphic below depicts the decomposition of the load bubble and portrays the granularity for which specific planning functions are appropriate.

[28] The latest report on the irrigation load control pilot program can be found online: https://edocs.puc.state.or.us/efdocs/HAD/adv242had164713.pdf

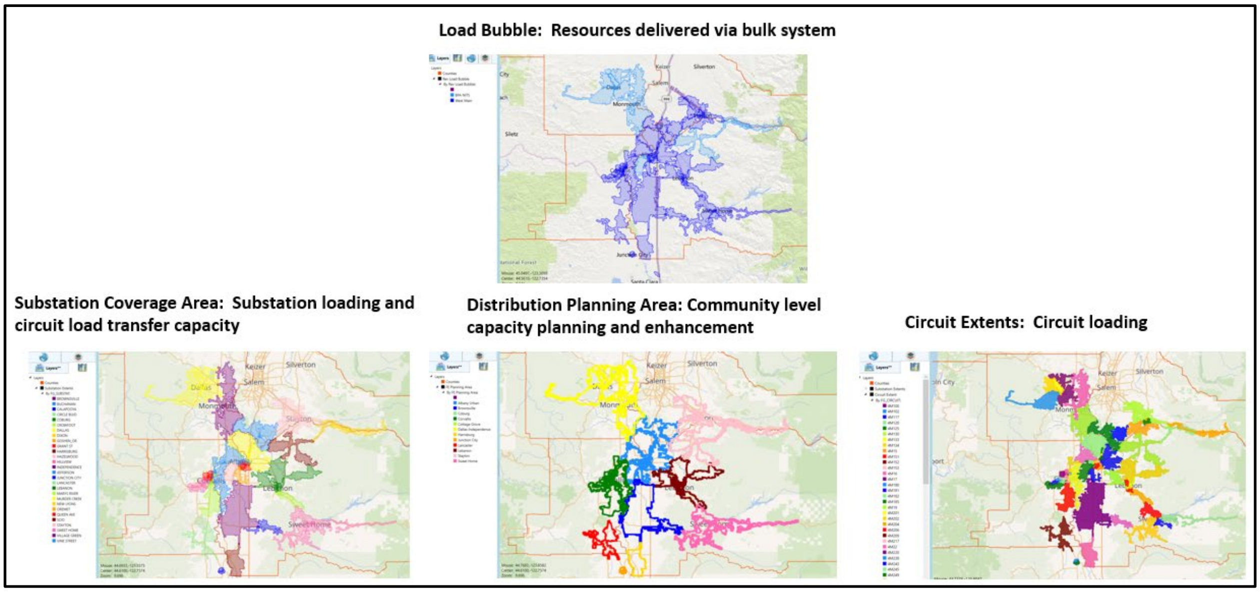


Figure 23: IRP to DSP Scenario Comparison

The load bubble is an aggregation of substations or substation buses, which are used to disaggregate the jurisdictional long-term load forecast to transmission-constrained areas and is then used in the capacity planning world of DSP by grouping these substations into engineering planning areas, in the manner shown in Figure 23. Capacity assessments, as described above, are performed at the load, engineering and area planning levels and should a deficiency be identified at either of those levels, consideration for the "load at risk" will necessitate assessment of mitigations. Resource assessments are evaluated through the lens of the integrated resource plan and consideration for mitigation of resource shortfalls could be conducted through application of distributed resources, including "non-wires alternatives" or traditional resource procurement.

Load Forecast

In the development of its load forecast, PacifiCorp employs econometric models that use historical data and inputs such as regional and national economic growth, weather, seasonality, and other customer usage and behavior changes. The forecast is divided into classes that use energy for similar purposes and at comparable retail rates. These separate customer classes include residential, commercial, industrial, irrigation, and lighting customer classes. The classes are modeled separately using variables specific to their usage patterns. These class level forecasts are produced at the jurisdictional level, which is the state forecast.

The load forecast used for IRP portfolio development includes the Company's expectations for transportation electrification and private generation adoption. Furthermore, PacifiCorp models Class 2 Demand Side Management programs (DSM) as a resource option to be selected as part of a cost-effective portfolio resource mix using the Company's Plexos capacity expansion optimization model. Once the optimal cost-effective DSM is determined, the DSM selections are incorporated as a post-model adjustment to the Company's load forecast.

Further disaggregation of the jurisdictional forecast is required, as it is necessary for the IRP optimization model to account for transmission constraints throughout the Company's six-state service territory. Therefore, the Company disaggregates the jurisdictional forecasts into separate load pockets, which are developed based on transmission capacity considerations.

The process for disaggregating the jurisdictional forecast to the load pockets is based on the Company's substation forecast. The load for each substation within the transmission constrained area is summed and divided by the load for all substations within the jurisdiction to calculate the proportion of jurisdictional load to apportion to the load pocket. Once the proportions for each transmission constrained area are determined, the jurisdictional load forecast is apportioned to each respective load pocket.

The current process of accounting for transportation electrification, private generation and DSM is conducted at the jurisdictional level prior to apportioning load to the fifty-two load pockets.

Distributed Energy Resources

After determining the base load forecast, adjustments are then made to account for distributed energy resource (DERs) programs including energy efficiency, demand response, distributed behind-the-meter generation, and electric vehicles. The impacts of distributed energy resources on the distribution system are far from uniform and depending on customer mix, penetration of resources, and timing of peak load, can be more or less influential to the overall consumption patterns on a given feeder.

Demand-side management programs (DSM)

DSM resources are captured through programmatic efforts that promote efficient electricity use through various intervention strategies, aimed at changing energy use during peak periods (load control), timing (price response and load shifting), intensity (energy efficiency), or behaviors (education and information). PacifiCorp has been operating successful DSM programs since the late 1970s. Over time, DSM resources have grown in terms of investment level, volume, breadth of resources, and resource planning considerations. Work continues to expand cost-effective program portfolios and savings opportunities, while at the same time adapting programs and measure baselines to reflect the impacts of advancing state and federal energy codes and standards.

Energy Efficiency

In Oregon, PacifiCorp works closely with the Energy Trust of Oregon to help identify additional energy efficiency resource opportunities, improve delivery and communication coordination, and provide company support in pursuit of energy efficiency resource targets[29]. Energy Trust provides information, cash incentives, and technical assistance to help people, businesses, and PacifiCorp customers save energy. Energy efficiency measures offered through Energy Trust cover all customer classes that are designed to reduce energy consumption across numerous end-use loads.

Figure 24 provides a summary of Energy Trust's generation and energy efficiency resource acquisition from 2016 through 2020.

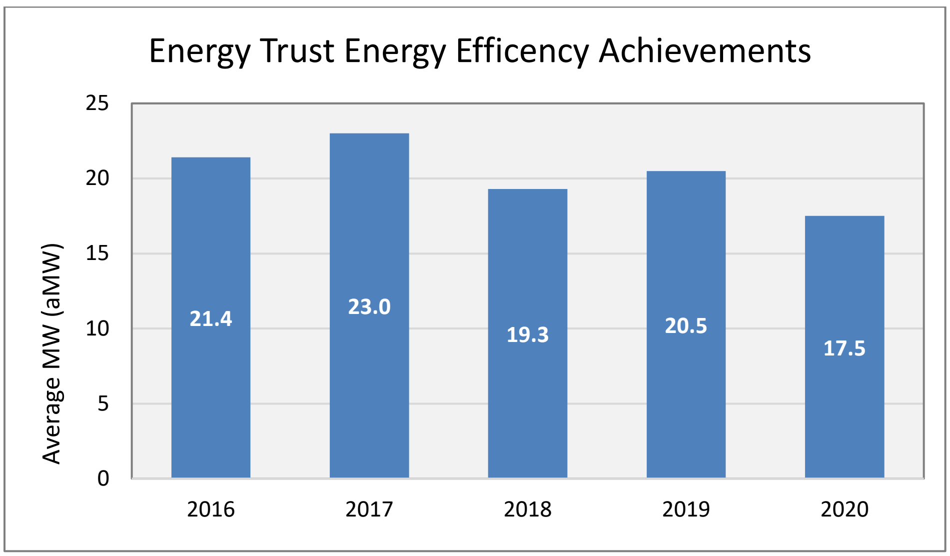


Figure 24 Energy Trust Energy Efficiency Achievements (2016 – 2020)

Energy Trust of Oregon currently provides PacifiCorp with monthly data reports summarizing the energy efficiency and small-scale renewable projects that were completed in the prior period. Energy Trust also provides PacifiCorp with information on current market activity, Energy Trust also provides a 20-year forecast of technical achievable energy efficiency potential which is used in the IRP process to determine levels of cost-effective energy efficiency over the next 20 years. The resulting energy efficiency from the IRP modeling is then used to reduce load and peak demand for the residential and commercial and industrial classes.

[29] Customers with consumption greater than 1aMW or 8,760,000 kWh in the prior year may be eligible for the self-direct program which allows them to administer energy efficiency directly.

Demand response (DR)

The Northwest Power and Conservation Council defines DR as a non-persistent intentional change in net electricity usage by end-use customers from normal consumptive patterns in response to a request on behalf of, or by, a power and/or distribution/transmission system operator. This change is driven by an agreement, potentially financial, or tariff between two or more participating parties[30]. In 2016, the OPUC approved a pilot irrigation load control program for customers within the Oregon portion of the Klamath Basin. The Irrigation Load Control Pilot Program[31] is intended to test the design characteristics of the company's existing irrigation load control program for Oregon customers. To date, this is the only demand response available in PacifiCorp's Oregon service area. The PacifiCorp Conservation Potential Assessment (CPA) for 2021–2040, performed by Applied Energy Group, investigated the potential for, and cost of, summer- and winter-focused demand response options[32]. PacifiCorp determines the need for new demand response through its CPA. The results of the CPA are used to evaluate demand response resources against supply-side alternatives in PacifiCorp's IRP. The 16 DR options in Oregon that were included for analysis are listed below. The results of the CPA are incorporated into IRP modeling, which evaluates the DR resources (along with other DSM) against supply side alternatives. The following demand response options were analyzed in the 2021 CPA:

- Residential Battery - direct load control
- Residential Electric vehicle chargers - direct load control
- Residential Grid Interactive Water Heaters
- Residential Home Energy Management System
- Residential HVAC - direct load control
- Residential Pool Pump - direct load control
- Residential Smart Thermostats
- Residential Water Heater - direct load control
- Commercial and Industrial Battery - direct load control
- Commercial and Industrial Grid Interactive Water Heater
- Commercial and Industrial HVAC - direct load control
- Commercial and Industrial Pool Pump - direct load control
- Commercial and Industrial Smart Thermostats
- Commercial and Industrial Curtailment
- Water Heater - direct load control
- Agriculture Irrigation - direct load control

PacifiCorp's 2021 Integrated Resource Plan identified an immediate need for demand response beginning in 2022. Prior to the 2021 Integrated Resource Plan, PacifiCorp issued an request for proposals (RFP) soliciting proposals from implementation contractors for DR resources. Although a variety of programs were eligible for consideration, of most interest to PacifiCorp were programs located in Oregon and/or Washington with the following focus:

[30] https://www.nwcouncil.org/energy/energy-advisory-committees/demand-response-advisory-committee
[31] More information available at adv242had164713.pdf (state.or.us)
[32] Available online IRP Support & Studies (pacificorp.com)

1. Non-Residential Curtailment
2. Residential and/or Small Commercial Smart Thermostat or Water Heaters
3. Irrigation load control

PacifiCorp anticipates that DR resources procured from the 2021 RFP will be implemented at scale with impacts occurring in the summer of 2022. While a full season of data related program impacts may not be available at the time of filing Part 2 of the distribution system plan, PacifiCorp expects to have additional information and specific regarding future DR based on filed programs in Oregon prior to the summer of 2022.

Private Generation

Private generation is typically understood to mean customer-sited (behind the meter) energy generation sites that are generally of relatively small size, generating less than the amount of energy used at the location and designed to primarily offset onsite load. While not limited to a specific technology, private generation systems almost exclusively use solar photovoltaic (PV) generation to produce power, with limited installations of other technologies (e.g., wind, hydro, biogas, or biomass) of other technologies primarily at commercial locations. In Oregon almost 98% of installed net metering capacity uses solar PV to generate power. As with energy efficiency, Energy Trust provides information, cash incentives, and technical assistance to help people and businesses install distributed generation.

Private generation interacts with Integrated Resource Plan in a different way than energy efficiency or demand response. Rather than being a resource that can be selected for acquisition, it is treated as a reduction to load. in essence, the Company forecasts the likely adoption of private generation by state and then calculates the corresponding energy production and the corresponding load shape. This information is used to adjust the load forecast to reflect this reduction in customer load from self-generated energy.

Historically, the Private Generation forecast has focused on the state level estimates of customer adoption, without additional granularity. The next version of this forecast will seek to disaggregate this state-based forecast into distribution, substation and corresponding load bubble levels. This will allow the company to refine the estimates of load growth in the different load bubbles and shape overarching system needs with more precision during the Integrated Resource Planning process.

Electric Vehicles

Although Oregon's EV market is still a small portion of overall vehicle sales, it has shown rapid growth over the past decade, with EV registrations rising from fewer than 100 vehicles in 2010 to close to over 35,000 vehicles in 2021[33]. In June of 2021 the OPUC approved three new

transportation electrification pilot programs to accelerate the adoption of electricity as a transportation fuel in Oregon: the Residential Charging Pilot, the Nonresidential Charging Pilot, and the Outreach and Education Pilot. Together, these pilot programs will advance achievement of the strategies and objectives identified in PacifiCorp's 2020 Transportation Electrification Plan[34], and Oregon's transportation electrification goals as they relate to climate change. The Company's transportation electrification pilot programs are described in more detail in Table 14

Table 14: Pacific Power Electric Vehicle Pilots

Pilot Program	Description
Residential Charging Pilot	Incentives up to $500, or up to $1000 for income-qualified customers to install qualifying EV charging equipment. Pilot is expected to reduce costs for residential customers, promote efficient charging habits through time-of-use pricing, and provide data on EV owner charging behavior.
Nonresidential Charging Pilot	Incentives for nonresidential customers up to $1000, or up to $3000 for multi-unit family dwellings, for the installation of qualifying EV charging equipment. Pilot is expected accelerate EV adoption by increasing charging access to EV owners, promote efficient charging habits through time-of-use pricing, and provide data on EV owner charging behavior.
Outreach and Education Pilot	Implement expanded outreach and education efforts in three broad categories, decision-making support, high quality EV experiences, and planning and studies. This program will educate customers on EV and charging equipment technologies and reduce market barriers to EV adoption.

[33] Based on Oregon Department of Energy's EV dashboard with data updated on 7/16/2021 State of Oregon: DATA & REPORTS - Oregon Electric Vehicle Dashboard

[34]Available online haa17127.pdf (state.or.us)

In 2021, the Oregon legislature passed house bill 2165 related to alternative fuel transportation[35]. The bill requires electric companies with sales of electricity to 25,000 or more retail electricity consumers in Oregon to collect funds in support transportation electrification pursuant to plans accepted by Public Utility Commission. PacifiCorp anticipates that these funds, which are set at a minimum of 0.25% of total revenue, will amount to at least approximately $30 million over the next 10 years. While the process and rules relating to collection of funds and approval of expenditures are still under development, it is expected that investments in transportation electrification will expand considerably in Oregon in the next 10 years.

PacifiCorp's load forecast makes adjustments to reflect updated electric vehicle actuals, and forecasts incremental adoption based on actual vehicle counts and local and national trends of fuel transition for vehicles. PacifiCorp relies on a number of publicly available data sources to help understand the current number of electric vehicles and load impacts in our Oregon service area. Table 15 provides the source, granularity, and URL of public data elements that PacifiCorp regularly uses to support tracking of electric vehicle impacts in Oregon.

Table 15: Public Data Summary for Electric Vehicles

Data Element	Source	Data Granularity	URL
Electric Vehicle Registrations	Oregon Electric Vehicle Dashboard	Census Block	https://www.oregon.gov/energy/Data-and-Reports/Pages/Oregon-Electric-Vehicle-Dashboard.aspx
Electric Vehicle Supply Equipment	National Renewable Energy Lab (NREL) Alternative Fuel Stations Database	GPS Coordinates	https://developer.nrel.gov/docs/transportation/alt-fuel-stations-v1/
Electric Vehicle Energy Consumption	Oregon Department of Environmental Quality (DEQ) Clean Fuel Programs	State	https://www.oregon.gov/deq/FilterDocs/cfp-resevcredits.pdf
Electric Vehicle Supply Equipment Load shapes	Regional Technical Forum (RTF)	Northwest Region	https://rtf.nwcouncil.org/work-products/supporting-documents/procost

[35] HB 2165 related to alternative fuel transportation available online https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2165

Current Customer Portal Product Offerings

Pacific Power has numerous product offerings for customers to provide education, assistance and other energy products on the company's customer portal. Some options are available in Spanish. Pacific Power has options for customers who want to manage their account via the web, mobile app or specific portals for small businesses or property managers. Customers have tools to help them monitor, analyze their usage history, including exporting their usage history to third party applications for additional analysis to assist in managing energy usage to lower and/or save on their electricity bills. Examples of Pacific Power's online energy tool and energy reports (from Bidgley) shown below:

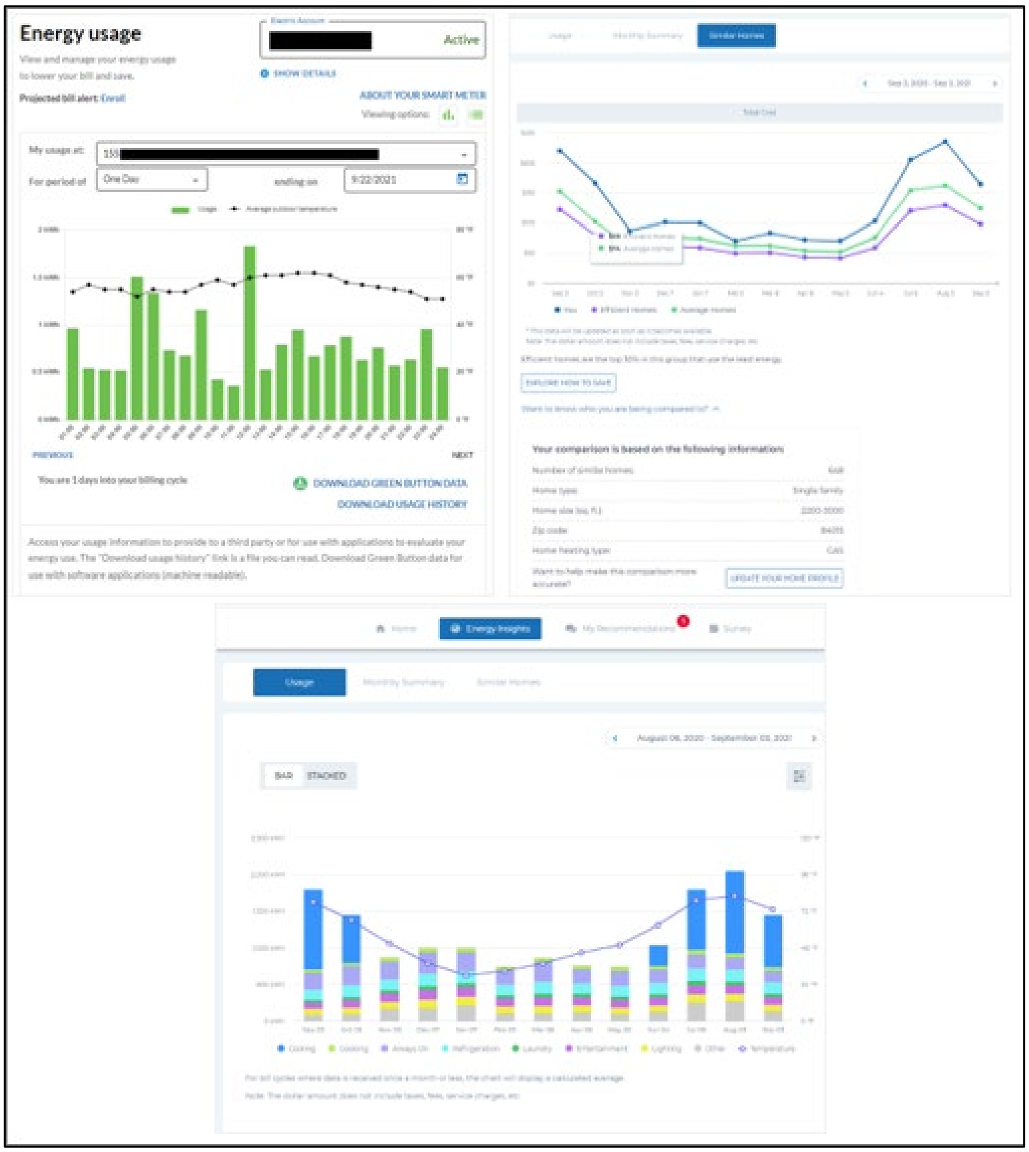


Figure 25: Examples of Pacific Power's Online Energy Tools

"As-Is" Energy Efficiency Programs and Customer Outreach

The company has historically focused its efforts to understand how energy incentives were accorded to customers through customer satisfaction survey results and using that information in collaboration with community-based organizations, including Energy Trust of Oregon, to align messages to enhance customer education about programs and opportunities. However, during stakeholder workshops the company heard that having information to inform direction of future spending would be highly valuable. Further, language and other access issues may be limiting participation, such that understanding these relationships to broader involvement is also a necessary part of our efforts. The company recognizes that language may be a primary factor, so outlines statewide data[36] in Figure 26 about language impacts to customers. In 2018, in Oregon there were 8.57 times more White (Non-Hispanic) residents (3.15M people) in Oregon than any other race or ethnicity.

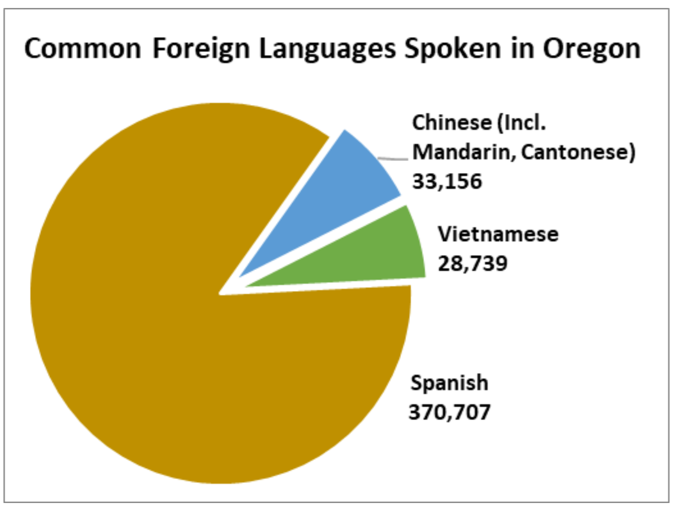


Figure 26: Common foreign languages spoken in Oregon

The most recent customer feedback regarding program awareness identifies that in 2020 80 percent of residential customers are aware that Pacific Power offers solutions to help

[36] https/datausa.io/profile/geo/Oregon/#demographics

customers use energy more efficiently.

During 2020 the company undertook an effort to identify how best to achieve energy equity and target energy savings programs using county density, county poverty and customers receiving energy assistance payments. In response to the analysis below, the company was able to deliver energy saver kits (efficient light bulbs, shower heads, etc.) to these cities and counties in a manner that aligns with recent legislative advancements providing a useful step in continuing the energy equity journey.

Table 16: Pacific Power Customer Energy Equity Targeting Data: 2020

City, County, Zip	RES customers # size rank of 180 zips*	% households receiving EAP	% of county living ≤ Federal poverty
1. Warm Springs, Jefferson 97761	728 (# 93)	39.6%	16.0%
2. Portland, Multnomah 97205	1,660 (# 67)	22.7%	12.0%
3. Sprague River, Klamath 97639	291 (#127)	16.2%	18.5%
4. Kerby, Josephine 97531	290 (#128)	13.8%	17.0%
5. Madras, Jefferson 97741	4,001 (# 38)	13.6%	16.0%
6. Cottage Grove, Lane 97424	3,302 (# 45)	13.5%	18.1%
7. Bly, Klamath 97622	265 (#131)	12.8%	18.5%
8. Beatty, Klamath 97621	159 (#141)	12.6%	18.5%
9. Lakeview, Lake 97630	1,691 (# 66)	10.4%	18.3%
10. Butte Falls, Jackson 97522	229 (#134)	10.0%	14.8%

County RES Customers	RES customers # size rank of 26 counties*	Geographic designation	% of county living ≤ Federal poverty
1. Klamath	28,619 (# 7)	Rural	18.5%
2. Lake	1,750 (#20)	Frontier	18.1%
3. Lane	6,814 (#16)	Urban/Rural	18.1%
4. Josephine	36,616 (# 5)	Rural	17.0%
5. Jefferson	5,990 (#18)	Rural	16.0%
6. Coos	20,988 (# 9)	Rural	15.9%
7. Benton	23,529 (# 8)	Urban/Rural	15.8%
8. Umatilla	14,376 (#11)	Rural	15.8%
9. Morrow	*28 (#24)*	*Frontier*	*15.4%*
10. Douglas	35,885 (# 6)	Rural	15.0%
11. Curry	*4 (#26)*	*Rural*	*14.9%*
12. Jackson	77,794 (# 1)	Urban/Rural	14.8%
13. Marion	10,611 (#13)	Rural	14.5%
14. Wallowa	4,054 (#19)	Frontier	14.5%
15. Sherman	631 (#21)	Frontier	13.9%
16. Lincoln	9,934 (#14)	Rural	13.6%
17. Wasco	497 (#22)	Rural	13.4%
18. Crook	7,124 (#15)	Rural	12.9%
19. Linn	45,794 (# 4)	Urban/Rural	12.7%
20. Polk	12,676 (#12)	Rural	12.7%
21. Multnomah	68,487 (# 2)	Urban	12.0%
22. Gilliam	338 (#23)	Frontier	11.4%
23. Clatsop	19,671 (#10)	Rural	11.0%
24. Hood River	6,020 (#17)	Rural	10.9%
25. Columbia	*12 (#25)*	*Rural*	*10.2%*
26. Deschutes	54,364 (# 3)	Urban/Rural	9.4%

*Oregon zip codes and counties within Pacific Power's Oregon service territory.

As a result, this recent history of spending by county helps guide future decisions to support diversity, equity, inclusion and clean energy goals. The company recognizes that delivering incentives can be challenging, specifically when there may be limitations to disaggregate critical decision metrics, such as data regarding energy burden, historic program spend and demographics that can guide better equity outcomes while efficiently delivering energy use reduction targets.

Table 17: 2021 Energy Trust of Oregon (ETO) Incentives by County (Pacific Power Service Territory)

2021 Incentives for Residential, Commercial & Unspecified				
County	**Total Customers served in County**	**August 2020-August 2021 ETO Incentive Spending**	**Average $ spent per customer served in county**	**Average $ spent per customer served in county** *(Including Unspecified Distributed funds of $9.81)*
Baker	-	$1,432.84	-	-
Benton	34,827	$335,491.66	$9.63	$19.45
Clatsop	24,844	$321,167.26	$12.93	$22.74
Coos	25,766	$355,569.90	$13.80	$23.61
Crook	7,590	$190,345.98	$25.08	$34.89
Deschutes	66,636	$1,248,753.82	$18.74	$28.55
Douglas	44,075	$577,579.77	$13.10	$22.92
Gilliam	579	$4,759.00	$8.22	$18.03
Hood River	7,705	$105,270.89	$13.66	$23.48
Jackson	92,829	$1,497,355.26	$16.13	$25.94
Jefferson	10,246	$104,919.35	$10.24	$20.05
Josephine	43,025	$790,257.66	$18.37	$28.18
Klamath	36,571	$640,631.96	$17.52	$27.33
Lake	2,303	$148,696.15	$64.57	$74.38
Lane	8,242	$99,000.70	$12.01	$21.83
Lincoln	11,955	$115,239.44	$9.64	$19.45
Linn	51,741	$673,376.33	$13.01	$22.83
Marion	12,692	$333,481.43	$26.27	$36.09
Morrow	160	$908.00	$5.68	$15.49
Multnomah	85,671	$3,966,259.92	$46.30	$56.11
Polk	15,368	$164,159.82	$10.68	$20.50
Sherman	964	$3,849.00	$3.99	$13.81
Tillamook	100	$0.00	$0.00	$9.81
Umatilla	18,728	$378,676.53	$20.22	$30.03
Wallowa	5,439	$53,951.15	$9.92	$19.73
Wasco	746	$28,029.75	$37.57	$47.39
Washington	-	$756.52		
Oregon-Unspecified	-	*$5,991,198.29*	*$9.81*	*$9.81*
Statewide Average	**610,478**			**$29.70**

Further analysis done by the company on historic incentives demonstrates additional opportunities for improving energy equity outcomes. Below in Figure 27 and Table 18 that history is provided. The graphic shows for each county how many PacifiCorp customers (as of 2021) there are versus the average residential and commercial incentive delivered through ETO. On average, Multnomah County electric customers receive more incentives than PacifiCorp's statewide average (as shown by the dotted line).

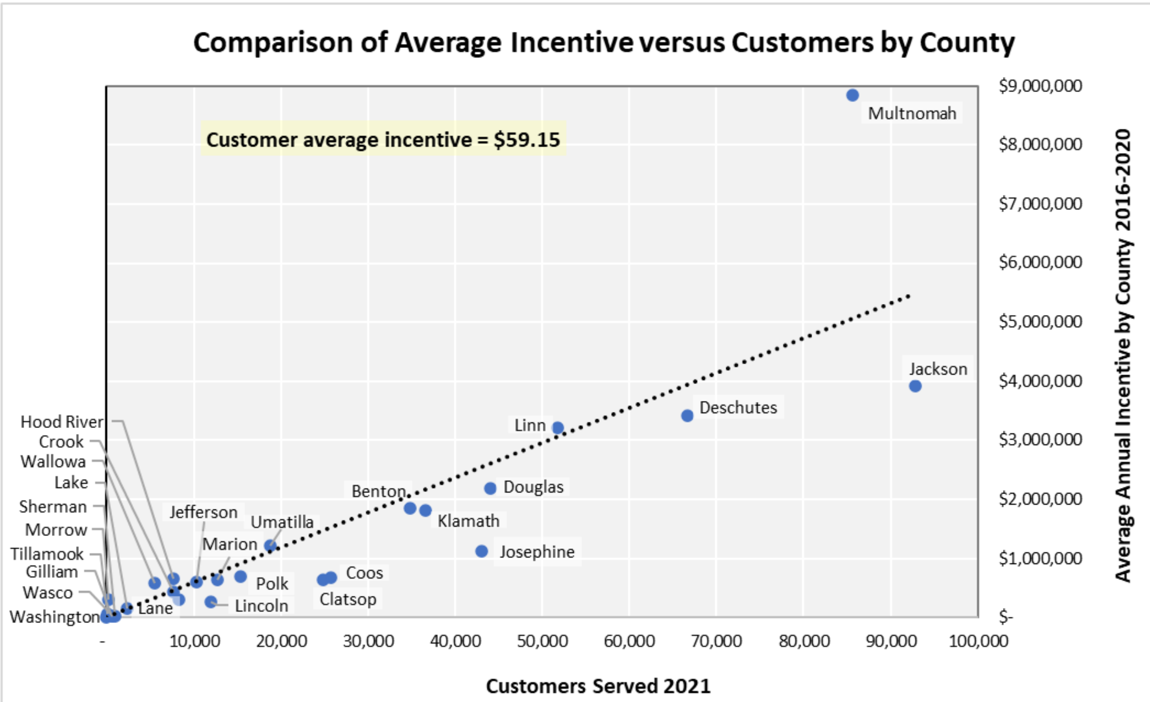


Figure 27: Comparison of Average ETO Incentive versus PacifiCorp Customers by County

Table 18: PacifiCorp Oregon Customers & ETO Incentive Spending: Aug 2020 - Aug 2021

PacifiCorp Oregon Customers and ETO Incentive Spending: August 2020-August 2021															
	Customer Account Type						Grant Classification						Factored Data		
County	Commercial	Industrial	Irrigation	Public Street and Hwy Lighting	Residential Sales	**Total Customers**	Renewable	Commercial	Industrial	Residential	Unspecified	**Sum of Grand Total**	**% of Customers Served**	**$/account**	**% of $ Granted**
Baker							$86,801			$1,433		**$88,234**			0.3%
Benton	3,147	51	268	23	31,338	**34,827**	$164,373	$234,638	$266,125	$100,854		**$765,990**	5.7%	$22	2.4%
Clatsop	3,375	66	9	61	21,333	**24,844**	$47,114	$297,940	$195,788	$23,227		**$564,070**	4.1%	$23	1.7%
Coos	3,176	94	146	28	22,322	**25,766**	$41,531	$173,688	$59,041	$181,882		**$456,142**	4.2%	$18	1.4%
Crook	1,163	36	471	6	7,590	**7,590**	$115,261	$149,219	$113,125	$41,127		**$418,732**	1.2%	$55	1.3%
Deschutes	8,712	145	321	23	57,435	**66,636**	$357,489	$975,054	$362,215	$273,700		**$1,968,458**	10.9%	$30	6.1%
Douglas	5,560	112	435	41	37,927	**44,075**	$46,097	$220,057	$918,122	$357,523		**$1,541,798**	7.2%	$35	4.8%
Gilliam	156	2	21	3	397	**579**	$2,450	$1,170		$3,589		**$7,209**	0.1%	$12	0.0%
Hood River	1,200	12	47	12	6,434	**7,705**	$78,566	$79,763	$84,966	$25,508		**$268,803**	1.3%	$35	0.8%
Jackson	10,197	225	830	42	81,535	**92,829**	$859,916	$1,024,331	$633,951	$473,024		**$2,991,223**	15.2%	$32	9.2%
Jefferson	1,155	57	423	8	8,603	**10,246**	$491,715	$79,834	$514,424	$25,085		**$1,111,058**	1.7%	$108	3.4%
Josephine	4,917	97	296	16	37,699	**43,025**	$282,547	$635,660	$91,248	$154,598		**$1,164,052**	7.0%	$27	3.6%
Klamath	4,547	74	1,913	74	29,963	**36,571**	$168,800	$498,911	$229,974	$141,721		**$1,039,406**	6.0%	$28	3.2%
Lake	421	26	15	4	1,837	**2,303**		$125,315	$1,638	$23,381		**$150,334**	0.4%	$65	0.5%
Lane	1,092	42	11	7	7,090	**8,242**	$5,490	$45,408	$24,429	$53,593		**$128,919**	1.4%	$16	0.4%
Lincoln	1,325	9		26	10,595	**11,955**	$6,309	$86,890		$28,350		**$121,548**	2.0%	$10	0.4%
Linn	5,454	191	709	45	45,342	**51,741**	$153,028	$442,870	$1,714,295	$230,506		**$2,540,699**	8.5%	$49	7.8%
Marion	1,278	27	442	13	10,932	**12,692**	$151,398	$159,425	$20,940	$174,057		**$505,819**	2.1%	$40	1.6%
Morrow	79	1	58		22	**160**	$13,231		$52,810	$908		**$66,949**	0.0%	$418	0.2%
Multnomah	8,297	106	1	11	77,256	**85,671**	$257,083	$2,162,686	$1,470,230	$1,803,574		**$5,693,573**	14.0%	$66	17.6%
Polk	1,501	15	180	10	13,662	**15,368**	$39,664	$87,990	$89,600	$76,170		**$293,424**	2.5%	$19	0.9%
Sherman	244	1	23	11	685	**964**	$2,400	$1,780		$2,069		**$6,249**	0.2%	$6	0.0%
Tillamook	7				93	**100**						**$0**	0.0%	$0	0.0%
Umatilla	2,713	52	792	38	15,133	**18,728**	$126,282	$246,126	$721,053	$132,550		**$1,226,012**	3.1%	$65	3.8%
Wallowa	1,008	20	265	6	4,140	**5,439**	$141,351	$46,837	$44,454	$7,114		**$239,755**	0.9%	$44	0.7%
Wasco	82	2	40	1	621	**746**	$2,604	$27,000		$1,030		**$30,634**	0.1%	$41	0.1%
Washington								$588		$169		**$757**			0.0%
Unspecified							$14,296	$44,493	$3,042,164	$2,479	$5,944,226	**$9,047,658**		$15	27.9%
Oregon	**70,806**	**1,463**	**7,716**	**509**	**529,984**	**610,478**	**$3,655,795**	**$7,847,672**	**$10,650,591**	**$4,339,221**	**$5,944,226**	**$32,437,505**	**100%**	**-**	**100%**

Below is a graphic representation of the August 2020 through August 2021 incentives for residential and commercial customers, on an average incentive per customer basis. The average incentive for these customer groups is $29.70 and the coloring identifies areas where higher average incentives per customer were recorded (in the reddish tones) while the areas where lower incentives are shown in blue tones.

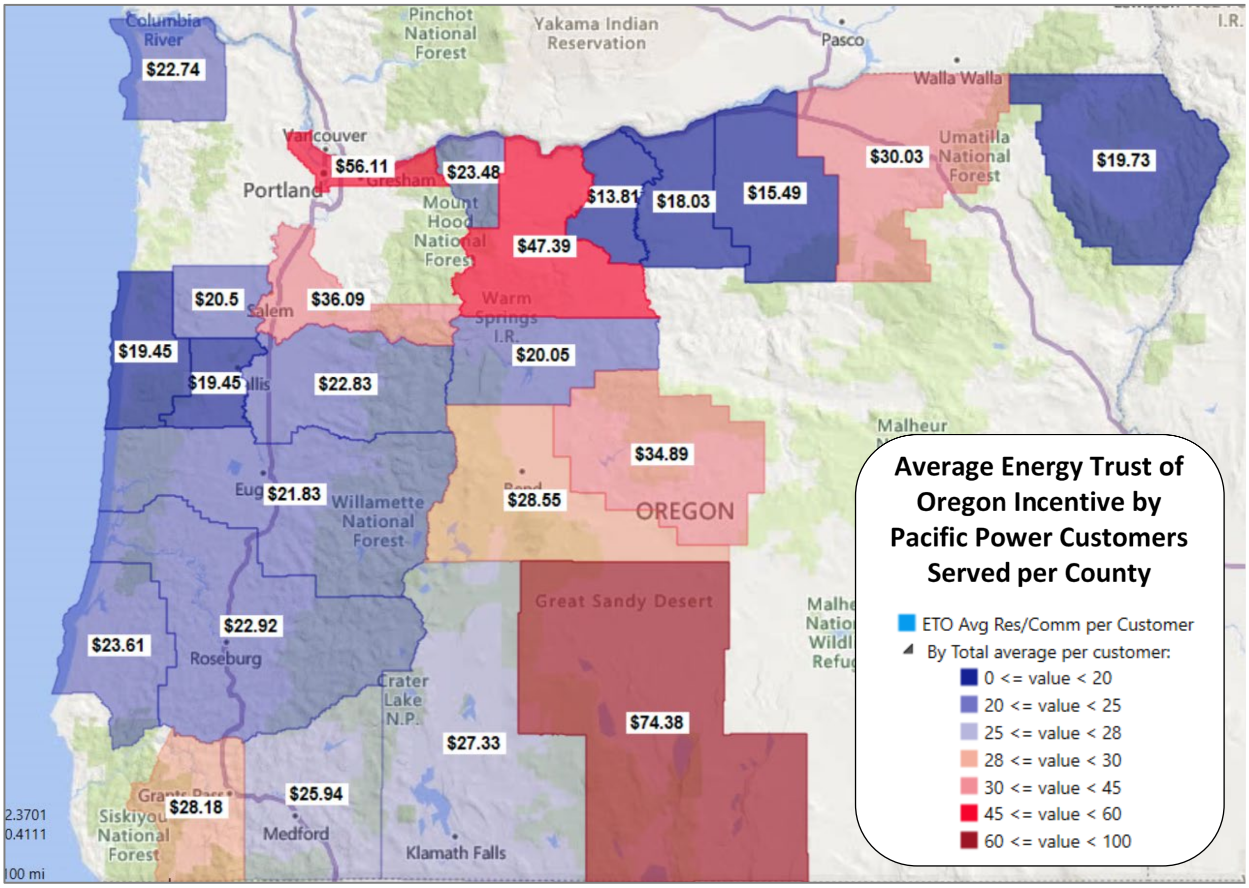


Figure 28: Average ETO Incentives by County (Residential and Commercial Only)

The company understands that to properly deliver energy equity and clean energy solutions stakeholders must have access to the utility topology; however, the company believes that it can produce data to start these conversations to advance these goals using a variety of map viewers and data products such as what is shown above, in combination with explicitly identified energy equity metrics. Certain of the energy metrics, such as energy burden and highly impacted communities appear to have value within social service organizations and energy professionals can work to advance coordination of these values within their programs. In that spirit the company provides the graphic in Figure 29 below which depicts home ownership ratios using all income levels within each census tract.

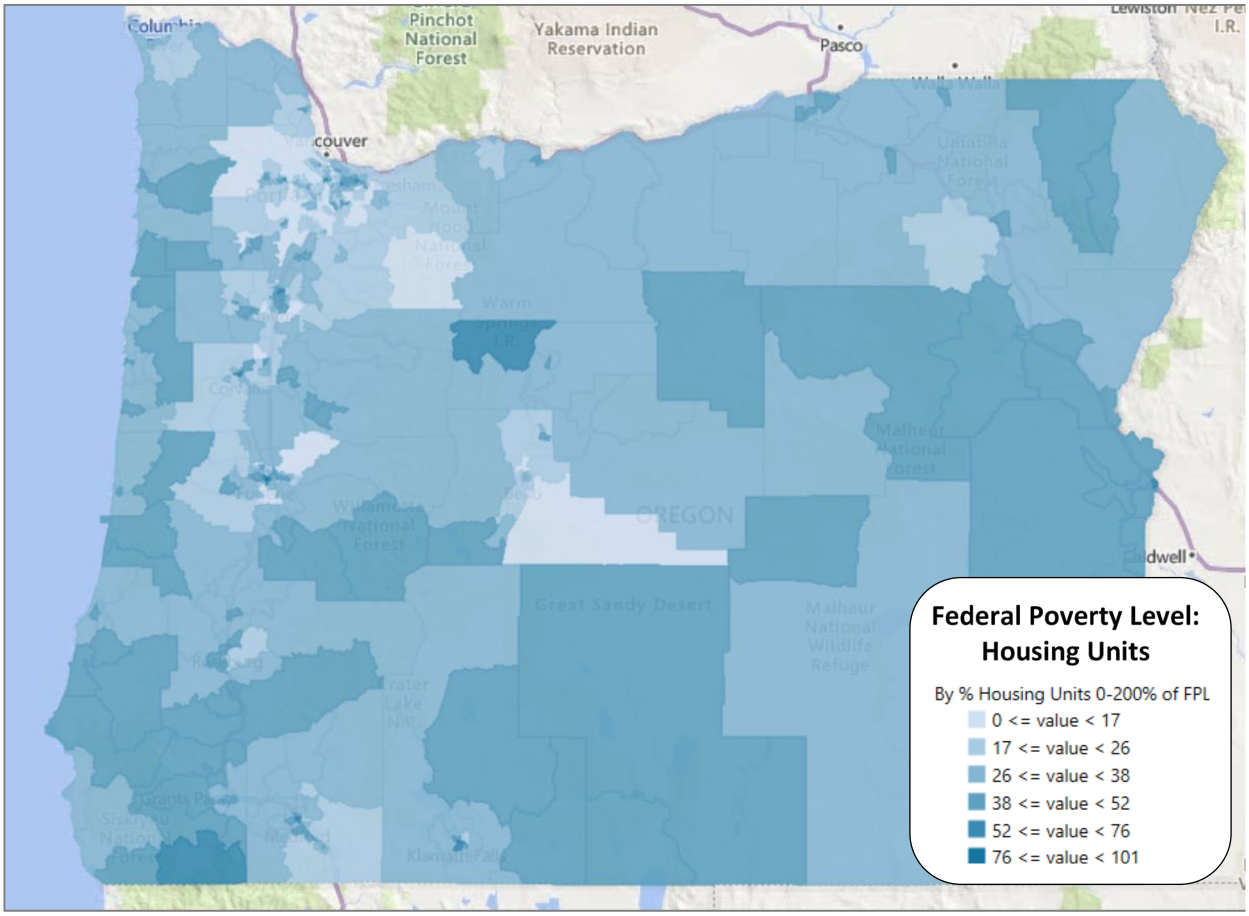


Figure 29: Federal Poverty Level: Housing Units

A metric which the company has evaluated is energy burden, which is defined as the ratio of household income versus average energy costs. On a statewide basis, the Oregon average energy burden is 2%, however, shown below in Figure 30 for the state of Oregon is the census tract level energy burden, as calculated through the DOE's Low Income Energy Affordability Data (LEAD) Tool.[37] Using tools and approaching programs informed by this data will yield more equitable outcomes for all customers.

[37] https://www.energy.gov/eere/slsc/maps/lead-tool.

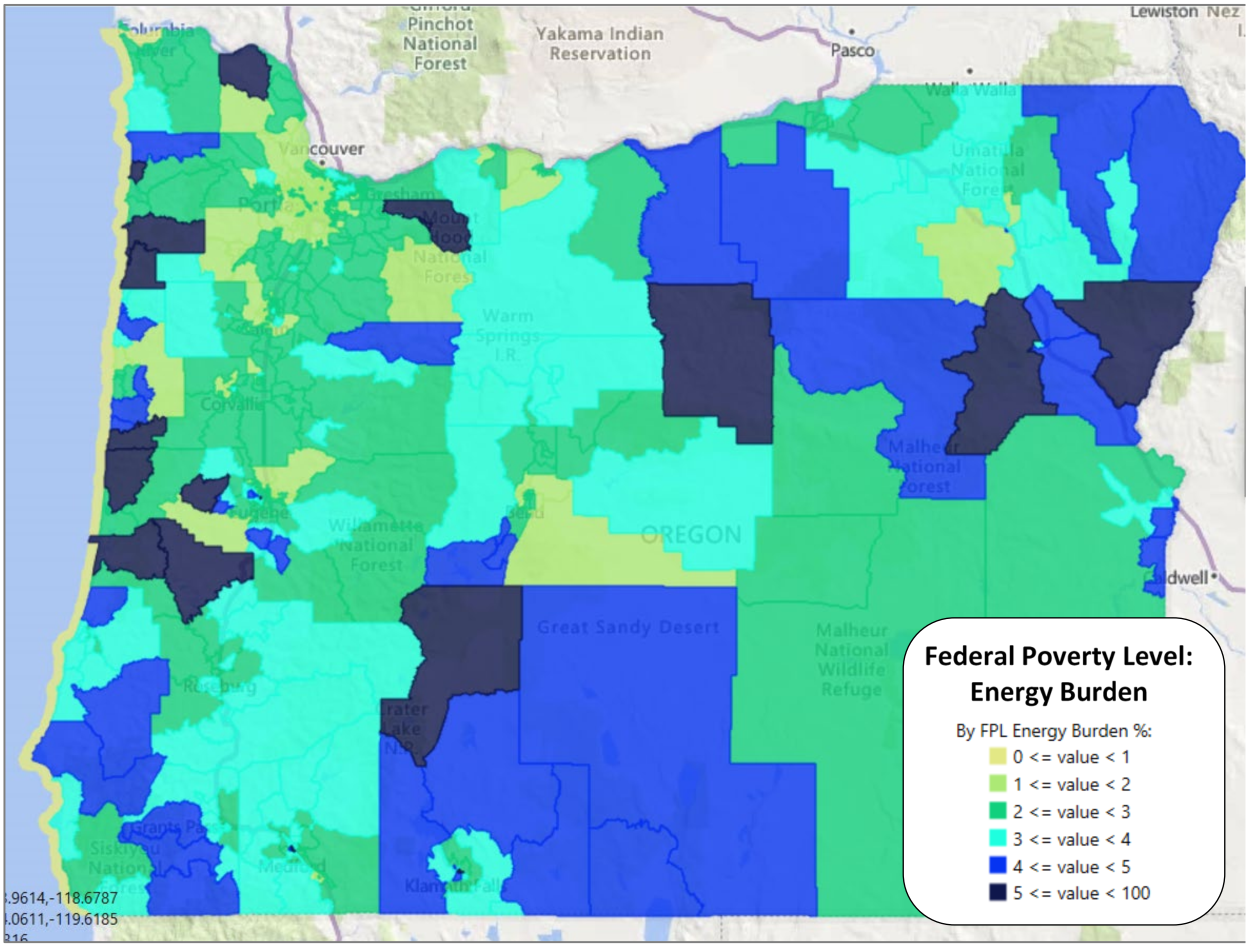


Figure 30: Federal Poverty Level: Energy Burden

Chapter 2 – Future State

PacifiCorp is excited to be an active facilitator of energy usage changes that will deliver on goals across its customer and community base. It anticipates that dialogue regarding next steps will provide rich conversation and inform investments throughout the network. It will be important that all stakeholders understand that this activity is the result of many orchestrated steps that have substantial effort associated with them. Thus, a long-term commitment to the goals of DSP is critical and needs to be properly aligned with other important business and societal goals.

In its Modern Distribution Grid Volume III, DOE articulates a variety of options for how utilities can transform and acclimate to a changing electric network, one state being "grid as backup", in which the utility serves as infrastructure only as a backup method when customer generation is not functioning (or if a customer hasn't chosen to self-generate). Alternative states include integration as customer choices are made, all the way to integrating the network as an enabler for communities and outcomes that provide benefit to customers and communities. The company provided the graphic in Figure 31 below to visualize how it envisions the utility of the future and offers that as its visual soundbite to encourage conversation and engagement from all stakeholders. PacifiCorp's vision is aligned with the more sophisticated network of the future in which a variety of technologies, uses and leveraging between energy and infrastructure choices can be advanced through the company's electrical network. This future relies upon a variety of participants within the entire environment. As such, knowledge, and opportunity to inform planning tools to make proper investments combined with advancement of operational technologies to operate the system in real time are critical.

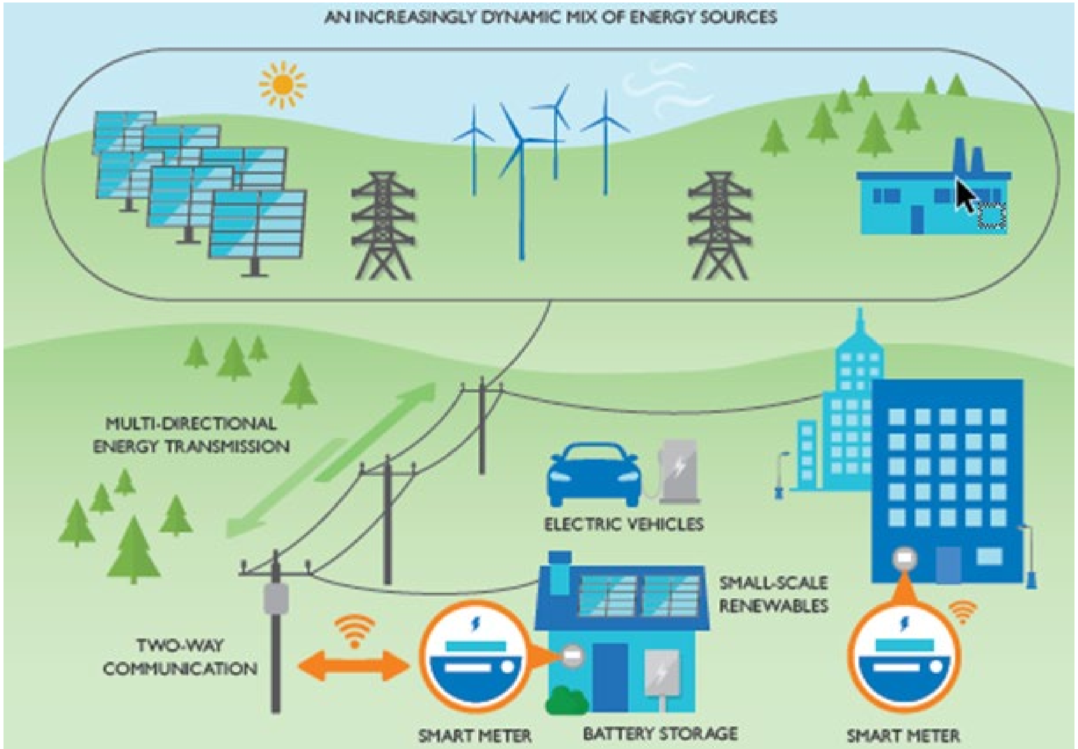


Figure 31: Future Electric System for DSP Framework

Through the assessment of DSP, PacifiCorp undertook an “as-is” comparison to its “to be” vision and identified a set of gaps to the transparent planning process which it must overcome. These are shown below to ensure there’s understanding of current limitations in combination with solutions for those limitations.

Process gaps are identified in the table below (As Is Process Gaps) relative to each of the planning activities, including capacity analysis, customer usage modifications, reliability improvements, asset management, mandates and resilience. The proposed enablers for that gap are listed if they are currently identified as enterprise initiatives or if they are required to progress the DSP journey (To Be Solutions); also, where available, cost estimates are identified in Chapter 6, as part of the Long-Term Plan. Additionally, for each of these gaps they may be categorized by the symptom for the gap type. These include data integrity, data insights, data transmission, uncertainty characterization, cybersecurity, policy or regulatory.

Table 19: Process Gaps Relative to Planning Activities and Solutions

Gaps	Processes						Solutions	Grouping of Symptom							
As Is Process Gaps	Capacity Analysis	Customer Usage Modifications	Reliability Improvements	Asset Management	Mandates	Resilience	**To Be Solutions**	data integrity	data analytics and insight	data transmission	characterizing uncertainty	software interaction	cyber-security	PacifiCorp policy	regulatory
Accuracy of existing facilities, customers and electrical connectivity and topology	•	•	•	•	•	•	LoadSEER, CYME Dynamic Data Pull, Improved Record Quality	x	x						
Assets generally known as families, not individual assets with specific historic performance and future expected performance			•	•		•	Enhancement of asset health index, Weibull, fragility and FMEA for equipment	x	x		x				
Better understanding of load development plans	•	•					DSP, LoadSEER		x		x				
Compounding of credible cases, particularly as resilience measures are outlined and planned for in the future	•	•					CYME				x	x			x
Confidence in timing, particularly with larger customers	•	•					LoadSEER			x					
Customer load prediction as a function of various temperature/growth/technology/arbitrage scenarios (LoadSEER)	•	•					LoadSEER, CYME LoadSEER Plug-in				x				
Customer usage information based on NEC rather than based on more reasonable loading as experienced by utility (total connected versus coincident values)	•	•					LoadSEER, CYME Dynamic Data Pull, CYME LoadSEER Plug-in	x			x				
Enterprise-wide method for document and retaining key facts about potential network modifications in advance of their budget approval (expansion and replacement of AMPS/Planning Peaks to solve issues independent of the trigger for planning)	•	•	•	•	•	•	AMPS Retooling for options analysis, CYME APM, Integration with geospatial tools							x	
Limited ways to record options analysis, i.e. how to solve a specific “problem” or need	•	•	•	•	•	•	AMPS Retooling for options analysis							x	
Failure analysis and material performance process limited			•		•	•	Enhancement of asset health index, Weibull, fragility and FMEA for equipment								
Gap in backcasting actuals to IRP for more regular reconciliation of loading cases and relevant scenarios (bottom up actuals for various scenarios versus top down actuals)	•	•					LoadSEER, SCADA				x				
Historic coincidence and load duration curves don’t correlate	•	•					LoadSEER, CYME, CYME AMI plug in	x							

Gaps	Processes						Solutions	Grouping of Symptom							
As Is Process Gaps	Capacity Analysis	Customer Usage Modifications	Reliability Improvements	Asset Management	Mandates	Resilience	**To Be Solutions**	data integrity	data analytics and insight	data transmission	characterizing uncertainty	software interaction	cyber-security	PacifiCorp policy	regulatory
Historic focus on peaks and coincidence restricts our ability to develop credible scenarios for the specific case which was experienced	•	•	•	•	•	•	LoadSEER, CYME, CYME AMI plug in	x			x				
Homogenous fragility curves largely independent of location			•	•	•	•	Enhancement of asset health index, Weibull, fragility and FMEA for equipment								
Limitations on various extreme credible cases to express risks to assets.	•	•	•	•		•	LRAM modeling				x				
Limited device/location specific performance history	•	•	•	•	•	•	Enhanced mapping and plant registry, Mapping Consolidation, Maximo, SCADA	x							
Limited knowledge for the vintage of mass asset equipment (i.e. conductors, appurtenances), and its historic performance	•	•	•	•	•	•	Enhanced mapping and plant registry, Mapping Consolidation, Maximo, SCADA	x							
Line extension policies favor overstatement of usage in order to maximize energy delivered to limit cost investment required by customer and doesn't require any kind of capacity charge for the customer's peaks and its impact to the system	•	•					Integration of LRAM, AHI, LoadSEER, CYME, SCADA							x	
Peak planning now requires looking at heavy and light loading cases which have different levels of coincidence in order to test at the low loading case, which creates a new perspective for a scenario with hosting capacity outputs	•	•	•	•	•	•	Integration of LRAM, AHI, LoadSEER, CYME, SCADA								
Stochastic modeling process improvements	•	•	•	•	•	•	Integration of LRAM, AHI, LoadSEER, CYME				x				
Substantial range of ages, families and equipment types makes developing detailed inventory with appropriately assigned history and forecast performance challenging	•	•	•	•	•	•	Enhancement of asset health index, Weibull, fragility and FMEA for equipment	x							
Tariffs that support less certain expansion planning	•	•					Rates and tariffs assessment							x	
Unknown feeder loading (lack of SCADA and extreme or expectable cases),	•	•	•	•	•	•	SCADA	x		x					

Planning Approach: Now and In the Future

In the future, PacifiCorp anticipates the need for more granular capacity analysis processes which are supported by advanced tools capable of forecasting using appropriate econometric and weather-normalized modeling. These modeling improvements will incorporate customer-driven and customer-provided data. PacifiCorp envisions this approach to be "crowd-sourced" options identification. The decisions made from these alternatives will need to consider the benefits, costs, risks and contingencies against which each of them must be weightedd.

To improve the current process and to allow for efficient management of data and enable scenario development, the company is proposing to incorporate PI Historian load data into a load analytics tool such as Integral Analytics' LoadSEER software. LoadSEER software will use the PI Historian data to build load profiles and growth curves so that batch, spatial, and econometric analysis can be performed. This analysis can then be used to create load forecast scenarios which can then be incorporated in company's load flow software CYMDIST and used in the distribution planning study process. This will improve the forecasting and scenario development and can be well-leveraged with the additional tools the company has implemented, notably AMI, CYME. It also is benefitted by the advancements proposed in this plan, specifically SCADA expansion, and well as other activities underway enterprise-wide, which improve asset management and work management capabilities.

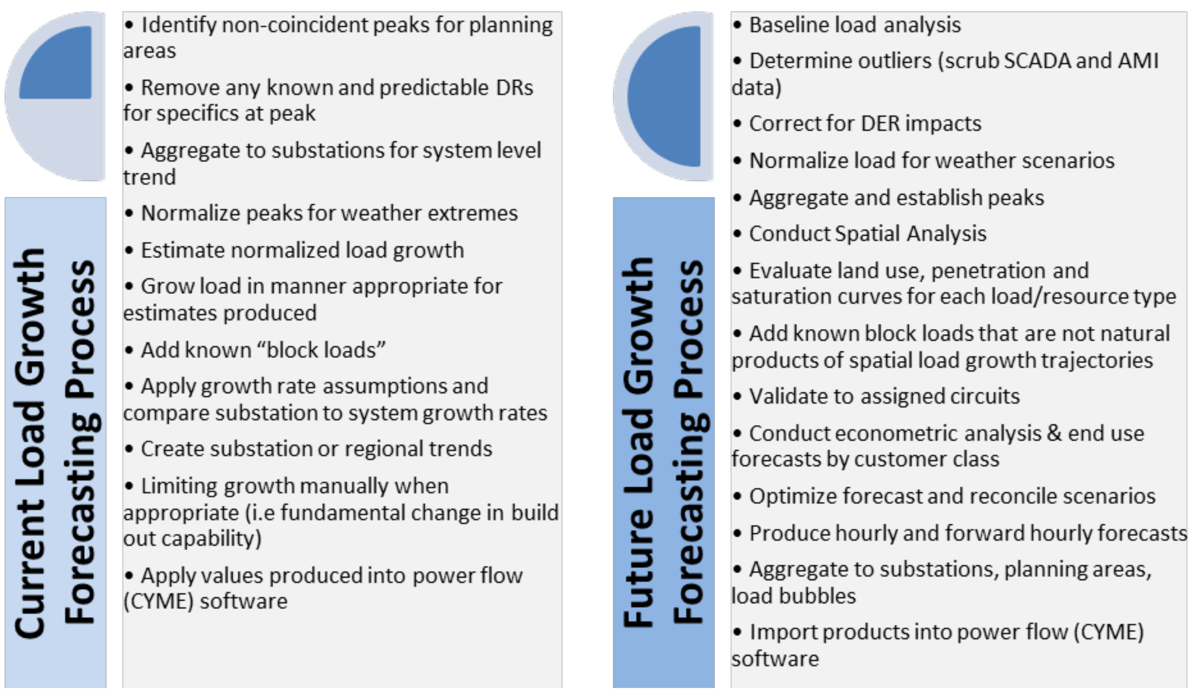


Figure 32: Load Growth Forecasting Process: Current versus Future

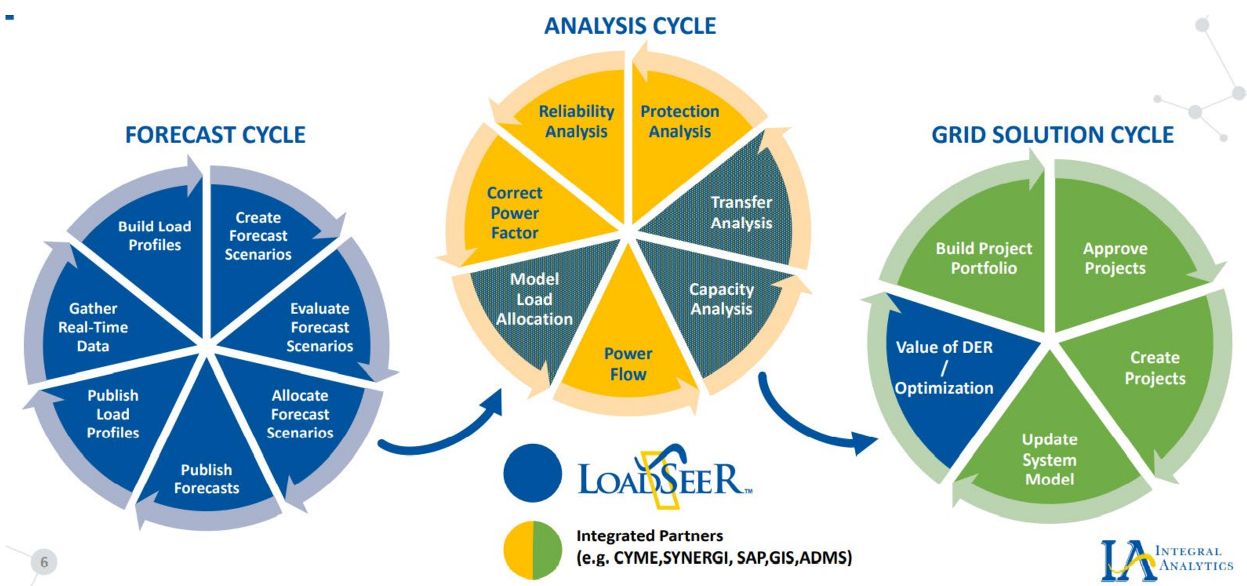


Figure 33: LoadSEER Integrated Planning Cycle

Software upgrades such as LoadSEER and Hosting Capacity Analysis in CYME will allow for greater scenario-based analyses. Currently, planning processes are limited to fairly linear projections. In Figure 34 below, much of the PacifiCorp planning process is limited to L1 or a limited level of L2, considering one or possibly a handful of options and outcomes. With greater processing power, more advanced software, and higher fidelity in input data, PacifiCorp will be able to move to more advanced decision matrices, considering a full range of possibilities and then selecting from among the best options without becoming so inundated with data that the point of complete ambiguity in L4 is reached.

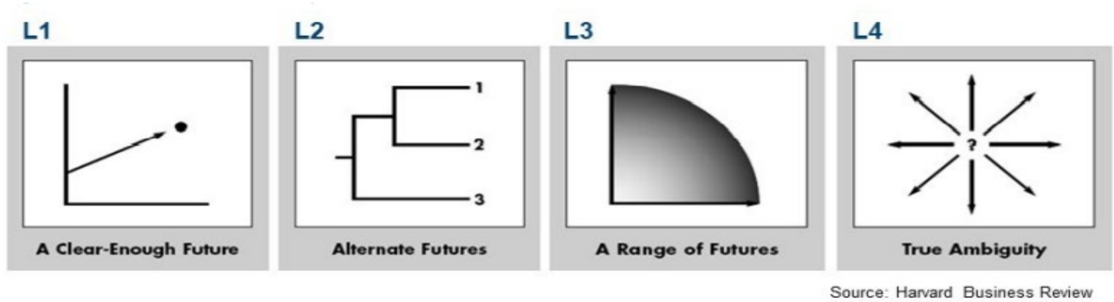


Figure 34: Rubric for envisioning uncertainty and options

After solutions options are modeled and appropriate evaluation metrics prepared, such as probability of cases, costs to mitigate, capabilities supported, contingencies of specific scenarios, these metrics would be assembled and optimized within the portfolio. The optimized set and solutions scoring lower would be shared with stakeholders and needed adjustments performed, very similar to the various cases conducted through the IRP process. Upon refinement, the "selected portfolio" of projects with expected costs and in service dates would be advanced. To the extent that they require external participation for successful deployment, alignment of implementation plans would be conducted. As more credible options become viable for consideration the range of options must be accommodated. With the augmentation of the company's forecasting process, at the highly granular level, with stochastic modeling variations, it will be poised to fulfill a variety of scenario assessments to support transparent and tailored solutions for each area in which it serves. At its conclusion, the options assessments would result in highly developed products which can be timecast to produce graphics showing how the system would perform as a function of time against each of the credible scenarios and their application of the various network resources in support of that scenario. As it continues to advance this interactive, highly collaborative, and well-communicated process, the company anticipates that many of the outward-facing benefits of this will be experienced throughout the communities it serves. In DOE's Grid Modernization Report it produced information regarding when certain types of customer and community participation can be achieved. This is shown in Figure 35 below. The complexity is shown, clearly recognizing that time is required for the evolution to the fully mature planning goals that are part of UM2005. However, as this complexity is incorporated into the process and transparency achieved, outcomes that are primary drivers to the DSP are delivered. Long term plan elements are further outlined in Chapter 6.

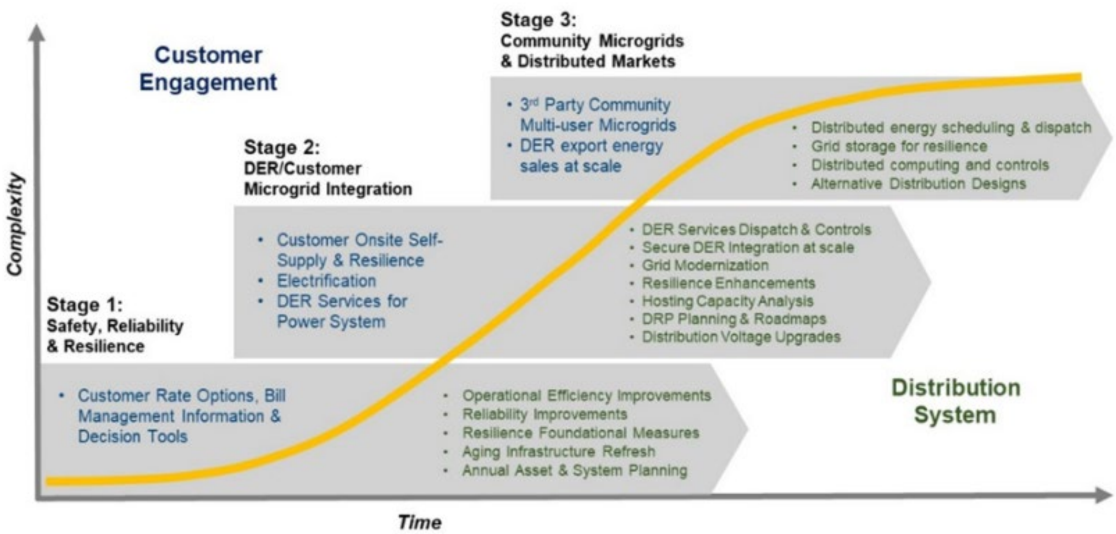


Figure 35: DOE's DSP Community-Accessible Program Options as a Function of Development Cycle.

During the transitional time, the company proposes using study areas identified for 2022 as target areas for conducting community-involved pilot options locations. Those areas are shown below in Table 20 and Figure 36. This list was selected based on the need for planning study to be performed, the existence of circuit-level SCADA and the availability of DG capacity and opportunity for its deployment (based on the DG readiness rating).

Table 20: 2022 Distribution System Planning Pilot Circuits

2022 Distribution System Planning Pilot Circuits								
Revised Load Bubble	**BPA NITS**		**Central Oregon**	**West Main**				
Revised Sub Load Bubble	Pendleton	Santiam	Bend	Clatsop Astoria	Southern Oregon/California			
DSP Planning Area	Pendleton	Stayton	Bend	Astoria	Klamath Urban	Merlin	Roseburg Urban	Upper Rogue
Circuits	5W202 5W203 5W401 5W402 5W403 7W451 7W452 7W453 7W454	4M120 4M70	5D10 5D12 5D155 5D196 5D238 5D241 5D243 5D411 5D413 5D418	5A204 5A211	5L112 5L113 5L45 5L46 5L48 5L49 5L54	5R232 5R234 5R248 5R251	4U10 4U22 4U30 4U31 4U38 4U39 4U5 4U81 5U15 5U17 5U19	4R13 4R17 4R9

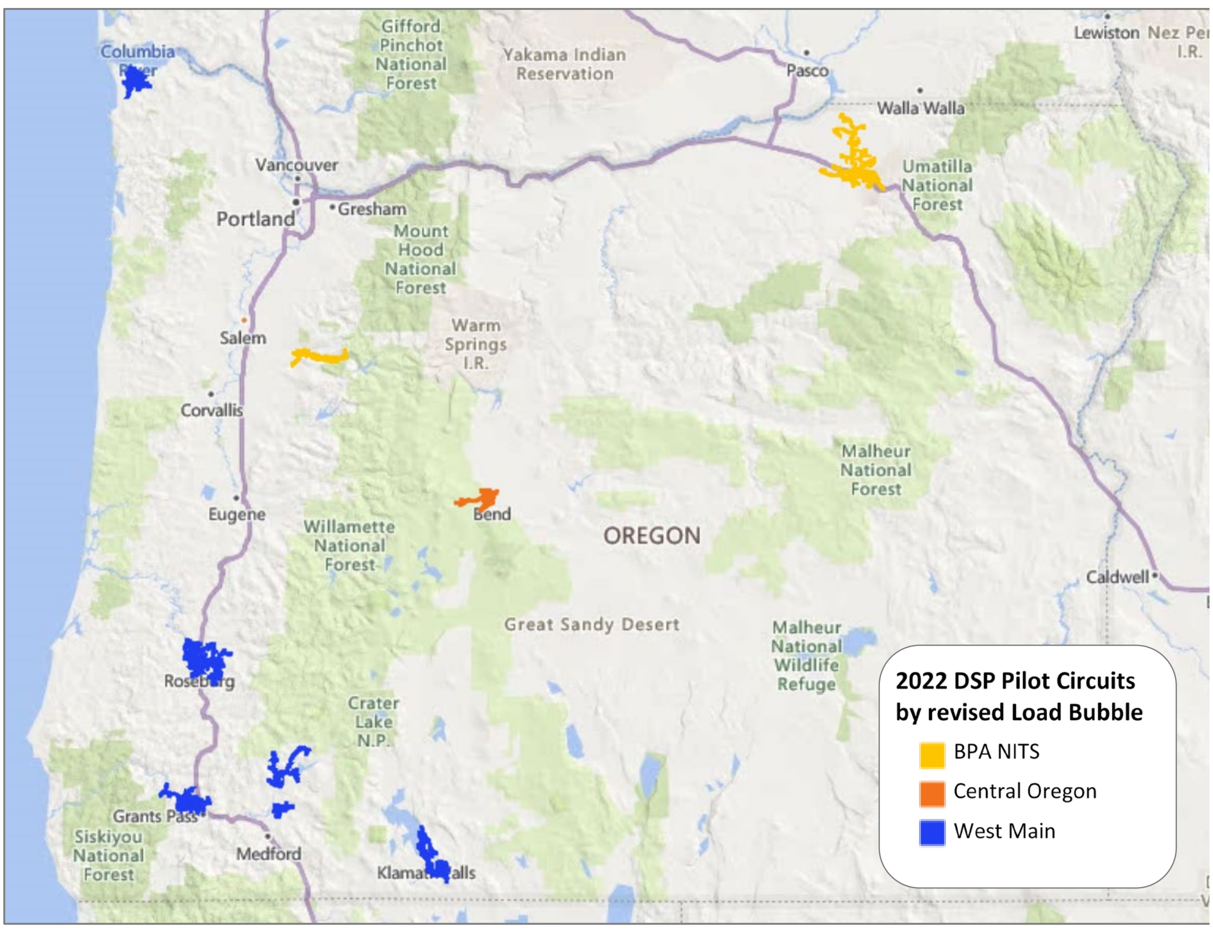


Figure 36: 2022 Pilot Circuit Locations.

This effort will require substantially more "up front" time than has previously been afforded in the planning process and also requires expanded staffing to accomplish the engagement, modeling, scenario development, quantification and enhanced study inputs required. Nonetheless, these activities will position the company to evolve the distribution network into a more valuable resource for the communitites and customers it serves. Thus another enabler to the process is the team required for this work. The team includes the functions below and is estimated to require 16 people; by the nature of this work it may be applied across more than Oregon service territory, but the efforts envisioned for distribution system planning will command a large majority of this team's time.

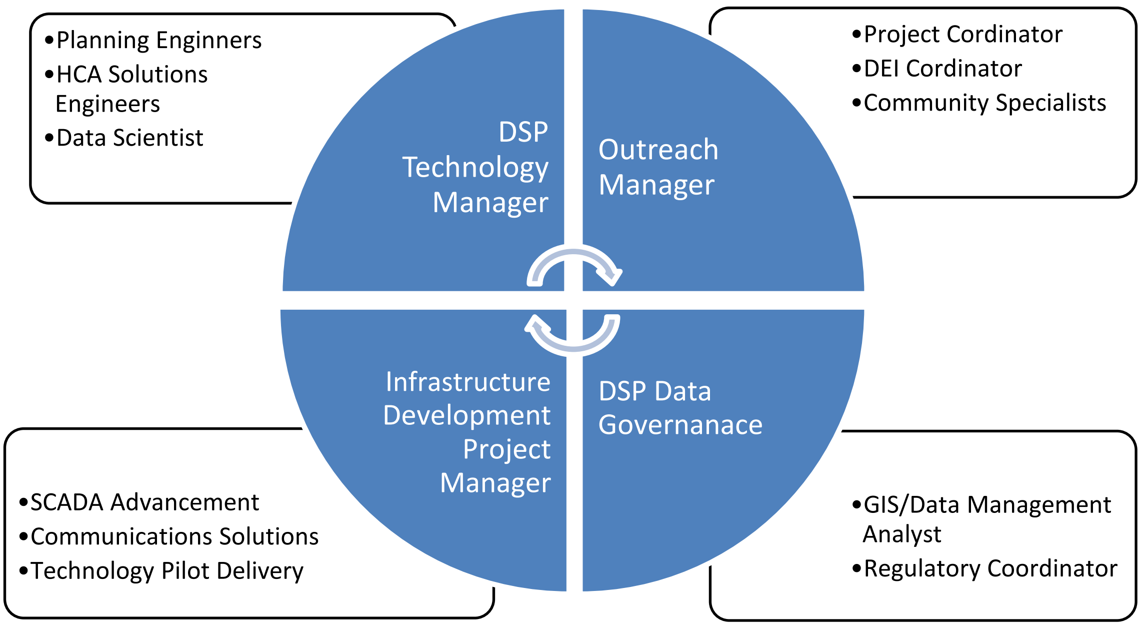


Figure 37: DSP Oversight Organizational Team and Resources

Chapter 3 – Community Outreach and Engagement Plan

Introduction

In compliance with docket UM 2005 PacifiCorp establishes this plan to encourage public participation throughout the DSP process. This community engagement plan is intended to address the ways in which the company will seek and incorporate robust public feedback to inform this ongoing process. Public participation for DSP will incorporate existing processes and advisory groups including the IRP public-input meetings, DSP workshops as well as the formation of an Oregon-based Community Input Group (CIG).

In 2020, the OPUC issued Order No. 20-485 which outlined a roadmap for an evolving method of utility system planning for the distribution system, which recognized that customer uses and wants, combined with evolving technology, are driving the electric utilities to deliver infrastructure differently than legacy processes. During this rulemaking activity, workshops were held which provided a variety of perspectives to engage on what the future of DSP might look like. At the conclusion of the rulemaking the OPUC issued Order No. 20-485, which directed utilities to develop Part 1 plans, to be filed on October 15, 2021 and Part 2 plans, on August 15, 2022.

In Part 1 the requirements include incorporating stakeholder feedback into current planning opportunities to refine the "to be" models being conceived in these two planning phases. Generally, a variety of stakeholders during the workshop series expressed that better transparency into utility investment, engineering and operational decisions would be a positive outcome from the DSP process. As a result, the order requires two workshops be conducted in which stakeholders can provide input into Part 1 of the DSP Report, with expectations of greater stakeholder input in Part 2 and subsequent plan filings. PacifiCorp held the following workshops:

PacifiCorp Distribution System Plan Workshops				
May 24, 2021	**June 29, 2021**	**July 20, 2021**	**August 24, 2021**	**September 24, 2021**

• Existing Distribution and Transmission Planning Process
• Distributed Resources
• Reliability Resources
• Baseline Data
	• Technology and Advancements
	• Advanced Metering Infrastructure
	• Load Planning Analysis
		• Customer Usage:
		  ◦ Load Forecasting
		  ◦ Demand Side Management
		  ◦ Customer Generation
		  ◦ Transportation Electrification
		• Distribution Automation: Pilot Projects
			• Community Engagement
			• Community Outreach
			• Survey on Concepts for Plan Development
				• Integrating IRP Components into DSP
				• Hosting Capacity Analysis - Geospatial Data Representation

Figure 38 - PacifiCorp Distribution System Plan Workshops - Part 1

PacifiCorp recognizes that, while stakeholder input is a valid inclusion in future plans, it is also important that the company have a mechanism for conveying response to that input, including explaining rationale for actual plans that will be conducted. These explanations could help convey that stakeholder wishes might be technically or economically infeasible, but regardless of the response, the feedback loop needs to be established, transparent, equitable and well understood by all process participants.

PacifiCorp is in the early stages of forming an Oregon-based Community Input Group (CIG) – and incorporating learnings from the company's existing advisory groups and public-input processes – to ensure that the health, safety, and interests of its communities is considered in the DSP development process in an equitable and inclusive manner. The CIG will be a coalition of community-based organizations, businesses, individuals, social justice groups, agencies, and other interested parties.

The DSP community engagement plan describes PacifiCorp's first-year vision and framework for how its stakeholders, including its Oregon customer base and advisory groups, will contribute to the development of several DSP pilot programs, as well as providing a roadmap for how PacifiCorp will encourage participation and ensure that relevant information is accessible.

PacifiCorp is dedicated to the transformative effort put forward by the requirements of the DSP Investigation and is prepared for the long-term work of learning, removing traditional barriers to equity and inclusion and advancing energy equity in Oregon.

Public Engagement – Outreach, Timing, Methods, and Language Considerations

PacifiCorp is working to establish a DSP public participation process that is open, transparent, equitable and accessible. To meet those goals, the company has begun the process of seeking input by working to ensure that communication with stakeholders is proactive and easy to understand. The company will also prioritize outreach to communities and customers who have been identified as traditionally underserved and underrepresented through perspectives including the DOE's Low Income Affordability Data (LEAD) Tool[38] which provides a visual of demographic data overlaid on the company's service area. Additionally, a review of Census Bureau, ACS data is being used to understand composition of service area relative to statewide demographic composition. Regional Business Managers are also a critical component to connecting with underserved groups and organizations through this process. As part of PacifiCorp's Integrated Resource Plan (filed September 1, 2021) the company is developing a Clean Energy Action Plan (CEAP) which is another data-driven process and will be used to help identify frontline communities.

PacifiCorp will engage with frontline communities, tribes, equity and environmental justice organizations, community-based organizations and others in Oregon to co-create the membership of the CIG and for input into the development of the DSP community

[38] DOE LEAD tool is at https://www.energy.gov/eere/slsc/maps/lead-tool

engagement plan.

PacifiCorp held DSP workshops in 2021. PacifiCorp's IRP public-input process generally holds meetings monthly during development of biennial integrated resource plans. PacifiCorp envisions holding as many as five workshops to fulfill steps to complete Part 2 (which are generally outlined in the company's near-term activities). Similar to the approach taken by the company in Washington related to the Clean Energy Transformation Act (CETA), PacifiCorp will develop its community input group schedule and will make it publicly available on the DSP webpage.

Outreach

An overview of PacifiCorp's community engagement plan outreach methods is provided in the table below. Additional details are described throughout this chapter.

Table 21: Outreach Methods and Opportunities for Feedback

GETTING THE WORD OUT		
Tool	**Description**	**Target Audience**
Project Website: https://www.pacificorp.com/energy/oregon-distribution-system-planning.html	The project website provides information about DSP in English and Spanish, including sharing public participation opportunities, hosting project information, collecting feedback on online surveys, documenting Community Input Group meeting materials, etc.	All customers, enlisted community-based organizations and community policy setters
Email updates	Announcements and DSP website updates are communicated to stakeholders via e-mail.	All customers with emails on record
Project fact sheet and flyers (in development)	PacifiCorp will provide digital and printed educational materials to customers in English and Spanish.	English and Spanish speaking stakeholders through a variety of outlet mechanisms
CIG pre-meeting materials	Meeting materials to be shared with advisory group members prior to each meeting. CIG premeeting materials include the presentation slide deck and an expanded agenda that describes the meeting objectives and discussion topics.	Community interest group and other advisory groups
Meeting summaries from Community Input Group meetings	Following each CIG meeting, meeting summaries are prepared and posted on the DSP webpage and distributed to CIG members.	All customers, enlisted community-based organizations and community policy setters
Utility bill inserts	Informational bill inserts are provided to customers who receive their bill in the mail in printed format and provided digitally to customers who are on paperless billing.	Customer account holders
Utility bill messages	Informational messages are printed or provided digitally with customer bills in English and Spanish.	Customer account holders

GETTING THE WORD OUT		
Tool	**Description**	**Target Audience**
Interactive Voice Response (IVR)	PacifiCorp customers in Oregon who call customer service receive a pre-recorded IVR message in English or Spanish that directs customers to the DSP webpage.	Any customer contacting the company
Social media (targeted)	Informational content is posted on the company's Oregon Twitter and Facebook accounts directing customers to the DSP webpage.	Social media user
Paid media	To reach customers in Oregon, the company uses paid advertising across various media channels.	General public
Partners channels	PacifiCorp will partner with its CIG and community-based organizations to share DSP information.	General public
SHARING INFORMATION AND SEEKING INPUT		
Tool	**Description**	**Target Audience**
Community Surveys	Data on energy services	Customers with emails on record, community-based organizations and community policy setters
Project email (dsp@pacificorp.com) and web comment form	Input from stakeholders is being collected via e-mail and from a comment form via DSP webpage.	DSP commenter
Public Meetings and Workshops	PacifiCorp will continue to host a series of public meetings and workshops to provide background on current DSP practices and solicit additional feedback from customers into the process.	Stakeholders

Broad, Initial Outreach Methods

Direct outreach methods to the DSP stakeholders occurs via email and through a dedicated DSP webpage that provides meeting materials, stakeholder feedback forms, and participation information for each meeting. PacifiCorp will continue to use these outreach methods as applicable during the development of the DSP process.

In addition to specific outreach to stakeholders, PacifiCorp has established a dedicated webpage to provide information to the public regarding how to participate in DSP. The webpage includes information about DSP, public workshops links to relevant documents, and will include:

- a schedule of upcoming advisory group meetings and a tentative schedule of topics to be discussed;
- meeting summaries, materials, and documents, including those from past meetings;
- information on how to participate in the development of DSP;

- data and information provided to support participant education as part of the CIG;
- stakeholder feedback received and utility responses; and
- links to filings and plans associated with DSP compliance are intended to be posted within thirty days following final action by the OPUC.

The website can be found at: https://www.pacificorp.com/energy/oregon-distribution-system-planning.html.

The DSP-specific webpage is designed to provide information to the public regarding how to participate in the DSP development process as well as a schedule and indicative agenda of upcoming meetings related to the development of DSP. The webpage was launched in May 2021 and will be updated with materials such as in response to stakeholder feedback and in compliance with docket UM 2005.

The company has also set up a dedicated email address, DSP@pacificorp.com, that is posted on the webpage and will facilitate timely response to any stakeholder questions. PacifiCorp has encouraged members of the public who would like to participate in the development of the DSP to join our email list, which is used to communicate upcoming meetings, available meeting materials, and other opportunities for education and feedback.

PacifiCorp is in the early stages of developing a customer survey administered by a hired third-party agency. The survey will be targeted at the company's Oregon customer base to gather input on DSP. The overall objective of this research is to measure the public's awareness of distribution system planning. Specific research objectives include:

- Provide high-level education/background on DSP;
- Measure recall and understanding of customer choice, energy efficiency, environmental respect and new technology in energy delivery strategies;
- Evaluate equitability of energy delivery (fair price/fair service);
- Evaluate energy charges for public purpose, i.e. fairness in supporting low-income programs or other items which may disproportionately affect certain customer sectors;
- Evaluate whether customers feel equipped to evaluate their energy usage options;
- Explore actions taken by customers to explore various "end use choices", change their energy behavior, or procure efficiency or generation options;
- Measure awareness of Pacific Power's efforts to reduce environmental impacts of energy delivery;
- Measure satisfaction with outreach and interactions with the utility;
- Understand whether customers feel connected to resources before, during, and after making personal changes regarding energy use;
- Determine whether resources provided to community-based organizations (CBOs), jurisdictional, and tribal agencies are effective in reaching target demographics within their organizations;
- Determine whether various communication methods and language are effectively

aligned with customers;

- Categorize survey recipient regarding relationship with Pacific Power (customer, jurisdiction, observer, developer, service provider);
- Seek to hear from a wide spectrum of customers, stakeholders and/or community voices;
- Collect customer geographic, socio-economic data and demographic data for insights into energy equity, and energy burden with respect to system reliability and customer options.

Target Audience

Residential and business customers of Pacific Power in Oregon. Respondents will be screened to ensure they are customers, and the person (or one of the people) likely to make decisions about Pacific Power services.

Methodology

Primary methodology will be through an online survey methodology.

The secondary methodology will be a phone survey of customers without an email address available for the online survey.

Both online and phone surveys will be available in English and Spanish. No quotas are envisioned for Spanish-speaking customers, and customers will have the choice to participate in their language of choice.

A tertiary methodology will be interviews conducted with CBO, jurisdictional, tribal agencies, and managed customer interviews. This in-depth interview approach allows for greater depth of engagement than a standard survey, and a trained third-party moderator will be able to probe and clarify responses in a more conversational manner customized to each participant, rather than using a standardized call script.

An incentive will be offered for stakeholders of CBOs, jurisdictional, tribal agencies, and managed customers to encourage participation and as a "thank you" for participation.

We will continue to work with stakeholders to determine additional outreach methods that could encourage public participation in the DSP process.

Language Considerations

PacifiCorp understands that accessibility is key to ensuring an inclusive public participation process. The company plans to work with a translation service to provide a Spanish version of the company's DSP website, which is consistent with the company's current outreach process in Oregon. PacifiCorp will work with stakeholders to assess how to make the public participation materials more accessible and may include translation support in additional languages if needed.

The website will include translated versions of past meeting materials, instructions regarding how to participate in future meetings as well as a tentative schedule for topics to be addressed during future meetings, and a link to contact PacifiCorp to request translation services at future DSP meetings.

Data Availability and Accessibility

PacifiCorp recognizes that for many participants, a utility planning process is new and contains data that can seem inaccessible. PacifiCorp is actively working to overcome this potential barrier by providing data and pre-read materials that are easy to understand and that are discussed in upcoming meetings.

Incorporating Learnings from Existing Stakeholder Groups

PacifiCorp has historically considered input throughout the planning process from the company's existing Oregon stakeholder groups including Energy Trust of Oregon and Northwest Energy Efficiency Alliance advisory groups, low-income community action agencies, and the IRP public participation process. These processes will continue to inform how the company approaches long- and intermediate-term planning, and the input from these stakeholders will inform the resource, strategy, and customer benefit indicators considered in the development of the DSP process.

Incorporating Stakeholder Feedback from IRP Public-Input Process

PacifiCorp develops its 20-year integrated resource plans on a biennial basis through a robust and inclusive public- input process that allows for stakeholder review and feedback on the company's long-term planning assumptions, methodologies, analysis, and results. PacifiCorp's 2021 Integrated Resource Plan development cycle public-input meetings began in January 2020 with a total of 18 public-input meetings held prior to PacifiCorp's filing of its 2021 Integrated Resource Plan on September 1, 2021. In addition, PacifiCorp's IRP team has held topic-specific technical workshops to discuss development of its Conservation Potential Assessment – and has held state- specific meetings at the start of the IRP development cycle to receive input on energy policy topics relevant to each state.

PacifiCorp's IRP public-input process uses stakeholder feedback forms as a vehicle outside of the public input meetings to receive and respond to stakeholder questions and recommendations

As a first step in developing DSP participants, PacifiCorp leveraged the IRP stakeholder process and distribution list to begin the conversation.

Identifying CIG Members and Participants

PacifiCorp's Regional Business Managers (RBM) serve as an essential community conduit and often collaborate with local stakeholders. The RBM group are also working to identify and recruit prospective CIG participants that have direct knowledge and experience within communities or populations identified as highly impacted or vulnerable. In the course of daily business, RBMs frequently interact with key community stakeholder groups including business chambers, city councils, large industrial and commercial customers, critical facility customers (e.g.; hospitals, city water, communications), community based organizations, low-income support agencies, nursing and hospice centers, school districts, tribal leadership, Rotary and Kiwanis clubs and many other community groups. Their vital role as a direct line for the company into communities served by the company cannot be understated.

The RBM team is working with stakeholders and expert advisors to:

- Identify CIG members and participants;
- Define the workplan and collaboration schedule for the CIG;
- Clarify where and how PacifiCorp should use the CIG to review, advise, co-create, or author inputs to the resource planning process, CEAP, and DSP;
- Build an inclusive and accessible process of consultation and collaboration with the CIG that will enable meaningful participation and engagement by all CIG members.

A core group of CIG members will be formalized that will include representatives from the following backgrounds and perspectives:

- Environmental justice
- Public health
- Tribal
- Asian Pacific Islander community
- Hispanic community
- Veterans
- Low-income population
- Agricultural workers
- Local social service leader
- Local business owner

We will work to identify potential barriers to public participation more broadly, and the company will work to apply the learnings to encourage participation from members of the public who may not currently be part of an advisory group. PacifiCorp has identified the following potential barriers to public participation:

- In-person outreach and in-person meetings could be challenging due to the COVID-19 pandemic. PacifiCorp recognizes that for true active outreach to encourage participation, the company will likely have to rely on non-digital channels such as outreach through regional offices, in-person meetings, and a presence at local events. Throughout the development of this plan, the company has kept safety concerns surrounding the COVID-19 pandemic top of mind. PacifiCorp is working to address the potential barrier caused by reduced in-person and in-community outreach by considering alternative methods of communication such as bill-inserts, customer phone surveys, and periodic re-assessment of safety protocols for in-person meetings.

- For customers who do not regularly participate in utility planning processes, there may be a perception that input will not be considered by the utility. PacifiCorp is working to clearly outline how feedback will be considered and taken into account as part of DSP. The company will work to address this barrier by conducting proactive outreach to community groups through our regional business managers (e.g., CIG recruitment), by providing meeting notes and materials that include stakeholder feedback received during meetings, and through a summary of stakeholder feedback and how that feedback will be ultimately incorporated into the plan.

The company has begun evaluating methods for assessing energy equity. Tools that are available include DOE's LEAD tool and Greenlink Analytics' Energy Equity Map (GEM) as well as certain state-specific reports. The company plans to engage stakeholders to review available data sources and how best to further the conversations regarding energy equity, particularly focusing on metrics and how to facilitate their broad availability for informed and action-oriented discourse.

Chapter 4 –Transparent Planning Process & Foundational Data

In DOE's SmartGrid Strategy, Volume IV[39] they provide perspectives to support integrated planning. First in Figure 39 below, the overarching process is laid out, which contrasts with the prior, highly serial flow chart shown in Chapter 1, Figure 5. Broad understanding of goals for energy plans, both by utilities and stakeholders are inputs to the process. Analysis is conducted on a variety of scenarios and candidate projects evaluated in the context of resources and capacity solutions both inside and outside the utility environment.

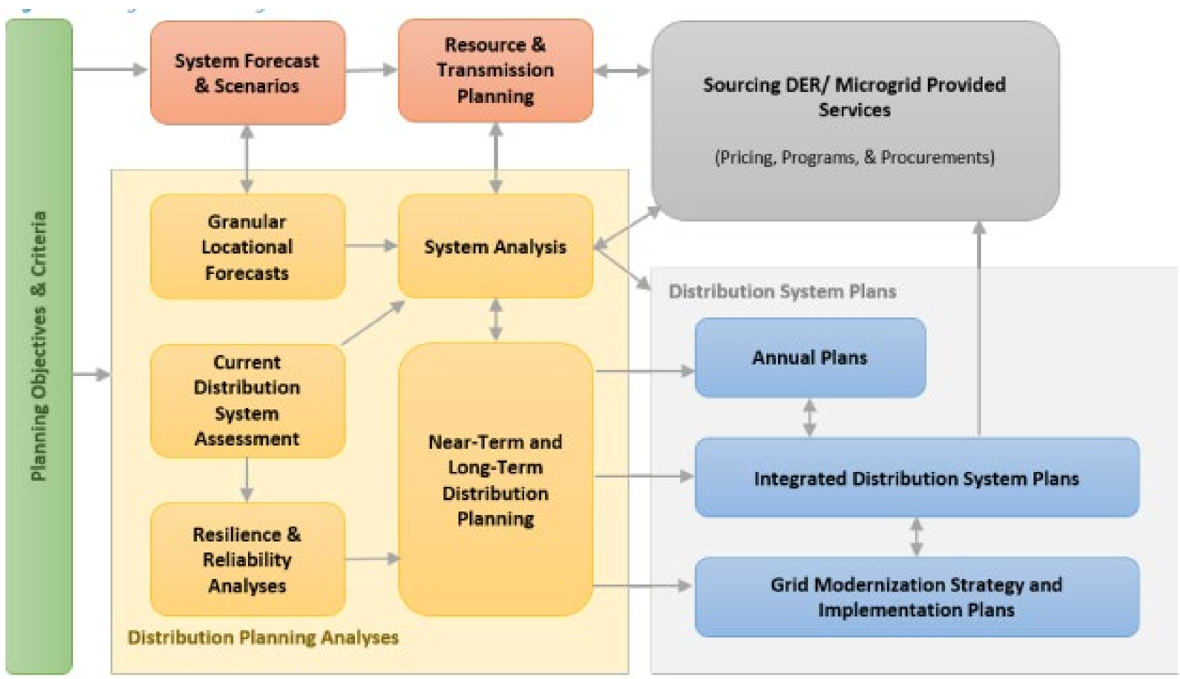


Figure 39: DOE Integrated Planning Process

DOE's strategy also highlights the foundation and pinnacles upon which a robust DSP process is founded. This is shown graphically in Figure 40 below. The foundation is safety, reliability, resilience, and asset management, upon which grid modernization can be placed. To support such an integrated, yet flexible energy environment, processes and systems must be aligned to produce the needed outcomes.

[39] https://gridarchitecture.pnnl.gov/modern-grid-distribution-project.aspx.

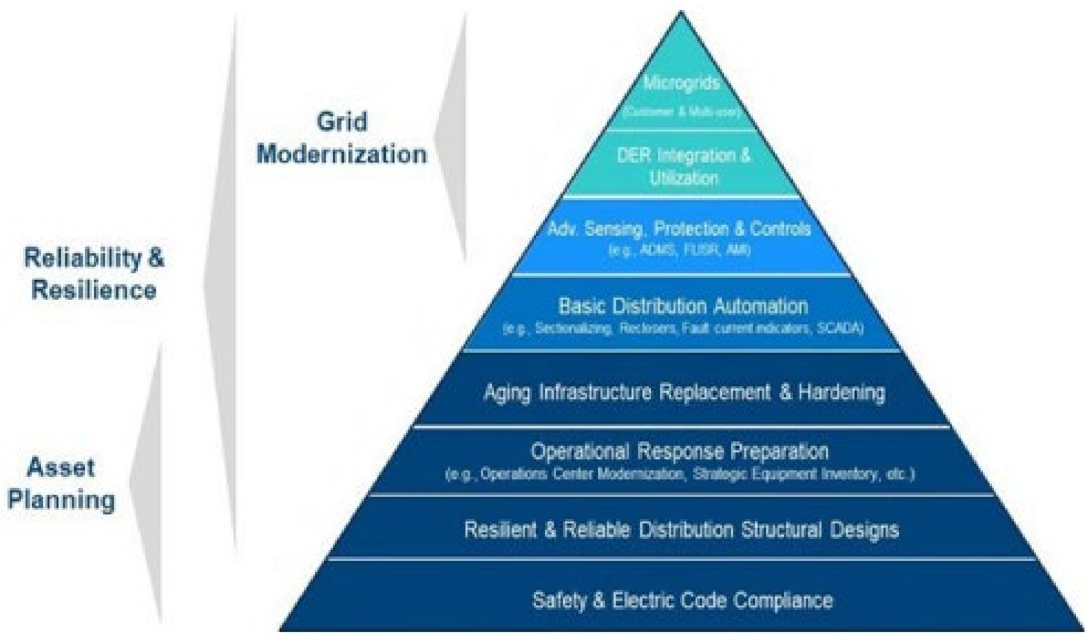


Figure 40: DOE Robust Planning Process

First, solid foundational data is paramount to produce accurate model results. Models are only as good as the quality of the data put into them, so it is critical not to overlook the initial state of the data. It is important to understand how much of the data actually exists versus relying on default or scripted data fill work arounds. Much of the data utilities have traditionally collected and stored have not been done with distribution circuits in mind and presents a significant shift in priorities for data collection and storage.

Confidentiality and sensitive data protections

Transparency in distribution system planning will surface the need to resolve the desire to be open but still maintain protection over critical data, including customer-sensitive information in addition to utility assets. Cyber-security protections will also be a foundational strategy incorporated into the process.

Concern over sensitive data from the utilities perspective generally focuses on risk of divulging location of critical infrastructure, such as key transmission substations and substantial generation at the transmission level. While this cannot be denied, it is also possible to identify and locate these critical structures with determined use of common applications like Google Earth or anything with good satellite imaging (just follow the transmission lines to a sufficiently large structure). However, additional features of that infrastructure may result in greater exploitation of information negatively so there will likely be some level of redaction for the most sensitive of critical infrastructure sites.

Any HCA visualization with sufficient granularity has potential to reveal some level of confidential customer information (particularly if more detailed time series analysis is used).

This is especially true in case of customer substations belonging specifically to a single industrial entity or part of the military.

System forecasts and plans

Long term planning based on circuit models requires a certain threshold of assured data quality

- More sophisticated than linear extrapolation of peak load
- Systematic approach leads to less variability in forecasting
- Can account for pending projects (load and DER) with greater efficiency
- Helpful in estimating impact as load and potential of EV as helping stabilize the grid in response to increased DER penetration
- Need to have confidence in line segment model granularity
- Visually identify aged conductors with potential need of replacement before outages

Transparency

An important part of the DSP and HCA process is the ability to effectively convey results to both internal stakeholders familiar with the process and related concepts and to external stake holders without a firm understanding of the grid. The granularity of the results will increase over time as PacifiCorp transitions its data to line segment model quality. This will allow various interested parties to focus on specific areas of interest and potentially reduce the screening needed for the interconnection process.

PacifiCorp has been developing tools to support DSP planning, including HCA visualization. These graphics display data relevant to our service area and our infrastructure, many of which are graphic depictions of baseline data supporting this filing. This DSP map-viewer is accessible at www.pacificorp.com/dsp .

We intend to augment these geographic displays but currently provide:

- HCA visualization at a feeder, circuit, and line segment levels
- DSP visualization tool
- Data reliability leading to visualization and remote control of the distribution grid
- Dashboard showing percentage of circuits with various levels of HCA
- Dashboard showing percentage of circuits with preexisting load conditions

Community and customer data

Accumulating quality data for modeling allows and requires PacifiCorp to identify specific regions relating to specific groups to use in considering options, including non-wires alternatives to assist in developing a more level playing field for traditionally under supported customers or communities. Features to be included are:

- Demographics
- Community goals
- Zoning information
- Customer usage patterns
- Customer resource patterns
- Status of customer's use or generation capability

System equipment and loading data

Traditionally utilities focused on transmission so that telemetry does not exist at all or even most of the distribution substations that feed distribution circuits. Additionally, much of the critical data, such as customer equipment, has not been collected to the degree it can be reliable in a circuit model. Building the foundational data required to build an HCA producing model represents a significant shift in how utilities deal with data that was not highly important in the past.

- The circuit source is the most important part of the circuit and must have good data
- Model connectivity requires data or a solid work around for every conductor
- Protection equipment is necessary for implementation of a FLISR system
- Customer equipment data, such as transformers, needs to be reliable
- Load allocation can be used to leverage SCADA data to compensate for missing customer data
- Transformers can be used to aggregate multiple customers for computational needs
- DERs need accurate size, type, and location
- Assumptions and use cases for DER profiles must be well defined for proper kW modeling
- The type of load data for customers must be consistent and reliable

Chapter 5 – Interoperability & future uses of the system

Hosting Capacity Analysis

One of the most significant requirements of UM 2005 and OPUC Order No. 20-485 is the completion of a hosting capacity options evaluation. The options, which detail the frequency, time and locational granularity and calculated attributes must include three alternatives, for which the company needs to identify risks and concerns for each alternative.

The options are summarized below:

Table 22: Summary of Hosting Capacity Options

Hosting Capacity Options						
Option	**Methodology**	**Geographic Granularity**	**Temporal Granularity**	**Data Presentation**	**Refresh**	**Planned/Queued Generation**
Option 1	Stochastic/ EPRI Drive	Circuit	Annual minimum daily load	Web-based map	Annual	Details such as number, size description, cost of upgrades, etc.
Option 2	Stochastic/ EPRI Drive	Feeder	Monthly minimum daily load	Web-based map	Monthly	Details such as number, size description, cost of upgrades, etc.
Option 3	Iterative	Line Segment	Hourly minimum daily load	Web-based map	Monthly	Details such as number, size description, cost of upgrades, etc.

HCA Modeling Methods and Estimated Effort

To ensure consistent understanding of modeling processes, the company outlines each of the viable options and their general benefits and limitations.

The stochastic method works as a form of "brute force" solution. In each feeder of a standard power flow model, DER penetration is increased using simulated distributed generators of various sizes and locations. The finished output is something close to a full range of DER configurations, exhibiting best and worst-case scenarios for every aspect of every feeder. While the method itself is easily communicated and understood, its data and storage intensive nature ultimately handicap it in many ways. The sheer cost of performing analyses for literally every potential case make it prohibitive in terms of processing and storage costs. This also paradoxically limits the range of possibilities that can be investigated, as additional parameters further increase resource usage.

The streamlined model eschews direct modeling in favor of a series of algorithms that evaluate power quality at each distribution node. This has several advantages in speed and overall resources. Arguably its greatest advantage is in solution convergence: streamlining does not generate divergent solutions given the same inputs, so results can be easily replicated and verified. The downside is that it is only useful for single site DERs and has uncommon data requirements, including smart meters and other data sources.

The Iterative Integration Capacity Analysis (ICA) approach uses "…distribution planning tools such as CYME and Synergi to perform the voltage and thermal impact assessments rather than utilizing a calculation-based approach." (Impact Factors, Methods, and Considerations for Calculating and Applying Hosting Capacity, pg. 3-14) The iteration in ICA takes places over a number of nodes at which increasingly larger amounts of DER are placed. The system is then analyzed for thermal and voltage stability. This approach is similar to existing interconnection studies, only adapted for DER analysis. As an HCA tool, it's effective for multi-feeder and single site DER analysis. But this capability comes at a cost in computing resources and flexibility. DER analysis and "what if" options can be limited compared to the other methods listed. Additionally, solutions are non-convergent, with demonstrated differences in solutions, particularly in voltage analysis.

Technology is advancing in this area, however. For example, the Electric Power Research Institute (EPRI) has created a proprietary method for hosting capacity analysis called DRIVE (Distribution Resource Integration and Value Estimation). DRIVE has its roots in stochastic analysis but takes a more targeted approach using the initial stochastic results to target and analyze problem areas. DRIVE is capable of both single and multi-site DER analysis with consistent solution convergence. It also has advantages in computing resources used and flexible scenario setup, however there are competing views about whether it can fully support sophisticated and highly variable modeling alternatives at scale.

In Table 23 below the estimated effort to model using various alternatives to achieve HCA options are outlined.

Table 23: Summary of Hosting Capacity Evaluation Approaches

Hosting Capacity Evaluation Approaches				
Method	**Description**	**Computational time per feeder**	**Data storage per feeder**	**Solution Convergence**
Stochastic	"brute force" computation for DERs, all levels all sites	20 hours	1 GB	Yes
Streamlined Integration Capacity Analysis (ICA)	Algorithms that evaluate power quality at each distribution node	2-30 minutes	15 MB	With correct baseline power flow
Iterative ICA	Increases DER resources at each node iteratively, evaluating thermal/voltage stability at each iteration	1/2 - 27 hours	15 MB	No
DRIVE	Uses initial stochastic results to target potential problem areas	5 minutes	1 MB	With correct baseline power flow

Granularity

The company has developed hosting capacity assessments based on the graphic below identifying locations on a given circuit at which capacity and protection performance are calculated. In Option 1 all assessment is conducted primarily on the circuit protection and substation equipment. In Option 2 modeling and scenarios are placed on momentary isolation equipment, specifically reclosers and breakers. While in Option 3 all line elements and all operating equipment are modeled for their performance in each scenario.

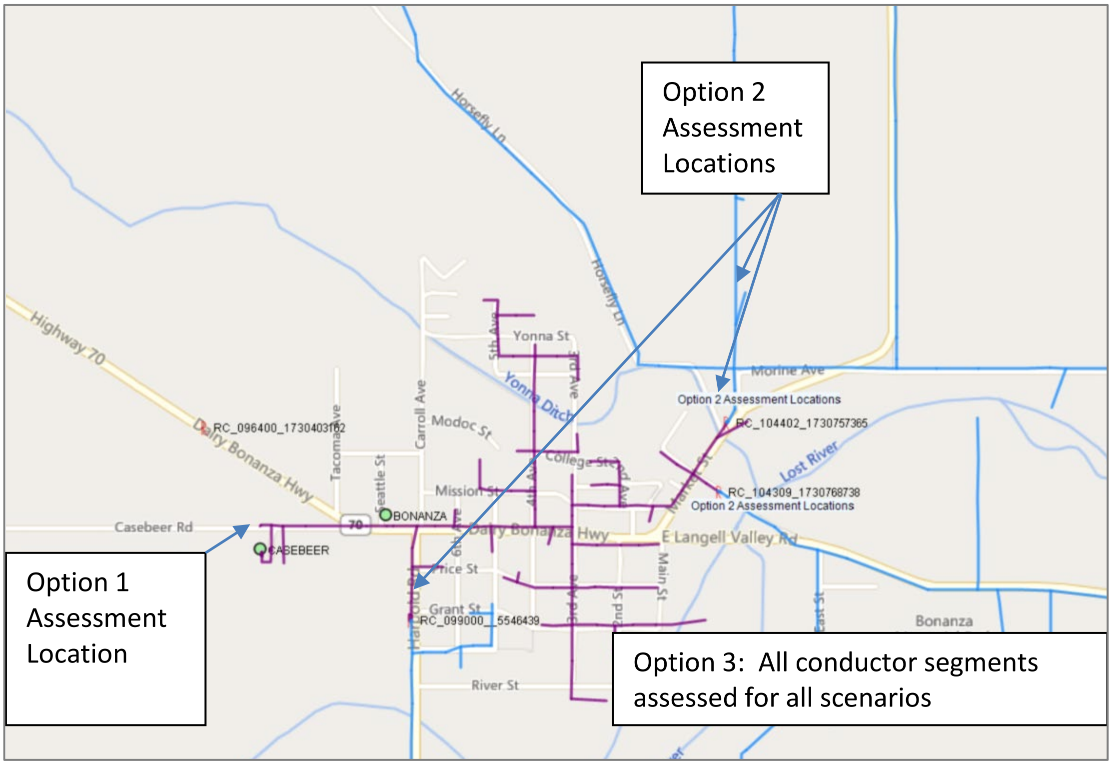


Figure 41: HCA Options Granularity Graphic

In Table 24 below, the company provides hosting capacity analysis options consistent with each of the rating methods and with cost estimates for required processes associated with that option.

Table 24: Summary of HCA Options

HCA Assessment			
Option	**Option 1**	**Option 2**	**Option 3**
Methodology	**Stochastic/EPRI Drive**	**Stochastic/EPRI Drive**	**Iterative**
Geographic Granularity	Circuit (substation breaker)	Feeder (momentary ZOP)	Line Segment
Data Presentation	Annual Minimum Daily Load	Monthly Minimum Daily Load	Hourly Assessment
Refresh	Annual	Monthly	Monthly
Planned/Queued Generation	Details such as number. Size, description, cost of upgrades, etc.	Details such as number. Size, description, cost of upgrades, etc.	Details such as number. Size, description, cost of upgrades, etc.
Data Security	Not a concern unless circuit only serves one customer	Becomes a concern when single larger customers are discernible against available or placed capacity	Concern is exacerbated due to ability to "learn" about placed or in progress producing projects based on temporal analysis
Result Validation	Subject matter review	Requires greater equipment and automation processes for credible reviews at feeder equipment levels	Requires greater equipment and automation processes for credible reviews at line segment levels, which requires key data points be calculated for verification and can only be performed on circuits having profile data available against time series models
Implementation Concerns	None; we did it	To maintain project confidentiality many feeder segments will require redaction and result in limited value to broad use by community stakeholders	High intensity computing requirements for limited duration applicability; work produced has a very short range or use for a high cost
Barriers	Requires development of core data to support refresh of information	Requires development of business rules to ensure proper confidentiality is retained; many line devices will have estimated results due to lack of line sensor data at momentary sectionalization level	Substantial technology, data and business rule establishment is required to support level of models being produced for external consumption and business decision processes without clear integration into the DSP transparent process

HCA Assessment – continued			
Option	**Option 1**	**Option 2**	**Option 3**
System Availability	**$ 361,920**	**$ 9,437,760**	**$ 62,714,400**
Establish Load Cases Establish Maximum Values for Equipment Identify Credible Values for Each Attribute Establish Use Cases Produce Use Case Values at Each Equipment Location Place Value in Repository and Geospatially			
Existing Inventory	**$ 90,480**	**$ 100,000**	**$ 100,000**
Summarize Placed Capacity Summarize In Progress Capacity Build integration between In Progress Projects and Issues/Alternatives System Reduce In Progress Capacity for Any Stale/Mothballed Projects Total Capacity for "Worst Case" Conditions Place Project & Capacity in Repository and Geospatially			
GIS	**$35,000**	**$ 45,000**	**$ 45,000**
Produce Map Views and Data for Current Capacity and Availability and Status Reporting			
Software Licensing & Implementation			
CYME/EPRI Drive		$ 34,500	
CYME ICA			$ 34,500
Computing Resources		$ 150,000	$ 325,000
Interface Creation		$ 325,000	$ 775,000
Report Development	$ 10,000	$ 10,000	$ 20,000
Total	**$ 497,400**	**$ 10,102,260**	**$ 64,013,900**

Chapter 6 – Evolution

PacifiCorp will continue to work on and focus on the next part of the Distribution System Plan, including evaluating and making advancements in the company's load forecasting, DER Adoption, EV Adoption. The company will assess grid adequacy and distribution system needs while continuing its ongoing distribution and transmission planning and analyses.

Table 25: Near Term DSP Activities

Tasks	Start	Finish
File DSP Part 1		10/15/21
Stakeholder Outreach	4/2021	8/2022
Engage customers and stakeholders for feedback to DSP	4/2021	8/2022
Initiate DSP community engagement survey	1/2022	2/2022
Evaluate feedback from survey and revise communication plan as needed	3/2022	3/2022
Develop content to train internal audiences on DSP	10/2021	1/2022
Evaluate options for multi-language production of content	12/2021	1/2022
Establish method for multi-language and language-impaired DSP communications	1/2022	3/2022
Modify long term relevant to progress and feedback received	4/2021	8/2022
Evaluate Energy Equity Metrics for Stakeholders, Engineers and Regulators	11/2021	9/2022
Value & Calibrate Energy Equity Metrics	11/2021	3/2022
Review energy equity metric displays	3/2022	5/2022
Develop a dashboard of energy equity metrics	5/2022	8/2022
Capacity Planning Transition Process	10/2021	8/2022
Refine planning transition schedule	10/2021	3/2022
Review planning schedule with stakeholders	1/2022	3/2022
Modify planning schedule as necessary	1/2022	8/2022
Resource Planning Transition Process	1/2022	8/2022
Receive DSM and DG forecasts for 2023 IRP	1/2022	3/2022
Integrate DSM and DG forecasts into legacy planning areas	3/2022	3/2022
Integrate DSM and DG forecasts into transitional planning areas	3/2022	8/2022
Aggregate forecasts into load forecast load bubbles	3/2022	6/1/22
Refine implementation plan for transitional planning process	6/2022	8/2022
Pilot Projects	11/2021	8/2022
Evaluate existing area plans for GNAs for pilot	11/2021	3/2022
Evaluate transitional area plans for GNAs for pilot	1/2022	3/2022
Identify range of pilot options (Non-wires Alternatives)	4/2021	7/2022
Identify pilot locations & project types	4/2022	7/2022
Determine Pilot selection metrics	4/2022	7/2022
Conduct Public Participation to assess Pilot alternatives	4/2022	7/2022
Pilot selections	3/2022	8/2022
File DSP Part 2 Plan		8/15/22

The company will begin the implementation of the community engagement plan and initial surveys, increase engagement with customers, stakeholders and communities, and incorporate feedback into the community engagement plan and DSP. Near term activities are outlined in Table 25 and will include at least two workshops (although as many as five are currently under consideration) and will also update its plans as it receives stakeholder feedback.

Integration with IRP

PacifiCorp's IRP has a long-established process with active public and stakeholder engagement. DSP products and touchpoints will continue to be incorporated and integrated with the company's IRP process, and as necessary DSP impacts to IRP will be addressed. In early 2022, the company will work on load forecast updates to the IRP and incorporate DER forecasts for the next IRP Update.

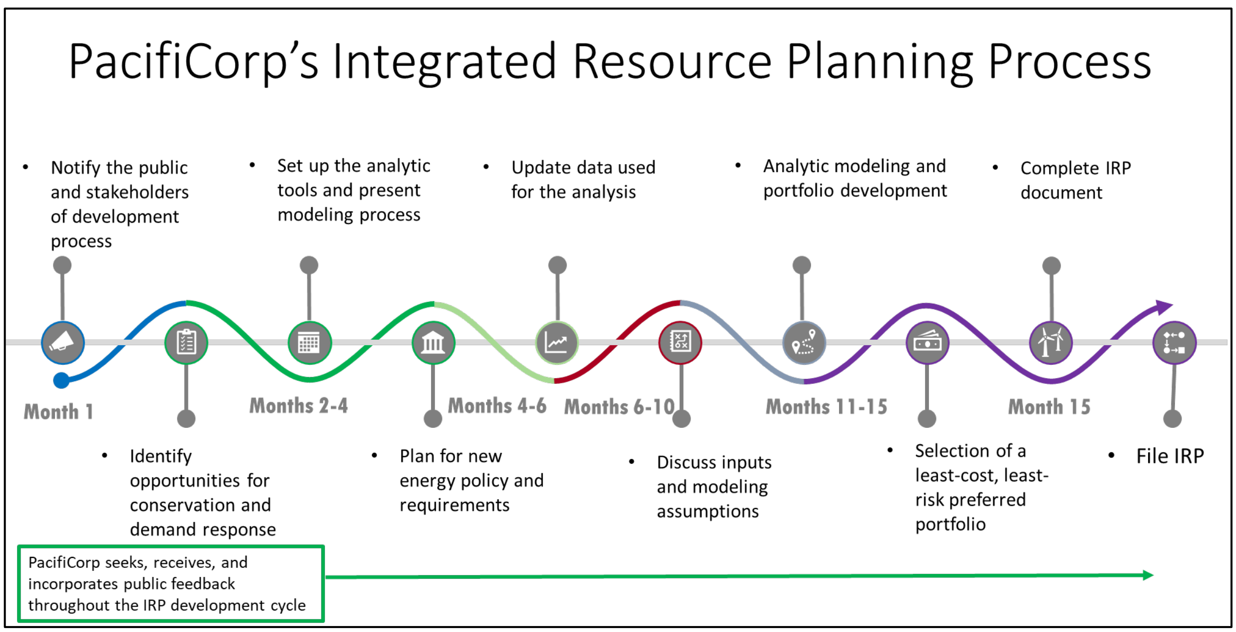


Figure 42: PacifiCorp's IRP Process

DER forecasting requires utilities to gather the best information about what has occurred in the past, isolate key parameters influencing adoption, and then determine what is likely to happen in the future. DER forecasting, particularly for resources in the nascent stages of adoption, can be particularly challenging when it comes to inputs as the historical data used for traditional forecasting is simply not available or necessarily accurate for some DERs. This can be further complicated for forecasts at the distribution level where inputs may not yet be available, even for long-standing resources. Industry tools and methodologies to incorporate DER forecasts into distribution plans and planning processes are evolving as data becomes more readily available and parameters and methodologies become more aligned with planning processes.

Going forward, as part of the normal annual long-term load forecast update, PacifiCorp's Customer Solutions group will continue to provide the long-term load forecast team the Company's expectations for electric-vehicle and private generation growth over the coming 20-year period. Concurrently, however, in forthcoming updates the granularity of electric-vehicle and private generation growth will be much more refined and will be provided into the distribution system planning process, where area planners will integrate the various cases under which these loads and resources will be considered. The two scenario modeling processes (those scenarios used in IRP versus those used in DSP) will be aligned and splined together to ensure appropriate edge cases are produced for both resource and capacity credible scenarios. In the transition period, future electric-vehicle and private generation updates will be provided at the load bubble granularity rather than at the jurisdictional granularity. These inputs will be incorporated into the load forecast at the load bubble granularity provided to – and used in – the Company's integrated resource planning process. As the company evolves through the transition period, the updates will continue to be produced at increasing levels of granularity and representation.

As mentioned previously, the CPA in Oregon is prepared by the Energy Trust of Oregon for development of energy efficiency (Class 2 DSM) resource potential and cost assumptions specific to PacifiCorp's Oregon service territory. The CPA supports the cost and savings data used during the IRP portfolio-development process. PacifiCorp will work with the Energy Trust to develop a methodology to disaggregate statewide energy efficiency potential to a more granular level in support of distribution system planning. At a minimum, the Class 2 DSM potential will rely on disaggregated loads to help segment potential to a more granular level, however, there may be additional parameters that can be incorporated to help further refine energy efficiency potential segmentation. These parameters will be investigated in subsequent discussions with the Energy Trust. Once the optimal Class 2 DSM selections are known from the Company's Plexos capacity expansion optimization model, as determined by the integrated resource planning team, they will be incorporated as a post-model adjustment to the Company's long-term load forecast at the load bubble granularity.

Once the load forecast with the Company's electric-vehicle, private-generation and Class 2 DSM selections are determined, the load forecast at the load bubble granularity will be provided to distribution planning for subsequent planning at the feeder level.

Future plans

At a high level, the company's plans for DSP involve targeted applications, processes and assets focused specifically on delivering the core elements outlined in UM2005, such as system-wide SCADA, integration of technologies such as granular AMI into load management systems, advanced spatial load forecasting, integration of scenario modeling into load planning software, which is visually outlined in Figure 43 below.

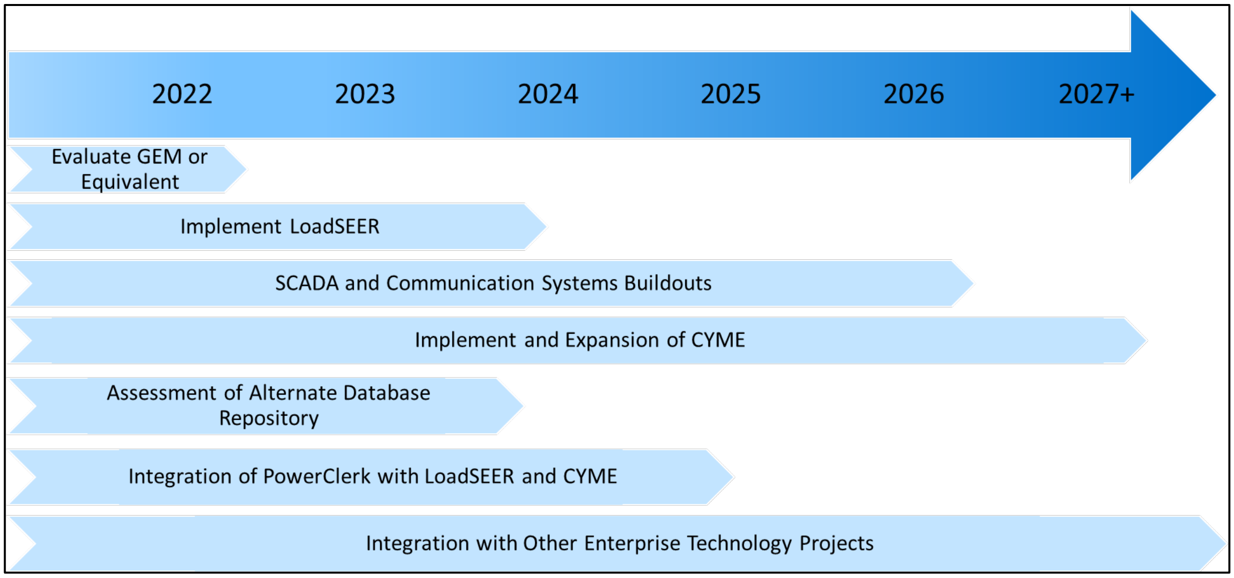


Figure 43: High Level Enablers to DSP Long Term Plan

PacifiCorp has currently underway several technology initiatives that will support distribution planning, namely the advancement of asset management software, an Oracle enterprise suite focused on utility applications, including replacement of capital planning, network management and work management functions. However, further technology as discussed previously is required to support the functionality envisioned in docket UM2005; specific cost estimate details to support DSP are shown in Table 26 below. Further, during the development of DSP Part 2 further technology requirements and cost estimates will be prepared, also over the next ten years plans should include advanced operational technologies which the company does not currently have within this or other roadmaps, such as the adoption of an Advanced Distribution Management System and more broad communication technology platform to support expanded distribution automation options throughout the system.

Table 26: DSP Cost Estimates, including HCA Options

Long Term Plan	One Time Cost	Annual Cost
Total Option 1 HCA	**$20,118,263**	**$7,615,440**
Total Option 2 HCA	**$29,723,123**	**$17,220,300**
Total Option 3 HCA	**$83,634,763**	**$12,546,840**

Long Term Plan Components		
SCADA build out (over five years of deployment) - 2026	$2,754,000	$350,000
Extensible base communication system to substations - 2026		$275,000
Leases	$250,000	
Fiber	$8,700,000	
Multiple Address System (MAS)	$775,000	
LoadSEER software license - 2022	$3,276,000	
Implement LoadSEER (if implemented system wide could result in cost reduction) - 2024	$775,000	
Implement & expand use of CYME DERie (based on HCA Option chosen) - 2027		
Expand pilots for DA/FLISR - 2031		$1,500,000
CYME plug ins (to be further assessed through Plan 2)		
AMI integration with Dynamic Data Pull		
EPRI Adapt (Advanced Distribution Assessment Planning Tools)		
Integration Capacity Analysis/DERie/EPRI Drive		
LoadSEER Implementation - 2024	$1,000,000	
Plug in implementation - 2026	$750,000	
Evaluate and Implement Greenlink Analytics (GEM) or Equivalent - 2022	$10,863	
Create alternatives assessment repository in AMPS database - 2023	$50,000	
Integrate PowerClerk with LoadSEER and CYME - 2024	$450,000	
Integration with other enterprise technology projects - 2027		
Communications Plan Implementation	$600,000	$650,000
Standup DSP communications collateral creation	$150,000	
Community Surveys (at least annual cadence, potentially twice)	$80,000	
DSP Education Materials		
DSP Education Events		
Core DSP Activities		$4,343,040
Conduct local planning meetings		
Share alternatives advocated by communities and stakeholders		
Perform legacy studies during transition period		
Perform integrative planning functions		
Communicate options and costs		
Maintain data repositories that are critical for DSP		
Advance technology in support of DSP stakeholders and participants		
Produce content for regular meetings, specific local area topics and regulatory obligations		
	$19,620,863	**$7,118,040**

Hosting Capacity Options		
Option 1	$497,400	$497,400
Option 2	$10,102,260	$10,102,260
Option 3	$64,013,900	$5,428,800

Challenges and Barriers

There are substantial challenges that the company will face to establish the fully developed DSP process outlined in UM2005. They include the rapid pace, substantial human, technology and process changes, the need for parallel operations of “as is” and “to be” and the potential conflict or dovetail with other important changes. In addition to these changes, DSP requires a manner of engagement of customers, communities and other stakeholders which hasn’t previously been undertaken. As such, foundational systems, methods for communicating, ensuring proper representation and inclusion of voices will be a substantial cultural shift. Many of these process, technology and human changes will test our employees’, customers’ and communities’ ability to acclimate and providing this space for acclimation is important. Thus, our expectations for involvement, healthy discourse and solutions that please the wide variety of stakeholders need to be managed.

Further, the system being discussed is not the most cost-efficient system and is in contradiction to the approach utilized previously to minimize cost while maximizing access based on simple customer class cost of service models. Advanced technology and the manner in which DSP contemplates engagement will require greater investment in technology, processes and employee and stakeholder resources. In PacifiCorp’s relatively rural and sparse population, these costs will be more extreme.

In spite of these barriers, the company is excited to begin this journey.

Chapter 7 – Conclusion

The scope and breadth established through OPUC Order No. 20-485 for a "transparent, robust and holistic" distribution system planning process is a heavy but necessary lift for Oregon IOUs. Achieving equity, inclusion and transparency in distribution system planning will empower our customers and lead us on a path to reducing energy burden in communities served by the company. PacifiCorp envisions an energy future where our distribution network is used by and for customers, delivering value to them and the communities we serve, through efficient and valued movement of energy at a pace and in a manner that uplifts our diverse mix of customers.

As we continue this journey and incorporate learnings and valuable insight into our system planning from an array of stakeholder groups and the broader public, we look to our guiding DSP core principles to ensure the grid of the future is just and equitable for all.

DSP Core Principles

- **Transparent and comprehensive data sets** for customers, communities, regulators and stakeholders to evaluate and set priorities recognizing goals of the state in advancing a clean, equitable energy future;
- **Robust engagement** with communities, stakeholders and regulators to ensure access to new datasets and technologies are properly advanced through investments by PacifiCorp and partners;
- **Technology adoption** at a pace customers can afford and the company can perform;
- **Increasing resilience** in the face of climate change and customer expectations.

PacifiCorp is excited to work alongside our communities to see this vision through and we look forward to Part 2 of this important and necessary work.

DSP Acronyms

Acronym	Term
AC	Air Conditioning
ADMS	Automated Distribution Management System
AEG	Applied Energy Group
AMI	Advanced Metering Infrastructure
AMM	Advanced Metering Management
AMR	Automated Meter Reading
AOC	AMI Operations Center
BES	Bulk Electric System
CAES	Compressed Air Energy Storage
CAIDI	Customer Average Interruption Duration Index
CES	Centralized Energy Storage
CFCI	Communicating Faulted Circuit Indicators
CGR	Connected Grid Router
CIG	Community Input Group
CIS	Customer Information System
DA	Distribution Automation
DEQ	Department of Environmental Quality
DER	Distributed Energy Resource
DG	Distributed Generation
DDR	Dynamic Disturbance Recorder
DFR	Digital Fault Recording
DLC	Direct Load Control
DLR	Dynamic Line Rating
DMS	Distribution Management System
DSM	Demand-Side Management
DSP	Distribution System Planning
DR	Demand Response
EIM	Energy Imbalance Market
EMS	Energy Management System
EPC	Engineer, Procure and Construct
ESS	Energy Storage Systems
ETR	Estimated Time of Restoration
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
FAN	Field Area Network
FDIR	Fault Detection, Isolation and Restoration
FLISR	Fault Location, Isolation and Service Restoration
FR	Fault Recording

Acronym	Term
GIS	Geographical Information System
HCA	Hosting Capacity Analysis
IEEE	Institute of Electrical and Electronics Engineers
IOC	Integrated Operations Center
IOU	Investor-Owned Utility
IRP	Integrated Resource Plan
ISO	Independent System Operator
IT	Information Technology
IVVO	Integrated Volt/VAR Optimization
kW	Kilowatt
kWh	Kilowatt-hour
LEAD	Low Income Affordability Data Tool by DOE at https://www.energy.gov/eere/slsc/maps/lead-tool
LTDSP	Long Term Distribution System Plan
MAIFI	Momentary Average Interruption Frequency Index
M&V	Measurement and Verification
MDMS	Meter Data Management System
MW	Megawatt
MWh	Megawatt-hour
NERC	North American Electric Reliability Corporation
NIST	National Institute of Standards and Technology
NREL	National Renewable Energy Laboratory
O&M	Operations and Maintenance
OMS	Outage Management System
OPUC	Public Utility Commission of Oregon
PDC	Phasor Data Concentrator
PHES	Pumped Hydroelectric Energy Storage
PMU	Phasor Measurement Unit
RAS	Remedial Action Scheme
RBM	Regional Business Manager
RE	Range Extender
RTU	Remote Terminal Unit
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SER	Sequence of Events Recording
SCADA	Supervisory Control and Data Acquisition
SOC2	Service Organization Controls
TOU	Time-of-Use
UL	Underwriters Laboratories
WECC	Western Electricity Coordinating Council

Appendix A:
Distribution System Plan Guidelines
References

4.1 Baseline Data

The baseline data is described in Chapter 1 and in supplemental Excel workpaper.

4.1	Baseline Data and System Assessment	Reference
4.1.a	A description of any currently used internal baseline and system assessment practices (such as system reliability baseline, system asset health baseline, etc.) that includes:	Tab: Baseline 4.1.a.i & ii
4.1.a.i	Method and tools used to develop the baseline and assessment	Tab: Baseline 4.1.a.i & ii
4.1.a.ii	Forecasting time horizon(s)	Tab: Baseline 4.1.a.i & ii
4.1.a.iii	Key performance metrics	Tab: Baseline 4.1.a.iii
4.1.b	A summary of the utility's distribution system assets including:	Tab: Baseline 4.1.b
4.1.b.i	Asset classes	Tab: Baseline 4.1.b
4.1.b.v	Number of assets in each class	Tab: Baseline 4.1.b
4.1.b.ii	Average age of assets in each class	Tab: Baseline 4.1.b
4.1.b.iii	Age range of assets in each class	Tab: Baseline 4.1.b
4.1.b.iv	Industry life expectancy of assets in each class	Tab: Baseline 4.1.b
4.1.c	A discussion of distribution system monitoring and control capabilities including:	Tab: Baseline 4.1.c – SCADA, Tab: Baseline 4.1.c - AMI
4.1.c.i	Number of feeders	Tab: Baseline 4.1.c – SCADA, Tab: Baseline 4.1.c - AMI
4.1.c.ii	Number of substations	Tab: Baseline 4.1.c – SCADA, Tab: Baseline 4.1.c - AMI
4.1.c.iii	Monitoring and control technologies (such as SCADA, AMI, etc.)	Tab: Baseline 4.1.c
4.1.c.iv	A description of the monitoring and control capabilities (for example, percentage of system with each technology, resulting capacity, such as remote fault detection or power quality monitoring, and what time interval measurements are available)	Tab: Baseline 4.1.c – SCADA, Tab: Baseline 4.1.c - AMI
4.1.d	A discussion of any advanced control and communication systems (for example: distribution management systems, distributed energy resources management systems, demand response management systems, outage management systems, field area networks, etc.). Include a description of system visibility and capabilities, the percentage of system reached with each	Tab: Baseline 4.1.d

4.1	Baseline Data and System Assessment	Reference
	capability, the percentage of customers reached with each capability, and any utility programs utilizing each capability.	
4.1.e	Historical distribution system spending for the past five years, in each category:	Tab: Baseline 4.1.e
4.1.e.i	Age-related replacements and asset renewal	Tab: Baseline 4.1.e
4.1.e.ii	System expansion or upgrades for capacity	Tab: Baseline 4.1.e
4.1.e.iii	System expansion or upgrades for reliability and power quality	Tab: Baseline 4.1.e
4.1.e.iv	New customer projects	Tab: Baseline 4.1.e
4.1.e.v	Grid modernization projects	Tab: Baseline 4.1.e
4.1.e.vi	Metering	Tab: Baseline 4.1.e
4.1.e.vii	Preventative maintenance	Tab: Baseline 4.1.e
4.1.f	Net Metering and Small Generator information:	Tab: Baseline 4.1.f
4.1.f.i	Total existing net metering facilities and small generator facilities interconnected to the distribution grid (or to the transmission system, as appropriate for small generator facilities) at time of filing, by feeder.	Tab: Baseline 4.1.f
4.1.f.i.1	The total number of net metering facilities by resource type	Tab: Baseline 4.1.f
4.1.f.i.2	The total estimated rated generating capacity of net metering facilities by resource type	Tab: Baseline 4.1.f
4.1.f.i.3	The total number of small generator facilities by resource type	Tab: Baseline 4.1.f
4.1.f.i.4	The total nameplate capacity of small generator facilities by resource type	Tab: Baseline 4.1.f
4.1.f.ii	The total number and nameplate capacity of queued net metering facilities and small generator facilities at time of filing, by feeder, broken down by resource type	Tab: Baseline 4.1.f
4.1.f.iii	A map, in electronic format, identifying locations of net metering facilities and small generator facilities interconnected to the distribution grid (or to the transmission system, as appropriate for small generator facilities) at time of filing.	https://www.pacificorp.com/energy/oregon-distribution-system-planning.html
4.1.g	Total number of EVs of various sizes served by the utility's system at time of filing	Tab: Baseline 4.1.g & h & i

4.1	Baseline Data and System Assessment	Reference
4.1.h	Number of EVs added to the utility's system in each of the last five years	Tab: Baseline 4.1.g & h & i
4.1.i	Total number of charging stations on the utility's system, broken down by type, ownership, and feeder	Tab: Baseline 4.1.g & h & i
4.1.j	Total number of charging stations added to the utility's system in each of the last five years, broken down by type	Tab: Baseline 4.1.g & h & i
4.1.j.i	Data on the availability and usage patterns of charging stations	Tab: Baseline 4.1.j
4.1.k	Summary data of other transportation electrification infrastructure, if applicable	Not Applicable
4.1.l	A high-level summary of demand response (DR) pilot and/or program performance metrics for the past five years including:	Tab: Baseline 4.1.l
4.1.l.i	Number of customers participating by residential and business customer class, and combined total	Tab: Baseline 4.1.l
4.1.l.ii	By winter and summer demand response season:	Tab: Baseline 4.1.l
4.1.l.ii.1	Maximum available capacity of DR by residential and business customer class, and combined total	Tab: Baseline 4.1.l
4.1.l.ii.2	Season system peak	Tab: Baseline 4.1.l
4.1.m - NM	Plans should include the utility's most recently filed Annual Net Metering Report and the most recently filed Annual Small Generator Report, each as an appendix to the Plan. (link is for 2020 numbers)	Appendix B, https://edocs.puc.state.or.us/efdocs/HAQ/re39haq105740.pdf
4.1.m - SGR	Plans should include the utility's most recently filed Annual Net Metering Report and the most recently filed Annual Small Generator Report, each as an appendix to the Plan. (link is for 2020 numbers)	Appendix C, https://edocs.puc.state.or.us/efdocs/HAQ/re66haq171141.pdf
4.1.n	Plans should include the utility's most recently filed Annual Reliability Report as an appendix to the Plan. Any descriptions of reliability challenges and opportunities in the Distribution System Plan should cross-reference underlying data and information contained in the Annual Reliability Report. (link is for 2020 numbers)	Appendix D, https://edocs.puc.state.or.us/efdocs/HAQ/re171haq16652.pdf

4.2 Hosting Capacity Analysis

4.2	Hosting Capacity Analysis	Reference
4.2.a	Utility should conduct a system evaluation to identify areas where it is difficult to interconnect DERs without system upgrades. Each utility should present the results through an unredacted map that is continuously available on the utility's website.	https://www.pacificorp.com/energy/oregon-distribution-system-planning.html
4.2.b	Analyze three options to meet future HCA needs consistent with Figure 2.	Chapter 5
4.2.b.i	Option 1	Chapter 5
4.2.b.ii	Option 2	Chapter 5
4.2.b.iii	Option 3	Chapter 5

4.3 Community Engagement Plan

4.3	Community Engagement Plan	Reference
4.3.a.i	A utility should host at least two workshops prior to filing each part of the utility's Plan, for a minimum total of four workshops.	https://www.pacificorp.com/energy/oregon-distribution-system-planning.html, Chapter 3
4.3.a.ii	A utility should develop a Community Engagement Plan	Chapter 3

4.4 Overarching Requirement – Long-term Distribution System Plan

4.4	Long-term Distribution System Plan (LTDSP)	Reference
4.4.a	The utility's vision for the distribution system over the next 5-10 years, including any strategies, goals or objectives, and their alignment with State law and OPUC policies. These goals may include increased reliability, effective integration of DERs, broader greenhouse gas emissions reduction, or others.	Chapter 1
4.4.b	Roadmap of the utility's planned investments, tools and activities to advance the long-term DSP vision, using a 5-10-year planning horizon.	Chapter 6
4.4.b.i	Assessment of investment options to enhance the grid across the following range of areas, including relative costs and benefits:	

4.4	Long-term Distribution System Plan (LTDSP)	Reference
4.4.b.i.1	Substation and distribution network and operations enhancements	Chapter 1
4.4.b.i.1.a	Plans for conservation voltage reduction	Chapter 1
4.4.b.i.2	Distributed resource and renewable resource enhancements	Chapter 1
4.4.b.i.2.a	Penetration and activation/utilization of smart inverters	Chapter 1, PacifiCorp Smart Grid Report
4.4.b.i.3	Transportation Electrification enhancements	Chapter 1
4.4.b.i.4	Customer information and demand-side management enhancements	Chapter 1
4.4.b.i.4.a	Plans to continue to expand customer benefits resulting from investments in advanced metering infrastructure	Chapter 3
4.4.b.i.5	General business enhancements	
4.4.b.i.5.a	Communications and supporting systems	Chapter 1
4.4.b.i.5.b	Interoperability of systems and equipment	Chapter 5
4.4.b.i.5.c	Work-management systems	Chapter 2
4.4.b.i.5.d	Other enhancements	Chapter 2
4.4.b.i.6	As applicable, any transmission network and operations enhancements	Chapter 1
4.4.b.ii	Explanation of how the investments reduce customer costs, improve customer service, improve reliability, facilitate adoption of demand-side and renewable resources, and convey other system benefits	Chapter 1 & 2
4.4.b.iii	Long-term assumptions, and impacts of Action Plan investments, etc.	Chapter 2, 5 & 6
4.4.b.iv	Forecasting future technical and market potential of DERs	Chapter 1
4.4.b.v	Plans to further build community needs assessment and co-created community solutions into DSP roadmap	Chapter 3
4.4.b.vi	Transitional planning and operational activities underway in the organization to build capabilities in DSP-related functions	Chapter 1
4.4.b.vii	Key barriers or constraints the utility faces to advancing investment (whether financial, technical, organizational) and mitigation plans	Chapter 6
4.4.c	Smart Grid investment opportunities (See footnote 25)	Chapter 1, PacifiCorp Smart Grid Report
4.4.c.i	List and describe smart-grid opportunities that the utility is considering for investment over the next 5-10 years and any constraints that affect the utility's investment considerations	Chapter 1, PacifiCorp Smart Grid Report
4.4.c.ii	Describe evaluations and assessments of any smart-grid technologies, applications, pilots, or programs that the company is monitoring or plans to undertake	Chapter 1, PacifiCorp Smart Grid Report

4.4	Long-term Distribution System Plan (LTDSP)	Reference
4.4.d	Key opportunities and possible benefits for distribution system investment	Chapter 2 & 3
4.4.e	Research and development the utility is undertaking or monitoring	Chapter 2
4.4.f	Future policy and planning intersections:	Chapter 2
4.4.f.i	Discussion of how planned investments fit with the utility's IRP	Chapter 6
4.4.f.ii	Discussion of how planned investments fit with the utility's annual construction budget for major distribution and transmission investments	Chapter 1
4.4.f.iii	Discussion of how distribution system planning may be coordinated in the future with other major policy and planning efforts discussed in these Guidelines. At a minimum, address the IRP and transmission planning, including: how the Distribution System Plan filing is coordinated with each policy or planning effort, related inputs and outputs such as data sets or prices, and assumptions such as macro-economic policies or growth rates	Chapter 2
4.4.g	Plans to monitor and adapt the long-term Distribution System Plan	Chapter 6
4.5	As Part of its Part 1 filing each utility should prepare for the upcoming transition period and include a high-level summary to discuss:	Chapter 6
4.5.a	How legacy distribution planning practices will be transitioned to the requirements of Part 2	Chapter 6
4.5.b	Whether all legacy distribution planning practices will be transitioned in time for filing Part 2, and if not, the expected timeframe for that eventual transition	Chapter 6
4.5.c	Efforts to synchronize IRP activities with requirements of Part 2	Chapter 6

Appendix B:
Annual Net Metering Report[40]

[40] Pacific Power's Annual Net Metering Report. https://edocs.puc.state.or.us/efdocs/HAQ/re39haq105740.pdf

Oregon Net Metering Report
2020

Net Metering Facilities by Resource Type*			
Type	**As of Dec. 31, 2019**	**Installed in 2020**	**Total**
Biomass	2	0	2
Digester Gas	1	0	1
Hydro	12	0	12
Mixed(wind/solar)	14	0	14
Solar	7,486	1,225	8,711
Wind	20	0	20
Total	**7,535**	**1,225**	**8,760**

Generation Capacity by Resource Type (kW)*			
Type	**As of Dec. 31, 2019**	**Installed in 2020**	**Total**
Biomass	119	0	119
Digester Gas	750	0	750
Hydro	632.80	0	632.80
Mixed(wind/solar)	677.30	0	677.30
Solar	75,381.72	14,315.34	89,697.06
Wind	104.99	0	104.99
Total	**77,665.81**	**14,315.34**	**91,981.15**

*Information compiled on March 26, 2021

Appendix C: Annual Small Generator Report[41]

[41] Pacific Power's Annual Interconnection Report. https://edocs.puc.state.or.us/efdocs/HAQ/re66haq171141.pdf

Oregon Public Utility Commission

e-FILING REPORT COVER SHEET

COMPANY NAME: Pacific Power

DOES REPORT CONTAIN CONFIDENTIAL INFORMATION? ■ No ☐ Yes If yes, submit a redacted public version (or a cover letter) by email. Submit the confidential information as directed in OAR 860-001-0070 or the terms of an applicable protective order.

Select report type: ■ RE (Electric) ☐ RG (Gas) ☐ RW (Water) ☐ RT (Telecommunications)
☐ RO (Other, for example, industry safety information)

Did you previously file a similar report? ☐ No ■ Yes, report docket number: RE 66

Report is required by: ■ OAR OAR 860-082-0065(3)
☐ Statute
☐ Order
Note: A one-time submission required by an order is a compliance filing and not a report (file compliance in the applicable docket)
☐ Other
(For example, federal regulations, or requested by Staff)

Is this report associated with a specific docket/case? ☐ No ■ Yes, docket number: RE 66

List Key Words for this report. We use these to improve search results.

Annual Interconnection Report

Send the completed Cover Sheet and the Report in an email addressed to PUC.FilingCenter@state.or.us

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May 21, 2021

VIA ELECTRONIC FILING

Public Utility Commission of Oregon
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Re: RE 66—PacifiCorp's Annual Interconnection Report

PacifiCorp d/b/a Pacific Power encloses for filing its Interconnection Report for calendar year 2020. This report is submitted in compliance with OAR 860-082-0065(3).

Please direct any questions on this filing to Cathie Allen at (503) 813-5934.

Sincerely,

Shelley McCoy

Shelley McCoy
Director, Regulation

Enclosure

PacifiCorp
Annual Interconnection Report Pursuant to OAR 860-082-0065(3)

Year	Applications Received	Interconnections Completed
2020	72	1

Interconnections Completed

Tier 4 Projects	Type of Facilities	Nameplate Rating (MW)	Project Zipcode
Q0660	Solar	10	97524

Applications Received

Tier 1 / Tier 2 Projects	Type of Facilities	Nameplate Rating (MW)	Project Zipcode
None			

Tier 3 Projects	Type of Facilities	Nameplate Rating (MW)	Project Zipcode	Basic Telemetry Configured
None	NA	NA	NA	NA

Tier 4 Projects	Type of Facilities	Nameplate Rating (MW)	Project Zipcode	Basic Telemetry Configured	Required Interconnection Facilities	Estimated Cost of Facilities	Required System Upgrades	Estimated Cost of Upgrades
x Q0971	Solar	2.97	97632	None	New substation line position, metering	$790,000	None	$0
*TCS-51	Solar	9	97754	Project still in study phase at time of report production				
*TCS-52	Solar	20	97754	Project still in study phase at time of report production				
*TCS-53	Solar	20	97754	Project still in study phase at time of report production				
*TCS-55	Solar	20	97754	Project still in study phase at time of report production				
OCS001	Solar	1.46	97754	Application withdrawn by customer prior to approval for interconnection				
OCS002	Solar	0.9	97754	None	Line extension, metering	$93,000	None	$0
OCS003	Solar	0.8	97633	Fiber optic cable	Line extension, metering	$137,000	None	$0
OCS004	Solar	0.8	97624	Fiber optic cable	Line extension, metering	$101,000	Substation relaying equipment	$147,000
OCS005	Solar	0.36	97828	None	Line extension, metering	$54,000	None	$0
OCS006	Solar	1.04	97828	Application withdrawn by customer prior to approval for interconnection				
OCS007	Solar	0.875	97886	Application withdrawn by customer prior to approval for interconnection				
OCS008	Solar	2.125	97348	None	Line extension, metering	$68,000	None	$0
OCS009	Solar	1.625	97862	Application withdrawn by customer prior to approval for interconnection				
OCS010	Solar	1.875	97828	Application withdrawn by customer prior to approval for interconnection				
OCS011	Solar	1	97885	Application withdrawn by customer prior to approval for interconnection				
OCS012	Solar	0.996	97211	None	Line extension, metering	$54,000	None	$0
OCS013	Solar	1.26	97734	Application withdrawn by customer prior to approval for interconnection				
OCS014	Solar	1.395	97446	Application withdrawn by customer prior to approval for interconnection				

Tier 4 Projects	Type of Facilities	Nameplate Rating (MW)	Project Zipcode	Basic Telemetry Configured	Required Interconnection Facilities	Estimated Cost of Facilities	Required System Upgrades	Estimated Cost of Upgrades
OCS015	Solar	1.98	97417	Application withdrawn by customer prior to approval for interconnection				
OCS016	Solar	2	97601	Application withdrawn by customer prior to approval for interconnection				
OCS017	Solar	1.287	97501	Application withdrawn by customer prior to approval for interconnection				
OCS018	Solar	0.567	97886	None	Line extension, metering	$101,000	None	$0
OCS019	Solar	0.882	97601	None	Line extension, metering	$93,000	None	$0
OCS020	Solar	0.165	97621	None	Line extension, metering	$106,000	None	$0
OCS021	Solar	1.4	97603	Application withdrawn by customer prior to approval for interconnection				
OCS022	Solar	0.9	97623	Application withdrawn by customer prior to approval for interconnection				
OCS023	Solar	0.6	97639	Application withdrawn by customer prior to approval for interconnection				
*OCS024	Solar	1.56	97801	Project still in study phase at time of report production				
OCS025	Solar	2.8	97601	Fiber optic cable	Line extension, metering	$316,000	Substation relaying equipment, recloser replacement	$147,000
OCS026	Solar	1.5	97358	None	Line extension, metering	$104,000	None	$0
OCS027	Solar	2.875	97321	Fiber optic cable	Line extension, metering	$193,000	Three phase line extension	$42,000
OCS028	Solar	1.75	97501	Application withdrawn by customer prior to approval for interconnection				
OCS029	Solar	0.522	97212	Application withdrawn by customer prior to approval for interconnection				
OCS030	Solar	1.728	97405	Application withdrawn by customer prior to approval for interconnection				
OCS031	Solar	1.791	97358	Application withdrawn by customer prior to approval for interconnection				
OCS032	Solar	1.5	97338	Application withdrawn by customer prior to approval for interconnection				
OCS033	Solar	1	97442	Application withdrawn by customer prior to approval for interconnection				
OCS034	Solar	0.978	97601	Fiber optic cable	Line extension, metering	$157,000	Recloser replacement	$129,000
OCS035	Solar	2.21	97212	Fiber optic cable	Line extension, metering	$226,000	None	$0
OCS036	Solar	1.125	97212	Radio system	Line extension, metering	$101,000	Substation relaying equipment	$147,000
OCS037	Solar	1.5	97501	None	Line extension, metering	$63,000	Relocation of line	$171,000
OCS038	Solar	0.981	97327	Fiber optic cable	Line extension, metering	$143,000	Recloser replacement	$73,000
OCS039	Solar	2.25	97523	Project still in study phase at time of report production				
OCS040	Solar	1.812	97504	Application withdrawn by customer prior to approval for interconnection				
OCS041	Solar	1.5	97446	Fiber optic cable	Line extension, metering	$310,000	Recloser replacement	$68,000
OCS042	Solar	0.1296	97540	Fiber optic cable	Line extension, metering	$7,500	None	$0
OCS043	Solar	0.36	97862	Application withdrawn by customer prior to approval for interconnection				
OCS044	Solar	0.447	97639	Project still in study phase at time of report production				
OCS045	Solar	2.875	97734	Fiber optic cable	Line extension, metering	$166,000	Line reconductor, recloser replacement substation relaying equipment	$371,000
*OCS046	Solar	2.25	97524	Project still in study phase at time of report production				
OCS047	Solar	2.25	97601	Fiber optic cable	Line extension, metering	$169,000	Relocated capacitor bank	$55,000
*OCS048	Solar	1.5	97502	Project still in study phase at time of report production				
*OCS049	Solar	2.99	97212	Project still in study phase at time of report production				
*OCS050	Solar	1	97457	Project still in study phase at time of report production				
*OCS051	Solar	1.5	97458	Project still in study phase at time of report production				

PacifiCorp
Annual Interconnection Report Pursuant to OAR 860-082-0065(3)

Tier 4 Projects	Type of Facilities	Nameplate Rating (MW)	Project Zipcode	Basic Telemetry Configured	Required Interconnection Facilities	Estimated Cost of Facilities	Required System Upgrades	Estimated Cost of Upgrades
OCS052	Solar	0.36	97502	Application withdrawn by customer prior to approval for interconnection				
OCS053	Solar	2	97524	Application withdrawn by customer prior to approval for interconnection				
*OCS054	Solar	0.9	97524	Project still in study phase at time of report production				
*OCS055	Solar	1.35	97212	Project still in study phase at time of report production				
*OCS056	Solar	2.9	97520	Project still in study phase at time of report production				
*OCS057	Solar	1	97212	Project still in study phase at time of report production				
*OCS058	Solar	1.25	97504	Project still in study phase at time of report production				
*OCS059	Solar	0.625	97622	Project still in study phase at time of report production				
*OCS060	Solar	1.125	97351	Project still in study phase at time of report production				
*OCS061	Solar	0.875	97338	Project still in study phase at time of report production				
*OCS062	Solar	2.4	97801	Project still in study phase at time of report production				
*OCS063	Solar	2.99	97801	Project still in study phase at time of report production				

Notes
* This infomormation will be reported in a future Annual Report should the Applicant execute an Interconnection Agreement.
x This request was initially reported in a prior year annual report

Large Generators	Type of Facilities	Nameplate Rating (MW)	Project Zipcode
TCS-43	Solar & Battery Storage	40	97754
TCS-44	Solar & Battery Storage	80	97754
TCS-45	Solar & Battery Storage	40	97754
TCS-46	Solar & Battery Storage	80	97754
TCS-54	Solar & Battery Storage	40	97754

Appendix D:
Annual Reliability Report[42]

[42] Pacific Power's Annual Reliability Report. https://edocs.puc.state.or.us/efdocs/HAQ/re171haq16652.pdf

PACIFIC POWER
A DIVISION OF PACIFICORP

825 NE Multnomah, Suite 2000
Portland, Oregon 97232

April 29, 2021

VIA ELECTRONIC FILING

Public Utility Commission of Oregon
Attn: Filing Center
201 High Street SE, Suite 100
Salem, OR 97301-3398

RE: RE 171—Annual Reliability Report for Calendar Year 2020

PacifiCorp d/b/a Pacific Power submits for filing its Annual Reliability Report for calendar year 2020. This filing is made in compliance with OAR 860-023-0151.

Please direct any questions on this report to Cathie Allen, Regulatory Affairs Manager, at (503) 813-5934.

Sincerely,

Shelley McCoy

Shelley McCoy
Director, Regulation

Enclosure

PACIFICORP
A BERKSHIRE HATHAWAY ENERGY COMPANY

Pacific Power's Annual Report:

Oregon Administrative Rules 860-023, 024 and 028

Calendar Year 2020 Review

(January 1 – December 31, 2020)

RELIABILITY

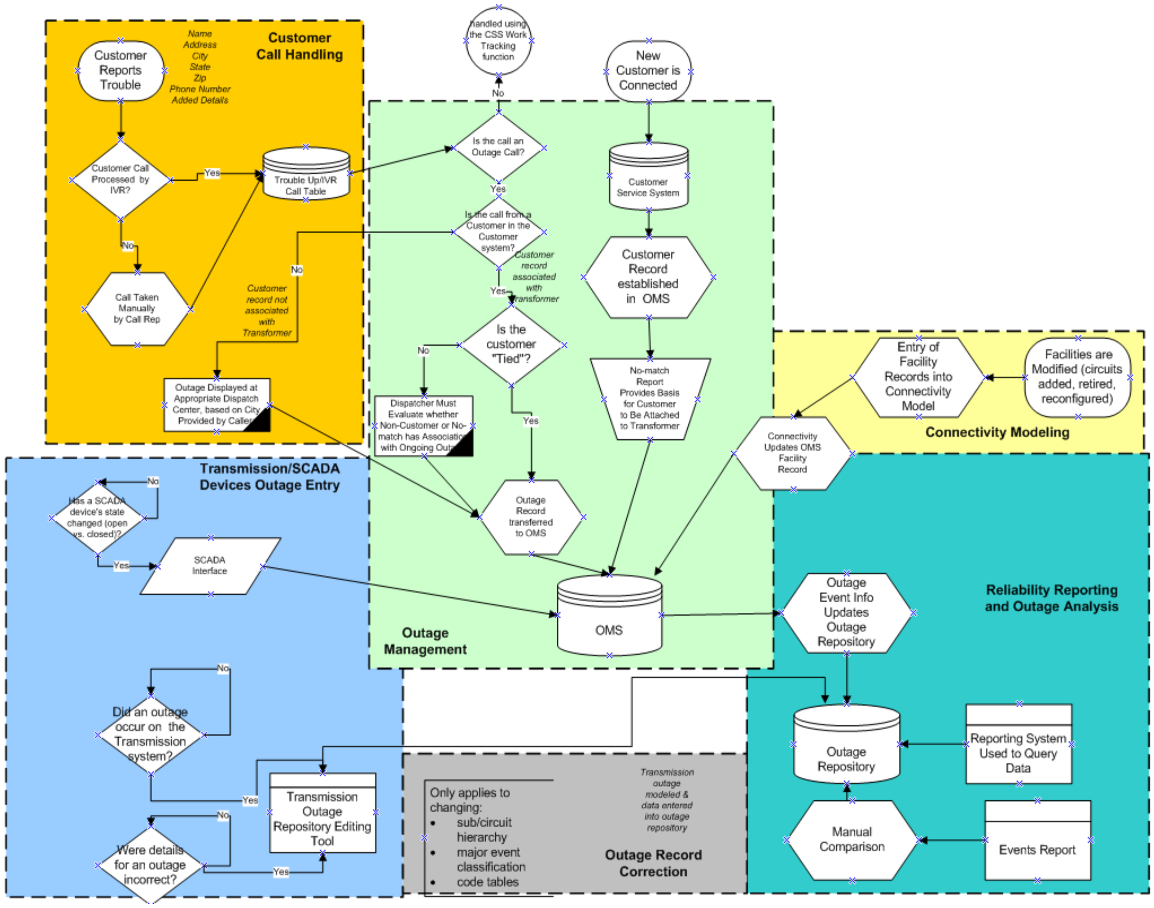
Introduction and Reliability Discussion

This year's reliability report includes a brief overview of Pacific Power's programs and initiatives to evaluate and enhance reliability. This report is consistent with Oregon Administration Rules 860-023, 024 and 028.

Monitoring, Recording, and Reporting Reliability

How Pacific Power Monitors Reliability

Pacific Power operates automated outage management and reporting systems; a diagram of the data flow process is shown below. Customer trouble calls and SCADA events are interfaced with the Company's real-time network connectivity model, its CADOPS system (Computer Aided Distribution Operations System). By overlaying these events onto the network model, the program infers outages at the appropriate devices (such as a transformer, fuse or other interrupting device) for all customers down line of the interrupting device. The outage is then routed to appropriate field operations staff for restoration and the outage event is recorded in the Company's Prosper/US outage repository. In addition to this real-time model of the system's electrical flow, the Company relies heavily upon the SCADA system it has in place. This includes the Dispatch Log System (an SQL database application) which serves to collect all events on SCADA-operable circuits. That data is then analyzed for momentary interruptions to establish state-level and circuit-level momentary interruption indices, per agreement with the Oregon PUC Staff. The Company has completed its implementation of an advanced metering infrastructure (AMI) system, which adds one more way in which the Company becomes aware of outages; this has resulted in methods used to weed out false positives, which continue to evolve, however, the Company hasn't identified substantial impacts with regard to "metric uplift" (that could result in an inability to compare legacy metric levels against future performance levels) but recognizes that such might be recognized in the future. The Company is also reviewing whether AMI data can replace momentary interruption reporting data, however its development of these analytics is still underway. In addition, the company is midway through a transmission outage reporting system, which will also target modifications in momentary outage reporting, which may require the company to restate history of these outage metrics. This implementation is scheduled for late fall 2021 and the outcome will be separately reported next year.



Reliability Reporting: Interpreting Indices and Metrics

Raw reliability data comes in the form of outage start and stop times, numbers of customers interrupted and outage cause codes. Out of these are derived an array of indices and acronyms that attempt to reduce complex data to a handful of numbers. This section briefly describes the metrics used by Pacific Power for reliability measurements.

SAIDI, SAIFI, CAIDI and $MAIFI_e$ are the most common indicators or indices used by utilities across the nation for measuring and reporting reliability. Along with other indices, they were first rigorously documented in Institute of Electrical and Electronics Engineers (IEEE) Standard 1366-1998, and since modified in IEEE 1366-2003/2012, IEEE Guide for Electric Power Distribution Reliability Indices. This standard for reporting reliability performance was adopted in OAR 860-023 and reports provided thereafter have adhered to this standard.

For performance reporting as contained within this document[1], Pacific Power uses the current standard indices, applied at the state level as well as to its defined reliability reporting regions. In years preceding 2012 the major events excluded from performance during the period were determined using the historic "10% of operating area customers" method, not the IEEE 1366 "2.5 beta" TMed method applied to these reliability reporting regions. Therefore, year-on-year comparisons need to be made carefully.

Regional reliability reporting areas were established by using statistical tools to determine the granular level at which performance complied with assumptions underlying the development of the major event thresholds adopted within the standard. For the Customer Guarantee element of the Performance Standards Program, exceptions to the guarantees may also be determined based on data at a state level.

[1] State administrative rules regarding service reliability were modified during 2011, which has resulted in significant modifications to this section of the report.

In order to devise circuit-level performance measures, Pacific Power performed research into which metrics are appropriate for ranking reliability investments in order to better serve the needs of customers. The need to reliably serve the areas with the greatest numbers of customers must be balanced against the need to maintain focus on service levels where there are fewer customers. To do this, Pacific Power implemented in 1999 a balanced set of circuit performance indices (known as CPI[99]) and methods that improve on those documented in IEEE 1366. Circuit performance is reviewed at least annually against these various metrics to determine the selection of circuits to be addressed within the Company's Worst-Performing Feeders Program; as time has elapsed and tools have evolved the Company has focused its analysis at a lower level than circuit, i.e. sub-circuit selection may have been chosen as the optimal improvement activity. Mining of this data allows the company to optimize cost against reliability metric improvements.

Reliability Tools: Improving Indices and Metrics

Pacific Power uses the reliability data in a variety of ways that are designed to improve reliability to its customers. It has devised methods that are contained in the recently-adopted industry guide for electric reliability, IEEE 1782-2014[2]. Some of these analytical methods render the outage data in a tabular, graphical and geospatial manner. All of them serve as input to developing projects that improve reliability, including the Company's fuse coordination program, Fuse It or Lose It (FIOLI), its circuit hardening program, Saving SAIDI, and its capital construction program, Network Initiatives. These programs are evaluated for their forecast improvements to network reliability, as measured by the avoidance of customer interruptions, customer minutes interrupted and momentary customer interruptions. Each project is assigned a value for reduced interruptions along with the cost for that project, and based upon the best cost projects, selected to align with budget and resource capacity targets. Other tools the Company has created to deliver better reliability to customers include web-based notifications when interrupting devices (such as circuit breakers, reclosers or fuses) have experienced more operations within a given time period than expected. This enables field engineering and operations management team members to promptly evaluate means to modify performance in that area of the system. These ad-hoc activities augment the Company's reliability planning process (which is conducted annually with interim updates); review of historic reliability performance demonstrates the process' efficacy. Annually the Company identifies five circuits that are designated as "underperforming circuits" against which the Company reports blended reliability metrics (SAIDI, SAIFI, MAIFI and breaker lockouts) to highlight performance changes for that family of circuits over the next five years; these circuits are reported later in this section.

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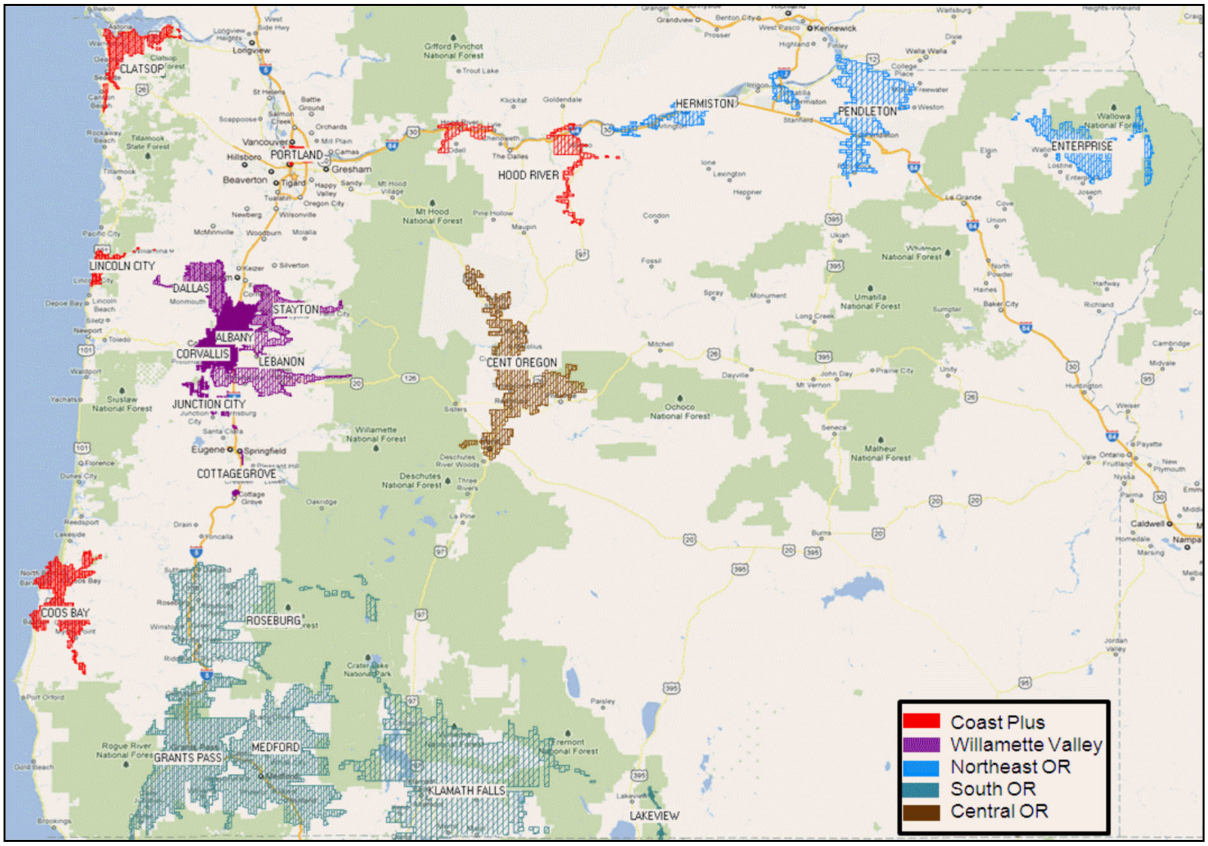
[2] IEEE-1782 (PE/T&D) Guide for Collecting, Categorizing and Utilization of Information Related to Electric Power Distribution Interruption Events was approved on March 27, 2014 and contains many of the approaches used by Pacific Power to evaluate system reliability and determine areas where improvements should be deployed.

Reliability Reporting Regions Map

The graphic below shows the grouping of operating areas into five reliability reporting regions.



Major Event Thresholds

Effective CY2012, the administrative rules were modified to replace the 10% of operating area customers methodology with IEEE P1366 "2.5 beta" or t_{med} methodology for determining major events. For Pacific Power's service territory in Oregon, all operating areas were grouped into five reliability reporting regions and each reliability region's threshold determined according to IEEE 1366-2003/2012. The tables below depict the composition of each region and its threshold as used during 2020 and for application during 2021. Since certain major events may be filed as a statewide event, the state threshold and history is also supplied.

2020 Major Event Threshold			
Reliability Region	**t_{med} SAIDI**	**t_{med} CMI**	**Operating Areas within Region**
Central OR	5.71	482,924	Bend/Redmond, Madras
Coast Plus	12.50	1,965,286	Clatsop/Astoria, Coos Bay/Coquille, Hood River, Lincoln City, Portland
Northeast OR	11.94	305,107	Enterprise, Hermiston, Milton-Freewater, Pendleton, Walla Walla
South OR	14.83	3,354,813	Grants Pass, Klamath Falls, Lakeview, Medford, Roseburg/Myrtle Creek
Willamette Valley	17.42	2,156,406	Albany, Corvallis, Cottage Grove/J. City, Dallas/Independence, Lebanon, Stayton
Oregon	**7.26**	**4,480,143**	

2021 Major Event Threshold			
Reliability Region	**t_{med} SAIDI**	**t_{med} CMI**	**Operating Areas within Region**
Central OR	5.80	507,120	Bend/Redmond, Madras
Coast Plus	12.75	2,025,865	Clatsop/Astoria, Coos Bay/Coquille, Hood River, Lincoln City, Portland
Northeast OR	11.43	294,942	Enterprise, Hermiston, Milton-Freewater, Pendleton, Walla Walla
South OR	14.51	3,275,975	Grants Pass, Klamath Falls, Lakeview, Medford, Roseburg/Myrtle Creek
Willamette Valley	16.47	2,066,210	Albany, Corvallis, Cottage Grove/J. City, Dallas/Independence, Lebanon, Stayton
Oregon	**7.02**	**4,375,795**	

The following table is a 5-year view of each region's t_{med} values.

Calendar Year	**2021**		**2020**		**2019**		**2018**		**2017**	
Region	**CMI**	**SAIDI**	**CMI**	**SAIDI**	**CMI**	**SAIDI**	**CMI**	**SAIDI**	**CMI**	**SAIDI**
Central OR	482,924	5.80	482,924	5.71	484,821	5.72	469,072	5.71	429,381	5.40
Coast Plus	1,965,286	12.75	1,965,286	12.50	1,860,107	11.91	1,722,410	11.20	1,687,255	11.09
Northeast OR	305,107	11.43	305,107	11.94	334,025	13.22	321,673	12.90	302,667	12.27
South OR	3,354,813	14.51	3,354,813	14.83	2,975,868	13.10	2,914,386	12.98	2,740,682	12.35
Willamette Valley	2,156,406	16.47	2,156,406	17.42	2,336,645	18.81	2,411,644	19.74	2,439,916	20.28
Oregon	**482,924**	**5.80**	**4,480,143**	**7.26**	**4,379,315**	**7.09**	**4,501,730**	**7.41**	**4,698,658**	**7.85**

Major Events Excluded Report

Pacific Power filed written documentation for five Major Events in 2020 that were excluded from underlying reliability performance results. They are summarized in the table below.

Oregon 2020 Major Events - Written Filings									
Event Date	**Reliability Reporting Region – Description**	**CML**	**CI**	**PUC Report Required**	**Region t_{med} SAIDI**	**Region Event SAIDI**	**Oregon SAIDI**	**Oregon SAIFI**	**Oregon CAIDI**
January 11 & January 15-20, 2020	Oregon – Winter Storm	47,162,384	54,620	Yes	-	-	76.40	0.088	863
February 23, 2020	Central – Wind Storm	1,205,515	2,776	Yes	14.26	0.033	1.95	0.004	434
February 23, 2020	Northeast – Wind Storm	351,569	857	Yes	13.75	0.034	0.57	0.001	410
May 30 - June 2, 2020	Oregon – Wind Storm	14,352,370	29,295	Yes	-	-	23.25	0.047	490
September 7-19, 2020	Oregon – Wind and Wildfires [3]	75,809,416	259,527	Yes	-	-	122.80	0.420	292
TOTAL Oregon Major Events Filed		**138,881,254**	**347,075**				**224.97**	**0.562**	**400**

In addition, the company excluded six events where CAIDI was less than five hours (300 CAIDI minutes), for which no filing is required according to Oregon Administrative Rules.

Oregon 2020 Major Events - Low CAIDI (<300) No Filings									
Event Date	**Reliability Reporting Region –Description**	**CML**	**CI**	**PUC Report Required**	**Region TMed SAIDI**	**Region Event SAIDI**	**Oregon SAIDI**	**Oregon SAIFI**	**Oregon CAIDI**
May 5, 2020	Central - Wind Storm	624,394	2,794	No	7.38	0.03	1.01	0.00	223
June 15, 2020	Willamette Valley - Loss of Substation	3,261,774	16,569	No	26.34	0.13	5.28	0.03	197
October 19-20, 2020	Central - Car hit pole	1,047,517	3,761	No	12.39	0.04	1.70	0.01	279
November 10-12, 2020	Northeast - Loss of Transmission Line	288,994[4]	2,141	No	11.31	0.08	0.47	0.00	135
November 13-14, 2020	Oregon - Wind Storm	5,467,138	28,235	No	8.86	0.05	8.86	0.05	194
November 17, 2020	Northeast - Tree	599,604	2,098	No	23.46	0.08	0.97	0.00	286
TOTAL Major Events with low CAIDI		**11,289,422**	**55,598**				**18.29**	**0.09**	**203**

Total Performance Summary

Oregon 2020 Major Events - Summary	**CML**	**CI**	**PUC Report Required**	**Oregon SAIDI**	**Oregon SAIFI**	**Oregon CAIDI**
Total Oregon Major Events Filed	138,881,254	347,075	Yes	224.97	0.56	400
Total Major Events with low CAIDI (no filling required)	11,289,422	55,598	No	18.29	0.09	203
TOTAL MAJOR EVENTS	150,170,676	402,673	-	243.26	0.65	373
Oregon Underlying Events - Excludes Major Event	68,342,063	614,851	-	110.71	1.00	111
Oregon Total Performance - Includes Major Event	218,512,739	1,017,524	-	353.96	1.65	215

[3] The event resulted in a SAIDI equivalent to 4.9 beta, which designates the event as catastrophic, since it exceeded 4.15 beta, which was found in prior IEEE task force work to be the appropriate threshold for catastrophic designation.

[4] In addition to the 288,994 underlying CML for the day there was an additional 77,843 customer notified outages as a result of crews contacting customers of a short notice outage prior to de-energization.

Targeted Reliability

The company annually establishes a list of targeted reliability projects for which it calculates cost per forecast reliability improvements, expressed as mitigation costs factored by avoided customer minutes interrupted or $/cmi. These projects often involve fuse coordination, circuit hardening (including animal, vehicle and vegetation management efforts) and reconductoring. The current roster of projects intended to be constructed during 2021 are shown below.

District	Circuit ID#	Program Type	Year Initiated	Expected Completion	Project Notes
Albany	4M258	FIOLI	2019	2021	Zone one fusing. Project delayed to the end of 2020 to accommodate other work taking place on the feeder.
	4M262	FIOLI	2020	2021	Install recloser to shrink zone one.
	4M335	FIOLI	2020	2021	Review feeder protection, install new fusing to reduce exposure in zones one and two.
	4M182	DRIP	2021	2021	Verify and fuse zone one taps, install visibility strips to reduce vehicle related outages.
	4M15	DRIP	2021	2021	Fuse taps on zone one, evaluate and fuse zone two to reduce exposure, and replace all unprotected copper conductor in both zones. Install visibility strips to reduce vehicle related outages. Replace porcelain cutouts where needed.
	4M16	DRIP	2021	2021	Install animal guarding, replace porcelain cutouts, fuse zones one and two, install new recloser in zone one.
Astoria	5A83	Circuit Hardening	2020	2021	Identify and replace failing splices, review fuse coordination, install new fusing where needed.
	5A83	FIOLI	2021	2021	Identify and replace failing splices, install new fuses in zones one and two, fuse all taps in zone one.
	5A10	FIOLI	2021	2021	Replace porcelain cutouts in zones one and two, fuse all unfused taps, install recloser, install two sets of fault indicators.
	5A211	FIOLI	2021	2021	New recloser installation. Trim all danger trees and limbs in zone one and two.
Bend	5D69	FIOLI	2021	2021	Protect all zones with updated fuse coordination, animal guarding where needed, and replacement of porcelain cutouts.
	5D227	FIOLI	2021	2021	Recloser installation.
	5D263	FIOLI	2021	2021	Install recloser or fuse savers.
	5D184	FIOLI	2021	2021	Review fuse coordination, shrink zone one to the extent possible, remove any danger trees or limbs in zone one. Confirm installation of fault indicators outside of substation.
Coos Bay	L804	Hendrix	2020	2021	Replace unprotected conductor with covered conductor (Hendrix Cable).
	4C90	FIOLI	2021	2021	Recloser installation to reduce zone one exposure.
Dallas	4M22	FIOLI	2021	2021	Add two reclosers to break up zone two. Fuse all zone one taps. Install visibility strips where needed to reduce vehicle related outages.
Grants Pass	5R295	FIOLI	2021	2021	Fuse all zone one taps.
	5R104	FIOLI	2021	2021	Fuse all zone one taps.
	5R105	FIOLI	2021	2021	Fuse all zone one taps.

District	Circuit ID#	Program Type	Year Initiated	Expected Completion	Project Notes
	5R114	FIOLI	2021	2021	Install recloser, install gang switch to create tie point between 5R114 and 5R115, install animal guarding where needed.
Hermiston	5W602	FIOLI	2021	2021	Install recloser and three fuse savers. Replace old copper conductor where needed. Update fuse coordination.
	4K46	FIOLI	2021	2021	Install fuse savers and fault indicators.
Hood River	5K37	FIOLI	2020	2021	Install animal guarding where needed. Replace all porcelain cutouts.
	5K43	FIOLI	2021	2021	Replace 100T fuses with fuse saver. Trim danger trees and limbs where needed. Fuse all taps.
	4K1	FIOLI	2021	2021	Recloser installation. Replace all porcelain cutouts and install visibility strips to reduce vehicle related outages.
Junction City	4M400	FIOLI	2020	2021	Recloser installation and fuse coordination.
Klamath Falls	4L16	FIOLI	2021	2021	Fuse all zone one taps.
	5L14	FIOLI	2021	2021	Recloser replacement.
	4L16	FIOLI	2021	2021	Recloser replacement.
	5L55	FIOLI	2021	2021	Recloser replacement.
	4L3	FIOLI	2021	2021	Recloser replacement.
	5L105	FIOLI	2021	2021	Recloser replacement.
	5L116	FIOLI	2021	2021	Fuse all zone one taps. Replace three trip savers with fuse savers.
Lebanon	4M204	FIOLI	2020	2021	Circuit reinforcement.
	4M17	FIOLI	2020	2021	Install recloser, coordinate zones two and three.
Lincoln City	4A316	FIOLI	2021	2021	New fuse installations focusing on zones two and three. Replace all porcelain cutouts and install visibility strips to reduce vehicle related outages.
Madras	5D57	FIOLI	2020	2021	Install new fuses to reduce exposure, replace all porcelain cutouts.
	5D61	FIOLI	2020	2021	Install new fuses to reduce exposure, replace all porcelain cutouts.
	5D52	DRIP	2021	2021	Install new fuses to reduce exposure, replace all porcelain cutouts, reconductor line segments where needed.
	5D53	DRIP	2021	2021	Install new fuses to reduce exposure, replace all porcelain cutouts, reconductor line segments where needed.
Medford	5R287	DRIP	2021	2021	Install line spacers to reduce momentary outages.
	4R13	FIOLI	2021	2021	Install recloser and downstream fault indicators.
	5R75	FIOLI	2021	2021	Fuse all zone one taps.
	5R21	FIOLI	2021	2021	Fuse all zone one taps.
	5R2	FIOLI	2021	2021	Fuse all zone one taps.
	5R28	FIOLI	2021	2021	Fuse all zone one taps.
Portland	5P392	FIOLI	2020	2021	Install three sectionalizers, fuse all zone one taps without a tie point.
	5P395	FIOLI	2020	2021	Install two reclosers.

District	Circuit ID#	Program Type	Year Initiated	Expected Completion	Project Notes
	5P89	DRIP	2021	2021	Install animal guarding in zone one, fuse all zone one taps and portions of zone two. Replace all porcelain cutouts.
	5P209	DRIP	2021	2021	Fuse all zone one taps. Replace approximately 750 feet of #8 copper conductor.
	5P208	FIOLI	2021	2021	Fuse entire circuit. Fuse all zone one taps.
	5P205	FIOLI	2021	2021	Fuse entire circuit. Fuse all zone one taps.
	5P292	DRIP	2021	2021	Install reclosers. Replace relays at Cully Substation.
Roseburg	5U920	Hendrix	2020	2021	Replace unprotected conductor with covered conductor (Hendrix Cable).
	5U2	FIOLI	2021	2021	Fuse zone two taps in the town of Riddle. Move existing recloser if needed for better coordination.
	5U32	FIOLI	2021	2021	Fuse all zone one taps. Install visibility strips to reduce vehicle related outages.
	5U44	FIOLI	2021	2021	Fuse all zone one taps.
	5U11	FIOLI	2021	2021	Fuse all zone one taps.
	5U83	FIOLI	2021	2021	Remove existing fuse savers and install new recloser. Fuse all zone one taps.
	4U31	FIOLI	2021	2021	Fuse all zone one taps.
	4U38	FIOLI	2021	2021	Install recloser and fuse zone one taps.

Under-Performing Circuits

After the completion of the development of reliability improvement plans (as discussed above), the Company evaluates those circuits whose blended reliability scores rank low, using its Circuit Performance Indicator (CPI). This is the primary basis for the next year's Worst Performing Feeders element of its Targeted Reliability Program. CPI is an acronym for Circuit Performance Indicator, which uses 3-year weighted reliability metrics of the circuit to identify underperformance. The company targets a 20% average improvement in this metric to validate its effectiveness. The application of CPI99 proved to demonstrate more consistently how performance comparisons could be made. The variables and equation for calculating CPI are:

CPI = Index * ((SAIDI * WF * NF) + (SAIFI * WF * NF) + (MAIFI * WF * NF) + (Lockouts * WF * NF))

Index: 10.645
SAIDI: Weighting Factor 0.30, Normalizing Factor 0.029
SAIFI: Weighting Factor 0.30, Normalizing Factor 2.439
MAIFI: Weighting Factor 0.20, Normalizing Factor 0.70
Lockouts: Weighting Factor 0.20, Normalizing Factor 2.00

Therefore, 10.645 * ((3-year SAIDI * 0.30 * 0.029) + (3-year SAIFI * 0.30 * 2.439) + (3-year MAIFI * 0.20 * 0.70) + (3-year breaker lockouts * 0.20 * 2.00)) = CPI Score

The following distribution feeders were selected as under-performing based on CPI scores ending 12/31/2020 and identified as Program Year 22 (2021) circuits in the Network Initiatives program:

Program Year 22 (2021) UNDER-PERFORMING CIRCUITS				
CIRCUIT ID	**CIRCUIT NAME**	**KV**	**OPERATING AREA**	**CPI99**
4M15	Ferry	20.8	Albany	118
5R114	Fruitdale	12.5	Grants Pass	136
5R287	Hummingbird	12.5	Medford	163
4K1	Sherman 208	20.8	Hood River	73
4M16	Water Street	20.8	Albany	87
			TARGET SCORE	**92**

The status of prior years' under-performing circuits is shown in the following table. (Targets for Program Years 1-10 were met and filed previously.)

UNDER-PERFORMING CIRCUITS				
CIRCUIT ID	**CIRCUIT NAME**	**OPERATING AREA**	**BASELINE**	**Performance 12/31/20**
Circuit Performance Indicator (CPI99)				
Program Year 2021 (2020):				
4C37	Maple Street	Myrtle Point	43	117
4M17	Calapooia	Brownsville	158	132
4M243	Scravel Hill	Murder Creek	136	151
5P288	Cully #3-UG	Cully	74	60
5R245	Valley View	Ashland (Mtn. Ave., PUD)	78	69
		TARGET SCORE = **78**	98	106

UNDER-PERFORMING CIRCUITS				
CIRCUIT ID	**CIRCUIT NAME**	**OPERATING AREA**	**BASELINE**	**Performance 12/31/20**
Circuit Performance Indicator (CPI99)				
Program Year 2020 (2019):				
5L43	Dairy	Klamath Falls	101	103
5R133	Glendale	Grants Pass	163	206
4M201	Industrial	Dallas/Independence	1,413	24
5A16	Mill (Warrenton)	Clatsop (Astoria)	129	10
5R63	Wood River	Grants Pass	143	130
		TARGET SCORE = **312**	**390**	**95**
Program Year 19 (2018):				
L804	Bandon	Coos Bay/Coquille	138	78
4M238	Dallas	Dallas/Independence	161	95
4M94	Foster	Lebanon	199	152
4M125	Mint	Albany	151	91
4L50	Rocky Point Feeder (Running Y)	Klamath Falls	249	99
		TARGET SCORE = **143**	**180**	**103**
Program Year 18 (2017):				
4M25	Buena Vista	Dallas/Independence	163	66
4C106	Coos River	Coos Bay/Coquille	212	284
4M120	Mill City	Stayton	261	206
5A211	Olney	Clatsop/Astoria	183	90
5R55	Siskiyou	Medford	220	116
	TARGET MET	TARGET SCORE = **166**	**208**	**152**
Program Year 17 (2016):				
5A20	SOUTH (Warrenton)	Warrenton	124	74
4C67	INDUSTRIAL	Coos Bay/Coquille	82	30
5L57	CRATER LAKE	Klamath Falls	200	100
4A316	LAKE (DEVILS LAKE)	Lincoln City	172	93
5U52	BEALS CREEK FEEDEER	Roseburg/Myrtle Creek	188	162
	TARGET MET	TARGET SCORE = **123**	**153**	**92**
Program Year 16 (2015):				
4C108	EMPIRE	Coos Bay/Coquille	16	49
5A93	BRADWOOD	Clatsop (Astoria)	114	83
5K43	BELMONT	Hood River	118	37
5R232	MERLIN-HUGO	Grants Pass	41	63
5R65	DEER CREEK	Grants Pass	59	91
		TARGET SCORE = 56	**70**	**65**
Program Year 15 (2014):				
4M268	KINGS ROAD	Corvallis	115	39
4M269	29TH STREET	Corvallis	133	64
4U5	DOUGLAS	Roseburg/Myrtle Creek	34	25
4C50	BUNKERHILL	Coos Bay/Coquille	152	63
5R63	WOOD RIVER	Grants Pass	193	130
	TARGET MET	**TARGET SCORE = 100**	**125**	**64**
Program Year 14 (2013):				
4C42	TERRES HGHTS	Coos Bay/Coquille	158	66
5K70	EASTSIDE (Hood River)	Hood River	110	82
5R133	GLENDALE	Grants Pass	171	206
5R259	CHINOOK (Grants Pass)	Grants Pass	131	45
5R53	ROUGH & READY	Grants Pass	69	73
	TARGET MET	**TARGET SCORE = 102**	**128**	**95**

UNDER-PERFORMING CIRCUITS				
CIRCUIT ID	CIRCUIT NAME	OPERATING AREA	BASELINE	Performance 12/31/20
Circuit Performance Indicator (CPI99)				
Program Year 13 (2012):				
5D144	D.R.W.	Bend/Redmond	124	17
5D2	DESCHUTES S	Bend/Redmond	104	30
4U39	GOEDECK	Roseburg/Myrtle Creek	24	46
5U84	LITTLE RIVER	Roseburg/Myrtle Creek	70	38
5L59	WEST	Klamath Falls	45	21
	TARGET MET	**TARGET SCORE = 59**	**73**	**30**

Oregon Five-Year Reliability Reporting Region Metrics

Excluding Major Events	SAIDI					SAIFI					MAIFIe				
OR REGION	**2016**	**2017**	**2018**	**2019**	**2020**	**2016**	**2017**	**2018**	**2019**	**2020**	**2016**	**2017**	**2018**	**2019**	**2020**
Central OR	45	52	39	30	44	0.40	0.41	0.62	0.23	0.29	2.50	3.29	2.97	1.50	2.20
CoastPlus	98	111	86	114	105	1.01	1.55	1.01	1.11	1.19	3.51	3.59	3.70	1.56	0.77
Northeast OR	87	95	129	84	96	0.66	1.05	1.71	0.54	1.02	5.34	4.63	2.92	3.46	0.37
South OR	123	106	110	119	129	1.01	0.98	1.56	1.08	1.03	3.54	4.41	3.96	1.71	0.83
Willamette Valley	157	177	124	139	133	1.76	2.02	1.23	1.17	1.15	2.79	2.70	3.22	2.92	0.79
OREGON	**111**	**114**	**98**	**108**	**111**	**1.07**	**1.26**	**1.23**	**0.97**	**1.00**	**3.23**	**3.54**	**3.59**	**1.92**	**0.99**

Including Major Events	SAIDI					SAIFI					MAIFIe				
OR REGION	**2016**	**2017**	**2018**	**2019**	**2020**	**2016**	**2017**	**2018**	**2019**	**2020**	**2016**	**2017**	**2018**	**2019**	**2020**
Central OR	74	102	83	85	229	0.70	0.56	1.09	0.85	0.64	2.50	3.29	2.97	1.50	2.20
CoastPlus	336	213	158	189	388	1.97	2.31	1.28	1.50	1.97	3.51	3.59	3.70	1.56	0.77
Northeast OR	146	147	164	91	261	0.92	1.17	1.80	0.56	1.79	5.34	4.63	2.92	3.46	0.37
South OR	184	442	166	772	434	1.38	1.85	1.83	1.75	1.63	3.54	4.41	3.96	1.71	0.83
Willamette Valley	264	371	131	340	270	2.23	2.65	1.26	1.47	1.94	2.79	2.70	3.22	2.92	0.79
OREGON	**223**	**312**	**146**	**416**	**354**	**1.59**	**1.93**	**1.47**	**1.46**	**1.65**	**3.23**	**3.54**	**3.59**	**1.92**	**0.99**

Oregon Five-Year Customer Count by Reliability Region and Operating Area

Region	Op Area	CY2020	CY2019	CY2018	CY2017	CY2016
Central OR	BEND/REDMOND	67,328	67,495	65,186	62,949	61,061
Central OR	MADRAS	17,235	17,312	16,897	16,623	16,476
	Central OR	**84,563**	**84,807**	**82,083**	**79,572**	**77,537**
CoastPlus	CLATSOP (ASTORIA)	25,031	25,060	24,657	24,422	24,146
CoastPlus	COOS BAY/COQUILLE	26,390	26,606	26,409	26,194	26,104
CoastPlus	HOOD RIVER	9,546	9,668	9,409	9,235	9,113
CoastPlus	LINCOLN CITY	12,330	12,280	12,172	12,047	11,926
CoastPlus	PORTLAND	83,892	82,618	81,104	80,241	79,156
	CoastPlus	**157,189**	**156,232**	**153,751**	**152,139**	**150,445**
Northeast OR	ENTERPRISE	5,476	5,510	5,432	5,353	5,316
Northeast OR	HERMISTON	4,829	4,802	4,696	4,639	4,634
Northeast OR	MILTON/FREEWATER	-	-	-	-	-
Northeast OR	PENDLETON	12,943	13,044	12,915	12,795	12,762
Northeast OR	WALLA WALLA OR	2,312	1,902	1,892	1,876	1,723
	Northeast OR	**25,560**	**25,258**	**24,935**	**24,663**	**24,435**
South OR	GRANTS PASS	52,143	52,457	51,864	51,217	50,709
South OR	KLAMATH FALLS	37,763	38,097	37,704	37,472	37,251
South OR	LAKEVIEW	2,412	2,450	2,439	2,328	2,410
South OR	MEDFORD	91,033	91,202	89,904	88,569	87,494
South OR	ROSEBURG/MYRTLECREEK	42,857	42,952	42,616	42,286	42,116
	South OR	**226,208**	**227,158**	**224,527**	**221,872**	**219,980**
Willamette Valley	ALBANY	32,228	32,471	31,783	31,250	30,943
Willamette Valley	CORVALLIS	29,956	29,875	29,657	29,445	29,072
Willamette Valley	COTTAGE GROVE/J.CITY	11,322	11,331	11,221	11,092	10,983
Willamette Valley	DALLAS/INDEPENDENCE	15,581	15,547	15,189	14,918	14,717
Willamette Valley	LEBANON	20,901	21,068	20,738	20,297	20,090
Willamette Valley	STAYTON	13,825	13,915	13,578	13,329	13,254
	Willamette Valley	**123,813**	**124,207**	**122,166**	**120,331**	**119,059**
	Oregon	**617,333**	**617,662**	**607,462**	**598,577**	**591,456**

Oregon Five-Year Cause Analysis by State

OAR Cause	2016 - State												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	591,456	188	9,532,451	198,764	16.12	0.336	48	300	27,098,992	318,380	45.82	0.538	85
B Loss of Supply - Substation	591,456	25	4,951,283	31,572	8.37	0.053	157	31	5,818,197	40,875	9.84	0.069	142
C Distribution - Equipment	591,456	2,950	15,570,834	91,980	26.33	0.156	169	3,126	17,118,826	99,052	28.94	0.167	173
D Distribution - Lightning	591,456	52	117,295	599	0.20	0.001	196	61	1,232,633	6,190	2.08	0.010	199
E Distribution - Planned	591,456	1,786	14,623,191	126,701	24.72	0.214	115	1,871	19,640,742	151,251	33.21	0.256	130
F Distribution - Public	591,456	361	9,712,274	56,293	16.42	0.095	173	373	10,629,771	61,372	17.97	0.104	173
G Distribution - Vegetation	591,456	773	11,030,285	68,588	18.65	0.116	161	1,343	34,340,220	156,096	58.06	0.264	220
H Distribution - Weather	591,456	89	1,873,058	8,183	3.17	0.014	229	363	17,483,571	54,858	29.56	0.093	319
I Distribution - Wildlife	591,456	659	1,958,040	23,776	3.31	0.040	82	671	2,521,806	28,874	4.26	0.049	87
J Distribution - Unknown	591,456	811	4,000,660	42,746	6.76	0.072	94	855	4,470,856	45,044	7.56	0.076	99
K Distribution - Other	591,456	144	789,002	27,051	1.33	0.046	29	155	838,662	27,136	1.42	0.046	31
Grand Total	**591,456**	**7,838**	**74,158,374**	**676,253**	**125.38**	**1.143**	**110**	**9,149**	**141,194,275**	**989,128**	**238.72**	**1.672**	**143**

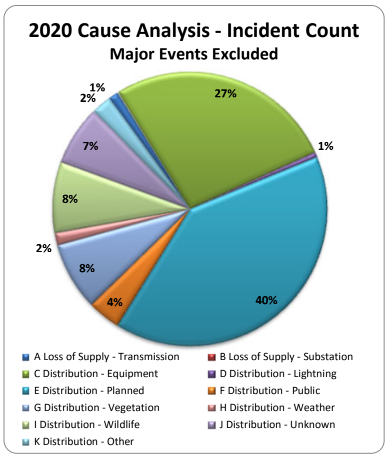
OAR Cause	2017 - State												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	598,577	270	13,534,770	317,164	22.61	0.530	43	407	39,608,911	499,581	66.17	0.835	79
B Loss of Supply - Substation	598,577	20	2,018,944	14,678	3.37	0.025	138	38	9,151,026	35,280	15.29	0.059	259
C Distribution - Equipment	598,577	3,432	14,030,069	88,692	23.44	0.148	158	3,685	23,094,567	112,390	38.58	0.188	205
D Distribution - Lightning	598,577	153	794,249	5,283	1.33	0.009	150	189	1,007,211	6,801	1.68	0.011	148
E Distribution - Planned	598,577	1,523	8,938,717	88,519	14.93	0.148	101	1,624	13,897,121	107,396	23.22	0.179	129
F Distribution - Public	598,577	326	10,866,265	58,584	18.15	0.098	185	334	10,888,994	58,723	18.19	0.098	185
G Distribution - Vegetation	598,577	938	12,870,920	92,260	21.50	0.154	140	1,572	49,019,419	170,446	81.89	0.285	288
H Distribution - Weather	598,577	192	2,601,716	18,421	4.35	0.031	141	930	34,360,669	80,695	57.40	0.135	426
I Distribution - Wildlife	598,577	763	1,479,958	20,593	2.47	0.034	72	772	1,488,024	20,676	2.49	0.035	72
J Distribution - Unknown	598,577	829	4,565,602	53,888	7.63	0.090	85	910	7,512,657	64,814	12.55	0.108	116
K Distribution - Other	598,577	151	2,016,839	36,069	3.37	0.060	56	193	2,496,082	38,568	4.17	0.064	65
Grand Total	**598,577**	**8,597**	**73,718,049**	**794,151**	**123.16**	**1.327**	**93**	**10,654**	**192,524,681**	**1,195,370**	**321.64**	**1.997**	**161**

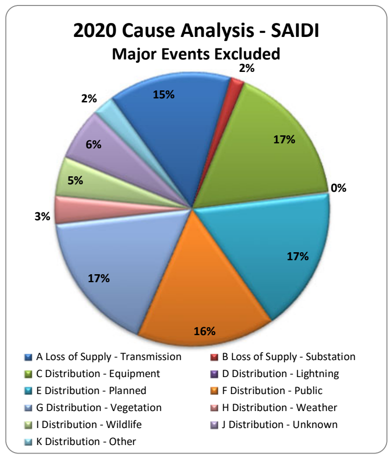
OAR Cause	2018 - State												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	607,462	333	10,306,569	361,135	16.97	0.594	29	371	16,784,063	418,325	27.63	0.689	40
B Loss of Supply - Substation	607,462	7	792,353	5,882	1.30	0.010	135	17	4,585,938	20,219	7.55	0.033	227
C Distribution - Equipment	607,462	3,080	12,297,291	89,870	20.24	0.148	137	3,166	14,920,795	99,102	24.56	0.163	151
D Distribution - Lightning	607,462	224	1,726,130	9,770	2.84	0.016	177	225	1,726,284	9,771	2.84	0.016	177
E Distribution - Planned	607,462	2,251	16,142,761	114,130	26.57	0.188	141	2,283	16,557,364	117,101	27.26	0.193	141
F Distribution - Public	607,462	387	9,656,979	47,865	15.90	0.079	202	392	9,665,121	47,904	15.91	0.079	202
G Distribution - Vegetation	607,462	948	9,892,562	64,757	16.29	0.107	153	1,129	18,586,721	96,952	30.60	0.160	192
H Distribution - Weather	607,462	214	2,885,703	16,162	4.75	0.027	179	320	8,418,248	37,075	13.86	0.061	227
I Distribution - Wildlife	607,462	763	1,712,107	17,426	2.82	0.029	98	775	3,043,203	27,427	5.01	0.045	111
J Distribution - Unknown	607,462	907	4,790,709	57,412	7.89	0.095	83	925	5,030,038	58,082	8.28	0.096	87
K Distribution - Other	607,462	225	1,928,504	18,822	3.17	0.031	102	231	1,930,598	18,826	3.18	0.031	103
Grand Total	**607,462**	**9,339**	**72,131,669**	**803,231**	**118.74**	**1.322**	**90**	**9,834**	**101,248,374**	**950,784**	**166.67**	**1.565**	**106**

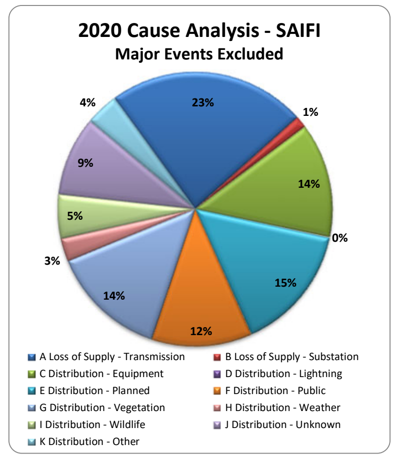
OAR Cause	2019 - State												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	617,662	155	7,680,620	149,652	12.43	0.242	51	282	68,975,629	293,620	111.67	0.475	235
B Loss of Supply - Substation	617,662	19	2,500,151	28,222	4.05	0.046	89	29	9,068,740	45,069	14.68	0.073	201
C Distribution - Equipment	617,662	3,122	15,729,005	105,719	25.47	0.171	149	3,358	19,665,070	110,712	31.84	0.179	178
D Distribution - Lightning	617,662	202	1,155,702	5,689	1.87	0.009	203	232	2,130,831	9,258	3.45	0.015	230
E Distribution - Planned	617,662	3,192	13,298,653	106,917	21.53	0.173	124	3,299	15,216,761	121,375	24.64	0.197	125
F Distribution - Public	617,662	353	7,951,803	59,839	12.87	0.097	133	366	8,389,819	62,584	13.58	0.101	134
G Distribution - Vegetation	617,662	914	16,377,247	94,003	26.51	0.152	174	1,472	49,538,031	129,618	80.20	0.210	382
H Distribution - Weather	617,662	216	3,375,682	17,743	5.47	0.029	190	724	81,353,803	84,459	131.71	0.137	963
I Distribution - Wildlife	617,662	802	2,514,079	22,863	4.07	0.037	110	808	2,524,756	22,982	4.09	0.037	110
J Distribution - Unknown	617,662	796	6,207,698	62,453	10.05	0.101	99	842	8,157,134	74,258	13.21	0.120	110
K Distribution - Other	617,662	231	973,621	14,908	1.58	0.024	65	284	2,795,825	19,774	4.53	0.032	141
Grand Total	**617,662**	**10,002**	**77,764,262**	**668,008**	**125.90**	**1.082**	**116**	**11,696**	**267,816,401**	**973,709**	**433.60**	**1.576**	**275**

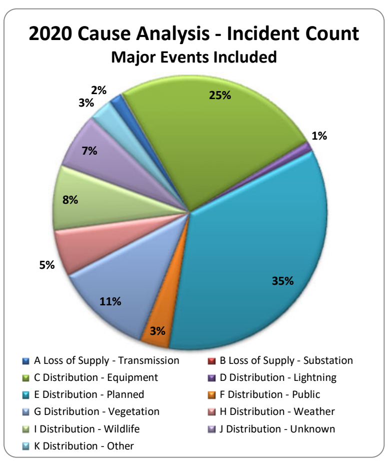
Oregon Five-Year Cause Analysis by State

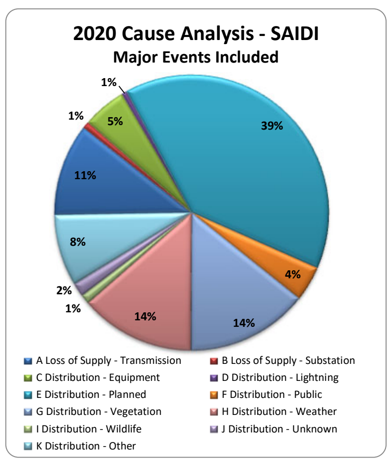
OAR Cause	2020 - State												
	Oregon Customer count	Major Event Excluded						Major Event Included					
		Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	617,333	129	11,351,096	157,078	18.39	0.254	72	217	38,070,885	287,784	61.67	0.466	132
B Loss of Supply - Substation	617,333	15	1,296,634	9,177	2.10	0.015	141	19	2,788,875	13,373	4.52	0.022	209
C Distribution - Equipment	617,333	3,086	12,984,979	90,670	21.03	0.147	143	3,421	18,019,512	109,423	29.19	0.177	165
D Distribution - Lightning	617,333	65	131,200	1,206	0.21	0.002	109	164	2,088,273	6,013	3.38	0.010	347
E Distribution - Planned	617,333	4,586	13,209,282	100,049	21.40	0.162	132	4,853	138,107,823	138,859	223.72	0.225	995
F Distribution - Public	617,333	442	12,711,604	79,546	20.59	0.129	160	475	14,391,245	88,684	23.31	0.144	162
G Distribution - Vegetation	617,333	920	12,991,558	92,038	21.04	0.149	141	1,595	50,451,924	154,242	81.73	0.250	327
H Distribution - Weather	617,333	167	2,590,978	18,273	4.20	0.030	142	764	47,500,323	151,750	76.94	0.246	313
I Distribution - Wildlife	617,333	956	3,614,105	34,932	5.85	0.057	103	1,069	3,820,365	36,536	6.19	0.059	105
J Distribution - Unknown	617,333	809	4,858,982	63,074	7.87	0.102	77	909	5,554,994	67,607	9.00	0.110	82
K Distribution - Other	617,333	269	1,977,895	26,063	3.20	0.042	76	392	29,380,754	43,294	47.59	0.070	679
Grand Total	**617,333**	**11,444**	**77,718,312**	**672,106**	**125.89**	**1.089**	**116**	**13,878**	**350,174,974**	**1,097,565**	**567.24**	**1.778**	**319**

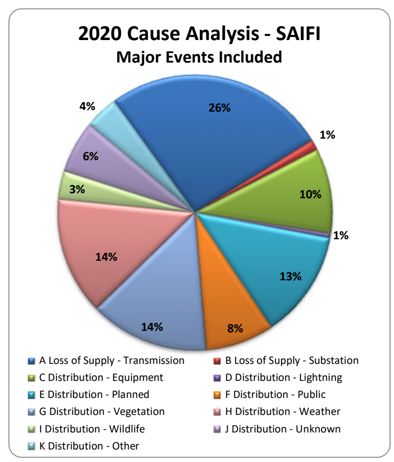












Central Oregon Reporting Region Five-Year Cause Analysis

OAR Cause	2016 - Central Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	77,537	3	43,074	2,068	0.56	0.027	21	16	887,385	18,601	11.44	0.240	48
B Loss of Supply - Substation	77,537	-	-	-	-	-	-	-	-	-	-	-	-
C Distribution - Equipment	77,537	301	2,044,649	10,112	26.37	0.130	202	306	2,046,437	10,119	26.39	0.131	202
D Distribution - Lightning	77,537	9	12,906	153	0.17	0.002	84	15	946,755	4,431	12.21	0.057	214
E Distribution - Planned	77,537	68	282,755	5,133	3.65	0.066	55	70	283,220	5,136	3.65	0.066	55
F Distribution - Public	77,537	39	389,605	2,301	5.02	0.030	169	39	389,605	2,301	5.02	0.030	169
G Distribution - Vegetation	77,537	23	417,075	3,388	5.38	0.044	123	23	417,075	3,388	5.38	0.044	123
H Distribution - Weather	77,537	5	18,606	129	0.24	0.002	144	6	41,613	195	0.54	0.003	213
I Distribution - Wildlife	77,537	58	117,294	2,044	1.51	0.026	57	62	533,386	4,697	6.88	0.061	114
J Distribution - Unknown	77,537	50	134,396	5,098	1.73	0.066	26	54	138,156	5,143	1.78	0.066	27
K Distribution - Other	77,537	5	78,284	615	1.01	0.008	127	5	78,284	615	1.01	0.008	127
Grand Total	**77,537**	**561**	**3,538,644**	**31,041**	**45.64**	**0.400**	**114**	**596**	**5,761,916**	**54,626**	**74.31**	**0.705**	**105**

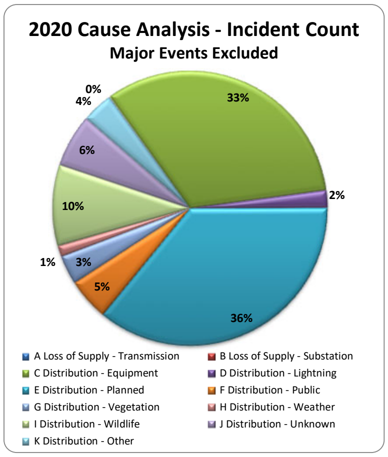
OAR Cause	2017 - Central Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	79,572	-	-	-	-	-	-	-	-	-	-	-	-
B Loss of Supply - Substation	79,572	1	125,527	1,016	1.58	0.013	124	1	125,527	1,016	1.58	0.013	124
C Distribution - Equipment	79,572	427	1,408,156	7,813	17.70	0.098	180	448	2,108,359	9,520	26.50	0.120	221
D Distribution - Lightning	79,572	13	13,312	100	0.17	0.001	133	13	13,312	100	0.17	0.001	133
E Distribution - Planned	79,572	65	222,975	1,624	2.80	0.020	137	67	256,497	1,769	3.22	0.022	145
F Distribution - Public	79,572	34	668,599	6,395	8.40	0.080	105	35	673,088	6,430	8.46	0.081	105
G Distribution - Vegetation	79,572	36	1,003,829	8,982	12.62	0.113	112	62	2,767,317	14,249	34.78	0.179	194
H Distribution - Weather	79,572	15	208,297	737	2.62	0.009	283	41	1,565,052	5,036	19.67	0.063	311
I Distribution - Wildlife	79,572	102	164,530	1,556	2.07	0.020	106	104	164,910	1,561	2.07	0.020	106
J Distribution - Unknown	79,572	66	458,041	4,127	5.76	0.052	111	73	477,442	4,152	6.00	0.052	115
K Distribution - Other	79,572	16	58,290	1,351	0.73	0.017	43	20	195,231	2,193	2.45	0.028	89
Grand Total	**79,572**	**775**	**4,331,555**	**33,701**	**54.44**	**0.424**	**129**	**864**	**8,346,734**	**46,026**	**104.90**	**0.578**	**181**

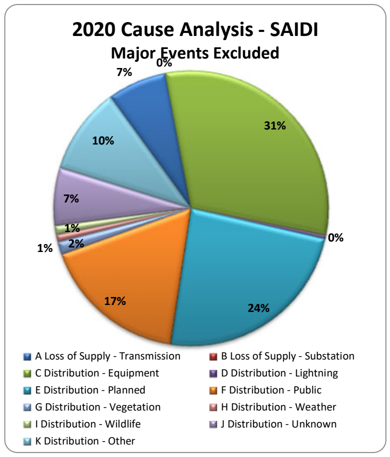
OAR Cause	2018 - Central Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	82,083	20	443,138	28,274	5.40	0.344	16	35	2,541,998	55,179	30.97	0.672	46
B Loss of Supply - Substation	82,083	-	-	-	-	-	-	-	-	-	-	-	-
C Distribution - Equipment	82,083	318	1,565,745	8,326	19.08	0.101	188	321	1,664,421	9,458	20.28	0.115	176
D Distribution - Lightning	82,083	22	37,474	174	0.46	0.002	215	23	37,628	175	0.46	0.002	215
E Distribution - Planned	82,083	96	301,427	4,505	3.67	0.055	67	97	302,522	4,535	3.69	0.055	67
F Distribution - Public	82,083	33	241,290	4,115	2.94	0.050	59	34	242,131	4,119	2.95	0.050	59
G Distribution - Vegetation	82,083	42	70,004	624	0.85	0.008	112	45	70,597	628	0.86	0.008	112
H Distribution - Weather	82,083	11	249,596	1,565	3.04	0.019	159	15	294,304	1,884	3.59	0.023	156
I Distribution - Wildlife	82,083	87	166,096	1,350	2.02	0.016	123	97	1,496,586	11,334	18.23	0.138	132
J Distribution - Unknown	82,083	80	284,981	3,493	3.47	0.043	82	82	286,355	3,507	3.49	0.043	82
K Distribution - Other	82,083	14	39,291	79	0.48	0.001	497	16	39,291	79	0.48	0.001	497
Grand Total	**82,083**	**723**	**3,399,041**	**52,505**	**41.41**	**0.640**	**65**	**765**	**6,975,832**	**90,898**	**84.99**	**1.107**	**77**

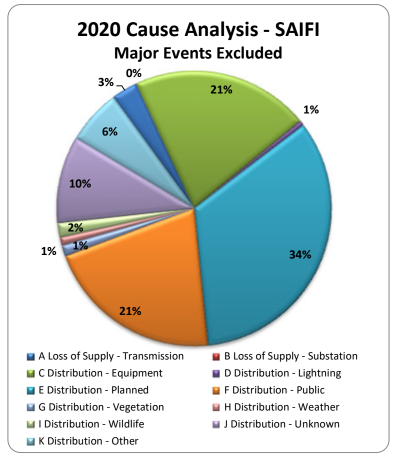
OAR Cause	2019 - Central Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	84,807	1	237	1	0.00	0.000	237	34	2,897,811	43,515	34.17	0.513	67
B Loss of Supply - Substation	84,807	-	-	-	-	-	-	-	-	-	-	-	-
C Distribution - Equipment	84,807	376	1,534,952	9,519	18.10	0.112	161	413	1,657,971	10,186	19.55	0.120	163
D Distribution - Lightning	84,807	27	253,286	1,227	2.99	0.014	206	57	1,228,415	4,796	14.48	0.057	256
E Distribution - Planned	84,807	119	1,161,191	7,670	13.69	0.090	151	124	1,164,810	7,725	13.73	0.091	151
F Distribution - Public	84,807	33	250,579	2,475	2.95	0.029	101	35	253,953	2,490	2.99	0.029	102
G Distribution - Vegetation	84,807	23	76,126	431	0.90	0.005	177	42	310,416	2,475	3.66	0.029	125
H Distribution - Weather	84,807	8	37,400	141	0.44	0.002	265	15	201,614	1,556	2.38	0.018	130
I Distribution - Wildlife	84,807	59	265,218	1,830	3.13	0.022	145	60	266,186	1,841	3.14	0.022	145
J Distribution - Unknown	84,807	47	60,139	491	0.71	0.006	122	55	302,294	2,468	3.56	0.029	122
K Distribution - Other	84,807	18	43,803	2,411	0.52	0.028	18	18	43,803	2,411	0.52	0.028	18
Grand Total	**84,807**	**711**	**3,682,930**	**26,196**	**43.43**	**0.309**	**141**	**853**	**8,327,273**	**79,463**	**98.19**	**0.937**	**105**

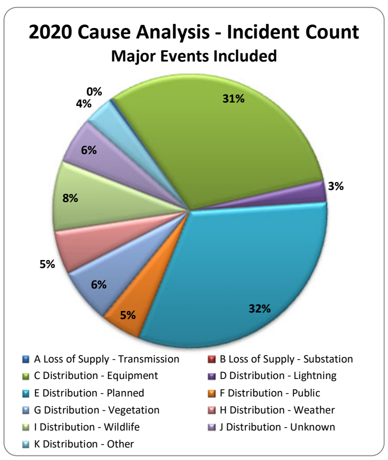
Central Oregon Reporting Region Five-Year Cause Analysis

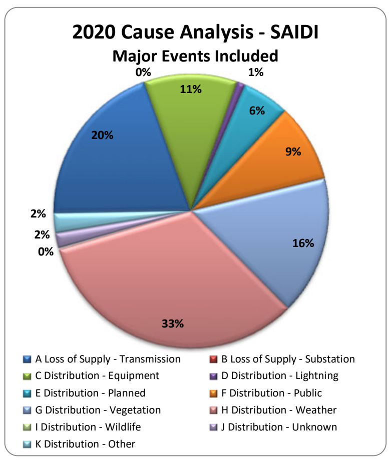
OAR Cause	2020 - Central Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	84,563	1	317,579	982	3.76	0.012	323	4	3,988,828	6,197	47.17	0.073	644
B Loss of Supply - Substation	84,563	-	-	-	-	-	-	-	-	-	-	-	-
C Distribution - Equipment	84,563	306	1,412,552	6,739	16.70	0.080	210	343	2,232,911	10,195	26.41	0.121	219
D Distribution - Lightning	84,563	19	18,933	175	0.22	0.002	108	28	192,756	334	2.28	0.004	577
E Distribution - Planned	84,563	336	1,080,090	10,813	12.77	0.128	100	356	1,120,178	12,012	13.25	0.142	93
F Distribution - Public	84,563	46	778,277	6,716	9.20	0.079	116	53	1,856,853	10,573	21.96	0.125	176
G Distribution - Vegetation	84,563	32	67,848	414	0.80	0.005	164	72	3,313,299	7,677	39.18	0.091	432
H Distribution - Weather	84,563	12	39,065	315	0.46	0.004	124	57	6,654,735	7,895	78.70	0.093	843
I Distribution - Wildlife	84,563	89	48,332	537	0.57	0.006	90	92	49,029	544	0.58	0.006	90
J Distribution - Unknown	84,563	58	308,623	3,283	3.65	0.039	94	61	349,438	3,585	4.13	0.042	97
K Distribution - Other	84,563	34	463,740	2,066	5.48	0.024	224	39	464,812	2,078	5.50	0.025	224
Grand Total	**84,563**	**933**	**4,535,040**	**32,040**	**53.63**	**0.379**	**142**	**1,105**	**20,222,841**	**61,090**	**239.15**	**0.722**	**331**

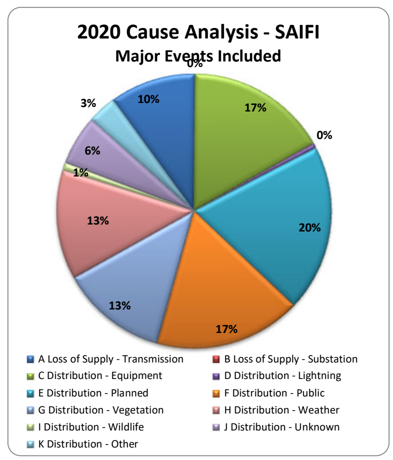












CoastPlus Reporting Region Five-Year Cause Analysis

OAR Cause	2016 - CoastPlus Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	150,445	48	2,376,182	53,129	15.79	0.353	45	79	12,070,434	100,863	80.23	0.670	120
B Loss of Supply - Substation	150,445	5	473,752	5,260	3.15	0.035	90	9	1,071,957	11,459	7.13	0.076	94
C Distribution - Equipment	150,445	761	3,433,274	21,381	22.82	0.142	161	825	3,691,644	22,723	24.54	0.151	162
D Distribution - Lightning	150,445	5	3,982	17	0.03	0.000	234	6	180,053	1,304	1.20	0.009	138
E Distribution - Planned	150,445	429	4,035,645	33,399	26.82	0.222	121	456	6,010,459	43,427	39.95	0.289	138
F Distribution - Public	150,445	83	3,264,792	19,707	21.70	0.131	166	87	3,669,394	20,884	24.39	0.139	176
G Distribution - Vegetation	150,445	229	3,216,527	25,241	21.38	0.168	127	504	13,176,044	62,657	87.58	0.416	210
H Distribution - Weather	150,445	25	51,481	338	0.34	0.002	152	170	13,814,744	41,140	91.83	0.273	336
I Distribution - Wildlife	150,445	91	402,771	6,153	2.68	0.041	65	92	403,246	6,154	2.68	0.041	66
J Distribution - Unknown	150,445	64	293,227	3,237	1.95	0.022	91	75	452,552	3,675	3.01	0.024	123
K Distribution - Other	150,445	36	113,987	4,671	0.76	0.031	24	37	114,163	4,672	0.76	0.031	24
Grand Total	**150,445**	**1,776**	**17,665,621**	**172,533**	**117.42**	**1.147**	**102**	**2,340**	**54,654,690**	**318,958**	**363.29**	**2.120**	**171**

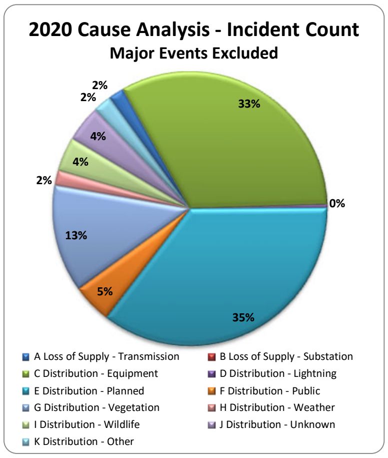
OAR Cause	2017 - CoastPlus Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	152,139	80	3,929,436	120,294	25.83	0.791	33	122	7,442,212	179,962	48.92	1.183	41
B Loss of Supply - Substation	152,139	5	481,420	5,274	3.16	0.035	91	11	1,006,510	11,607	6.62	0.076	87
C Distribution - Equipment	152,139	788	2,664,512	19,897	17.51	0.131	134	859	7,514,544	28,700	49.39	0.189	262
D Distribution - Lightning	152,139	4	25,564	208	0.17	0.001	123	5	25,621	209	0.17	0.001	123
E Distribution - Planned	152,139	369	2,867,590	26,495	18.85	0.174	108	401	3,414,446	32,729	22.44	0.215	104
F Distribution - Public	152,139	60	1,475,562	10,007	9.70	0.066	147	62	1,476,321	10,009	9.70	0.066	147
G Distribution - Vegetation	152,139	318	4,637,640	34,736	30.48	0.228	134	447	7,205,438	52,429	47.36	0.345	137
H Distribution - Weather	152,139	33	845,510	5,809	5.56	0.038	146	102	4,253,234	21,246	27.96	0.140	200
I Distribution - Wildlife	152,139	105	278,148	3,045	1.83	0.020	91	108	280,959	3,063	1.85	0.020	92
J Distribution - Unknown	152,139	108	732,694	7,620	4.82	0.050	96	117	852,899	9,312	5.61	0.061	92
K Distribution - Other	152,139	37	762,171	11,380	5.01	0.075	67	42	920,280	12,771	6.05	0.084	72
Grand Total	**152,139**	**1,907**	**18,700,247**	**244,765**	**122.92**	**1.609**	**76**	**2,276**	**34,392,466**	**362,037**	**226.06**	**2.380**	**95**

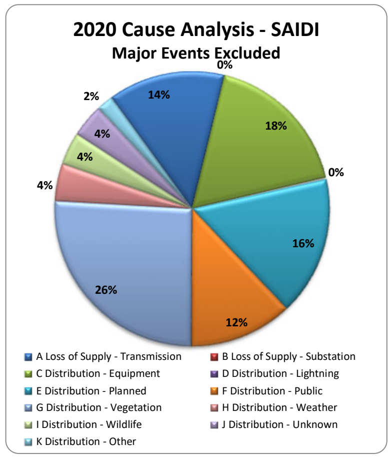
OAR Cause	2018 - CoastPlus Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	153,751	65	2,912,493	74,715	18.94	0.486	39	69	4,870,107	84,674	31.68	0.551	58
B Loss of Supply - Substation	153,751	-	-	-	-	-	-	1	194,654	1,071	1.27	0.007	182
C Distribution - Equipment	153,751	763	2,658,320	21,336	17.29	0.139	125	792	3,586,763	23,820	23.33	0.155	151
D Distribution - Lightning	153,751	14	27,593	110	0.18	0.001	251	14	27,593	110	0.18	0.001	251
E Distribution - Planned	153,751	481	7,634,839	34,849	49.66	0.227	219	488	7,730,580	35,614	50.28	0.232	217
F Distribution - Public	153,751	63	1,331,852	6,185	8.66	0.040	215	65	1,338,166	6,216	8.70	0.040	215
G Distribution - Vegetation	153,751	338	2,740,342	19,573	17.82	0.127	140	419	8,457,684	40,927	55.01	0.266	207
H Distribution - Weather	153,751	47	799,281	4,121	5.20	0.027	194	100	2,918,617	10,513	18.98	0.068	278
I Distribution - Wildlife	153,751	99	314,522	3,154	2.05	0.021	100	99	314,522	3,154	2.05	0.021	100
J Distribution - Unknown	153,751	87	717,843	7,421	4.67	0.048	97	91	868,699	7,587	5.65	0.049	114
K Distribution - Other	153,751	53	1,067,465	8,335	6.94	0.054	128	54	1,069,309	8,336	6.95	0.054	128
Grand Total	**153,751**	**2,010**	**20,204,551**	**179,799**	**131.41**	**1.169**	**112**	**2,192**	**31,376,693**	**222,022**	**204.07**	**1.444**	**141**

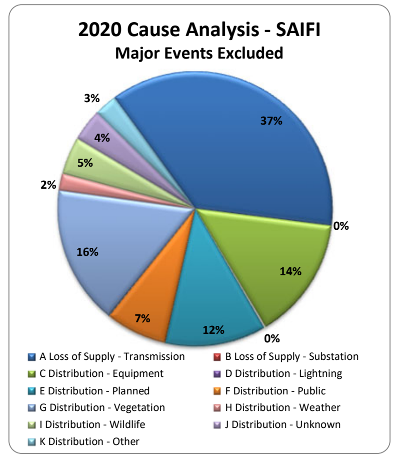
OAR Cause	2019 - CoastPlus Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	156,232	65	2,912,493	74,715	18.64	0.478	39	65	3,144,203	80,837	20.13	0.517	39
B Loss of Supply - Substation	156,232	-	-	-	-	-	-	12	4,817,144	21,842	30.83	0.140	221
C Distribution - Equipment	156,232	763	2,658,320	21,336	17.02	0.137	125	821	5,859,739	35,834	37.51	0.229	164
D Distribution - Lightning	156,232	14	27,593	110	0.18	0.001	251	14	78,416	345	0.50	0.002	227
E Distribution - Planned	156,232	481	7,634,839	34,849	48.87	0.223	219	653	6,571,881	43,778	42.06	0.280	150
F Distribution - Public	156,232	63	1,331,852	6,185	8.52	0.040	215	67	1,892,691	12,120	12.11	0.078	156
G Distribution - Vegetation	156,232	338	2,740,342	19,573	17.54	0.125	140	372	6,972,735	28,906	44.63	0.185	241
H Distribution - Weather	156,232	47	799,281	4,121	5.12	0.026	194	98	3,522,477	14,588	22.55	0.093	241
I Distribution - Wildlife	156,232	99	314,522	3,154	2.01	0.020	100	108	789,529	4,962	5.05	0.032	159
J Distribution - Unknown	156,232	87	717,843	7,421	4.59	0.047	97	95	1,424,702	16,717	9.12	0.107	85
K Distribution - Other	156,232	53	1,067,465	8,335	6.83	0.053	128	47	178,479	4,355	1.14	0.028	41
Grand Total	**156,232**	**2,010**	**20,204,551**	**179,799**	**129.32**	**1.151**	**112**	**2,352**	**35,251,996**	**264,284**	**225.64**	**1.692**	**133**

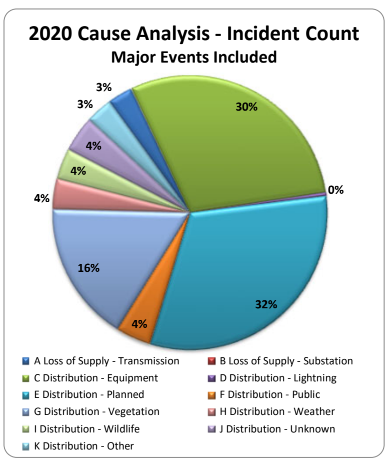
CoastPlus Reporting Region Five-Year Cause Analysis

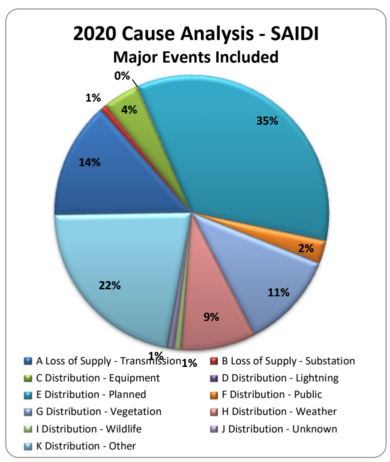
OAR Cause	2020 - CoastPlus Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	157,189	43	2,571,426	75,441	16.36	0.480	34	81	12,574,356	137,438	80.00	0.874	91
B Loss of Supply - Substation	157,189	-	-	-	-	-	-	2	738,370	991	4.70	0.006	745
C Distribution - Equipment	157,189	766	3,263,393	29,436	20.76	0.187	111	822	3,870,450	32,357	24.62	0.206	120
D Distribution - Lightning	157,189	8	36,634	459	0.23	0.003	80	11	53,086	465	0.34	0.003	114
E Distribution - Planned	157,189	833	3,050,080	24,282	19.40	0.154	126	877	31,847,588	34,434	202.61	0.219	925
F Distribution - Public	157,189	108	2,263,278	14,813	14.40	0.094	153	115	2,496,941	18,202	15.88	0.116	137
G Distribution - Vegetation	157,189	297	4,805,105	33,413	30.57	0.213	144	458	10,426,274	55,196	66.33	0.351	189
H Distribution - Weather	157,189	41	823,032	3,971	5.24	0.025	207	100	8,069,226	22,502	51.33	0.143	359
I Distribution - Wildlife	157,189	95	715,713	9,044	4.55	0.058	79	101	726,824	9,088	4.62	0.058	80
J Distribution - Unknown	157,189	100	728,075	7,734	4.63	0.049	94	117	781,370	8,099	4.97	0.052	96
K Distribution - Other	157,189	51	359,441	5,429	2.29	0.035	66	87	20,008,230	16,905	127.29	0.108	1,184
Grand Total	**157,189**	**2,342**	**18,616,177**	**204,022**	**118.43**	**1.298**	**91**	**2,771**	**91,592,715**	**335,677**	**582.69**	**2.135**	**273**

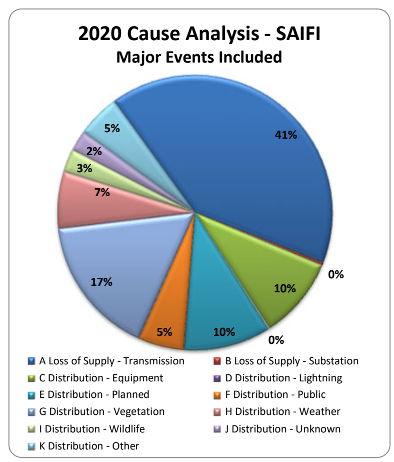












Northeast Oregon Reporting Region Five-Year Cause Analysis

OAR Cause	2016 - Northeast Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	24,435	1	44,433	836	1.82	0.034	53	1	44,433	836	1.82	0.034	53
B Loss of Supply - Substation	24,435	2	180,919	456	7.40	0.019	397	2	180,919	456	7.40	0.019	397
C Distribution - Equipment	24,435	189	421,196	2,477	17.24	0.101	170	210	1,153,953	6,267	47.23	0.256	184
D Distribution - Lightning	24,435	14	10,519	144	0.43	0.006	73	14	10,519	144	0.43	0.006	73
E Distribution - Planned	24,435	56	274,238	2,060	11.22	0.084	133	59	295,133	2,467	12.08	0.101	120
F Distribution - Public	24,435	20	282,738	2,012	11.57	0.082	141	22	288,625	2,051	11.81	0.084	141
G Distribution - Vegetation	24,435	27	460,481	3,769	18.85	0.154	122	46	1,054,643	5,834	43.16	0.239	181
H Distribution - Weather	24,435	8	80,739	1,416	3.30	0.058	57	15	200,934	1,826	8.22	0.075	110
I Distribution - Wildlife	24,435	77	300,131	2,358	12.28	0.097	127	77	300,131	2,358	12.28	0.097	127
J Distribution - Unknown	24,435	52	129,389	927	5.30	0.038	140	52	129,389	927	5.30	0.038	140
K Distribution - Other	24,435	2	256	2	0.01	0.000	128	2	256	2	0.01	0.000	128
Grand Total	**24,435**	**448**	**2,185,039**	**16,457**	**89.42**	**0.674**	**133**	**500**	**3,658,936**	**23,168**	**149.74**	**0.948**	**158**

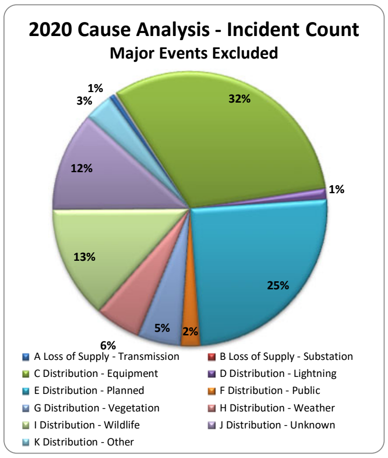
OAR Cause	2017 - Northeast Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	24,663	19	478,271	12,077	19.39	0.490	40	19	478,271	12,077	19.39	0.490	40
B Loss of Supply - Substation	24,663	3	71,844	270	2.91	0.011	266	3	71,844	270	2.91	0.011	266
C Distribution - Equipment	24,663	253	782,405	4,170	31.72	0.169	188	262	937,198	4,643	38.00	0.188	202
D Distribution - Lightning	24,663	14	36,510	206	1.48	0.008	177	14	36,510	206	1.48	0.008	177
E Distribution - Planned	24,663	30	154,392	2,304	6.26	0.093	67	35	238,689	2,636	9.68	0.107	91
F Distribution - Public	24,663	15	241,253	1,199	9.78	0.049	201	15	241,253	1,199	9.78	0.049	201
G Distribution - Vegetation	24,663	30	131,097	691	5.32	0.028	190	43	297,156	1,060	12.05	0.043	280
H Distribution - Weather	24,663	26	51,215	699	2.08	0.028	73	46	908,428	2,244	36.83	0.091	405
I Distribution - Wildlife	24,663	92	141,183	906	5.72	0.037	156	92	141,183	906	5.72	0.037	156
J Distribution - Unknown	24,663	70	195,566	2,712	7.93	0.110	72	76	211,799	2,828	8.59	0.115	75
K Distribution - Other	24,663	10	84,898	1,441	3.44	0.058	59	11	94,017	1,492	3.81	0.060	63
Grand Total	**24,663**	**562**	**2,368,633**	**26,675**	**96.04**	**1.082**	**89**	**616**	**3,656,348**	**29,561**	**148.25**	**1.199**	**124**

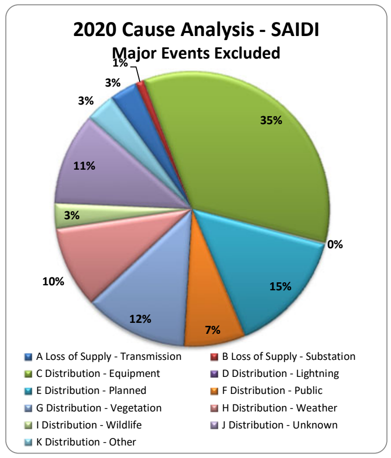
OAR Cause	2018 - Northeast Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	24,935	33	838,895	21,685	33.64	0.870	39	34	866,092	22,061	34.73	0.885	39
B Loss of Supply - Substation	24,935	2	68,637	1,396	2.75	0.056	49	2	68,637	1,396	2.75	0.056	49
C Distribution - Equipment	24,935	192	730,473	3,740	29.30	0.150	195	202	1,515,877	5,160	60.79	0.207	294
D Distribution - Lightning	24,935	25	27,466	120	1.10	0.005	229	25	27,466	120	1.10	0.005	229
E Distribution - Planned	24,935	35	700,713	9,566	28.10	0.384	73	35	700,713	9,566	28.10	0.384	73
F Distribution - Public	24,935	31	605,619	3,225	24.29	0.129	188	31	605,619	3,225	24.29	0.129	188
G Distribution - Vegetation	24,935	44	164,592	672	6.60	0.027	245	49	174,555	697	7.00	0.028	250
H Distribution - Weather	24,935	15	38,004	216	1.52	0.009	176	18	67,868	611	2.72	0.025	111
I Distribution - Wildlife	24,935	81	59,201	605	2.37	0.024	98	81	59,201	605	2.37	0.024	98
J Distribution - Unknown	24,935	102	179,359	1,497	7.19	0.060	120	106	194,684	1,649	7.81	0.066	118
K Distribution - Other	24,935	10	301,581	1,850	12.09	0.074	163	10	301,581	1,850	12.09	0.074	163
Grand Total	**24,935**	**570**	**3,714,540**	**44,572**	**148.97**	**1.788**	**83**	**593**	**4,582,293**	**46,940**	**183.77**	**1.882**	**98**

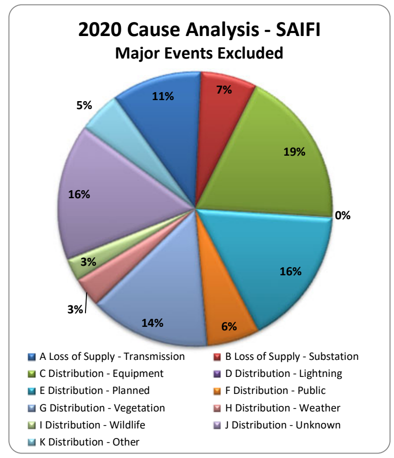
OAR Cause	2019 - Northeast Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	25,258	7	257,401	2,084	10.19	0.083	124	7	257,401	2,084	10.19	0.083	124
B Loss of Supply - Substation	25,258	-	-	-	-	-	-	-	-	-	-	-	-
C Distribution - Equipment	25,258	257	729,622	4,312	28.89	0.171	169	262	854,638	4,518	33.84	0.179	189
D Distribution - Lightning	25,258	32	68,549	486	2.71	0.019	141	32	68,549	486	2.71	0.019	141
E Distribution - Planned	25,258	54	493,300	2,900	19.53	0.115	170	54	493,300	2,900	19.53	0.115	170
F Distribution - Public	25,258	15	400,017	2,614	15.84	0.103	153	15	400,017	2,614	15.84	0.103	153
G Distribution - Vegetation	25,258	27	130,017	630	5.15	0.025	206	30	185,750	836	7.35	0.033	222
H Distribution - Weather	25,258	27	190,182	759	7.53	0.030	251	28	202,405	788	8.01	0.031	257
I Distribution - Wildlife	25,258	80	65,542	534	2.59	0.021	123	80	65,542	534	2.59	0.021	123
J Distribution - Unknown	25,258	64	169,271	1,902	6.70	0.075	89	64	169,271	1,902	6.70	0.075	89
K Distribution - Other	25,258	7	61,546	111	2.44	0.004	554	7	61,546	111	2.44	0.004	554
Grand Total	**25,258**	**570**	**2,565,447**	**16,332**	**101.57**	**0.647**	**157**	**579**	**2,758,419**	**16,773**	**109.21**	**0.664**	**164**

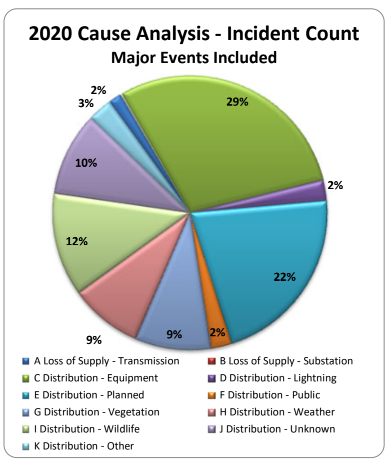
Northeast Oregon Reporting Region Five-Year Cause Analysis

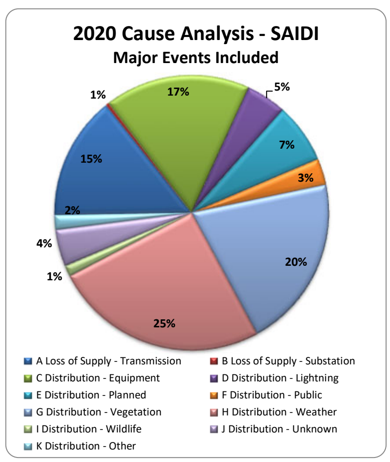
OAR Cause	2020 - Northeast Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	25,560	5	88,111	3,188	3.45	0.125	28	15	1,016,302	10,576	39.76	0.414	96
B Loss of Supply - Substation	25,560	2	26,713	1,991	1.05	0.078	13	2	26,713	1,991	1.05	0.078	13
C Distribution - Equipment	25,560	248	932,302	5,530	36.48	0.216	169	289	1,197,281	8,049	46.84	0.315	149
D Distribution - Lightning	25,560	10	5,052	29	0.20	0.001	174	24	329,959	245	12.91	0.010	1,347
E Distribution - Planned	25,560	194	390,991	4,869	15.30	0.190	80	211	493,057	6,605	19.29	0.258	75
F Distribution - Public	25,560	18	194,736	1,854	7.62	0.073	105	24	216,942	1,927	8.49	0.075	113
G Distribution - Vegetation	25,560	40	326,541	4,244	12.78	0.166	77	88	1,421,314	7,923	55.61	0.310	179
H Distribution - Weather	25,560	42	258,488	1,051	10.11	0.041	246	84	1,766,273	5,348	69.10	0.209	330
I Distribution - Wildlife	25,560	104	80,323	786	3.14	0.031	102	120	90,120	884	3.53	0.035	102
J Distribution - Unknown	25,560	92	291,791	4,784	11.42	0.187	61	97	300,872	4,826	11.77	0.189	62
K Distribution - Other	25,560	26	93,062	1,476	3.64	0.058	63	28	119,040	1,503	4.66	0.059	79
Grand Total	**25,560**	**781**	**2,688,110**	**29,802**	**105.17**	**1.166**	**90**	**982**	**6,977,873**	**49,877**	**273.00**	**1.951**	**140**

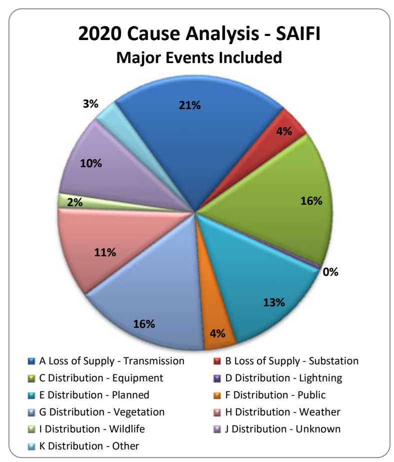












Southern Oregon Reporting Region Five-Year Cause Analysis

OAR Cause	2016 - Southern Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	219,980	79	2,027,969	54,260	9.22	0.247	37	132	6,134,948	97,728	27.89	0.444	63
B Loss of Supply - Substation	219,980	11	2,291,178	12,403	10.42	0.056	185	12	2,393,032	13,972	10.88	0.064	171
C Distribution - Equipment	219,980	1,116	5,567,714	31,833	25.31	0.145	175	1,172	6,009,647	33,185	27.32	0.151	181
D Distribution - Lightning	219,980	19	86,616	256	0.39	0.001	338	21	92,034	282	0.42	0.001	326
E Distribution - Planned	219,980	711	6,799,046	53,467	30.91	0.243	127	733	7,007,555	55,540	31.86	0.252	126
F Distribution - Public	219,980	132	4,089,546	25,805	18.59	0.117	158	136	4,342,381	27,458	19.74	0.125	158
G Distribution - Vegetation	219,980	269	4,982,206	23,201	22.65	0.105	215	383	11,946,398	46,176	54.31	0.210	259
H Distribution - Weather	219,980	32	1,576,356	5,601	7.17	0.025	281	102	2,801,521	9,695	12.74	0.044	289
I Distribution - Wildlife	219,980	262	752,471	7,808	3.42	0.035	96	269	899,669	10,252	4.09	0.047	88
J Distribution - Unknown	219,980	339	2,035,921	17,267	9.26	0.078	118	350	2,087,179	17,556	9.49	0.080	119
K Distribution - Other	219,980	62	424,286	8,306	1.93	0.038	51	66	460,152	8,366	2.09	0.038	55
Grand Total	**219,980**	**3,032**	**30,633,309**	**240,207**	**139.25**	**1.092**	**128**	**3,376**	**44,174,516**	**320,210**	**200.81**	**1.456**	**138**

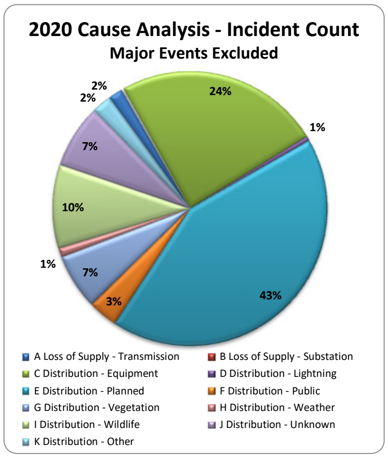
OAR Cause	2017 - Southern Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	221,872	99	4,331,267	77,423	19.52	0.349	56	178	21,941,278	174,711	98.89	0.787	126
B Loss of Supply - Substation	221,872	9	985,315	6,088	4.44	0.027	162	11	3,360,991	9,933	15.15	0.045	338
C Distribution - Equipment	221,872	1,316	5,395,996	33,503	24.32	0.151	161	1,422	6,127,922	37,208	27.62	0.168	165
D Distribution - Lightning	221,872	120	635,621	4,511	2.86	0.020	141	154	848,525	6,028	3.82	0.027	141
E Distribution - Planned	221,872	578	3,380,189	33,366	15.23	0.150	101	616	4,744,648	37,002	21.38	0.167	128
F Distribution - Public	221,872	107	3,778,559	21,011	17.03	0.095	180	109	3,787,721	21,033	17.07	0.095	180
G Distribution - Vegetation	221,872	295	4,194,492	27,662	18.91	0.125	152	654	31,589,480	74,290	142.38	0.335	425
H Distribution - Weather	221,872	89	935,334	8,043	4.22	0.036	116	620	24,673,689	42,471	111.21	0.191	581
I Distribution - Wildlife	221,872	311	363,256	5,496	1.64	0.025	66	312	363,366	5,497	1.64	0.025	66
J Distribution - Unknown	221,872	333	1,368,235	13,144	6.17	0.059	104	356	2,484,811	14,779	11.20	0.067	168
K Distribution - Other	221,872	47	547,085	7,052	2.47	0.032	78	50	547,350	7,055	2.47	0.032	78
Grand Total	**221,872**	**3,304**	**25,915,349**	**237,299**	**116.80**	**1.070**	**109**	**4,482**	**100,469,781**	**430,007**	**452.83**	**1.938**	**234**

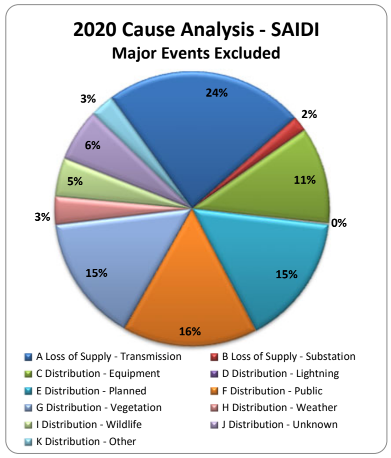
OAR Cause	2018 - Southern Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	224,527	191	5,588,500	210,694	24.89	0.938	27	209	7,982,323	230,644	35.55	1.027	35
B Loss of Supply - Substation	224,527	5	723,716	4,486	3.22	0.020	161	14	4,322,647	17,752	19.25	0.079	244
C Distribution - Equipment	224,527	1,180	4,796,929	31,379	21.36	0.140	153	1,215	5,498,426	35,261	24.49	0.157	156
D Distribution - Lightning	224,527	145	1,549,801	9,035	6.90	0.040	172	145	1,549,801	9,035	6.90	0.040	172
E Distribution - Planned	224,527	784	2,860,746	25,150	12.74	0.112	114	801	3,163,738	27,179	14.09	0.121	116
F Distribution - Public	224,527	136	2,528,578	15,767	11.26	0.070	160	137	2,529,407	15,770	11.27	0.070	160
G Distribution - Vegetation	224,527	273	4,103,349	24,051	18.28	0.107	171	327	6,464,548	32,975	28.79	0.147	196
H Distribution - Weather	224,527	98	1,023,242	7,140	4.56	0.032	143	132	4,215,541	20,018	18.78	0.089	211
I Distribution - Wildlife	224,527	308	804,225	8,225	3.58	0.037	98	309	804,278	8,226	3.58	0.037	98
J Distribution - Unknown	224,527	325	1,773,741	19,299	7.90	0.086	92	329	1,806,284	19,448	8.04	0.087	93
K Distribution - Other	224,527	79	403,696	5,334	1.80	0.024	76	82	403,947	5,337	1.80	0.024	76
Grand Total	**224,527**	**3,524**	**26,156,522**	**360,560**	**116.50**	**1.606**	**73**	**3,700**	**38,740,940**	**421,645**	**172.54**	**1.878**	**92**

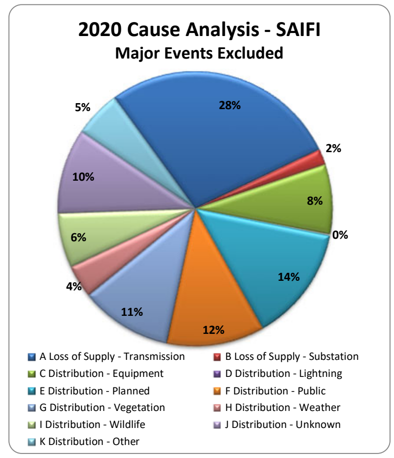
OAR Cause	2019 - Southern Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	227,158	84	3,890,444	71,847	17.13	0.316	54	166	57,338,706	153,302	252.42	0.675	374
B Loss of Supply - Substation	227,158	12	1,724,962	12,672	7.59	0.056	136	15	3,998,311	18,770	17.60	0.083	213
C Distribution - Equipment	227,158	1,166	4,518,301	32,869	19.89	0.145	137	1,266	7,849,286	35,265	34.55	0.155	223
D Distribution - Lightning	227,158	92	236,664	1,564	1.04	0.007	151	92	236,664	1,564	1.04	0.007	151
E Distribution - Planned	227,158	1,256	2,955,447	32,556	13.01	0.143	91	1,293	3,531,193	33,591	15.55	0.148	105
F Distribution - Public	227,158	127	2,698,638	21,441	11.88	0.094	126	132	2,719,859	21,706	11.97	0.096	125
G Distribution - Vegetation	227,158	365	7,395,254	37,545	32.56	0.165	197	628	32,696,434	54,359	143.94	0.239	601
H Distribution - Weather	227,158	119	1,881,793	11,052	8.28	0.049	170	444	62,867,546	50,008	276.76	0.220	1,257
I Distribution - Wildlife	227,158	372	833,469	11,140	3.67	0.049	75	376	840,789	11,227	3.70	0.049	75
J Distribution - Unknown	227,158	366	2,541,749	25,325	11.19	0.111	100	385	3,268,380	26,661	14.39	0.117	123
K Distribution - Other	227,158	107	402,334	4,577	1.77	0.020	88	148	2,054,878	8,715	9.05	0.038	236
Grand Total	**227,158**	**4,066**	**29,079,055**	**262,588**	**128.01**	**1.156**	**111**	**4,945**	**177,402,047**	**415,168**	**780.96**	**1.828**	**427**

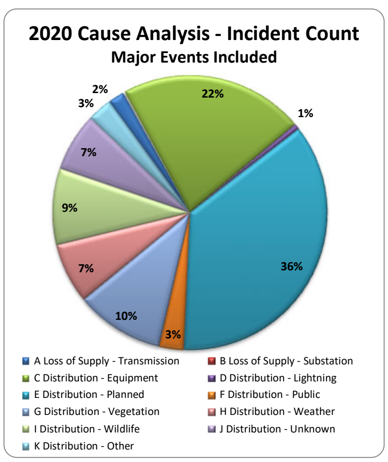
Southern Oregon Reporting Region Five-Year Cause Analysis

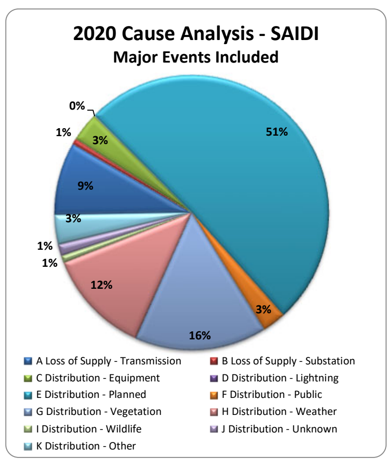
OAR Cause	2020 - Southern Oregon Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	226,208	76	7,769,837	70,261	34.35	0.311	111	107	16,676,623	110,624	73.72	0.489	151
B Loss of Supply - Substation	226,208	12	584,440	4,655	2.58	0.021	126	14	1,338,311	7,860	5.92	0.035	170
C Distribution - Equipment	226,208	1,104	3,759,518	20,556	16.62	0.091	183	1,230	6,564,911	29,450	29.02	0.130	223
D Distribution - Lightning	226,208	23	67,715	506	0.30	0.002	134	36	135,064	1,141	0.60	0.005	118
E Distribution - Planned	226,208	1,933	5,094,748	34,352	22.52	0.152	148	2,045	98,610,381	52,836	435.93	0.234	1,866
F Distribution - Public	226,208	157	5,259,220	29,029	23.25	0.128	181	165	5,374,578	29,346	23.76	0.130	183
G Distribution - Vegetation	226,208	298	4,929,854	27,182	21.79	0.120	181	590	30,188,522	49,754	133.45	0.220	607
H Distribution - Weather	226,208	48	1,091,750	9,716	4.83	0.043	112	404	23,998,882	51,804	106.09	0.229	463
I Distribution - Wildlife	226,208	448	1,508,496	16,210	6.67	0.072	93	509	1,647,857	17,442	7.28	0.077	94
J Distribution - Unknown	226,208	341	2,047,871	25,253	9.05	0.112	81	389	2,600,507	28,572	11.50	0.126	91
K Distribution - Other	226,208	105	927,354	13,823	4.10	0.061	67	163	6,689,187	18,957	29.57	0.084	353
Grand Total	**226,208**	**4,545**	**33,040,804**	**251,543**	**146.06**	**1.112**	**131**	**5,652**	**193,824,821**	**397,786**	**856.84**	**1.758**	**487**

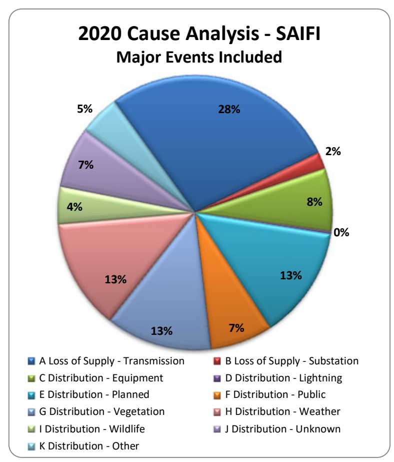












Willamette Valley Reporting Region Five-Year Cause Analysis

OAR Cause	2016 - Willamette Valley Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	119,059	58	5,040,793	88,471	42.34	0.743	57	72	7,961,792	100,352	66.87	0.843	79
B Loss of Supply - Substation	119,059	7	2,005,435	13,453	16.84	0.113	149	8	2,172,289	14,988	18.25	0.126	145
C Distribution - Equipment	119,059	583	4,104,001	26,177	34.47	0.220	157	613	4,217,144	26,758	35.42	0.225	158
D Distribution - Lightning	119,059	5	3,272	29	0.03	0.000	113	5	3,272	29	0.03	0.000	113
E Distribution - Planned	119,059	523	3,231,507	32,642	27.14	0.274	99	553	6,044,374	44,681	50.77	0.375	135
F Distribution - Public	119,059	87	1,685,593	6,468	14.16	0.054	261	89	1,939,765	8,678	16.29	0.073	224
G Distribution - Vegetation	119,059	225	1,953,996	12,989	16.41	0.109	150	387	7,746,061	38,041	65.06	0.320	204
H Distribution - Weather	119,059	19	145,876	699	1.23	0.006	209	70	624,759	2,002	5.25	0.017	312
I Distribution - Wildlife	119,059	171	385,374	5,413	3.24	0.045	71	171	385,374	5,413	3.24	0.045	71
J Distribution - Unknown	119,059	305	1,402,594	16,207	11.78	0.136	87	324	1,663,580	17,743	13.97	0.149	94
K Distribution - Other	119,059	40	177,320	13,467	1.49	0.113	13	45	185,807	13,481	1.56	0.113	14
Grand Total	**119,059**	**2,023**	**20,135,761**	**216,015**	**169.12**	**1.814**	**93**	**2,337**	**32,944,217**	**272,166**	**276.70**	**2.286**	**121**

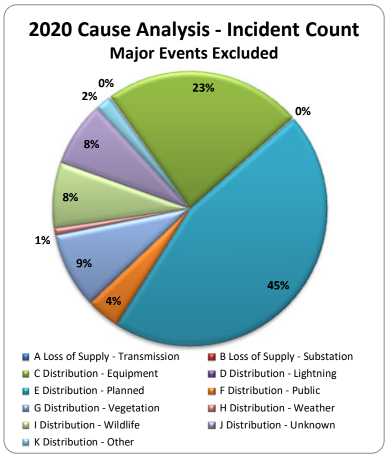
OAR Cause	2017 - Willamette Valley Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	120,331	72	4,795,797	107,370	39.86	0.892	45	88	9,747,151	132,831	81.00	1.104	73
B Loss of Supply - Substation	120,331	2	354,839	2,030	2.95	0.017	175	12	4,586,155	12,454	38.11	0.103	368
C Distribution - Equipment	120,331	648	3,778,999	23,309	31.41	0.194	162	694	6,406,544	32,319	53.24	0.269	198
D Distribution - Lightning	120,331	3	83,243	258	0.69	0.002	323	3	83,243	258	0.69	0.002	323
E Distribution - Planned	120,331	482	2,313,571	24,730	19.23	0.206	94	505	5,242,842	33,260	43.57	0.276	158
F Distribution - Public	120,331	111	4,702,292	19,972	39.08	0.166	235	113	4,710,610	20,052	39.15	0.167	235
G Distribution - Vegetation	120,331	259	2,903,863	20,189	24.13	0.168	144	366	7,160,027	28,418	59.50	0.236	252
H Distribution - Weather	120,331	29	561,360	3,133	4.67	0.026	179	121	2,960,267	9,698	24.60	0.081	305
I Distribution - Wildlife	120,331	154	532,841	9,590	4.43	0.080	56	156	537,607	9,649	4.47	0.080	56
J Distribution - Unknown	120,331	252	1,811,066	26,285	15.05	0.218	69	288	3,485,706	33,743	28.97	0.280	103
K Distribution - Other	120,331	43	564,518	14,847	4.69	0.123	38	70	739,202	15,057	6.14	0.125	49
Grand Total	**120,331**	**2,055**	**22,402,388**	**251,713**	**186.17**	**2.092**	**89**	**2,416**	**45,659,353**	**327,739**	**379.45**	**2.724**	**139**

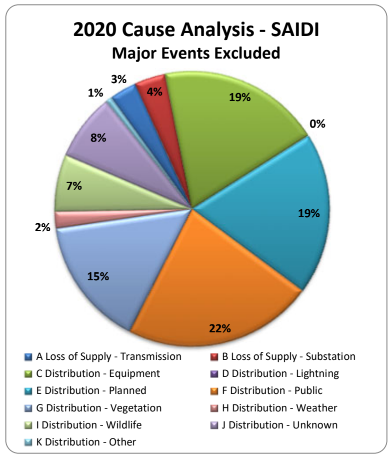
OAR Cause	2018 - Willamette Valley Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	122,166	24	523,543	25,767	4.29	0.211	20	24	523,543	25,767	4.29	0.211	20
B Loss of Supply - Substation	122,166	-	-	-	-	-	-	-	-	-	-	-	-
C Distribution - Equipment	122,166	627	2,545,824	25,089	20.84	0.205	101	636	2,655,308	25,403	21.74	0.208	105
D Distribution - Lightning	122,166	18	83,796	331	0.69	0.003	253	18	83,796	331	0.69	0.003	253
E Distribution - Planned	122,166	855	4,645,037	40,060	38.02	0.328	116	862	4,659,811	40,207	38.14	0.329	116
F Distribution - Public	122,166	124	4,949,641	18,573	40.52	0.152	266	125	4,949,799	18,574	40.52	0.152	266
G Distribution - Vegetation	122,166	251	2,814,275	19,837	23.04	0.162	142	289	3,419,337	21,725	27.99	0.178	157
H Distribution - Weather	122,166	43	775,579	3,120	6.35	0.026	249	55	921,917	4,049	7.55	0.033	228
I Distribution - Wildlife	122,166	188	368,064	4,092	3.01	0.033	90	189	368,616	4,108	3.02	0.034	90
J Distribution - Unknown	122,166	313	1,834,784	25,702	15.02	0.210	71	317	1,874,017	25,891	15.34	0.212	72
K Distribution - Other	122,166	69	116,471	3,224	0.95	0.026	36	69	116,471	3,224	0.95	0.026	36
Grand Total	**122,166**	**2,512**	**18,657,014**	**165,795**	**152.72**	**1.357**	**113**	**2,584**	**19,572,616**	**169,279**	**160.21**	**1.386**	**116**

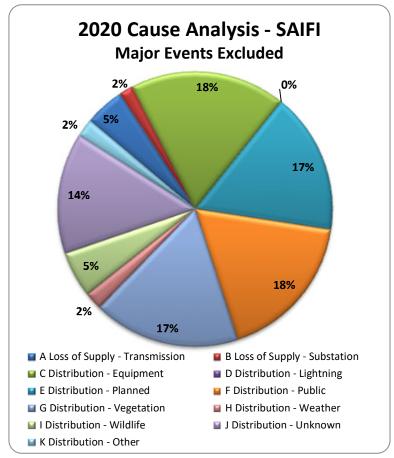
OAR Cause	2019 - Willamette Valley Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	124,207	6	763,494	9,024	6.15	0.073	85	10	5,337,509	13,882	42.97	0.112	384
B Loss of Supply - Substation	124,207	2	253,285	4,457	2.04	0.036	57	2	253,285	4,457	2.04	0.036	57
C Distribution - Equipment	124,207	567	3,295,512	24,218	26.53	0.195	136	596	3,443,437	24,909	27.72	0.201	138
D Distribution - Lightning	124,207	37	518,787	2,067	4.18	0.017	251	37	518,787	2,067	4.18	0.017	251
E Distribution - Planned	124,207	1,128	2,395,675	26,168	19.29	0.211	92	1,175	3,455,577	33,381	27.82	0.269	104
F Distribution - Public	124,207	114	3,111,728	23,613	25.05	0.190	132	117	3,123,299	23,654	25.15	0.190	132
G Distribution - Vegetation	124,207	251	4,688,796	33,495	37.75	0.270	140	400	9,372,696	43,042	75.46	0.347	218
H Distribution - Weather	124,207	20	328,877	2,364	2.65	0.019	139	139	14,559,760	17,519	117.22	0.141	831
I Distribution - Wildlife	124,207	183	560,321	4,397	4.51	0.035	127	184	562,710	4,418	4.53	0.036	127
J Distribution - Unknown	124,207	237	2,742,386	26,113	22.08	0.210	105	243	2,992,487	26,510	24.09	0.213	113
K Distribution - Other	124,207	60	319,558	3,590	2.57	0.029	89	64	457,119	4,182	3.68	0.034	109
Grand Total	**124,207**	**2,605**	**18,978,419**	**159,506**	**152.80**	**1.284**	**119**	**2,967**	**44,076,666**	**198,021**	**354.86**	**1.594**	**223**

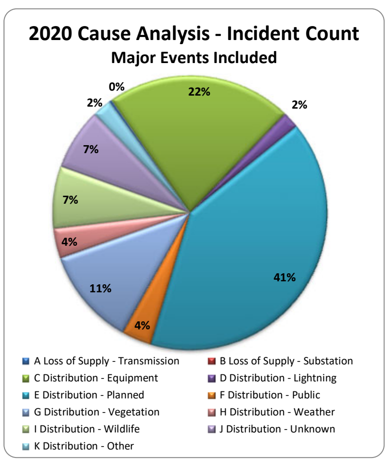
Willamette Valley Reporting Region Five-Year Cause Analysis

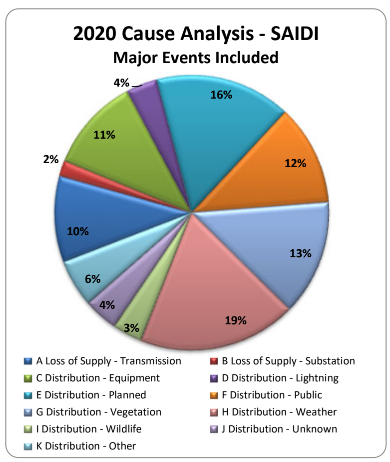
OAR Cause	2020 - Willamette Valley Reporting Region												
		Major Event Excluded						Major Event Included					
	Oregon Customer count	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI	Sustained Incident Count	Customer Minutes Lost for Incident	Customers In Incident Sustained	SAIDI	SAIFI	CAIDI
A Loss of Supply - Transmission	123,813	4	604,142	7,206	4.88	0.058	84	10	3,814,777	22,949	30.81	0.185	166
B Loss of Supply - Substation	123,813	1	685,481	2,531	5.54	0.020	271	1	685,481	2,531	5.54	0.020	271
C Distribution - Equipment	123,813	662	3,617,213	28,409	29.22	0.229	127	737	4,153,958	29,372	33.55	0.237	141
D Distribution - Lightning	123,813	5	2,865	37	0.02	0.000	77	65	1,377,409	3,828	11.12	0.031	360
E Distribution - Planned	123,813	1,290	3,593,373	25,733	29.02	0.208	140	1,364	6,036,619	32,972	48.76	0.266	183
F Distribution - Public	123,813	113	4,216,093	27,134	34.05	0.219	155	118	4,445,931	28,636	35.91	0.231	155
G Distribution - Vegetation	123,813	253	2,862,210	26,785	23.12	0.216	107	387	5,102,514	33,692	41.21	0.272	151
H Distribution - Weather	123,813	24	378,643	3,220	3.06	0.026	118	119	7,011,208	64,201	56.63	0.519	109
I Distribution - Wildlife	123,813	220	1,261,242	8,355	10.19	0.067	151	247	1,306,536	8,578	10.55	0.069	152
J Distribution - Unknown	123,813	218	1,482,621	22,020	11.97	0.178	67	245	1,522,807	22,525	12.30	0.182	68
K Distribution - Other	123,813	53	134,297	3,269	1.08	0.026	41	75	2,099,485	3,851	16.96	0.031	545
Grand Total	**123,813**	**2,843**	**18,838,181**	**154,699**	**152.15**	**1.249**	**122**	**3,368**	**37,556,725**	**253,135**	**303.33**	**2.044**	**148**

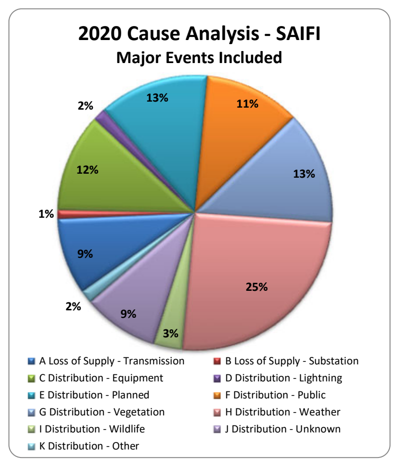












Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Central OR	BEND/REDMOND	BEND	5D10	PORTLAND AVE	12.5	2,411
Central OR	BEND/REDMOND	BEND	5D11	GLEN VISTA	12.5	1,242
Central OR	BEND/REDMOND	BEND	5D12	DIVISION ST.	12.5	214
Central OR	BEND/REDMOND	BEND	5D196	MALLARD	12.5	1,400
Central OR	BEND/REDMOND	BEND	CO08-1	BEND-PILOT BUTTE-69KV	69	0
Central OR	BEND/REDMOND	BEND	CO09B	PENSTOCK-JUNIPER RIDGE(COID)-69KV	69	0
Central OR	BEND/REDMOND	BOND STREET	5D411	BACHELOR	12.5	2,148
Central OR	BEND/REDMOND	BOND STREET	5D413	OLD MILL.	12.5	386
Central OR	BEND/REDMOND	BOND STREET	5D418	BLAKELY	12.5	1,185
Central OR	BEND/REDMOND	CHINA HAT	5D140	LAVA (CHINA HAT)	12.5	2,334
Central OR	BEND/REDMOND	CHINA HAT	5D142	HIGH DESERT	12.5	1,713
Central OR	BEND/REDMOND	CHINA HAT	5D144	D.R.W.	12.5	2,482
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D30	ARROWHEAD	12.5	1,272
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D35	WICKIUP	12.5	1,064
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D38	TOMAHAWK	12.5	1,439
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D94	TEEPEE	12.5	3,769
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D96	OBSIDIAN	12.5	880
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D98	HUCKLEBERRY	12.5	1,179
Central OR	BEND/REDMOND	CLEVELAND AVE.	CO11	CLEVELAND-CHINA HAT-69KV	69	0
Central OR	BEND/REDMOND	COVE (OR)	CO20	COVE-ROUND BUTTE(PGE)#1-230KV	230	0
Central OR	BEND/REDMOND	COVE (OR)	CO21	COVE-ROUND BUTTE(PGE)#2-230KV	230	0
Central OR	BEND/REDMOND	CROOKED RIVER RANCH	4D131	CANYON	20.8	1,807
Central OR	BEND/REDMOND	CROOKED RIVER RANCH	4D30	CROOKED R.R.	20.8	783
Central OR	BEND/REDMOND	DESCHUTES	5D184	PRONGHORN	12.5	1,114
Central OR	BEND/REDMOND	DESCHUTES	5D2	DESCHUTES S	12.5	1,019
Central OR	BEND/REDMOND	HUNTERS CIRCLE	5D192	Mackinaw	12.5	698
Central OR	BEND/REDMOND	MIDPOINT	CO01-1	MIDPOINT-HEMMINGWAY-500KV	500	0
Central OR	BEND/REDMOND	OVERPASS	5D104	AWBREY	12.5	1,955
Central OR	BEND/REDMOND	OVERPASS	5D106	NEZ PERCE	12.5	2,692
Central OR	BEND/REDMOND	OVERPASS	5D120	CHINOOK	12.5	1,791
Central OR	BEND/REDMOND	OVERPASS	5D128	PAIUTE	12.5	2,155
Central OR	BEND/REDMOND	OVERPASS	5D155	APACHE	12.5	824
Central OR	BEND/REDMOND	PILOT BUTTE	5D261	KLONDIKE	12.5	1,538
Central OR	BEND/REDMOND	PILOT BUTTE	5D263	DRAKE FEEDER	12.5	2,477
Central OR	BEND/REDMOND	PILOT BUTTE	5D265	DOBBIN	12.5	1,676
Central OR	BEND/REDMOND	PILOT BUTTE	CO09	BEND-PILOT BUTTE-TAP TO REDMOND-69KV	69	2
Central OR	BEND/REDMOND	PILOT BUTTE	CO16	PILOT BUTTE-CLEVELAND-69KV	69	0
Central OR	BEND/REDMOND	PILOT BUTTE	CO17	PILOT BUTTE - CEC 69KV	69	0
Central OR	BEND/REDMOND	PILOT BUTTE	CO-1-BPA	PONDEROSA(BPA)-PILOT BUTTE-230KV	230	0
Central OR	BEND/REDMOND	PILOT BUTTE	CO-2-BPA	REDMOND(BPA)-PILOT BUTTE-230KV	230	0
Central OR	BEND/REDMOND	PILOT BUTTE	CO-3-BPA	LAPINE(BPA)-PILOT BUTTE-230KV	230	0
Central OR	BEND/REDMOND	REDMOND	5D21	SOUTH (REDMOND)	12.5	760
Central OR	BEND/REDMOND	REDMOND	5D22	INDUSTRIAL	12.5	1,507
Central OR	BEND/REDMOND	REDMOND	5D223	TETHEROW	12.5	863
Central OR	BEND/REDMOND	REDMOND	5D226	CLINE FALLS	12.5	1,496
Central OR	BEND/REDMOND	REDMOND	5D227	WINDSOR	12.5	3,206
Central OR	BEND/REDMOND	REDMOND	5D228	CITY	12.5	1,307
Central OR	BEND/REDMOND	REDMOND	5D229	JUNIPER	12.5	418
Central OR	BEND/REDMOND	REDMOND	CO006	REDMOND-COVE-69KV	69	1
Central OR	BEND/REDMOND	REDMOND	CO03-1	HOUSTON LAKE-REDMOND(BPA)-115KV	115	0
Central OR	BEND/REDMOND	REDMOND	CO03-3	POWELL BUTTE-REDMOND-115KV	115	0
Central OR	BEND/REDMOND	REDMOND	CO06A	TAP TO CROOKED RIVER-69KV	69	0
Central OR	BEND/REDMOND	REDMOND	CO06B	TAP TO OPAL SPRINGS-69KV	69	0
Central OR	BEND/REDMOND	REDMOND	CO07	REMOND-REDMOND BPA-69KV	69	0
Central OR	BEND/REDMOND	REDMOND BPA	CO02	REDMOND BPA-REDMOND-115KV	115	0

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Central OR	BEND/REDMOND	SHEVLIN PARK	5D238	WOLVERINE (SHP) (WAS 5D327)	12.5	2,771
Central OR	BEND/REDMOND	SHEVLIN PARK	5D241	BADGER (SHP)	12.5	2,604
Central OR	BEND/REDMOND	SHEVLIN PARK	5D243	Black Bear	12.5	1,774
Central OR	BEND/REDMOND	SUMMER LAKE (BPA)	CO01-1A	SUMMER LAKE (BPA)-HEMMINGWAY-500KV	500	0
Central OR	BEND/REDMOND	YEW AVENUE	5D322	BIRDIE	12.5	1,936
Central OR	BEND/REDMOND	YEW AVENUE	5D323	FAIRWAY	12.5	392
Central OR	BEND/REDMOND	YEW AVENUE	5D325	EAGLE	12.5	2,660
Central OR	BEND/REDMOND	YEW AVENUE	C018	TAP TO YEW AVE-115KV	115	0
Central OR	MADRAS	CHERRY LANE	5D295	7 PEAKS	12.5	145
Central OR	MADRAS	CHERRY LANE	CO05-2	CHERRY LANE-WARM SPRINGS-69KV	69	0
Central OR	MADRAS	CORRAL	CO34	CORRAL-FRIEND-230KV	230	0
Central OR	MADRAS	CORRAL	CO34-1	CORRAL-OCHOCO-230KV	230	0
Central OR	MADRAS	CORRAL	CO35	CORRAL-PONDEROSA(BPA)#1-230KV	230	0
Central OR	MADRAS	CORRAL	CO35-1	CORRAL-PONDEROSA(BPA)#2-230KV	230	0
Central OR	MADRAS	CORRAL	CO36	CORRAL-PONDEROSA-230KV	230	0
Central OR	MADRAS	COVE (OR)	CO005	COVE-WARM SPRINGS-69KV	69	1
Central OR	MADRAS	COVE (OR)	CO012	COVE-WARM SPRINGS-69KV	69	1
Central OR	MADRAS	COVE (OR)	CO05-1	CHERRY LANE-COVE-69KV	69	0
Central OR	MADRAS	CULVER	5D5	CULVER	12.5	1,838
Central OR	MADRAS	MADRAS	5D52	MADRAS RURAL	12.5	1,054
Central OR	MADRAS	MADRAS	5D53	AGATE	12.5	1,288
Central OR	MADRAS	MADRAS	5D57	QUARTZ	12.5	1,400
Central OR	MADRAS	MADRAS	5D61	MADRAS CITY	12.5	1,276
Central OR	MADRAS	PONDEROSA-P	CO14-2	BALDWIN ROAD-PONDEROSA-115KV	115	0
Central OR	MADRAS	PONDEROSA-P	CO14-3	BALDWIN ROAD-PRINEVILLE-115KV	115	0
Central OR	MADRAS	PONDEROSA-P	CO14-4	HOUSTON LAKE-PRINEVILLE-115KV	115	0
Central OR	MADRAS	PONDEROSA-P	CO19	HOUSTON LAKE-PONDEROSA#2-115KV	115	0
Central OR	MADRAS	POWELL BUTTE	5D1	POWELL BUTTE	12.5	649
Central OR	MADRAS	PRINEVILLE	5D126	RIMROCK	12.5	872
Central OR	MADRAS	PRINEVILLE	5D167	NORTHVILLE	12.5	2,693
Central OR	MADRAS	PRINEVILLE	5D25	OCHOCO	12.5	997
Central OR	MADRAS	PRINEVILLE	5D47	MC KAY (PRINEVILLE)	12.5	1,732
Central OR	MADRAS	PRINEVILLE	5D48	LAMONTA	12.5	621
Central OR	MADRAS	PRINEVILLE	5D50	PINE CONE	12.5	79
Central OR	MADRAS	PRINEVILLE	5D69	GRIMES FLAT	12.5	1,611
Central OR	MADRAS	WARM SPRINGS	4D68	WARM SPRINGS (OR)	20.8	977
Central OR	MADRAS	WARM SPRINGS	CO05	MADRAS-WARM SPRINGS-69KV	69	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL01-3	ASTORIA-TILLAMOOK-115KV	115	1
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL01-3A	ASTORIA-WARRENTON TAP-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL01-3B	SEASIDE-WARRENTON TAP-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL01-3C	CANNON BEACH TAP-SEASIDE-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL01-3D	CANNON BEACH TAP-NEHALEM(TPUD)-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL01-3E	MOHLER(TPUD)-NEHALEM(TPUD)-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL01-3F	GARIBALDI(TPUD)-MOHLER(TPUD)-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL01-3G	GARIBALDI(TPUD)-TILLAMOOK(BPA)-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL01-4	ASTORIA-DRISCOLL(BPA)-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL01-AST	ASTORIA SUB	0	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL02	LEWIS&CLARK-WARRENTON-WARRENTON TAP-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL04A	CANNON BEACH-CANNON BEACH TAP-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	ASTORIA	CL04B	CANNON BEACHTAP-NECANICUM(TPUD)-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	CANNON BEACH	5A10	HAYSTACK	12.5	1,608
CoastPlus	CLATSOP (ASTORIA)	CANNON BEACH	5A8	ECOLA	12.5	1,217
CoastPlus	CLATSOP (ASTORIA)	FERN HILL SUB	5A51	JOHN DAY	12.5	270
CoastPlus	CLATSOP (ASTORIA)	FERN HILL SUB	5A52	SCANDINAVIAN	12.5	382
CoastPlus	CLATSOP (ASTORIA)	KNAPPA SVENSEN	5A92	SVENSEN	12.5	728

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
CoastPlus	CLATSOP (ASTORIA)	KNAPPA SVENSEN	5A93	BRADWOOD	12.5	933
CoastPlus	CLATSOP (ASTORIA)	LEWIS & CLARK	CL03	LEWIS & CLARK-CLATSOP-BPA-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A80	GROVE	12.5	2,405
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A81	CENTRAL	12.5	1,622
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A82	NECANICUM	12.5	1,200
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A83	GEARHART	12.5	3,367
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	CL01-SSD	SEASIDE SUB	115	0
CoastPlus	CLATSOP (ASTORIA)	WARRENTON	5A15	CITY	12.5	247
CoastPlus	CLATSOP (ASTORIA)	WARRENTON	5A16	MILL (WARRENTON)	12.5	2,255
CoastPlus	CLATSOP (ASTORIA)	WARRENTON	5A20	SOUTH (WARRENTON)	12.5	1,727
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A202	PORT DOCK	12.5	1,184
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A204	MOO COW	12.5	1,163
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A205	FIFTH STREET	12.5	987
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A206	YOUNGS BAY #6	12.5	336
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A210	YOUNGS BAY #10	12.5	945
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A211	OLNEY	12.5	1,099
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A213	INDUSTRIAL	12.5	1,355
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	CL01-1	YOUNGS BAY-ASTORIA-115KV	115	0
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	CL01-YOU	YOUNGS BAY SUB	115	0
CoastPlus	COOS BAY/COQUILLE	BANDON TIE (BPA)	L804	BANDON	20.8	754
CoastPlus	COOS BAY/COQUILLE	COOS RIVER	4C106	COOS RIVER	20.8	1,357
CoastPlus	COOS BAY/COQUILLE	COOS RIVER	CB02-COO	COOS RIVER SUB	115	0
CoastPlus	COOS BAY/COQUILLE	COQUILLE	4C41	HENRY STREET	20.8	1,681
CoastPlus	COOS BAY/COQUILLE	COQUILLE	4C42	TERRES HGHTS	20.8	1,548
CoastPlus	COOS BAY/COQUILLE	COQUILLE	4C43	INDUSTRIAL	20.8	154
CoastPlus	COOS BAY/COQUILLE	COQUILLE	CB02-4	EMPIRE-RED DIKE TAP-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	COQUILLE	CB02-5	COQUILLE-NORWAY SW STATION-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	COQUILLE	CB02-6	MYRTLE POINT-NORWAY SW STATION-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	COQUILLE	CB02-COQ	COQUILLE SUB	115	0
CoastPlus	COOS BAY/COQUILLE	EMPIRE	4C108	EMPIRE	20.8	1,738
CoastPlus	COOS BAY/COQUILLE	EMPIRE	4C89	SCOTT	20.8	1,440
CoastPlus	COOS BAY/COQUILLE	EMPIRE	4C90	CHARLESTON	20.8	2,093
CoastPlus	COOS BAY/COQUILLE	EMPIRE	CB02-EMP	EMPIRE SUB	115	0
CoastPlus	COOS BAY/COQUILLE	EMPIRE	CB03-2	EMPIRE-STATE STREET-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	FAIRVIEW (BPA)	CB01	FAIRVIEW-ISTHMUS-230KV	230	0
CoastPlus	COOS BAY/COQUILLE	FAIRVIEW (BPA)	CB02	COQUILLE-LOCKHART-MYRTLE POINT-BPA FAIRVIEW-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	FAIRVIEW (BPA)	CB02-1	COQUILLE-BPA FAIRVIEW115KV	115	0
CoastPlus	COOS BAY/COQUILLE	ISTHMUS	CB01-IST	ISTHMUS SUB	115	0
CoastPlus	COOS BAY/COQUILLE	ISTHMUS	CB06	ISTHMUS-LOCKHART-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	ISTHMUS	CB06-1	COOS RIVER-ISTHMUS-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	JORDAN POINT	5C11	WEYCO#2	12.5	1
CoastPlus	COOS BAY/COQUILLE	JORDAN POINT	5C5	MENASHA	12.5	0
CoastPlus	COOS BAY/COQUILLE	JORDAN POINT	5C6	SAND DUNES (JORDAN POINT)	12.5	29
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C48	CITY CENTER	20.8	1,507
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C49	EASTSIDE	20.8	776
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C5	GEORGIA-PAC	20.8	86
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C50	BUNKERHILL	20.8	1,835
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C97	ENGLEWOOD	20.8	1,384
CoastPlus	COOS BAY/COQUILLE	LOCKHART	CB02-2	COQUILLE-RED DIKE TAP-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	LOCKHART	CB02-3	LOCKHART-RED DIKE TAP-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	LOCKHART	CB02-LHS	LOCKHART SUB	115	0
CoastPlus	COOS BAY/COQUILLE	LOCKHART	CB03	EMPIRE-LOCKHART-SOUTH DUNES-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	LOCKHART	CB03-1	LOCKHART-STATE STREET-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	LOCKHART	CB06-2	COOS RIVER-LOCKHART-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	MYRTLE POINT	4C36	NORTH (MYRTLE POINT)	20.8	331

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
CoastPlus	COOS BAY/COQUILLE	MYRTLE POINT	4C37	MAPLE STREET	20.8	2,077
CoastPlus	COOS BAY/COQUILLE	SOUTH DUNES	5C9	DOUGLAS CHIP	12.5	3
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C112	WOODLAND	20.8	1,867
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C66	BAYSHORE	20.8	1,716
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C67	INDUSTRIAL	20.8	2,222
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C86	BANGOR	20.8	1,791
CoastPlus	COOS BAY/COQUILLE	STATE STREET	CB03-3	JORDAN POINT-STATE STREET-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	STATE STREET	CB03-4	JORDAN POINT-SOUTH DUNES-115KV	115	0
CoastPlus	COOS BAY/COQUILLE	STATE STREET	CB03-STS	STATE STREET SUB	115	0
CoastPlus	HOOD RIVER	GORDON HOLLOW	4K1	SHERMAN 208	20.8	712
CoastPlus	HOOD RIVER	GORDON HOLLOW	WW13-1	DEMOSS(BPA)-GORDON HOLLOW-69KV	69	0
CoastPlus	HOOD RIVER	HOOD RIVER	5K37	RESIDENTIAL	12.5	2,112
CoastPlus	HOOD RIVER	HOOD RIVER	5K43	BELMONT	12.5	1,189
CoastPlus	HOOD RIVER	HOOD RIVER	5K44	NORTH (HOOD RIVER)	12.5	1,798
CoastPlus	HOOD RIVER	HOOD RIVER	5K70	EASTSIDE	7.2	1,071
CoastPlus	HOOD RIVER	HOOD RIVER	5K74	SOUTH (HOOD RIVER)	12.5	1,572
CoastPlus	HOOD RIVER	KENWOOD	5K50	OAKGROVE	12.5	815
CoastPlus	HOOD RIVER	POWERDALE JUNCTION SWITCHYARD 69KV	HR03-1	POWERDALE JUNCTION-BALD MOUNTAIN(BPA)-69KV	69	0
CoastPlus	HOOD RIVER	TUCKER	HR01	TUCKER-POWERDALE-69KV	69	0
CoastPlus	HOOD RIVER	TUCKER	HR04	TUCKER-POWERDALE-69KV	69	2
CoastPlus	HOOD RIVER	WASCO	7K1	WASCO	4.1	275
CoastPlus	LINCOLN CITY	BOYER	LC01	BOYER-DEVILS LAKE #1-115KV	115	0
CoastPlus	LINCOLN CITY	BOYER	LC01-A	BOYER-GRAND RONDE(PGE)-115KV	115	0
CoastPlus	LINCOLN CITY	BOYER	LC01-BOY	BOYER SUB	115	0
CoastPlus	LINCOLN CITY	BOYER	LC02	BOYER-DEVILS LAKE #2-115KV	115	0
CoastPlus	LINCOLN CITY	BOYER	LC03	BOYER-TILLAMOOK(BPA)-115KV	115	0
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A310	INLAND FEEDER	20.8	1,907
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A312	OCEAN	20.8	3,020
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A316	LAKE (DEVILS LAKE)	20.8	4,579
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A338	SIUSLAW	20.8	661
CoastPlus	LINCOLN CITY	DEVILS LAKE	LC01-DVK	DEVILS LAKE SUB	115	0
CoastPlus	LINCOLN CITY	GLENEDEN	7A364	GLENEDEN	4.1	715
CoastPlus	LINCOLN CITY	GLENEDEN	7A366	SALISHAN	4.1	357
CoastPlus	LINCOLN CITY	NELSCOTT	7A390	NELSCOTT	4.1	352
CoastPlus	LINCOLN CITY	PGE GRAND RONDE	R114	BOYER	12	19
CoastPlus	LINCOLN CITY	WECOMA BEACH	7A354	WECOMA	4.1	720
CoastPlus	PORTLAND	ALBINA	5P111	ALBINA 11C01-UG	11.7	613
CoastPlus	PORTLAND	ALBINA	5P150	ALBINA 11C15	11.7	0
CoastPlus	PORTLAND	ALBINA	5P194	11C24-UG	11.7	224
CoastPlus	PORTLAND	ALBINA	5P196	11C16-UG	11.7	550
CoastPlus	PORTLAND	ALBINA	5P200	11C20-UG	11.7	463
CoastPlus	PORTLAND	ALBINA	5P66	11C25	11.7	0
CoastPlus	PORTLAND	ALBINA	5P91	11C11-UG	11.7	317
CoastPlus	PORTLAND	ALBINA	5P92	11C12-UG	11.7	161
CoastPlus	PORTLAND	ALBINA	P12-2	ALBINA-KNOTT-115KV	115	0
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	5P22	ALDERWOOD #2	12.5	199
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	5P23	ALDERWOOD #1-UG	12.5	0
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	5P33	ALDERWOOD #4	12.5	177
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	5P604	ALDERWOOD #3	12.5	206
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	P19-1	ALDERWOOD-KILLINGSWORTH-69KV	69	0
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	P19-2	ALDERWOOD-TROUTDALE-69KV	69	0
CoastPlus	PORTLAND	BLOSS	5P170	OFFICE	12.5	0
CoastPlus	PORTLAND	BLOSS	5P172	FURNACE	12.5	1
CoastPlus	PORTLAND	BPA ST JOHNS	P10-2	BPA ST JOHNS-ST JOHNS-115KV	115	0
CoastPlus	PORTLAND	BPA ST JOHNS	P11	ST JOHNS-KNOTT-115KV	115	0

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
CoastPlus	PORTLAND	COLUMBIA (OR)	5P266	COLUMBIA #2	12.5	2,617
CoastPlus	PORTLAND	COLUMBIA (OR)	5P268	COLUMBIA #1	12.5	359
CoastPlus	PORTLAND	COLUMBIA (OR)	5P474	COLUMBIA #6	12.5	546
CoastPlus	PORTLAND	COLUMBIA (OR)	5P476	COLUMBIA #3	12.5	858
CoastPlus	PORTLAND	COLUMBIA (OR)	5P478	COLUMBIA #4	12.5	886
CoastPlus	PORTLAND	COLUMBIA (OR)	5P480	COLUMBIA #5	12.5	22
CoastPlus	PORTLAND	COLUMBIA (OR)	P23	COLUMBIA-KNOTT-57KV (OR)	57	0
CoastPlus	PORTLAND	COLUMBIA (OR)	P25	COLUMBIA-KILLINGSWORTH-69KV	57	0
CoastPlus	PORTLAND	CULLY	5P288	CULLY #3-UG	12.5	824
CoastPlus	PORTLAND	CULLY	5P290	CULLY #2	12.5	2,397
CoastPlus	PORTLAND	CULLY	5P292	CULLY #1	12.5	2,917
CoastPlus	PORTLAND	CULLY	P14-1	CULLY-PARKROSE TAP-115KV	115	0
CoastPlus	PORTLAND	CULLY	P14-2	PARKROSE TAP-HEMLOCK-TROUTDALE-115KV	115	0
CoastPlus	PORTLAND	CULLY	P14-3	CULLY-HOLLYWOOD-115KV	115	0
CoastPlus	PORTLAND	HARRISON	P17	HARRISON-PGE EASTPORT-115KV	115	0
CoastPlus	PORTLAND	HARRISON	P18	HARRISON-LINCOLN-115KV	115	0
CoastPlus	PORTLAND	HOLLADAY (OR)	5P145	HOLLADAY #1-UG	11.7	206
CoastPlus	PORTLAND	HOLLADAY (OR)	5P146	HOLLADAY #2-UG	11.7	343
CoastPlus	PORTLAND	HOLLADAY (OR)	5P147	HOLLADAY #3-UG	11.7	163
CoastPlus	PORTLAND	HOLLADAY (OR)	5P156	HOLLADAY #4-UG	11.7	792
CoastPlus	PORTLAND	HOLLADAY (OR)	5P157	HOLLADAY #5-UG	11.7	139
CoastPlus	PORTLAND	HOLLADAY (OR)	5P158	HOLLADAY #6	11.7	904
CoastPlus	PORTLAND	HOLLADAY (OR)	P13	HOLLADAY-HARRISON-115KV	115	0
CoastPlus	PORTLAND	HOLLADAY (OR)	P13-1	HOLLADAY-KNOTT-115KV	115	0
CoastPlus	PORTLAND	HOLLYWOOD	5P203	HOLLYWOOD #3	12.5	1,471
CoastPlus	PORTLAND	HOLLYWOOD	5P204	HOLLYWOOD #2	12.5	742
CoastPlus	PORTLAND	HOLLYWOOD	5P205	HOLLYWOOD #1	12.5	2,142
CoastPlus	PORTLAND	HOLLYWOOD	5P208	HOLLYWOOD #5	12.5	3,319
CoastPlus	PORTLAND	HOLLYWOOD	5P209	HOLLYWOOD #4	12.5	2,358
CoastPlus	PORTLAND	KENNEDY	5P12	CB 5P12	12.5	0
CoastPlus	PORTLAND	KENNEDY	5P14	CB 5P14	12.5	0
CoastPlus	PORTLAND	KENNEDY	5P15	CB 5P15	12.5	0
CoastPlus	PORTLAND	KILLINGSWORTH	5P123	KILLINGSWORTH #3	12.5	309
CoastPlus	PORTLAND	KILLINGSWORTH	5P217	KILLINGSWORTH #5	12.5	422
CoastPlus	PORTLAND	KILLINGSWORTH	5P41	KILLINGSWORTH #4	12.5	2,786
CoastPlus	PORTLAND	KILLINGSWORTH	5P88	KILLINGSWORTH #1-UG	12.5	1
CoastPlus	PORTLAND	KILLINGSWORTH	5P89	KILLINGSWORTH #2	12.5	3,173
CoastPlus	PORTLAND	KNOTT	5P231	KNOTT #1	12.5	2,997
CoastPlus	PORTLAND	KNOTT	5P232	KNOTT #2	12.5	2,298
CoastPlus	PORTLAND	KNOTT	5P233	KNOTT #3	12.5	2,272
CoastPlus	PORTLAND	KNOTT	5P366	11010	11.7	51
CoastPlus	PORTLAND	KNOTT	5P368	11022	11.7	171
CoastPlus	PORTLAND	KNOTT	5P372	11046	11.7	705
CoastPlus	PORTLAND	KNOTT	5P374	11020	11.7	987
CoastPlus	PORTLAND	KNOTT	P14-4	HOLLYWOOD-KNOTT-115KV	115	0
CoastPlus	PORTLAND	KNOTT	P26	KNOTT-PARKROSE-57KV	57	1
CoastPlus	PORTLAND	KNOTT	P26-1	KNOTT-SW3P278-57KV	57	0
CoastPlus	PORTLAND	KNOTT	P26-2	SW3P214-SW3P208-57KV	57	1
CoastPlus	PORTLAND	KNOTT	P26-3	SW3P278-SW3P214-57KV	57	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P418	11D17	11.7	133
CoastPlus	PORTLAND	LINCOLN (OR)	5P420	11D14	11.7	22
CoastPlus	PORTLAND	LINCOLN (OR)	5P422	11D06-UG	11.7	879
CoastPlus	PORTLAND	LINCOLN (OR)	5P424	11D03-UG	11.7	1
CoastPlus	PORTLAND	LINCOLN (OR)	5P426	11D04-UG	11.7	320
CoastPlus	PORTLAND	LINCOLN (OR)	5P430	11D05-UG	11.7	369

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
CoastPlus	PORTLAND	LINCOLN (OR)	5P432	11D02-UG	11.7	677
CoastPlus	PORTLAND	LINCOLN (OR)	5P434	11D12-UG	11.7	14
CoastPlus	PORTLAND	LINCOLN (OR)	5P436	11G18-UG	11.7	96
CoastPlus	PORTLAND	LINCOLN (OR)	5P438	11D08-UG	11.7	16
CoastPlus	PORTLAND	LINCOLN (OR)	5P456	11D09-UG	11.7	182
CoastPlus	PORTLAND	LINCOLN (OR)	5P458	11D07-UG	11.7	217
CoastPlus	PORTLAND	LINCOLN (OR)	5P460	11D01-UG	11.7	1
CoastPlus	PORTLAND	LINCOLN (OR)	5P462	11G13-UG	11.7	35
CoastPlus	PORTLAND	LINCOLN (OR)	5P464	11G16-UG	11.6	169
CoastPlus	PORTLAND	LINCOLN (OR)	P16	LINCOLN-URBAN-115KV	115	1
CoastPlus	PORTLAND	MALLORY	5P162	MALLORY #1	12.8	2,178
CoastPlus	PORTLAND	MALLORY	5P164	MALLORY #2	12.8	3,173
CoastPlus	PORTLAND	MERWIN	P08	MERWIN-BPA CARDWELL-115KV	115	1
CoastPlus	PORTLAND	MERWIN	P09	MERWIN-YALE-115KV	115	1
CoastPlus	PORTLAND	MERWIN	P10-1	MERWIN-ST JOHNS-115KV	115	0
CoastPlus	PORTLAND	MERWIN	P-GEN1	MERWIN #1-MERWIN-115KV	115	0
CoastPlus	PORTLAND	MERWIN	P-GEN2	MERWIN #2-MERWIN-115KV	115	0
CoastPlus	PORTLAND	MERWIN	P-GEN3	MERWIN #3-MERWIN-115KV	115	0
CoastPlus	PORTLAND	PARKROSE	5P244	PARKROSE#4	12.5	3,131
CoastPlus	PORTLAND	PARKROSE	5P246	PARKROSE#3	12.5	3,080
CoastPlus	PORTLAND	PARKROSE	5P250	PARKROSE#2	12.5	659
CoastPlus	PORTLAND	PARKROSE	5P252	PARKROSE#1	12.5	1,804
CoastPlus	PORTLAND	PARKROSE	5P717	PARKROSE 5	12.5	67
CoastPlus	PORTLAND	PARKROSE	5P728	PARKROSE 6	12.5	0
CoastPlus	PORTLAND	RUSSELLVILLE	5P274	RUSSELLVILLE #3	12.5	3,110
CoastPlus	PORTLAND	RUSSELLVILLE	5P276	RUSSELLVILLE #4	12.5	2,331
CoastPlus	PORTLAND	RUSSELLVILLE	5P278	RUSSELLVILLE #1	12.5	3,291
CoastPlus	PORTLAND	RUSSELLVILLE	5P280	RUSSELLVILLE #2	12.5	1,250
CoastPlus	PORTLAND	SWIFT	P-GEN4	SWIFT UNIT #1-SWIFT-230KV	230	0
CoastPlus	PORTLAND	SWIFT	P-GEN5	SWIFT UNIT #2-SWIFT-230KV	230	0
CoastPlus	PORTLAND	TROUTDALE	P14	TROUTDALE-KNOTT-115KV	115	0
CoastPlus	PORTLAND	TROUTDALE	P22-1	TROUTDALE-LADY-SUB #8-69KV	69	0
CoastPlus	PORTLAND	TROUTDALE	P22-2	TROUTDALE-JAMES RIV WEST-69KV	69	1
CoastPlus	PORTLAND	TROUTDALE	P22-3	TROUTDALE-JAMES RIV EAST-69KV	69	0
CoastPlus	PORTLAND	TROUTDALE	P34	TROUTDALE-CPU RUNYAN-115KV	115	0
CoastPlus	PORTLAND	TROUTDALE TIE (BPA)	P03	BPA TROUTDALE-PGE GRESHAM-230KV	230	0
CoastPlus	PORTLAND	TROUTDALE TIE (BPA)	P04	BPA TROUTDALE-PGE LINNEMAN-230KV	230	0
CoastPlus	PORTLAND	VERNON	5P391	VERNON #1	12.5	1,810
CoastPlus	PORTLAND	VERNON	5P392	VERNON NO. 2	12.5	2,600
CoastPlus	PORTLAND	VERNON	5P393	VERNON #3	12.5	3,453
CoastPlus	PORTLAND	VERNON	5P394	VERNON # 4	12.5	3,449
CoastPlus	PORTLAND	VERNON	5P395	VERNON # 5	12.5	2,285
CoastPlus	PORTLAND	YALE	5P53	YALE VILLAGE	12.5	0
Northeast	ENTERPRISE	ENTERPRISE (OR)	4W8	CREIGHTON LN	20.8	1,480
Northeast	ENTERPRISE	ENTERPRISE (OR)	5W15	CITY	12.5	942
Northeast	ENTERPRISE	ENTERPRISE (OR)	5W26	RURAL (ENTERPRISE)	12.5	1,083
Northeast	ENTERPRISE	ENTERPRISE (OR)	WW07	ENTERPRISE-ELGIN-69KV	69	0
Northeast	ENTERPRISE	ENTERPRISE (OR)	WW07A	TAP TO MINAM-69KV	69	0
Northeast	ENTERPRISE	HURRICANE (OR)	WW01-2	HURRICANE-HELLS CANYON(IPCO)-230KV	230	0
Northeast	ENTERPRISE	HURRICANE (OR)	WW08	HURRICANE-ENTERPRISE-69KV	69	0
Northeast	ENTERPRISE	JOSEPH	5W21	PRAIRIE	12.5	849
Northeast	ENTERPRISE	MINAM	5W18	MINAM	12.5	13
Northeast	ENTERPRISE	PALLETTE	4W14	PALLETTE NORTH	19.9	173
Northeast	ENTERPRISE	PALLETTE	4W15	PALLETTE SOUTH	19.9	54
Northeast	ENTERPRISE	WALLOWA	5W28	CITY	12.5	882

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Northeast	HERMISTON	ARLINGTON	5K25	ARLINGTON	12.5	519
Northeast	HERMISTON	BLALOCK	5K40	BLALOCK	12.5	20
Northeast	HERMISTON	COLD SPRINGS	WW16	COLD SPRINGS-HERMISTON-69KV	69	0
Northeast	HERMISTON	CREEK	4K30	WILLOW CREEK	34.5	0
Northeast	HERMISTON	CREEK	WW13	WILLOW CREEK-BPA DEMOSS-69KV	69	0
Northeast	HERMISTON	DALREED	4K16	WILLOW COVE	34.5	74
Northeast	HERMISTON	DALREED	4K36	SIMTAG	34.5	19
Northeast	HERMISTON	DALREED	4K46	BOEING	34.5	179
Northeast	HERMISTON	HERMISTON	5W602	RURAL (HERMISTON)	12.5	1,391
Northeast	HERMISTON	HERMISTON	WW14-1	HERMISTON-HINKLE-69KV	69	0
Northeast	HERMISTON	HINKLE	5W82	MEADOWS	12.5	376
Northeast	HERMISTON	MCNARY (BPA)	WW15	BPA MCNARY-HERMISTON-69KV	69	0
Northeast	HERMISTON	UMATILLA	5W658	UMATILLA	12.5	1,248
Northeast	HERMISTON	UMATILLA	5W660	MCNARY	12.5	944
Northeast	HERMISTON	UMATILLA	5W664	PORT FEEDER	12.5	60
Northeast	PENDLETON	ATHENA	5W703	CITY	12.5	843
Northeast	PENDLETON	ATHENA	5W705	HELIX	12.5	421
Northeast	PENDLETON	BUCKAROO	5W201	STATE HOSP.	12.5	383
Northeast	PENDLETON	BUCKAROO	5W202	REITH	12.5	1,552
Northeast	PENDLETON	BUCKAROO	5W203	MONTEE	12.5	1,738
Northeast	PENDLETON	HERMISTON	WW14	HERMISTON-PENDLETON-69KV	69	0
Northeast	PENDLETON	MCKAY (OR)	5W856	MCKAY	12.47	136
Northeast	PENDLETON	MCKAY (OR)	5W857	WILDHORSE	12.47	1,744
Northeast	PENDLETON	PENDLETON	5W401	WEST HILLS	12.5	1,674
Northeast	PENDLETON	PENDLETON	5W402	HARRIS HTS	12.5	2,060
Northeast	PENDLETON	PENDLETON	5W403	MISSION	12.5	1,041
Northeast	PENDLETON	PENDLETON	7W451	BUSINESS	4.1	270
Northeast	PENDLETON	PENDLETON	7W452	NORTHWEST	4.1	518
Northeast	PENDLETON	PENDLETON	7W453	SOUTHWEST (PENDELTON)	4.1	332
Northeast	PENDLETON	PENDLETON	7W454	EAST END	4.1	249
Northeast	PENDLETON	PENDLETON	WW09-2	PENDLETON-WESTON-69KV	69	0
Northeast	PENDLETON	PENDLETON	WW10	PENDLETON-BPA ROUNDUP-69KV	69	0
Northeast	PENDLETON	PENDLETON	WW12	PENDLETON-BPA ROUNDUP-69KV	69	0
Northeast	PENDLETON	PILOT ROCK	5W404	MILL (PILOT ROCK)	12.5	1
Northeast	PENDLETON	PILOT ROCK	5W406	PILOT ROCK CITY	12.5	1,393
Northeast	PENDLETON	ROUNDUP (BPA)	WW11	BPA ROUNDUP-PILOT ROCK-69KV	69	0
Northeast	PENDLETON	WESTON NEW (OR)	5W40	WESTON CANNERY	12.5	16
Northeast	PENDLETON	WESTON NEW (OR)	5W7	SCOTTS FEEDER	12.5	452
Northeast	WALLA WALLA	UMAPINE	5W105	UMAPINE FEEDER	12.5	965
Northeast	WALLA WALLA	UMAPINE	5W106	FERNDALE	12.5	1,347
Southern OR	GRANTS PASS	AGNESS AVE	5R172	SPALDING MILL	12.5	883
Southern OR	GRANTS PASS	AGNESS AVE	5R173	JONES CREEK	12.5	888
Southern OR	GRANTS PASS	AGNESS AVE	5R322	ANTEATER	12.5	990
Southern OR	GRANTS PASS	APPLEGATE	5R267	MURPHY	12.5	1,048
Southern OR	GRANTS PASS	APPLEGATE	5R278	HIGHWAY	12.5	1,629
Southern OR	GRANTS PASS	APPLEGATE	R02-3	APPLEGATE-CAVE JUNCTION-115KV	115	0
Southern OR	GRANTS PASS	APPLEGATE	R23-2	APPLEGATE-HUMBUG CREEK-69KV	69	0
Southern OR	GRANTS PASS	APPLEGATE	R23-21	APPLEGATE-PROVOLT-69KV	69	0
Southern OR	GRANTS PASS	APPLEGATE	R23-22	PROVOLT-HUMBUG CREEK-69KV	69	0
Southern OR	GRANTS PASS	APPLEGATE	R23-A	TAP TO PROVOLT-69KV	69	0
Southern OR	GRANTS PASS	BEACON	5R104	SAVAGE ST	12.5	1,272
Southern OR	GRANTS PASS	BEACON	5R105	BEACON ST	12.5	845
Southern OR	GRANTS PASS	CAVE JUNCTION	5R52	FREE& EASY	12.5	2,407
Southern OR	GRANTS PASS	CAVE JUNCTION	5R53	ROUGH &READY	12.5	1,532
Southern OR	GRANTS PASS	CAVE JUNCTION	R02	CAVE JUNCTION-GRANTS PASS-115KV	115	0

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Southern OR	GRANTS PASS	CAVE JUNCTION	R02-2	CAVE JCTN-DEL NORTE-115KV	115	0
Southern OR	GRANTS PASS	CAVE JUNCTION	R04	CAVE JCTN-DEL NORTE-115KV	115	0
Southern OR	GRANTS PASS	CAVE JUNCTION	R04-1	CAVE JCTN-O BRIEN-115KV	115	0
Southern OR	GRANTS PASS	CAVE JUNCTION	R04-2	O BRIEN-PATRICK CREEK-115KV	115	0
Southern OR	GRANTS PASS	CAVE JUNCTION	S15	CAVE JCTN-HAPPY CAMP-69KV	69	0
Southern OR	GRANTS PASS	CAVEMAN	5R295	QUAIL	12.5	1,119
Southern OR	GRANTS PASS	CAVEMAN	5R82	WASHINGTON	12.5	1,192
Southern OR	GRANTS PASS	CAVEMAN	5R98	MANZANITA	12.5	575
Southern OR	GRANTS PASS	CAVEMAN	5R99	CAVEMAN	12.5	1,208
Southern OR	GRANTS PASS	DOWELL	5R330	DOWELL CB 5R330	12.5	0
Southern OR	GRANTS PASS	DOWELL	5R331	DOVE	12.5	1,492
Southern OR	GRANTS PASS	DOWELL	5R334	DUCK	12.5	2,530
Southern OR	GRANTS PASS	EASY VALLEY	5R123	G STREET	12.5	2,172
Southern OR	GRANTS PASS	EASY VALLEY	5R125	ROGUE	12.5	1,780
Southern OR	GRANTS PASS	EASY VALLEY	5R259	CHINOOK	12.5	1,324
Southern OR	GRANTS PASS	FIELDER CREEK	4R33	ELK FDR.	20.8	1,846
Southern OR	GRANTS PASS	FIELDER CREEK	4R34	BEAR FDR	20.8	860
Southern OR	GRANTS PASS	GLENDALE SUBSTATION	5R133	GLENDALE	12.5	1,886
Southern OR	GRANTS PASS	GLENDALE SUBSTATION	5R143	INDUSTRIAL	12.5	656
Southern OR	GRANTS PASS	GLENDALE SUBSTATION	BB08-3	GLENDALE-HANNA TAP-230KV	230	0
Southern OR	GRANTS PASS	GRANTS PASS	BB08-4	GRANTS PASS-GLENDALE-230KV	230	0
Southern OR	GRANTS PASS	GRANTS PASS	BB13-2	GRANTS PASS-WHETSTONE-230KV	230	0
Southern OR	GRANTS PASS	GRANTS PASS	R01-B	GRANTS PASS-WHITE CITY-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R02-1	APPLEGATE-GRANTS PASS-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R03	GRANTS PASS-CAVE JCTN-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R03-1	GRANTS PASS-PARK DALE JCT-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R03-2	JEROME PRAIRIE-PARK DALE JCT-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R03-3	JEROME PRAIRIE-SELMA-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R03-4	CAVE JCTN-SELMA-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R06	DOWELL-GRANTS PASS-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R06-1	AGNESS AVE-GRANTS PASS-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R06-2	AGNESS AVE-PARK ST-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R06-3	PARK ST-PARK DALE JCT-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R06-4	DOWELL-PARK DALE JCT-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R1	GRANTS PASS-WHETSTONE-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R1-1	GRANTS PASS-FIELDER CREEK-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R13	GRANTS PASS-TOLO-69KV	69	0
Southern OR	GRANTS PASS	GRANTS PASS	R13-1	GRANTS PASS-ROGUE RIVER-69KV	69	0
Southern OR	GRANTS PASS	GRANTS PASS	R13-6	GRANTS PASS-SAVAGE RAPIDS-69KV	69	0
Southern OR	GRANTS PASS	GRANTS PASS	R13-7	ROGUE RIVER-SAVAGE RAPIDS-69KV	69	0
Southern OR	GRANTS PASS	GRANTS PASS	R24	GRANTS PASS-BEACON-69KV	69	0
Southern OR	GRANTS PASS	GRANTS PASS	R7	DOWELL-GRANTS PASS 2-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R7-1	CAVEMAN-GRANTS PASS-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R7-2	CAVEMAN-MERLIN-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R7-3	EASY VALLEY-MERLIN-115KV	115	0
Southern OR	GRANTS PASS	GRANTS PASS	R7-4	DOWELL-EASY VALLEY-115KV	115	0
Southern OR	GRANTS PASS	JEROME PRAIRIE	5R62	WILD PRAIRIE	12.5	1,630
Southern OR	GRANTS PASS	JEROME PRAIRIE	5R63	WOOD RIVER	12.5	1,600
Southern OR	GRANTS PASS	MERLIN	5R232	MERLIN-HUGO	12.5	1,021
Southern OR	GRANTS PASS	MERLIN	5R234	PARADISE	12.5	1,200
Southern OR	GRANTS PASS	MERLIN	5R248	PLEASANT VALLEY-MERLIN FEEDER	12.5	1,140
Southern OR	GRANTS PASS	MERLIN	5R251	BADGER	12.5	928
Southern OR	GRANTS PASS	MERLIN	5R288	MONARCH	12.5	1,749
Southern OR	GRANTS PASS	OBRIEN	5R106	O'BRIEN	12.5	431
Southern OR	GRANTS PASS	PARK STREET (OR)	5R114	FRUITDALE	12.5	2,185

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Southern OR	GRANTS PASS	PARK STREET (OR)	5R115	ALLEN CREEK	12.5	1,010
Southern OR	GRANTS PASS	PARK STREET (OR)	5R121	NEW HOPE	12.5	1,857
Southern OR	GRANTS PASS	PARK STREET (OR)	5R164	EXPRESS	12.5	320
Southern OR	GRANTS PASS	PARK STREET (OR)	5R169	PORTOLA	12.5	1,384
Southern OR	GRANTS PASS	PROVOLT	5R67	NORTH-SOUTH	12.5	1,444
Southern OR	GRANTS PASS	ROGUE RIVER	5R77	SAVAGE/WIMER	12.5	1,855
Southern OR	GRANTS PASS	ROGUE RIVER	5R78	ROCKY POINT (ROGUE RIVER)	12.5	1,058
Southern OR	GRANTS PASS	ROGUE RIVER	R13-3	GOLD HILL-ROGUE RIVER-69KV	69	0
Southern OR	GRANTS PASS	SELMA	5R65	DEER CREEK	12.5	1,201
Southern OR	KLAMATH FALLS	BEATTY	5L1	BEATTY	12.5	388
Southern OR	KLAMATH FALLS	BLY	5L14	TOWN (BLY)	12.5	417
Southern OR	KLAMATH FALLS	BOISE CASCADE	7L9	BOISE CASCAD	4.1	1
Southern OR	KLAMATH FALLS	BONANZA (OR)	5L7	POE VALLEY	12.5	470
Southern OR	KLAMATH FALLS	BRYANT	5L2	GARY STREET	12.5	2,140
Southern OR	KLAMATH FALLS	BRYANT	5L3	WASHBURN	12.5	1,822
Southern OR	KLAMATH FALLS	BRYANT	5L4	SUMMERS LANE	12.5	1,969
Southern OR	KLAMATH FALLS	BRYANT	5L5	MOYINA HTS.	12.5	2,460
Southern OR	KLAMATH FALLS	CAPTAIN JACK (BPA)	BB02-1A	KLAMATH COGEN-SNOW GOOSE-500KV	500	0
Southern OR	KLAMATH FALLS	CAPTAIN JACK (BPA)	BB02-1B	CAPTAIN JACK(BPA)-SNOW GOOSE-500KV	500	0
Southern OR	KLAMATH FALLS	CASEBEER SUB	4L16	LANGELL VLY	20.8	1,160
Southern OR	KLAMATH FALLS	CHILOQUIN	5L57	CRATER LAKE	12	1,060
Southern OR	KLAMATH FALLS	CHILOQUIN	BB04-1	KLAMATH FALLS-CHILOQUIN-230KV	230	0
Southern OR	KLAMATH FALLS	CHILOQUIN	BB04-2	CHILOQUIN-LA PINE-230KV	230	0
Southern OR	KLAMATH FALLS	CHILOQUIN	K02	CHILOQUIN-MILE HI-115KV	115	0
Southern OR	KLAMATH FALLS	CHILOQUIN	K02-1	CHILOQUIN-FISH HOLE-115KV	115	0
Southern OR	KLAMATH FALLS	CHILOQUIN	K02-2	FISH HOLE-MILE HI-115KV	115	0
Southern OR	KLAMATH FALLS	CHILOQUIN	K11	CHILOQUIN-CHILOQUIN MARKET-69KV	69	0
Southern OR	KLAMATH FALLS	CHILOQUIN	K11-1	BOISE CASCADE-CHILOQUIN-69KV	69	0
Southern OR	KLAMATH FALLS	CHILOQUIN	K11-2	BOISE CASCADE-MODOC-69KV	69	0
Southern OR	KLAMATH FALLS	CHILOQUIN	K11-3	CHILOQUIN MARKET-MODOC-69KV	69	0
Southern OR	KLAMATH FALLS	CHILOQUIN MRKT	5L37	WILLIAMSON	12.5	551
Southern OR	KLAMATH FALLS	DAIRY	5L42	SWAN LAKE	12.5	259
Southern OR	KLAMATH FALLS	DAIRY	5L43	DAIRY	12.5	496
Southern OR	KLAMATH FALLS	DORRIS	K10	DORRIS-TUNNEL TAP-69KV	69	0
Southern OR	KLAMATH FALLS	FISHHOLE	K05-4	BONANZA TAP-FISHHOLE-69KV	69	0
Southern OR	KLAMATH FALLS	FISHHOLE	K05-4A	BONANZA TAP-SPRAGUE RIVER-69KV	69	0
Southern OR	KLAMATH FALLS	FISHHOLE	K05-4B	BEATTY-SPRAGUE RIVER-69KV	69	0
Southern OR	KLAMATH FALLS	FISHHOLE	K05-4C	BEATTY-BLY-69KV	69	0
Southern OR	KLAMATH FALLS	FISHHOLE	K05-4D	BLY-FISHHOLE-69KV	69	0
Southern OR	KLAMATH FALLS	HAMAKER	5L55	KENO	12.5	1,706
Southern OR	KLAMATH FALLS	HAMAKER	5L56	MOUNTAIN	12.5	159
Southern OR	KLAMATH FALLS	HENLEY	5L58	HENLEY	12.5	232
Southern OR	KLAMATH FALLS	HENLEY	5L59	WEST	12.5	537
Southern OR	KLAMATH FALLS	HORNET	5L44	HOMEDALE	12.5	2,811
Southern OR	KLAMATH FALLS	HORNET	5L45	CRYSTAL SPR	12.5	1,471
Southern OR	KLAMATH FALLS	HORNET	K04-2K	HENLEY TAP-MERRILL-69KV	69	0
Southern OR	KLAMATH FALLS	HORNET	K04-2L	HENLEY TAP-HENLEY-69KV	69	0
Southern OR	KLAMATH FALLS	HORNET	K04-2M	HENLEY TAP-HORNET-69KV	69	0
Southern OR	KLAMATH FALLS	JOHN C. BOYLE SUB	BB06-4	BOYLE-COPCO 2-230KV	230	0
Southern OR	KLAMATH FALLS	JOHN C. BOYLE SUB	K12-3	JC BOYLE TAP-KLAMATH FALLS-WEYEHAUSER-69KV	69	0
Southern OR	KLAMATH FALLS	JOHN C. BOYLE SUB	K12-3A	HAMAKER-JC BOYLE TAP-69KV	69	0
Southern OR	KLAMATH FALLS	JOHN C. BOYLE SUB	K12-3B	HAMAKER-WEYERHAUSER TAP-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	BB06-1	BOYLE-KLAMATH FALLS-230KV	230	0
Southern OR	KLAMATH FALLS	KLAMATH	K05-1	KLAMATH FALLS-BONANZA-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K05-1A	KLAMATH FALLS-HORNET-TEXUM TAP-69KV	69	0

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Southern OR	KLAMATH FALLS	KLAMATH	K05-1B	DAIRY-HORNET-LAKEVIEW JCT-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K05-1C	BONANZA TAP-DAIRY-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K05-A	TEXUM-TEXUM TAP-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K05-B	BONANZA-BONANZA TAP-CASEBEER-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K07-1	KLAMATH FALLS-WESTSIDE-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K07-2	KLAMATH FALLS-LAKEVIEW JCT-LAKEPORT-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K07-2A	KLAMATH FALLS-TEXUM-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K07-2B	BRYANT-TEXUM-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K07-2C	BRYANT-BRYANT TAP-ROSS AVE-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K07-2D	LAKEPORT-ROSS AVE-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K07-B	BRYANT TAP-LAKEVIEW JCT-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K08	KLAMATH FALLS-WEYERHAUSER-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K12-3C	RUNNING Y TAP-WEYERHAUSER TAP-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K12-3D	KLAMATH FALLS-RUNNING Y TAP-WESTSIDE-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K12B	WEYERHAUSER-WEYERHAUSER TAP-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K12F	RUNNING Y-RUNNING Y TAP-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K13	KLAMATH FALLS-LAKEPORT-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K13-2	KLAMATH FALLS-WESTSIDE-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K13-3	EASTSIDE-LAKEPORT-WESTSIDE-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K14-2	KLAMATH FALLS-PICARD SW STATION-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K14-2A	DORRIS-KLAMATH FALLS-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH	K14-2B	DORRIS-PICARD SW STATION-69KV	69	0
Southern OR	KLAMATH FALLS	KLAMATH COGEN 500KV SWITCH	BB02-1	KLAMATH CO-GEN - CAPT JACK	500	0
Southern OR	KLAMATH FALLS	KLAMATH COGEN 500KV SWITCH	BB02-2	KLAMATH COGEN-MERIDAN 500KV LINE	500	0
Southern OR	KLAMATH FALLS	LAKEPORT	5L49	WOCUS	12.5	213
Southern OR	KLAMATH FALLS	LAKEPORT	5L54	SOUTH (LAKEPORT)	12.5	2,424
Southern OR	KLAMATH FALLS	LAKEPORT	5L61	JELDWEN	12.5	7
Southern OR	KLAMATH FALLS	MALIN	BB01	MALIN-ROUND MOUNTAIN #2-525KV	500	0
Southern OR	KLAMATH FALLS	MALIN	BB05	KLAMATH FALLS-MALIN-230KV	230	0
Southern OR	KLAMATH FALLS	MALIN	BB14	CAPTAIN JACK-MALIN-500KV	500	0
Southern OR	KLAMATH FALLS	MALIN	BB17	MALIN-BPA WARNER-230KV	230	0
Southern OR	KLAMATH FALLS	MALIN	K04-2E	MALIN TAP-TULELAKE TAP-69KV	69	0
Southern OR	KLAMATH FALLS	MALIN	K04-2F	MALIN TAP-TURKEY HILL-69KV	69	0
Southern OR	KLAMATH FALLS	MALIN	K04-2G	MERRILL JCT-TURKEY HILL-69KV	69	0
Southern OR	KLAMATH FALLS	MALIN	K04-2H	MERRILL JCT-TUNNEL TAP-69KV	69	0
Southern OR	KLAMATH FALLS	MALIN	K04-2J	MERRILL -MERRILL JCT-69KV	69	0
Southern OR	KLAMATH FALLS	MALIN	K09-1	MALIN-MALIN TAP-69KV	69	0
Southern OR	KLAMATH FALLS	MERRILL (OR)	5L26	LAKE (MERRILL)	12.5	858
Southern OR	KLAMATH FALLS	MERRILL (OR)	5L27	NORTH (MERRILL)	12.5	562
Southern OR	KLAMATH FALLS	MERRILL (OR)	K04-3	MERRILL-HORNET-69KV	69	1
Southern OR	KLAMATH FALLS	MERRILL (OR)	K04B	MERRILL JCT-TUNNEL TAP-69KV	69	0
Southern OR	KLAMATH FALLS	MODOC	5L36	MODOC	12.5	845
Southern OR	KLAMATH FALLS	ROSS AVENUE	5L46	ELDORADO	12.5	1,384
Southern OR	KLAMATH FALLS	ROSS AVENUE	5L47	FORT ROAD	12.5	0
Southern OR	KLAMATH FALLS	ROSS AVENUE	5L48	BROAD ST.	12.5	1,201
Southern OR	KLAMATH FALLS	RUNNING Y	4L50	ROCKY POINT FEEDER (RUNNING Y)	20.8	1,456
Southern OR	KLAMATH FALLS	SHASTA WAY	7L25	SHASTA WAY	4.1	430
Southern OR	KLAMATH FALLS	SNOW GOOSE	5L490	SNOW GOOSE CB 5L490	12.5	0
Southern OR	KLAMATH FALLS	SNOW GOOSE	5L491	SNOW GOOSE CB 5L491	12.5	0
Southern OR	KLAMATH FALLS	SPRAGUE RIVER	5L8	SPRAGUE RIVER	12.5	507
Southern OR	KLAMATH FALLS	SUMMER LAKE (BPA)	CO01-2	MALIN-SUMMER LAKE-500KV	500	0
Southern OR	KLAMATH FALLS	TEXUM	5L112	ANDERSON	12.5	1,204
Southern OR	KLAMATH FALLS	TEXUM	5L113	TOWER	12.5	287
Southern OR	KLAMATH FALLS	TEXUM	5L116	ALTAMONT	12.5	1,481
Southern OR	KLAMATH FALLS	TURKEY HILL	5L20	MALIN CITY	12.5	821

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Southern OR	KLAMATH FALLS	TURKEY HILL	5L23	RURAL (TURKEY HILL)	12.5	322
Southern OR	KLAMATH FALLS	WEST SIDE	5L12	ORINDALE	12.5	791
Southern OR	KLAMATH FALLS	WEST SIDE	5L15	CALIFORNIA	12.5	1,359
Southern OR	KLAMATH FALLS	WEST SIDE	5L16	MAIN ST (WEST SIDE HE PLANT)	12.5	108
Southern OR	KLAMATH FALLS	WEST SIDE	5L17	PINE ST (WEST SIDE HE PLANT)	12.5	501
Southern OR	KLAMATH FALLS	WEST SIDE	5L18	RIVERSIDE (WEST SIDE HE PLANT)	12.5	584
Southern OR	KLAMATH FALLS	WEST SIDE	5L19	LAKESHORE	12.5	307
Southern OR	KLAMATH FALLS	WEST SIDE	8L10	CITY WTR PMP	2.4	1
Southern OR	LAKEVIEW	MILE-HI	5L104	INDUSTRIAL	12.5	703
Southern OR	LAKEVIEW	MILE-HI	5L105	BUSINESS	12.5	1,707
Southern OR	LAKEVIEW	MILE-HI	K03	ALTURAS-(BPA)CEDARVILLE-BULLARD-115KV	115	2
Southern OR	LAKEVIEW	MILE-HI	K03-3	DAVIS CREEK-BULLARD-115KV	115	0
Southern OR	LAKEVIEW	MILE-HI	K03-4	BULLARD-MILE HI-115KV	115	0
Southern OR	LAKEVIEW	MILE-HI	K15-1	MILE HI-SVEC-69KV	69	0
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	5R241	CITY	12.5	12
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	5R245	VALLEY VIEW	12.5	987
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	R08-2	ASHLAND-MOUNTAIN AVE(BPA)-115KV	115	0
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	R08-3	MOUNTAIN AVE(BPA)-OAK KNOLL-115KV	115	0
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	R18	ASHLAND-BELKNAP-115KV	115	0
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	R18-1	ASHLAND-BALDY SW STA-BELKNAP-GRIFFIN CREEK-115KV	115	0
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	R18-2	ASHLAND-TALENT-115KV	115	0
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	R18-3	TALENT-VOORHEES CROSSING-115KV	115	0
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	R18-4	GRIFFIN CREEK-VOORHEES CROSSING-115KV	115	0
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	R18-5	BELKNAP-VOORHEES CROSSING-115KV	115	0
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	R18-6	CAMPBELL-VOORHEES CROSSING-115KV	115	0
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	R18-7	BALDY SW STA-CAMPBELL-115KV	115	0
Southern OR	MEDFORD	BEALL LANE	5R359	BEEHIVE	12.5	2
Southern OR	MEDFORD	BEALL LANE	5R361	BULLDOG	12.5	1,720
Southern OR	MEDFORD	BEALL LANE	5R364	BOBCAT	12.5	2,151
Southern OR	MEDFORD	BELKNAP	5R1	KOGAP	12.5	1,024
Southern OR	MEDFORD	BELKNAP	5R2	RIVERSIDE (BELKNAP)	12.5	668
Southern OR	MEDFORD	BELKNAP	5R3	BARNETT	12.5	1,618
Southern OR	MEDFORD	BELKNAP	5R47	STEWART	12.5	2,125
Southern OR	MEDFORD	BROOKHURST	5R118	SPRINGBROOK	12.5	1,840
Southern OR	MEDFORD	BROOKHURST	5R135	ROBERTS (BROOKHURST)	12.5	1,669
Southern OR	MEDFORD	BROOKHURST	5R32	ROXY	12.5	1,790
Southern OR	MEDFORD	BROOKHURST	5R33	CRATER LAKE	12.5	1,728
Southern OR	MEDFORD	BROOKHURST	5R75	SUNRISE (BROOKHURST)	12.5	1,235
Southern OR	MEDFORD	CAMPBELL	5R216	VOORHIES	12.5	851
Southern OR	MEDFORD	CAMPBELL	5R218	PHOENIX	12.5	1,517
Southern OR	MEDFORD	CAMPBELL	5R227	FERN VALLEY	12.5	1,395
Southern OR	MEDFORD	CAMPBELL	5R312	COBRA	12.5	1,499
Southern OR	MEDFORD	DODGE BRIDGE	4R1	SALMON	20.8	1,637
Southern OR	MEDFORD	DODGE BRIDGE	4R35	MEADOWS ROAD	20.8	1,372
Southern OR	MEDFORD	FOOTHILLS	5R252	HILLCREST ROAD	12.5	0
Southern OR	MEDFORD	FOOTHILLS	5R38	HOSPITAL	12.5	773
Southern OR	MEDFORD	FOOTHILLS	5R39	PIERCE ROAD	12.5	1,157
Southern OR	MEDFORD	FRALEY	5R87	TABLE ROCK	12.5	525
Southern OR	MEDFORD	FRALEY	5R88	DODGE BRIDGE	12.5	367
Southern OR	MEDFORD	GOLD HILL	5R103	GOLD HILL	12.5	2018
Southern OR	MEDFORD	GOLD HILL	R13-4	GOLD HILL-TOLO-69KV	69	0
Southern OR	MEDFORD	GRIFFIN CREEK	5R200	ARNOLD LANE	12.5	0
Southern OR	MEDFORD	GRIFFIN CREEK	5R204	HULL RD	12.5	2722
Southern OR	MEDFORD	GRIFFIN CREEK	5R206	GRIFFIN CREEK	12.5	1752
Southern OR	MEDFORD	HUMBUG CREEK	5R287	HUMMINGBIRD	12.5	689

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Southern OR	MEDFORD	JACKSONVILLE	5R284	STAGE RD	12.5	2082
Southern OR	MEDFORD	JACKSONVILLE	5R285	JACKSONVILLE HWY	12.5	2221
Southern OR	MEDFORD	LONE PINE	R10-1	LONE PINE-WHETSTONE-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R10-1B	WHETSTONE-WHITE CITY-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R10-1C	LONE PINE-VILAS ROAD-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R10-1D	VILAS ROAD-WHITE CITY115KV	115	0
Southern OR	MEDFORD	LONE PINE	R12	LONE PINE-PROSPECT CENTRAL-69KV	69	0
Southern OR	MEDFORD	LONE PINE	R12-1	FRALEY-LONE PINE-69KV	69	0
Southern OR	MEDFORD	LONE PINE	R12-2	DODGE BRIDGE-FRALEY-69KV	69	0
Southern OR	MEDFORD	LONE PINE	R12-3	DODGE BRIDGE-PROSPECT CENTRAL-69KV	69	0
Southern OR	MEDFORD	LONE PINE	R19-1	LONE PINE-BELKNAP-69KV	69	0
Southern OR	MEDFORD	LONE PINE	R19-11	FOOTHILL-LONE PINE-69KV	69	0
Southern OR	MEDFORD	LONE PINE	R19-12	BELKNAP-FOOTHILL-69KV	69	0
Southern OR	MEDFORD	LONE PINE	R25	LONE PINE-MEDFORD-69KV	69	0
Southern OR	MEDFORD	LONE PINE	R26	LONE PINE-SAGE ROAD-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R26-1	BROOKHURST-LONE PINE-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R26-2	BROOKHURST-MEDFORD-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R26-3	MEDFORD-SAGE ROAD-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R27-1	LONE PINE-BALDY SW STA-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R27-1A	LONE PINE-ROXY ANN-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R27-1B	BALDY SW STA-ROXY ANN-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R27-2	LONE PINE-PROSPECT CENTRAL-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R27-2A	LONE PINE-STEVENS ROAD-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R27-2B	EAGLE POINT-STEVENS ROAD-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R27-2C	EAGLE POINT-LOST CREEK-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R27-2D	LOST CREEK-TAKELMA-115KV	115	0
Southern OR	MEDFORD	LONE PINE	R27-2E	PROSPECT CENTRAL-TAKELMA-115KV	115	0
Southern OR	MEDFORD	MEDCO	5R280	BOISE CASCADE	12.5	1
Southern OR	MEDFORD	MEDFORD	5R21	MELROSE	12.5	1567
Southern OR	MEDFORD	MEDFORD	5R23	SPRING ST.	12.5	1616
Southern OR	MEDFORD	MEDFORD	5R250	BIG Y	12.5	1858
Southern OR	MEDFORD	MEDFORD	5R253	APPLE	12.5	1110
Southern OR	MEDFORD	MEDFORD	5R257	PEAR	12.5	640
Southern OR	MEDFORD	MEDFORD	5R659	MCLEAN	12.5	676
Southern OR	MEDFORD	MEDFORD	R23-10	HUMBUG CREEK-JACKSONVILLE-MEDFORD-69KV	69	0
Southern OR	MEDFORD	MEDFORD	R23-11	MEDFORD-JACKSONVILLE-69KV	69	0
Southern OR	MEDFORD	MEDFORD	R23-13	JACKSONVILLE-RUCH-69KV	69	0
Southern OR	MEDFORD	MEDFORD	R23-14	HUMBUG CREEK-RUCH-69KV	69	0
Southern OR	MEDFORD	MERIDIAN	BB07	LONE PINE #1-MERIDIAN-230KV	230	0
Southern OR	MEDFORD	MERIDIAN	BB13-1	MERIDIAN-WHETSTONE-230KV	230	0
Southern OR	MEDFORD	MERIDIAN	BB16	LONE PINE #2-MERIDIAN-230KV	230	0
Southern OR	MEDFORD	OAK KNOLL	5R55	SISKIYOU	12.5	1507
Southern OR	MEDFORD	OAK KNOLL	5R56	HIGHWAY 99	12.5	119
Southern OR	MEDFORD	OAK KNOLL	R08	TAP TO OAK KNOLL-115KV	115	0
Southern OR	MEDFORD	OAK KNOLL	R08-1	OAK KNOLL-ASHLAND-115KV	115	1
Southern OR	MEDFORD	OAK KNOLL	R11-2A	BLADY SW STA-OAK KNOLL-115KV	115	0
Southern OR	MEDFORD	OAK KNOLL	R11-2C	GREEN SPRINGS-OAK KNOLL-115KV	115	0
Southern OR	MEDFORD	OAK KNOLL	R11-2E	BALDY SW STA-COPCO2-OAK KNOLL-115KV	115	0
Southern OR	MEDFORD	PROSPECT 3	5R290	P-3 FOREBAY	12.5	1
Southern OR	MEDFORD	PROSPECT CNTRL	5R40	NEW CASCADE	12.5	334
Southern OR	MEDFORD	PROSPECT CNTRL	8R5	COTTAGES	2.4	0
Southern OR	MEDFORD	PROSPECT CNTRL	8R8	DAM & FOREBAY	2.4	0
Southern OR	MEDFORD	PROSPECT CNTRL	R14	PROSPECT CNTRL-PROSPECT #3-69KV	69	1
Southern OR	MEDFORD	PROSPECT CNTRL	R14-1	PROSPECT CENTRAL-RED BLANKET-69KV	69	0
Southern OR	MEDFORD	PROSPECT CNTRL	R14-2	PROSPECT 3-RED BLANKET-69KV	69	1

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Southern OR	MEDFORD	PROSPECT CNTRL	R15	PROSPECT-PROSPECT CNTRL #1-69KV	69	0
Southern OR	MEDFORD	PROSPECT CNTRL	R16	PROSPECT-PROSPECT CNTRL #2-69KV	69	0
Southern OR	MEDFORD	PROSPECT CNTRL	R17	PROSPECT-PROSPECT CNTRL #2-69KV	69	0
Southern OR	MEDFORD	RED BLANKET	7R5	PROSPECT	4.1	396
Southern OR	MEDFORD	ROXY ANN	5R350	St. Bernard	12.5	1286
Southern OR	MEDFORD	ROXY ANN	5R352	ROXYANN2	12.5	0
Southern OR	MEDFORD	ROXY ANN	5R354	RACCOON	12.5	1567
Southern OR	MEDFORD	ROXY ANN	5R356	ROXY ANN CB5R356	12.5	0
Southern OR	MEDFORD	RUCH	5R68	APPLEGATE	12.5	930
Southern OR	MEDFORD	RUCH	5R69	RUCH	12.5	541
Southern OR	MEDFORD	SAGE ROAD (OR)	5R209	TIMBER PROD	12.5	1
Southern OR	MEDFORD	SAGE ROAD (OR)	5R211	COLUMBUS	12.5	1944
Southern OR	MEDFORD	SAGE ROAD (OR)	5R226	BOISE	12.5	921
Southern OR	MEDFORD	SAGE ROAD (OR)	5R27	MCANDREWS	12.5	111
Southern OR	MEDFORD	SAGE ROAD (OR)	5R28	ROSS	12.5	1996
Southern OR	MEDFORD	SAGE ROAD (OR)	5R29	EDWARDS	12.5	741
Southern OR	MEDFORD	SAGE ROAD (OR)	R10-2	SAGE ROAD-WHETSTONE-115KV	115	0
Southern OR	MEDFORD	SAGE ROAD (OR)	R10-2A	BEALL LANE-MEDCO-115KV	115	0
Southern OR	MEDFORD	SAGE ROAD (OR)	R10-2B	BEALL LANE-SCENIC-115KV	115	0
Southern OR	MEDFORD	SAGE ROAD (OR)	R10-2D	MEDCO-SAGE ROAD-115KV	115	0
Southern OR	MEDFORD	SAGE ROAD (OR)	R27-3	BALDY SW STA-SAGE ROAD-115KV	115	0
Southern OR	MEDFORD	SAGE ROAD (OR)	R27-4	GRIFFIN CREEK-SAGE ROAD-115KV	115	0
Southern OR	MEDFORD	SAGE ROAD (OR)	R27-4A	GRIFFIN CREEK-JACKSONVILLE-115KV	115	0
Southern OR	MEDFORD	SAGE ROAD (OR)	R27-4B	JACKSONVILLE-SAGE ROAD-115KV	115	0
Southern OR	MEDFORD	SCENIC	5R174	UPTON	12.5	2002
Southern OR	MEDFORD	SCENIC	5R180	HEAD RD	12.5	1171
Southern OR	MEDFORD	SCENIC	5R182	TAYLOR RD	12.5	1755
Southern OR	MEDFORD	SCENIC	5R184	CHENEY	12.5	1493
Southern OR	MEDFORD	SCENIC	R13-2	GOLD HILL-SCENIC-69KV	69	0
Southern OR	MEDFORD	SCENIC	R13-5	SCENIC-TOLO-69KV	69	0
Southern OR	MEDFORD	STEVENS ROAD	4R13	HENRY MILLER	20.8	2350
Southern OR	MEDFORD	STEVENS ROAD	4R17	Stingray	20.8	2563
Southern OR	MEDFORD	STEVENS ROAD	4R41	ANTELOPE	20.8	1149
Southern OR	MEDFORD	TAKELMA	4R9	LOST CK. (TAKELMA)	20.8	2651
Southern OR	MEDFORD	TALENT	5R237	TALENT	12.5	2487
Southern OR	MEDFORD	TALENT	5R238	ANDERSON CRK	12.5	1730
Southern OR	MEDFORD	TALENT	5R239	HARTLEY ROAD	12.5	1551
Southern OR	MEDFORD	TALENT	5R240	NORTH HWY	12.5	1184
Southern OR	MEDFORD	TOLO	5R90	TBL ROCK LBR	12.5	161
Southern OR	MEDFORD	TOLO	5R91	SAMS VALLEY	12.5	654
Southern OR	MEDFORD	TOLO	5R92	KIRTLAND RD	12.5	203
Southern OR	MEDFORD	VILAS ROAD	5R110	MCLAUGHLIN	12.5	955
Southern OR	MEDFORD	VILAS ROAD	5R146	KING CENTER	12.5	1,447
Southern OR	MEDFORD	VILAS ROAD	5R305	WEBFOOT	12.5	874
Southern OR	MEDFORD	WHETSTONE	R10-2C	SCENIC-WHETSONE-115KV	115	0
Southern OR	MEDFORD	WHETSTONE	R1-2	FIELDER CREEK-WHETSTONE115KV	115	0
Southern OR	MEDFORD	WHITE CITY	5R11	EAGLE POINT	12.5	1,479
Southern OR	MEDFORD	WHITE CITY	5R12	INDUSTRIAL	12.5	35
Southern OR	MEDFORD	WHITE CITY	5R13	FIR-PLY	12.5	23
Southern OR	MEDFORD	WHITE CITY	5R14	AGATE	12.5	110
Southern OR	MEDFORD	WHITE CITY	5R19	3M	12.5	121
Southern OR	MEDFORD	WHITE CITY	5R66	4 CORNERS	12.5	1,792
Southern OR	MEDFORD	WHITE CITY	5R76	AVE C	12.5	81
Southern OR	ROSEBURG/MYRTLECREEK	ALVEY (BPA)	BB03	ALVEY-DIXONVILLE-500KV	500	0
Southern OR	ROSEBURG/MYRTLECREEK	ALVEY (BPA)	WI03	ALVEY-DIXONVILLE-230KV	230	0

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

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Southern OR	ROSEBURG/MYRTLECREEK	CANYONVILLE	5U46	CANYONVILLE	12.5	389
Southern OR	ROSEBURG/MYRTLECREEK	CANYONVILLE	5U52	BEALS CREEK FEEDER	12.5	884
Southern OR	ROSEBURG/MYRTLECREEK	CARNES	5U44	RND PRARIE	12.5	418
Southern OR	ROSEBURG/MYRTLECREEK	CARNES	5U45	GREEN	12.5	0
Southern OR	ROSEBURG/MYRTLECREEK	CLEARWATER	U07	CLEARWATER-LEMOLO #1-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	CLEARWATER	U08	CLEARWATER-LEMOLO #2-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	CLEARWATER	U09	CLEARWATER-CLEARWATER #1-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	CLEARWATER #1 SUB	6U17	BRIGGS	7.2	3
Southern OR	ROSEBURG/MYRTLECREEK	CLEARWATER #2 SUB	6U33	CLEARWATER	7.2	95
Southern OR	ROSEBURG/MYRTLECREEK	CLOAKE	4U37	RUSA	20.8	1
Southern OR	ROSEBURG/MYRTLECREEK	CLOAKE	4U38	HARVARD	20.8	2,956
Southern OR	ROSEBURG/MYRTLECREEK	CLOAKE	4U39	GOEDECK	20.8	1,273
Southern OR	ROSEBURG/MYRTLECREEK	DAYS CREEK	U01	DAYS CREEK-PROSPECT CNTRL-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DAYS CREEK	U01-1	DAYS CREEK-TILLER-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DAYS CREEK	U01-2	PROSPECT CENTRAL-TILLER-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DAYS CREEK	U14-1	CANYONVILLE-DAYS CREEK-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DAYS CREEK	U14-2	CANYONVILLE-RIDDLE-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DAYS CREEK	U14-3	RIDDLE-RIDDLE VENEER-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DAYS CREEK	U14-4	NICKEL MOUNTAIN-RIDDLE VENEER-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DAYS CREEK	U17-2	DAYS CREEK-NICKEL MOUNTAIN-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	BB08-1	DIXONVILLE-NICKEL MOUNTAIN-GRANTS PASS-230KV	230	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	BB08-2	DIXONVILLE-HANNA TAP-230KV	230	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	BB09	DIXONVILLE-RESTON-230KV	230	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	BB09-1	DIXONVILLE-BPA-FAIRVIEW-230KV	230	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	BB10	DIXONVILLE-MERIDIAN-500KV	500	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	BB12	DIXONVILLE 500KV-DIXONVILLE-230KV	230	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U02	DIXONVILLE-DAYS CREEK-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U03	DIXONVILLE-TOKETEE SW STA-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U03-1	DIXONVILLE-GLIDE-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U03-2	GLIDE-STEAMBOAT-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U03-3	ILLAHEE FLAT-STEAMBOAT-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U03-4	ILLAHEE FLAT-TOKETEE SW STA-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U05	DIXONVILLE-SODA SPRINGS-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U05-1	BOUNDARY ROAD-DIXONVILLE-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U05-2	BOUNDARY ROAD-ILLAHEE FLAT-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U05-3	ILLAHEE FLAT-SODA SPRINGS-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U10	CLOAKE-DIXONVILLE-GREEN-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U10-4	DIXONVILLE-SOUTHGATE-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U10-5	SOUTHGATE-SOUTHGATE TAP-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U10-6	CLOAKE-SOUTHGATE TAP-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U10-7	LOOKINGLASS TAP-SOUTHGATE TAP-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U10-8	GREEN-LOOKINGLASS TAP-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U11	DIXONVILLE-ROBERTS CREEK-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U12-3	DIXONVILLE-WINCHESTER #1-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U12-3A	DIXONVILLE-SUTHERLIN-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U12-3B	OAKLAND-SUTHERLIN-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U12-3C	DOUGLAS COUNTY FOREST PRODUCTS TAP-OAKLAND-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U12-3D	DOUGLAS COUNTY FOREST PROD TAP-WINCHESTER-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U12-4	DIXONVILLE-WINCHESTER #2-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U12-4A	DIXONVILLE-ROSEBURG-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U12-4B	ROSEBURG-WINCHESTER-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	DIXONVILLE	U15	DIXONVILLE-DOUGLAS VENEER-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	GARDEN VALLEY	4U80	EDENBOWER	20.8	806
Southern OR	ROSEBURG/MYRTLECREEK	GARDEN VALLEY	4U81	VALLEY	20.8	1,385

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Southern OR	ROSEBURG/MYRTLECREEK	GLIDE SUBSTATION	5U83	IDLEYLD	12.5	988
Southern OR	ROSEBURG/MYRTLECREEK	GLIDE SUBSTATION	5U84	LITTLE RIVER	12.5	1,374
Southern OR	ROSEBURG/MYRTLECREEK	GREEN SUBSTATION	5U32	SAFARI	12.5	2,189
Southern OR	ROSEBURG/MYRTLECREEK	GREEN SUBSTATION	5U33	SUNNYSLOPE	12.5	1,638
Southern OR	ROSEBURG/MYRTLECREEK	GREEN SUBSTATION	U10-3A	CARNES-GREEN-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	GREEN SUBSTATION	U10-3B	CARNES-ROBERTS MOUNTAIN TAP-WINSTON-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	GREEN SUBSTATION	U10-3C	CARNES-ROBERTS CREEK-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	ILLAHEE FLATS	6U13	ILLAHEE FLATS SINGLE PHASE RECLOSER	7.2	27
Southern OR	ROSEBURG/MYRTLECREEK	LEMOLO # 1	5U920	DIAMOND LAKE	12.5	179
Southern OR	ROSEBURG/MYRTLECREEK	MYRTLE CREEK	5U76	SUPER Y	12.5	1,540
Southern OR	ROSEBURG/MYRTLECREEK	MYRTLE CREEK	5U77	BOOMER HILL	12.5	2,312
Southern OR	ROSEBURG/MYRTLECREEK	NICKEL MOUNTAIN	BB11	NICKEL MOUNTAIN-HANNA TAP SW STATION-230KV	230	0
Southern OR	ROSEBURG/MYRTLECREEK	OAKLAND (OR)	5U11	UMPQUA	12.5	1,264
Southern OR	ROSEBURG/MYRTLECREEK	OAKLAND (OR)	5U12	STAGECOACH	12.5	556
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE	5U1	TRI CITY	12.5	994
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE	5U2	COW CREEK	12.5	1,562
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE	5U3	HANNA	12.5	284
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE	U13-2	MYRTLE CREEK-RIDDLE-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE-VENEER	5U23	FORD MILL	12.5	1
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE-VENEER	5U50	RFP-LVL (EWP)	12	30
Southern OR	ROSEBURG/MYRTLECREEK	ROBERTS CREEK	U10-3	GREEN-ROBERTS CREEK-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	ROBERTS CREEK	U13	MYRTLE CREEK-ROBERTS CREEK-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	ROBERTS CREEK	U13-3	DILLARD TAP-ROBERTS CREEK-ROBERTS MTN TAP-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	ROBERTS CREEK	U13-4	DILLARD TAP-ROSEBURG LUMBER-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	ROBERTS CREEK	U13-5	DILLARD TAP-MYRTLE CREEK-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	ROSEBURG	4U10	DIAMOND	20.8	2,521
Southern OR	ROSEBURG/MYRTLECREEK	ROSEBURG	4U22	DIXON	20.8	1,140
Southern OR	ROSEBURG/MYRTLECREEK	ROSEBURG	4U5	DOUGLAS	20.8	2,075
Southern OR	ROSEBURG/MYRTLECREEK	SLIDE CREEK	6U76	SLIDE CREEK CAMP	7.2	4
Southern OR	ROSEBURG/MYRTLECREEK	SODA SPRINGS HE PLT	6U1	DRY CREEK	7.2	1
Southern OR	ROSEBURG/MYRTLECREEK	SODA SPRINGS HE PLT	6U10	CB6U10	12.5	1
Southern OR	ROSEBURG/MYRTLECREEK	SODA SPRINGS HE PLT	U04	SODA SPRINGS-TOKETEE SW STA-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	SODA SPRINGS HE PLT	U04-1	SLIDE CREEK-SODA SPRINGS-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	SODA SPRINGS HE PLT	U04-2	FISH CREEK-SLIDE CREEK-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	SODA SPRINGS HE PLT	U04-3	FISH CREEK-TOKETEE-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	SODA SPRINGS HE PLT	U04-4	TOKETEE-TOKETEE SW STA-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	SOUTHGATE	4U30	SHADY POINT	20.8	1,598
Southern OR	ROSEBURG/MYRTLECREEK	SOUTHGATE	4U31	BOOTH	20.8	1,563
Southern OR	ROSEBURG/MYRTLECREEK	STEAMBOAT	6U18	STEAMBOAT	7.2	22
Southern OR	ROSEBURG/MYRTLECREEK	SUTHERLIN	5U35	NON-PAREIL	12.5	1,307
Southern OR	ROSEBURG/MYRTLECREEK	SUTHERLIN	5U36	DEADY	12.5	1,362
Southern OR	ROSEBURG/MYRTLECREEK	SUTHERLIN	5U56	Industrial	12.5	547
Southern OR	ROSEBURG/MYRTLECREEK	TILLER	5U89	JACKSON CRK	12.5	303
Southern OR	ROSEBURG/MYRTLECREEK	TOKETEE	6U21	BACK UP FOR CLEARWATER 6U33	6.9	0
Southern OR	ROSEBURG/MYRTLECREEK	TOKETEE	8U12	TOKETEE CITY	2.4	19
Southern OR	ROSEBURG/MYRTLECREEK	TOKETEE	U06	TOKETEE-CLEARWATER-115KV	115	0
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	4U18	WILBUR	20.8	1,638
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	5U15	NEWTON CREEK	12.5	1,782
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	5U17	FISHER	12.5	771
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	5U19	EVANS	12.5	734
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	U10-9	CLOAKE-WINCHESTER-69KV	69	0

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	U10-9A	GARDEN VALLEY-WINCHESTER-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	U10-9B	CLOAKE-GARDEN VALLEY-69KV	69	0
Southern OR	ROSEBURG/MYRTLECREEK	WINSTON	5U48	BROCKWAY	12.5	863
Southern OR	ROSEBURG/MYRTLECREEK	WINSTON	5U49	DILLARD	12.5	1,459
Willamette Valley	ALBANY	BPA ALBANY	WI09	BPA ALBANY-HAZELWOOD-115KV	115	0
Willamette Valley	ALBANY	HAZELWOOD	4M335	WEST HIGH	20.8	1,476
Willamette Valley	ALBANY	HAZELWOOD	4M336	RIVERVIEW (HAZELWOOD)	20.8	1,235
Willamette Valley	ALBANY	HAZELWOOD	WI07	HAZELWOOD-FRY-115KV	115	0
Willamette Valley	ALBANY	HAZELWOOD	WI10	HAZELWOOD-MARYS RIVER-115KV	115	0
Willamette Valley	ALBANY	HAZELWOOD	WI10-1	HAZELWOOD-GRANT-115KV	115	0
Willamette Valley	ALBANY	HAZELWOOD	WI13-1	HAZELWOOD-VINE ST-69KV	69	0
Willamette Valley	ALBANY	HAZELWOOD	WI14-1	HAZELWOOD-QUEEN AVE-69KV	69	0
Willamette Valley	ALBANY	JEFFERSON (OR)	4M117	MARION	20.8	720
Willamette Valley	ALBANY	JEFFERSON (OR)	4M125	MINT	20.8	2,483
Willamette Valley	ALBANY	MURDER CREEK	4M243	SCRAVEL HILL	20.8	3,758
Willamette Valley	ALBANY	MURDER CREEK	4M245	RURAL NW	20.8	2,248
Willamette Valley	ALBANY	MURDER CREEK	4M249	DURA-PACIFIC	20.8	181
Willamette Valley	ALBANY	MURDER CREEK	4M250	INDUSTRIAL	20.8	4
Willamette Valley	ALBANY	MURDER CREEK	5M131	WAH CHANG SOUTH	12.5	1
Willamette Valley	ALBANY	MURDER CREEK	5M132	WAH CHANG WEST	12.5	0
Willamette Valley	ALBANY	OREMET	4M295	OAK CREEK	20.8	100
Willamette Valley	ALBANY	OREMET	4M296	ROGERSDALE	20.8	2,159
Willamette Valley	ALBANY	OREMET	5M19	OREMET	12.5	1
Willamette Valley	ALBANY	OREMET	5M20	OREMET-BPA	12.5	0
Willamette Valley	ALBANY	PARRISH GAP	WI15-1	PARRISH GAP-STAYTON-69KV	69	0
Willamette Valley	ALBANY	PARRISH GAP	WI15-3	PARRISH GAP-JEFFERSON-69KV	69	0
Willamette Valley	ALBANY	PARRISH GAP	WI15-4	JEFFERSON-JEFFERSON TAP-69KV	69	1
Willamette Valley	ALBANY	QUEEN AVE	4M217	SANTIAM	20.8	1,887
Willamette Valley	ALBANY	QUEEN AVE	4M258	HILL STREET	20.8	2,574
Willamette Valley	ALBANY	QUEEN AVE	4M261	WAVERLY	20.8	3,645
Willamette Valley	ALBANY	QUEEN AVE	4M262	GEARY STREET	20.8	2,633
Willamette Valley	ALBANY	QUEEN AVE	WI14-2	QUEEN-SCIO-69KV	69	0
Willamette Valley	ALBANY	QUEEN AVE	WI17	JEFFERSON JCT-JEFFERSON TAP-69KV	69	0
Willamette Valley	ALBANY	VINE STREET	4M15	FERRY	20.8	2,894
Willamette Valley	ALBANY	VINE STREET	4M16	WATER STREET	20.8	4,228
Willamette Valley	ALBANY	VINE STREET	WI13-3	VINE ST-INDEPENDENCE-69KV	69	0
Willamette Valley	ALBANY	VINE STREET	WI13-3A	VINE ST-SW3M215-69KV	69	0
Willamette Valley	ALBANY	VINE STREET	WI13-3B	INDEPENDENCE-SW3M215-69KV	69	0
Willamette Valley	ALBANY	VINE STREET	WI16	VINE STREET-JEFFERSON TAP-69KV	69	0
Willamette Valley	CORVALLIS	BUCHANAN	4M130	HEWLETT PACKARD	20.8	2,701
Willamette Valley	CORVALLIS	BUCHANAN	4M133	PEORIA	20.8	2,437
Willamette Valley	CORVALLIS	BUCHANAN	4M134	N. NINTH ST.	20.8	2,592
Willamette Valley	CORVALLIS	BUCHANAN	WI06-3	BUCHANAN-DIXON-115KV	115	0
Willamette Valley	CORVALLIS	CIRCLE BLVD	4M394	H. P. #1	20.8	1
Willamette Valley	CORVALLIS	CIRCLE BLVD	4M396	H. P. #2	20.8	0
Willamette Valley	CORVALLIS	CIRCLE BLVD	4M427	H. P. #3	20.8	1
Willamette Valley	CORVALLIS	CIRCLE BLVD	4M428	H. P. #4	20.8	0
Willamette Valley	CORVALLIS	CIRCLE BLVD	4M429	H. P. #5	20.8	1
Willamette Valley	CORVALLIS	CIRCLE BLVD	4M430	H. P. #6	20.8	0
Willamette Valley	CORVALLIS	CIRCLE BLVD	WI06-2	CIRCLE BLVD-BUCHANAN-115KV	115	0
Willamette Valley	CORVALLIS	DIXON	7M26	FOURTH ST.	4.1	234

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Willamette Valley	CORVALLIS	DIXON	7M29	SECOND ST.	4.1	276
Willamette Valley	CORVALLIS	GRANT ST	4M265	HIGH SCHOOL	20.8	2,485
Willamette Valley	CORVALLIS	GRANT ST	4M266	CHINTIMINI	20.8	2,536
Willamette Valley	CORVALLIS	GRANT ST	4M268	KINGS ROAD	20.8	2,565
Willamette Valley	CORVALLIS	GRANT ST	4M269	29TH STREET	20.8	3,303
Willamette Valley	CORVALLIS	GRANT ST	WI10-2	GRANT-HILLVIEW-115KV	115	0
Willamette Valley	CORVALLIS	GRANT ST TEMP	4M265T	HIGH SCHOOL TEMP	12.5	0
Willamette Valley	CORVALLIS	GRANT ST TEMP	4M266T	CHINTIMINI TEMP	12.5	0
Willamette Valley	CORVALLIS	GRANT ST TEMP	4M268T	KINGS ROAD TEMP	12.5	0
Willamette Valley	CORVALLIS	GRANT ST TEMP	4M269T	29TH ST TEMP	12.5	0
Willamette Valley	CORVALLIS	HILLVIEW	4M180	WEST HILLS	20.8	1,909
Willamette Valley	CORVALLIS	HILLVIEW	4M181	PHILOMATH	20.8	1,181
Willamette Valley	CORVALLIS	HILLVIEW	4M182	SUNSET	20.8	1,765
Willamette Valley	CORVALLIS	HILLVIEW	4M185	PLYMOUTH	20.8	2,010
Willamette Valley	CORVALLIS	MARYS RIVER	4M151	GREENBERRY	20.8	3,613
Willamette Valley	CORVALLIS	MARYS RIVER	4M152	AVERY	20.8	187
Willamette Valley	CORVALLIS	MARYS RIVER	4M153	GALLAGHER	20.8	159
Willamette Valley	CORVALLIS	MARYS RIVER	WI06-4	MARY'S RIVER-DIXON-115KV	115	0
Willamette Valley	CORVALLIS	MARYS RIVER	WI10-3	MARY'S RIVER-HILLVIEW-115KV	115	0
Willamette Valley	COTTAGE GROVE/J.CITY	ALVEY (BPA)	WI12	BPA ALVEY-VILLAGE GREEN-115KV	115	1
Willamette Valley	COTTAGE GROVE/J.CITY	COBURG	4M220	DETERING	20.8	587
Willamette Valley	COTTAGE GROVE/J.CITY	DIAMOND HILL	WI02-2	DIAMOND HILL-BPA ALVEY-230KV	230	0
Willamette Valley	COTTAGE GROVE/J.CITY	DIAMOND HILL	WI02-2A	DIAMOND HILL-MCKENZIE(EWEB)-230KV	230	0
Willamette Valley	COTTAGE GROVE/J.CITY	DIAMOND HILL	WI02-2B	BPA ALVEY-MCKENZIE(EWEB)-230KV	230	0
Willamette Valley	COTTAGE GROVE/J.CITY	DIAMOND HILL	WI19-2	DIAMOND HILL-LANCASTER TAP-69KV	69	0
Willamette Valley	COTTAGE GROVE/J.CITY	DIAMOND HILL	WI20	DIAMOND HILL-EWEB MCKENZIE-69KV	69	0
Willamette Valley	COTTAGE GROVE/J.CITY	DIAMOND HILL	WI21	DIAMOND HILL-JUNCTION CITY-69KV	69	0
Willamette Valley	COTTAGE GROVE/J.CITY	GOSHEN (OR)	4M360	GOSHEN FDR	20.8	1,623
Willamette Valley	COTTAGE GROVE/J.CITY	HARRISBURG SUB	4M400	TERRITORIAL	20.8	1,847
Willamette Valley	COTTAGE GROVE/J.CITY	JUNCTION CITY	4M102	6TH STREET	20.8	1,167
Willamette Valley	COTTAGE GROVE/J.CITY	JUNCTION CITY	4M99	PRAIRIE ROAD	20.8	1,003
Willamette Valley	COTTAGE GROVE/J.CITY	JUNCTION CITY	W121-1	WILKINS CORNER-VAUGHN TAP-69KV	69	0
Willamette Valley	COTTAGE GROVE/J.CITY	JUNCTION CITY	W121-2	JUNCTION CITY-VAUGHN TAP-69KV	69	0
Willamette Valley	COTTAGE GROVE/J.CITY	LANCASTER	4M209	MONROE	20.8	1,097
Willamette Valley	COTTAGE GROVE/J.CITY	MARTIN CREEK (BPA)	WI12B	BPA MARTIN CREEK-VLG GREEN-115KV	115	1
Willamette Valley	COTTAGE GROVE/J.CITY	VILLAGE GREEN	4M84	NORTH SIDE	20.8	2,400
Willamette Valley	COTTAGE GROVE/J.CITY	VILLAGE GREEN	4M86	MADISON	20.8	1,596
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M100	RURAL (DALLAS)	20.8	1,856
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M201	INDUSTRIAL	20.8	3,084
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M202	ELLENDALE	20.8	2,978
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M238	DALLAS	20.8	2,310
Willamette Valley	DALLAS/INDEPENDENCE	INDEPENDENCE	4M22	RICKREAL	20.8	3,325
Willamette Valley	DALLAS/INDEPENDENCE	INDEPENDENCE	4M25	BUENA VISTA	20.8	2,028
Willamette Valley	DALLAS/INDEPENDENCE	MONPAC	WI05	MONPAC-BPA SALEM-115KV	115	0
Willamette Valley	DALLAS/INDEPENDENCE	MONPAC	WI05-1	DALLAS-MONPOC-115KV	115	0
Willamette Valley	DALLAS/INDEPENDENCE	MONPAC	WI05-2	BPA SALEM-DALLAS-115KV	115	0
Willamette Valley	DALLAS/INDEPENDENCE	MONPAC	WI13-4	MONPAC-INDEPENDENCE-69KV	69	0
Willamette Valley	LEBANON	BROWNSVILLE	4M17	CALAPOOIA	12.5	1,700
Willamette Valley	LEBANON	BROWNSVILLE	WI18-2	HALSEY-BROWNSVILLE-69KV	69	0
Willamette Valley	LEBANON	CALAPOOYA	4M850	SPAULDING	20.8	1,118
Willamette Valley	LEBANON	CALAPOOYA	4M851	BEAR	20.8	32

Oregon 2020 Active Circuits with Substation, Voltage and Customer Counts

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count
Willamette Valley	LEBANON	CALAPOOYA	WI118-1	CALAPOOYA-BROWNSVILLE-69KV	69	0
Willamette Valley	LEBANON	CALAPOOYA	WI23	CALAPOOYA-HALSEY-69KV	69	0
Willamette Valley	LEBANON	CROWFOOT	4M204	CROWFOOT	20.8	1,505
Willamette Valley	LEBANON	CROWFOOT	4M206	US PLYWOOD (LEBANON)	20.8	1,868
Willamette Valley	LEBANON	DIAMOND HILL	WI02-1A	CALAPOOYA-DIAMOND HILL-230KV	230	0
Willamette Valley	LEBANON	DIAMOND HILL	WI19	DIAMOND HILL-BROWNSVILLE-69KV	69	0
Willamette Valley	LEBANON	FRY	WI01-A	FRY-PARRISH GAP-230KV	230	0
Willamette Valley	LEBANON	FRY	WI02-1	FRY-DIAMOND HILL	230	0
Willamette Valley	LEBANON	FRY	WI02-1B	CALAPOOYA-FRY-230KV	230	0
Willamette Valley	LEBANON	FRY	WI06	FRY-MARYS RIVER-115KV	115	0
Willamette Valley	LEBANON	FRY	WI06-1	FRY-CIRCLE BLVD-115KV	115	0
Willamette Valley	LEBANON	FRY	WI08	FRY-WESTERN KRAFT-115KV	115	0
Willamette Valley	LEBANON	FRY	WI08-1	FRY-MURDER CREEK-115KV	115	0
Willamette Valley	LEBANON	FRY	WI08-2	MURDER CREEK-WESTREN KRAFT-115KV	115	0
Willamette Valley	LEBANON	FRY	WI08-3	WESTERN KRAFT-CONSER TAP-115KV	115	0
Willamette Valley	LEBANON	FRY	WI11	FRY-FOSTER-115KV	115	0
Willamette Valley	LEBANON	FRY	WI11-1	FOSTER-BPA LEBANON-115KV	115	0
Willamette Valley	LEBANON	FRY	WI11-2	FRY-LEBANON-115KV	115	0
Willamette Valley	LEBANON	FRY	WI11-3	CROWFOOT-LEBANON-115KV	115	0
Willamette Valley	LEBANON	FRY	WI11-4	CROWFOOT-SWEET HOME-115KV	115	0
Willamette Valley	LEBANON	FRY	WI11-5	FOSTER-SWEET HOME-115KV	115	0
Willamette Valley	LEBANON	HALSEY SW STA	WI19-1	HALSEY-LANCASTER TAP-69KV	69	0
Willamette Valley	LEBANON	LEBANON	4M61	TANGENT	20.8	2,622
Willamette Valley	LEBANON	LEBANON	4M62	RALSTON	20.8	2,004
Willamette Valley	LEBANON	LEBANON	4M63	TENNESSEE	20.8	1,790
Willamette Valley	LEBANON	LEBANON	4M79	CROWN Z	20.8	1,166
Willamette Valley	LEBANON	SWEET HOME	4M37	HOLLEY	20.8	2,033
Willamette Valley	LEBANON	SWEET HOME	4M38	NARROWS	20.8	976
Willamette Valley	LEBANON	SWEET HOME	4M93	AMES CREEK	20.8	1,678
Willamette Valley	LEBANON	SWEET HOME	4M94	FOSTER	20.8	2,409
Willamette Valley	PRINEVILLE	BALDWIN ROAD	CO14-5	BALDWIN ROAD-HOUSTON LAKE-115KV	115	0
Willamette Valley	PRINEVILLE	BALDWIN ROAD	CO29	BALDWIN ROAD-PILLAR(APPLE)	115	1
Willamette Valley	PRINEVILLE	HOUSTON LAKE	CO03-2	HOUSTON LAKE-POWELL BUTTE-115KV	115	0
Willamette Valley	PRINEVILLE	HOUSTON LAKE	CO22	HOUSTON LAKE-PRN1(FACEBOOK)-115KV	115	0
Willamette Valley	PRINEVILLE	HOUSTON LAKE	CO23	HOUSTON LAKE-PRN2(FACEBOOK)-115KV	115	0
Willamette Valley	PRINEVILLE	PONDEROSA-P	CO24	GALA SOLAR-PONDEROSA-115KV	115	0
Willamette Valley	STAYTON	BPA SANTIAM	ZB001	BPA SANTIAM-BPA ALBANY#1-230KV	230	0
Willamette Valley	STAYTON	LYONS	4M120	MILL CITY	20.8	731
Willamette Valley	STAYTON	LYONS	4M70	MEHAMA	20.8	2,146
Willamette Valley	STAYTON	OLD LYONS	WI14-3A	TAP TO EVERGREEN BIO POWER-69KV	69	1
Willamette Valley	STAYTON	OLD LYONS	WI14-4	LYONS-SANTIAM SWITCH STATION-69KV	69	0
Willamette Valley	STAYTON	PARRISH GAP	WI01-B	PARRISH GAP-PGE BETHEL-230KV	230	0
Willamette Valley	STAYTON	SCIO	5M126	THOMAS	12.5	1,569
Willamette Valley	STAYTON	SCIO	WI14-3	SCIO-LYONS-69KV	69	0
Willamette Valley	STAYTON	STAYTON	4M19	AUMSVILLE	20.8	3,380
Willamette Valley	STAYTON	STAYTON	4M353	WEST STAYTON	20.8	3,504
Willamette Valley	STAYTON	STAYTON	4M370	CASCADE	20.8	1,581
Willamette Valley	STAYTON	STAYTON	4M50	3RD STREET	20.8	913
Willamette Valley	STAYTON	STAYTON CITY	WI15-2	STAYTON-SANTIAM SWITCH STATION-69KV	69	0
Willamette Valley	STAYTON	STAYTON CITY	WI15A	SANTIAM SW STA-SANTIAM(BPA)-69KV	69	0

Oregon 2020 Circuit Metrics (excluding major events)

Oregon Regions	Op Area Name	Substation Name	Circuit Id	Circuit Name	Customers in Incident Sustained	Customer Minutes Lost	Circuit Customer Count	SAIDI	SAIFI
Central OR	BEND/REDMOND	BEND	5D10	PORTLAND AVE	108	18,564	2,411	7.70	0.045
Central OR	BEND/REDMOND	BEND	5D11	GLEN VISTA	55	9,507	1,242	7.65	0.044
Central OR	BEND/REDMOND	BEND	5D196	MALLARD	142	34,064	1,400	24.33	0.101
Central OR	BEND/REDMOND	BOND STREET	5D411	BACHELOR	742	168,098	2,148	78.26	0.345
Central OR	BEND/REDMOND	BOND STREET	5D418	BLAKELY	1,320	71,650	1,185	60.46	1.114
Central OR	BEND/REDMOND	CHINA HAT	5D140	LAVA (CHINA HAT)	369	64,733	2,334	27.73	0.158
Central OR	BEND/REDMOND	CHINA HAT	5D142	HIGH DESERT	372	19,271	1,713	11.25	0.217
Central OR	BEND/REDMOND	CHINA HAT	5D144	D.R.W.	210	34,500	2,482	13.90	0.085
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D30	ARROWHEAD	365	33,381	1,272	26.24	0.287
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D35	WICKIUP	18	1,643	1,064	1.54	0.017
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D38	TOMAHAWK	158	26,924	1,439	18.71	0.110
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D94	TEEPEE	204	36,512	3,769	9.69	0.054
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D96	OBSIDIAN	1,028	60,262	880	68.48	1.168
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D98	HUCKLEBERRY	25	3,275	1,179	2.78	0.021
Central OR	BEND/REDMOND	CROOKED RIVER RANCH	4D131	CANYON	1,487	80,123	1,807	44.34	0.823
Central OR	BEND/REDMOND	CROOKED RIVER RANCH	4D30	CROOKED R.R.	851	111,421	783	142.30	1.087
Central OR	BEND/REDMOND	DESCHUTES	5D184	PRONGHORN	198	19,075	1,114	17.12	0.178
Central OR	BEND/REDMOND	DESCHUTES	5D2	DESCHUTES S	97	23,151	1,019	22.72	0.095
Central OR	BEND/REDMOND	HUNTERS CIRCLE	5D192	Mackinaw	32	3,796	698	5.44	0.046
Central OR	BEND/REDMOND	OVERPASS	5D104	AWBREY	150	27,943	1,955	14.29	0.077
Central OR	BEND/REDMOND	OVERPASS	5D106	NEZ PERCE	773	103,284	2,692	38.37	0.287
Central OR	BEND/REDMOND	OVERPASS	5D120	CHINOOK	3	548	1,791	0.31	0.002
Central OR	BEND/REDMOND	OVERPASS	5D128	PAIUTE	30	38,634	2,155	17.93	0.014
Central OR	BEND/REDMOND	OVERPASS	5D155	APACHE	1	39	824	0.05	0.001
Central OR	BEND/REDMOND	PILOT BUTTE	5D261	KLONDIKE	1,546	86,751	1,538	56.41	1.005
Central OR	BEND/REDMOND	PILOT BUTTE	5D263	DRAKE FEEDER	267	46,214	2,477	18.66	0.108
Central OR	BEND/REDMOND	PILOT BUTTE	5D265	DOBBIN	529	107,127	1,676	63.92	0.316
Central OR	BEND/REDMOND	REDMOND	5D21	SOUTH (REDMOND)	61	8,910	760	11.72	0.080
Central OR	BEND/REDMOND	REDMOND	5D22	INDUSTRIAL	166	36,541	1,507	24.25	0.110
Central OR	BEND/REDMOND	REDMOND	5D223	TETHEROW	138	34,785	863	40.31	0.160
Central OR	BEND/REDMOND	REDMOND	5D226	CLINE FALLS	235	24,551	1,496	16.41	0.157
Central OR	BEND/REDMOND	REDMOND	5D227	WINDSOR	138	24,332	3,206	7.59	0.043
Central OR	BEND/REDMOND	REDMOND	5D228	CITY	76	12,934	1,307	9.90	0.058
Central OR	BEND/REDMOND	REDMOND	5D229	JUNIPER	69	32,734	418	78.31	0.165
Central OR	BEND/REDMOND	SHEVLIN PARK	5D238	WOLVERINE (SHP) (WAS 5D327)	181	123,514	2,771	44.57	0.065
Central OR	BEND/REDMOND	SHEVLIN PARK	5D241	BADGER (SHP)	167	15,647	2,604	6.01	0.064
Central OR	BEND/REDMOND	SHEVLIN PARK	5D243	Black Bear	43	10,442	1,774	5.89	0.024
Central OR	BEND/REDMOND	YEW AVENUE	5D322	BIRDIE	670	48,319	1,936	24.96	0.346
Central OR	BEND/REDMOND	YEW AVENUE	5D323	FAIRWAY	480	160,691	392	409.93	1.224
Central OR	BEND/REDMOND	YEW AVENUE	5D325	EAGLE	3	464	2,660	0.17	0.001
Central OR	MADRAS	CHERRY LANE	5D295	7 PEAKS	6	1,581	145	10.90	0.041
Central OR	MADRAS	CULVER	5D5	CULVER	801	81,335	1,838	44.25	0.436
Central OR	MADRAS	MADRAS	5D52	MADRAS RURAL	457	48,032	1,054	45.57	0.434

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Central OR	MADRAS	MADRAS	5D53	AGATE	395	57,990	1,288	45.02	0.307
Central OR	MADRAS	MADRAS	5D57	QUARTZ	115	23,759	1,400	16.97	0.082
Central OR	MADRAS	MADRAS	5D61	MADRAS CITY	19	3,662	1,276	2.87	0.015
Central OR	MADRAS	POWELL BUTTE	5D1	POWELL BUTTE	1,216	337,619	649	520.21	1.874
Central OR	MADRAS	PRINEVILLE	5D126	RIMROCK	1,106	236,139	872	270.80	1.268
Central OR	MADRAS	PRINEVILLE	5D167	NORTHVILLE	323	63,216	2,693	23.47	0.120
Central OR	MADRAS	PRINEVILLE	5D25	OCHOCO	1,357	109,128	997	109.46	1.361
Central OR	MADRAS	PRINEVILLE	5D47	MC KAY (PRINEVILLE)	352	24,310	1,732	14.04	0.203
Central OR	MADRAS	PRINEVILLE	5D48	LAMONTA	36	8,127	621	13.09	0.058
Central OR	MADRAS	PRINEVILLE	5D50	PINE CONE	1,719	414,104	79	5,241.82	21.759
Central OR	MADRAS	PRINEVILLE	5D69	GRIMES FLAT	2,241	169,864	1,611	105.44	1.391
Central OR	MADRAS	WARM SPRINGS	4D68	WARM SPRINGS (OR)	1,283	355,739	977	364.11	1.313
CoastPlus	CLATSOP (ASTORIA)	CANNON BEACH	5A10	HAYSTACK	6,197	294,596	1,608	183.21	3.854
CoastPlus	CLATSOP (ASTORIA)	CANNON BEACH	5A8	ECOLA	3,824	93,121	1,217	76.52	3.142
CoastPlus	CLATSOP (ASTORIA)	FERN HILL SUB	5A51	JOHN DAY	1,581	198,444	270	734.98	5.856
CoastPlus	CLATSOP (ASTORIA)	FERN HILL SUB	5A52	SCANDINAVIAN	683	91,516	382	239.57	1.788
CoastPlus	CLATSOP (ASTORIA)	KNAPPA SVENSEN	5A92	SVENSEN	68	10,471	728	14.38	0.093
CoastPlus	CLATSOP (ASTORIA)	KNAPPA SVENSEN	5A93	BRADWOOD	1,590	257,385	933	275.87	1.704
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A80	GROVE	7,834	188,657	2,405	78.44	3.257
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A81	CENTRAL	5,559	138,613	1,622	85.46	3.427
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A82	NECANICUM	4,647	182,786	1,200	152.32	3.873
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A83	GEARHART	15,487	466,982	3,367	138.69	4.600
CoastPlus	CLATSOP (ASTORIA)	WARRENTON	5A15	CITY	358	82,506	247	334.03	1.449
CoastPlus	CLATSOP (ASTORIA)	WARRENTON	5A16	MILL (WARRENTON)	112	16,192	2,255	7.18	0.050
CoastPlus	CLATSOP (ASTORIA)	WARRENTON	5A20	SOUTH (WARRENTON)	3,543	480,300	1,727	278.11	2.052
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A202	PORT DOCK	605	104,158	1,184	87.97	0.511
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A204	MOO COW	1,789	300,019	1,163	257.97	1.538
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A205	FIFTH STREET	21	1,397	987	1.42	0.021
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A210	YOUNGS BAY #10	18	1,759	945	1.86	0.019
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A211	OLNEY	2,442	476,528	1,099	433.60	2.222
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A213	INDUSTRIAL	3,115	769,618	1,355	567.98	2.299
CoastPlus	COOS BAY/COQUILLE	BANDON TIE (BPA)	L804	BANDON	266	63,645	754	84.41	0.353
CoastPlus	COOS BAY/COQUILLE	COOS RIVER	4C106	COOS RIVER	3,540	656,371	1,357	483.69	2.609
CoastPlus	COOS BAY/COQUILLE	COQUILLE	4C41	HENRY STREET	3,030	239,688	1,681	142.59	1.802
CoastPlus	COOS BAY/COQUILLE	COQUILLE	4C42	TERRES HGHTS	2,638	357,282	1,548	230.80	1.704
CoastPlus	COOS BAY/COQUILLE	COQUILLE	4C43	INDUSTRIAL	6	1,493	154	9.69	0.039
CoastPlus	COOS BAY/COQUILLE	EMPIRE	4C108	EMPIRE	2,197	115,860	1,738	66.66	1.264
CoastPlus	COOS BAY/COQUILLE	EMPIRE	4C89	SCOTT	92	10,927	1,440	7.59	0.064
CoastPlus	COOS BAY/COQUILLE	EMPIRE	4C90	CHARLESTON	873	105,689	2,093	50.50	0.417
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C48	CITY CENTER	18	4,707	1,507	3.12	0.012
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C49	EASTSIDE	286	20,801	776	26.81	0.369
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C50	BUNKERHILL	2,245	397,666	1,835	216.71	1.223
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C97	ENGLEWOOD	1,313	92,327	1,384	66.71	0.949

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CoastPlus	COOS BAY/COQUILLE	MYRTLE POINT	4C36	NORTH (MYRTLE POINT)	1,216	304,613	331	920.28	3.674
CoastPlus	COOS BAY/COQUILLE	MYRTLE POINT	4C37	MAPLE STREET	3,670	1,370,746	2,077	659.96	1.767
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C112	WOODLAND	1,998	164,274	1,867	87.99	1.070
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C66	BAYSHORE	51	4,703	1,716	2.74	0.030
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C67	INDUSTRIAL	288	90,554	2,222	40.75	0.130
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C86	BANGOR	1,835	69,971	1,791	39.07	1.025
CoastPlus	HOOD RIVER	GORDON HOLLOW	4K1	SHERMAN 208	1,231	173,725	712	244.00	1.729
CoastPlus	HOOD RIVER	HOOD RIVER	5K37	RESIDENTIAL	597	51,554	2,112	24.41	0.283
CoastPlus	HOOD RIVER	HOOD RIVER	5K43	BELMONT	2,182	147,551	1,189	124.10	1.835
CoastPlus	HOOD RIVER	HOOD RIVER	5K44	NORTH (HOOD RIVER)	2,090	83,532	1,798	46.46	1.162
CoastPlus	HOOD RIVER	HOOD RIVER	5K70	EASTSIDE	368	64,234	1,071	59.98	0.344
CoastPlus	HOOD RIVER	HOOD RIVER	5K74	SOUTH (HOOD RIVER)	949	280,197	1,572	178.24	0.604
CoastPlus	HOOD RIVER	KENWOOD	5K50	OAKGROVE	1,692	143,133	815	175.62	2.076
CoastPlus	HOOD RIVER	WASCO	7K1	WASCO	297	49,140	275	178.69	1.080
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A310	INLAND FEEDER	185	30,961	1,907	16.24	0.097
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A312	OCEAN	4,030	168,396	3,020	55.76	1.334
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A316	LAKE (DEVILS LAKE)	18,144	1,374,736	4,579	300.23	3.962
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A338	SIUSLAW	466	87,865	661	132.93	0.705
CoastPlus	LINCOLN CITY	GLENEDEN	7A364	GLENEDEN	117	11,305	715	15.81	0.164
CoastPlus	LINCOLN CITY	GLENEDEN	7A366	SALISHAN	114	34,909	357	97.79	0.319
CoastPlus	LINCOLN CITY	NELSCOTT	7A390	NELSCOTT	21	4,211	352	11.96	0.060
CoastPlus	LINCOLN CITY	WECOMA BEACH	7A354	WECOMA	874	52,467	720	72.87	1.214
CoastPlus	PORTLAND	ALBINA	5P150	ALBINA 11C15	42	4,260	135	31.56	0.311
CoastPlus	PORTLAND	ALBINA	5P194	11C24-UG	194	16,306	224	72.79	0.866
CoastPlus	PORTLAND	ALBINA	5P66	11C25	86	27,250	27	31.56	0.311
CoastPlus	PORTLAND	ALBINA	5P92	11C12-UG	161	9,588	161	59.55	1.000
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	5P22	ALDERWOOD #2	32	4,362	199	21.92	0.161
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	5P604	ALDERWOOD #3	3	886	206	4.30	0.015
CoastPlus	PORTLAND	BLOSS	5P172	FURNACE	2	701	1	700.97	2.000
CoastPlus	PORTLAND	COLUMBIA (OR)	5P266	COLUMBIA #2	5,311	155,269	2,617	59.33	2.029
CoastPlus	PORTLAND	COLUMBIA (OR)	5P268	COLUMBIA #1	359	5,279	359	14.71	1.000
CoastPlus	PORTLAND	COLUMBIA (OR)	5P474	COLUMBIA #6	581	13,458	546	24.65	1.064
CoastPlus	PORTLAND	COLUMBIA (OR)	5P476	COLUMBIA #3	1,814	144,231	858	168.10	2.114
CoastPlus	PORTLAND	COLUMBIA (OR)	5P478	COLUMBIA #4	2,222	311,859	886	351.98	2.508
CoastPlus	PORTLAND	COLUMBIA (OR)	5P480	COLUMBIA #5	22	308	22	14.00	1.000
CoastPlus	PORTLAND	CULLY	5P288	CULLY #3-UG	123	16,439	824	19.95	0.149
CoastPlus	PORTLAND	CULLY	5P290	CULLY #2	2,523	164,973	2,397	68.82	1.053
CoastPlus	PORTLAND	CULLY	5P292	CULLY #1	5,861	281,149	2,917	96.38	2.009
CoastPlus	PORTLAND	HOLLADAY (OR)	5P156	HOLLADAY #4-UG	802	56,361	792	71.16	1.013
CoastPlus	PORTLAND	HOLLADAY (OR)	5P158	HOLLADAY #6	71	29,470	904	32.60	0.079
CoastPlus	PORTLAND	HOLLYWOOD	5P203	HOLLYWOOD #3	53	4,305	1,471	2.93	0.036
CoastPlus	PORTLAND	HOLLYWOOD	5P204	HOLLYWOOD #2	34	6,973	742	9.40	0.046
CoastPlus	PORTLAND	HOLLYWOOD	5P205	HOLLYWOOD #1	2,213	526,723	2,142	245.90	1.033

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CoastPlus	PORTLAND	HOLLYWOOD	5P208	HOLLYWOOD #5	281	52,151	3,319	15.71	0.085
CoastPlus	PORTLAND	HOLLYWOOD	5P209	HOLLYWOOD #4	41	9,144	2,358	3.88	0.017
CoastPlus	PORTLAND	KILLINGSWORTH	5P123	KILLINGSWORTH #3	969	99,971	309	323.53	3.136
CoastPlus	PORTLAND	KILLINGSWORTH	5P217	KILLINGSWORTH #5	1,799	187,710	422	444.81	4.263
CoastPlus	PORTLAND	KILLINGSWORTH	5P41	KILLINGSWORTH #4	6,021	553,685	2,786	198.74	2.161
CoastPlus	PORTLAND	KILLINGSWORTH	5P88	KILLINGSWORTH #1-UG	2	172	1	172.05	2.000
CoastPlus	PORTLAND	KILLINGSWORTH	5P89	KILLINGSWORTH #2	6,566	993,451	3,173	313.10	2.069
CoastPlus	PORTLAND	KNOTT	5P231	KNOTT #1	97	4,389	2,997	1.46	0.032
CoastPlus	PORTLAND	KNOTT	5P232	KNOTT #2	82	9,143	2,298	3.98	0.036
CoastPlus	PORTLAND	KNOTT	5P233	KNOTT #3	99	17,212	2,272	7.58	0.044
CoastPlus	PORTLAND	KNOTT	5P368	11022	16	1,437	171	8.40	0.094
CoastPlus	PORTLAND	LINCOLN (OR)	5P422	11D06-UG	961	121,418	879	138.13	1.093
CoastPlus	PORTLAND	LINCOLN (OR)	5P430	11D05-UG	154	89,903	369	243.64	0.417
CoastPlus	PORTLAND	LINCOLN (OR)	5P432	11D02-UG	1	6	677	0.01	0.001
CoastPlus	PORTLAND	MALLORY	5P162	MALLORY #1	2,374	45,393	2,178	20.84	1.090
CoastPlus	PORTLAND	MALLORY	5P164	MALLORY #2	4,614	183,153	3,173	57.72	1.454
CoastPlus	PORTLAND	PARKROSE	5P244	PARKROSE#4	109	16,198	3,131	5.17	0.035
CoastPlus	PORTLAND	PARKROSE	5P246	PARKROSE#3	221	68,337	3,080	22.19	0.072
CoastPlus	PORTLAND	PARKROSE	5P250	PARKROSE#2	20	5,911	659	8.97	0.030
CoastPlus	PORTLAND	PARKROSE	5P252	PARKROSE#1	2,216	451,922	1,804	250.51	1.228
CoastPlus	PORTLAND	PARKROSE	5P717	PARKROSE 5	69	8,187	67	122.20	1.030
CoastPlus	PORTLAND	RUSSELLVILLE	5P274	RUSSELLVILLE #3	3,440	425,016	3,110	136.66	1.106
CoastPlus	PORTLAND	RUSSELLVILLE	5P276	RUSSELLVILLE #4	465	106,136	2,331	45.53	0.199
CoastPlus	PORTLAND	RUSSELLVILLE	5P278	RUSSELLVILLE #1	74	9,363	3,291	2.84	0.022
CoastPlus	PORTLAND	RUSSELLVILLE	5P280	RUSSELLVILLE #2	233	83,397	1,250	66.72	0.186
CoastPlus	PORTLAND	VERNON	5P391	VERNON #1	1,938	44,574	1,810	24.63	1.071
CoastPlus	PORTLAND	VERNON	5P392	VERNON NO. 2	2,936	43,379	2,600	16.68	1.129
CoastPlus	PORTLAND	VERNON	5P393	VERNON #3	4,914	73,623	3,453	21.32	1.423
CoastPlus	PORTLAND	VERNON	5P394	VERNON # 4	3,605	75,962	3,449	22.02	1.045
CoastPlus	PORTLAND	VERNON	5P395	VERNON # 5	2,306	40,179	2,285	17.58	1.009
Northeast OR	ENTERPRISE	ENTERPRISE (OR)	4W8	CREIGHTON LN	3,697	277,198	1,480	187.30	2.498
Northeast OR	ENTERPRISE	ENTERPRISE (OR)	5W15	CITY	150	10,205	942	10.83	0.159
Northeast OR	ENTERPRISE	ENTERPRISE (OR)	5W26	RURAL (ENTERPRISE)	525	64,056	1,083	59.15	0.485
Northeast OR	ENTERPRISE	JOSEPH	5W21	PRAIRIE	1,971	98,279	849	115.76	2.322
Northeast OR	ENTERPRISE	MINAM	5W18	MINAM	18	4,408	13	339.05	1.385
Northeast OR	ENTERPRISE	PALLETTE	4W14	PALLETTE NORTH	557	99,170	173	573.24	3.220
Northeast OR	ENTERPRISE	WALLOWA	5W28	CITY	326	75,711	882	85.84	0.370
Northeast OR	HERMISTON	ARLINGTON	5K25	ARLINGTON	302	36,467	519	70.26	0.582
Northeast OR	HERMISTON	BLALOCK	5K40	BLALOCK	1	172	20	8.60	0.050
Northeast OR	HERMISTON	DALREED	4K16	WILLOW COVE	199	39,808	74	537.95	2.689
Northeast OR	HERMISTON	DALREED	4K36	SIMTAG	18	7,218	19	379.91	0.947
Northeast OR	HERMISTON	DALREED	4K46	BOEING	268	19,115	179	106.79	1.497
Northeast OR	HERMISTON	HERMISTON	5W602	RURAL (HERMISTON)	3,012	138,684	1,391	99.70	2.165

Oregon 2020 Circuit Metrics (excluding major events)

Oregon Regions	Op Area Name	Substation Name	Circuit Id	Circuit Name	Customers in Incident Sustained	Customer Minutes Lost	Circuit Customer Count	SAIDI	SAIFI
Northeast OR	HERMISTON	HINKLE	5W82	MEADOWS	484	33,249	376	88.43	1.287
Northeast OR	HERMISTON	UMATILLA	5W658	UMATILLA	289	61,360	1,248	49.17	0.232
Northeast OR	HERMISTON	UMATILLA	5W660	MCNARY	322	68,742	944	72.82	0.341
Northeast OR	HERMISTON	UMATILLA	5W664	PORT FEEDER	4	1,202	60	20.03	0.067
Northeast OR	PENDLETON	ATHENA	5W703	CITY	157	34,796	843	41.28	0.186
Northeast OR	PENDLETON	ATHENA	5W705	HELIX	103	25,711	421	61.07	0.245
Northeast OR	PENDLETON	BUCKAROO	5W201	STATE HOSP.	76	17,068	383	44.56	0.198
Northeast OR	PENDLETON	BUCKAROO	5W202	REITH	4,947	335,290	1,552	216.04	3.188
Northeast OR	PENDLETON	BUCKAROO	5W203	MONTEE	659	111,169	1,738	63.96	0.379
Northeast OR	PENDLETON	PENDLETON	5W401	WEST HILLS	209	17,369	1,674	10.38	0.125
Northeast OR	PENDLETON	PENDLETON	5W402	HARRIS HTS	446	82,396	2,060	40.00	0.217
Northeast OR	PENDLETON	PENDLETON	5W403	MISSION	2,276	129,632	1,041	124.53	2.186
Northeast OR	PENDLETON	PENDLETON	7W451	BUSINESS	13	2,556	270	9.47	0.048
Northeast OR	PENDLETON	PENDLETON	7W452	NORTHWEST	2	190	518	0.37	0.004
Northeast OR	PENDLETON	PENDLETON	7W453	SOUTHWEST (PENDELTON)	13	1,788	332	5.39	0.039
Northeast OR	PENDLETON	PENDLETON	7W454	EAST END	11	614	249	2.47	0.044
Northeast OR	PENDLETON	PILOT ROCK	5W406	PILOT ROCK CITY	3,197	264,211	1,393	189.67	2.295
Northeast OR	PENDLETON	WESTON NEW (OR)	5W40	WESTON CANNERY	1	140	16	8.74	0.063
Northeast OR	PENDLETON	WESTON NEW (OR)	5W7	SCOTTS FEEDER	169	28,520	452	63.10	0.374
Northeast OR	WALLA WALLA	UMAPINE	5W105	UMAPINE FEEDER	258	44,459	965	46.07	0.267
Northeast OR	WALLA WALLA	UMAPINE	5W106	FERNDALE	1,468	349,218	1,347	259.26	1.090
Southern OR	GRANTS PASS	AGNESS AVE	5R172	SPALDING MILL	1,600	483,272	883	547.31	1.812
Southern OR	GRANTS PASS	AGNESS AVE	5R173	JONES CREEK	36	4,132	888	4.65	0.041
Southern OR	GRANTS PASS	AGNESS AVE	5R322	ANTEATER	1,078	116,636	990	117.81	1.089
Southern OR	GRANTS PASS	APPLEGATE	5R267	MURPHY	3,214	365,815	1,048	349.06	3.067
Southern OR	GRANTS PASS	APPLEGATE	5R278	HIGHWAY	3,092	689,996	1,629	423.57	1.898
Southern OR	GRANTS PASS	BEACON	5R104	SAVAGE ST	1,347	355,018	1,272	279.10	1.059
Southern OR	GRANTS PASS	BEACON	5R105	BEACON ST	971	244,921	845	289.85	1.149
Southern OR	GRANTS PASS	CAVE JUNCTION	5R52	FREE& EASY	2,732	592,227	2,407	246.04	1.135
Southern OR	GRANTS PASS	CAVE JUNCTION	5R53	ROUGH &READY	880	214,857	1,532	140.25	0.574
Southern OR	GRANTS PASS	CAVEMAN	5R295	QUAIL	2,326	254,568	1,119	227.50	2.079
Southern OR	GRANTS PASS	CAVEMAN	5R82	WASHINGTON	631	52,830	1,192	44.32	0.529
Southern OR	GRANTS PASS	CAVEMAN	5R98	MANZANITA	40	7,769	575	13.51	0.070
Southern OR	GRANTS PASS	CAVEMAN	5R99	CAVEMAN	54	16,152	1,208	13.37	0.045
Southern OR	GRANTS PASS	DOWELL	5R331	DOVE	1,959	69,689	1,492	46.71	1.313
Southern OR	GRANTS PASS	DOWELL	5R334	DUCK	174	22,783	2,530	9.01	0.069
Southern OR	GRANTS PASS	EASY VALLEY	5R123	G STREET	2,270	28,258	2,172	13.01	1.045
Southern OR	GRANTS PASS	EASY VALLEY	5R125	ROGUE	2,177	54,069	1,780	30.38	1.223
Southern OR	GRANTS PASS	EASY VALLEY	5R259	CHINOOK	1,490	53,923	1,324	40.73	1.125
Southern OR	GRANTS PASS	FIELDER CREEK	4R33	ELK FDR.	1,660	135,294	1,846	73.29	0.899
Southern OR	GRANTS PASS	FIELDER CREEK	4R34	BEAR FDR	702	140,341	860	163.19	0.816
Southern OR	GRANTS PASS	GLENDALE SUBSTATION	5R133	GLENDALE	2,944	485,616	1,886	257.48	1.561
Southern OR	GRANTS PASS	GLENDALE SUBSTATION	5R143	INDUSTRIAL	46	8,953	656	13.65	0.070

Oregon 2020 Circuit Metrics (excluding major events)

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Southern OR	GRANTS PASS	JEROME PRAIRIE	5R62	WILD PRAIRIE	2,011	311,699	1,630	191.23	1.234
Southern OR	GRANTS PASS	JEROME PRAIRIE	5R63	WOOD RIVER	5,956	672,907	1,600	420.57	3.723
Southern OR	GRANTS PASS	MERLIN	5R232	MERLIN-HUGO	150	23,303	1,021	22.82	0.147
Southern OR	GRANTS PASS	MERLIN	5R234	PARADISE	677	105,382	1,200	87.82	0.564
Southern OR	GRANTS PASS	MERLIN	5R248	PLEASANT VALLEY-MERLIN FEEDER	315	110,683	1,140	97.09	0.276
Southern OR	GRANTS PASS	MERLIN	5R251	BADGER	59	10,716	928	11.55	0.064
Southern OR	GRANTS PASS	MERLIN	5R288	MONARCH	479	39,217	1,749	22.42	0.274
Southern OR	GRANTS PASS	OBRIEN	5R106	O'BRIEN	77	11,568	431	26.84	0.179
Southern OR	GRANTS PASS	PARK STREET (OR)	5R114	FRUITDALE	9,092	937,306	2,185	428.97	4.161
Southern OR	GRANTS PASS	PARK STREET (OR)	5R115	ALLEN CREEK	38	6,379	1,010	6.32	0.038
Southern OR	GRANTS PASS	PARK STREET (OR)	5R121	NEW HOPE	2,363	143,799	1,857	77.44	1.272
Southern OR	GRANTS PASS	PARK STREET (OR)	5R164	EXPRESS	326	149,963	320	468.64	1.019
Southern OR	GRANTS PASS	PARK STREET (OR)	5R169	PORTOLA	1,644	94,287	1,384	68.13	1.188
Southern OR	GRANTS PASS	PROVOLT	5R67	NORTH-SOUTH	4,553	662,648	1,444	458.90	3.153
Southern OR	GRANTS PASS	ROGUE RIVER	5R77	SAVAGE/WIMER	14,988	2,272,222	1,855	1,224.92	8.080
Southern OR	GRANTS PASS	ROGUE RIVER	5R78	ROCKY POINT (ROGUE RIVER)	5,377	1,681,234	1,058	1,589.07	5.082
Southern OR	GRANTS PASS	SELMA	5R65	DEER CREEK	2,699	466,164	1,201	388.15	2.247
Southern OR	KLAMATH FALLS	BEATTY	5L1	BEATTY	794	99,143	388	255.52	2.046
Southern OR	KLAMATH FALLS	BLY	5L14	TOWN (BLY)	2,317	296,549	417	711.15	5.556
Southern OR	KLAMATH FALLS	BOISE CASCADE	7L9	BOISE CASCAD	2	279	1	278.67	2.000
Southern OR	KLAMATH FALLS	BONANZA (OR)	5L7	POE VALLEY	40	4,664	470	9.92	0.085
Southern OR	KLAMATH FALLS	BRYANT	5L2	GARY STREET	118	20,298	2,140	9.49	0.055
Southern OR	KLAMATH FALLS	BRYANT	5L3	WASHBURN	26	1,648	1,822	0.90	0.014
Southern OR	KLAMATH FALLS	BRYANT	5L4	SUMMERS LANE	79	7,018	1,969	3.56	0.040
Southern OR	KLAMATH FALLS	BRYANT	5L5	MOYINA HTS.	131	5,456	2,460	2.22	0.053
Southern OR	KLAMATH FALLS	CASEBEER SUB	4L16	LANGELL VLY	225	33,565	1,160	28.93	0.194
Southern OR	KLAMATH FALLS	CHILOQUIN	5L57	CRATER LAKE	909	153,323	1,060	144.64	0.858
Southern OR	KLAMATH FALLS	CHILOQUIN MRKT	5L37	WILLIAMSON	1,248	186,003	551	337.57	2.265
Southern OR	KLAMATH FALLS	DAIRY	5L42	SWAN LAKE	107	8,149	259	31.46	0.413
Southern OR	KLAMATH FALLS	DAIRY	5L43	DAIRY	1,248	156,159	496	314.84	2.516
Southern OR	KLAMATH FALLS	HAMAKER	5L55	KENO	943	170,704	1,706	100.06	0.553
Southern OR	KLAMATH FALLS	HAMAKER	5L56	MOUNTAIN	12	516	159	3.25	0.075
Southern OR	KLAMATH FALLS	HENLEY	5L58	HENLEY	52	3,911	232	16.86	0.224
Southern OR	KLAMATH FALLS	HENLEY	5L59	WEST	557	52,931	537	98.57	1.037
Southern OR	KLAMATH FALLS	HORNET	5L44	HOMEDALE	520	74,658	2,811	26.56	0.185
Southern OR	KLAMATH FALLS	HORNET	5L45	CRYSTAL SPR	3,173	259,570	1,471	176.46	2.157
Southern OR	KLAMATH FALLS	LAKEPORT	5L54	SOUTH (LAKEPORT)	350	41,063	2,424	16.94	0.144
Southern OR	KLAMATH FALLS	MERRILL (OR)	5L26	LAKE (MERRILL)	323	55,558	858	64.75	0.376
Southern OR	KLAMATH FALLS	MERRILL (OR)	5L27	NORTH (MERRILL)	16	1,447	562	2.57	0.028
Southern OR	KLAMATH FALLS	MODOC	5L36	MODOC	1,922	275,038	845	325.49	2.275
Southern OR	KLAMATH FALLS	ROSS AVENUE	5L46	ELDORADO	343	26,065	1,384	18.83	0.248
Southern OR	KLAMATH FALLS	ROSS AVENUE	5L48	BROAD ST.	19	2,691	1,201	2.24	0.016
Southern OR	KLAMATH FALLS	RUNNING Y	4L50	ROCKY POINT FEEDER (RUNNING Y)	1,451	212,882	1,456	146.21	0.997

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Southern OR	KLAMATH FALLS	SHASTA WAY	7L25	SHASTA WAY	17	1,030	430	2.39	0.040
Southern OR	KLAMATH FALLS	SPRAGUE RIVER	5L8	SPRAGUE RIVER	1,449	161,252	507	318.05	2.858
Southern OR	KLAMATH FALLS	TEXUM	5L112	ANDERSON	47	4,652	1,204	3.86	0.039
Southern OR	KLAMATH FALLS	TEXUM	5L113	TOWER	19	2,813	287	9.80	0.066
Southern OR	KLAMATH FALLS	TEXUM	5L116	ALTAMONT	214	29,960	1,481	20.23	0.144
Southern OR	KLAMATH FALLS	TURKEY HILL	5L20	MALIN CITY	1,248	168,091	821	204.74	1.520
Southern OR	KLAMATH FALLS	TURKEY HILL	5L23	RURAL (TURKEY HILL)	390	37,649	322	116.92	1.211
Southern OR	KLAMATH FALLS	WEST SIDE	5L12	ORINDALE	16	2,721	791	3.44	0.020
Southern OR	KLAMATH FALLS	WEST SIDE	5L15	CALIFORNIA	53	5,749	1,359	4.23	0.039
Southern OR	KLAMATH FALLS	WEST SIDE	5L17	PINE ST (WEST SIDE HE PLANT)	28	2,935	501	5.86	0.056
Southern OR	KLAMATH FALLS	WEST SIDE	5L18	RIVERSIDE (WEST SIDE HE PLANT)	37	3,305	584	5.66	0.063
Southern OR	KLAMATH FALLS	WEST SIDE	5L19	LAKESHORE	307	4,616	307	15.03	1.000
Southern OR	LAKEVIEW	MILE-HI	5L104	INDUSTRIAL	220	25,061	703	35.65	0.313
Southern OR	LAKEVIEW	MILE-HI	5L105	BUSINESS	821	117,556	1,707	68.87	0.481
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	5R241	CITY	6	561	12	46.77	0.500
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	5R245	VALLEY VIEW	133	12,253	987	12.41	0.135
Southern OR	MEDFORD	BEALL LANE	5R359	BEEHIVE	2	587	2	293.57	1.000
Southern OR	MEDFORD	BEALL LANE	5R361	BULLDOG	102	22,393	1,720	13.02	0.059
Southern OR	MEDFORD	BEALL LANE	5R364	BOBCAT	421	66,414	2,151	30.88	0.196
Southern OR	MEDFORD	BELKNAP	5R1	KOGAP	78	25,073	1,024	24.49	0.076
Southern OR	MEDFORD	BELKNAP	5R2	RIVERSIDE (BELKNAP)	1,257	67,258	668	100.69	1.882
Southern OR	MEDFORD	BELKNAP	5R3	BARNETT	377	98,970	1,618	61.17	0.233
Southern OR	MEDFORD	BELKNAP	5R47	STEWART	4,699	416,455	2,125	195.98	2.211
Southern OR	MEDFORD	BROOKHURST	5R118	SPRINGBROOK	2,057	162,018	1,840	88.05	1.118
Southern OR	MEDFORD	BROOKHURST	5R135	ROBERTS (BROOKHURST)	1,870	46,904	1,669	28.10	1.120
Southern OR	MEDFORD	BROOKHURST	5R32	ROXY	201	34,580	1,790	19.32	0.112
Southern OR	MEDFORD	BROOKHURST	5R33	CRATER LAKE	239	56,001	1,728	32.41	0.138
Southern OR	MEDFORD	BROOKHURST	5R75	SUNRISE (BROOKHURST)	24	3,104	1,235	2.51	0.019
Southern OR	MEDFORD	CAMPBELL	5R216	VOORHIES	852	37,019	851	43.50	1.001
Southern OR	MEDFORD	CAMPBELL	5R218	PHOENIX	2,314	94,574	1,517	62.34	1.525
Southern OR	MEDFORD	CAMPBELL	5R227	FERN VALLEY	1,471	69,052	1,395	49.50	1.054
Southern OR	MEDFORD	CAMPBELL	5R312	COBRA	1,606	97,316	1,499	64.92	1.071
Southern OR	MEDFORD	DODGE BRIDGE	4R1	SALMON	5,555	497,059	1,637	303.64	3.393
Southern OR	MEDFORD	DODGE BRIDGE	4R35	MEADOWS ROAD	2,623	131,542	1,372	95.88	1.912
Southern OR	MEDFORD	FOOTHILLS	5R38	HOSPITAL	12	2,293	773	2.97	0.016
Southern OR	MEDFORD	FOOTHILLS	5R39	PIERCE ROAD	52	12,800	1,157	11.06	0.045
Southern OR	MEDFORD	FRALEY	5R87	TABLE ROCK	690	35,915	525	68.41	1.314
Southern OR	MEDFORD	FRALEY	5R88	DODGE BRIDGE	457	27,404	367	74.67	1.245
Southern OR	MEDFORD	GOLD HILL	5R103	GOLD HILL	1,657	353,592	2,018	175.22	0.821
Southern OR	MEDFORD	GRIFFIN CREEK	5R204	HULL RD	2,996	427,811	2,722	157.17	1.101
Southern OR	MEDFORD	GRIFFIN CREEK	5R206	GRIFFIN CREEK	3,714	633,699	1,752	361.70	2.120
Southern OR	MEDFORD	HUMBUG CREEK	5R287	HUMMINGBIRD	5,237	698,425	689	1,013.68	7.601
Southern OR	MEDFORD	JACKSONVILLE	5R284	STAGE RD	4,028	733,029	2,082	352.08	1.935

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Southern OR	MEDFORD	JACKSONVILLE	5R285	JACKSONVILLE HWY	3,148	367,132	2,221	165.30	1.417
Southern OR	MEDFORD	MEDCO	5R280	BOISE CASCADE	1	331	1	331.12	1.000
Southern OR	MEDFORD	MEDFORD	5R21	MELROSE	1,638	49,480	1,567	31.58	1.045
Southern OR	MEDFORD	MEDFORD	5R23	SPRING ST.	14	1,315	1,616	0.81	0.009
Southern OR	MEDFORD	MEDFORD	5R250	BIG Y	418	57,432	1,858	30.91	0.225
Southern OR	MEDFORD	MEDFORD	5R253	APPLE	1,230	187,816	1,110	169.20	1.108
Southern OR	MEDFORD	MEDFORD	5R257	PEAR	872	43,362	640	67.75	1.363
Southern OR	MEDFORD	MEDFORD	5R659	MCLEAN	61	5,155	676	7.63	0.090
Southern OR	MEDFORD	OAK KNOLL	5R55	SISKIYOU	681	116,618	1,507	77.38	0.452
Southern OR	MEDFORD	OAK KNOLL	5R56	HIGHWAY 99	1	47	119	0.40	0.008
Southern OR	MEDFORD	PROSPECT CNTRL	5R40	NEW CASCADE	190	52,162	334	156.17	0.569
Southern OR	MEDFORD	RED BLANKET	7R5	PROSPECT	293	118,471	396	299.17	0.740
Southern OR	MEDFORD	ROXY ANN	5R350	St. Bernard	1,424	102,918	1,286	80.03	1.107
Southern OR	MEDFORD	ROXY ANN	5R354	RACCOON	1,939	186,309	1,567	118.90	1.237
Southern OR	MEDFORD	RUCH	5R68	APPLEGATE	3,447	346,586	930	372.67	3.706
Southern OR	MEDFORD	RUCH	5R69	RUCH	1,116	87,029	541	160.87	2.063
Southern OR	MEDFORD	SAGE ROAD (OR)	5R211	COLUMBUS	54	6,489	1,944	3.34	0.028
Southern OR	MEDFORD	SAGE ROAD (OR)	5R226	BOISE	3	343	921	0.37	0.003
Southern OR	MEDFORD	SAGE ROAD (OR)	5R28	ROSS	4,740	616,734	1,996	308.99	2.375
Southern OR	MEDFORD	SAGE ROAD (OR)	5R29	EDWARDS	37	23,445	741	31.64	0.050
Southern OR	MEDFORD	SCENIC	5R174	UPTON	1,605	207,456	2,002	103.62	0.802
Southern OR	MEDFORD	SCENIC	5R180	HEAD RD	32	7,460	1,171	6.37	0.027
Southern OR	MEDFORD	SCENIC	5R182	TAYLOR RD	276	15,132	1,755	8.62	0.157
Southern OR	MEDFORD	SCENIC	5R184	CHENEY	127	22,727	1,493	15.22	0.085
Southern OR	MEDFORD	STEVENS ROAD	4R13	HENRY MILLER	121	18,247	2,350	7.76	0.051
Southern OR	MEDFORD	STEVENS ROAD	4R17	Stingray	2,616	402,994	2,563	157.24	1.021
Southern OR	MEDFORD	STEVENS ROAD	4R41	ANTELOPE	2,312	443,667	1,149	386.13	2.012
Southern OR	MEDFORD	TAKELMA	4R9	LOST CK. (TAKELMA)	863	260,341	2,651	98.20	0.326
Southern OR	MEDFORD	TALENT	5R237	TALENT	163	33,508	2,487	13.47	0.066
Southern OR	MEDFORD	TALENT	5R238	ANDERSON CRK	1,755	455,968	1,730	263.57	1.014
Southern OR	MEDFORD	TALENT	5R239	HARTLEY ROAD	2,221	252,197	1,551	162.60	1.432
Southern OR	MEDFORD	TALENT	5R240	NORTH HWY	22	4,053	1,184	3.42	0.019
Southern OR	MEDFORD	TOLO	5R90	TBL ROCK LBR	13	1,042	161	6.47	0.081
Southern OR	MEDFORD	TOLO	5R91	SAMS VALLEY	1,177	190,825	654	291.78	1.800
Southern OR	MEDFORD	TOLO	5R92	KIRTLAND RD	18	744	203	3.66	0.089
Southern OR	MEDFORD	VILAS ROAD	5R110	MCLAUGHLIN	1,452	40,479	955	42.39	1.520
Southern OR	MEDFORD	VILAS ROAD	5R146	KING CENTER	1,509	55,730	1,447	38.51	1.043
Southern OR	MEDFORD	VILAS ROAD	5R305	WEBFOOT	484	32,795	874	37.52	0.554
Southern OR	MEDFORD	WHITE CITY	5R11	EAGLE POINT	219	34,735	1,479	23.49	0.148
Southern OR	MEDFORD	WHITE CITY	5R13	FIR-PLY	1	62	23	2.69	0.043
Southern OR	MEDFORD	WHITE CITY	5R14	AGATE	6	751	110	6.83	0.055
Southern OR	MEDFORD	WHITE CITY	5R19	3M	4	422	121	3.49	0.033
Southern OR	MEDFORD	WHITE CITY	5R66	4 CORNERS	55	29,056	1,792	16.21	0.031

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Oregon Regions	Op Area Name	Substation Name	Circuit Id	Circuit Name	Customers in Incident Sustained	Customer Minutes Lost	Circuit Customer Count	SAIDI	SAIFI
Southern OR	MEDFORD	WHITE CITY	5R76	AVE C	1	120	81	1.48	0.012
Southern OR	ROSEBURG/MYRTLECREEK	CANYONVILLE	5U46	CANYONVILLE	134	17,106	389	43.98	0.344
Southern OR	ROSEBURG/MYRTLECREEK	CANYONVILLE	5U52	BEALS CREEK FEEDER	1,806	177,915	884	201.26	2.043
Southern OR	ROSEBURG/MYRTLECREEK	CARNES	5U44	RND PRARIE	526	59,146	418	141.50	1.258
Southern OR	ROSEBURG/MYRTLECREEK	CLEARWATER #1 SUB	6U17	BRIGGS	6	3,879	3	1,293.13	2.000
Southern OR	ROSEBURG/MYRTLECREEK	CLEARWATER #2 SUB	6U33	CLEARWATER	618	92,803	95	976.87	6.505
Southern OR	ROSEBURG/MYRTLECREEK	CLOAKE	4U37	RUSA	1	51	1	50.55	1.000
Southern OR	ROSEBURG/MYRTLECREEK	CLOAKE	4U38	HARVARD	3,661	232,456	2,956	78.64	1.238
Southern OR	ROSEBURG/MYRTLECREEK	CLOAKE	4U39	GOEDECK	522	79,694	1,273	62.60	0.410
Southern OR	ROSEBURG/MYRTLECREEK	GARDEN VALLEY	4U80	EDENBOWER	822	8,992	806	11.16	1.020
Southern OR	ROSEBURG/MYRTLECREEK	GARDEN VALLEY	4U81	VALLEY	2,686	335,321	1,385	242.11	1.939
Southern OR	ROSEBURG/MYRTLECREEK	GLIDE SUBSTATION	5U83	IDLEYLD	1,571	230,180	988	232.98	1.590
Southern OR	ROSEBURG/MYRTLECREEK	GLIDE SUBSTATION	5U84	LITTLE RIVER	1,075	217,747	1,374	158.48	0.782
Southern OR	ROSEBURG/MYRTLECREEK	GREEN SUBSTATION	5U32	SAFARI	5,821	276,618	2,189	126.37	2.659
Southern OR	ROSEBURG/MYRTLECREEK	GREEN SUBSTATION	5U33	SUNNYSLOPE	3,396	157,256	1,638	96.00	2.073
Southern OR	ROSEBURG/MYRTLECREEK	ILLAHEE FLATS	6U13	ILLAHEE FLATS SINGLE PHASE RECLOSER	106	30,674	27	1,136.08	3.926
Southern OR	ROSEBURG/MYRTLECREEK	LEMOLO # 1	5U920	DIAMOND LAKE	1,449	457,722	179	2,557.11	8.095
Southern OR	ROSEBURG/MYRTLECREEK	MYRTLE CREEK	5U76	SUPER Y	3,358	501,927	1,540	325.93	2.181
Southern OR	ROSEBURG/MYRTLECREEK	MYRTLE CREEK	5U77	BOOMER HILL	1,268	133,227	2,312	57.62	0.548
Southern OR	ROSEBURG/MYRTLECREEK	OAKLAND (OR)	5U11	UMPQUA	1,729	129,247	1,264	102.25	1.368
Southern OR	ROSEBURG/MYRTLECREEK	OAKLAND (OR)	5U12	STAGECOACH	770	60,226	556	108.32	1.385
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE	5U1	TRI CITY	2,631	187,660	994	188.79	2.647
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE	5U2	COW CREEK	1,995	211,264	1,562	135.25	1.277
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE	5U3	HANNA	576	98,283	284	346.07	2.028
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE-VENEER	5U50	RFP-LVL (EWP)	1	94	30	3.12	0.033
Southern OR	ROSEBURG/MYRTLECREEK	ROSEBURG	4U10	DIAMOND	673	46,366	2,521	18.39	0.267
Southern OR	ROSEBURG/MYRTLECREEK	ROSEBURG	4U22	DIXON	301	34,489	1,140	30.25	0.264
Southern OR	ROSEBURG/MYRTLECREEK	ROSEBURG	4U5	DOUGLAS	41	3,882	2,075	1.87	0.020
Southern OR	ROSEBURG/MYRTLECREEK	SLIDE CREEK	6U76	SLIDE CREEK CAMP	4	2,380	4	594.90	1.000
Southern OR	ROSEBURG/MYRTLECREEK	SODA SPRINGS HE PLT	6U10	CB6U10	1	680	1	680.22	1.000
Southern OR	ROSEBURG/MYRTLECREEK	SOUTHGATE	4U30	SHADY POINT	3,355	219,110	1,598	137.12	2.099
Southern OR	ROSEBURG/MYRTLECREEK	SOUTHGATE	4U31	BOOTH	1,755	120,201	1,563	76.90	1.123
Southern OR	ROSEBURG/MYRTLECREEK	STEAMBOAT	6U18	STEAMBOAT	43	8,055	22	366.12	1.955
Southern OR	ROSEBURG/MYRTLECREEK	SUTHERLIN	5U35	NON-PAREIL	22	1,504	1,307	1.15	0.017
Southern OR	ROSEBURG/MYRTLECREEK	SUTHERLIN	5U36	DEADY	300	41,264	1,362	30.30	0.220
Southern OR	ROSEBURG/MYRTLECREEK	SUTHERLIN	5U56	Industrial	4	881	547	1.61	0.007
Southern OR	ROSEBURG/MYRTLECREEK	TILLER	5U89	JACKSON CRK	492	104,167	303	343.79	1.624
Southern OR	ROSEBURG/MYRTLECREEK	TOKETEE	6U21	BACK UP FOR CLEARWATER 6U33	19	250	19	13.13	1.000
Southern OR	ROSEBURG/MYRTLECREEK	TOKETEE	8U12	TOKETEE CITY	38	6,645	19	349.73	2.000
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	4U18	WILBUR	408	48,169	1,638	29.41	0.249
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	5U15	NEWTON CREEK	62	2,616	1,782	1.47	0.035
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	5U17	FISHER	145	13,400	771	17.38	0.188
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	5U19	EVANS	91	19,203	734	26.16	0.124

Oregon 2020 Circuit Metrics (excluding major events)

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Southern OR	ROSEBURG/MYRTLECREEK	WINSTON	5U48	BROCKWAY	996	83,258	863	96.47	1.154
Southern OR	ROSEBURG/MYRTLECREEK	WINSTON	5U49	DILLARD	1,558	142,017	1,459	97.34	1.068
Willamette Valley	ALBANY	HAZELWOOD	4M335	WEST HIGH	68	10,194	1,476	6.91	0.046
Willamette Valley	ALBANY	HAZELWOOD	4M336	RIVERVIEW (HAZELWOOD)	336	43,063	1,235	34.87	0.272
Willamette Valley	ALBANY	JEFFERSON (OR)	4M117	MARION	4,560	457,862	720	635.92	6.333
Willamette Valley	ALBANY	JEFFERSON (OR)	4M125	MINT	12,337	1,493,965	2,483	601.68	4.969
Willamette Valley	ALBANY	MURDER CREEK	4M243	SCRAVEL HILL	5,505	691,006	3,758	183.88	1.465
Willamette Valley	ALBANY	MURDER CREEK	4M245	RURAL NW	635	91,390	2,248	40.65	0.282
Willamette Valley	ALBANY	MURDER CREEK	4M249	DURA-PACIFIC	1,220	165,026	181	911.74	6.740
Willamette Valley	ALBANY	OREMET	4M295	OAK CREEK	5	631	100	6.31	0.050
Willamette Valley	ALBANY	OREMET	4M296	ROGERSDALE	2,654	187,851	2,159	87.01	1.229
Willamette Valley	ALBANY	QUEEN AVE	4M217	SANTIAM	30	3,330	1,887	1.76	0.016
Willamette Valley	ALBANY	QUEEN AVE	4M258	HILL STREET	1,050	58,352	2,574	22.67	0.408
Willamette Valley	ALBANY	QUEEN AVE	4M261	WAVERLY	1,223	129,290	3,645	35.47	0.336
Willamette Valley	ALBANY	QUEEN AVE	4M262	GEARY STREET	3,260	315,870	2,633	119.97	1.238
Willamette Valley	ALBANY	VINE STREET	4M15	FERRY	3,464	197,743	2,894	68.33	1.197
Willamette Valley	ALBANY	VINE STREET	4M16	WATER STREET	13,635	1,467,724	4,228	347.14	3.225
Willamette Valley	CORVALLIS	BUCHANAN	4M130	HEWLETT PACKARD	28	702	2,701	0.26	0.010
Willamette Valley	CORVALLIS	BUCHANAN	4M133	PEORIA	1,374	198,115	2,437	81.29	0.564
Willamette Valley	CORVALLIS	BUCHANAN	4M134	N. NINTH ST.	4,668	413,399	2,592	159.49	1.801
Willamette Valley	CORVALLIS	GRANT ST	4M265	HIGH SCHOOL	210	16,328	2,485	6.57	0.085
Willamette Valley	CORVALLIS	GRANT ST	4M266	CHINTIMINI	152	13,390	2,536	5.28	0.060
Willamette Valley	CORVALLIS	GRANT ST	4M268	KINGS ROAD	1,430	179,597	2,565	70.02	0.558
Willamette Valley	CORVALLIS	GRANT ST	4M269	29TH STREET	4,768	399,277	3,303	120.88	1.444
Willamette Valley	CORVALLIS	HILLVIEW	4M180	WEST HILLS	75	6,500	1,909	3.41	0.039
Willamette Valley	CORVALLIS	HILLVIEW	4M181	PHILOMATH	1,357	135,827	1,181	115.01	1.149
Willamette Valley	CORVALLIS	HILLVIEW	4M182	SUNSET	437	32,011	1,765	18.14	0.248
Willamette Valley	CORVALLIS	HILLVIEW	4M185	PLYMOUTH	2,151	64,425	2,010	32.05	1.070
Willamette Valley	CORVALLIS	MARYS RIVER	4M151	GREENBERRY	8,096	355,723	3,613	98.46	2.241
Willamette Valley	CORVALLIS	MARYS RIVER	4M152	AVERY	14	1,345	187	7.19	0.075
Willamette Valley	CORVALLIS	MARYS RIVER	4M153	GALLAGHER	6	369	159	2.32	0.038
Willamette Valley	COTTAGE GROVE/J.CITY	COBURG	4M220	DETERING	8	1,962	587	3.34	0.014
Willamette Valley	COTTAGE GROVE/J.CITY	GOSHEN (OR)	4M360	GOSHEN FDR	3,612	298,881	1,623	184.15	2.226
Willamette Valley	COTTAGE GROVE/J.CITY	HARRISBURG SUB	4M400	TERRITORIAL	2,023	306,717	1,847	166.06	1.095
Willamette Valley	COTTAGE GROVE/J.CITY	JUNCTION CITY	4M102	6TH STREET	210	54,086	1,167	46.35	0.180
Willamette Valley	COTTAGE GROVE/J.CITY	JUNCTION CITY	4M99	PRAIRIE ROAD	916	86,743	1,003	86.48	0.913
Willamette Valley	COTTAGE GROVE/J.CITY	LANCASTER	4M209	MONROE	3,128	280,700	1,097	255.88	2.851
Willamette Valley	COTTAGE GROVE/J.CITY	VILLAGE GREEN	4M84	NORTH SIDE	2,934	403,470	2,400	168.11	1.223
Willamette Valley	COTTAGE GROVE/J.CITY	VILLAGE GREEN	4M86	MADISON	1,958	244,479	1,596	153.18	1.227
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M100	RURAL (DALLAS)	995	172,010	1,856	92.68	0.536
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M201	INDUSTRIAL	594	78,739	3,084	25.53	0.193
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M202	ELLENDALE	3,409	660,248	2,978	221.71	1.145
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M238	DALLAS	2,431	601,694	2,310	260.47	1.052

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Willamette Valley	DALLAS/INDEPENDENCE	INDEPENDENCE	4M22	RICKREAL	3,411	697,092	3,325	209.65	1.026
Willamette Valley	DALLAS/INDEPENDENCE	INDEPENDENCE	4M25	BUENA VISTA	3,536	623,888	2,028	307.64	1.744
Willamette Valley	LEBANON	BROWNSVILLE	4M17	CALAPOOIA	693	87,790	1,700	51.64	0.408
Willamette Valley	LEBANON	CALAPOOYA	4M850	SPAULDING	162	9,584	1,118	8.57	0.145
Willamette Valley	LEBANON	CALAPOOYA	4M851	BEAR	4	298	32	9.31	0.125
Willamette Valley	LEBANON	CROWFOOT	4M204	CROWFOOT	252	48,624	1,505	32.31	0.167
Willamette Valley	LEBANON	CROWFOOT	4M206	US PLYWOOD (LEBANON)	8	1,588	1,868	0.85	0.004
Willamette Valley	LEBANON	LEBANON	4M61	TANGENT	482	72,770	2,622	27.75	0.184
Willamette Valley	LEBANON	LEBANON	4M62	RALSTON	1,194	133,637	2,004	66.69	0.596
Willamette Valley	LEBANON	LEBANON	4M63	TENNESSEE	4,556	1,116,506	1,790	623.75	2.545
Willamette Valley	LEBANON	LEBANON	4M79	CROWN Z	13	1,428	1,166	1.23	0.011
Willamette Valley	LEBANON	SWEET HOME	4M37	HOLLEY	1,981	343,180	2,033	168.80	0.974
Willamette Valley	LEBANON	SWEET HOME	4M38	NARROWS	1,268	116,524	976	119.39	1.299
Willamette Valley	LEBANON	SWEET HOME	4M93	AMES CREEK	869	107,963	1,678	64.34	0.518
Willamette Valley	LEBANON	SWEET HOME	4M94	FOSTER	3,192	338,771	2,409	140.63	1.325
Willamette Valley	STAYTON	LYONS	4M120	MILL CITY	2,447	269,395	731	368.53	3.347
Willamette Valley	STAYTON	LYONS	4M70	MEHAMA	6,491	468,266	2,146	218.20	3.025
Willamette Valley	STAYTON	SCIO	5M126	THOMAS	2,353	230,641	1,569	147.00	1.500
Willamette Valley	STAYTON	STAYTON	4M19	AUMSVILLE	11,517	1,240,295	3,380	366.95	3.407
Willamette Valley	STAYTON	STAYTON	4M353	WEST STAYTON	587	159,548	3,504	45.53	0.168
Willamette Valley	STAYTON	STAYTON	4M370	CASCADE	529	105,258	1,581	66.58	0.335
Willamette Valley	STAYTON	STAYTON	4M50	3RD STREET	42	10,064	913	11.02	0.046

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Central OR	BEND/REDMOND	BEND	5D10	PORTLAND AVE	109	18,637	2,411	7.73	0.045
Central OR	BEND/REDMOND	BEND	5D11	GLEN VISTA	89	15,957	1,242	12.85	0.072
Central OR	BEND/REDMOND	BEND	5D196	MALLARD	1,558	408,769	1,400	291.98	1.113
Central OR	BEND/REDMOND	BOND STREET	5D411	BACHELOR	744	168,960	2,148	78.66	0.346
Central OR	BEND/REDMOND	BOND STREET	5D418	BLAKELY	2,513	632,238	1,185	533.53	2.121
Central OR	BEND/REDMOND	CHINA HAT	5D140	LAVA (CHINA HAT)	2,821	748,124	2,334	320.53	1.209
Central OR	BEND/REDMOND	CHINA HAT	5D142	HIGH DESERT	420	31,114	1,713	18.16	0.245
Central OR	BEND/REDMOND	CHINA HAT	5D144	D.R.W.	1,537	601,770	2,482	242.45	0.619
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D30	ARROWHEAD	368	34,772	1,272	27.34	0.289
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D35	WICKIUP	26	2,362	1,064	2.22	0.024
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D38	TOMAHAWK	201	36,315	1,439	25.24	0.140
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D94	TEEPEE	204	36,512	3,769	9.69	0.054
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D96	OBSIDIAN	1,028	60,262	880	68.48	1.168
Central OR	BEND/REDMOND	CLEVELAND AVE.	5D98	HUCKLEBERRY	25	3,275	1,179	2.78	0.021
Central OR	BEND/REDMOND	CROOKED RIVER RANCH	4D131	CANYON	3,401	372,325	1,807	206.05	1.882
Central OR	BEND/REDMOND	CROOKED RIVER RANCH	4D30	CROOKED R.R.	4,295	3,521,424	783	4,497.35	5.485
Central OR	BEND/REDMOND	DESCHUTES	5D184	PRONGHORN	198	19,075	1,114	17.12	0.178
Central OR	BEND/REDMOND	DESCHUTES	5D2	DESCHUTES S	111	25,982	1,019	25.50	0.109
Central OR	BEND/REDMOND	HUNTERS CIRCLE	5D192	Mackinaw	32	3,796	698	5.44	0.046
Central OR	BEND/REDMOND	OVERPASS	5D104	AWBREY	2,235	763,849	1,955	390.72	1.143
Central OR	BEND/REDMOND	OVERPASS	5D106	NEZ PERCE	777	104,033	2,692	38.65	0.289
Central OR	BEND/REDMOND	OVERPASS	5D120	CHINOOK	163	53,156	1,791	29.68	0.091
Central OR	BEND/REDMOND	OVERPASS	5D128	PAIUTE	34	38,868	2,155	18.04	0.016
Central OR	BEND/REDMOND	OVERPASS	5D155	APACHE	1	39	824	0.05	0.001
Central OR	BEND/REDMOND	PILOT BUTTE	5D261	KLONDIKE	1,546	86,751	1,538	56.41	1.005
Central OR	BEND/REDMOND	PILOT BUTTE	5D263	DRAKE FEEDER	267	46,214	2,477	18.66	0.108
Central OR	BEND/REDMOND	PILOT BUTTE	5D265	DOBBIN	529	107,127	1,676	63.92	0.316
Central OR	BEND/REDMOND	REDMOND	5D21	SOUTH (REDMOND)	62	8,978	760	11.81	0.082
Central OR	BEND/REDMOND	REDMOND	5D22	INDUSTRIAL	1,836	809,533	1,507	537.18	1.218
Central OR	BEND/REDMOND	REDMOND	5D223	TETHEROW	140	35,644	863	41.30	0.162
Central OR	BEND/REDMOND	REDMOND	5D226	CLINE FALLS	236	24,967	1,496	16.69	0.158
Central OR	BEND/REDMOND	REDMOND	5D227	WINDSOR	138	24,332	3,206	7.59	0.043
Central OR	BEND/REDMOND	REDMOND	5D228	CITY	87	29,603	1,307	22.65	0.067
Central OR	BEND/REDMOND	REDMOND	5D229	JUNIPER	184	52,086	418	124.61	0.440
Central OR	BEND/REDMOND	SHEVLIN PARK	5D238	WOLVERINE (SHP) (WAS 5D327)	2,973	747,720	2,771	269.84	1.073
Central OR	BEND/REDMOND	SHEVLIN PARK	5D241	BADGER (SHP)	383	21,911	2,604	8.41	0.147
Central OR	BEND/REDMOND	SHEVLIN PARK	5D243	Black Bear	43	10,442	1,774	5.89	0.024
Central OR	BEND/REDMOND	YEW AVENUE	5D322	BIRDIE	670	48,319	1,936	24.96	0.346
Central OR	BEND/REDMOND	YEW AVENUE	5D323	FAIRWAY	480	160,691	392	409.93	1.224
Central OR	BEND/REDMOND	YEW AVENUE	5D325	EAGLE	4	677	2,660	0.25	0.002
Central OR	MADRAS	CHERRY LANE	5D295	7 PEAKS	7	1,879	145	12.96	0.048
Central OR	MADRAS	CULVER	5D5	CULVER	6,044	5,018,595	1,838	2,730.47	3.288
Central OR	MADRAS	MADRAS	5D52	MADRAS RURAL	2,455	1,719,336	1,054	1,631.25	2.329
Central OR	MADRAS	MADRAS	5D53	AGATE	395	57,990	1,288	45.02	0.307

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Central OR	MADRAS	MADRAS	5D57	QUARTZ	137	61,783	1,400	44.13	0.098
Central OR	MADRAS	MADRAS	5D61	MADRAS CITY	21	3,936	1,276	3.08	0.016
Central OR	MADRAS	POWELL BUTTE	5D1	POWELL BUTTE	1,219	337,917	649	520.67	1.878
Central OR	MADRAS	PRINEVILLE	5D126	RIMROCK	1,106	236,139	872	270.80	1.268
Central OR	MADRAS	PRINEVILLE	5D167	NORTHVILLE	525	188,069	2,693	69.84	0.195
Central OR	MADRAS	PRINEVILLE	5D25	OCHOCO	1,399	140,489	997	140.91	1.403
Central OR	MADRAS	PRINEVILLE	5D47	MC KAY (PRINEVILLE)	914	223,191	1,732	128.86	0.528
Central OR	MADRAS	PRINEVILLE	5D48	LAMONTA	37	8,612	621	13.87	0.060
Central OR	MADRAS	PRINEVILLE	5D50	PINE CONE	1,719	414,104	79	5,241.82	21.759
Central OR	MADRAS	PRINEVILLE	5D69	GRIMES FLAT	3,878	414,102	1,611	257.05	2.407
Central OR	MADRAS	WARM SPRINGS	4D68	WARM SPRINGS (OR)	1,533	633,845	977	648.77	1.569
CoastPlus	CLATSOP (ASTORIA)	CANNON BEACH	5A10	HAYSTACK	9,445	2,032,239	1,608	1,263.83	5.874
CoastPlus	CLATSOP (ASTORIA)	CANNON BEACH	5A8	ECOLA	6,308	1,195,967	1,217	982.72	5.183
CoastPlus	CLATSOP (ASTORIA)	FERN HILL SUB	5A51	JOHN DAY	1,765	251,939	270	933.11	6.537
CoastPlus	CLATSOP (ASTORIA)	FERN HILL SUB	5A52	SCANDINAVIAN	683	91,516	382	239.57	1.788
CoastPlus	CLATSOP (ASTORIA)	KNAPPA SVENSEN	5A92	SVENSEN	174	42,389	728	58.23	0.239
CoastPlus	CLATSOP (ASTORIA)	KNAPPA SVENSEN	5A93	BRADWOOD	2,750	396,837	933	425.33	2.947
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A80	GROVE	12,708	893,593	2,405	371.56	5.284
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A81	CENTRAL	9,238	647,689	1,622	399.32	5.695
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A82	NECANICUM	7,510	589,982	1,200	491.65	6.258
CoastPlus	CLATSOP (ASTORIA)	SEASIDE	5A83	GEARHART	24,069	1,843,118	3,367	547.41	7.149
CoastPlus	CLATSOP (ASTORIA)	WARRENTON	5A15	CITY	359	82,681	247	334.74	1.453
CoastPlus	CLATSOP (ASTORIA)	WARRENTON	5A16	MILL (WARRENTON)	151	17,055	2,255	7.56	0.067
CoastPlus	CLATSOP (ASTORIA)	WARRENTON	5A20	SOUTH (WARRENTON)	3,559	488,395	1,727	282.80	2.061
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A202	PORT DOCK	605	104,158	1,184	87.97	0.511
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A204	MOO COW	1,863	306,422	1,163	263.48	1.602
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A205	FIFTH STREET	21	1,397	987	1.42	0.021
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A210	YOUNGS BAY #10	18	1,759	945	1.86	0.019
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A211	OLNEY	2,563	508,069	1,099	462.30	2.332
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A213	INDUSTRIAL	3,128	770,671	1,355	568.76	2.308
CoastPlus	COOS BAY/COQUILLE	BANDON TIE (BPA)	L804	BANDON	1,807	355,559	754	471.56	2.397
CoastPlus	COOS BAY/COQUILLE	COOS RIVER	4C106	COOS RIVER	4,513	837,012	1,357	616.81	3.326
CoastPlus	COOS BAY/COQUILLE	COQUILLE	4C41	HENRY STREET	4,806	302,166	1,681	179.75	2.859
CoastPlus	COOS BAY/COQUILLE	COQUILLE	4C42	TERRES HGHTS	4,359	467,483	1,548	301.99	2.816
CoastPlus	COOS BAY/COQUILLE	COQUILLE	4C43	INDUSTRIAL	158	6,126	154	39.78	1.026
CoastPlus	COOS BAY/COQUILLE	EMPIRE	4C108	EMPIRE	4,968	249,661	1,738	143.65	2.858
CoastPlus	COOS BAY/COQUILLE	EMPIRE	4C89	SCOTT	1,572	72,804	1,440	50.56	1.092
CoastPlus	COOS BAY/COQUILLE	EMPIRE	4C90	CHARLESTON	3,215	234,024	2,093	111.81	1.536
CoastPlus	COOS BAY/COQUILLE	JORDAN POINT	5C6	SAND DUNES (JORDAN POINT)	3	610	29	21.05	0.103
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C48	CITY CENTER	21	6,841	1,507	4.54	0.014
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C49	EASTSIDE	357	26,311	776	33.91	0.460
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C50	BUNKERHILL	2,305	420,165	1,835	228.97	1.256
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C97	ENGLEWOOD	1,406	118,890	1,384	85.90	1.016
CoastPlus	COOS BAY/COQUILLE	MYRTLE POINT	4C36	NORTH (MYRTLE POINT)	1,558	320,039	331	966.88	4.707

Oregon 2020 Circuit Metrics (including major events)

Oregon Regions	Op Area Name	Substation Name	Circuit Id	Circuit Name	Customers in Incident Sustained	Customer Minutes Lost	Circuit Customer Count	SAIDI	SAIFI
CoastPlus	COOS BAY/COQUILLE	MYRTLE POINT	4C37	MAPLE STREET	5,771	1,437,811	2,077	692.25	2.779
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C112	WOODLAND	3,893	412,201	1,867	220.78	2.085
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C66	BAYSHORE	232	39,486	1,716	23.01	0.135
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C67	INDUSTRIAL	370	92,877	2,222	41.80	0.167
CoastPlus	COOS BAY/COQUILLE	STATE STREET	4C86	BANGOR	1,835	69,971	1,791	39.07	1.025
CoastPlus	HOOD RIVER	GORDON HOLLOW	4K1	SHERMAN 208	2,145	802,588	712	1,127.23	3.013
CoastPlus	HOOD RIVER	HOOD RIVER	5K37	RESIDENTIAL	599	52,328	2,112	24.78	0.284
CoastPlus	HOOD RIVER	HOOD RIVER	5K43	BELMONT	2,185	147,779	1,189	124.29	1.838
CoastPlus	HOOD RIVER	HOOD RIVER	5K44	NORTH (HOOD RIVER)	2,179	97,610	1,798	54.29	1.212
CoastPlus	HOOD RIVER	HOOD RIVER	5K70	EASTSIDE	1,649	503,517	1,071	470.14	1.540
CoastPlus	HOOD RIVER	HOOD RIVER	5K74	SOUTH (HOOD RIVER)	960	280,571	1,572	178.48	0.611
CoastPlus	HOOD RIVER	KENWOOD	5K50	OAKGROVE	1,692	143,133	815	175.62	2.076
CoastPlus	HOOD RIVER	WASCO	7K1	WASCO	854	337,864	275	1,228.60	3.105
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A310	INLAND FEEDER	4,111	3,102,906	1,907	1,627.11	2.156
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A312	OCEAN	8,206	5,581,838	3,020	1,848.29	2.717
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A316	LAKE (DEVILS LAKE)	28,676	12,123,800	4,579	2,647.70	6.263
CoastPlus	LINCOLN CITY	DEVILS LAKE	4A338	SIUSLAW	3,556	2,495,397	661	3,775.19	5.380
CoastPlus	LINCOLN CITY	GLENEDEN	7A364	GLENEDEN	2,819	2,610,166	715	3,650.58	3.943
CoastPlus	LINCOLN CITY	GLENEDEN	7A366	SALISHAN	1,194	1,273,297	357	3,566.66	3.345
CoastPlus	LINCOLN CITY	NELSCOTT	7A390	NELSCOTT	1,096	1,236,576	352	3,513.00	3.114
CoastPlus	LINCOLN CITY	WECOMA BEACH	7A354	WECOMA	3,044	1,787,747	720	2,482.98	4.228
CoastPlus	PORTLAND	ALBINA	5P150	ALBINA 11C15	42	4,260	135	31.56	0.311
CoastPlus	PORTLAND	ALBINA	5P194	11C24-UG	194	16,306	224	72.79	0.866
CoastPlus	PORTLAND	ALBINA	5P66	11C25	86	27,250	27	1,009.28	3.185
CoastPlus	PORTLAND	ALBINA	5P92	11C12-UG	161	9,588	161	59.55	1.000
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	5P22	ALDERWOOD #2	32	4,362	199	21.92	0.161
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	5P604	ALDERWOOD #3	3	886	206	4.30	0.015
CoastPlus	PORTLAND	BLOSS	5P172	FURNACE	3	777	1	776.55	3.000
CoastPlus	PORTLAND	COLUMBIA (OR)	5P266	COLUMBIA #2	7,947	501,068	2,617	191.47	3.037
CoastPlus	PORTLAND	COLUMBIA (OR)	5P268	COLUMBIA #1	716	60,225	359	167.76	1.994
CoastPlus	PORTLAND	COLUMBIA (OR)	5P474	COLUMBIA #6	1,125	88,746	546	162.54	2.060
CoastPlus	PORTLAND	COLUMBIA (OR)	5P476	COLUMBIA #3	2,719	277,495	858	323.42	3.169
CoastPlus	PORTLAND	COLUMBIA (OR)	5P478	COLUMBIA #4	3,364	468,029	886	528.25	3.797
CoastPlus	PORTLAND	COLUMBIA (OR)	5P480	COLUMBIA #5	44	3,269	22	148.58	2.000
CoastPlus	PORTLAND	CULLY	5P288	CULLY #3-UG	123	16,439	824	19.95	0.149
CoastPlus	PORTLAND	CULLY	5P290	CULLY #2	2,524	165,470	2,397	69.03	1.053
CoastPlus	PORTLAND	CULLY	5P292	CULLY #1	5,875	283,428	2,917	97.16	2.014
CoastPlus	PORTLAND	HOLLADAY (OR)	5P156	HOLLADAY #4-UG	802	56,361	792	71.16	1.013
CoastPlus	PORTLAND	HOLLADAY (OR)	5P158	HOLLADAY #6	71	29,470	904	32.60	0.079
CoastPlus	PORTLAND	HOLLYWOOD	5P203	HOLLYWOOD #3	54	4,565	1,471	3.10	0.037
CoastPlus	PORTLAND	HOLLYWOOD	5P204	HOLLYWOOD #2	34	6,973	742	9.40	0.046
CoastPlus	PORTLAND	HOLLYWOOD	5P205	HOLLYWOOD #1	2,213	526,723	2,142	245.90	1.033
CoastPlus	PORTLAND	HOLLYWOOD	5P208	HOLLYWOOD #5	763	262,122	3,319	78.98	0.230
CoastPlus	PORTLAND	HOLLYWOOD	5P209	HOLLYWOOD #4	61	22,110	2,358	9.38	0.026

Oregon 2020 Circuit Metrics (including major events)

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CoastPlus	PORTLAND	KILLINGSWORTH	5P123	KILLINGSWORTH #3	1,290	103,551	309	335.12	4.175
CoastPlus	PORTLAND	KILLINGSWORTH	5P217	KILLINGSWORTH #5	2,229	192,440	422	456.02	5.282
CoastPlus	PORTLAND	KILLINGSWORTH	5P41	KILLINGSWORTH #4	9,897	967,353	2,786	347.22	3.552
CoastPlus	PORTLAND	KILLINGSWORTH	5P88	KILLINGSWORTH #1-UG	2	172	1	172.05	2.000
CoastPlus	PORTLAND	KILLINGSWORTH	5P89	KILLINGSWORTH #2	8,299	1,033,537	3,173	325.73	2.616
CoastPlus	PORTLAND	KNOTT	5P231	KNOTT #1	554	277,141	2,997	92.47	0.185
CoastPlus	PORTLAND	KNOTT	5P232	KNOTT #2	82	9,143	2,298	3.98	0.036
CoastPlus	PORTLAND	KNOTT	5P233	KNOTT #3	100	17,463	2,272	7.69	0.044
CoastPlus	PORTLAND	KNOTT	5P368	11022	16	1,437	171	8.40	0.094
CoastPlus	PORTLAND	LINCOLN (OR)	5P422	11D06-UG	961	121,418	879	138.13	1.093
CoastPlus	PORTLAND	LINCOLN (OR)	5P430	11D05-UG	154	89,903	369	243.64	0.417
CoastPlus	PORTLAND	LINCOLN (OR)	5P432	11D02-UG	1	6	677	0.01	0.001
CoastPlus	PORTLAND	MALLORY	5P162	MALLORY #1	4,806	370,426	2,178	170.08	2.207
CoastPlus	PORTLAND	MALLORY	5P164	MALLORY #2	8,658	689,991	3,173	217.46	2.729
CoastPlus	PORTLAND	PARKROSE	5P244	PARKROSE#4	3,228	169,071	3,131	54.00	1.031
CoastPlus	PORTLAND	PARKROSE	5P246	PARKROSE#3	223	68,769	3,080	22.33	0.072
CoastPlus	PORTLAND	PARKROSE	5P250	PARKROSE#2	20	5,911	659	8.97	0.030
CoastPlus	PORTLAND	PARKROSE	5P252	PARKROSE#1	2,216	451,922	1,804	250.51	1.228
CoastPlus	PORTLAND	PARKROSE	5P717	PARKROSE 5	69	8,187	67	122.20	1.030
CoastPlus	PORTLAND	RUSSELLVILLE	5P274	RUSSELLVILLE #3	3,440	425,016	3,110	136.66	1.106
CoastPlus	PORTLAND	RUSSELLVILLE	5P276	RUSSELLVILLE #4	465	106,136	2,331	45.53	0.199
CoastPlus	PORTLAND	RUSSELLVILLE	5P278	RUSSELLVILLE #1	4,264	705,863	3,291	214.48	1.296
CoastPlus	PORTLAND	RUSSELLVILLE	5P280	RUSSELLVILLE #2	312	96,216	1,250	76.97	0.250
CoastPlus	PORTLAND	VERNON	5P391	VERNON #1	3,994	307,713	1,810	170.01	2.207
CoastPlus	PORTLAND	VERNON	5P392	VERNON NO. 2	5,863	461,012	2,600	177.31	2.255
CoastPlus	PORTLAND	VERNON	5P393	VERNON #3	9,868	1,943,941	3,453	562.97	2.858
CoastPlus	PORTLAND	VERNON	5P394	VERNON # 4	10,174	884,560	3,449	256.47	2.950
CoastPlus	PORTLAND	VERNON	5P395	VERNON # 5	4,583	332,433	2,285	145.49	2.006
Northeast OR	ENTERPRISE	ENTERPRISE (OR)	4W8	CREIGHTON LN	5,272	798,752	1,480	539.70	3.562
Northeast OR	ENTERPRISE	ENTERPRISE (OR)	5W15	CITY	156	10,415	942	11.06	0.166
Northeast OR	ENTERPRISE	ENTERPRISE (OR)	5W26	RURAL (ENTERPRISE)	631	78,786	1,083	72.75	0.583
Northeast OR	ENTERPRISE	JOSEPH	5W21	PRAIRIE	2,961	417,044	849	491.22	3.488
Northeast OR	ENTERPRISE	MINAM	5W18	MINAM	18	4,408	13	339.05	1.385
Northeast OR	ENTERPRISE	PALLETTE	4W14	PALLETTE NORTH	1,082	312,757	173	1,807.85	6.254
Northeast OR	ENTERPRISE	PALLETTE	4W15	PALLETTE SOUTH	55	43,358	54	802.93	1.019
Northeast OR	ENTERPRISE	WALLOWA	5W28	CITY	1,296	197,672	882	224.12	1.469
Northeast OR	HERMISTON	ARLINGTON	5K25	ARLINGTON	836	110,959	519	213.79	1.611
Northeast OR	HERMISTON	BLALOCK	5K40	BLALOCK	1	172	20	8.60	0.050
Northeast OR	HERMISTON	DALREED	4K16	WILLOW COVE	282	172,177	74	2,326.71	3.811
Northeast OR	HERMISTON	DALREED	4K36	SIMTAG	40	35,697	19	1,878.76	2.105
Northeast OR	HERMISTON	DALREED	4K46	BOEING	466	346,196	179	1,934.05	2.603
Northeast OR	HERMISTON	HERMISTON	5W602	RURAL (HERMISTON)	8,780	1,108,948	1,391	797.23	6.312
Northeast OR	HERMISTON	HINKLE	5W82	MEADOWS	1,428	336,698	376	895.47	3.798
Northeast OR	HERMISTON	UMATILLA	5W658	UMATILLA	1,686	295,709	1,248	236.95	1.351

Oregon 2020 Circuit Metrics (including major events)

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Northeast OR	HERMISTON	UMATILLA	5W660	MCNARY	1,297	181,529	944	192.30	1.374
Northeast OR	HERMISTON	UMATILLA	5W664	PORT FEEDER	136	122,297	60	2,038.28	2.267
Northeast OR	PENDLETON	ATHENA	5W703	CITY	175	37,604	843	44.61	0.208
Northeast OR	PENDLETON	ATHENA	5W705	HELIX	131	53,595	421	127.30	0.311
Northeast OR	PENDLETON	BUCKAROO	5W201	STATE HOSP.	92	33,244	383	86.80	0.240
Northeast OR	PENDLETON	BUCKAROO	5W202	REITH	5,316	432,258	1,552	278.52	3.425
Northeast OR	PENDLETON	BUCKAROO	5W203	MONTEE	2,409	163,669	1,738	94.17	1.386
Northeast OR	PENDLETON	PENDLETON	5W401	WEST HILLS	515	151,379	1,674	90.43	0.308
Northeast OR	PENDLETON	PENDLETON	5W402	HARRIS HTS	2,593	253,284	2,060	122.95	1.259
Northeast OR	PENDLETON	PENDLETON	5W403	MISSION	2,371	172,372	1,041	165.58	2.278
Northeast OR	PENDLETON	PENDLETON	7W451	BUSINESS	295	46,609	270	172.63	1.093
Northeast OR	PENDLETON	PENDLETON	7W452	NORTHWEST	3	906	518	1.75	0.006
Northeast OR	PENDLETON	PENDLETON	7W453	SOUTHWEST (PENDELTON)	13	1,788	332	5.39	0.039
Northeast OR	PENDLETON	PENDLETON	7W454	EAST END	12	729	249	2.93	0.048
Northeast OR	PENDLETON	PILOT ROCK	5W406	PILOT ROCK CITY	3,249	276,462	1,393	198.46	2.332
Northeast OR	PENDLETON	WESTON NEW (OR)	5W40	WESTON CANNERY	1	140	16	8.74	0.063
Northeast OR	PENDLETON	WESTON NEW (OR)	5W7	SCOTTS FEEDER	250	44,381	452	98.19	0.553
Northeast OR	WALLA WALLA	UMAPINE	5W105	UMAPINE FEEDER	471	84,075	965	87.12	0.488
Northeast OR	WALLA WALLA	UMAPINE	5W106	FERNDALE	1,515	362,696	1,347	269.26	1.125
Southern OR	GRANTS PASS	AGNESS AVE	5R172	SPALDING MILL	1,754	641,934	883	726.99	1.986
Southern OR	GRANTS PASS	AGNESS AVE	5R173	JONES CREEK	36	4,132	888	4.65	0.041
Southern OR	GRANTS PASS	AGNESS AVE	5R322	ANTEATER	1,085	118,645	990	119.84	1.096
Southern OR	GRANTS PASS	APPLEGATE	5R267	MURPHY	3,532	471,494	1,048	449.90	3.370
Southern OR	GRANTS PASS	APPLEGATE	5R278	HIGHWAY	4,836	1,715,619	1,629	1,053.17	2.969
Southern OR	GRANTS PASS	BEACON	5R104	SAVAGE ST	1,357	358,344	1,272	281.72	1.067
Southern OR	GRANTS PASS	BEACON	5R105	BEACON ST	971	244,921	845	289.85	1.149
Southern OR	GRANTS PASS	CAVE JUNCTION	5R52	FREE& EASY	5,444	6,692,084	2,407	2,780.26	2.262
Southern OR	GRANTS PASS	CAVE JUNCTION	5R53	ROUGH &READY	2,182	2,542,720	1,532	1,659.74	1.424
Southern OR	GRANTS PASS	CAVEMAN	5R295	QUAIL	2,326	254,568	1,119	227.50	2.079
Southern OR	GRANTS PASS	CAVEMAN	5R82	WASHINGTON	631	52,830	1,192	44.32	0.529
Southern OR	GRANTS PASS	CAVEMAN	5R98	MANZANITA	47	23,101	575	40.18	0.082
Southern OR	GRANTS PASS	CAVEMAN	5R99	CAVEMAN	202	88,859	1,208	73.56	0.167
Southern OR	GRANTS PASS	DOWELL	5R331	DOVE	1,961	70,309	1,492	47.12	1.314
Southern OR	GRANTS PASS	DOWELL	5R334	DUCK	2,720	729,288	2,530	288.26	1.075
Southern OR	GRANTS PASS	EASY VALLEY	5R123	G STREET	5,810	1,231,987	2,172	567.21	2.675
Southern OR	GRANTS PASS	EASY VALLEY	5R125	ROGUE	2,354	71,567	1,780	40.21	1.322
Southern OR	GRANTS PASS	EASY VALLEY	5R259	CHINOOK	1,916	1,179,834	1,324	891.11	1.447
Southern OR	GRANTS PASS	FIELDER CREEK	4R33	ELK FDR.	2,997	1,766,390	1,846	956.87	1.624
Southern OR	GRANTS PASS	FIELDER CREEK	4R34	BEAR FDR	1,631	860,611	860	1,000.71	1.897
Southern OR	GRANTS PASS	GLENDALE SUBSTATION	5R133	GLENDALE	6,335	6,116,159	1,886	3,242.93	3.359
Southern OR	GRANTS PASS	GLENDALE SUBSTATION	5R143	INDUSTRIAL	1,417	884,764	656	1,348.73	2.160
Southern OR	GRANTS PASS	JEROME PRAIRIE	5R62	WILD PRAIRIE	4,542	3,596,467	1,630	2,206.42	2.787
Southern OR	GRANTS PASS	JEROME PRAIRIE	5R63	WOOD RIVER	9,788	3,325,335	1,600	2,078.33	6.118
Southern OR	GRANTS PASS	MERLIN	5R232	MERLIN-HUGO	1,939	3,566,595	1,021	3,493.24	1.899

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Southern OR	GRANTS PASS	MERLIN	5R234	PARADISE	806	445,052	1,200	370.88	0.672
Southern OR	GRANTS PASS	MERLIN	5R248	PLEASANT VALLEY-MERLIN FEEDER	1,584	2,859,290	1,140	2,508.15	1.389
Southern OR	GRANTS PASS	MERLIN	5R251	BADGER	174	45,268	928	48.78	0.188
Southern OR	GRANTS PASS	MERLIN	5R288	MONARCH	2,063	2,972,536	1,749	1,699.56	1.180
Southern OR	GRANTS PASS	OBRIEN	5R106	O'BRIEN	815	1,233,134	431	2,861.10	1.891
Southern OR	GRANTS PASS	PARK STREET (OR)	5R114	FRUITDALE	11,518	1,029,355	2,185	471.10	5.271
Southern OR	GRANTS PASS	PARK STREET (OR)	5R115	ALLEN CREEK	666	263,218	1,010	260.61	0.659
Southern OR	GRANTS PASS	PARK STREET (OR)	5R121	NEW HOPE	2,484	158,991	1,857	85.62	1.338
Southern OR	GRANTS PASS	PARK STREET (OR)	5R164	EXPRESS	326	149,963	320	468.64	1.019
Southern OR	GRANTS PASS	PARK STREET (OR)	5R169	PORTOLA	1,976	152,712	1,384	110.34	1.428
Southern OR	GRANTS PASS	PROVOLT	5R67	NORTH-SOUTH	5,704	2,376,951	1,444	1,646.09	3.950
Southern OR	GRANTS PASS	ROGUE RIVER	5R77	SAVAGE/WIMER	17,134	3,307,373	1,855	1,782.95	9.237
Southern OR	GRANTS PASS	ROGUE RIVER	5R78	ROCKY POINT (ROGUE RIVER)	6,675	2,122,921	1,058	2,006.54	6.309
Southern OR	GRANTS PASS	SELMA	5R65	DEER CREEK	5,967	4,073,774	1,201	3,391.99	4.968
Southern OR	KLAMATH FALLS	BEATTY	5L1	BEATTY	794	99,143	388	255.52	2.046
Southern OR	KLAMATH FALLS	BLY	5L14	TOWN (BLY)	2,319	296,885	417	711.95	5.561
Southern OR	KLAMATH FALLS	BOISE CASCADE	7L9	BOISE CASCAD	2	279	1	278.67	2.000
Southern OR	KLAMATH FALLS	BONANZA (OR)	5L7	POE VALLEY	40	4,664	470	9.92	0.085
Southern OR	KLAMATH FALLS	BRYANT	5L2	GARY STREET	222	33,916	2,140	15.85	0.104
Southern OR	KLAMATH FALLS	BRYANT	5L3	WASHBURN	26	1,648	1,822	0.90	0.014
Southern OR	KLAMATH FALLS	BRYANT	5L4	SUMMERS LANE	86	9,027	1,969	4.58	0.044
Southern OR	KLAMATH FALLS	BRYANT	5L5	MOYINA HTS.	332	28,346	2,460	11.52	0.135
Southern OR	KLAMATH FALLS	CASEBEER SUB	4L16	LANGELL VLY	231	34,705	1,160	29.92	0.199
Southern OR	KLAMATH FALLS	CHILOQUIN	5L57	CRATER LAKE	2,392	1,280,792	1,060	1,208.29	2.257
Southern OR	KLAMATH FALLS	CHILOQUIN MRKT	5L37	WILLIAMSON	1,248	186,003	551	337.57	2.265
Southern OR	KLAMATH FALLS	DAIRY	5L42	SWAN LAKE	107	8,149	259	31.46	0.413
Southern OR	KLAMATH FALLS	DAIRY	5L43	DAIRY	1,258	158,003	496	318.55	2.536
Southern OR	KLAMATH FALLS	HAMAKER	5L55	KENO	944	170,848	1,706	100.15	0.553
Southern OR	KLAMATH FALLS	HAMAKER	5L56	MOUNTAIN	12	516	159	3.25	0.075
Southern OR	KLAMATH FALLS	HENLEY	5L58	HENLEY	52	3,911	232	16.86	0.224
Southern OR	KLAMATH FALLS	HENLEY	5L59	WEST	559	53,169	537	99.01	1.041
Southern OR	KLAMATH FALLS	HORNET	5L44	HOMEDALE	523	74,976	2,811	26.67	0.186
Southern OR	KLAMATH FALLS	HORNET	5L45	CRYSTAL SPR	3,175	259,781	1,471	176.60	2.158
Southern OR	KLAMATH FALLS	LAKEPORT	5L54	SOUTH (LAKEPORT)	357	42,533	2,424	17.55	0.147
Southern OR	KLAMATH FALLS	MERRILL (OR)	5L26	LAKE (MERRILL)	323	55,558	858	64.75	0.376
Southern OR	KLAMATH FALLS	MERRILL (OR)	5L27	NORTH (MERRILL)	18	1,640	562	2.92	0.032
Southern OR	KLAMATH FALLS	MODOC	5L36	MODOC	1,944	286,197	845	338.70	2.301
Southern OR	KLAMATH FALLS	ROSS AVENUE	5L46	ELDORADO	343	26,065	1,384	18.83	0.248
Southern OR	KLAMATH FALLS	ROSS AVENUE	5L48	BROAD ST.	19	2,691	1,201	2.24	0.016
Southern OR	KLAMATH FALLS	RUNNING Y	4L50	ROCKY POINT FEEDER (RUNNING Y)	1,646	329,257	1,456	226.14	1.130
Southern OR	KLAMATH FALLS	SHASTA WAY	7L25	SHASTA WAY	31	1,906	430	4.43	0.072
Southern OR	KLAMATH FALLS	SPRAGUE RIVER	5L8	SPRAGUE RIVER	1,455	162,037	507	319.60	2.870
Southern OR	KLAMATH FALLS	TEXUM	5L112	ANDERSON	51	4,907	1,204	4.08	0.042
Southern OR	KLAMATH FALLS	TEXUM	5L113	TOWER	19	2,813	287	9.80	0.066

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Southern OR	KLAMATH FALLS	TEXUM	5L116	ALTAMONT	829	61,985	1,481	41.85	0.560
Southern OR	KLAMATH FALLS	TURKEY HILL	5L20	MALIN CITY	1,248	168,091	821	204.74	1.520
Southern OR	KLAMATH FALLS	TURKEY HILL	5L23	RURAL (TURKEY HILL)	536	59,599	322	185.09	1.665
Southern OR	KLAMATH FALLS	WEST SIDE	5L12	ORINDALE	821	106,050	791	134.07	1.038
Southern OR	KLAMATH FALLS	WEST SIDE	5L15	CALIFORNIA	54	5,841	1,359	4.30	0.040
Southern OR	KLAMATH FALLS	WEST SIDE	5L17	PINE ST (WEST SIDE HE PLANT)	28	2,935	501	5.86	0.056
Southern OR	KLAMATH FALLS	WEST SIDE	5L18	RIVERSIDE (WEST SIDE HE PLANT)	37	3,305	584	5.66	0.063
Southern OR	KLAMATH FALLS	WEST SIDE	5L19	LAKESHORE	307	4,616	307	15.03	1.000
Southern OR	LAKEVIEW	MILE-HI	5L104	INDUSTRIAL	220	25,061	703	35.65	0.313
Southern OR	LAKEVIEW	MILE-HI	5L105	BUSINESS	874	120,175	1,707	70.40	0.512
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	5R241	CITY	6	561	12	46.77	0.500
Southern OR	MEDFORD	ASHLAND (MTN.AVE, PUD)	5R245	VALLEY VIEW	188	92,482	987	93.70	0.190
Southern OR	MEDFORD	BEALL LANE	5R359	BEEHIVE	2	587	2	293.57	1.000
Southern OR	MEDFORD	BEALL LANE	5R361	BULLDOG	102	22,393	1,720	13.02	0.059
Southern OR	MEDFORD	BEALL LANE	5R364	BOBCAT	423	68,072	2,151	31.65	0.197
Southern OR	MEDFORD	BELKNAP	5R1	KOGAP	78	25,073	1,024	24.49	0.076
Southern OR	MEDFORD	BELKNAP	5R2	RIVERSIDE (BELKNAP)	1,257	67,258	668	100.69	1.882
Southern OR	MEDFORD	BELKNAP	5R3	BARNETT	402	106,757	1,618	65.98	0.248
Southern OR	MEDFORD	BELKNAP	5R47	STEWART	4,700	416,522	2,125	196.01	2.212
Southern OR	MEDFORD	BROOKHURST	5R118	SPRINGBROOK	2,057	162,018	1,840	88.05	1.118
Southern OR	MEDFORD	BROOKHURST	5R135	ROBERTS (BROOKHURST)	1,870	46,904	1,669	28.10	1.120
Southern OR	MEDFORD	BROOKHURST	5R32	ROXY	201	34,580	1,790	19.32	0.112
Southern OR	MEDFORD	BROOKHURST	5R33	CRATER LAKE	244	57,184	1,728	33.09	0.141
Southern OR	MEDFORD	BROOKHURST	5R75	SUNRISE (BROOKHURST)	25	3,331	1,235	2.70	0.020
Southern OR	MEDFORD	CAMPBELL	5R216	VOORHIES	4,264	953,051	851	1,119.92	5.011
Southern OR	MEDFORD	CAMPBELL	5R218	PHOENIX	4,330	709,050	1,517	467.40	2.854
Southern OR	MEDFORD	CAMPBELL	5R227	FERN VALLEY	3,979	325,539	1,395	233.36	2.852
Southern OR	MEDFORD	CAMPBELL	5R312	COBRA	8,816	2,470,176	1,499	1,647.88	5.881
Southern OR	MEDFORD	DODGE BRIDGE	4R1	SALMON	6,344	617,009	1,637	376.91	3.875
Southern OR	MEDFORD	DODGE BRIDGE	4R35	MEADOWS ROAD	3,293	440,867	1,372	321.33	2.400
Southern OR	MEDFORD	FOOTHILLS	5R38	HOSPITAL	16	2,491	773	3.22	0.021
Southern OR	MEDFORD	FOOTHILLS	5R39	PIERCE ROAD	52	12,800	1,157	11.06	0.045
Southern OR	MEDFORD	FRALEY	5R87	TABLE ROCK	693	36,133	525	68.82	1.320
Southern OR	MEDFORD	FRALEY	5R88	DODGE BRIDGE	459	28,021	367	76.35	1.251
Southern OR	MEDFORD	GOLD HILL	5R103	GOLD HILL	1,800	374,268	2,018	185.47	0.892
Southern OR	MEDFORD	GRIFFIN CREEK	5R204	HULL RD	8,464	1,399,576	2,722	514.17	3.109
Southern OR	MEDFORD	GRIFFIN CREEK	5R206	GRIFFIN CREEK	10,763	2,282,932	1,752	1,303.04	6.143
Southern OR	MEDFORD	HUMBUG CREEK	5R287	HUMMINGBIRD	6,082	780,518	689	1,132.83	8.827
Southern OR	MEDFORD	JACKSONVILLE	5R284	STAGE RD	6,137	878,550	2,082	421.97	2.948
Southern OR	MEDFORD	JACKSONVILLE	5R285	JACKSONVILLE HWY	7,294	2,501,760	2,221	1,126.41	3.284
Southern OR	MEDFORD	MEDCO	5R280	BOISE CASCADE	1	331	1	331.12	1.000
Southern OR	MEDFORD	MEDFORD	5R21	MELROSE	3,231	446,137	1,567	284.71	2.062
Southern OR	MEDFORD	MEDFORD	5R23	SPRING ST.	1,636	382,837	1,616	236.90	1.012
Southern OR	MEDFORD	MEDFORD	5R250	BIG Y	418	57,432	1,858	30.91	0.225

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Southern OR	MEDFORD	MEDFORD	5R253	APPLE	1,230	187,816	1,110	169.20	1.108
Southern OR	MEDFORD	MEDFORD	5R257	PEAR	872	43,362	640	67.75	1.363
Southern OR	MEDFORD	MEDFORD	5R659	MCLEAN	61	5,155	676	7.63	0.090
Southern OR	MEDFORD	OAK KNOLL	5R55	SISKIYOU	1,063	261,415	1,507	173.47	0.705
Southern OR	MEDFORD	OAK KNOLL	5R56	HIGHWAY 99	1	47	119	0.40	0.008
Southern OR	MEDFORD	PROSPECT CNTRL	5R40	NEW CASCADE	225	60,479	334	181.07	0.674
Southern OR	MEDFORD	RED BLANKET	7R5	PROSPECT	747	166,844	396	421.32	1.886
Southern OR	MEDFORD	ROXY ANN	5R350	St. Bernard	1,424	102,918	1,286	80.03	1.107
Southern OR	MEDFORD	ROXY ANN	5R354	RACCOON	2,104	207,828	1,567	132.63	1.343
Southern OR	MEDFORD	RUCH	5R68	APPLEGATE	5,981	853,155	930	917.37	6.431
Southern OR	MEDFORD	RUCH	5R69	RUCH	1,748	135,791	541	251.00	3.231
Southern OR	MEDFORD	SAGE ROAD (OR)	5R211	COLUMBUS	54	6,489	1,944	3.34	0.028
Southern OR	MEDFORD	SAGE ROAD (OR)	5R226	BOISE	3	343	921	0.37	0.003
Southern OR	MEDFORD	SAGE ROAD (OR)	5R28	ROSS	4,740	616,734	1,996	308.99	2.375
Southern OR	MEDFORD	SAGE ROAD (OR)	5R29	EDWARDS	37	23,445	741	31.64	0.050
Southern OR	MEDFORD	SCENIC	5R174	UPTON	1,651	227,313	2,002	113.54	0.825
Southern OR	MEDFORD	SCENIC	5R180	HEAD RD	73	27,611	1,171	23.58	0.062
Southern OR	MEDFORD	SCENIC	5R182	TAYLOR RD	277	15,371	1,755	8.76	0.158
Southern OR	MEDFORD	SCENIC	5R184	CHENEY	131	24,815	1,493	16.62	0.088
Southern OR	MEDFORD	STEVENS ROAD	4R13	HENRY MILLER	5,957	1,050,410	2,350	446.98	2.535
Southern OR	MEDFORD	STEVENS ROAD	4R17	Stingray	5,304	921,368	2,563	359.49	2.069
Southern OR	MEDFORD	STEVENS ROAD	4R41	ANTELOPE	3,538	706,293	1,149	614.70	3.079
Southern OR	MEDFORD	TAKELMA	4R9	LOST CK. (TAKELMA)	6,276	953,986	2,651	359.86	2.367
Southern OR	MEDFORD	TALENT	5R237	TALENT	2,781	155,166	2,487	62.39	1.118
Southern OR	MEDFORD	TALENT	5R238	ANDERSON CRK	1,953	503,153	1,730	290.84	1.129
Southern OR	MEDFORD	TALENT	5R239	HARTLEY ROAD	2,244	254,967	1,551	164.39	1.447
Southern OR	MEDFORD	TALENT	5R240	NORTH HWY	1,189	161,686	1,184	136.56	1.004
Southern OR	MEDFORD	TOLO	5R90	TBL ROCK LBR	13	1,042	161	6.47	0.081
Southern OR	MEDFORD	TOLO	5R91	SAMS VALLEY	1,204	210,994	654	322.62	1.841
Southern OR	MEDFORD	TOLO	5R92	KIRTLAND RD	18	744	203	3.66	0.089
Southern OR	MEDFORD	VILAS ROAD	5R110	MCLAUGHLIN	1,457	41,267	955	43.21	1.526
Southern OR	MEDFORD	VILAS ROAD	5R146	KING CENTER	1,511	55,949	1,447	38.67	1.044
Southern OR	MEDFORD	VILAS ROAD	5R305	WEBFOOT	484	32,795	874	37.52	0.554
Southern OR	MEDFORD	WHITE CITY	5R11	EAGLE POINT	219	34,735	1,479	23.49	0.148
Southern OR	MEDFORD	WHITE CITY	5R13	FIR-PLY	1	62	23	2.69	0.043
Southern OR	MEDFORD	WHITE CITY	5R14	AGATE	6	751	110	6.83	0.055
Southern OR	MEDFORD	WHITE CITY	5R19	3M	7	645	121	5.33	0.058
Southern OR	MEDFORD	WHITE CITY	5R66	4 CORNERS	55	29,056	1,792	16.21	0.031
Southern OR	MEDFORD	WHITE CITY	5R76	AVE C	1	120	81	1.48	0.012
Southern OR	ROSEBURG/MYRTLECREEK	CANYONVILLE	5U46	CANYONVILLE	528	23,817	389	61.23	1.357
Southern OR	ROSEBURG/MYRTLECREEK	CANYONVILLE	5U52	BEALS CREEK FEEDER	2,692	189,665	884	214.55	3.045
Southern OR	ROSEBURG/MYRTLECREEK	CARNES	5U44	RND PRARIE	945	68,790	418	164.57	2.261
Southern OR	ROSEBURG/MYRTLECREEK	CLEARWATER #1 SUB	6U17	BRIGGS	8	4,459	3	1,486.37	2.667
Southern OR	ROSEBURG/MYRTLECREEK	CLEARWATER #2 SUB	6U33	CLEARWATER	732	143,476	95	1,510.28	7.705

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Southern OR	ROSEBURG/MYRTLECREEK	CLOAKE	4U37	RUSA	2	250	1	249.67	2.000
Southern OR	ROSEBURG/MYRTLECREEK	CLOAKE	4U38	HARVARD	3,677	233,607	2,956	79.03	1.244
Southern OR	ROSEBURG/MYRTLECREEK	CLOAKE	4U39	GOEDECK	1,079	111,491	1,273	87.58	0.848
Southern OR	ROSEBURG/MYRTLECREEK	GARDEN VALLEY	4U80	EDENBOWER	822	8,992	806	11.16	1.020
Southern OR	ROSEBURG/MYRTLECREEK	GARDEN VALLEY	4U81	VALLEY	2,693	336,805	1,385	243.18	1.944
Southern OR	ROSEBURG/MYRTLECREEK	GLIDE SUBSTATION	5U83	IDLEYLD	4,062	2,910,515	988	2,945.87	4.111
Southern OR	ROSEBURG/MYRTLECREEK	GLIDE SUBSTATION	5U84	LITTLE RIVER	2,276	392,844	1,374	285.91	1.656
Southern OR	ROSEBURG/MYRTLECREEK	GREEN SUBSTATION	5U32	SAFARI	8,021	311,969	2,189	142.52	3.664
Southern OR	ROSEBURG/MYRTLECREEK	GREEN SUBSTATION	5U33	SUNNYSLOPE	5,040	183,627	1,638	112.10	3.077
Southern OR	ROSEBURG/MYRTLECREEK	ILLAHEE FLATS	6U13	ILLAHEE FLATS SINGLE PHASE RECLOSER	106	30,674	27	1,136.08	3.926
Southern OR	ROSEBURG/MYRTLECREEK	LEMOLO # 1	5U920	DIAMOND LAKE	1,983	4,237,602	179	23,673.75	11.078
Southern OR	ROSEBURG/MYRTLECREEK	MYRTLE CREEK	5U76	SUPER Y	4,905	616,371	1,540	400.24	3.185
Southern OR	ROSEBURG/MYRTLECREEK	MYRTLE CREEK	5U77	BOOMER HILL	3,472	299,366	2,312	129.48	1.502
Southern OR	ROSEBURG/MYRTLECREEK	OAKLAND (OR)	5U11	UMPQUA	1,791	136,510	1,264	108.00	1.417
Southern OR	ROSEBURG/MYRTLECREEK	OAKLAND (OR)	5U12	STAGECOACH	770	60,226	556	108.32	1.385
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE	5U1	TRI CITY	3,773	203,402	994	204.63	3.796
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE	5U2	COW CREEK	4,188	283,904	1,562	181.76	2.681
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE	5U3	HANNA	862	102,001	284	359.16	3.035
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE-VENEER	5U23	FORD MILL	1	13	1	13.00	1.000
Southern OR	ROSEBURG/MYRTLECREEK	RIDDLE-VENEER	5U50	RFP-LVL (EWP)	31	484	30	16.12	1.033
Southern OR	ROSEBURG/MYRTLECREEK	ROSEBURG	4U10	DIAMOND	1,900	194,973	2,521	77.34	0.754
Southern OR	ROSEBURG/MYRTLECREEK	ROSEBURG	4U22	DIXON	625	57,744	1,140	50.65	0.548
Southern OR	ROSEBURG/MYRTLECREEK	ROSEBURG	4U5	DOUGLAS	44	4,594	2,075	2.21	0.021
Southern OR	ROSEBURG/MYRTLECREEK	SLIDE CREEK	6U76	SLIDE CREEK CAMP	4	2,380	4	594.90	1.000
Southern OR	ROSEBURG/MYRTLECREEK	SODA SPRINGS HE PLT	6U10	CB6U10	1	680	1	680.22	1.000
Southern OR	ROSEBURG/MYRTLECREEK	SOUTHGATE	4U30	SHADY POINT	3,543	235,102	1,598	147.12	2.217
Southern OR	ROSEBURG/MYRTLECREEK	SOUTHGATE	4U31	BOOTH	2,016	173,087	1,563	110.74	1.290
Southern OR	ROSEBURG/MYRTLECREEK	STEAMBOAT	6U18	STEAMBOAT	43	8,055	22	366.12	1.955
Southern OR	ROSEBURG/MYRTLECREEK	SUTHERLIN	5U35	NON-PAREIL	52	9,907	1,307	7.58	0.040
Southern OR	ROSEBURG/MYRTLECREEK	SUTHERLIN	5U36	DEADY	423	61,724	1,362	45.32	0.311
Southern OR	ROSEBURG/MYRTLECREEK	SUTHERLIN	5U56	Industrial	8	1,203	547	2.20	0.015
Southern OR	ROSEBURG/MYRTLECREEK	TILLER	5U89	JACKSON CRK	1,161	131,416	303	433.72	3.832
Southern OR	ROSEBURG/MYRTLECREEK	TOKETEE	6U21	BACK UP FOR CLEARWATER 6U33	19	250	19	13.13	1.000
Southern OR	ROSEBURG/MYRTLECREEK	TOKETEE	8U12	TOKETEE CITY	38	6,645	19	349.73	2.000
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	4U18	WILBUR	410	48,440	1,638	29.57	0.250
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	5U15	NEWTON CREEK	62	2,616	1,782	1.47	0.035
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	5U17	FISHER	719	117,165	771	151.97	0.933
Southern OR	ROSEBURG/MYRTLECREEK	WINCHESTER	5U19	EVANS	92	19,331	734	26.34	0.125
Southern OR	ROSEBURG/MYRTLECREEK	WINSTON	5U48	BROCKWAY	1,869	103,551	863	119.99	2.166
Southern OR	ROSEBURG/MYRTLECREEK	WINSTON	5U49	DILLARD	3,025	176,022	1,459	120.65	2.073
Willamette Valley	ALBANY	HAZELWOOD	4M335	WEST HIGH	74	10,972	1,476	7.43	0.050
Willamette Valley	ALBANY	HAZELWOOD	4M336	RIVERVIEW (HAZELWOOD)	337	43,121	1,235	34.92	0.273
Willamette Valley	ALBANY	JEFFERSON (OR)	4M117	MARION	4,572	464,684	720	645.39	6.350
Willamette Valley	ALBANY	JEFFERSON (OR)	4M125	MINT	12,357	1,497,959	2,483	603.29	4.977

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Willamette Valley	ALBANY	MURDER CREEK	4M243	SCRAVEL HILL	11,571	1,275,952	3,758	339.53	3.079
Willamette Valley	ALBANY	MURDER CREEK	4M245	RURAL NW	5,364	401,384	2,248	178.55	2.386
Willamette Valley	ALBANY	MURDER CREEK	4M249	DURA-PACIFIC	1,222	167,210	181	923.81	6.751
Willamette Valley	ALBANY	OREMET	4M295	OAK CREEK	5	631	100	6.31	0.050
Willamette Valley	ALBANY	OREMET	4M296	ROGERSDALE	2,655	187,948	2,159	87.05	1.230
Willamette Valley	ALBANY	QUEEN AVE	4M217	SANTIAM	3,840	161,618	1,887	85.65	2.035
Willamette Valley	ALBANY	QUEEN AVE	4M258	HILL STREET	3,932	203,819	2,574	79.18	1.528
Willamette Valley	ALBANY	QUEEN AVE	4M261	WAVERLY	1,241	131,802	3,645	36.16	0.340
Willamette Valley	ALBANY	QUEEN AVE	4M262	GEARY STREET	5,946	487,379	2,633	185.10	2.258
Willamette Valley	ALBANY	VINE STREET	4M15	FERRY	7,867	481,008	2,894	166.21	2.718
Willamette Valley	ALBANY	VINE STREET	4M16	WATER STREET	18,032	1,681,365	4,228	397.67	4.265
Willamette Valley	CORVALLIS	BUCHANAN	4M130	HEWLETT PACKARD	2,982	65,468	2,701	24.24	1.104
Willamette Valley	CORVALLIS	BUCHANAN	4M133	PEORIA	1,985	243,992	2,437	100.12	0.815
Willamette Valley	CORVALLIS	BUCHANAN	4M134	N. NINTH ST.	7,533	463,729	2,592	178.91	2.906
Willamette Valley	CORVALLIS	DIXON	7M29	SECOND ST.	272	3,269	276	11.84	0.986
Willamette Valley	CORVALLIS	GRANT ST	4M265	HIGH SCHOOL	1,403	47,728	2,485	19.21	0.565
Willamette Valley	CORVALLIS	GRANT ST	4M266	CHINTIMINI	2,702	55,492	2,536	21.88	1.065
Willamette Valley	CORVALLIS	GRANT ST	4M268	KINGS ROAD	1,502	184,829	2,565	72.06	0.586
Willamette Valley	CORVALLIS	GRANT ST	4M269	29TH STREET	4,953	480,764	3,303	145.55	1.500
Willamette Valley	CORVALLIS	HILLVIEW	4M180	WEST HILLS	554	51,958	1,909	27.22	0.290
Willamette Valley	CORVALLIS	HILLVIEW	4M181	PHILOMATH	1,373	137,217	1,181	116.19	1.163
Willamette Valley	CORVALLIS	HILLVIEW	4M182	SUNSET	437	32,011	1,765	18.14	0.248
Willamette Valley	CORVALLIS	HILLVIEW	4M185	PLYMOUTH	2,386	121,429	2,010	60.41	1.187
Willamette Valley	CORVALLIS	MARYS RIVER	4M151	GREENBERRY	8,329	366,255	3,613	101.37	2.305
Willamette Valley	CORVALLIS	MARYS RIVER	4M152	AVERY	21	1,683	187	9.00	0.112
Willamette Valley	CORVALLIS	MARYS RIVER	4M153	GALLAGHER	7	457	159	2.87	0.044
Willamette Valley	COTTAGE GROVE/J.CITY	COBURG	4M220	DETERING	11	3,811	587	6.49	0.019
Willamette Valley	COTTAGE GROVE/J.CITY	GOSHEN (OR)	4M360	GOSHEN FDR	5,235	1,075,757	1,623	662.82	3.226
Willamette Valley	COTTAGE GROVE/J.CITY	HARRISBURG SUB	4M400	TERRITORIAL	2,119	344,475	1,847	186.51	1.147
Willamette Valley	COTTAGE GROVE/J.CITY	JUNCTION CITY	4M102	6TH STREET	242	58,525	1,167	50.15	0.207
Willamette Valley	COTTAGE GROVE/J.CITY	JUNCTION CITY	4M99	PRAIRIE ROAD	942	101,084	1,003	100.78	0.939
Willamette Valley	COTTAGE GROVE/J.CITY	LANCASTER	4M209	MONROE	3,204	296,211	1,097	270.02	2.921
Willamette Valley	COTTAGE GROVE/J.CITY	VILLAGE GREEN	4M84	NORTH SIDE	7,859	804,664	2,400	335.28	3.275
Willamette Valley	COTTAGE GROVE/J.CITY	VILLAGE GREEN	4M86	MADISON	3,597	290,443	1,596	181.98	2.254
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M100	RURAL (DALLAS)	3,614	785,486	1,856	423.21	1.947
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M201	INDUSTRIAL	3,746	767,753	3,084	248.95	1.215
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M202	ELLENDALE	6,578	2,087,525	2,978	700.98	2.209
Willamette Valley	DALLAS/INDEPENDENCE	DALLAS	4M238	DALLAS	4,824	1,152,588	2,310	498.96	2.088
Willamette Valley	DALLAS/INDEPENDENCE	INDEPENDENCE	4M22	RICKREAL	7,051	953,121	3,325	286.65	2.121
Willamette Valley	DALLAS/INDEPENDENCE	INDEPENDENCE	4M25	BUENA VISTA	5,826	714,610	2,028	352.37	2.873
Willamette Valley	LEBANON	BROWNSVILLE	4M17	CALAPOOIA	893	192,701	1,700	113.35	0.525
Willamette Valley	LEBANON	CALAPOOYA	4M850	SPAULDING	1,410	126,174	1,118	112.86	1.261
Willamette Valley	LEBANON	CALAPOOYA	4M851	BEAR	4	298	32	9.31	0.125
Willamette Valley	LEBANON	CROWFOOT	4M204	CROWFOOT	346	130,101	1,505	86.45	0.230

Oregon 2020 Circuit Metrics (including major events)

Oregon Regions	Op Area Name	Substation Name	Circuit Id	Circuit Name	Customers in Incident Sustained	Customer Minutes Lost	Circuit Customer Count	SAIDI	SAIFI
Willamette Valley	LEBANON	CROWFOOT	4M206	US PLYWOOD (LEBANON)	88	34,217	1,868	18.32	0.047
Willamette Valley	LEBANON	LEBANON	4M61	TANGENT	3,412	1,132,244	2,622	431.82	1.301
Willamette Valley	LEBANON	LEBANON	4M62	RALSTON	3,955	739,082	2,004	368.80	1.974
Willamette Valley	LEBANON	LEBANON	4M63	TENNESSEE	6,540	2,708,076	1,790	1,512.89	3.654
Willamette Valley	LEBANON	LEBANON	4M79	CROWN Z	20	11,091	1,166	9.51	0.017
Willamette Valley	LEBANON	SWEET HOME	4M37	HOLLEY	6,270	1,311,914	2,033	645.31	3.084
Willamette Valley	LEBANON	SWEET HOME	4M38	NARROWS	1,393	181,518	976	185.98	1.427
Willamette Valley	LEBANON	SWEET HOME	4M93	AMES CREEK	1,135	282,215	1,678	168.19	0.676
Willamette Valley	LEBANON	SWEET HOME	4M94	FOSTER	6,565	1,910,298	2,409	792.98	2.725
Willamette Valley	STAYTON	LYONS	4M120	MILL CITY	3,333	797,181	731	1,090.53	4.560
Willamette Valley	STAYTON	LYONS	4M70	MEHAMA	8,761	2,386,055	2,146	1,111.86	4.082
Willamette Valley	STAYTON	SCIO	5M126	THOMAS	4,349	538,800	1,569	343.40	2.772
Willamette Valley	STAYTON	STAYTON	4M19	AUMSVILLE	15,060	1,583,323	3,380	468.44	4.456
Willamette Valley	STAYTON	STAYTON	4M353	WEST STAYTON	4,388	258,268	3,504	73.71	1.252
Willamette Valley	STAYTON	STAYTON	4M370	CASCADE	1,171	164,238	1,581	103.88	0.741
Willamette Valley	STAYTON	STAYTON	4M50	3RD STREET	963	51,436	913	56.34	1.055

Oregon 2020 Circuit Metrics (Zero Outage Circuits)

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count	SAIDI	SAIFI
Central OR	BEND/REDMOND	BEND	5D12	DIVISION ST.	12.5	214	0	0
Central OR	BEND/REDMOND	BOND STREET	5D413	OLD MILL.	12.5	386	0	0
CoastPlus	CLATSOP (ASTORIA)	YOUNGS BAY	5A206	YOUNGS BAY #6	12.5	336	0	0
CoastPlus	COOS BAY/COQUILLE	JORDAN POINT	5C11	WEYCO#2	12.5	1	0	0
CoastPlus	COOS BAY/COQUILLE	LOCKHART	4C5	GEORGIA-PAC	20.8	86	0	0
CoastPlus	COOS BAY/COQUILLE	SOUTH DUNES	5C9	DOUGLAS CHIP	12.5	3	0	0
CoastPlus	LINCOLN CITY	PGE GRAND RONDE	R114	BOYER	12	19	0	0
CoastPlus	PORTLAND	ALBINA	5P111	ALBINA 11C01-UG	11.7	613	0	0
CoastPlus	PORTLAND	ALBINA	5P196	11C16-UG	11.7	550	0	0
CoastPlus	PORTLAND	ALBINA	5P200	11C20-UG	11.7	463	0	0
CoastPlus	PORTLAND	ALBINA	5P91	11C11-UG	11.7	317	0	0
CoastPlus	PORTLAND	ALDERWOOD 115/12.5	5P33	ALDERWOOD #4	12.5	177	0	0
CoastPlus	PORTLAND	HOLLADAY (OR)	5P145	HOLLADAY #1-UG	11.7	206	0	0
CoastPlus	PORTLAND	HOLLADAY (OR)	5P146	HOLLADAY #2-UG	11.7	343	0	0
CoastPlus	PORTLAND	HOLLADAY (OR)	5P147	HOLLADAY #3-UG	11.7	163	0	0
CoastPlus	PORTLAND	HOLLADAY (OR)	5P157	HOLLADAY #5-UG	11.7	139	0	0
CoastPlus	PORTLAND	KNOTT	5P366	11010	11.7	51	0	0
CoastPlus	PORTLAND	KNOTT	5P372	11046	11.7	705	0	0
CoastPlus	PORTLAND	KNOTT	5P374	11020	11.7	987	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P418	11D17	11.7	133	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P420	11D14	11.7	22	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P424	11D03-UG	11.7	1	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P426	11D04-UG	11.7	320	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P434	11D12-UG	11.7	14	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P436	11G18-UG	11.7	96	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P438	11D08-UG	11.7	16	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P456	11D09-UG	11.7	182	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P458	11D07-UG	11.7	217	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P460	11D01-UG	11.7	1	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P462	11G13-UG	11.7	35	0	0
CoastPlus	PORTLAND	LINCOLN (OR)	5P464	11G16-UG	11.6	169	0	0
Northeast	PENDLETON	MCKAY (OR)	5W856	MCKAY	12.47	136	0	0
Northeast	PENDLETON	MCKAY (OR)	5W857	WILDHORSE	12.47	1744	0	0
Northeast	PENDLETON	PILOT ROCK	5W404	MILL (PILOT ROCK)	12.5	1	0	0
Southern OR	KLAMATH FALLS	LAKEPORT	5L49	WOCUS	12.5	213	0	0
Southern OR	KLAMATH FALLS	LAKEPORT	5L61	JELDWEN	12.5	7	0	0
Southern OR	KLAMATH FALLS	WEST SIDE	5L16	MAIN ST (WEST SIDE HE PLANT)	12.5	108	0	0
Southern OR	KLAMATH FALLS	WEST SIDE	8L10	CITY WTR PMP	2.4	1	0	0
Southern OR	MEDFORD	PROSPECT 3	5R290	P-3 FOREBAY	12.5	1	0	0
Southern OR	MEDFORD	SAGE ROAD (OR)	5R209	TIMBER PROD	12.5	1	0	0
Southern OR	MEDFORD	SAGE ROAD (OR)	5R27	MCANDREWS	12.5	111	0	0

Oregon 2020 Circuit Metrics (Zero Outage Circuits)

Oregon Region	Op Area Name	Substation Name	Circuit Id	Circuit Name	kV	Circuit Customer Count	SAIDI	SAIFI
Southern OR	MEDFORD	WHITE CITY	5R12	INDUSTRIAL	12.5	35	0	0
Southern OR	ROSEBURG/MYRTLECREEK	SODA SPRINGS HE PLT	6U1	DRY CREEK	7.2	1	0	0
Willamette Valley	ALBANY	MURDER CREEK	4M250	INDUSTRIAL	20.8	4	0	0
Willamette Valley	ALBANY	MURDER CREEK	5M131	WAH CHANG SOUTH	12.5	1	0	0
Willamette Valley	ALBANY	OREMET	5M19	OREMET	12.5	1	0	0
Willamette Valley	CORVALLIS	CIRCLE BLVD	4M394	H. P. #1	20.8	1	0	0
Willamette Valley	CORVALLIS	CIRCLE BLVD	4M427	H. P. #3	20.8	1	0	0
Willamette Valley	CORVALLIS	CIRCLE BLVD	4M429	H. P. #5	20.8	1	0	0
Willamette Valley	CORVALLIS	DIXON	7M26	FOURTH ST.	4.1	234	0	0

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Tree Program Reporting

Report as of December 31, 2020

Distribution Four Year Cycle 1/1/2020-12/31/2023

	Total	Current Year Reporting				Total Cycle Reporting			
	Total Line Miles	1/1/2020-12/31/2020 Miles Planned	1/1/2020 - 12/31/2020 Actual Miles	1/1/2020 - 12/31/2020 Ahead/Behind	1/1/2020 - 12/31/2020 % Ahead/Behind	1/1/2020 through end of cycle Miles Planned	1/1/2020 through end of cycle Actual Miles	1/1/2020 through end of cycle Ahead/Behind	1/1/2020 through end of cycle % Ahead/Behind
	column a	*column b*	*column c*	*column d*	*column e*	*column f*	*column g*	*column h*	*column i*
Oregon	**13,941**	**3,886**	**2,808**	**-1,078**	**72.3%**	**3,886**	**2,808**	**-1,078**	**72.3%**
ALBANY	537	324	324	0	100.0%	324	324	0	100.0%
CENTRAL OREGON	1,345	475	360	-115	75.8%	475	360	-115	75.8%
CORVALLIS	305	0	0	0	0.0%	0	0	0	0.0%
COTTAGE GROVE	52	0	0	0	0.0%	0	0	0	0.0%
DALLAS	409	0	0	0	0.0%	0	0	0	0.0%
JUNCTION CITY	155	0	0	0	0.0%	0	0	0	0.0%
LEBANON	695	0	0	0	0.0%	0	0	0	0.0%
LINCOLN CITY	164	0	0	0	0.0%	0	0	0	0.0%
STAYTON	445	389	150	-239	38.6%	389	150	-239	38.6%
COOS BAY	644	185	185	0	100.0%	185	185	0	100.0%
GRANTS PASS	1,636	401	293	-108	73.1%	401	293	-108	73.1%
NO MEDFORD	893	240	225	-15	93.8%	240	225	-15	93.8%
ROSEBURG	1,193	379	242	-137	63.9%	379	242	-137	63.9%
KLAMATH FALLS	1,844	513	339	-174	66.1%	513	339	-174	66.1%
LAKEVIEW	35	0	0	0	0.0%	0	0	0	0.0%
MEDFORD	1,009	224	192	-32	85.7%	224	192	-32	85.7%
CLATSOP	374	80	55	-25	68.8%	80	55	-25	68.8%
ENTERPRISE	433	76	65	-11	85.5%	76	65	-11	85.5%
HERMISTON	254	58	58	0	100.0%	58	58	0	100.0%
HOOD RIVER	306	84	61	-23	72.6%	84	61	-23	72.6%
MILTON FREEWATER/WALLA WALLA(OR)	155	83	83	0	100.0%	83	83	0	100.0%
PENDLETON	611	179	17	-162	9.5%	179	17	-162	9.5%
PORTLAND*	447	196	159	-37	81.1%	196	159	-37	81.1%

Portland has 447 miles. Portland is on a two year cycle which causes us to do two cycles in a four year period.

Distribution cycle $/tree: *	$105.52
Distribution cycle $/mile:	$7,814.85
Distribution cycle removal % *	25.11%

Transmission

Total Line Miles	Line Miles Scheduled	Line Miles Worked	Miles Ahead(behind) Schedule	% of miles on/behind Schedule
2,989	66	62	(4)	94%

Notes:

Column a: Total overhead pole miles by district
Column b: Total overhead pole miles planned for the period January 1, 2020 through December 31, 2020
Column c: Actual overhead pole miles worked during the period January 1, 2020 through December 31, 2020
Column d: Miles ahead or behind for the period January 1, 2020 through December 31, 2020 (column c-column b)
Column e: Percent of actual compared to planned for the period January 1, 2020 through December 31, 2020 ((column c÷b)×100)
Column f: Total overhead pole miles planned for the period January 1, 2020 through end of cycle
Column g: Actual overhead pole miles worked during the period January 1 2020 through end of cycle
Column h: Miles ahead or behind for the period January 1, 2020 through end of cycle (column g-column f)
Column i: Percent of actual compared to planned for the period January 1, 2020 through end of cycle ((column g÷f)×100).
* Conversion calculation for sq ft of brush to a tree was changed for in 2014 from 10 sq ft of brush = 1 tree to 100 sq ft of brush = 1 tree.

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Tree Program Reporting (C)

Report as of December 31, 2020

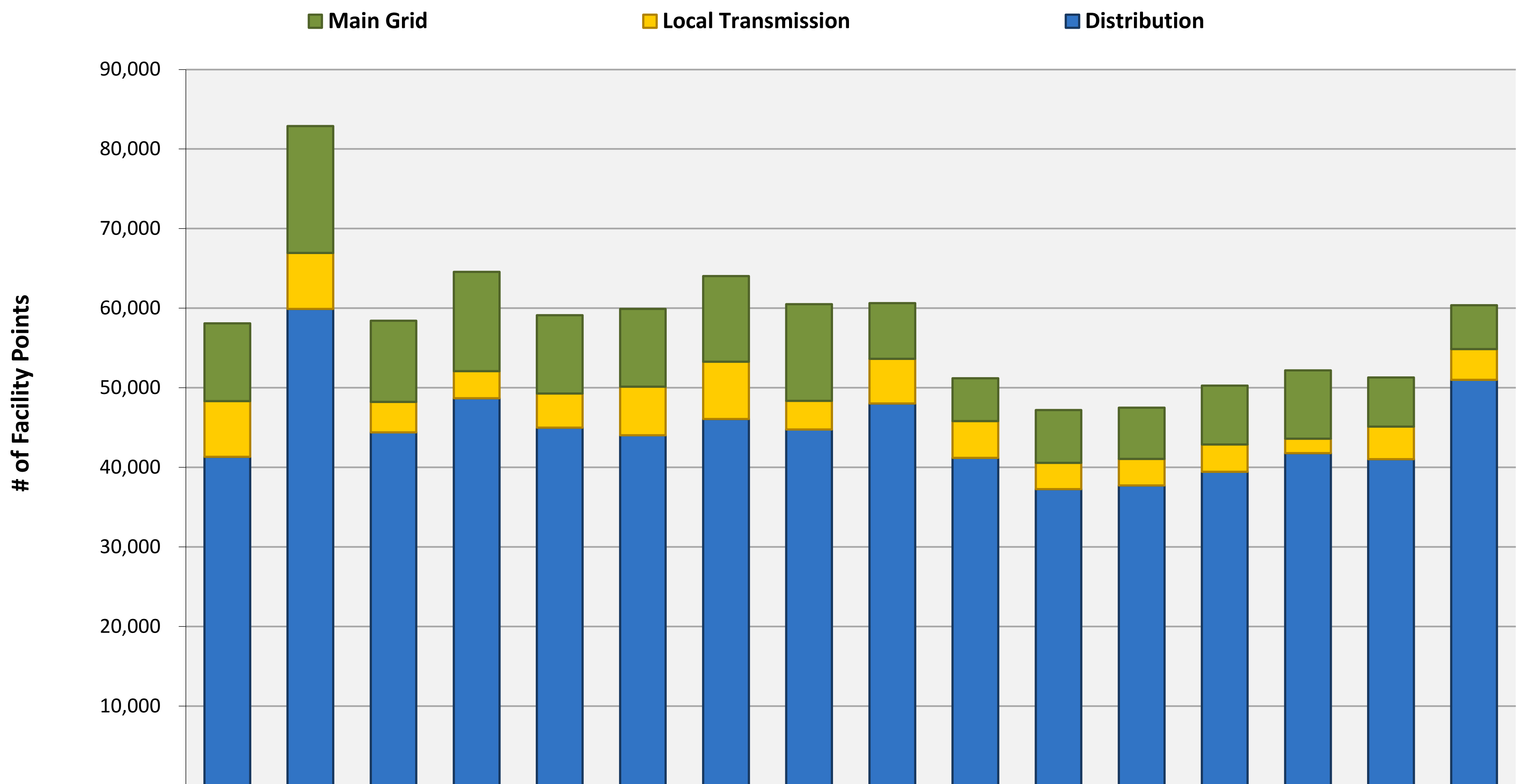
	2020 est	2021 est	2022 est	2023 est	2024 est	2025 est
Distribution						
Tree Budget	24,636,200	28,739,356	28,739,356	28,739,356	28,739,356	28,739,356
Transmission						
Tree Budget	2,467,724	1,260,645	1,260,645	1,260,645	1,260,645	1,260,645
Total Tree Budget	**$ 27,103,924**	**$ 30,000,000**	**$ 30,000,000**	**$ 30,000,000**	**$ 30,000,000**	**$ 30,000,000**

	2014	2015	2016	2017	2018	2019
Distribution						
Tree Actuals	23,191,320	21,923,393	17,489,336	18,646,639	18,502,712	22,848,077
Transmission						
Tree Actuals	2,370,822	2,355,070	3,745,786	2,660,821	2,528,003	2,524,520
Total Tree Actuals	**$ 25,562,142**	**$ 24,278,463**	**$ 21,235,122**	**$ 21,307,460**	**$ 21,030,715**	**$ 25,372,597**

Calendar Year 2020	Distribution Actuals	Distribution Budget	Distribution Variance	Transmission Actuals	Transmission Budget	Transmission Variance
Jan	$ 1,682,170	$ 2,053,009	$ (370,839)	$ 110,600	$ 205,644	$ (95,044)
Feb	$ 1,798,379	$ 2,053,008	$ (254,629)	$ 285,384	$ 205,644	$ 79,740
Mar	$ 2,847,162	$ 2,053,008	$ 794,154	$ 123,566	$ 205,644	$ (82,077)
Apr	$ 2,795,963	$ 2,053,008	$ 742,954	$ 104,046	$ 205,644	$ (101,597)
May	$ 3,359,814	$ 2,053,008	$ 1,306,806	$ 247,248	$ 205,644	$ 41,604
Jun	$ 4,327,450	$ 2,053,008	$ 2,274,442	$ 284,003	$ 205,644	$ 78,359
Jul	$ 4,007,448	$ 2,053,008	$ 1,954,439	$ 348,160	$ 205,644	$ 142,516
Aug	$ 3,263,694	$ 2,053,008	$ 1,210,686	$ 205,046	$ 205,644	$ (597)
Sep	$ 1,961,435	$ 2,053,008	$ (91,574)	$ 74,618	$ 205,644	$ (131,025)
Oct	$ 3,098,574	$ 2,053,008	$ 1,045,566	$ 116,964	$ 205,644	$ (88,679)
Nov	$ 1,846,246	$ 2,053,008	$ (206,762)	$ 112,683	$ 205,644	$ (92,960)
Dec	$ 3,201,842	$ 2,053,008	$ 1,148,833	$ 254,854	$ 205,644	$ 49,210
Total	**$ 34,190,176**	**$ 24,636,100**	**$ 9,554,076**	**$ 2,267,173**	**$ 2,467,724**	**$ (200,551)**

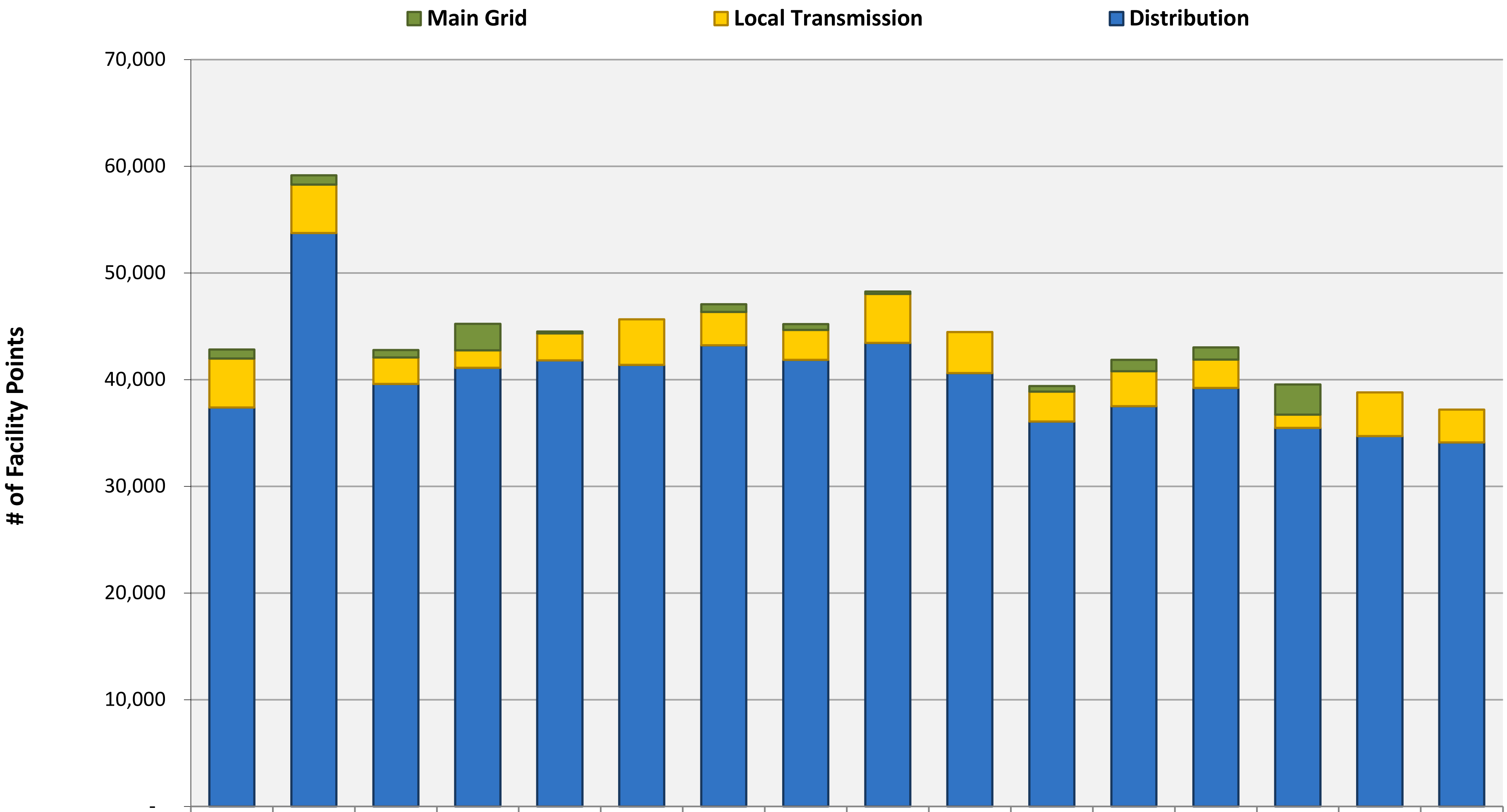
Average # Tree Crews on Property (YTD)	**120**

CY2020 Overhead Detail Inspection History



	FY2006	CY2006	CY2007	CY2008	CY2009	CY2010	CY2011	CY2012	CY2013	CY2014	CY2015	CY2016	CY2017	CY2018	CY2019	CY2020
Main Grid	9,765	15,927	10,185	12,467	9,813	9,778	10,752	12,144	7,004	5,373	6,621	6,429	7,420	8,583	6,165	5,521
Local Transmission	7,005	7,023	3,849	3,412	4,310	6,097	7,217	3,595	5,623	4,608	3,315	3,316	3,411	1,805	4,089	3,851
Distribution	41,322	59,919	44,376	48,667	44,982	44,030	46,065	44,745	48,014	41,195	37,250	37,737	39,448	41,784	41,031	50,999

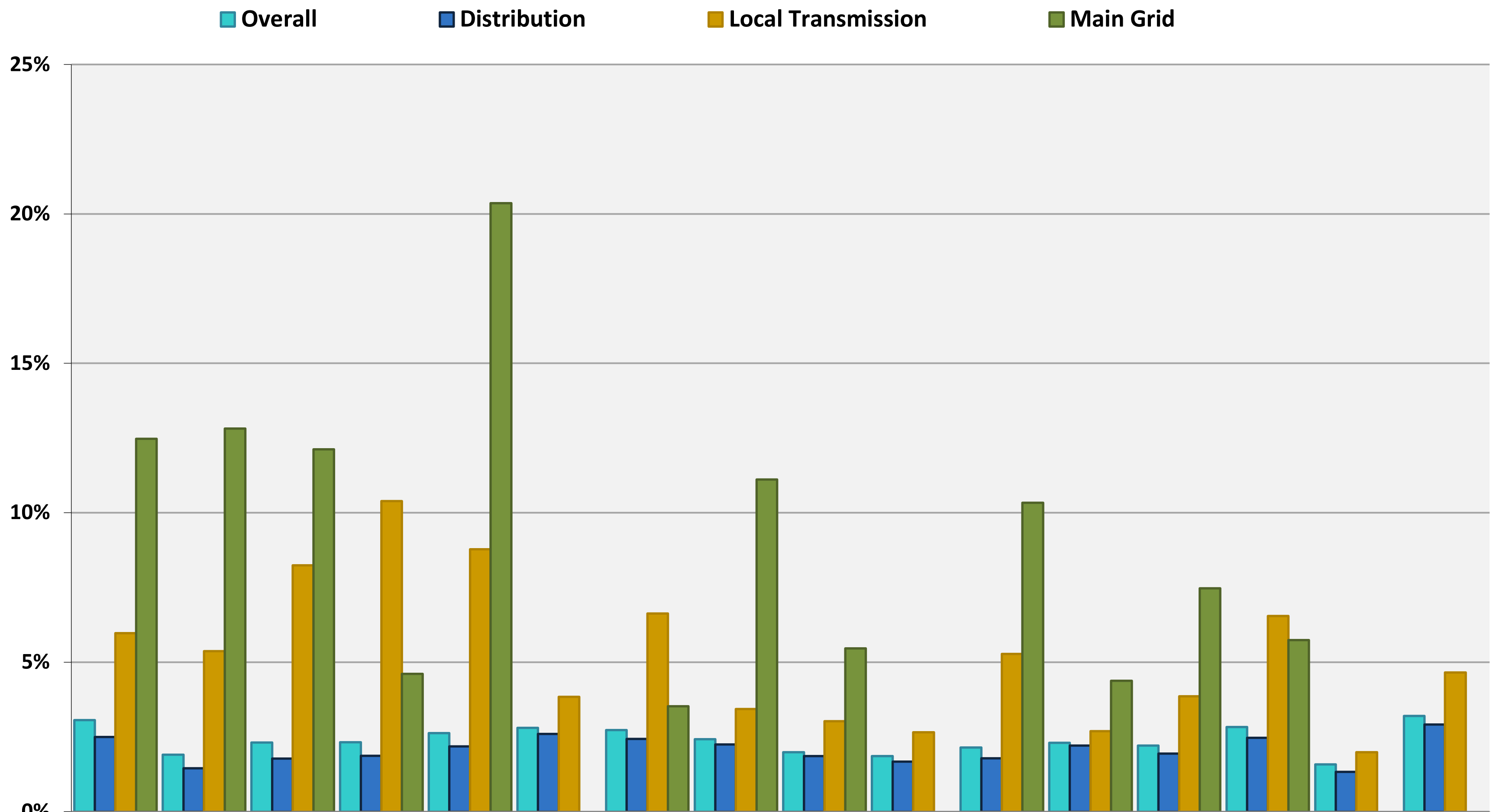
CY2020 Pole Test and Treat History



	FY2006	CY2006	CY2007	CY2008	CY2009	CY2010	CY2011	CY2012	CY2013	CY2014	CY2015	CY2016	CY2017	CY2018	CY2019	CY2020
Main Grid	858	858	693	2,493	167	-	739	549	238	-	513	1,075	1,138	2,824	-	-
Local Transmission	4,592	4,529	2,488	1,636	2,541	4,271	3,121	2,797	4,573	3,832	2,810	3,273	2,644	1,238	4,089	3,091
Distribution	37,380	53,755	39,604	41,107	41,808	41,395	43,218	41,865	43,457	40,622	36,074	37,508	39,234	35,487	34,709	34,104

Includes intrusive and physical testing

CY2020 Pole Reject Rate History



	FY2006	CY2006	CY2007	CY2008	CY2009	CY2010	CY2011	CY2012	CY2013	CY2014	CY2015	CY2016	CY2017	CY2018	CY2019	CY2020
Overall	3.1%	1.9%	2.3%	2.3%	2.6%	2.8%	2.7%	2.4%	2.0%	1.9%	2.1%	2.3%	2.2%	2.8%	1.6%	3.2%
Distribution	2.5%	1.5%	1.8%	1.9%	2.2%	2.6%	2.4%	2.2%	1.9%	1.7%	1.8%	2.2%	1.9%	2.5%	1.3%	2.9%
Local Transmission	6.0%	5.4%	8.2%	10.4%	8.8%	3.8%	6.6%	3.4%	3.0%	2.7%	5.3%	2.7%	3.9%	6.5%	2.0%	4.7%
Main Grid	12.5%	12.8%	12.1%	4.6%	20.4%	0.0%	3.5%	11.1%	5.5%	0.0%	10.3%	4.4%	7.5%	5.7%	0.0%	0.0%

(In FY2005, Distribution and blended Transmission breakout became available; effective FY2006, full breakout views were available.
Main Grid rates combine intrusive inspection rejects with detail inspection BOPOLE.)

INSPECTION AND MAINTENANCE PROGRAMS

Inspection and Repairs

In Calendar Year 2020 (January 01 through December 31, 2020), among distribution and transmission facilities (both overhead and underground), 2,799 'A' Priority conditions were recorded and 2,599 were corrected.

For 'B' priority conditions, 21,829 were identified and 18,305 were corrected in CY2020.

Reporting of 'C' priority conditions was terminated early 2014, however some are still occasionally entered into the inspection system inadvertently. 126 were identified in 2020 and these will be reviewed and reprioritized as required. 135 of 'C' priority conditions were corrected.

Pole and Overhead Facilities

- PacifiCorp is currently on a 10-year cycle for the Detail inspection and treatment of overhead Distribution and Transmission facilities. In CY2020, 50,999 Distribution, 3,851 Local Transmission and 5,521 Main Grid Transmission Detail inspections were performed. Detail inspections were performed on 13.55% of the total 445,619 overhead facilities.
- 34,104 Distribution poles, 3,094 Local Transmission poles and 0 Main Grid Transmission poles were Tested and Treated. Test and Treatment was performed on 8.35% of the total 445,619 overhead facilities.
- PacifiCorp replaced or reinforced 1,270 poles that were rejected through the Test and Treat inspection program. The 2020 rejection rate was 2.91% for Distribution, 4.65% for Local Transmission and 0% for Main Grid Transmission. The overall reject rate was 3.20%.

A. Visual Inspections

The visual inspection of the Distribution and Transmission system is on a 2-year cycle. In CY2020, 216,832 Distribution, 20,309 Local Transmission and 11,651 Main Grid inspections were performed for a total of 248,792 inspections which equates to 55.83% of the total overhead facilities. Random re-inspections were performed by operations managers to ensure uniform results and adherence.

B. Underground Facilities

The inspection of underground facilities is on a 10-year cycle. It includes a detail inspection of primary underground facilities and an infrared inspection of accessible terminals and splices. During CY2020, 13,427 inspections were performed; 11.19% of 120,016 underground facilities.

C. Marina Inspection Program

The inspection of marinas is annual. In CY2020, 100% of marinas were inspected.

D. Line Equipment Maintenance

Line Equipment – Overhead Reclosers, Sectionalizers, Regulators, Switches

Line equipment is inspected during the 2-year cycle Visual Survey; therefore, inspection requirements have been met for Reclosers, Sectionalizers and Regulators and Switches.

SUBSTATION MAINTENANCE PROGRAMS

A. Performance Measure X3 Substation Maintenance Programs

1. Description - Substations are critical utility network facilities requiring more frequent inspections and testing of all its equipment. The Company will provide, at the annual meetings, information of its Substation maintenance programs.
2. Program Interval - The program interval will be dictated by the substation equipment operational requirements.
3. Program Expenditures - PacifiCorp is to submit an annual actual versus budgeted expenditures for all substations equipment maintenance programs.

B. Substation Security Inspections

Substation security inspections are performed on cycles based on policy. This includes a detailed inspection of the fence, gates, warning signs, grounding systems, etc. The inspector is trained to look for security violations and public hazards. Copies of the inspection results are filed at the substation and field office. Field personnel are instructed to immediately correct all perimeter security violations.

Reference PacifiCorp Maintenance Policy 034 - Substation Inspection Policy and form 3274F-Substation Inspection.

PacifiCorp operates 279 substation and communication facilities in Oregon. PacifiCorp performed 99.08% of the planned substation security inspections in CY2020.

C. Substation Equipment Inspections

Batteries, Capacitor Banks, Circuit Breakers, Switches, LTC's, Regulators, Transformers, and protective relays are inspected on cycles based on policy. Inspections check pressure, temperature, voltage, LTC and regulator operation, cooling equipment, insulators, relay targets, etc.

Reference PacifiCorp Maintenance Policy 034 - Substation Inspection Policy and form 3274F-Substation Inspection.

PacifiCorp performed 99.08% of the planned substation equipment inspections in Oregon in CY2020.

BUDGET

Inspection and Maintenance Budget

Pole Inspect & Treat			ACTUALS	*BUDGET*
Distribution	T&T	515	$2,380,823	$2,141,926
	Detail	520	$248,075	$221,826
Transmission	T&T	843, 883	$281,711	$403,489
	Detail	840, 880	$254,876	$213,960
		Total	**$3,165,485**	**$2,981,200**

Pole Replacements	ACTUALS	*BUDGET*
Distribution	$11,181,696	$11,417,970
Transmission	$7,219,448	$9,760,570
Total	**$18,401,144**	**$21,178,540**

Repair and Replace Facilities		ACTUALS	*BUDGET*
Distribution	**500**, 501, 502, 503, 504,**505**, **509**, **518, 526**, **527, 595,** 624,625, 626, 905	$13,766,690	$12,450,724
Transmission	**845**, 847, **846**, 865, **884**,**886,** 848, 889	$434,683	$1,152,126
	Total	**$14,201,373**	**$13,602,850**

Visual Inspections (Includes Equipment Inspections)		ACTUALS	*BUDGET*
Distribution	521	$649,813	$657,511
Transmission	841, 881	$274,142	$359,582
	Total	**$923,956**	**$1,017,093**

Underground Inspections		ACTUALS	*BUDGET*
Distribution	508	$343,716	$509,039
	Total	**$343,716**	**$509,039**

Substation Maintenance	ACTUALS	*BUDGET*
Distribution Preventative Maintenance	$2,205,711	$2,131,688
Distribution Corrective Maintenance	$1,012,641	$1,522,846
Transmission Preventative Maintenance	$1,877,639	$2,099,904
Transmission Corrective Maintenance	$1,365,048	$1,182,896
Total	**$6,461,039**	**$6,937,334**