EXHIBIT NO. ___(CAK-3C)
DOCKETS UE-17___/UG-17___
2017 PSE GENERAL RATE CASE
WITNESS: CATHERINE A. KOCH

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**Docket UE-17____** **Docket UG-17____**

SECOND EXHIBIT (CONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF

CATHERINE A. KOCH

ON BEHALF OF PUGET SOUND ENERGY

REDACTED VERSION

JANUARY 13, 2017

PUGET SOUND ENERGY

2017 AND 2018 ELECTRIC RELIABILITY PLAN

CONTENTS

I. INTRODUCTION

PSE proposes an Electric Reliability Plan that consists of two targeted areas: 1) accelerating underground cable replacement, and 2) addressing reliability of the Worst Performing Circuits.

The Electric Reliability Plan has two parts: 1) a Master Plan that defines the population and overall plan to address the full population, and 2) a Two-Year Plan that specifically identifies the projects and goals for the upcoming two-year period.

II. ACCELERATING UNDERGROUND CABLE REPLACEMENT PLAN

A. Background

PSE began installing high-molecular-weight ("HMW") bare concentric neutral direct-bury underground cable just prior to 1965. Approximately 4,800 miles were installed through PSE territory until early 1985. PSE began experiencing failure of this HMW cable just after 20 years of service as the insulation of the direct-bury underground cable installed prior to 1982 became susceptible to the formation of "water trees" allowing ground water to migrate to the conductor and cause faults. Warm weather can increase the probability of failure (such as experienced during the hot summer of 2015).

By 1985 PSE began installing a cable with tree-retardant crosslinked polyethylene ("TRXLPE"), a more robust insulation, and a polyethylene jacket containing the neutral. By 1992 PSE had begun installing the majority of primary cables in conduit, and new non-high-molecular-weight cable which has experienced a longer life (40-60 years).

Since 1990, PSE has replaced or silicone injected approximately 2,500 miles of the failure prone cable and by the end of 2015 approximately 1,800 miles of this HMW direct-bury cable remained to be replaced.[1]

B. PSE Experience

In 1988, Puget Sound Power & Light studied this further and published the Underground Cable Failure Report which identified the occurrence of increasing failure of HMW insulated cables installed between 1964 and 1988 due to formation of water trees and corroded concentric neutrals. The report estimated that the average age of cables failing was 17 years with failure rates of 25 per 100 miles during the 1980s.

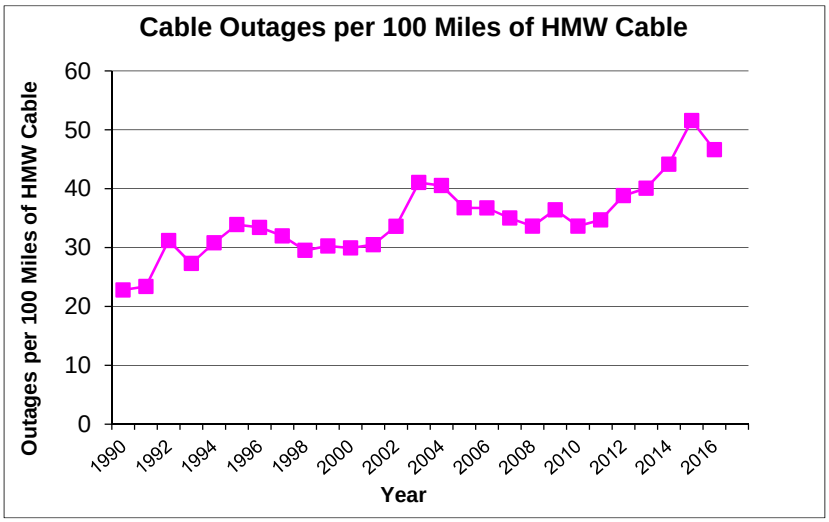
Today PSE experiences about 1,000 underground cable failures per year, of which 95% occur on HMW underground cable. About 450 failures per year are first time failures. The failure rate has increased over time to an average 40 failures per 100 miles depending on the summer's temperature and amount of precipitation. In 2015, PSE experienced more than 50 failures per 100 miles. Between 2011 and 2013 PSE experienced a 4% failure rate. Between 2013 and 2015 there was an increase in the average failure rate up to 8%.

Underground cable failures result in lengthy outages because repairs require crews to locate the underground fault, dig up the location, and splice the cable or install new conduit. On average an underground cable failure results in a 57% longer outage than overhead equipment failure.

[1] There is approximately 500 miles additional of HMW cable in conduit.

When an underground cable fails, PSE repairs, injects or replaces it based on specific criteria. During the 1990s, PSE began a cable silicone injection program to extend the life of underground cable but over time focused this alternative on only single phase cables due to cost of testing and implementation for three phase cables. Figure 1 below shows failure rate per 100 miles since 1990.

Figure 1. Cable failures per 100 miles (1990-September 30, 2016)



In 2016, after experiencing the increasing rate of failure, PSE embarked on accelerating the replacement of underground cable, replacing approximately 125 miles, which is up from 70 miles replaced in 2015.

C. Industry Experience

The failure rate for these vintages of HMW cable is widely recognized by industry, with utilities across the nation implementing similar cable replacement programs. The cause of failure is generic to all HMW insulated cables as the technology is inferior compared to current cable design and not based on one particular

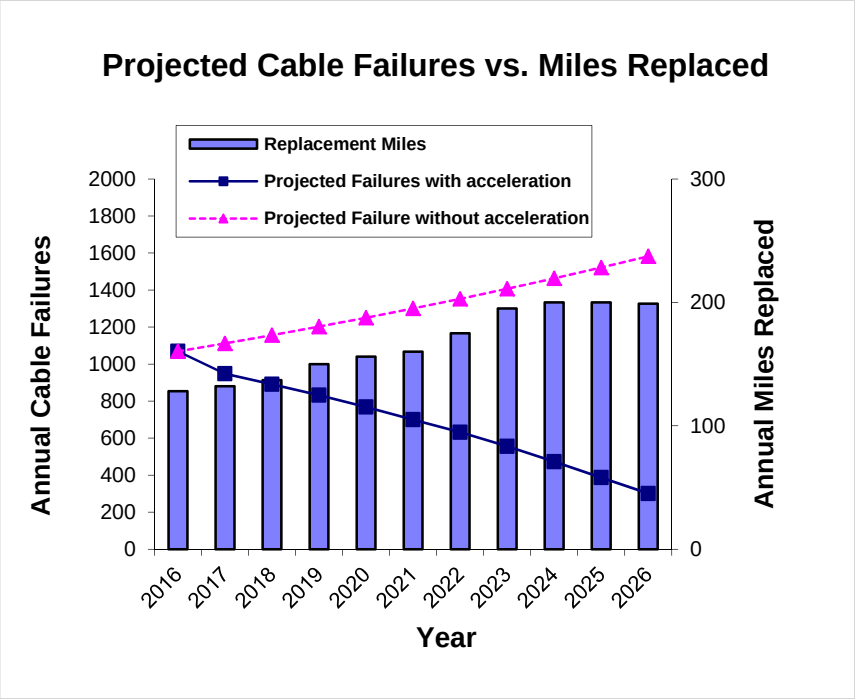
manufacturer. Current industry studies show similar increasing failure rates on a per mile basis.

D. Prediction of Useful Remaining Life

PSE has been tracking cable failures by type and year to aid in the estimation of remaining useful life. This, with standard industry data and performance, provides a guideline on the useful life of the cable, but there are many variables on an annual basis that impact results, including climate conditions. PSE estimates a conservative linear 4% failure rate recognizing that failure rate is likely not linear as the cable ages as indicated by PSE's recent experience as noted above. Figure 2 below shows how cable failures will decrease with a proposed 10-year plan. The dotted line is the projected failures as if no acceleration was in place.

After all the HMW underground cable is replaced there will still be some cable failures due to either injected cables that are eventually failing or other types of cable issues.

Figure 2. Projected cable failure



E. Risk

The deferred risk of not accelerating will be continued interruptions due to cable failure, customer dissatisfaction, and emergency expense for repairs. Once a cable fails, PSE has experienced an increase in subsequent failures resulting in continued disruption for customers, complaints and frustration.

F. Master Plan

The objective of this plan as it relates to the Accelerating Underground Cable Replacement Plan is to more aggressively replace the remaining 1,800 miles of direct-bury distribution cable systems over approximately 10 years, specifically older vintage HMW insulated cables installed prior to 1982. The accelerated replacement plan began in 2016 at about 125 miles and will continue to ramp up to approximately 160-195 cable

miles per year to meet this objective. PSE estimates replacement to total approximately $[redacted] million ($[redacted] million over the next five years), which will eliminate approximately 195,000 customer interruptions based on actual historical performance. PSE anticipates that the full benefit of replacement will be greater, as more cable is likely to fail before PSE is able to replace it. This will effectively reduce HMW preventable non-injected cable related outages to 0 over 10 years.

G. Two-Year Plan

The Two-Year Plan identifies the specific locations and goals of 2017 and 2018 of the Master Plan.

1. Identification and Prioritization Criteria

Cable failures are identified on an ongoing basis as they occur through PSE's asset management system, SAP, and the outage logs listed in the PSE outage management systems. The failures are verified using the GIS mapping system and documented by failure date, location, length and the number of customers connected to that same cable system.

Using this information, PSE will prioritize using a similar approach as today based on number of outages, vintage, neutral corrosion concerns, system configuration, cost, and number of customers. As PSE replaces all previously failed cables and moves to replacing cables prior to failure, PSE will develop a prioritization model that balances cost and risk and begins to analyze the probability for failure based on asset information.

2. 2017 and 2018 Plan

Table 1 shows the planned replacement cable miles and expenditures of underground direct-bury HMW distribution cable from January 1 to December 31 for calendar years 2017 and 2018.

Table 1. Planned Replacement Miles and Expenditures

Program Year	Planned Replacement Miles	Planned Expenditures[2]
2017	134	$ 39 million
2018	134	$ 42 million

Appendix A provides a list of the 2017 and 2018 projects that PSE plans to undertake to meet this plan. Adjustments to projects will be made as required while managing to the Master Plan and overall system benefit. Project challenges such as permitting or access rights may hinder some projects from being completed within a scheduled timeframe. These risks will be managed over the Two-Year Plan and, if necessary, some projects will be moved forward to meet the calendar plan metrics. PSE also manages this risk by initiating projects for engineering that may be ready to construct should a scheduled project be affected by one of these circumstances, and not be able to be completed as scheduled in the Two-Year Plan.

H. Benefits

PSE's mission is to provide a safe, dependable and reliable system for all our customers. The new cable system is more resilient to deterioration and dig-ins, which improves the reliability for customers, results in fewer long outages and less disruption

[2] Planned expenditures do not include AFUDC.

due to power outages, and enhances public safety. Neighborhoods will not be disrupted by PSE repair crews, and over time PSE will see a reduction in repair costs. Benefits are measured through the industry metrics of SAIFI and SAIDI.

Table 2 quantifies the historical failure impacts from the cables that will be replaced in 2017 and 2018 in terms of customer minute interruptions saved, customer interruptions saved, avoided outages and improvement in SAIDI and SAIFI performance as experienced today. In 2015, cable failures accounted for 12 non-major event SAIDI minutes. PSE estimates that over the next two years, it can reduce its SAIDI minutes by an average of 1.5 minutes per year by accelerating the replacement of the aging underground cable. This analysis is backwards looking only and does not factor in future outages avoided or the potential for greater frequency of outages as cables age. As a result, the benefits of the 2018 work will be higher when evaluated at the end of 2017, as additional outages are likely to occur on the cables planned for 2018 in the meantime.

Table 2. Eliminated Historical Failure Impacts

Program Year	Customer Minutes Interruptions	Customer Interruptions	Outages	SAIDI	SAIFI
2017	2.7 million	86,000	150	2.38	0.008
2018	0.77million	22,000	156	0.70	0.002

III. WORST PERFORMING CIRCUIT PLAN

A. Background

PSE has over 1,100 distribution circuits. For the past decade, PSE has identified its 50 worst performing circuits and developed projects to address the reliability issues on those circuits. The Commission-approved monitoring plan for the Service Quality and Electric Service Reliability Report has traditionally defined a worst performing circuit.

As Service Quality Indices changed, this definition was modified. The list from this definition was updated annually based on the previous five years of outage history so there is movement on the list, e.g., some circuits drop off the list as others are added.

Over the past several years, PSE has had a focused effort on the 50 worst performing circuits and has been modestly successful in addressing the reliability on those circuits.

B. PSE Experience

Historically, PSE has annually identified the 50 worst performing distribution circuits as those that have contributed the most customer minute interruptions to PSE's "all-in" companywide annual SAIDI performance based on a five-year average ranking. PSE publishes this list in Appendix N of the annual Service Quality and Electric Service Reliability Report and the actions taken on these circuits are identified. Since 2011, 90 circuits have appeared on one or more of the annual lists.[3] PSE has taken action on addressing 66 of these circuits over the past five years, investing $50 million on targeted reliability improvement. PSE recognizes that its current planning process does not favor projects on circuits that have a low or lower number of customers, which tend to be in heavily treed areas. As a result, the distribution circuits serving these customers experience the worst performance each year, and they land on the worst performing circuit list year after year. These circuits are challenged by characteristics such as

[3] The circuit count does not include a Jefferson County circuit.

topology, tree exposure and circuit configuration and as a result 45 circuits have appeared on three or more of the annual lists.

Adding to the historic view, PSE reviewed circuits with high circuit Customer Minute Interruptions ("CMI"), SAIDI[4], and SAIFI since 2013[5] to ensure the view of the worst performing circuits was complete. Additionally in some cases a lateral or part of the circuit is plagued with multiple outages, but this may not be evident in circuit level metrics. Customers Experiencing Multiple Interruptions ("CEMI") is a measure that will be used to identify pockets of poorest reliability on a worst performing circuit, often times voiced through public comments and complaints. An additional 45 circuits were added to the list of worst performing circuits as a result of this further analysis. This analysis does not include transmission related outages.

C. Risks

Disruptions to power systems pose more than an inconvenience in today's technology-driven culture; customers depend on reliable, resilient, safe, and secure power systems to ensure vital necessities, including: operating cellular networks; running fuel pumps; providing business and consumer access to banking systems; maintaining home and business climate control, lighting, and security systems; and in rural areas on wells, providing access to water. Failure to address circuits with poor performance puts populations served by these circuits at a disadvantage. PSE expects reliability trends on

[4] SAIDI is calculated using the SQI No. 3 calculation agreed to by the parties and approved by the Commission in 2016 in Docket UE-072300, Order 29.

[5] SAIFI is calculated using performance after 2013, when PSE implemented its outage management system ("OMS").

these circuits would remain fairly stagnant if historic levels of reliability programs continued. The risk of not pursuing a more aggressive approach is that existing worst performing circuit programs alone will fail to adequately improve system performance enough to make any noticeable change in reliability indices.

D. Master Plan

Of PSE's 1,100 circuits, there are 135 circuits that have been identified as worst performing. This mechanism would cover investments made to any of these identified 135 circuits with the intent of improving their reliability by approximately 50% as measured by the metric that resulted in the circuit being on the worst performing circuit list. PSE plans to target about 40 circuits annually as it incrementally works to improve the broader 135 circuits. Appendix C includes a list of these 135 circuits.

The worst performing circuits will change over time as system conditions or configurations change and improvements to circuit reliability are achieved. It is the intent of this program to remain focused on the circuits as identified in Appendix C until reliability improvement is achieved. New poor performing circuits that may be identified will be considered for inclusion in the plan. PSE estimates investment of approximately $[redacted] million from 2017-2021 to address these circuits and anticipates ramping up further over the next 5-10 year timeframe.

E. Two-Year Plan

The Two-Year Plan identifies the specific locations and goals of 2017 and 2018 of the Master Plan.

1. Identification and Prioritization Criteria

Circuits will be identified based on CMI, circuit SAIDI, circuit SAIFI, and CEMI. CEMI helps to identify pockets of poorest reliability within a worst performing circuit.

Specifically, the highest priority circuits are deemed those with more than 3 million customer minutes of interruption on non-major event days over three years or with more than 750,000 non-major event day customer minutes for at least two out of three years. This criteria tends to favor large circuits over smaller circuits experiencing long outages, so circuits with SAIDI greater than 300 minutes (five hours), circuits with SAIFI of two or more interruptions in two of three years, and circuits with CEMI of six or more interruptions per year for the last three years will be prioritized as well.

2. 2017 and 2018 Plan

Table 3 shows the planned number of worst performing circuits and expenditures from January 1 to December 31 for calendar years 2017 and 2018.

Table 3. Planned Circuits and Expenditures

Program Year	Planned Circuits	Planned Capital Expenditures[6]
2017	50	$37.2 million
2018	32	$39.3 million

Appendix B provides a list of the 2017 and 2018 projects that PSE plans to undertake to meet this plan. Adjustments to projects will be made as required while managing to the Master Plan and overall system benefit. Project challenges such as permitting and obtaining access rights may hinder some projects from being completed

[6] Planned expenditures do not include AFUDC.

within a scheduled timeframe. These risks will be managed over the Two-Year Plan and, if necessary, some projects will be pulled forward to meet the calendar plan metrics. PSE also manages this risk by initiating projects for engineering that may be ready to construct should a risk occur with another project. A bulk of the projects included in the first Two-Year Plan are focused on those circuits identified as the worst performing circuits in the 2015 Service Quality and Electric Service Reliability Report due to their readiness. Moving forward projects will expand to the broader population and prioritization described.

F. Benefits

PSE's mission is to provide a safe, dependable and reliable system for all our customers. Addressing the worst performing circuits improves reliability for impacted customers; it will result in shorter and fewer outages and will improve system measurements of SAIDI, SAIFI, and CEMI. Neighborhoods will experience fewer disruptions by PSE repair crews, and over time PSE will see a reduction in repair costs.

Table 4 quantifies the historical failure impacts in terms of customer minute interruptions, customer interruptions, outages and improvement in SAIDI and SAIFI performance. In 2015, the worst performing circuits accounted for 53 non-major event SAIDI minutes. PSE estimates that over the next two years, addressing these circuits will reduce PSE's non-major event SAIDI by an average of five minutes per year. The benefits are measured based on historical interruptions and outages as a result of the work that will be completed over the next two years. This analysis does not factor in future

outages avoided that would result in higher benefits when evaluated at the end of each year for the next year.

Table 4. Eliminated Historical Failure Impacts

Program Year	Customer Minute Interruptions	Customer Interruptions	Outages	SAIDI Minutes	SAIFI Minutes
2017	6.4 million	30,000	58	5.7	0.03
2018	5.9 million	29,000	48	5.3	0.03

IV. RATE IMPACT

A discussion regarding the rate impact of the proposed work will be a normal element of the Electric Reliability Plan. Please refer to the Prefiled Direct Testimony of Katherine J. Barnard, Exhibit No. ___(KJB-1T), which outlines the calculation in detail. Ms. Barnard's testimony concludes the rate impact based on the estimated 2017 and 2018 expenditures for replacing HMW cable and addressing the worst performing circuits would result in an average annual increase of [redacted]% in overall customer rates.

APPENDIX A: ACCELERATING UNDERGROUND CABLE REPLACEMENT PLAN

Table A-1. 2017 Accelerating Underground Cable Replacement Plan

Project	City	Planned Replacement Footage
T Ave	Anacortes	681
Bowman Bay	Anacortes	1,792
Skyline	Anacortes	8,517
Mill Pond Apt NW	Auburn	6,193
Villa Del Riva	Auburn	1,155
151st Pl SE	Auburn	4,763
170th Ave SE	Auburn	632
Riverview Dr NE	Auburn	5,688
J St SE	Auburn	2,775
SE 293rd St	Auburn	3,383
Olympian Apts	Bainbridge Island	668
Westerly Ln	Bainbridge Island	1,442
Penny Place	Bainbridge Island	2,930
Toe Jam Hill Rd, to S Beach Rd	Bainbridge Island	665
Day Rd West	Bainbridge Island	3,060
Sunrise	Bainbridge Island	1,895
NE West Port Madison Rd	Bainbridge Island	1,329
Manitou	Bainbridge Island	557
Agate Pt	Bainbridge Island	1,239
Fletcher Bay Rd	Bainbridge Island	1,283
Crystal Springs Dr NE	Bainbridge Island	818
Hansen Rd	Bainbridge Island	498
Crossroad Apts	Bellevue	3,482
Colonial Manor	Bellevue	3,546
Donogh Condo	Bellevue	2,726
Woodside East	Bellevue	2,997
Forty one point five	Bellevue	3,116
Fontanelle Apartments	Bellevue	2,602
Eastgate Way	Bellevue	866
Skyridge	Bellevue	2,315
SE 46th ST	Bellevue	884
Bel-Red Rd	Bellevue	2,873

Project	City	Planned Replacement Footage
127th Ave SE	Bellevue	1,758
SE 12th W Lk Samm	Bellevue	420
158th pl NE	Bellevue	-
Horizon View	Bellevue	6,327
SE 51st St	Bellevue	5,907
96th Ave SE	Bellevue	788
Somerset	Bellevue	1,785
Horizon Heights	Bellevue	7,379
Knox Ave	Bellingham	414
Viewcrest Rd	Bellingham	371
Maplewood	Bellingham	294
Polo Park Dr	Bellingham	255
Chuckanut Dr N	Bellingham	1,931
Douglas Ave	Bellingham	3,267
Whitecap Rd	Bellingham	773
Aldewood Ave	Bellingham	465
31st ST	Bellingham	1,199
21st St	Bellingham	771
Moore St	Bellingham	206
Lisa Lane	Bellingham	999
SE Mountain View Dr	Black Diamond	2,625
Delta Line Rd	Blaine	2,493
Haynie Rd	Blaine	3,649
Entwistle Rd E	Bonney Lake	981
School St	Bremerton	2,349
Shearwater Ln	Bremerton	9,131
Salt Springs	Bremerton	1,224
Nellita Rd	Bremerton	1,652
Nellita Rd	Bremerton	795
Rainier Glen	Buckley	3,080
Shamrock Ct	Buckley	1,071
Schuler Ave	Burlington	2,360
NE 45th	Carnation	2,156
NE 60th ST & 324th AVE NE	Carnation	5,835
Lk Langlois RD	Carnation	4,275
Able Lane	Concrete	1,338
SR 20	Coupeville	561

Project	City	Planned Replacement Footage
Madrona Heights	Coupeville	1,202
Covington Park	Covington	5,996
Covington Properties	Covington	4,077
SE 262nd St	Covington	6,398
Mt. Baker Hwy	Deming	2,346
Silver Lake Rd	Deming	2,535
Brandywind Ave	Dupont	2,950
NE 161st	Duvall	4,454
Odell Rd	Duvall	3,095
Stampede Pass Rd	Easton	6,135
West Easton	Easton	7,330
Stampede Pass Rd	Easton	825
Cooper Pass Rd	Easton	4,050
47th St Ct E	Edgewood	363
Umptanum Rd	Ellensburg	1,227
Williams Lake Rd	Everson	2,163
Teamousey Ln	Everson	498
Hannegan Rd	Everson	893
Mosquito Lake Rd	Everson	3,678
Rutsatz Rd	Everson	2,856
Hannegan Rd	Everson	278
Michael Rd	Everson	2,270
SE 46TH ST	Fall City	7,815
274TH AVE SE	Fall City	3,985
Lookout Rd	Fall City	7,838
Westfair	Federal Way	1,057
S 320TH ST	Federal Way	1,611
SW Cemetary Dr	Federal Way	975
Oak Hill Blvd	Federal Way	9,325
S 320TH ST	Federal Way	7,600
S 314th St	Federal Way	803
S 320TH ST	Federal Way	4,440
SW 317th St	Federal Way	4,272
Wood Trails Village	Federal Way	6,222
SW 320th St	Federal Way	150
Hawthorne	Ferndale	552
W Smith Rd	Ferndale	612

Project	City	Planned Replacement Footage
Freeland Ave	Freeland	731
Sealawn	Freeland	1,913
283rd ST	Graham	1,641
Orville Rd	Graham	351
Smugglers Cove Rd	Greenbank	2,331
Day Rd	Greenbank	1,352
Greenbank Dr	Greenbank	1,049
11906 176th Ave SE	Issaquah	2,547
SE 146th	Issaquah	1,275
Riperian Apts	Issaquah	503
Sycamore Dr	Issaquah	6,296
Burnett Ave N	Issaquah	6,760
MacDonald Heights	Kenmore	1,530
85 PL NE	Kenmore	305
Jaunita Drive	Kenmore	333
Inglewood NE Rd	Kenmore	1,733
NE 190th NE	Kenmore	1,050
73rd Ave NE	Kenmore	1,230
Inglewood Village	Kenmore	2,536
North Lake Heights	Kenmore	2,378
Rainier View	Kent	3,349
Villa Trailor Park	Kent	4,494
Mcnalley Addition	Kent	2,052
Williams Condo	Kent	329
108TH AVE SE	Kent	1,176
SE 268TH ST	Kent	515
144th Ave SE	Kent	2,468
N 6th Ave S	Kent	1,412
Crystal Glen	Kent	1,670
Kingston Hts	Kingston	3,408
Juanita Estates	Kirkland	2,253
4th Pl NE	Kirkland	786
7th Ave S	Kirkland	308
128th Ave NE	Kirkland	1,733
Kittitas Hwy	Kittitas	3,615
Nisqually Vista	Lacey	1,125
Carpenter	Lacey	234

Project	City	Planned Replacement Footage
Arrowhead	Lakewood	3,782
Far West	Lakewood	1,080
Veterans Dr	Lakewood	309
Holden	Lakewood	183
Murdock Rd	Langley	4,793
Roseberry St	Langley	768
Highview	Langley	1,532
Forest Ct	Lynden	770
Haveman Rd	Lynden	876
Cedar Shadows	Maple Valley	5,462
SE 208TH ST	Maple Valley	2,541
SE 262nd St	Maple Valley	1,955
SE 238th St	Maple Valley	2,348
SE 216th St	Maple Valley	900
SE 208th St	Maple Valley	1,443
SE 40th	Mercer Island	245
Eastbay	Mercer Island	843
Cherokee Lane	Mt Vernon	1,709
Old Hwy 99	Mt Vernon	893
25th St	Mt Vernon	2,982
Bulson Rd	Mt Vernon	278
Little Mt Road	Mt Vernon	810
Catalina	Oak Harbor	495
Lanyard Loop	Oak Harbor	936
Goldie Rd	Oak Harbor	1,617
Mt. Baker Circle	Oak Harbor	3,125
Glencoe St	Oak Harbor	1,046
Pioneer Way	Oak Harbor	180
NW Jib St	Oak Harbor	257
Surfcrest Beach	Oak Harbor	7,542
Oyster Bay Rd	Olympia	3,534
Sunwood Lakes	Olympia	4,412
Sunwood Lk	Olympia	4,499
Evergreen Pk	Olympia	1,107
Sunwood Lakes	Olympia	4,263
Seashore Villa	Olympia	3,338
Riverlea	Olympia	6,896

Project	City	Planned Replacement Footage
Fern Gully	Olympia	2,402
Conifer Village	Olympia	1,724
Rainbow Point	Olympia	1,551
Biscay Villa	Olympia	1,692
Maple Valley	Olympia	5,004
Muirhead Ave NW	Olympia	63
42nd CT	Olympia	749
79th Ave SE	Olympia	3,087
Cedar Flats Rd SW	Olympia	680
Tri-Way	Olympia	359
Sunrise Bch Rd	Olympia	756
Champion Dr SW	Olympia	672
Old Steamboat Isl Rd	Olympia	396
Miller Av	Olympia	282
Mason Way	Olympia	2,270
Susan Ct	Olympia	2,183
211th St	Orting	8,923
Villa Carmel	Port Orchard	6,014
Overra Rd	Port Orchard	5,658
Hadfield	Port Orchard	1,398
Tall Firs Ln	Port Orchard	2,438
Salmonberry	Port Orchard	1,470
Jackson Ave	Port Orchard	1,971
SW Christmas Tree Ln	Port Orchard	2,367
SE Vanskiver Rd	Port Orchard	480
View Park Rd-- Beach	Port Orchard	1,605
Eastway Dr	Port Orchard	1,502
Old Wye Lake	Port Orchard	423
Kings End	Port Orchard	650
SE Willock Rd	Port Orchard	909
Wicks Lake Rd SW	Port Orchard	570
Hadfield Rd SE	Port Orchard	372
11th Ave	Poulsbo	479
off Pugh Rd NE	Poulsbo	1,154
Mesford Rd	Poulsbo	368
SR 104 Pt Gamble	Poulsbo	530
Vista Key	Poulsbo	203

Project	City	Planned Replacement Footage
Lincoln Rd NE	Poulsbo	450
Lofall Rd	Poulsbo	645
Tahoma Vista Ests	Puyallup	4,712
Manorwood	Puyallup	8,966
Springfield	Puyallup	2,331
74th Ave	Puyallup	5,454
56th Ave Ct E	Puyallup	5,683
154th St E	Puyallup	4,649
Bath Rd	Puyallup	2,933
Springfield	Puyallup	3,969
11th Ave E and 126th St Ct E	Puyallup	884
103rd Ave Ct E	Puyallup	1,151
95th Ave	Puyallup	1,103
23rd & Shaw	Puyallup	851
Meridian Rd	Puyallup	345
Vail Cut Off Rd SE	Rainier	2,736
163RD AVE SE	Rainier	3,765
220th Ave NE	Redmond	546
224th Ave NE	Redmond	770
NE 58th St	Redmond	3,728
Bel-Red Rd	Redmond	4,820
Western View Estate	Redondo	4,139
S 272nd St	Redondo	2,856
S Either Rd	Renton	5,635
Fairwood Bluff Apt	Renton	2,688
W Spring Lake Dr SE	Renton	839
Weikswood	Rochester	1,460
Lenets Trlr Pk	Rochester	1,974
Crescent Park	Rochester	1,716
176th Ave SW	Rochester	1,383
S 167th St & 51st Ave S	SeaTac	813
Wicker Rd	Sedro Woolley	3,216
Cedar Lane Mobile	Sedro Woolley	3,398
Orth Way	Sedro Woolley	1,581
Dana Dr	Sedro Woolley	1,774
Clearidge and Loretta Hts	Silverdale	22,859
Avante Dr	Silverdale	4,175

Project	City	Planned Replacement Footage
W M Rd NW	Silverdale	3,537
Warren Rd NW	Silverdale	1,943
Dickey Rd	Silverdale	348
Stavis Bay	Silverdale	504
NW Pioneer Rd	Silverdale	201
63rd ST CT	Sumner	1,596
McElfresh	Tenino	3,608
Oakview Dr	Tenino	1,064
Fox Run	Tracyton	756
29th Ave	Tumwater	2,450
Villa Granada	Tumwater	4,573
Tumwater Blvd SW	Tumwater	1,221
Delphi Rd	Tumwater	252
Sherman Valley Rd	Tumwater	6,278
Waddle Creek Rd	Tumwater	1,185
76th Ave SW	Tumwater	1,158
Squire Estates	Tumwater	2,018
Vashon wy SW	Vashon	3,075
SW Bank Rd	Vashon	857
111th and 220th	Vashon	3,210
Vashon Hwy SW	Vashon	1,268
SW 267th Ln	Vashon	1,965
Bayview Rd	Vashon	1,064
Westside Hwy	Vashon	1,446
Orchard Beach	Vashon	381
Vashon Hwy SW	Vashon	848
107th Ave SW	Vashon	915
SW 232nd st	Vashon	750
Westside Hwy SW	Vashon	1,904
SW 240th St	Vashon	983
SW 112th St	Vashon	1,895
Portage-Dockton Rd	Vashon	902
144th Ave NE	Woodinville	692
Brookside Acres	Woodinville	6,135
NE 202nd St	Woodinville	1,701
NE 137th St	Woodinville	1,047
NE 154th St	Woodinville	2,115

Project	City	Planned Replacement Footage
NE 159th St	Woodinville	1,800
230th Ave NE	Woodinville	450
232nd Ave NE	Woodinville	1,200
Reintree	Woodinville	5,272
Lake Tuck	Woodinville	5,850
North Glen	Woodinville	7,203
22nd Ave S	Yelm	569
368th St S	Yelm	3,990
46th Ave	Yelm	2,780
		708,903 ft.

Table A-2. 2018 Accelerating Underground Cable Replacement Plan

Project Name	City	Planned Replacement Footage
Campbell Lake Rd	Anacortes	780
Haddon Lane	Anacortes	836
Skyline	Anacortes	2,559
Birch Way	Anacortes	246
Channel View Ln	Anacortes	893
132rd Ave SE	Auburn	1,350
SE 364th St	Auburn	2,309
Auburn-Enumclaw Hwy	Auburn	885
Lk Holm Rd	Auburn	2,685
132nd Ave SE	Auburn	540
SE Lake Holm Rd	Auburn	833
Old Creosote Hill Rd	Bainbridge Island	6,450
Wing Point North	Bainbridge Island	3,855
Old Mill Rd	Bainbridge Island	1,106
94th Ave NE	Bellevue	306
Brentwood Lane	Bellevue	1,245
Crossroads Village Apt	Bellevue	2,994
Lincoln Place	Bellevue	3,005
NE 28th St	Bellevue	602
NE 50th ST	Bellevue	450

Project Name	City	Planned Replacement Footage
SE 24th ST	Bellevue	1,077
140th Ave NE	Bellevue	560
140th Ave NE	Bellevue	722
Innis Glen Apts	Bellevue	3,619
124th Ave NE	Bellevue	1,613
Midlakes Center	Bellevue	480
32nd St	Bellingham	567
Kline Rd	Bellingham	2,346
Mill wheel	Bellingham	5,265
Old Samish Way	Bellingham	1,253
W Smith Rd	Bellingham	774
32nd St	Bellingham	512
Chuckanut Dr	Bellingham	894
Forest View Dr	Bellingham	879
Giarde Ln	Bellingham	3,573
Guide Meridian	Bellingham	1,769
Husky Dr	Bellingham	1,709
Lake Whatcom Blvd	Bellingham	1,646
Wahl Rd	Bellingham	273
Yew St	Bellingham	1,032
206th Ave SE	Black Diamond	1,644
Copeland	Black Diamond	2,723
Blaine Rd	Blaine	858
Birch Bay Lynden Rd	Blaine	638
Brown Rd	Blaine	501
Sweet Rd	Blaine	1,893
Valley View Rd	Blaine	435
Birch Bay Rd	Blaine	3,008
226th Ave E	Bonney Lake	4,403
View Reyal Estates	Bonney Lake	1,778
207th AVE E	Bonney Lake	3,960
SR 410 E	Bonney Lake	840
High Cedars Ranch	Bonney Lake	4,830
103rd Ave NE	Bothell	372
Norway Vista	Bothell	4,568
133rd Ct NE	Bothell	630
Stafford	Bothell	1,331
Meadowood	Bremerton	4,715

Project Name	City	Planned Replacement Footage
Westmont Ln	Bremerton	2,475
Varsity Ln	Bremerton	2,987
274th Ave E	Buckley	2,103
Ambaum Blvd S	Burien	864
SW 16th St	Burien	1,757
Fernhaven	Burlington	8,018
Old Hwy 99	Burlington	368
Peterson Rd	Burlington	4,850
Alger Cain Lake Rd	Burlington	1,998
Darrk Lane	Burlington	303
Ida Dr	Burlington	4,391
Lake Samish Dr	Burlington	576
Prairie Lane	Burlington	306
Shallow Shores Rd	Burlington	461
325th Ave NE	Carnation	900
1910 346th AVE	Carnation	1,620
Lk Langlois Rd Ne	Carnation	1,079
Lk Langlios Rd	Carnation	1,118
John MacDonald Park	Carnation	1,076
Upper Baker Dam	Concrete	347
Hazzle CT	Coupeville	3,512
Turkey hill	Coupeville	1,656
Ft Ebey Rd	Coupeville	765
Kennedy Lagoon Ct	Coupeville	1,502
N Main St	Coupeville	344
Monterey Dr	Coupeville	945
Parker Rd	Coupeville	345
Cathedral Drive	Coupeville	3,272
Leisure St	Coupeville	2,192
Summit Loop	Coupeville	804
Forest Crest Estates	Covington	450
Winter Woods Estate	Covington	630
Silver Lake Rd	Deming	924
Silver Lake Rd	Deming	462
James Rd	Deming	566
Mt Baker Hwy	Deming	3,408
Marine View Dr SW	Des Moines	758
320th Ave NE	Duvall	3,968

Project Name	City	Planned Replacement Footage
Radar Lake	Duvall	2,175
312th Ave NE	Duvall	525
320th Ave NE	Duvall	1,485
NE 193rd St	Duvall	1,440
342nd Ave NE	Duvall	1,262
Mountainview Rd	Duvall	617
Batten Rd	Duvall	975
Radar Lake	Ellensburg	4,500
Crystal Mountain Condo	Enumclaw	5,070
191st Ave SE	Enumclaw	900
236th Ave SE	Enumclaw	6,023
208th Ave SE	Enumclaw	2,190
Green Valley Rd	Enumclaw	3,011
Forward Thurst Pool	Enumclaw	1,244
SE 400th St	Enumclaw	618
SE 380th St	Enumclaw	2,003
SE 384th St	Enumclaw	749
336th Pl SE	Enumclaw	2,537
218th Ave SE	Enumclaw	2,496
Western	Enumclaw	1,590
400th St SE	Enumclaw	654
312th Ave SE	Enumclaw	342
SE 358th St	Enumclaw	13,880
257th Pl SE	Enumclaw	1,278
Auburn-Enumclaw Hwy	Enumclaw	1,271
Everson Goshen Rd	Everson	1,764
Old Guide Rd	Everson	1,350
Ten Mile Rd	Everson	608
Ten mile Rd	Everson	1,617
Bartlette Lane	Everson	1,647
Beard Rd	Everson	747
Noon Rd	Everson	2,610
Pole Rd	Everson	945
Roeder Lane	Everson	2,348
Van Dyk Rd	Everson	941
Rutsatz	Everson	2,084
David Powell Rd	Fall City	2,175
SE Red Fall City Way	Fall City	543

Project Name	City	Planned Replacement Footage
SE 94th ST	Fall City	1,200
404th Ave SE	Fall City	750
Weathervane	Fall City	1,139
SE Issaquah Rd	Fall City	867
21ST Ave SW	Federal Way	143
289 PL & 13 PLS	Federal Way	4,101
Haxton Way	Ferndale	1,205
Lake Terrel Rd	Ferndale	3,000
Mountain View Rd	Ferndale	699
Norway Rd	Ferndale	402
Serene Pl	Ferndale	1,469
Trigg Rd	Ferndale	668
Unick Rd	Ferndale	872
Woodland Rd	Ferndale	1,082
Enterprise Rd	Ferndale	1,658
Lancaster Rd	Freeland	1,805
Discovery Pl	Freeland	3,165
Dolphin Dr	Freeland	1,139
110th Ave E	Graham	1,500
248th St Ct	Graham	1,275
288th St E	Graham	969
150th Ave E	Graham	1,043
260th St E	Graham	3,743
Rehberg Rd	Greenbank	645
Renton-Issaquah Rd	Issaquah	2,775
SE 156th St	Issaquah	1,095
164th AVE SE	Issaquah	300
239th Ave SE	Issaquah	2,985
255th Ave SE	Issaquah	755
SE 188TH ST	Issaquah	1,575
SE 188th St	Issaquah	591
Renton-Maple Valley Hwy	Issaquah	797
Sycamore Dr	Issaquah	7,505
244th Ave	Issaquah	840
Issaquah-Hobart Rd	Issaquah	582
Tiger Moutain Way	Issaquah	779
84th Ave NE	Kenmore	773
62nd Ave NE	Kenmore	1,110

Project Name	City	Planned Replacement Footage
85th Ave NE	Kenmore	483
72nd Ave NE	Kenmore	915
Auburn-Black Diamond Rd	Kent	600
156th Ave SE	Kent	2,778
SE 330th St	Kent	5,378
S 228th St	Kent	627
SE 240th St	Kent	663
Redwood Hill	Kent	458
94th Ave S	Kent	1,313
160th Ave SE	Kent	2,630
S 261st St	Kent	411
W Valley Hwy	Kent	300
S 218th St	Kent	2,033
Contemporary Structures	Kent	1,758
Hancock	Kent	644
Pactrust	Kent	5,093
S 216th St	Kent	458
Taree Blvd	Kingston	2,363
108th Ave NE	Kirkland	300
Northpark	Kirkland	498
NE 124th St	Kirkland	1,628
106th Ave NE	Kirkland	2,867
Northpark	Kirkland	536
Exit 110 and Rd 6	Kittitas	2,700
Denmark Rd	Kittitas	590
Meridian Rd	Lacey	780
Puget Beach Rd NE	Lacey	1,893
20th Ave	Lacey	1,515
Ardenwood	Lakewood	638
Bond Duplex	Lakewood	212
Gravelly Lk	Lakewood	1,439
Crawford Rd	Langley	5,530
Ewing Rd	Langley	797
Frog Water Rd	Langley	4,404
Hwy 525	Langley	1,656
Olympic Marine View	Langley	2,205
Deer Lake Road	Langley	1,857
Kineth Point Pl	Langley	3,635

Project Name	City	Planned Replacement Footage
Scatchet Head Dr	Langley	518
Shokowakan Dr	Langley	2,280
Wilkenson Rd	Langley	1,001
Fiske Rd	Langley	2,730
Axling Rd	Lynden	1,454
Bradley Meadows	Lynden	1,174
Birch Bay Lynden Rd	Lynden	825
Birch Bay Lynden Rd	Lynden	620
Bob Hall Rd	Lynden	1,919
Bob Hall Rd	Lynden	1,659
Lavender Lane	Lynden	453
Loomis Trail Rd	Lynden	671
Park Place	Lynden	495
Loomis Trail Rd	Lynden	672
SE 247th ST	Maple Valley	732
210th Ave SE	Maple Valley	2,021
SE 200th St	Maple Valley	542
SE 208th St	Maple Valley	2,010
Canda	Maple Valley	915
Cheryl Lee Heights	Maple Valley	3,435
Dorre Don W	Maple Valley	150
Tourangeau	Maple Valley	897
Clydemoor & Woodside	Medina	4,630
E Mercer Highlands	Mercer Island	2,415
Eastbay	Mercer Island	1,076
Ridgecrest Ln	Mercer Island	462
Chuckanut Dr	Mt Vernon	764
Doe Lane	Mt Vernon	1,112
Doe Lane	Mt Vernon	2,151
Burkland Rd	Mt Vernon	300
Discovery Dr	Mt Vernon	2,252
Old Day Creek Rd	Mt Vernon	2,654
Bulson Rd	Mt Vernon	651
Little Mt Rd	Mt Vernon	810
Otter Pond	Mt Vernon	366
Snee Oosh Rd	Mt Vernon	1,118
SE 141st St	North Bend	2,180
Balda Rd	Oak Harbor	1,248

Project Name	City	Planned Replacement Footage
Ireland St	Oak Harbor	554
Brideck Ln	Oak Harbor	1,758
Cerullo Dr	Oak Harbor	651
Cornet Bay Rd	Oak Harbor	888
Goose Lane	Oak Harbor	1,580
Hunt Rd	Oak Harbor	725
Kettle St	Oak Harbor	341
Monroe Landing	Oak Harbor	399
Nubian Way	Oak Harbor	581
Ponderosa Dr	Oak Harbor	2,933
Rifle Rd	Oak Harbor	3,879
Slater Rd	Oak Harbor	788
Swantown Rd	Oak Harbor	774
Thunder Lane	Oak Harbor	1,151
W 3rd Ave	Oak Harbor	405
W Beach Rd	Oak Harbor	389
Wieldraayer Rd	Oak Harbor	209
Windshake Ln	Oak Harbor	390
Zylstra Rd	Oak Harbor	2,769
Heller Rd	Oak Harbor	1,814
Polnell Shores	Oak Harbor	5,594
Shadowbrook Ln	Oak Harbor	920
Boulder Ln	Olympia	953
Cuyamaca Village	Olympia	4,043
Forest Shores Dr	Olympia	7,230
Hawks Prairie Rd NE	Olympia	330
Lemon Rd	Olympia	723
Sunset Dr	Olympia	2,636
48th Way	Olympia	398
95th LN SE	Olympia	2,078
Ashram Ln NW	Olympia	1,659
Boston Harbor	Olympia	1,029
Cedar Flats Rd SW	Olympia	1,463
Crestline Blvd NW	Olympia	1,079
Drewry Rd	Olympia	1,283
Englewood Dr SE	Olympia	321
Fox Hall	Olympia	1,985
Gull Harbor	Olympia	1,712

Project Name	City	Planned Replacement Footage
Home Rd	Olympia	2,087
Johnson Pt	Olympia	236
Johnson Pt Rd	Olympia	494
Lorraine Dr	Olympia	897
Old Tilley Rd	Olympia	2,163
73rd Ave SE	Olympia	525
Sleater Kinney	Olympia	1,700
South Bay Road NE	Olympia	605
Sunset Dr NW	Olympia	608
Tilley Rd	Olympia	903
36th Ave	Olympia	900
Landau Ave	Olympia	2,679
Summit Lake	Olympia	252
221st St E	Orting	1,910
230th St E	Orting	1,575
154th Ave	Orting	747
Clifton Rd	Port Orchard	612
Sedgwick Rd	Port Orchard	1,350
SW Pine Rd	Port Orchard	473
Long Lake Rd SE	Port Orchard	1,110
Blake Island State Park	Port Orchard	2,520
Bothwell St	Port Orchard	563
S Pine Rd	Port Orchard	1,020
Mile Hill Dr	Port Orchard	2,978
SW Spruce Rd	Port Orchard	1,148
Vandecar Rd	Port Orchard	2,354
Gatewood Manor	Port Orchard	890
Gold Mountain	Port Orchard	6,071
Central Valley Rd	Poulsbo	1,227
Hansville rd	Poulsbo	1,275
Brownsville	Poulsbo	1,452
Emerald Ln	Poulsbo	1,253
NE Highland Blvd	Poulsbo	345
James Way	Poulsbo	1,620
Front St NE	Poulsbo	335
Lindvog Rd	Poulsbo	1,425
SR 3 & Scenic	Poulsbo	344
South Keyport Rd	Poulsbo	783

Project Name	City	Planned Replacement Footage
31st St E	Puyallup	1,920
Canyoncrest East	Puyallup	1,519
Heritage Glen	Puyallup	4,663
113th Ave Ct E	Puyallup	453
80th Ave	Puyallup	533
9th Ave	Puyallup	834
Cameron Add	Puyallup	1,946
110th Ave E	Puyallup	1,703
26th Ave Ct SW	Puyallup	1,457
19th Ave SE	Puyallup	623
Clarks Creek	Puyallup	4,704
Sundridge	Puyallup	9,098
Horizon Pioneer	Rainier	1,209
Jade St	Rainier	252
Moses Rd	Rainier	1,244
Reichel Rd	Rainier	374
Waddle Rd	Rainier	1,043
Reichel Rd SE	Rainier	4,539
228th Ave NE	Redmond	750
Bellewood	Redmond	2,925
224th Ave NE	Redmond	885
NE 80th and 169th AVE	Redmond	1,898
173rd Ave NE	Redmond	359
NE 107th Pl	Redmond	401
Redondo Beach Dr S	Redondo	1,106
SE 213th St	Renton	6,765
Sunset Boulevard	Renton	215
SE 128th St	Renton	429
Dale Shows Tracts	Renton	1,671
SE 192nd St	Renton	1,610
SE Petrovitsky Rd	Renton	1,704
SW 16th St	Renton	180
Sunset Hwy	Renton	3,638
Monteray Ave	Renton	1,473
Mountain View Ave	Renton	768
185th Ave SW	Rochester	1,260
Hwy 12 SW	Rochester	825
James Rd	Rochester	756

Project Name	City	Planned Replacement Footage
Jordan St SW	Rochester	1,022
Old 99	Rochester	1,020
Independence	Rochester	3,080
228th Ave NE	Sammamish	3,878
SE 4th ST	Sammamish	794
NE 11th	Sammamish	488
NE 25th	Sammamish	903
NE Red Facll City Rd	Sammamish	1,302
243rd Ave NE	Sammamish	2,522
NE 14th St W	Sammamish	4,035
NE 6th Pl	Sammamish	2,745
S 212th St	SeaTac	400
S 200th St	SeaTac	1,622
Internatioanl Blvd	SeaTac	848
SR 20	Sedro Woolley	1,232
Hoehn Rd	Sedro Woolley	1,700
Nature View Rd	Sedro Woolley	2,289
Owens Lane	Sedro-Woolley	1,277
S Skagit Hwy	Sedro-Woolley	293
Walberg Rd	Sedro-Woolley	203
Dawn Park Estates	Silverdale	2,895
Clear Crk	Silverdale	492
Nuthatch	Silverdale	573
NE 197th Pl	Skykomish	707
Little Creek Rd	South Cle Elum	4,416
South Pass Rd	Sumas	1,098
23rd St SE	Sumner	465
159th Ave	Sumner	956
185th Ave SE	Tenino	2,348
Bucoda Hwy SE	Tenino	1,620
142nd Ave SW	Tenino	474
Bronson St SE	Tenino	3,795
Coal Rd SE	Tenino	1,361
Northcraft Dr SE	Tenino	450
Old Hwy 99	Tenino	224
Tilley Rd SW	Tenino	633
Cedar Hills	Tracyton	1,088
Meadow Ln	Tracyton	986

Project Name	City	Planned Replacement Footage
Creekwood Dr SE	Tumwater	870
Littlerock Rd SW	Tumwater	567
Raintree	Tumwater	2,664
107th Ave SW	Vashon	1,035
131 Ave SW	Vashon	1,050
99th Ave SW	Vashon	1,500
99th Ave SW	Vashon	675
91st Ave SW	Vashon	263
87th Ave SW	Vashon	1,554
238th Ave E	Wilkeson	758
Carbo-S. Prairie Rd	Wilkeson	1,688
184th Ave NE	Woodinville	807
Wood Red Rd	Woodinville	600
NE 152nd St	Woodinville	893
Brookside Acres	Woodinville	6,713
161st Ave NE	Woodinville	1,845
156th PL NE	Woodinville	1,125
199th Ave NE	Woodinville	1,010
Carriage Estates Highlands	Woodinville	1,103
Few Firs	Woodinville	674
Gold Creek Heights	Woodinville	1,568
NE 202nd Pl	Woodinville	1,091
NE 185th St	Woodinville	875
148th Ave NE	Woodinville	3,456
74th Ave S	Yelm	4,665
Bald Hills Rd	Yelm	2,925
Smith Prairie Rd SE	Yelm	1,206
Harris Rd	Yelm	2,234
63rd Ave S	Yelm	1,613
Allen Rd	Yelm	405
382nd St S	Yelm	1,760
Harts Lake Loop Rd S	Yelm	2,175
Harts Lake Rd S	Yelm	857
Locke Dr	Yelm	1,575
McKenna Rd	Yelm	338
Rathburn Rd	Yelm	527
		705,255 ft.

APPENDIX B: WORST PERFORMING CIRCUITS PLAN

Table B-1. 2017 Worst Performing Circuit Plan

Project Description	City	Planned Circuit Work
Airport-23	Maytown	Tree Wire
Airport-23	Olympia	Tree Wire
Alger-12	Burlington	Upgrade Overhead System
Alger-12	Burlington	Upgrade Overhead System
Alger-12	Burlington	New Underground Feeder
Alger-15	Sedro Woolley	Improve Overhead Reliability and Underground Conversion
Big Rock-15	Mount Vernon	Tree Wire
Big Rock-15	Mount Vernon	New Underground Feeder and Upgrade Overhead System
Big Rock-15	Mount Vernon	Tree Wire
Birch Bay-15	Bellingham	Upgrade Overhead System
Black Diamond-13	Black Diamond	Tree Wire
Blaine-13	Blaine	Tree Wire
Blumaer-16	Tenino	Tree Wire
Central Kitsap-14	Silverdale	Tree Wire
Chico-12	Silverdale	Improve Underground Reliability
Cottage Brook-13	Woodinville	Tree Wire
Duvall-16 (feeder tie to Duvall-15)	Duvall	Upgrade Underground System
Easton-13	Easton	Tree Wire
Eld Inlet-25	Olympia	Tree Wire
Eld Inlet-27	Olympia	Tree Wire
Eld Inlet-27	Olympia	Tree Wire
Fernwood-16	Port Orchard	Tree Wire
Fragaria-12	Olalla	Overhead System Rebuild
Fragaria-15	Port Orchard	Tree Wire
Fragaria-16	Olalla	Tree Wire
Gravelly Lake-15	Lakewood	Tree Wire
Greenbank-13	Greenbank	Tree Wire
Griffin-13	Olympia	Tree Wire

Project Description	City	Planned Circuit Work
Griffin-13	Olympia	Distribution Automation
Happy Valley-16	Bellingham	Underground Conversion
Hickox-16	Mount Vernon	Distribution Automation
Hobart-15	Hobart	Replace old vintage conductor
Hobart-15	Ravensdale	Distribution Automation
Inglewood-13	Bothell	Distribution Automation
Inglewood-13	Bothell	Distribution Automation
Kenmore-23	Kenmore	Tree Wire
Kenmore-26	Kenmore	Tree Wire
Kingston-24	Hansville	Overhead System Rebuild
Kingston-24	Hansville	Overhead System Rebuild
Lake Louise-17	Bellingham	Underground System Rebuild
Longmire-17	Yelm	Tree Wire
Longmire-17	Yelm	Tree Wire
Longmire-25	Roy	Overhead System Rebuild
Longmire-25	Roy	Tree Wire
Marine View-13	Auburn	Distribution Automation
Mottman-14	Olympia	Tree Wire
Mottman-14	Olympia	Tree Wire
Pickering-21	Issaquah	Tree Wire
Pickering-21	Issaquah	Improve Underground Reliability and Tree Wire
Point Roberts-14	Point Roberts	Tree Wire and Upgrade Underground System
Port Madison-12	Bainbridge Island	Overhead System Rebuild
Poulsbo-15	Poulsbo	Overhead System Rebuild
Prine-13	Olympia	Distribution Automation
Prine-13	Tumwater	Tree Wire

Project Description	City	Planned Circuit Work
Sherwood-18	Auburn	Replace old vintage conductor
Silverdale-13	Silverdale	Tree Wire
Silverdale-15	Seabeck	Overhead System Rebuild
Silverdale-15	Seabeck	Tree Wire and Underground System Rebuild
Silverdale-15	Seabeck	Tree Wire
Silverdale-15	Seabeck	Tree Wire
Silverdale-15	Silverdale	Upgrade Overhead System
Silverdale-16	Silverdale	Tree Wire
Sinclair Inlet-25	Port Orchard	Overhead System Rebuild
Sinclair Inlet-25	Port Orchard	Overhead System Rebuild
Snoqualmie-13	Snoqualmie	Tree Wire
Soos Creek-25	Auburn	Tree Wire
Soos Creek-25	Auburn	Distribution Automation
Vashon Substation getaways	Vashon Island	Underground Conversion
Vashon-12	Vashon Island	Overhead System Rebuild
Vashon-12	Vashon Island	Distribution Automation
Vashon-13	Vashon Island	Tree Wire
Vashon-23	Vashon Island	Tree Wire
Vashon-23	Vashon Island	Tree Wire
Total Number of Projects		**73**
Total Number of Circuits		**50**

Table B-2. 2018 Worst Performing Circuit Improvement Plan

Project Name	Planned Circuit Work
Airport-23 and Blumaer-13, Olympia	New Overhead Feeder
Airport-23, Olympia	Improve Underground Reliability
Baker River Sw-24, Rockport	Underground System Rebuild
Big Rock-15, Mount Vernon	Overhead System Rebuild
Blaine-13, Blaine	Tree Wire
Brooks Hill-15, Langley	Improve Overhead Reliability and New Overhead Feeder
Eld Inlet-27, Olympia	Tree Wire
Fernwood-17, Port Orchard	Tree Wire and Upgrade Underground System
Fragaria-13, Port Orchard	Tree Wire
Fragaria-13, Port Orchard	Tree Wire
Friendly Grove-24, Olympia	Tree Wire
Greenwater-13, Enumclaw	Tree Wire
Hamilton-15, Concrete	Improve Overhead Reliability
Hobart-15, Maple Valley	Tree Wire
Hobart-15, Ravensdale	Tree Wire
Kendall-12, Kendall	Tree Wire
Kingston-24, Hansville	Tree Wire
Kingston-24, Kingston	Overhead System Rebuild
Knoble-11, Bonney Lake	Tree Wire
Long Lake-21, Port Orchard	Overhead System Rebuild
Maxwelton-11 (feeder tie to Langley-16), Langley	New Overhead Feeder
McAllister Springs-15, Lacey	Tree Wire
Miller Bay-22, Kingston	Overhead System Rebuild
Norlum-15, Sedro Woolley	Overhead System Rebuild
Orting-22, Graham	Tree Wire
Orting-26 (formerly Orting-22), Graham	Tree Wire
Port Gamble-12, Poulsbo	Tree Wire
Port Gamble-12, Poulsbo	Overhead System Rebuild
Rainier View-13, Rainer	Tree Wire
Serwold-13, Poulsbo	Tree Wire
Serwold-13, Poulsbo	Overhead System Rebuild
Silverdale-13, Silverdale	Tree Wire
Silverdale-16, Silverdale	Tree Wire
Summit Park-21, Anacortes	Overhead System Rebuild
Vashon-12, Vashon Island	Tree Wire
Vashon-12, Vashon Island	Overhead System Rebuild
Vashon-12, Vashon Island	Tree Wire
Vashon-13, Vashon Island	Overhead System Rebuild
Vashon-13, Vashon Island	Overhead System Rebuild
Wilson-16, Bow	Improve Underground Reliability
Winslow-13, Bainbridge Island	Overhead System Rebuild

Project Name	Planned Circuit Work
Woburn-23, Bellingham	Distribution Automation
Total Number of Projects	**42**
Total Number of Circuits	**32**

APPENDIX C: ELECTRIC RELIABILITY PLAN WORST PERFORMING CIRCUITS

Electric Reliability Plan Worst Performing Circuits[1]	
1	Airport-23
2	Alger-12
3	Alger-15
4	Avondale-15
5	Baker River Sw-24
6	Belmore-26
7	Big Rock-15
8	Birch Bay-15
9	Black Diamond-13
10	Blaine-12
11	Blaine-13
12	Blumaer-16
13	Blumaer-17
14	Burrows Bay-13
15	Central Kitsap-14
16	Chambers-13
17	Chambers-15
18	Chico-12
19	Christensens Corner-22
20	Christensens Corner-23
21	Christopher-22
22	Cle Elum-11
23	Cottage Brook-13
24	Cottage Brook-15
25	Dieringer-15
26	Duvall-12
27	Duvall-15
28	Easton-13
29	Eld Inlet-25
30	Eld Inlet-27
31	Evergreen-13
32	Fall City-15

[1] Does not include a Jefferson County circuit that appeared on the 2011 Worst Performing Circuit List

Electric Reliability Plan Worst Performing Circuits[1]	
33	Fernwood-16
34	Fernwood-17
35	Four Corners-14
36	Fragaria-12
37	Fragaria-13
38	Fragaria-15
39	Fragaria-16
40	Freeland-12
41	Freeland-13
42	Freeland-15
43	Friendly Grove-24
44	Gardella-16
45	Goodes Corner-15
46	Gravelly Lake-15
47	Greenbank-13
48	Greenwater-13
49	Greenwater-16
50	Griffin-13
51	Griffin-16
52	Hamilton-15
53	Happy Valley-16
54	Hickox-16
55	Hobart-15
56	Hobart-16
57	Hyak-13
58	Inglewood-13
59	Inglewood-15
60	Kendall-12
61	Kenmore-23
62	Kenmore-26
63	Kingston-24
64	Knoble-11
65	Lake Leota-13
66	Lake Louise-17
67	Lake Meridian-15
68	Lake Tapps-17
69	Lake Tapps-18
70	Lake Wilderness-14
71	Langley-12
72	Langley-15

Electric Reliability Plan Worst Performing Circuits[1]	
73	Langley-16
74	Lea Hill-17
75	Long Lake-21
76	Long Lake-23
77	Longmire-17
78	Longmire-25
79	Luhr Beach-14
80	Manchester-15
81	Marine View-13
82	Marine View-17
83	McAllister Springs-15
84	Mckinley-17
85	Miller Bay-17
86	Miller Bay-22
87	Miller Bay-23
88	Mottman-14
89	Norlum-15
90	Nugents Corner-26
91	Orchard-13
92	Orting-22
93	Patterson-15
94	Pickering-21
95	Point Roberts-14
96	Point Roberts-16
97	Port Gamble-12
98	Port Gamble-13
99	Port Gamble-16
100	Port Madison-12
101	Poulsbo-13
102	Poulsbo-15
103	Prine-13
104	Rainier View-13
105	Semiahmoo-13
106	Sequoia-16
107	Serwold-13
108	Sheridan-16
109	Sherwood-18
110	Silverdale-13
111	Silverdale-15
112	Silverdale-16

Electric Reliability Plan Worst Performing Circuits[1]	
113	Sinclair Inlet-25
114	Skykomish-23
115	Skykomish-25
116	Slater-16
117	Snoqualmie-13
118	Snoqualmie-17
119	Soos Creek-25
120	South Keyport-22
121	South Mercer-12
122	Southwick-15
123	Summit Park-21
124	Tolt-15
125	Vashon-12
126	Vashon-13
127	Vashon-23
128	Wayne-15
129	West Olympia-23
130	Wilson-16
131	Winslow-12
132	Winslow-13
133	Winslow-15
134	Woburn-23
135	Yelm-27

APPENDIX D: ABBREVIATIONS AND ACRONYMS

CEMI	Customers Experiencing Multiple Interruptions
CMI	Customer Minutes of Interruption
HMW	High Molecular Weight
OMS	Outage Management System
PSE	Puget Sound Energy
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
TRXLPE	Tree-Retardant Crosslinked Polyethylene