2024 Electric System Reliability Performance Report

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Executive Summary

This report describes the Snohomish County PUD's (District) electric system reliability from January 1, 2024, through December 31, 2024.

In February of 2017, the District retired the legacy Outage Reporting System (ORS) as the system of record when the new Outage Management System (OMS) was put into service. In conjunction with the adoption of OMS as the system of record, several significant changes occurred.

The number of outages recorded in 2017 and beyond increased as compared to previous years because outage records are automatically generated in OMS, rather than the manual process required by ORS. IEEE recognizes this phenomenon as typical and provides a calculation method for an 'uplift factor', described in IEEE Standard 1782, as a means of allowing a more accurate comparison of records prior to an OMS implementation, to post-OMS data. This 'uplift factor' has been applied to the data prior to OMS data. The 'uplift" factor is no longer used because in 2023 the previous five year data is post 2017. Appendix C provides additional data on historical performance without the uplift factor applied.

Before OMS, manually tracking outages in ORS was suspended during declared major events, and high-level estimates of outages were used. Because of the ability to record all outages in OMS, the District has adopted the IEEE defined term, Major Event Day (MED). This allows outages occurring during non-routine conditions to be differentiated from daily operations. MEDs are defined in IEEE Guideline 1366 "Guide for Electric Power Distribution Reliability Indices."

In addition to tracking outages during non-routine conditions, the District now tracks planned outages, although neither planned outages nor those occurring on MEDs will be included in the District's SAIDI, SAIFI and CAIDI system indices, and are listed separately. This will allow these reliability indices to reflect reliability experienced under routine conditions to better reveal trends in daily operation, which could be skewed by major events or construction.

District customers lost power for an average of 183.2 minutes (SAIDI) in 2024 during routine operation. This is higher than the adjusted five-year average of 120.9 minutes. The average length of time required to restore power after an outage was 120.2 minutes (CAIDI) in 2024 during routine operation. This is higher than the adjusted five-year average of 108.7 minutes. District customers lost power an average of 1.52 times (SAIFI) in 2024 during routine operation. This is higher than the adjusted five-year average of 1.11 interruptions.

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1 Background

1.1 Introduction

Understanding the causes of outages and developing methods or programs to reduce their rate of occurrence are two of the most important goals in the operation of any electric utility. This report identifies the causes of the outages in 2024 and their impacts on system reliability.

The District receives power from the Bonneville Power Administration (BPA) at three delivery points, the BPA Murray, SnoKing, and Snohomish substations. Transmission lines from those substations deliver power at 115 kV to 96 substations and switching stations in the District's service area. A typical distribution substation has four 12.47 kV circuits and serves an average of 4,000 customers. The District's service territory includes long circuits in the eastern and northern areas of the county, with high tree exposure through rural areas. These circuits experience relatively more outages. The urban and suburban areas in Everett and the south county area typically have shorter circuits and fewer outages.

1.2 Statistical indicators used

The District measures electric system reliability using indices defined by the Institute of Electrical and Electronics Engineers (IEEE). The definitions come from the current revision of IEEE Standard 1366- IEEE Guide for Electric Power Distribution Reliability Indices. The standard defines these indices as "sustained interruption indices," meaning a loss of service to one or more customers for more than five minutes. At present, the District defines an outage as a loss of service for one or more minutes.

SAIDI (System Average Interruption Duration Index)

This index measures the total duration of interruption for the average customer during a predefined period of time. It is commonly measured in customer minutes of interruption. Mathematically, this is calculated using the following equation:

$$\text{SAIDI} = \frac{\sum \text{Customer Interruption Durations}}{\text{Total Number of Customers Served}}$$

SAIDI can be calculated for any defined set of customers, such as all customers served from a specific circuit, all customers served from a specific substation, or for all District customers.

CAIDI (Customer Average Interruption Duration Index)

This index represents the average time required to restore service to customers after an interruption. Mathematically, this is calculated using the following equation:

$$\text{CAIDI} = \frac{\sum \text{Customer Interruption Durations}}{\text{Total Number of Customers Interrupted}}$$

CAIDI can also be calculated for any defined set of customers.

SAIFI (System Average Interruption Frequency Index)

This index indicates how often the average customer experiences a sustained interruption over a predefined period of time. Mathematically, this is calculated using the following equation:

$$\text{SAIFI} = \frac{\sum \text{Total Number of Customers Interrupted}}{\text{Total Number of Customers Served}}$$

Similar to SAIDI and CAIDI, SAIFI can be calculated for any defined set of customers.

MED (Major Event Day)

A Major Event Day is used to define a 24-hour period during which SAIDI exceeds a threshold, separating these statistics from those for typical day-to-day operations. This will prevent exceptional days from skewing statistics, allowing reliability analysis to be based on typical days. At the District, MEDs typically occur on snow or wind related days, causing significant tree related outages. The SAIDI threshold to distinguish a day as a MED is calculated using the equation:

$$\text{MED} = e^{(\alpha + 2.5\beta)}$$

Where α is the average of the logarithms of the daily non-zero SAIDI and β is the log-standard deviation of the daily SAIDI.

In 2024 the SAIDI threshold to distinguish a day as MED was found to be 15.70, and there were four days that exceeded that threshold.

1.3 Record-keeping

Until February 2017, the District used a computerized Outage Reporting System (ORS) to manually record information on outages occurring during routine operations. The District's practice was not to record outages that occurred during major events. This was done to alleviate the need for time spent recording outages, so that efforts could be focused on restoration.

Starting in February 2017, the District switched to using an Outage Management System (OMS). OMS automatically creates outage records based on customer calls, prediction rules, and switching operations regardless of a major event, on all days of the year. The purpose of this change is to be more consistent and comprehensive in outage information recording. The effect of implementing this new system has been an increase in recorded SAIDI and SAIFI, as all customer outages are now accounted for automatically.

In addition, ORS was not used to track planned outages. That capability is included in OMS, and planned outages are now recorded.

With the change to IEEE standard outage reporting, the MED threshold is now used to determine which outages are excluded from routine-operation statistics, rather than declared storms. MEDs will be included in their own category for record keeping.

2 System Reliability Statistics

2.1 Data for 2024

The tables below show the statistical data for outages in 2024, as well as average data for the five previous years. Refer to Section 1 for definitions of the terms SAIDI, CAIDI, and SAIFI.

The 2024 total system SAIDI, CAIDI, and SAIFI values were higher than the five-year averages. Outages that occurred during a MED, prearranged/planned outages, and outages caused by another utility were excluded from these numbers but are shown in their own row for reference.

Table 2-1: General Descriptive Data

Year	2024
System Customers	386,741
Area Served	2,200 square miles

Table 2-2: Outage Data for 2024

(Sustained Outage > 1 Minute)

	SAIDI	CAIDI	SAIFI	Customer Outages
Distribution	175.3	128.3	1.37	528,375
Transmission	8.0	50.5	0.16	61,005
Overall	183.2	120.2	1.52	589,379
Planned, MED, or External	452.4	481.4	0.94	363,504
Total	635.7	258	2.46	952,883

Table 2-3: Five-Year Average Annual Outage Data for the Period 2019-2023 (Non-Adjusted)

(Sustained Outage > 1 Minute)

	SAIDI	CAIDI	SAIFI	Customer Outages
Distribution	112.1	112.2	1.00	372,475
Transmission	8.8	78.1	0.11	42,001
Overall	120.9	108.7	1.11	414,596
Planned, MED, or External	310.4	537.2	0.58	215,236
Total	431.4	255.3	1.69	630,058

2.2 Effect of Major Event Days on the District

MEDs are days in which the daily system SAIDI exceeds a calculated threshold. These are independent of declared major events, which had been used in the past to separate extreme outage days. MEDs are identified to allow study of the system's daily operation, without being influenced by a few large events.

Beginning in 2017, the District implemented OMS, which captures all outage information, including Major Event Days. In 2024 the SAIDI threshold to distinguish a day as MED was found to be 15.70 and there were four days that exceeded the threshold.

Table 2-4: 2024 Major Event Days

(SAIDI > 15.70 Minute)

Date	SAIDI	SAIFI	CAIDI
11/19/2024	358.5	0.38	956.8
11/20/2024	49.5	0.04	1,283.8
12/14/2024	17.2	0.12	139.8
12/18/2024	19.6	0.29	68.4

3 The Transmission System

3.1 Introduction

For consideration as a transmission outage, an outage must involve the operation of a 230 kV or 115 kV protective device, such as those operating circuit switcher or power circuit breaker. Transmission system outages usually have an impact on a significant number of customers, as all substations fed by that portion of the system are affected, and substation outages affect all customers fed by the station.

3.2 Outages

Of the 45 transmission system operations in 2024:

- 16 resulted in sustained outages to District customers, which caused 18.8 million customer minutes of interruption (CMI). There were 28 more operations and about 14.6 million more CMI than in 2023.
- Automatic switching schemes operated in 23 of the transmission system outages, 7 of which were caused by temporary faults while the remaining 16 were caused by permanent faults. During 12 of those permanent faults, automatic switching schemes operated as designed to help restore load. However there were 5 instances where those schemes couldn't help restore load due to reasons external to the schemes' design (disabled or failed breaker reclosing, faults taking longer than expected to clear, abnormal line configurations requiring the schemes to be disabled).

- 13 of the transmission outages were caused by trees and/or tree branches, 7 were caused by equipment failure or malfunction, 3 were caused by Generation equipment failure or malfunction and the remaining had unknown causes.

Table 3-1 provides the summary information for each transmission or substation operation during 2024.

Table 3-1: Transmission Outages

Outage Number	Date	Line or Device	Substation(s)	Cause	CMI
1	2/6/2024	Delta-Stimson Crossing (D-SC) Line	Tulalip, Quil Ceda, Village	Unknown	Momentary
2	2/25/2024	Stimson Crossing-Camano Line	Twin City, Camano, Sunset and South Camano	Unknown	Momentary
3	2/28/2024	East Arlington-Oso Line	Oso	Unknown	Momentary
4	3/16/2024	East Arlington-Murray Line	N/A	Murray 230kV failed arrester	0
5	3/16/2024	Stimson Crossing-Murray Line	Smokey Point, Edgecomb	Murray 230kV failed arrester	119,736
6	3/16/2024	BPA Snohomish-Murray Line	Granite Falls, Hartford, East Marysville, Frontier, Lake Stevens, Bunk Foss	Murray 230kV failed arrester	201,220
7	3/18/2024	Jackson Hydro Project - Unit 3	N/A	Generator Breaker MOC malfunction	0
8	3/29/2024	BPA Snohomish-Murray Line	Granite Falls, Hartford, East Marysville, Frontier, Lake Stevens, Bunk Foss	Fallen conductor	302,759
9	4/25/2024	Jackson Hydro Project - Unit 3	N/A	Reverse Power during Startup	0
10	6/3/2024	Swamp Creek-Brightwater (SC-BW) Line	Floral Hills, Turner's Corner, York	Tree	88,464
11	6/3/2024	Everett-BPA Snohomish Line	N/A	Unknown	0
12	6/4/2024	Delta-Stimson Crossing (D-SC) Line	Tulalip, Quil Ceda, Village	Unknown	Momentary

Outage Number	Date	Line or Device	Substation(s)	Cause	CMI
13	7/21/2024	Delta-Stimson Crossing (D-M) Line	North Marysville, Kellogg Marsh, at Central Marysville	Unknown	Momentary
14	8/17/2024	Stimson Crossing-Camano Line	Twin City, Camano, Sunset and South Camano	Unknown	Momentary
15	8/26/2024	Jackson Hydro Project - Unit 3	N/A	Bearing Low Oil Flow	0
16	9/11/2024	Jackson South Loop	Snohomish, West Monroe, Woods Creek, Sky Valley, Sultan, Wallace River, Goldbar	Guy wire broken by lawnmower.	101,756
17	10/18/2024	Halls Lake-Five Corners Line	Five Corners, Maplewood, Perrinville, Lynnwood	Unknown	Momentary
18	10/18/2024	Halls Lake-BPA Snoking #2 Line Trip	Mountlake, Canyon Park, Fitzgerald	Tree	912,240
19	10/20/2024	Stimson Crossing-Camano Line	Twin City, Camano, Sunset and South Camano	Unknown	Momentary
20	11/4/2024	Jackson North Loop	Three Lakes, Lake Chaplain	Tree	0
21	11/4/2024	Beverly Park- Paine Field Line	Mukilteo, Casino, Picnic Point, Harbour Pointe	Unknown	Momentary
22	11/4/2024	Delta-Stimson Crossing (D-SC) Line	Tulalip, Quil Ceda, Village	Unknown	Momentary
23	11/4/2024	Lake Goodwin-North Stanwood Line	N/A	Tree	0
24	11/18/2024	Halls Lake-BPA Snoking (SK-HL#1) Line	Brier, Thrashers Corner	Mylar Balloon	0
25	11/19/2024	BPA Murray- BPA Snohomish Line Trip	Granite Falls, Hartford, East Marysville, Frontier, Lake Stevens, Bunk Foss	Tree	2,500,658
26	11/19/2024	Jackson North Loop Trip#1	Three Lakes, Lake Chaplain	Unknown	0
27	11/19/2024	Jackson North Loop Trip#2	Three Lakes, Lake Chaplain	Unknown	3,149,958

Outage Number	Date	Line or Device	Substation(s)	Cause	CMI
28	11/19/2024	BPA Snohomish-Jackson Hydro (South Loop) Trip	Snohomish, West Monroe, Woods Creek, Sky Valley, Sultan, Wallace River, Goldbar	Unknown	669,528
29	11/19/2024	BPA Snoking-Swamp Creek Line Trip1	N/A	Unknown	Momentary
30	11/19/2024	BPA Snoking-Swamp Creek Line Trip2	N/A	Tree	0
31	11/19/2024	Halls Lake-Five Corners Line Trip	Five Corners, Maplewood, Perrinville, Lynnwood	Tree	1,069,813
32	11/19/2024	Beverly Park-Everett Line	Pinehurst	Tree	29,420
33	11/19/2024	Beverly Park-Paine Field Line	Mukilteo, Casino, Picnic Point, Harbour Pointe	Unknown	Momentary
34	11/19/2024	Delta-Snohomish Line	Tenth Street, Fobes	Tree	235,837
35	11/19/2024	Delta-Stimson Crossing (D-SC) Line	Tulalip, Quil Ceda, Village	Unknown	Momentary
36	11/19/2024	Lake Goodwin-North Stanwood Line	N/A	Unknown	Momentary
37	11/19/2024	Stimson Crossing-Camano Line (trip #1)	Twin City, Camano, Sunset and South Camano	Unknown	Momentary
38	11/19/2024	Stimson Crossing-Camano Line (trip #2)	Twin City, Camano, Sunset and South Camano	Tree	3,578,758
39	11/19/2024	Jackson Hydro Project - Units 2 & 4	N/A	Overfrequency trip during island condition	0
40	11/20/2024	Jackson North Loop	Three Lakes, Lake Chaplain	Unknown	Momentary
41	12/14/2024	Halls Lake-BPA Snoking2 (SK-HL#2) Line Trip	Mountlake, Canyon Park, Fitzgerald	Unknown	Momentary
42	12/18/2024	BPA Murray- East Arlington Line	N/A	Unknown	0

Outage Number	Date	Line or Device	Substation(s)	Cause	CMI
43	12/18/2024	BPA Murray-Stimson Crossing Line	Smokey Point, Edgecomb	Tree	79,874
44	12/18/2024	BPA Murray- BPA Snohomish Line Trip	Granite Falls, Hartford, East Marysville, Frontier, Lake Stevens, Bunk Foss	Tree	5,442,526
45	12/18/2024	Halls Lake-Five Corners Line Trip	Five Corners, Maplewood, Perrinville, Lynnwood	Tree	349,982

Transmission Outage Summaries:

1. **02/06/2024 Delta-Stimson Crossing (D-SC) Line Trip:** The line tripped due to a temporary B-G fault ~1.3 miles from Delta. Both terminals tripped and reclosed as designed and the Quil Ceda Auto-Transfer scheme operated as designed as well.
2. **02/25/2024 Stimson Crossing-Camano Line Trip**: The line tripped due to a temporary A-B fault 16.6 miles from Stimson Crossing. Both breakers tripped and reclosed as designed. Twin City, Camano, Sunset and South Camano all experienced a momentary outage.
3. **02/28/2024 East Arlington-Oso Line Trip**: The line tripped due to a temporary B-C fault ~5.3 miles from East Arlington, both breakers tripped and reclosed as designed. Oso sustained a momentary outage.
4. **03/16/2024 East Arlington-Murray Line Trip**: The line tripped due to a permanent B-G fault caused by a failed surge arrester on the Murray 230kV bus. The arrester was not part of the 230kV bus differential scheme at Murray at the time of the event, and the fault had to be cleared through remote backup protection, resulting in all Murray transmission lines tripping. The East Arlington breakers tripped as designed but since they only reclose under Hot Bus-Hot Line supervision, they couldn't reclose since Murray substation was completely islanded when their open interval timed out.
5. **03/16/2024 Stimson Crossing-Murray Line Trip**: The line tripped due to a permanent B-G fault caused by a failed surge arrester on the Murray 230kV bus. The arrester was not part of the 230kV bus differential scheme at Murray at the time of the event, and the fault had to be cleared through remote backup protection, resulting in all Murray transmission lines tripping. The Edgecomb and Smokey Point Auto-Sectionalizing schemes operated as designed but Stimson Crossing PCB 2994 after auto-reclosing as designed after 13 secs eventually tripped to lockout after a close-trip-close-trip sequence. None of the trips following the reclose attempt were caused by relay action. Substation Maintenance investigated the issue and performed maintenance on that breaker on 03/29 but couldn't find any issues.
6. **03/16/2024 BPA Snohomish-Murray Line Trip**: The line tripped due to a permanent B-G fault caused by a failed surge arrester on the Murray 230kV bus. The arrester was not part of the 230kV bus differential scheme at Murray at the time of the event, and the fault had to be cleared through remote backup protection, resulting in all Murray transmission lines tripping. The East Marysville auto-break w/Transfer scheme operated as designed and the BPA-Snohomish terminal reclosed successfully, restoring the Snohomish-East Marysville line section.
7. **03/18/2024 Jackson Hydro Project - Unit 3 Trip**: Internal mechanical components in breaker 1635 had loosened during operations and were causing the MOC contacts to malfunction. The event on 3/18/24 and the high-level protection review following on 3/19/24 did not explicitly indicate that the MOC contacts were not functioning properly. This initial review indicated that all protective relays functioned properly, and the incomplete start was due to a recent replacement of a Protocol Converter. Therefore, it wasn't until the next attempted START on 4/3/24 that further investigations continued. A total of four events occurred in the period between 3/18/24 and 4/18/24. In all cases, the 86N LOR tripped breaker 1635 due to an

Incomplete Start Sequence which was being caused by the MOC contacts not properly indicating breaker position. The 86N LOR and breaker operating in this manner is as intended.

8. **03/29/2024 BPA Snohomish-Murray Line Trip**: The line tripped due to a Permanent SLG (C-G) fault caused by a fallen conductor between BPA-Snohomish and Bunk Foss substation. The auto-sectionalizing schemes at East Marysville and Frontier substations operated as designed; the BPA-Murray terminal successful reclosed and the BPA-Snohomish reclosing locked-out.
9. **04/25/2024 BPA Jackson Hydro Project - Unit 3 Trip**: Two attempts to start Unit 3 were made within an hour of each other. On both occasions the Unit Control System failed to properly load the unit after starting, and the Generator Protective Relay tripped on Reverse Power. This caused the 86EP Lockout Relay to trip, in turn opening breaker 52-1635. The protective relays, LOR, and breaker operated as expected.
10. **06/03/2024 Swamp Creek-Brightwater Line Trip**: The line tripped to lockout due to permanent (B-C) tree fault 6.23 miles from the Swamp Creek terminal during the windstorm event of that day. Both terminals tripped as designed and the automatic switching schemes at Floral Hills and Turner's Corner substations operated as designed. York substation experienced a sustained outage (114 min).
11. **06/03/2024 Everett-BPA Snohomish Line Trip**: The line tripped due to a Permanent A-B fault ~3.9 miles from Everett during the day's wind event. Both terminals tripped as designed and BPA Snohomish breaker B-488 tripped to lockout after one failed reclose attempt (Everett only recloses under Hot Bus-Hot Line supervision). The line was patrolled, and no fault was found. No load is served by the line, so no customer interruption occurred.
12. **06/04/2024 Delta-Stimson Crossing (D-SC) Line Trip**: The line tripped due to a Temporary B-C fault ~4.0 miles from Stimson Crossing terminal during the day wind event. Both terminals tripped and reclosed as designed and the Quil Ceda Auto-Transfer scheme also operated as designed.
13. **07/21/2024 Delta-Stimson Crossing (D-M) Line Trip**: The line tripped due to Temporary C-G fault ~0.5 miles from Stimson Crossing. Both terminals tripped and reclosed successfully, and the Kellogg Marsh Auto-Transfer scheme also operated as designed.
14. **08/17/2024 Stimson Crossing-Camano Line Trip**: The line tripped due to a Temporary B-G fault located ~14.5 mi from Stimson Crossing, most likely caused by lightning as thunderstorms were reported in the area. Both breakers tripped and reclosed as designed. Momentary outages occurred at Sunset, South Camano and Twin City; North Camano was offloaded at the time of the event as part of the station rebuild project.
15. **08/26/2024 Jackson Hydro Project - Unit 3 Trip**: A Lube Oil Pump failed, resulting in low oil flow to the Unit 3 Generator Bearing. This condition tripped the 86N lockout relay, opening breaker 52-1635. The Unit was placed in an outage, and the failed pump was replaced.
16. **09/11/2024 Jackson South Loop Trip**: The line tripped due to a single line-to-ground (A-G) fault when a lawnmower cut through a guy wire which flew into the line. Jackson Hydro Project (JHP) was under clearance for regular maintenance and the North/South line relay replacement project. The POTT scheme and the reclosing were disabled. At the BPA Snohomish terminal, the set 2 (SEL-321) relay's Zone 1 ground distance element operated to trip PCB B-485 (Set 1 was being tested at the time). The auto-sectionalizing schemes at West Monroe and Sultan on the South Loop were enabled but due to the reclosing being disabled, they were not effective in restoring load automatically.
17. **10/18/2024 Halls Lake-Five Corners Line Trip**: The line tripped due to a temporary LL (A-B) fault, the Halls Lake relays' Zone 1 mho phase distance element (Z1P) operated to trip PCB 2873 and PCB 2874 and clear the fault in a total of ~4 cycles. The Maplewood auto-sectionalizing scheme and Lynnwood auto-transfer scheme schemes did not operate for this temporary fault, as designed.
18. **10/18/2024 Halls Lake-BPA Snoking#2 Line Trip**: The line tripped due to a permanent LL (B-C) fault, both terminals' relays' instantaneous phase distance elements operated and the breakers auto-reclosed as designed. The auto-sectionalizing schemes at the Mountlake and Fitzgerald substations operated as designed. The event resulted in a momentary outage at Fitzgerlad and Mountlake substation while Canyon Park substation experienced a sustained outage of (168 min).
19. **10/20/2024 Stimson Crossing-Camano Line Trip**: The line tripped due to a temporary 3PH fault ~22.7 mi from Stimson Crossing, during that day's wind event. Both breakers tripped and reclosed as designed. Sunset, South Camano and Twin City experienced a momentary outage; North Camano was offloaded at the time of the event as part of the station rebuild project.

20. **11/04/2024 Jackson North Loop Line Trip**: The line tripped due to a temporary LL (A-C) fault, 4.96 miles from the Jackson Hydro terminal; the BPA Snohomish and Jackson Hydro terminals tripped and reclosed successfully, the Auto-Sectionalizing schemes at Lake Chaplain and Three Lakes did not operate, as designed.
21. **11/04/2024 Beverly Park- Paine Field Line Trip**: The line tripped due to a temporary B-C fault ~7.7 miles from Beverly Park during the day's wind event. Both terminals of the line tripped and reclosed as designed and the Picnic Point Auto-Sectionalizing scheme operated as designed.
22. **11/04/2024 Delta-Stimson Crossing (D-SC) Line Trip**: The line tripped due to a temporary A-C fault ~7.3 miles from Delta during the day's wind event. Both terminals tripped and reclosed as designed and the Quil Ceda Auto-Transfer scheme also operated as designed.
23. **11/04/2024 Lake Goodwin-North Stanwood Line Trip**: The line tripped due to a permanent B-C tree fault 1.95 mi from Lake Goodwin. The line was unloaded at the time of the event and restored at 21:52.
24. **11/18/2024 Halls Lake-BPA Snoking #1 Line Trip**: The line tripped due to a temporary LL (A-C) fault caused by a Mylar balloon ~ 0.9 miles from Halls Lake, both line terminals successfully reclosed. The Auto-Break with Transfer scheme at Thrashers Corner substation operated as designed to restore service to the line.
25. **11/19/2024 BPA Murray-Snohomish Line Trip**: The line tripped due to a permanent SLG (A-G) tree fault during the major storm (extratropical cyclone) event of that day. The auto-sectionalizing schemes at East Marysville and Granite Falls substations operated as designed. The BPA Snohomish terminal reclosed successfully, restoring the Snohomish-East Marysville line section. The BPA-Murray terminal didn't reclose because of a latching problem in the circuit breaker close circuit, which resulted in extended outages as Granite Falls (23min) and Hartford (508 min).
26. **11/19/2024 Jackson North Loop Trip #1**: The line tripped due to a permanent LL (A-B) fault between Three Lakes and Lake Chaplain during the major storm (extratropical cyclone) event of that day. The line reclosing at both terminals operated as designed and the Lake Chaplain and Three Lakes Auto-Sectionalizing schemes operated as designed to restore service at those substations.
27. **11/19/2024 Jackson North Loop Trip #2**: The line tripped due to a permanent LL (C-A) fault between BPA Snohomish and Three Lakes, during the major storm event of that day. At the time of this event, SW 1812D at Three Lakes and SW 1851D at Lake Chaplain were already opened by the line's auto-sectionalizing schemes following a previous fault. The BPA Snohomish terminal tripped to lockout, resulting in a 777 minute outage at Three Lakes.
28. **11/19/2024 Jackson South Loop Trip**: The line tripped due to a permanent LL (B-C) fault during the major storm event of that day. The BPA-Snohomish terminal reclosed successfully, restoring the BPA Snohomish-Sultan section of the line but the reclosing at Jackson Hydro locked out, resulting in extended outages at Wallace River (136 min) and Goldbar (136 min) substations.
29. **11/19/2024 BPA Snoking-Swamp Creek (SK-SC) Line Trip #1**: The line tripped due to a temporary LL (A-B) fault during the major storm event of that day. There are no auto-sectionalizing schemes on this line. Both terminals tripped and reclosed as designed.
30. **11/19/2024 BPA Snoking-Swamp Creek (SK-SC) Line Trip #2**: The line tripped due to a permanent LL (B-C) fault caused by a downed tree on the line during the major storm event of that day. There are no auto-sectionalizing schemes on this line; both terminals tripped to lockout.
31. **11/19/2024 Halls Lake-Five Corners Line Trip**: The line tripped due to a permanent LL (B-C) tree fault between Halls Lake and Maplewood, during the major storm event of that day. The Halls Lake terminal tripped to lockout, resulting in extended outages at Perrinville substation (9 min), Maplewood substation (9 min) and Five Corners substation (176 min); Lynnwood was restored after a momentary outage via its Auto-Transfer scheme.
32. **11/19/2024 Beverly Park-Everett Line Trip**: The line tripped due to a permanent tree fault that resulted in a broken conductor and a trip of feeder 12-0149 on the 12kV underbuild. The fault was initially an A-B one before evolving into a 3PH fault and was located 0.3 mi from Beverly Park. The Pinehurst Auto-Sectionalizing scheme operated as designed and the Beverly Park terminal tripped to lockout. Service was restored at Pinehurst via SCADA after a 4.5 min outage.

33. **11/19/2024 Beverly Park-Paine Field Line Trip**: The line tripped due to a temporary A-B fault ~11.5 mi from Beverly Park during the day's wind event. Both terminals tripped and reclosed as designed and the Picnic Point Auto-Sectionalizing scheme also operated as designed.
34. **11/19/2024 Delta-Snohomish Line Trip**: The line tripped due to a permanent tree fault ~1.8 miles from BPA Snohomish; the Delta terminal reclosed as designed after the Fobes Auto-Sectionalizing scheme operated; BPA Snohomish B-472 tripped to lockout. Because B-472 was able to reclose and hold for a little over 2 secs during both reclose attempts, the Fobes A/S2 scheme interpreted the first failed attempt as a bus fault at Fobes and went into Manual mode with both its line switches open. Fobes had to be restored via SCADA after a 48.5 min outage while Tenth St. substation experienced a momentary outage.
35. **11/19/2024 Delta-Stimson Crossing (D-SC) Line Trip**: The line tripped due to a temporary A-C fault ~6.5 miles from Delta. Both terminals tripped and reclosed as designed and the Quil Ceda Auto-Transfer scheme also operated as designed.
36. **11/19/2024 Lake Goodwin-North Stanwood Line Trip**: The line tripped due to a temporary A-C fault ~1.0 mile from Lake Goodwin. Lake Goodwin PCB 3015 tripped and reclosed as designed. The line wasn't serving any load at the time.
37. **11/19/2024 Stimson Crossing-Camano Line Trip #1**: The line tripped due to a temporary A-C fault ~22.0 miles from Stimson Crossing. Both breakers tripped and reclosed as designed.
38. **11/19/2024 Stimson Crossing-Camano Line Trip #2**: The line tripped due to a permanent C-G tree fault ~20.5 miles from Stimson Crossing (between Twin City and Sunset). The Stimson Crossing-Twin City section of the line was automatically restored but South Camano and Sunset experienced sustained outages (502 mins).
39. **11/19/2024 Jackson Hydro Project - Units 2 & 4 Trip**: With the North and South Lines opened at their BPA terminals as a result of prior trips earlier in the day, Jackson became islanded. Both Generator Units 2 & 4 tripped on overfrequency when the Jackson South Loop tripped at 23:59.
40. **11/20/2024 Jackson North Loop Trip**: The line tripped due to a temporary LL (B-C) fault during the major storm (extratropical cyclone) event of that day. At the time of this event, SW 1851D at Lake Chaplain, SW 1812D and SW 1811B at Three Lakes, and PCB B-1699 at BPA-Snohomish were already opened from a prior fault that occurred the previous day on the North Loop. Both terminals tripped and reclosed as designed.
41. **12/14/2024 Halls Lake-BPA Snoking #2 Line Trip**: The line tripped due to a temporary LL (A-C) fault, both terminals tripped and reclosed as designed. The Auto-sectionalizing schemes at the Mountlake and Fitzgerald substations operated as designed.
42. **12/14/2024 BPA Murray- East Arlington Line Trip**: The line tripped due to a temporary B-C fault ~1.5 miles from East Arlington. Both terminals tripped and reclosed as designed.
43. **12/18/2024 BPA Murray-Stimson Crossing Line Trip**: The line tripped due to a Permanent C-G tree fault ~4.5 mi from Stimson Crossing during the morning's wind event. Both terminals tripped as intended and the Smokey Point and Edgecomb Auto-Sectionalizing schemes operated as designed. B-1747 tripped to lockout as designed, however Stimson PCB 2994 failed to auto-reclose. Smokey Point (7.5 mins) and Edgecomb (10 mins) both experienced sustained outages as a result.
44. **12/18/2024 BPA Murray- BPA Snohomish Line Trip**: The line tripped to lockout twice due to permanent SLG (C-G) tree faults between BPA Snohomish and East Marysville. The BPA Snohomish terminal tripped to lockout and the BPA Murray breaker (B-1749) failed to reclose a result of the wiring issue that was discovered during the previous storm. All substations on the line experienced extended outages as a result.
45. **12/28/2024 Halls Lake-Five Corners Line Trip**: The line tripped due to a permanent LL (B-C) tree fault, between Maplewood and Lynnwood; both substations as well as Five Corner substation experienced a momentary outage before being automatically restored by the line's automatic switching schemes at Maplewood and Lynnwood, but Perrinville experienced a 87 minute outage.

4 The Distribution System

4.1 Introduction

This section describes outages on the District 12.47 kV distribution system. These outages are more frequent and involve fewer customers per event than most transmission system outages. While the number of outages are somewhat balanced between trees, animals, and equipment failures, most of the outage minutes are due to outages caused by trees and motor vehicle accidents. Animal and equipment failures often involve distribution transformers and affect a small number of customers. Damage caused by trees and motor vehicles is less discriminating and can affect infrastructure such as feeders and large branch circuits, which have larger customer impacts.

4.2 System Performance

4.2.1 Outage Causes

Figures 4-1 and 4-2 show the count of distribution outages by cause for 2024 and the average for the five-year period of 2019-2023. In 2024, 2,937 distribution outages were recorded during routine operation, compared to the five-year average of 2,454 annual outages. The percentages shown in Figures 4-1 and 4-2 are percentages of the total number of outages in each period. The District started tracking planned outages in 2017.

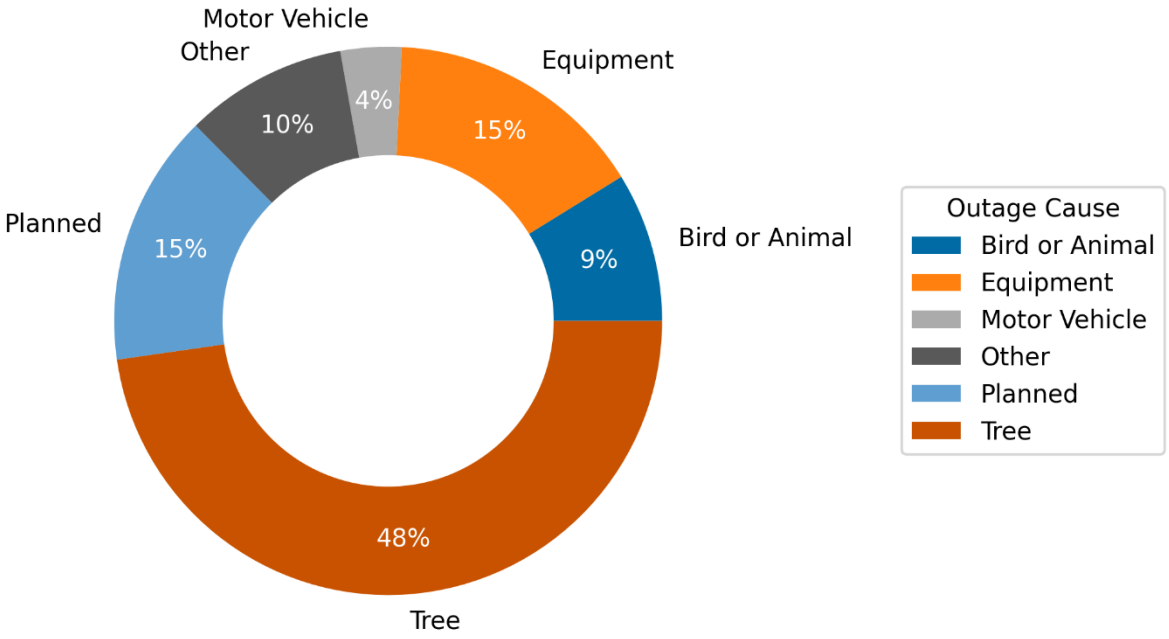

Figure 4-1: 2024 Distribution Outages by Cause

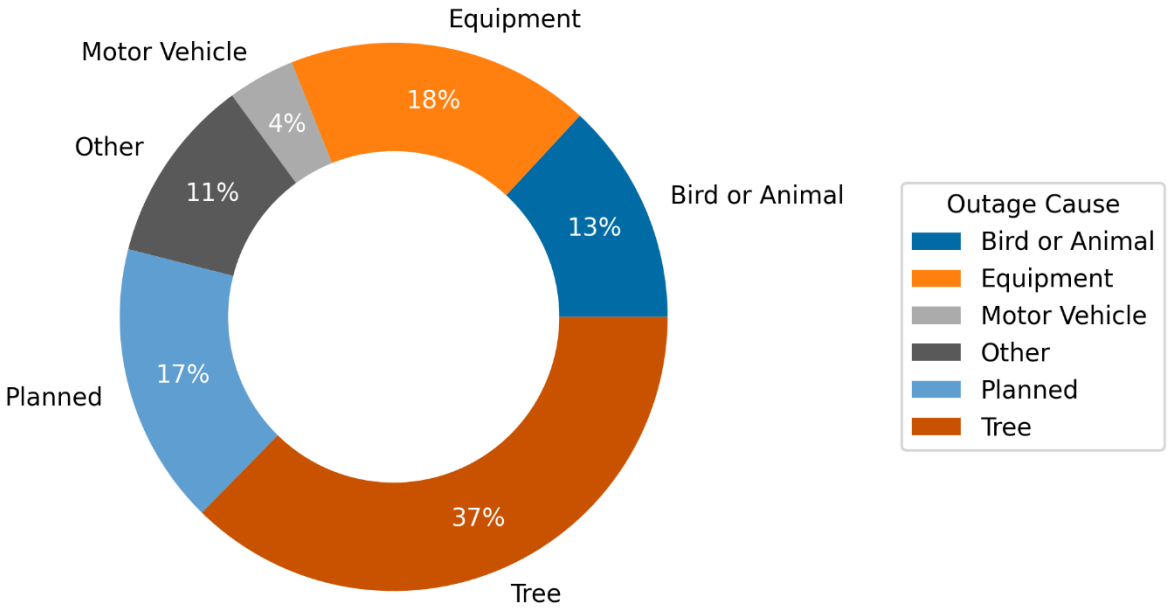

Figure 4-2: Five-Year Average Distribution Outages by Cause (2019-2023)

Figures 4-3 and 4-4 show the 2024 and five-year average percent of customer outage minutes by cause. District customers lost power for a combined total of 67,787,238 minutes in 2024 due to distribution outages, compared to the five-year average of 41,866,799 uplifted minutes. Both the number of outages and the customer minutes of outage are important parameters for planning effective outage impact reduction measures.

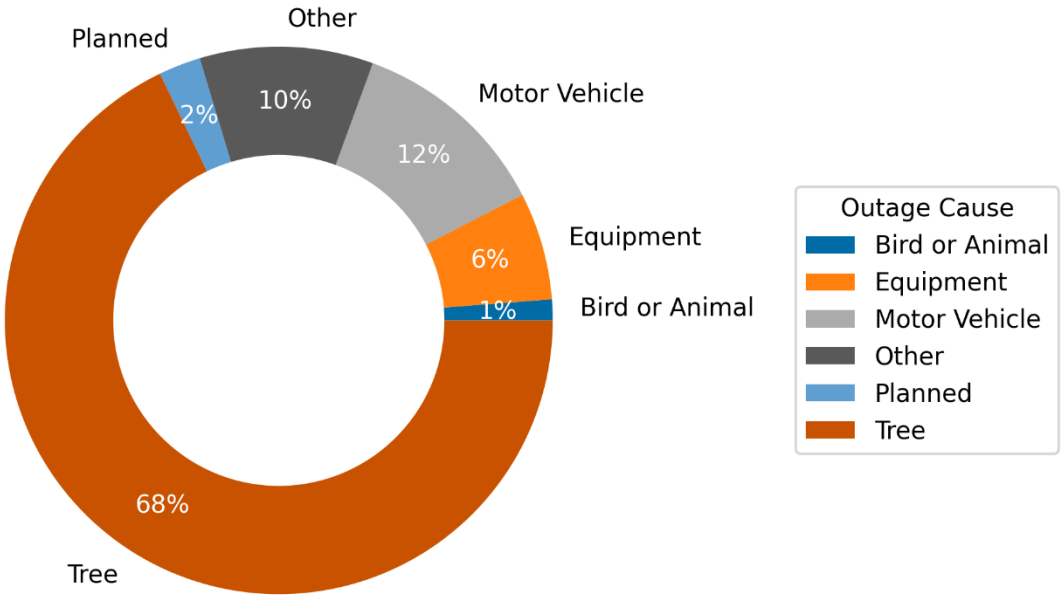

Figure 4-3: 2024 Distribution Outage Minutes by Cause

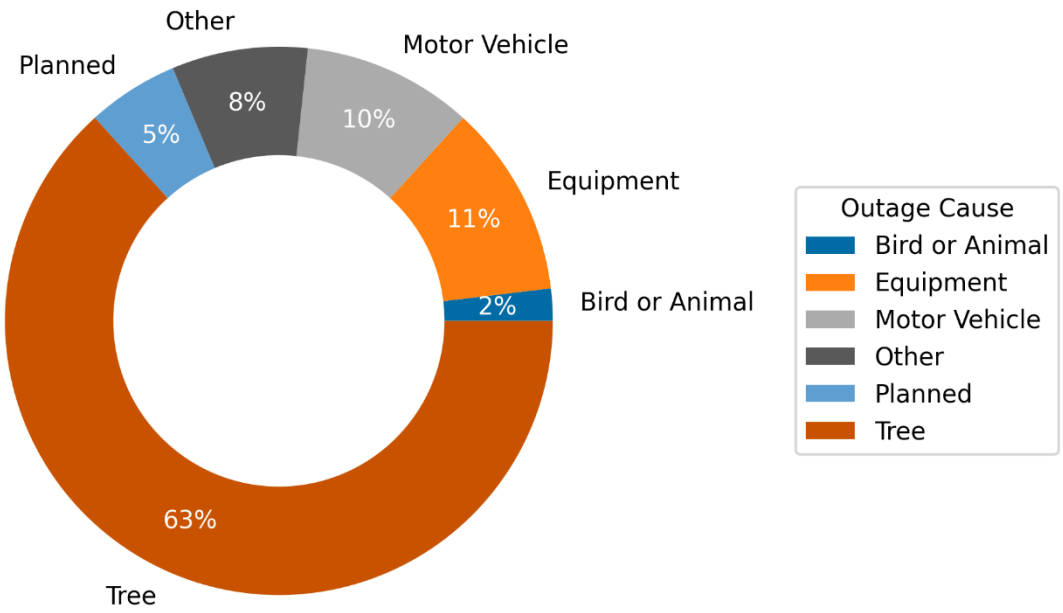

Figure 4-4: Five-Year Average Distribution Outage Minutes by Cause (2019-2023)

4.2.2 Explanation of Equipment Failure Category

Equipment failures may include any component of the distribution system, from primary overhead conductors, to fuses, transformers, insulators, and secondary service conductors. Figure 4-5 (blue bars) shows the number of recorded equipment failures by category during 2024. The ten most common types of equipment failure accounted for 531 outages in 2024. For comparison, Figure 4-5 (orange bars) shows the five-year average of the number of equipment failures for each category.

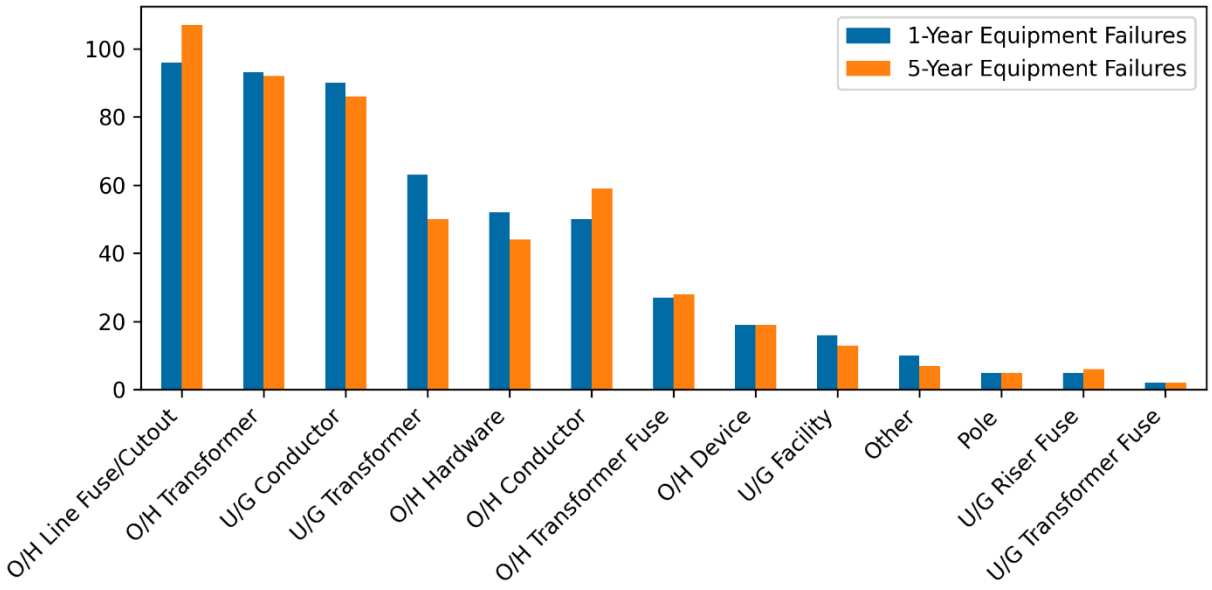

Figure 4-5: 2024 Equipment Failures

4.3 Urban, Suburban, Rural Classifications

IEEE Standard 1782 defines circuits as urban (greater than 150 customers per mile), suburban (between 150 and 50 customers per mile) and rural (less than 50 customers per mile). Classifying circuits indicates how susceptible those circuits are to having an outage. Shorter circuits are less likely to have an outage, due to less available exposure to faults. Conversely, longer circuits have more conductor, and thus are more likely to be damaged. To compare similar circuits, circuits are identified by performance based on circuit length. This table does not include outages that occurred during declared major events or planned outages.

Table 4-1: Circuit Classification Data

Classification (# of circuits)	Average Circuit Length	Average Number of Customers	Customers per Mile	Average Circuit SAIDI	Average SAIFI	# of Outages
Urban (40)	6.7 miles	1,350	970.5	53.1	0.80	137
Suburban (180)	13.6 miles	1,251	96.5	76.1	0.82	895
Rural (98)	31.7 miles	844	27.6	489.4	2.72	1873

Figure 4-6 shows the system SAIDI contribution from each classification type.

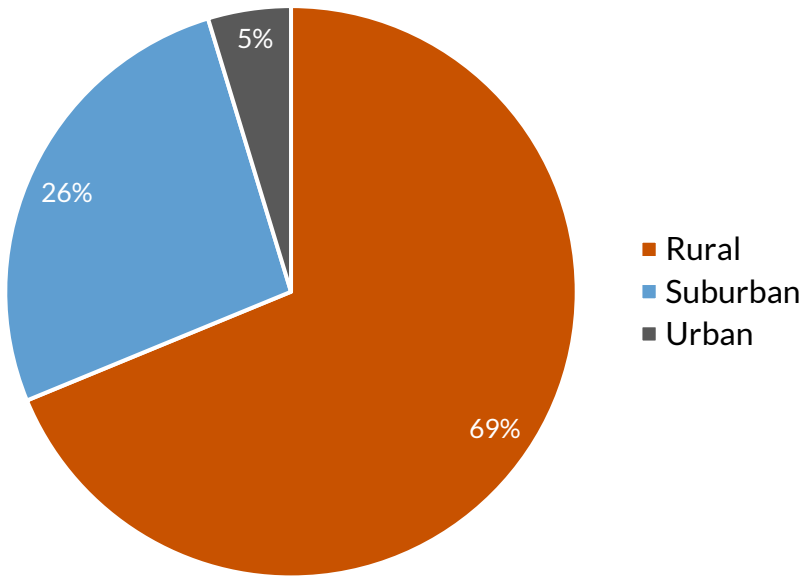

Figure 4-6: System SAIDI per Classification

4.4 Reliability Improvement Priority

Before 2017, the System Planning and Protection department used the "20 Worst Circuits" annually to target circuits for reliability improvements. This method had flaws. Typically, the same circuits would show up year after year due to their circuit length, rather than their relative reliability. There were also circuits on the list that had experienced no distribution outages, with all outage minutes caused by transmission outages. While valuable to know, that measure was irrelevant, as no distribution improvements would improve the reliability of the circuit. In 2017, an objective metric to help prioritize feeders for reliability work was developed comparing SAIDI normalized by circuit length and SAIFI. The metric is based on distribution outages only, allowing results to guide engineers to help decide which distribution changes should be prioritized to improve reliability. For this list, the circuit SAIDI and SAIFI were based on the number of customers on their original circuit. The OMS system has a design flaw when counting CMI for outages that involve multiple circuits. This happens when a breaker opens while a circuit is picking up a second circuit. This causes highly inaccurate reliability statistics for circuits with this type of outage. This should reduce the impact of the OMS design flaw on our reliability statistics.

$$rank(d,f) = \frac{d - \mu_d}{\sigma_d} + \frac{f - \mu_f}{\sigma_f}$$

Where 'd' is the circuit SAIDI divided by the circuit length, 'f' is the circuit SAIFI, 'μ' is the mean, and 'σ' is the standard deviation

Table 4-2: Circuit Reliability Improvement Priority for 2024

Rank	Feeder	Substation	Length	SAIFI	SAIDI	Incident Count	Customers	Score
1	12-5374	Cedar Valley	0.7	1.44	334.6	5	335	13.6
2	12-2036	Lake Chaplain	29.1	12.00	3,985.8	37	720	9.6
3	12-3090	Stimson Crossing	3.6	1.14	965.9	2	50	6.9
4	12-0810	Granite Falls	38.9	10.77	1,694.9	50	l,121	6.4
5	12-1310	Oso	12.1	5.10	1,585.7	15	150	5.4
6	12-5004	Sultan	8.2	4.00	1,213.0	4	1	5.3
7	12-1593	Sultan	25.4	7.86	909.0	24	590	4.5
8	12-0554	Goldbar	63.8	7.26	2,133.3	67	2,059	4.1
9	12-1840	Meadowdale	9.3	5.21	551.6	7	577	3.6
10	12-0379	Lake Goodwin	58.1	7.21	813.8	33	1,258	3.5
11	12-0382	Lake Goodwin	19.0	5.61	538.5	24	917	3.0
12	12-5208	Sunset	40.4	6.46	400.2	33	1,397	3.0
13	12-0124	Lake Stevens	57.0	6.03	984.9	58	1,879	2.9
14	12-1820	Three Lakes	89.8	6.06	1,148.6	97	1,614	2.8
15	12-0587	Clearview	60.3	5.41	1,605.8	43	1,683	2.8
16	12-3091	Stimson Crossing	48.9	6.12	479.1	24	1,325	2.7
17	12-0586	Clearview	14.5	3.56	911.4	19	710	2.7
18	12-1533	South Camano	36.1	4.71	795.9	34	1,088	2.3
19	12-1811	Woods Creek	29.5	4.35	845.3	24	1,187	2.2
20	12-2897	Gibson	19.7	4.83	327.3	18	3,159	2.2

Appendix A

District Outage Management System

These tables include outages that occurred on both the transmission system and on the distribution system. They do not include outages that occurred during declared major events or planned outages.

Table A-1: Substation Metrics

This table shows the substation reliability metrics for 2024 and the previous five year average.

Substation	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
20th Ave	2024	2,522	7.0	366,165	145.2	2.11	68.7
20th Ave	2019-2023	2,467	8.6	177,992	72.1	1.04	69.7
52nd St	2024	3,967	24.0	287,693	72.5	0.53	137.4
52nd St	2019-2023	3,589	17.4	170,097	47.8	0.45	106.0
Alderwood	2024	3,150	11.0	75,179	23.9	0.06	368.5
Alderwood	2019-2023	3,447	8.8	46,451	13.7	0.24	57.0
Ballinger	2024	3,974	11.0	92,504	23.3	0.08	308.3
Ballinger	2019-2023	3,774	18.6	306,513	81.5	1.00	81.6
Brier	2024	5,993	24.0	443,458	74.0	1.24	59.9
Brier	2019-2023	5,866	27.6	575,469	98.4	1.34	73.2
Bunk Foss	2024	2,354	23.0	104,783	44.5	0.36	122.4
Bunk Foss	2019-2023	2,275	24.0	123,966	54.3	0.81	66.9
Canyon Park	2024	5,425	25.0	168,221	31.0	0.24	129.2
Canyon Park	2019-2023	5,288	20.6	327,975	61.5	0.89	69.2
Cascade	2024	10,451	7.0	9,829	0.9	0.00	351.0
Cascade	2019-2023	10,170	8.0	374,621	36.2	0.26	141.0
Casino	2024	4,215	12.0	312,887	74.2	1.06	69.9
Casino	2019-2023	3,790	11.0	144,690	38.0	0.59	64.0
Cedar Valley	2024	2,899	10.0	162,659	56.1	0.28	203.6
Cedar Valley	2019-2023	2,280	5.6	195,969	83.8	0.84	100.3
Central Marysville	2024	5,312	17.0	354,377	66.7	1.48	45.0
Central Marysville	2019-2023	5,437	20.8	262,168	47.8	0.84	56.7
Clearview	2024	5,073	110.0	4,281,158	843.9	4.56	184.9
Clearview	2019-2023	4,835	80.2	1,298,241	269.6	2.72	99.2
Delta	2024	1,155	3.0	16051	13.9	0.26	52.5
Delta	2019-2023	1,128	7.4	19,300	16.9	0.09	184.1
Eagle Creek	2024	9,757	170.0	2,967,656	304.2	1.69	180.0
Eagle Creek	2019-2023	9,062	126.8	1,890,388	208.5	1.68	123.9
East Marysville	2024	12,439	45.0	1,145,112	92.1	0.79	116.8
East Marysville	2019-2023	11,460	35.4	755,883	65.1	0.66	98.9
Edgecomb	2024	4,199	38.0	763,507	181.8	1.61	113.1
Edgecomb	2019-2023	3,800	19.2	215,036	56.4	0.44	127.0

Substation	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Esperance	2024	6,351	18.0	206,727	32.6	0.42	76.8
Esperance	2019-2023	6,100	17.4	127,613	21.1	0.19	112.2
Everett	2024	6,021	14.0	88,347	14.7	0.15	99.6
Everett	2019-2023	5,445	16.8	209,829	39.3	0.33	118.4
Fitzgerald	2024	1,195	1.0	16,940	14.2	0.71	20.0
Fitzgerald	2019-2023	1,136	4.4	83,169	73.5	1.00	73.8
Five Corners	2024	5,618	18.0	105,557	18.8	0.22	86.8
Five Corners	2019-2023	5,571	21.8	216,209	38.7	0.47	81.9
Floral Hills	2024	8,936	28.0	1,654,008	185.1	1.45	127.4
Floral Hills	2019-2023	8,657	31.2	757,616	87.1	0.75	115.7
Fobes	2024	4,813	50.0	837,678	174.0	1.83	95.1
Fobes	2019-2023	4,650	25.2	236,737	50.9	0.53	95.1
Frontier	2024	7,764	20.0	756,869	97.5	0.90	107.9
Frontier	2019-2023	7,634	20.2	352,315	46.4	0.51	90.5
Gibson	2024	7,441	38.0	1,509,410	202.9	3.42	59.3
Gibson	2019-2023	7,151	23.0	506,380	69.2	0.39	177.1
Glenwood	2024	5,676	21.0	806,223	142.0	1.28	110.7
Glenwood	2019-2023	5,612	22.0	202,812	36.1	0.60	59.9
Goldbar	2024	2,840	95.0	4,521,614	1592.1	7.68	207.3
Goldbar	2019-2023	2,776	81.4	3,186,554	1144.0	3.34	342.5
Granite Falls	2024	7,058	176.0	3,783,969	536.1	2.83	189.7
Granite Falls	2019-2023	6,933	124.4	2,357,458	340.6	2.25	151.3
Harbour Pointe	2024	5,060	9.0	42,826	8.5	0.04	235.3
Harbour Pointe	2019-2023	5,063	6.6	187,193	36.9	0.40	92.9
Hardeson	2024	0	0.0	0	0.0	0.00	0.0
Hardeson	2019-2023	32	0.2	199	6.2	0.01	496.5
Hartford	2024	4,603	99.0	1,596,634	346.9	1.48	234.0
Hartford	2019-2023	4,286	65.0	714,627	166.7	1.09	153.4
Hilton Lake	2024	6,879	20.0	191,902	27.9	0.70	39.7
Hilton Lake	2019-2023	6,680	17.0	457,062	68.6	1.14	60.3
Jennings Park	2024	4,849	3.0	39,246	8.1	0.03	263.4
Jennings Park	2019-2023	0	0.0	0	0.0	0.00	0.0
Kellogg Marsh	2024	5,427	28.0	706,479	130.2	0.75	173.5
Kellogg Marsh	2019-2023	5,368	16.0	415,382	76.9	0.33	234.4
Lake Chaplain	2024	825	38.0	2,871,158	3480.2	10.94	318.0
Lake Chaplain	2019-2023	642	25.6	581,004	888.5	7.85	113.1
Lake Goodwin	2024	5,447	125.0	3,101,160	569.3	4.93	115.5
Lake Goodwin	2019-2023	5,245	88.6	1,167,824	222.8	2.21	100.9
Lake Serene	2024	6,307	10.0	100,326	15.9	0.25	63.2
Lake Serene	2019-2023	6,173	13.2	269,518	43.5	0.42	103.8
Lake Stevens	2024	8,174	74.0	2,548,940	311.8	1.50	208.2
Lake Stevens	2019-2023	7,538	43.6	852,601	113.5	1.03	110.2

Substation	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Lynnwood	2024	4,952	22.0	94,125	19.0	0.39	49.0
Lynnwood	2019-2023	4,859	26.6	234,534	48.5	0.57	84.9
Maplewood	2024	4,432	29.0	504,037	113.7	2.12	53.6
Maplewood	2019-2023	4,407	23.0	374,860	85.1	0.68	125.0
Mariner	2024	5,440	11.0	299,598	55.1	0.46	120.6
Mariner	2019-2023	5,292	10.2	91,736	17.4	0.34	51.6
Martha Lake	2024	6,566	16.0	258,152	39.3	0.72	54.8
Martha Lake	2019-2023	6,302	18.8	423,412	68.5	0.78	88.2
Meadowdale	2024	5,042	22.0	614,921	122.0	1.30	93.8
Meadowdale	2019-2023	4,943	22.2	207,722	42.1	0.57	73.9
Mountlake	2024	6,115	18.0	312,050	51.0	0.34	150.6
Mountlake	2019-2023	6,336	33.2	380,738	61.1	0.42	146.6
Mukilteo	2024	4,387	20.0	326,162	74.3	0.72	103.2
Mukilteo	2019-2023	4,334	16.2	138,519	32.0	0.68	47.3
Murphy's Corner	2024	4,720	7.0	13,669	2.9	0.01	262.9
Murphy's Corner	2019-2023	4,680	10.0	136,003	29.0	0.47	61.8
North Alderwood	2024	1,986	2.0	32,023	16.1	0.29	55.7
North Alderwood	2019-2023	969	1.6	31,614	37.5	0.34	108.9
North Camano	2024	3,033	30.0	1,135,158	374.3	2.81	133.4
North Camano	2019-2023	2,976	35.4	603,298	201.8	1.94	103.8
North Creek	2024	7,190	7.0	27,952	3.9	0.02	201.1
North Creek	2019-2023	7,135	9.4	106,304	14.8	0.08	184.7
North Marysville	2024	2,979	17.0	319,358	107.2	1.32	81.3
North Marysville	2019-2023	2,847	10.0	35,508	12.4	0.36	35.0
North Mountain	2024	1,956	67.0	1,277,533	653.1	2.08	313.6
North Mountain	2019-2023	1,904	56.2	1,061,912	556.2	2.77	200.5
North Stanwood	2024	0	0.0	0	0.0	0.00	0.0
North Stanwood	2019-2023	7,012	75.8	1,018,532	144.5	1.15	125.4
Norton Ave	2024	3,360	7.0	17,342	5.2	0.06	84.2
Norton Ave	2019-2023	3,194	4.2	31,567	10.1	0.15	66.7
Olivia Park	2024	4,838	7.0	11,336	2.3	0.01	241.2
Olivia Park	2019-2023	4,642	11.8	99,400	21.4	0.33	65.1
Oso	2024	469	22.0	405,282	864.1	2.78	311.3
Oso	2019-2023	435	14.8	205,141	459.2	2.66	172.8
Paine Field	2024	8,851	18.0	125,163	14.1	0.43	33.2
Paine Field	2019-2023	8,668	16.2	413,512	47.6	0.65	73.8
Park Ridge	2024	5,176	26.0	251,893	48.7	0.21	228.6
Park Ridge	2019-2023	4,927	30.0	430,103	86.9	0.88	99.1
Perrinville	2024	4,573	20.0	327,303	71.6	0.30	239.3
Perrinville	2019-2023	4,520	27.0	385,946	84.9	1.08	78.5
Picnic Point	2024	3,913	32.0	507,296	129.6	1.62	79.8
Picnic Point	2019-2023	3,808	29.4	251,919	66.2	0.60	109.7

Substation	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Pinehurst	2024	5,884	15.0	103,576	17.6	0.31	56.4
Pinehurst	2019-2023	6,691	28.8	447,442	66.4	0.67	98.9
Polaris	2024	4,473	16.0	419,448	93.8	1.70	55.0
Polaris	2019-2023	4,179	8.2	75,248	18.1	0.19	97.5
Portage	2024	2,399	32.0	617,670	257.5	2.04	126.1
Portage	2019-2023	2,542	34.0	413,997	164.2	2.08	78.9
Quil Ceda	2024	2,919	39.0	355,003	121.6	1.65	73.9
Quil Ceda	2019-2023	2,853	33.4	626,767	218.8	2.23	98.3
Richmond Park	2024	3,764	30.0	316,440	84.1	0.84	99.9
Richmond Park	2019-2023	3,311	32.8	362,292	108.8	0.89	121.9
Silver Lake	2024	6,209	19.0	505,482	81.4	0.26	318.9
Silver Lake	2019-2023	6,169	13.6	317,922	51.8	0.52	98.7
Sky Valley	2024	3,447	64.0	1,184,175	343.5	3.94	87.1
Sky Valley	2019-2023	3,219	3.8	13,405	4.2	0.01	343.7
Smokey Point	2024	5,303	7.0	196,737	37.1	0.47	78.2
Smokey Point	2019-2023	4,689	12.6	366,240	79.3	1.00	79.5
Snohomish	2024	3,280	32.0	830,769	253.3	2.79	90.8
Snohomish	2019-2023	3,118	29.8	184,126	59.0	0.92	63.8
South Camano	2024	3,934	71.0	1,617,019	411.0	3.01	136.4
South Camano	2019-2023	3,849	70.0	1,355,453	351.9	3.05	115.4
Stimson Crossing	2024	1,898	33.0	796,249	419.5	4.82	87.1
Stimson Crossing	2019-2023	1,849	34.4	588,821	318.1	2.78	114.4
Sultan	2024	3,106	80.0	1,602,116	515.8	3.44	149.9
Sultan	2019-2023	3,050	55.4	1,320,644	434.9	3.65	119.1
Sunset	2024	4,096	64.0	1,183,806	289.0	4.34	66.5
Sunset	2019-2023	4,000	57.2	1,058,017	263.9	2.42	108.9
Tenth Street	2024	4,198	7.0	6,390	1.5	0.01	213.0
Tenth Street	2019-2023	4,265	10.2	242,657	57.7	0.42	137.2
Thrashers Corner	2024	7,151	22.0	1,293,829	180.9	0.83	218.8
Thrashers Corner	2019-2023	6,781	13.8	432,673	63.4	0.53	119.3
Three Lakes	2024	4,054	160.0	3,401,971	839.2	3.85	217.8
Three Lakes	2019-2023	4,243	109.8	1,656,237	389.7	3.71	105.2
Tulalip	2024	2,312	14.0	210,211	90.9	0.56	163.0
Tulalip	2019-2023	2,263	21.8	370418	163.7	1.40	117.1
Turners Corner	2024	2,253	54.0	1,031,708	457.9	4.87	94.0
Turners Corner	2019-2023	2,452	42.8	659,648	276.5	1.85	149.5
Twin City	2024	7,502	109.0	1,753,408	233.7	2.80	83.4
Twin City	2019-2023	7,378	16.0	255,888	34.7	0.29	121.4
Village	2024	2,163	41.0	487,361	225.3	1.94	116.2
Village	2019-2023	2,120	24.8	221,533	104.4	1.16	90.1
Wallace River	2024	2,083	19.0	297,948	143.0	1.69	84.7
Wallace River	2019-2023	1,614	21.8	293,952	177.8	1.18	150.2

Substation	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Waterfront	2024	3,071	3.0	1,987	0.6	0.00	132.5
Waterfront	2019-2023	3,072	7.0	134,180	43.7	0.37	116.7
West Monroe	2024	7,607	58.0	2,206,011	290.0	0.40	726.6
West Monroe	2019-2023	7,569	42.6	512,623	67.8	0.60	112.8
Westgate	2024	4,306	19.0	69,394	16.1	0.11	150.2
Westgate	2019-2023	4,231	19.4	258,781	61.0	0.56	108.4
Woods Creek	2024	3,259	68.0	1,511,178	463.7	2.62	176.7
Woods Creek	2019-2023	5,710	90.2	2,342,735	409.6	2.84	144.0
York	2024	6,043	34.0	1,482,355	245.3	3.86	63.5
York	2019-2023	5,931	32.4	844,986	142.1	2.19	64.8

Table A-2: Circuit Metrics

This table shows the circuit reliability metrics for 2024 and the previous five year average.

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
20th Ave	12-1493	2024	27	1.0	184	6.3	0.07	92.0
20th Ave	12-1493	2019-2023	26	0.0	0	0.0	0.00	0.0
20th Ave	12-1494	2024	7	0.0	0	0.0	0.00	0.0
20th Ave	12-1494	2019-2023	8	0.0	0	0.0	0.00	0.0
20th Ave	12-1495	2024	17	1.0	510	30.0	0.06	510.0
20th Ave	12-1495	2019-2023	17	0.2	115	9.6	0.30	32.0
20th Ave	12-1496	2024	30	0.0	0	0.0	0.00	0.0
20th Ave	12-1496	2019-2023	27	0.2	26	1.2	0.04	32.5
20th Ave	12-2723	2024	600	0.0	0	0.0	0.00	0.0
20th Ave	12-2723	2019-2023	596	3.6	2,756	4.6	0.05	86.9
20th Ave	12-2724	2024	412	0.0	0	0.0	0.00	0.0
20th Ave	12-2724	2019-2023	406	0.4	312	0.8	0.01	74.2
20th Ave	12-2725	2024	1,003	3.0	364,060	361.9	5.29	68.4
20th Ave	12-2725	2019-2023	993	1.6	107,983	108.3	1.25	86.3
20th Ave	12-2726	2024	397	2.0	1,411	3.6	0.02	201.6
20th Ave	12-2726	2019-2023	389	2.4	40,268	105.8	1.33	79.5
20th Ave	12-6026	2024	0	0.0	0	0.0	0.00	0.0
20th Ave	12-6026	2019-2023	0	0.0	0	0.0	0.00	0.0
52nd St	12-0183	2024	1,156	3.0	4,198	3.1	0.04	85.7
52nd St	12-0183	2019-2023	607	2.6	37,549	55.8	0.88	63.6
52nd St	12-0184	2024	1,055	12.0	202,303	213.0	1.23	173.2
52nd St	12-0184	2019-2023	1,200	3.8	38,466	30.0	0.33	90.2
52nd St	12-0185	2024	720	5.0	38,093	52.8	0.31	170.1
52nd St	12-0185	2019-2023	720	4.8	44,189	62.3	0.45	138.8
52nd St	12-0186	2024	921	4.0	43,099	46.9	0.71	66.0
52nd St	12-0186	2019-2023	919	6.2	49,894	54.2	0.30	179.3
Alderwood	12-0116	2024	591	3.0	16,472	27.7	0.11	242.2
Alderwood	12-0116	2019-2023	601	2.2	3,603	5.2	0.02	320.5
Alderwood	12-0117	2024	1,375	2.0	8,234	6.5	0.01	548.9
Alderwood	12-0117	2019-2023	1,416	2.4	19,240	13.7	0.27	50.5
Alderwood	12-0132	2024	305	0.0	0	0.0	0.00	0.0
Alderwood	12-0132	2019-2023	1,549	1.6	3,122	9.6	0.06	150.7
Alderwood	12-0141	2024	963	6.0	50,473	52.3	0.13	417.1
Alderwood	12-0141	2019-2023	966	2.6	20,486	22.2	0.45	48.7
Ballinger	12-0258	2024	477	3.0	88,578	183.8	0.38	478.8
Ballinger	12-0258	2019-2023	484	4.0	43,820	92.0	1.54	59.9
Ballinger	12-0259	2024	716	1.0	80	0.1	0.00	80.0

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Ballinger	12-0259	2019-2023	717	3.0	71,477	100.3	1.07	93.6
Ballinger	12-0260	2024	1,164	3.0	2,773	2.4	0.04	67.6
Ballinger	12-0260	2019-2023	1,103	4.0	27,106	23.7	0.25	94.4
Ballinger	12-0261	2024	1,590	4.0	1,073	0.7	0.05	14.7
Ballinger	12-0261	2019-2023	1,390	7.6	164,110	114.9	1.37	83.7
Ballinger	12-5578	2024	1	0.0	0	0.0	0.00	0.0
Ballinger	12-5578	2019-2023	1	0.0	0	0.0	0.00	0.0
Brier	12-0501	2024	1,771	4.0	111,631	63.1	1.01	62.3
Brier	12-0501	2019-2023	1,771	5.4	133,527	74.6	0.79	94.7
Brier	12-0502	2024	1,178	7.0	69,107	58.6	0.31	187.3
Brier	12-0502	2019-2023	1,113	4.8	34,646	29.9	0.48	61.8
Brier	12-0503	2024	1,485	4.0	233,605	156.6	3.02	51.8
Brier	12-0503	2019-2023	1,499	8.0	219,050	151.5	2.25	67.3
Brier	12-0504	2024	1,528	9.0	29,115	18.8	0.48	39.5
Brier	12-0504	2019-2023	1,426	9.0	133,255	92.0	1.24	74.1
Bunk Foss	12-4111	2024	804	3.0	2,669	3.3	0.01	242.6
Bunk Foss	12-4111	2019-2023	743	5.4	29,248	37.7	0.82	46.0
Bunk Foss	12-4112	2024	674	3.0	14,492	21.3	0.17	126.0
Bunk Foss	12-4112	2019-2023	656	7.0	16,097	24.0	0.62	38.8
Bunk Foss	12-4113	2024	472	7.0	42,827	88.5	1.04	84.8
Bunk Foss	12-4113	2019-2023	450	4.2	50,680	109.7	0.92	119.5
Bunk Foss	12-4114	2024	370	10.0	44,795	120.7	0.61	199.1
Bunk Foss	12-4114	2019-2023	363	7.4	27,940	76.1	1.04	73.3
Bunk Foss	12-4115	2024	0	0.0	0	0.0	0.00	0.0
Bunk Foss	12-4115	2019-2023	0	0.0	0	0.0	0.00	0.0
Canyon Park	12-1093	2024	1,217	6.0	28,579	23.5	0.04	583.2
Canyon Park	12-1093	2019-2023	954	6.0	89,623	75.2	1.10	68.2
Canyon Park	12-1094	2024	1,188	7.0	27,306	22.9	0.28	80.8
Canyon Park	12-1094	2019-2023	1,129	4.2	136,882	115.3	1.68	68.7
Canyon Park	12-1095	2024	1,538	7.0	23,239	15.1	0.07	223.5
Canyon Park	12-1095	2019-2023	1,461	8.4	92,285	61.7	0.70	88.6
Canyon Park	12-1096	2024	1,033	1.0	82,425	73.8	0.70	105.0
Canyon Park	12-1096	2019-2023	1,075	1.0	9,010	8.2	0.34	24.0
Canyon Park	12-3488	2024	354	4.0	6,672	18.5	0.07	256.6
Canyon Park	12-3488	2019-2023	390	1.0	175	0.5	0.00	174.5
Cascade	12-2087	2024	2,453	2.0	433	0.2	0.00	144.3
Cascade	12-2087	2019-2023	2,037	2.0	3,229	1.4	0.01	155.8
Cascade	12-2088	2024	2,979	2.0	274	0.1	0.00	91.3
Cascade	12-2088	2019-2023	2,804	4.2	235,281	79.2	0.38	210.7
Cascade	12-2089	2024	2,161	2.0	5,020	2.4	0.01	334.7

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Cascade	12-2089	2019-2023	1,981	0.8	127,367	63.0	0.72	87.4
Cascade	12-2090	2024	2,920	1.0	4,102	1.4	0.00	586.0
Cascade	12-2090	2019-2023	2,919	1.0	8,744	3.4	0.02	143.8
Casino	12-0308	2024	986	6.0	172,243	130.3	2.21	59.0
Casino	12-0308	2019-2023	983	2.8	76,588	79.8	1.07	74.3
Casino	12-0309	2024	386	1.0	146	0.4	0.01	73.0
Casino	12-0309	2019-2023	370	1.4	1,641	4.3	0.43	10.1
Casino	12-0310	2024	1,196	3.0	101,766	84.9	0.16	519.2
Casino	12-0310	2019-2023	1,199	2.6	16,539	13.8	0.21	64.4
Casino	12-0311	2024	1,260	2.0	38,732	30.4	1.07	28.5
Casino	12-0311	2019-2023	1,258	4.2	49,921	39.6	0.65	61.3
Cedar Valley	12-5372	2024	1,120	0.0	0	0.0	0.00	0.0
Cedar Valley	12-5372	2019-2023	1,095	1.6	42,601	38.0	0.48	78.6
Cedar Valley	12-5373	2024	991	5.0	50,556	50.9	0.32	159.5
Cedar Valley	12-5373	2019-2023	970	3.2	122,380	123.9	0.87	143.1
Cedar Valley	12-5374	2024	11	5.0	112,103	334.6	1.44	232.6
Cedar Valley	12-5374	2019-2023	271	0.0	0	0.0	0.00	0.0
Cedar Valley	12-5375	2024	313	0.0	0	0.0	0.00	0.0
Cedar Valley	12-5375	2019-2023	247	0.6	4,822	62.4	0.65	95.7
Cedar Valley	12-5376	2024	2	0.0	0	0.0	0.00	0.0
Cedar Valley	12-5376	2019-2023	1	0.0	0	0.0	0.00	0.0
Central Marysville	12-1419	2024	1,227	5.0	209,126	192.2	3.53	54.4
Central Marysville	12-1419	2019-2023	1,138	4.4	63,822	54.2	0.70	77.1
Central Marysville	12-1420	2024	1,311	2.0	30,328	46.1	0.98	47.0
Central Marysville	12-1420	2019-2023	1,262	5.4	22,949	17.5	0.25	69.9
Central Marysville	12-1421	2024	1,616	5.0	80,931	58.3	2.35	24.8
Central Marysville	12-1421	2019-2023	1,588	4.2	64,884	40.1	1.08	37.1
Central Marysville	12-1422	2024	1,360	5.0	33,992	25.0	0.08	295.6
Central Marysville	12-1422	2019-2023	1,332	6.6	32,870	24.3	0.45	53.9
Clearview	12-0584	2024	1,594	31.0	819,564	511.3	5.22	97.9
Clearview	12-0584	2019-2023	322	19.2	354,037	230.2	2.31	99.8
Clearview	12-0585	2024	1,080	17.0	110,001	101.9	2.01	50.7
Clearview	12-0585	2019-2023	1,123	15.0	36,461	33.0	0.26	129.0
Clearview	12-0586	2024	701	19.0	649,077	914.2	4.93	185.3
Clearview	12-0586	2019-2023	1,529	11.8	118,049	157.0	2.29	68.4
Clearview	12-0587	2024	1,675	43.0	2,702,516	1605.8	5.41	296.7
Clearview	12-0587	2019-2023	1,727	34.2	789,692	470.6	4.83	97.3
Delta	12-3653	2024	155	1.0	4,539	51.6	1.01	51.0
Delta	12-3653	2019-2023	76	4.6	17,657	200.1	1.00	200.5
Delta	12-3654	2024	21	0.0	0	0.0	0.00	0.0

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Delta	12-3654	2019-2023	14	0.0	0	0.0	0.00	0.0
Delta	12-3655	2024	210	2.0	11,512	54.6	1.03	53.1
Delta	12-3655	2019-2023	210	1.2	354	1.7	0.01	118.0
Delta	12-3656	2024	812	0.0	0	0.0	0.00	0.0
Delta	12-3656	2019-2023	712	1.2	590	0.7	0.00	215.0
Delta	12-3657	2024	11	0.0	0	0.0	0.00	0.0
Delta	12-3657	2019-2023	0	0.4	699	36.8	0.19	194.2
Eagle Creek	12-0986	2024	1,222	7.0	11,216	9.0	0.04	211.6
Eagle Creek	12-0986	2019-2023	1,109	2.8	9,615	8.0	0.06	145.6
Eagle Creek	12-0987	2024	939	1.0	58,058	58.1	1.00	58.0
Eagle Creek	12-0987	2019-2023	770	2.4	23,862	26.0	0.13	205.4
Eagle Creek	12-0988	2024	1,645	31.0	619,094	364.4	0.90	403.6
Eagle Creek	12-0988	2019-2023	1,510	32.8	410,948	256.0	2.46	104.1
Eagle Creek	12-0989	2024	957	5.0	27,610	28.7	0.29	98.3
Eagle Creek	12-0989	2019-2023	947	4.4	61,831	64.7	1.08	59.9
Eagle Creek	12-2617	2024	1,549	64.0	1,329,169	851.5	5.17	164.8
Eagle Creek	12-2617	2019-2023	1,478	38.2	910,947	597.8	4.26	140.2
Eagle Creek	12-2618	2024	976	33.0	369,121	377.0	2.05	183.8
Eagle Creek	12-2618	2019-2023	1,045	31.2	347,152	366.0	2.35	155.7
Eagle Creek	12-2619	2024	1,836	29.0	553,388	293.4	1.88	156.0
Eagle Creek	12-2619	2019-2023	1,487	14.6	125,740	76.2	0.80	95.2
Eagle Creek	12-2620	2024	419	0.0	0	0.0	0.00	0.0
Eagle Creek	12-2620	2019-2023	412	0.4	294	0.7	0.03	23.7
Eagle Creek	12-5839	2024	0	0.0	0	0.0	0.00	0.0
Eagle Creek	12-5839	2019-2023	0	0.0	0	0.0	0.00	0.0
Eagle Creek	12-5840	2024	0	0.0	0	0.0	0.00	0.0
Eagle Creek	12-5840	2019-2023	0	0.0	0	0.0	0.00	0.0
East Marysville	12-0002	2024	701	20.0	377,264	535.9	1.78	301.3
East Marysville	12-0002	2019-2023	671	13.0	106,274	153.1	0.51	297.7
East Marysville	12-0037	2024	1,883	6.0	207,446	106.7	1.02	104.6
East Marysville	12-0037	2019-2023	1,680	8.2	288,518	159.4	2.27	70.1
East Marysville	12-0038	2024	2,395	6.0	440,959	161.3	2.17	74.4
East Marysville	12-0038	2019-2023	1,606	5.2	232,281	103.3	0.64	160.4
East Marysville	12-0070	2024	2,082	5.0	14,721	7.1	0.05	144.3
East Marysville	12-0070	2019-2023	2,029	3.0	77,623	37.3	0.62	60.4
East Marysville	12-0115	2024	1,380	2.0	1,098	0.8	0.00	183.0
East Marysville	12-0115	2019-2023	1,375	1.2	2,864	2.1	0.01	223.7
East Marysville	12-5203	2024	1,531	0.0	0	0.0	0.00	0.0
East Marysville	12-5203	2019-2023	1,507	0.8	468	0.3	0.00	157.0
East Marysville	12-5204	2024	1,968	6.0	103,624	51.3	0.26	194.4

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
East Marysville	12-5204	2019-2023	1,728	4.0	47,857	26.3	0.26	100.6
Edgecomb	12-4831	2024	575	0.0	0	0.0	0.00	0.0
Edgecomb	12-4831	2019-2023	197	1.2	24,751	55.3	0.87	63.5
Edgecomb	12-4832	2024	1,607	10.0	355,611	221.2	2.05	107.7
Edgecomb	12-4832	2019-2023	1,506	6.4	21,415	13.9	0.22	63.5
Edgecomb	12-4833	2024	1,466	4.0	137,278	93.4	1.11	84.4
Edgecomb	12-4833	2019-2023	1,342	1.8	18,332	13.4	0.21	64.7
Edgecomb	12-4834	2024	450	24.0	270,618	598.7	4.03	148.6
Edgecomb	12-4834	2019-2023	420	9.8	150,538	345.0	1.72	200.6
Edgecomb	12-6059	2024	0	0.0	0	0.0	0.00	0.0
Edgecomb	12-6059	2019-2023	0	0.0	0	0.0	0.00	0.0
Edgecomb	12-6060	2024	0	0.0	0	0.0	0.00	0.0
Edgecomb	12-6060	2019-2023	0	0.0	0	0.0	0.00	0.0
Edgecomb	12-6061	2024	0	0.0	0	0.0	0.00	0.0
Edgecomb	12-6061	2019-2023	0	0.0	0	0.0	0.00	0.0
Edgecomb	12-6062	2024	0	0.0	0	0.0	0.00	0.0
Edgecomb	12-6062	2019-2023	0	0.0	0	0.0	0.00	0.0
Edgecomb	12-6063	2024	0	0.0	0	0.0	0.00	0.0
Edgecomb	12-6063	2019-2023	0	0.0	0	0.0	0.00	0.0
Esperance	12-0687	2024	1,698	3.0	346	0.2	0.00	86.5
Esperance	12-0687	2019-2023	1,649	2.4	646	0.4	0.00	124.0
Esperance	12-0688	2024	1,146	4.0	29,652	25.9	0.22	119.1
Esperance	12-0688	2019-2023	1,159	1.6	3,320	2.9	0.03	86.3
Esperance	12-0689	2024	1,273	3.0	9,850	8.2	0.03	234.5
Esperance	12-0689	2019-2023	1,243	8.4	77,481	59.6	0.36	164.5
Esperance	12-1597	2024	2,223	8.0	166,879	75.1	1.08	69.6
Esperance	12-1597	2019-2023	1,898	5.0	46,167	23.6	0.30	78.3
Everett	12-0100	2024	378	0.0	0	0.0	0.00	0.0
Everett	12-0100	2019-2023	375	0.8	13,964	36.9	0.42	88.0
Everett	12-0101	2024	436	0.0	0	0.0	0.00	0.0
Everett	12-0101	2019-2023	245	1.0	40,848	176.8	0.74	239.0
Everett	12-0112	2024	976	8.0	37,887	38.8	0.16	236.8
Everett	12-0112	2019-2023	922	7.8	84,757	87.3	0.63	137.9
Everett	12-0113	2024	362	1.0	8,964	25.0	0.07	373.5
Everett	12-0113	2019-2023	363	2.8	4,996	13.8	0.07	197.5
Everett	12-0118	2024	1,297	1.0	432	0.3	0.01	48.0
Everett	12-0118	2019-2023	1,261	2.2	29,127	21.9	0.42	52.3
Everett	12-0119	2024	1,128	1.0	336	0.3	0.01	28.0
Everett	12-0119	2019-2023	1,087	1.4	12,103	10.7	0.07	144.1
Everett	12-0121	2024	890	3.0	40,728	41.8	0.70	59.7

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Everett	12-0121	2019-2023	331	0.0	0	0.0	0.00	0.0
Everett	12-0122	2024	401	0.0	0	0.0	0.00	0.0
Everett	12-0122	2019-2023	331	0.8	24,034	70.9	0.41	173.0
Everett	12-3700	2024	0	0.0	0	0.0	0.00	0.0
Everett	12-3700	2019-2023	0	0.0	0	0.0	0.00	0.0
Everett	12-3701	2024	0	0.0	0	0.0	0.00	0.0
Everett	12-3701	2019-2023	0	0.0	0	0.0	0.00	0.0
Everett	12-3702	2024	28	0.0	0	0.0	0.00	0.0
Everett	12-3702	2019-2023	0	0.0	0	0.0	0.00	0.0
Fitzgerald	12-5508	2024	839	1.0	16,940	20.0	1.00	20.0
Fitzgerald	12-5508	2019-2023	805	2.8	66,755	81.3	1.09	74.9
Fitzgerald	12-5509	2024	7	0.0	0	0.0	0.00	0.0
Fitzgerald	12-5509	2019-2023	7	0.2	163	23.3	0.23	102.0
Fitzgerald	12-5510	2024	239	0.0	0	0.0	0.00	0.0
Fitzgerald	12-5510	2019-2023	241	1.2	14,660	60.5	0.89	68.1
Fitzgerald	12-5511	2024	77	0.0	0	0.0	0.00	0.0
Fitzgerald	12-5511	2019-2023	5	0.2	1,591	20.7	0.20	102.0
Five Corners	12-1282	2024	1,057	4.0	2,553	2.4	0.04	60.8
Five Corners	12-1282	2019-2023	1,022	6.0	89,387	83.3	1.10	75.6
Five Corners	12-1283	2024	1,814	5.0	14,284	7.8	0.03	291.5
Five Corners	12-1283	2019-2023	1,785	5.6	101,296	56.1	0.45	125.6
Five Corners	12-1284	2024	920	4.0	53,064	57.1	1.03	55.3
Five Corners	12-1284	2019-2023	870	2.2	12,260	13.3	0.22	61.0
Five Corners	12-1285	2024	1,796	5.0	35,656	19.9	0.09	216.1
Five Corners	12-1285	2019-2023	1,778	8.0	13,267	7.4	0.25	29.7
Floral Hills	12-2062	2024	1,140	8.0	293,919	251.6	1.10	228.0
Floral Hills	12-2062	2019-2023	1,184	8.8	468,992	416.2	2.56	162.3
Floral Hills	12-2063	2024	3,022	5.0	13,046	4.6	0.01	395.3
Floral Hills	12-2063	2019-2023	2,752	8.4	53,227	18.3	0.08	236.0
Floral Hills	12-2064	2024	1,980	6.0	29,540	14.3	0.23	60.8
Floral Hills	12-2064	2019-2023	1,719	6.6	57,656	33.2	0.12	268.6
Floral Hills	12-2065	2024	2,827	9.0	1,317,503	459.7	3.90	117.9
Floral Hills	12-2065	2019-2023	2,730	7.4	177,741	64.1	1.15	55.5
Fobes	12-0398	2024	1,984	14.0	413,779	202.7	2.12	95.6
Fobes	12-0398	2019-2023	1,854	7.6	51,104	25.9	0.28	93.1
Fobes	12-0399	2024	954	13.0	126,912	128.6	1.32	97.8
Fobes	12-0399	2019-2023	963	5.4	70,517	75.0	0.68	110.3
Fobes	12-0400	2024	1,262	8.0	155,787	122.8	2.03	60.4
Fobes	12-0400	2019-2023	1,184	6.8	90,192	74.8	0.85	87.5
Fobes	12-0401	2024	521	8.0	114,805	217.4	0.87	249.0

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Fobes	12-0401	2019-2023	510	5.4	24,924	48.0	0.53	90.5
Frontier	12-0533	2024	1,990	8.0	642,948	322.6	2.08	155.3
Frontier	12-0533	2019-2023	1,792	8.2	86,155	44.8	0.65	68.6
Frontier	12-0534	2024	1,426	3.0	500	0.4	0.00	83.3
Frontier	12-0534	2019-2023	1,478	3.8	57,578	40.3	0.69	58.1
Frontier	12-0535	2024	2,625	6.0	98,280	37.3	1.02	36.5
Frontier	12-0535	2019-2023	2,515	3.4	104,557	40.0	0.22	183.0
Frontier	12-0536	2024	1,702	3.0	15,141	8.9	0.10	86.5
Frontier	12-0536	2019-2023	1,640	4.8	104,025	62.5	0.64	97.1
Gibson	12-2897	2024	3,142	18.0	1,034,096	327.3	4.83	67.8
Gibson	12-2897	2019-2023	2,823	8.6	299,868	95.8	0.41	232.7
Gibson	12-2898	2024	1,843	8.0	169,703	90.6	2.04	44.3
Gibson	12-2898	2019-2023	1,602	6.2	40,535	22.5	0.44	50.7
Gibson	12-2899	2024	1,001	3.0	88,851	88.6	2.01	44.1
Gibson	12-2899	2019-2023	986	2.2	121,329	122.4	0.59	207.6
Gibson	12-2900	2024	1,399	9.0	216,760	154.8	3.09	50.1
Gibson	12-2900	2019-2023	1,280	6.0	44,647	35.0	0.14	244.7
Glenwood	12-0592	2024	1,072	5.0	163,339	152.9	3.10	49.4
Glenwood	12-0592	2019-2023	1,084	7.2	97,974	90.7	1.22	74.3
Glenwood	12-0593	2024	1,055	6.0	298,309	272.7	1.24	220.5
Glenwood	12-0593	2019-2023	1,039	5.6	11,759	11.5	0.24	48.2
Glenwood	12-0594	2024	2,516	10.0	344,575	136.5	1.04	131.6
Glenwood	12-0594	2019-2023	2,470	8.6	86,776	34.9	0.71	49.3
Glenwood	12-0595	2024	941	0.0	0	0.0	0.00	0.0
Glenwood	12-0595	2019-2023	975	0.6	6,302	7.2	0.08	89.3
Goldbar	12-0554	2024	2,048	67.0	4,392,412	2133.3	9.92	215.0
Goldbar	12-0554	2019-2023	1,973	58.6	2,739,531	1356.3	3.74	363.1
Goldbar	12-0555	2024	771	20.0	115,276	147.4	1.51	97.9
Goldbar	12-0555	2019-2023	740	22.4	435,678	571.4	1.58	362.4
Granite Falls	12-0808	2024	633	26.0	594,014	942.9	3.09	305.2
Granite Falls	12-0808	2019-2023	528	15.2	144,554	249.2	1.66	150.3
Granite Falls	12-0809	2024	1,283	37.0	295,829	229.9	0.66	346.4
Granite Falls	12-0809	2019-2023	1,248	21.6	424,744	330.1	2.47	133.8
Granite Falls	12-0810	2024	1,105	50.0	1,899,928	1694.9	10.78	157.2
Granite Falls	12-0810	2019-2023	1,059	36.4	948,599	876.5	5.22	167.9
Granite Falls	12-0811	2024	875	13.0	133,979	153.1	1.19	129.2
Granite Falls	12-0811	2019-2023	856	11.6	48,176	55.8	0.25	222.4
Granite Falls	12-4612	2024	461	1.0	15,708	34.0	1.00	34.0
Granite Falls	12-4612	2019-2023	456	3.2	21,443	46.8	0.23	204.9
Granite Falls	12-4613	2024	969	17.0	62,920	66.2	0.22	299.6

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Granite Falls	12-4613	2019-2023	674	6.6	15,612	16.5	0.09	190.4
Granite Falls	12-4614	2024	319	5.0	83,195	260.0	2.04	127.6
Granite Falls	12-4614	2019-2023	261	1.8	9,583	30.9	0.33	94.7
Granite Falls	12-4615	2024	1,395	27.0	698,396	497.1	1.93	258.1
Granite Falls	12-4615	2019-2023	1,331	28.0	744,746	539.2	3.82	141.0
Harbour Pointe	12-2277	2024	1,274	1.0	8,364	6.6	0.01	1045.5
Harbour Pointe	12-2277	2019-2023	1,273	1.6	56,510	61.4	0.93	66.3
Harbour Pointe	12-2278	2024	643	0.0	0	0.0	0.00	0.0
Harbour Pointe	12-2278	2019-2023	624	0.2	0	0.0	0.00	0.0
Harbour Pointe	12-2279	2024	560	3.0	3,965	7.1	0.03	220.3
Harbour Pointe	12-2279	2019-2023	558	1.6	50,363	89.9	0.21	433.3
Harbour Pointe	12-2280	2024	624	3.0	28,059	44.2	0.23	193.5
Harbour Pointe	12-2280	2019-2023	635	1.8	13,276	21.4	0.09	233.7
Harbour Pointe	12-4674	2024	697	0.0	0	0.0	0.00	0.0
Harbour Pointe	12-4674	2019-2023	697	0.8	32,013	39.1	0.67	58.5
Harbour Pointe	12-4675	2024	286	0.0	0	0.0	0.00	0.0
Harbour Pointe	12-4675	2019-2023	286	0.2	2,043	6.2	0.03	232.1
Harbour Pointe	12-4676	2024	0	0.0	0	0.0	0.00	0.0
Harbour Pointe	12-4676	2019-2023	0	0.0	0	0.0	0.00	0.0
Harbour Pointe	12-4677	2024	819	2.0	2,438	2.9	0.01	221.6
Harbour Pointe	12-4677	2019-2023	860	0.4	32,989	39.9	0.42	95.9
Hardeson	12-4556	2024	1	0.0	0	0.0	0.00	0.0
Hardeson	12-4556	2019-2023	0	0.0	0	0.0	0.00	0.0
Hardeson	12-4557	2024	6	0.0	0	0.0	0.00	0.0
Hardeson	12-4557	2019-2023	6	0.0	0	0.0	0.00	0.0
Hardeson	12-4558	2024	10	0.0	0	0.0	0.00	0.0
Hardeson	12-4558	2019-2023	11	0.0	0	0.0	0.00	0.0
Hardeson	12-4559	2024	27	0.0	0	0.0	0.00	0.0
Hardeson	12-4559	2019-2023	27	0.2	199	9.0	0.02	496.5
Hardeson	12-4560	2024	0	0.0	0	0.0	0.00	0.0
Hardeson	12-4560	2019-2023	0	0.0	0	0.0	0.00	0.0
Hartford	12-3117	2024	987	43.0	1,151,691	1161.0	3.56	326.4
Hartford	12-3117	2019-2023	948	28.0	494,035	512.2	3.00	170.5
Hartford	12-3118	2024	481	8.0	69,539	142.2	0.56	252.0
Hartford	12-3118	2019-2023	368	6.8	35,678	90.6	0.79	114.0
Hartford	12-3119	2024	830	18.0	101,573	117.8	0.43	273.8
Hartford	12-3119	2019-2023	801	8.2	35,551	43.6	0.19	231.6
Hartford	12-3120	2024	1,590	21.0	232,642	143.3	1.57	91.2
Hartford	12-3120	2019-2023	1,246	17.4	101,584	67.2	0.65	103.5
Hartford	12-3327	2024	634	6.0	38,839	61.4	0.13	473.6

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Hartford	12-3327	2019-2023	570	4.2	47,397	76.1	0.50	153.0
Hilton Lake	12-0497	2024	1,451	6.0	128,481	85.8	2.04	42.0
Hilton Lake	12-0497	2019-2023	1,419	4.0	159,034	113.0	1.23	91.9
Hilton Lake	12-0498	2024	877	1.0	23,733	27.0	1.00	27.0
Hilton Lake	12-0498	2019-2023	783	1.2	47,637	54.3	0.81	66.8
Hilton Lake	12-0499	2024	2,349	6.0	9,503	4.1	0.04	100.0
Hilton Lake	12-0499	2019-2023	2,269	7.0	135,046	57.9	0.92	62.7
Hilton Lake	12-0500	2024	2,109	7.0	30,185	13.9	0.37	37.4
Hilton Lake	12-0500	2019-2023	2,092	4.8	115,346	55.4	1.43	38.7
Jennings Park	12-6065	2024	938	0.0	0	0.0	0.00	0.0
Jennings Park	12-6065	2019-2023	938	0.0	0	0.0	0.00	0.0
Jennings Park	12-6066	2024	1,042	2.0	11,186	10.7	0.05	196.2
Jennings Park	12-6066	2019-2023	1,042	0.0	0	0.0	0.00	0.0
Jennings Park	12-6067	2024	1,185	1.0	28,060	23.7	0.08	305.0
Jennings Park	12-6067	2019-2023	1,185	0.0	0	0.0	0.00	0.0
Jennings Park	12-6068	2024	651	0.0	0	0.0	0.00	0.0
Jennings Park	12-6068	2019-2023	651	0.0	0	0.0	0.00	0.0
Kellogg Marsh	12-0904	2024	1,173	6.0	210,282	179.7	1.37	131.1
Kellogg Marsh	12-0904	2019-2023	1,139	2.6	13,997	12.0	0.10	120.5
Kellogg Marsh	12-0905	2024	2,089	16.0	431,371	206.6	1.11	185.4
Kellogg Marsh	12-0905	2019-2023	2,050	9.4	348,218	167.3	0.62	271.6
Kellogg Marsh	12-0906	2024	1,203	5.0	56,094	46.3	0.09	534.2
Kellogg Marsh	12-0906	2019-2023	1,176	3.6	51,295	43.3	0.31	140.6
Kellogg Marsh	12-0907	2024	952	1.0	8,732	9.2	0.04	236.0
Kellogg Marsh	12-0907	2019-2023	904	0.4	1,872	2.0	0.01	246.2
Lake Chaplain	12-2034	2024	101	1.0	662	6.7	0.02	331.0
Lake Chaplain	12-2034	2019-2023	96	3.6	47,106	630.7	6.28	100.5
Lake Chaplain	12-2035	2024	2	0.0	0	0.0	0.00	0.0
Lake Chaplain	12-2035	2019-2023	2	1.6	80,926	40462.0	636.80	63.5
Lake Chaplain	12-2036	2024	712	37.0	2,870,496	3986.8	12.54	318.0
Lake Chaplain	12-2036	2019-2023	473	20.4	452,973	822.8	6.24	131.9
Lake Goodwin	12-0379	2024	1,112	33.0	1,023,787	813.8	7.21	112.9
Lake Goodwin	12-0379	2019-2023	983	18.2	131,191	129.6	1.32	98.5
Lake Goodwin	12-0380	2024	1,814	28.0	952,153	518.3	3.98	130.3
Lake Goodwin	12-0380	2019-2023	1,180	21.0	390,349	305.3	2.78	109.8
Lake Goodwin	12-0381	2024	805	12.0	100,029	320.6	1.24	259.1
Lake Goodwin	12-0381	2019-2023	974	11.4	174,771	176.9	2.19	80.9
Lake Goodwin	12-0382	2024	913	24.0	494,087	538.8	5.62	95.9
Lake Goodwin	12-0382	2019-2023	903	13.8	230,974	254.1	3.11	81.6
Lake Goodwin	12-0383	2024	1,106	28.0	531,104	474.6	4.41	107.7

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Lake Goodwin	12-0383	2019-2023	1,008	24.0	240,380	226.8	1.64	137.9
Lake Serene	12-0337	2024	1,232	3.0	60,839	49.3	1.06	46.4
Lake Serene	12-0337	2019-2023	1,207	2.6	36,242	29.4	0.41	71.1
Lake Serene	12-0338	2024	1,367	2.0	5,038	3.7	0.02	186.6
Lake Serene	12-0338	2019-2023	1,309	2.6	81,128	59.4	0.43	138.1
Lake Serene	12-0339	2024	1,260	4.0	29,954	23.6	0.17	135.5
Lake Serene	12-0339	2019-2023	1,186	2.8	15,154	12.5	0.25	50.0
Lake Serene	12-0340	2024	1,542	0.0	0	0.0	0.00	0.0
Lake Serene	12-0340	2019-2023	2,344	4.4	105,789	46.3	0.43	107.7
Lake Serene	12-5205	2024	880	1.0	4,495	5.1	0.03	155.0
Lake Serene	12-5205	2019-2023	809	0.8	31,204	35.5	0.21	170.9
Lake Stevens	12-0124	2024	1,872	57.0	1,848,966	984.0	6.04	163.0
Lake Stevens	12-0124	2019-2023	1,795	29.4	773,293	417.6	3.06	136.5
Lake Stevens	12-0125	2024	2,755	11.0	619,583	218.3	0.29	747.4
Lake Stevens	12-0125	2019-2023	2,450	11.0	67,071	25.8	0.75	34.1
Lake Stevens	12-0273	2024	1,041	1.0	60,230	58.0	0.01	6023.0
Lake Stevens	12-0273	2019-2023	507	1.4	354	0.4	0.00	94.2
Lake Stevens	12-0274	2024	2,379	5.0	20,161	8.4	0.03	305.5
Lake Stevens	12-0274	2019-2023	2,028	1.8	11,883	5.5	0.05	104.8
Lake Stevens	12-4034	2024	0	0.0	0	0.0	0.00	0.0
Lake Stevens	12-4034	2019-2023	0	0.0	0	0.0	0.00	0.0
Lynnwood	12-0724	2024	1,568	10.0	34,403	21.1	1.03	20.5
Lynnwood	12-0724	2019-2023	1,626	5.2	71,872	46.6	0.28	166.4
Lynnwood	12-0725	2024	829	2.0	805	1.0	0.01	161.0
Lynnwood	12-0725	2019-2023	823	8.2	52,354	63.4	1.05	60.6
Lynnwood	12-0726	2024	859	6.0	44,280	51.2	0.22	228.2
Lynnwood	12-0726	2019-2023	864	3.6	70,881	83.3	0.79	105.6
Lynnwood	12-0727	2024	1,291	3.0	14,473	11.2	0.03	380.9
Lynnwood	12-0727	2019-2023	1,291	7.4	26,018	20.1	0.29	69.5
Lynnwood	12-4867	2024	335	1.0	164	0.5	0.01	41.0
Lynnwood	12-4867	2019-2023	330	2.0	3,025	8.9	0.12	72.5
Maplewood	12-0343	2024	1,776	13.0	212,452	119.1	2.66	44.8
Maplewood	12-0343	2019-2023	1,724	7.0	192,901	109.2	1.01	108.1
Maplewood	12-0344	2024	1,035	4.0	7,396	7.1	0.03	264.1
Maplewood	12-0344	2019-2023	1,027	3.8	3,983	3.8	0.02	245.2
Maplewood	12-0345	2024	779	8.0	280,492	359.1	5.91	60.8
Maplewood	12-0345	2019-2023	759	6.4	46,197	59.9	0.39	151.6
Maplewood	12-0346	2024	808	4.0	3,697	4.5	0.02	205.4
Maplewood	12-0346	2019-2023	806	5.6	30,378	37.6	0.47	79.3
Mariner	12-3346	2024	247	0.0	0	0.0	0.00	0.0

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Mariner	12-3346	2019-2023	247	0.2	1,350	5.5	0.20	27.0
Mariner	12-3347	2024	1,747	4.0	51,787	29.5	0.43	68.1
Mariner	12-3347	2019-2023	1,319	6.6	59,793	36.3	0.66	55.0
Mariner	12-3348	2024	1,315	3.0	2,979	2.2	0.03	78.4
Mariner	12-3348	2019-2023	1,337	1.2	17,217	12.8	0.44	29.0
Mariner	12-3349	2024	699	1.0	238	0.3	0.00	119.0
Mariner	12-3349	2019-2023	700	0.6	237	0.4	0.00	108.8
Mariner	12-3391	2024	1,384	3.0	244,594	176.6	1.22	145.2
Mariner	12-3391	2019-2023	1,374	1.6	13,139	10.3	0.04	286.9
Martha Lake	12-0073	2024	2,354	1.0	209,308	87.5	1.31	67.0
Martha Lake	12-0073	2019-2023	3,276	6.8	285,242	85.1	0.84	100.7
Martha Lake	12-0074	2024	22	0.0	0	0.0	0.00	0.0
Martha Lake	12-0074	2019-2023	22	0.8	2,619	24.0	0.49	48.9
Martha Lake	12-0251	2024	1,239	6.0	8,996	7.0	0.02	321.3
Martha Lake	12-0251	2019-2023	1,020	5.4	82,992	71.3	1.36	52.3
Martha Lake	12-0466	2024	1,507	5.0	35,518	23.5	0.14	171.6
Martha Lake	12-0466	2019-2023	1,399	5.4	52,193	34.8	0.24	143.5
Martha Lake	12-5695	2024	1,355	4.0	4,330	3.2	0.99	3.2
Martha Lake	12-5695	2019-2023	1,303	0.4	366	0.3	0.00	57.2
Meadowdale	12-1837	2024	1,959	4.0	1,264	0.6	0.00	140.4
Meadowdale	12-1837	2019-2023	1,867	5.0	20,443	10.8	0.22	49.8
Meadowdale	12-1838	2024	1,332	1.0	4,221	3.2	0.02	201.0
Meadowdale	12-1838	2019-2023	1,304	1.8	24,087	18.4	0.25	73.6
Meadowdale	12-1839	2024	1,142	10.0	291,021	254.6	3.08	82.7
Meadowdale	12-1839	2019-2023	1,139	10.2	61,702	56.7	0.96	59.2
Meadowdale	12-1840	2024	575	7.0	318,415	551.8	5.21	105.9
Meadowdale	12-1840	2019-2023	567	5.0	65,248	114.4	1.51	75.6
Mountlake	12-0133	2024	1,734	5.0	87,292	49.5	0.18	282.5
Mountlake	12-0133	2019-2023	1,477	8.2	8,414	5.2	0.08	64.3
Mountlake	12-0134	2024	667	0.0	0	0.0	0.00	0.0
Mountlake	12-0134	2019-2023	1,799	3.8	155,085	202.6	0.97	208.5
Mountlake	12-0135	2024	1,646	7.0	216,226	131.3	1.05	125.6
Mountlake	12-0135	2019-2023	1,672	5.2	50,548	30.7	0.41	75.3
Mountlake	12-0136	2024	2,029	6.0	8,532	4.2	0.02	208.1
Mountlake	12-0136	2019-2023	2,030	16.0	166,691	82.0	0.51	160.7
Mukilteo	12-0128	2024	1,257	5.0	13,875	10.8	0.05	207.1
Mukilteo	12-0128	2019-2023	1,211	3.6	69,422	56.3	0.93	60.4
Mukilteo	12-0129	2024	956	8.0	301,650	314.5	3.11	101.1
Mukilteo	12-0129	2019-2023	957	4.2	30,773	32.2	0.45	71.6
Mukilteo	12-0600	2024	1,291	5.0	7,781	6.0	0.06	99.8

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Mukilteo	12-0600	2019-2023	1,271	4.6	17,528	14.1	0.71	19.9
Mukilteo	12-4523	2024	855	2.0	2,856	3.4	0.04	89.2
Mukilteo	12-4523	2019-2023	850	3.8	20,796	24.3	0.52	46.2
Murphy'S Corner	12-1748	2024	1,912	0.0	0	0.0	0.00	0.0
Murphy'S Corner	12-1748	2019-2023	1,909	1.8	45,324	23.7	0.62	38.2
Murphy'S Corner	12-1749	2024	757	2.0	2,364	3.1	0.01	262.7
Murphy'S Corner	12-1749	2019-2023	1,497	4.8	20,529	14.6	0.25	59.1
Murphy'S Corner	12-1750	2024	698	0.0	0	0.0	0.00	0.0
Murphy'S Corner	12-1750	2019-2023	677	1.6	9,046	13.2	0.41	32.5
Murphy'S Corner	12-1751	2024	1,345	5.0	11,305	8.4	0.03	262.9
Murphy'S Corner	12-1751	2019-2023	543	1.8	61,104	63.1	0.40	159.6
North Alderwood	12-0509	2024	925	1.0	237	0.3	0.00	79.0
North Alderwood	12-0509	2019-2023	671	0.6	8,739	21.5	0.14	152.8
North Alderwood	12-0510	2024	488	1.0	31,786	55.5	1.00	55.6
North Alderwood	12-0510	2019-2023	180	0.8	6,980	14.6	0.25	58.1
North Alderwood	12-0511	2024	137	0.0	0	0.0	0.00	0.0
North Alderwood	12-0511	2019-2023	92	0.0	0	0.0	0.00	0.0
North Alderwood	12-0512	2024	211	0.0	0	0.0	0.00	0.0
North Alderwood	12-0512	2019-2023	53	0.2	15,895	345.6	3.21	107.5
North Camano	12-0313	2024	953	7.0	40,529	42.5	1.20	35.4
North Camano	12-0313	2019-2023	893	11.6	151,307	161.3	1.31	123.2
North Camano	12-0314	2024	102	1.0	13,208	137.6	1.08	127.0
North Camano	12-0314	2019-2023	103	2.4	3,422	32.9	0.11	311.8
North Camano	12-0315	2024	511	7.0	152,401	294.8	2.05	143.5
North Camano	12-0315	2019-2023	483	9.4	143,506	283.8	3.24	87.7
North Camano	12-0316	2024	1,455	15.0	929,020	633.7	4.23	149.9
North Camano	12-0316	2019-2023	1,394	12.0	305,063	212.2	2.05	103.7
North Camano	12-0329	2024	0	0.0	0	0.0	0.00	0.0
North Camano	12-0329	2019-2023	0	0.0	0	0.0	0.00	0.0
North Creek	12-1410	2024	1,781	5.0	19,618	11.0	0.04	265.1
North Creek	12-1410	2019-2023	1,678	2.8	13,160	7.5	0.05	154.2
North Creek	12-1411	2024	1,286	0.0	0	0.0	0.00	0.0
North Creek	12-1411	2019-2023	1,315	0.4	17,092	13.2	0.07	184.0
North Creek	12-1412	2024	1,659	1.0	8,204	4.9	0.04	128.2
North Creek	12-1412	2019-2023	1,528	4.0	33,394	20.4	0.16	124.4
North Creek	12-1413	2024	1,704	0.0	0	0.0	0.00	0.0
North Creek	12-1413	2019-2023	1,646	2.0	42,009	24.7	0.07	334.1
North Creek	12-3733	2024	703	1.0	130	0.2	0.00	130.0
North Creek	12-3733	2019-2023	722	0.2	648	1.0	0.00	324.0
North Marysville	12-0142	2024	291	0.0	0	0.0	0.00	0.0

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
North Marysville	12-0142	2019-2023	292	1.2	5,560	19.2	0.23	83.7
North Marysville	12-0143	2024	845	0.0	0	0.0	0.00	0.0
North Marysville	12-0143	2019-2023	799	0.8	5,786	7.1	0.02	328.4
North Marysville	12-0144	2024	1,090	10.0	252,112	230.4	2.84	81.0
North Marysville	12-0144	2019-2023	1,064	3.0	9,396	8.7	0.68	12.8
North Marysville	12-0254	2024	693	7.0	67,246	94.8	1.15	82.3
North Marysville	12-0254	2019-2023	648	5.0	14,765	22.4	0.30	74.6
North Mountain	12-2514	2024	1,471	44.0	859,517	579.2	1.77	327.8
North Mountain	12-2514	2019-2023	1,414	32.0	550,167	380.5	2.30	165.1
North Mountain	12-2515	2024	463	19.0	403,698	860.8	2.65	325.0
North Mountain	12-2515	2019-2023	446	23.8	497,975	1084.9	4.16	261.0
North Mountain	12-2516	2024	1	0.0	0	0.0	0.00	0.0
North Mountain	12-2516	2019-2023	1	0.2	52	26.2	0.20	131.0
North Stanwood	115-1643	2024	0	0.0	0	0.0	0.00	0.0
North Stanwood	115-1643	2019-2023	0	0.0	0	0.0	0.00	0.0
North Stanwood	12-0996	2024	0	0.0	0	0.0	0.00	0.0
North Stanwood	12-0996	2019-2023	237	3.8	18,247	77.3	1.18	65.4
North Stanwood	12-0997	2024	0	0.0	0	0.0	0.00	0.0
North Stanwood	12-0997	2019-2023	678	9.2	66,734	98.4	1.45	67.9
North Stanwood	12-0998	2024	0	0.0	0	0.0	0.00	0.0
North Stanwood	12-0998	2019-2023	1,700	15.6	228,260	117.6	1.26	93.5
North Stanwood	12-0999	2024	0	0.0	0	0.0	0.00	0.0
North Stanwood	12-0999	2019-2023	1,971	24.6	418,827	223.1	1.46	152.7
North Stanwood	12-3204	2024	1,758	0.0	0	0.0	0.00	0.0
North Stanwood	12-3204	2019-2023	2,022	22.6	286,465	132.6	0.87	151.7
Norton Ave	12-0588	2024	2	0.0	0	0.0	0.00	0.0
Norton Ave	12-0588	2019-2023	77	0.0	0	0.0	0.00	0.0
Norton Ave	12-0589	2024	997	4.0	12,802	12.8	0.17	74.9
Norton Ave	12-0589	2019-2023	990	1.0	26,325	26.9	0.21	126.6
Norton Ave	12-0590	2024	1,221	1.0	486	0.4	0.00	81.0
Norton Ave	12-0590	2019-2023	1,211	1.6	3,524	3.0	0.22	13.5
Norton Ave	12-0591	2024	1,131	2.0	4,054	3.6	0.03	139.8
Norton Ave	12-0591	2019-2023	849	1.6	1,718	1.8	0.01	151.9
Olivia Park	12-2576	2024	1,588	1.0	52	0.0	0.00	52.0
Olivia Park	12-2576	2019-2023	1,428	1.0	19,493	13.1	0.42	30.8
Olivia Park	12-2577	2024	789	3.0	2,130	2.7	0.02	118.3
Olivia Park	12-2577	2019-2023	781	5.6	19,812	25.8	0.32	81.6
Olivia Park	12-2578	2024	1,046	2.0	8,868	8.5	0.02	341.1
Olivia Park	12-2578	2019-2023	1,026	1.8	19,576	20.9	0.28	74.9
Olivia Park	12-2579	2024	1,407	1.0	286	0.2	0.00	143.0

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Olivia Park	12-2579	2019-2023	1,357	3.4	40,519	29.5	0.30	99.0
Oso	12-1309	2024	312	11.0	158,878	501.2	1.89	265.7
Oso	12-1309	2019-2023	202	9.6	55,967	186.1	1.60	116.1
Oso	12-1310	2024	145	11.0	246,404	1642.7	4.69	350.0
Oso	12-1310	2019-2023	140	4.8	56,774	395.3	2.96	133.5
Paine Field	12-0385	2024	265	1.0	11,518	41.9	0.19	221.5
Paine Field	12-0385	2019-2023	267	1.2	1,307	4.9	0.66	7.4
Paine Field	12-0386	2024	115	0.0	0	0.0	0.00	0.0
Paine Field	12-0386	2019-2023	112	0.4	90	0.8	0.00	227.1
Paine Field	12-0387	2024	1,636	4.0	48,595	29.1	1.03	28.3
Paine Field	12-0387	2019-2023	1,630	5.0	83,284	50.9	0.84	61.0
Paine Field	12-0388	2024	808	3.0	18,925	23.4	0.03	727.9
Paine Field	12-0388	2019-2023	617	1.2	17,874	25.7	0.41	62.5
Paine Field	12-1729	2024	1,870	1.0	777	0.4	0.00	259.0
Paine Field	12-1729	2019-2023	1,870	2.8	53,797	29.8	0.45	66.2
Paine Field	12-1730	2024	1,600	5.0	21,572	13.5	1.07	12.6
Paine Field	12-1730	2019-2023	1,602	3.6	152,668	95.4	1.15	83.0
Paine Field	12-1731	2024	2,340	4.0	23,776	9.9	0.11	94.0
Paine Field	12-1731	2019-2023	2,322	1.2	94,401	40.5	0.47	85.9
Paine Field	12-1732	2024	139	0.0	0	0.0	0.00	0.0
Paine Field	12-1732	2019-2023	142	0.8	10,091	72.5	0.13	543.0
Park Ridge	12-2319	2024	372	2.0	21,099	56.4	1.23	46.0
Park Ridge	12-2319	2019-2023	367	2.0	15,043	44.0	0.96	45.8
Park Ridge	12-2320	2024	914	8.0	25,707	27.9	0.20	139.7
Park Ridge	12-2320	2019-2023	787	4.8	59,018	69.3	0.72	96.8
Park Ridge	12-2321	2024	1,609	5.0	21,663	13.4	0.13	100.8
Park Ridge	12-2321	2019-2023	1,553	3.2	79,735	49.9	0.30	168.6
Park Ridge	12-2322	2024	1,080	11.0	183,424	164.1	0.22	751.7
Park Ridge	12-2322	2019-2023	957	15.2	94,106	91.4	0.79	115.7
Park Ridge	12-4183	2024	1,127	0.0	0	0.0	0.00	0.0
Park Ridge	12-4183	2019-2023	961	4.8	182,201	165.4	1.92	86.2
Perrinville	12-0092	2024	766	5.0	222,184	291.2	1.04	280.5
Perrinville	12-0092	2019-2023	763	5.4	69,114	90.4	1.97	45.8
Perrinville	12-0093	2024	1,223	6.0	53,785	44.0	0.12	361.0
Perrinville	12-0093	2019-2023	1,196	7.0	88,239	74.5	0.74	100.8
Perrinville	12-0126	2024	1,495	8.0	49,584	33.2	0.28	118.1
Perrinville	12-0126	2019-2023	1,484	8.8	119,344	80.0	0.91	88.2
Perrinville	12-0221	2024	1,085	1.0	1,750	1.6	0.01	250.0
Perrinville	12-0221	2019-2023	967	5.8	109,248	100.5	1.08	93.3
Picnic Point	12-1414	2024	685	9.0	22,593	31.1	0.23	132.9

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Picnic Point	12-1414	2019-2023	672	11.6	62,665	92.3	0.62	148.2
Picnic Point	12-1415	2024	1,115	12.0	408,085	366.7	5.31	69.1
Picnic Point	12-1415	2019-2023	1,154	6.6	88,918	77.9	1.18	66.2
Picnic Point	12-1416	2024	1,461	8.0	74,336	50.1	0.18	285.9
Picnic Point	12-1416	2019-2023	1,413	9.2	93,018	65.3	0.29	228.2
Picnic Point	12-1417	2024	589	3.0	2,282	3.9	0.03	120.1
Picnic Point	12-1417	2019-2023	518	2.0	7,317	14.1	0.25	57.3
Pinehurst	12-0147	2024	802	0.0	0	0.0	0.00	0.0
Pinehurst	12-0147	2019-2023	793	5.0	34,807	43.7	0.66	66.6
Pinehurst	12-0148	2024	1,303	3.0	702	0.5	0.01	87.8
Pinehurst	12-0148	2019-2023	1,312	3.8	29,442	22.8	0.28	80.2
Pinehurst	12-0149	2024	1,742	4.0	3,629	2.1	0.02	103.7
Pinehurst	12-0149	2019-2023	1,736	5.6	170,831	98.5	1.06	93.2
Pinehurst	12-0220	2024	1,098	3.0	9,368	8.2	0.02	360.3
Pinehurst	12-0220	2019-2023	1,053	5.0	8,996	8.3	0.05	181.6
Pinehurst	12-3350	2024	1,363	5.0	89,877	102.8	2.02	50.8
Pinehurst	12-3350	2019-2023	1,849	9.4	203,366	110.4	0.95	116.2
Polaris	12-4500	2024	524	3.0	80,737	154.1	2.15	71.5
Polaris	12-4500	2019-2023	524	0.6	570	1.2	0.02	50.4
Polaris	12-4501	2024	1,442	9.0	260,401	193.2	3.24	59.7
Polaris	12-4501	2019-2023	1,416	5.0	27,734	19.3	0.08	238.2
Polaris	12-4502	2024	1,612	1.0	73,465	36.4	1.04	35.0
Polaris	12-4502	2019-2023	1,986	1.2	23,160	14.7	0.26	56.0
Polaris	12-4503	2024	737	3.0	4,845	6.5	0.04	179.4
Polaris	12-4503	2019-2023	19	1.4	23,784	37.4	0.39	95.9
Portage	12-3502	2024	210	3.0	39,382	186.6	2.07	90.1
Portage	12-3502	2019-2023	183	3.6	7,886	42.8	2.78	15.4
Portage	12-3503	2024	270	3.0	41,436	154.0	1.02	150.7
Portage	12-3503	2019-2023	259	6.6	16,235	60.2	4.44	13.6
Portage	12-3504	2024	999	23.0	535,263	553.0	4.32	128.1
Portage	12-3504	2019-2023	991	18.6	358,032	367.8	2.98	123.2
Portage	12-3505	2024	915	3.0	1,589	1.7	0.01	176.6
Portage	12-3505	2019-2023	1,166	5.0	13,324	14.5	0.44	32.8
Quil Ceda	12-3177	2024	323	2.0	224	0.7	0.01	56.0
Quil Ceda	12-3177	2019-2023	326	0.8	521	1.7	0.02	89.8
Quil Ceda	12-3178	2024	1,350	29.0	239,000	174.2	1.68	103.9
Quil Ceda	12-3178	2019-2023	1,332	26.0	537,486	399.8	3.58	111.6
Quil Ceda	12-3179	2024	34	1.0	1,376	47.4	0.07	688.0
Quil Ceda	12-3179	2019-2023	29	0.4	477	23.6	0.35	66.9
Quil Ceda	12-3180	2024	1,178	7.0	114,403	96.1	2.10	45.9

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Quil Ceda	12-3180	2019-2023	1,137	6.2	88,283	76.8	1.35	57.0
Richmond Park	12-0232	2024	820	14.0	244,376	298.7	3.19	93.5
Richmond Park	12-0232	2019-2023	814	9.2	105,594	128.9	1.73	74.3
Richmond Park	12-0233	2024	1,104	14.0	71,573	64.8	0.50	130.1
Richmond Park	12-0233	2019-2023	1,096	12.4	125,820	116.2	0.82	141.6
Richmond Park	12-2048	2024	902	0.0	0	0.0	0.00	0.0
Richmond Park	12-2048	2019-2023	360	3.6	109,800	153.6	0.96	159.4
Richmond Park	12-5217	2024	764	2.0	491	0.6	0.01	122.8
Richmond Park	12-5217	2019-2023	756	7.6	21,079	28.1	0.17	167.1
Silver Lake	12-0239	2024	1,729	5.0	93,533	54.0	0.21	262.7
Silver Lake	12-0239	2019-2023	1,690	2.8	28,015	16.3	0.22	75.2
Silver Lake	12-0240	2024	1,036	6.0	38,942	37.6	0.10	367.4
Silver Lake	12-0240	2019-2023	1,034	2.8	50,331	49.7	0.46	108.3
Silver Lake	12-0253	2024	1,739	6.0	350,732	199.8	0.58	345.9
Silver Lake	12-0253	2019-2023	1,732	5.2	195,028	114.9	1.19	96.2
Silver Lake	12-0267	2024	829	2.0	22,275	26.8	0.13	204.4
Silver Lake	12-0267	2019-2023	830	1.4	10,616	13.0	0.11	120.1
Silver Lake	12-0290	2024	850	0.0	0	0.0	0.00	0.0
Silver Lake	12-0290	2019-2023	846	1.4	33,932	39.9	0.30	131.2
Sky Valley	12-6045	2024	1,522	19.0	391,670	244.8	3.08	79.3
Sky Valley	12-6045	2019-2023	1,583	0.2	2,598	1.7	0.00	448.0
Sky Valley	12-6046	2024	60	1.0	260	4.3	0.08	52.0
Sky Valley	12-6046	2019-2023	60	0.0	0	0.0	0.00	0.0
Sky Valley	12-6047	2024	973	25.0	195,633	190.1	2.93	64.9
Sky Valley	12-6047	2019-2023	1,005	1.2	772	0.8	0.01	82.1
Sky Valley	12-6048	2024	554	19.0	596,612	919.3	8.68	105.9
Sky Valley	12-6048	2019-2023	608	1.8	9,938	17.9	0.04	432.1
Smokey Point	12-1507	2024	404	1.0	50,050	123.6	1.60	77.0
Smokey Point	12-1507	2019-2023	379	1.6	22,947	60.4	1.14	53.1
Smokey Point	12-1508	2024	989	1.0	990	1.0	0.01	165.0
Smokey Point	12-1508	2019-2023	907	1.4	6,764	7.0	0.10	69.8
Smokey Point	12-1509	2024	1,684	5.0	145,697	81.8	1.04	78.3
Smokey Point	12-1509	2019-2023	1,382	6.2	144,962	86.0	1.26	68.0
Smokey Point	12-1510	2024	1,117	0.0	0	0.0	0.00	0.0
Smokey Point	12-1510	2019-2023	1,026	1.8	43,434	41.0	0.75	54.7
Smokey Point	12-5696	2024	34	0.0	0	0.0	0.00	0.0
Smokey Point	12-5696	2019-2023	14	0.0	0	0.0	0.00	0.0
Smokey Point	12-5697	2024	1	0.0	0	0.0	0.00	0.0
Smokey Point	12-5697	2019-2023	0	0.0	0	0.0	0.00	0.0
Smokey Point	12-5698	2024	1,383	0.0	0	0.0	0.00	0.0

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Smokey Point	12-5698	2019-2023	0	0.6	15,067	12.1	0.09	134.3
Smokey Point	12-5699	2024	132	0.0	0	0.0	0.00	0.0
Smokey Point	12-5699	2019-2023	0	0.6	88	0.7	0.01	110.5
Snohomish	12-0103	2024	508	4.0	201,087	397.4	6.13	64.8
Snohomish	12-0103	2019-2023	495	3.8	39,639	78.6	1.51	52.1
Snohomish	12-0104	2024	584	11.0	355,322	479.5	6.30	76.1
Snohomish	12-0104	2019-2023	549	8.8	46,620	80.4	1.82	44.3
Snohomish	12-0123	2024	1,428	4.0	56,181	39.5	0.20	202.1
Snohomish	12-0123	2019-2023	1,429	5.2	8,537	5.9	0.04	146.4
Snohomish	12-0151	2024	622	13.0	218,179	347.4	1.75	198.0
Snohomish	12-0151	2019-2023	598	12.0	89,330	146.7	1.67	87.9
South Camano	12-1530	2024	700	20.0	350,087	496.6	4.40	113.0
South Camano	12-1530	2019-2023	655	18.6	342,170	499.7	5.33	93.8
South Camano	12-1531	2024	495	2.0	81,692	164.7	1.01	162.7
South Camano	12-1531	2019-2023	463	2.0	28,416	57.9	0.47	123.5
South Camano	12-1532	2024	1,629	15.0	319,138	194.2	1.91	102.0
South Camano	12-1532	2019-2023	1,561	18.0	355,946	222.4	1.50	147.9
South Camano	12-1533	2024	1,082	34.0	866,102	796.0	4.71	168.9
South Camano	12-1533	2019-2023	1,024	31.2	622,846	583.9	4.43	131.8
Stimson Crossing	12-3090	2024	46	2.0	76,237	1524.7	6.04	252.4
Stimson Crossing	12-3090	2019-2023	43	0.6	1,234	28.0	0.42	67.1
Stimson Crossing	12-3091	2024	1,317	24.0	634,836	479.1	6.15	77.9
Stimson Crossing	12-3091	2019-2023	1,286	24.4	379,696	292.8	2.78	105.3
Stimson Crossing	12-3092	2024	245	2.0	12,213	50.1	1.02	49.0
Stimson Crossing	12-3092	2019-2023	252	2.0	92,556	372.7	3.88	96.2
Stimson Crossing	12-3093	2024	254	5.0	72,963	240.8	1.45	165.8
Stimson Crossing	12-3093	2019-2023	261	7.2	47,924	188.6	1.14	165.4
Sultan	12-1593	2024	587	24.0	536,472	909.3	7.86	115.7
Sultan	12-1593	2019-2023	545	12.0	168,606	294.9	4.85	60.8
Sultan	12-1594	2024	385	12.0	243,268	625.4	2.37	264.1
Sultan	12-1594	2019-2023	367	10.0	252,951	678.3	1.72	393.7
Sultan	12-1595	2024	1,461	35.0	725,473	495.9	3.08	160.8
Sultan	12-1595	2019-2023	1,976	27.2	815,559	569.3	4.30	132.4
Sultan	12-1596	2024	654	5.0	95,690	145.4	0.93	156.6
Sultan	12-1596	2019-2023	632	2.8	48,747	74.5	0.65	114.5
Sultan	12-5004	2024	1	4.0	1,213	1213.0	4.0	303.3
Sultan	12-5004	2019-2023	1	3.0	594	594.0	3.0	198.0
Sunset	12-5208	2024	1,384	33.0	914,901	654.9	11.22	58.4
Sunset	12-5208	2019-2023	1,308	24.0	681,791	499.8	4.79	104.3
Sunset	12-5209	2024	715	10.0	99,886	138.9	2.13	65.3

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Sunset	12-5209	2019-2023	686	7.0	131,198	185.5	0.85	219.4
Sunset	12-5210	2024	555	9.0	46,750	83.8	0.26	326.9
Sunset	12-5210	2019-2023	537	8.4	34,741	63.1	0.25	256.1
Sunset	12-5211	2024	345	3.0	26,727	75.9	0.41	184.3
Sunset	12-5211	2019-2023	315	4.4	51,445	152.8	0.69	222.5
Sunset	12-5212	2024	1,063	9.0	95,542	89.3	0.28	316.4
Sunset	12-5212	2019-2023	1,016	13.2	119,352	114.2	1.76	65.1
Tenth Street	12-0298	2024	1,014	2.0	3,301	3.3	0.01	253.9
Tenth Street	12-0298	2019-2023	1,020	1.0	8,184	8.1	0.21	38.4
Tenth Street	12-0299	2024	1,076	0.0	0	0.0	0.00	0.0
Tenth Street	12-0299	2019-2023	1,001	1.4	13,433	13.2	0.26	51.1
Tenth Street	12-0300	2024	1,558	4.0	2,765	1.8	0.01	251.4
Tenth Street	12-0300	2019-2023	1,351	5.0	199,358	138.4	0.67	207.2
Tenth Street	12-0301	2024	703	1.0	324	0.5	0.01	54.0
Tenth Street	12-0301	2019-2023	702	2.8	21,682	30.9	0.48	64.7
Tenth Street	12-0327	2024	0	0.0	0	0.0	0.00	0.0
Tenth Street	12-0327	2019-2023	0	0.0	0	0.0	0.00	0.0
Thrashers Corner	12-0275	2024	332	0.0	0	0.0	0.00	0.0
Thrashers Corner	12-0275	2019-2023	330	0.8	12,447	41.9	0.48	87.4
Thrashers Corner	12-0276	2024	1,139	12.0	1,224,013	875.5	4.04	216.8
Thrashers Corner	12-0276	2019-2023	1,119	3.8	76,158	68.6	1.21	56.6
Thrashers Corner	12-0277	2024	1,847	3.0	66,960	35.9	0.14	265.7
Thrashers Corner	12-0277	2019-2023	1,840	3.0	60,988	33.1	0.14	243.6
Thrashers Corner	12-0278	2024	1,480	2.0	450	0.3	0.00	75.0
Thrashers Corner	12-0278	2019-2023	1,292	2.4	269,345	181.8	1.11	164.2
Thrashers Corner	12-3304	2024	0	0.0	0	0.0	0.00	0.0
Thrashers Corner	12-3304	2019-2023	0	0.0	0	0.0	0.00	0.0
Thrashers Corner	12-3471	2024	80	2.0	1,030	12.9	0.04	343.3
Thrashers Corner	12-3471	2019-2023	82	1.0	11,392	142.0	2.66	53.4
Thrashers Corner	12-3472	2024	1,935	3.0	1,376	0.7	0.00	275.2
Thrashers Corner	12-3472	2019-2023	1,508	2.2	744	0.4	0.00	122.1
Thrashers Corner	12-3473	2024	71	0.0	0	0.0	0.00	0.0
Thrashers Corner	12-3473	2019-2023	26	0.6	1,599	30.5	0.45	68.2
Thrashers Corner	12-3474	2024	11	0.0	0	0.0	0.00	0.0
Thrashers Corner	12-3474	2019-2023	11	0.0	0	0.0	0.00	0.0
Three Lakes	12-1818	2024	806	26.0	766,273	947.2	1.34	704.3
Three Lakes	12-1818	2019-2023	731	23.0	384,190	527.2	2.47	213.7
Three Lakes	12-1819	2024	1,186	26.0	540,455	451.1	3.14	143.8
Three Lakes	12-1819	2019-2023	1,137	20.8	246,835	211.3	3.07	68.8
Three Lakes	12-1820	2024	1,596	97.0	1,853,841	1148.6	6.06	189.4

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Three Lakes	12-1820	2019-2023	1,528	51.6	842,421	509.1	4.83	105.4
Three Lakes	12-1821	2024	596	11.0	241,402	561.4	2.30	243.8
Three Lakes	12-1821	2019-2023	703	14.4	182,790	259.9	3.23	80.4
Tulalip	12-0505	2024	210	1.0	3,752	13.9	0.03	536.0
Tulalip	12-0505	2019-2023	300	2.8	19,256	77.8	0.47	164.1
Tulalip	12-0506	2024	403	2.0	44	0.1	0.02	6.3
Tulalip	12-0506	2019-2023	399	3.0	21,720	54.0	0.45	120.9
Tulalip	12-0507	2024	1,073	8.0	200,329	186.2	1.09	170.2
Tulalip	12-0507	2019-2023	1,045	9.8	309,625	292.8	2.46	118.8
Tulalip	12-0508	2024	562	3.0	6,086	10.8	0.18	61.5
Tulalip	12-0508	2019-2023	554	6.2	19,818	36.3	0.50	72.9
Turners Corner	12-1428	2024	169	5.0	4,318	25.6	0.06	431.8
Turners Corner	12-1428	2019-2023	160	2.8	42,031	257.9	3.73	69.1
Turners Corner	12-1429	2024	592	14.0	322,506	549.4	3.59	153.2
Turners Corner	12-1429	2019-2023	597	10.6	190,865	322.2	0.94	343.8
Turners Corner	12-1430	2024	635	15.0	195,192	285.4	8.70	32.8
Turners Corner	12-1430	2019-2023	833	14.8	144,563	194.9	2.04	95.4
Turners Corner	12-1431	2024	815	20.0	509,692	663.7	3.79	175.0
Turners Corner	12-1431	2019-2023	823	13.0	281,571	340.6	2.16	157.5
Turners Corner	12-4310	2024	42	0.0	0	0.0	0.00	0.0
Turners Corner	12-4310	2019-2023	46	1.6	619	13.1	0.26	51.3
Twin City	12-6028	2024	686	7.0	7,184	10.5	0.06	171.0
Twin City	12-6028	2019-2023	662	1.0	797	1.2	0.01	147.7
Twin City	12-6029	2024	696	0.0	0	0.0	0.00	0.0
Twin City	12-6029	2019-2023	651	0.0	0	0.0	0.00	0.0
Twin City	12-6030	2024	2,342	55.0	940,794	387.8	4.99	77.8
Twin City	12-6030	2019-2023	2,374	6.6	150,748	64.4	0.23	277.6
Twin City	12-6031	2024	2,456	0.0	0	0.0	0.00	0.0
Twin City	12-6031	2019-2023	2,456	0.0	0	0.0	0.00	0.0
Twin City	12-6032	2024	0	0.0	0	0.0	0.00	0.0
Twin City	12-6032	2019-2023	0	0.0	0	0.0	0.00	0.0
Twin City	12-6035	2024	0	0.0	0	0.0	0.00	0.0
Twin City	12-6035	2019-2023	0	0.0	0	0.0	0.00	0.0
Twin City	12-6036	2024	1,401	7.0	45,580	32.4	0.06	569.8
Twin City	12-6036	2019-2023	1,365	1.4	624	0.4	0.00	195.1
Twin City	12-6037	2024	2,028	32.0	464,318	227.8	2.35	97.0
Twin City	12-6037	2019-2023	2,010	4.6	86,567	42.7	0.67	63.8
Twin City	12-6038	2024	0	0.0	0	0.0	0.00	0.0
Twin City	12-6038	2019-2023	0	0.0	0	0.0	0.00	0.0
Twin City	12-6039	2024	215	8.0	295,532	1374.6	18.70	73.5

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
Twin City	12-6039	2019-2023	204	2.4	17,152	79.8	0.92	86.4
Village	12-4303	2024	0	0.0	0	0.0	0.00	0.0
Village	12-4303	2019-2023	0	0.0	0	0.0	0.00	0.0
Village	12-4304	2024	406	7.0	13,423	32.8	0.07	497.1
Village	12-4304	2019-2023	397	4.8	21,749	55.2	0.37	150.9
Village	12-4305	2024	1,716	33.0	472,765	274.1	2.40	114.1
Village	12-4305	2019-2023	1,663	18.6	199,506	117.6	1.36	86.3
Village	12-4306	2024	4	0.0	0	0.0	0.00	0.0
Village	12-4306	2019-2023	4	0.4	88	22.1	0.30	73.7
Village	12-4307	2024	23	1.0	1,173	51.0	1.00	51.0
Village	12-4307	2019-2023	19	1.0	190	9.0	0.13	70.0
Wallace River	12-4485	2024	422	9.0	82,149	195.1	0.40	486.1
Wallace River	12-4485	2019-2023	404	10.6	128,275	308.6	1.03	298.7
Wallace River	12-4486	2024	0	0.0	0	0.0	0.00	0.0
Wallace River	12-4486	2019-2023	0	0.4	16	15.8	0.40	39.5
Wallace River	12-4487	2024	1,521	10.0	215,799	130.0	2.02	64.4
Wallace River	12-4487	2019-2023	717	10.6	158,076	125.5	0.94	133.6
Waterfront	12-1842	2024	1,130	0.0	0	0.0	0.00	0.0
Waterfront	12-1842	2019-2023	1,142	2.4	117,826	102.9	0.96	107.6
Waterfront	12-1843	2024	896	0.0	0	0.0	0.00	0.0
Waterfront	12-1843	2019-2023	887	1.0	7,068	7.9	0.02	318.4
Waterfront	12-1846	2024	407	1.0	749	1.8	0.02	107.0
Waterfront	12-1846	2019-2023	412	1.4	5,134	12.5	0.06	194.0
Waterfront	12-1847	2024	601	2.0	1,238	2.0	0.01	154.8
Waterfront	12-1847	2019-2023	601	2.2	4,152	7.0	0.03	233.5
West Monroe	12-0631	2024	679	5.0	49,977	73.4	1.10	66.9
West Monroe	12-0631	2019-2023	646	2.6	3,410	5.2	0.05	113.8
West Monroe	12-0632	2024	1,443	3.0	32,868	24.6	0.08	322.2
West Monroe	12-0632	2019-2023	1,413	7.8	27,933	19.5	0.26	75.7
West Monroe	12-0633	2024	1,124	12.0	216,250	191.9	0.41	464.1
West Monroe	12-0633	2019-2023	794	7.0	55,717	53.2	0.73	73.2
West Monroe	12-0634	2024	342	8.0	32,602	94.8	1.10	86.2
West Monroe	12-0634	2019-2023	332	7.6	117,459	349.0	2.71	128.7
West Monroe	12-3360	2024	731	21.0	1,826,356	2491.6	1.58	1575.8
West Monroe	12-3360	2019-2023	679	10.6	110,636	153.8	1.70	90.2
West Monroe	12-3361	2024	1,095	0.0	0	0.0	0.00	0.0
West Monroe	12-3361	2019-2023	1,086	1.4	51,293	48.6	0.83	58.4
West Monroe	12-3362	2024	1,395	2.0	16,880	12.1	0.03	411.7
West Monroe	12-3362	2019-2023	1,300	3.0	127,183	94.3	0.23	413.1
West Monroe	12-3363	2024	881	4.0	10,640	12.1	0.10	125.2

Substation	Circuit	Period	Customers	Outages	CMI	SAIDI	SAIFI	CAIDI
West Monroe	12-3363	2019-2023	855	2.6	18,992	24.3	0.07	354.0
Westgate	12-0404	2024	798	5.0	2,768	3.5	0.03	125.8
Westgate	12-0404	2019-2023	842	3.4	63,851	79.8	0.94	84.8
Westgate	12-0405	2024	994	5.0	42,339	42.0	0.19	226.4
Westgate	12-0405	2019-2023	838	6.2	104,958	105.9	0.90	117.3
Westgate	12-0406	2024	1,443	6.0	2,571	1.8	0.01	135.3
Westgate	12-0406	2019-2023	1,398	5.0	78,490	54.1	0.45	121.1
Westgate	12-0407	2024	1,020	3.0	21,716	20.8	0.22	92.8
Westgate	12-0407	2019-2023	997	4.8	11,482	11.5	0.09	128.3
Woods Creek	12-1808	2024	1,468	0.0	0	0.0	0.00	0.0
Woods Creek	12-1808	2019-2023	1,861	31.0	1,057,597	568.4	3.86	147.4
Woods Creek	12-1809	2024	1,680	43.0	507,252	300.3	2.00	150.0
Woods Creek	12-1809	2019-2023	1,416	36.6	763,682	478.2	3.26	146.5
Woods Creek	12-1810	2024	1,153	1.0	287	1.3	0.00	287.0
Woods Creek	12-1810	2019-2023	1,097	8.2	150,040	123.8	1.03	120.2
Woods Creek	12-1811	2024	1,187	24.0	1,003,639	845.5	4.35	194.2
Woods Creek	12-1811	2019-2023	1,154	14.4	371,417	318.0	2.17	146.7
York	12-5392	2024	1,570	7.0	575,033	363.3	3.21	113.1
York	12-5392	2019-2023	1,543	7.6	136,662	87.5	1.06	82.4
York	12-5393	2024	1,856	7.0	306,355	165.2	2.74	60.3
York	12-5393	2019-2023	1,830	5.2	142,957	77.7	1.63	47.6
York	12-5394	2024	1,782	6.0	471,909	263.8	5.90	44.7
York	12-5394	2019-2023	1,702	6.4	278,797	159.0	2.22	71.6
York	12-5395	2024	787	14.0	129,058	158.5	3.24	48.9
York	12-5395	2019-2023	744	13.2	286,570	371.2	5.79	64.1

Appendix B

Historical Data: SAIDI, CAIDI, and SAIFI

No uplift factor was applied to these historical metrics.

Table B-1: SAIDI 1991 - 2024

Year	Distribution	Transmission	Overall	Excluded Outages	Overall (Everything)
1991	68.3	27.7	96	180	276
1992	95.3	5.5	101.4	82.3	183.7
1993	87.4	9.8	97.2	1136.2	1233.5
1994	60.2	41.5	101.7	9.2	110.9
1995	81.6	12.9	94.5	359.5	454
1996	52.1	8.5	60.6	60.7	121.1
1997	47.7	2.8	50.5	43.8	94.3
1998	47.9	24.3	72.2	40.4	112.6
1999	46.2	17.3	63.5	134.1	236.1
2000	52.5	3.1	55.6	147.3	219.4
2001	34.6	14.7	49.3	7.4	88.8
2002	32.4	21.8	54.2	25.5	89.8
2003	31.7	19.9	52.6	105.1	185.9
2004	35.9	4.2	40.1	237.8	287.2
2005	57.3	6.8	64.1	0	74.7
2006	50.6	17.7	68.3	567.2	684.2
2007	38.4	28.8	67.3	188.8	274.8
2008	41.6	8.4	50	33.8	97.2
2009	49.8	15.3	65.1	0	76.4
2010	69.1	10.9	79.9	34.2	114.1
2011	77.2	6.2	83.3	0	83.3
2012	63.2	8.4	71.6	44.2	115.9
2013	63.7	20.8	84.5	0	84.5
2014	90.3	21.8	112	116.9	228.9
2015	64.1	16.9	81	1312.1	1390.1
2016	57.5	2.1	59.6	77	136.6
2017	117.7	11.9	129.6	43.9	173.6
2018	86.9	5.4	92.4	172.5	264.9
2019	84.8	6.5	91.3	33.5	124.9
2020	107.1	16.5	123.6	139.1	262.6
2021	131.3	6.5	137.9	505	642.9
2022	133.5	4.2	137.7	866.4	1004.1
2023	101.6	10.3	111.9	8.3	120.2
2024	175.3	8.0	183.2	452.4	635.7
5-Year Average (2019-2023)	112.1	8.8	120.9	310.4	431.4

Table B-2: CAIDI 1991 - 2024

Year	Distribution	Transmission	Overall	Excluded Outages	Overall (Everything)
1991	91.0	62.0	80.0	175.0	124.0
1992	100.7	31.6	90.1	235.0	128.0
1993	93.4	38.7	81.7	1001.9	530.7
1994	78.8	163.0	99.9	96.5	99.6
1995	89.9	68.0	86.1	197.7	155.7
1996	81.0	48.7	74.1	84.0	78.7
1997	78.6	23.6	69.5	117.0	85.7
1998	77.8	74.8	76.8	98.8	83.5
1999	73.3	198.0	88.5	155.2	107.9
2000	97.0	44.4	90.9	132.2	118.9
2001	66.5	57.1	63.4	56.2	63.5
2002	66.4	149.8	85.6	94.8	87.4
2003	88.8	88.9	88.8	107.4	106.8
2004	75.1	35.6	67.3	286.5	157.0
2005	83.6	42.5	75.8	0.0	76.5
2006	94.7	54.7	79.7	301.5	217.3
2007	76.2	164.6	99.0	220.9	158.5
2008	86.6	47.0	75.8	148.7	73.0
2009	86.8	51.9	75.0	0.0	74.1
2010	106.4	68.2	98.9	141.4	108.7
2011	112.7	40.6	99.6	0.0	99.6
2012	101.8	33.4	82.0	108.2	190.2
2013	104.3	95.7	102.0	0.0	102.0
2014	117.8	70.4	104.2	338.4	205.8
2015	100.3	79.0	94.9	699.4	509.2
2016	106.2	27.7	96.4	160.4	124.2
2017	98.0	51.7	90.7	168.8	102.1
2018	106	78.7	103.9	236.5	163.6
2019	108.2	86.6	106.3	230.3	124.3
2020	105.2	114.5	106.4	261.9	155.2
2021	109.5	71.0	106.7	530.1	286.4
2022	130.4	35.0	120.3	735.6	432.4
2023	107.4	68.6	102.1	100.1	101.9
2024	128.3	50.5	120.2	481.4	258
5-Year Average (2019-2023)	112.2	78.1	108.7	537.2	255.3

Table B-3: SAIFI 1991 - 2024

Year	Distribution	Transmission	Overall	Excluded Outages	Overall (Everything)
1991	0.75	0.45	1.20	1.03	2.23
1992	0.95	0.17	1.13	0.35	1.48
1993	0.94	0.26	1.19	1.13	2.32
1994	0.76	0.26	1.02	0.10	1.11
1995	0.91	0.19	1.10	1.82	2.92
1996	0.64	0.17	0.82	0.72	1.54
1997	0.61	0.12	0.73	0.37	1.10
1998	0.62	0.32	0.94	0.41	1.35
1999	0.63	0.09	0.72	0.86	2.19
2000	0.54	0.07	0.61	1.11	1.85
2001	0.26	0.52	0.78	0.13	1.40
2002	0.49	0.15	0.63	0.27	1.03
2003	0.37	0.22	0.59	0.98	1.74
2004	0.47	0.12	0.58	0.83	1.52
2005	0.69	0.16	0.85	0.00	0.98
2006	0.53	0.33	0.86	1.88	3.15
2007	0.50	0.18	0.68	1.19	2.13
2008	0.48	0.18	0.66	0.23	1.35
2009	0.57	0.30	0.87	0.00	1.03
2010	0.65	0.16	0.81	0.24	1.05
2011	0.68	0.15	0.84	0.00	0.84
2012	0.62	0.25	0.87	0.41	1.28
2013	0.61	0.22	0.83	0.00	0.83
2014	0.77	0.31	1.08	0.35	1.47
2015	0.64	0.21	0.85	1.88	2.73
2016	0.55	0.08	0.63	0.48	1.11
2017	1.20	0.23	1.43	0.26	1.70
2018	0.82	0.07	0.89	0.73	1.62
2019	0.78	0.08	0.86	0.15	1.0
2020	1.02	0.14	1.16	0.53	1.69
2021	1.20	0.09	1.29	0.95	2.24
2022	1.02	0.12	1.14	1.18	2.32
2023	0.95	0.15	1.10	0.08	1.18
2024	1.37	0.16	1.52	0.94	2.46
5-Year Average (2019-2023)	1.00	0.11	1.11	0.58	1.69