Exh. HLR-1T

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BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

DOCKET NO. UE-19_____

DOCKET NO. UG-19_____

DIRECT TESTIMONY OF

HEATHER L. ROSENTRATER

REPRESENTING AVISTA CORPORATION

I. INTRODUCTION

Q. Please state your name, employer and business address.

A. My name is Heather Rosentrater and I am employed as the Vice President of Energy Delivery for Avista Utilities (Avista or Company), at 1411 East Mission Avenue, Spokane, Washington.

Q. Would you briefly describe your educational background and professional experience?

A. I received a Bachelor of Science degree in Electrical Engineering from Gonzaga University, and hold a Professional Engineer (PE) credential. I joined Avista in 1996 as an electrical engineering student at the Company's former subsidiary, Avista Labs, where I developed electrical systems for fuel cells. I joined Avista in 2003 and have broad experience on both the electric and natural gas side of the business, having managed departments and projects in electric transmission, distribution, SCADA, asset management and supply chain, as well as business process improvement using LEAN and Six Sigma techniques. I was named to my current position in December 2015. In this role, I am responsible for electric and natural gas engineering, operations and shared services – fleet, facilities, and supply chain.

I currently serve on the board of directors for the Vanessa Behan Crisis Nursery and Second Harvest Food Bank in Spokane, Washington. In addition, I am a member of the Gonzaga University School of Engineering and Applied Science Executive Advisory Council.

Q. What is the scope of your testimony?

A. I will provide an overview of the Company's electric and natural gas energy delivery facilities, discuss our electric reliability trends and areas of focus, and explain the

factors driving our continuing investment in electric distribution infrastructure. I will explain how our efforts to maintain the asset health and performance of our electric transmission system, including compliance with mandatory federal standards for transmission planning and operations, is driving a continuing demand for new investment. Further, I will describe why our investments in natural gas distribution are necessary in the time frames completed and why each capital investment in our operations facilities and fleet operations is needed to support the efficient delivery of service to our customers, today and into the future. A table of the contents for my testimony is as follows:

Q. Are you sponsoring any exhibits in this proceeding?

A. Yes. I am sponsoring the following exhibits:

- Exh. HLR-2, Avista's Electric Distribution Infrastructure Plan for 2017
- Exh. HLR-3, Avista's Natural Gas Infrastructure Plan for 2019
- Exh. HLR-4, Avista's Priority Aldyl-A Protocol report
- Exh. HLR-5, Study of Aldyl-A Mainline Pipe Leaks - 2018 Update
- Exh. HLR-6, Avista's Electric Transmission Infrastructure Plan for 2018
- Exh. HLR-7, Listing of all program investments in my area of responsibility for 2017 and 2018
- Exh. HLR-8, Capital Business Case documents for each of the 2017 and 2018 major projects and programs described in my testimony, as well as the 2019 pro forma projects I support.

II. OVERVIEW OF AVISTA'S ENERGY DELIVERY SERVICE

Q. Please describe Avista's electric and natural gas utility operations.

A. Avista operates a vertically-integrated electric system in Washington and Idaho, and local distribution natural gas operations in Washington, Idaho, and Oregon. In addition to the hydroelectric and thermal generating resources described by Company witness Mr. Thackston, the Company has approximately 18,300 miles of primary and secondary electric distribution lines. Avista has an electric transmission system of 685 miles of 230 kV lines and 1,534 miles of 115 kV lines. Avista owns and maintains 7,650 miles of natural gas distribution lines, served from the Williams Northwest and Gas Transmission Northwest (GTN) pipelines. A map showing the Company's electric and natural gas service area in Washington, Idaho, and Oregon is provided by Company witness Mr. Vermillion.

As detailed in the Company's 2017 Electric Integrated Resource Plan,[1] Avista expects retail electric sales growth to average 0.47% annually for the next ten years in our service territory, a decline from the 0.6% forecast in the 2015 IRP. Also, based on Avista's 2018 Natural Gas Integrated Resource Plan,[2] in Washington and Idaho the number of natural gas customers is projected to increase at an average annual rate of 0.36%, with demand growing at a compounded average annual rate of 1.3%.

Q. How many customers are served by Avista in Washington?

A. Of the Company's 387,662 electric and 354,955 natural gas customers (as of December 31, 2018), 254,232 and 167,009, respectively, were Washington customers.

[1] A copy of the Company's 2017 Electric IRP has been provided by Company witness Mr. Thackston as Exh. JRT-2.

[2] A copy of the Company's 2018 Natural Gas IRP has been provided by Company witness Ms. Morehouse as Exh. JM-2.

Q. Please list the Company's operations service centers that support electric and natural gas customers in Washington.

A. The Company has central office and operations service facilities in Spokane and local operations service centers in the communities of Colville, Othello, Pullman, Clarkston, Deer Park, and Davenport.

Q. Summarize the need for continuing investments in the <u>electric distribution</u> system.

A. Avista, like utilities across the country, continues to respond to the sustained need for substantial investment in electric distribution infrastructure. The pattern of our investments bears a striking resemblance to that of the industry, which should not be a surprise, since we are all responding to the same predominant needs: first, the need to replace an increasing amount of infrastructure that has reached the end of its useful life (based on asset condition), and second, responding to the need for technology investments required to build the integrated energy services grid of the future. For additional detail around the factors driving our need for electric distribution investment, we have organized the Company's planned spending over the current five-year planning horizon by "Investment Driver" categories shown below, and as previously discussed by Company witness Mr. Thies.

1. Respond to customer requests for new service or service enhancements;
2. Meet our customers' expectations for quality and reliability of service;
3. Meet regulatory and other mandatory obligations;
4. Address system performance and capacity issues;
5. Replace infrastructure at the end of its useful life based on asset condition, and;
6. Replace equipment that is damaged or fails, and support field operations.

The great majority of our planned investment each year is required to connect new customers who request electric service from the Company, to meet our objectives supporting

customer service quality and reliability, and to replace assets that have reached the end of their useful life based on asset condition. In my testimony, I explain the need for major capital projects and programs supporting our electric distribution system, building upon a more-detailed discussion of our electric distribution investment needs provided in the Company's Electric Distribution Infrastructure Investment Plan for 2017, Exh. HLR-2, and enterprise-wide Infrastructure Investment Plan for 2019, Exh. MTT-4.

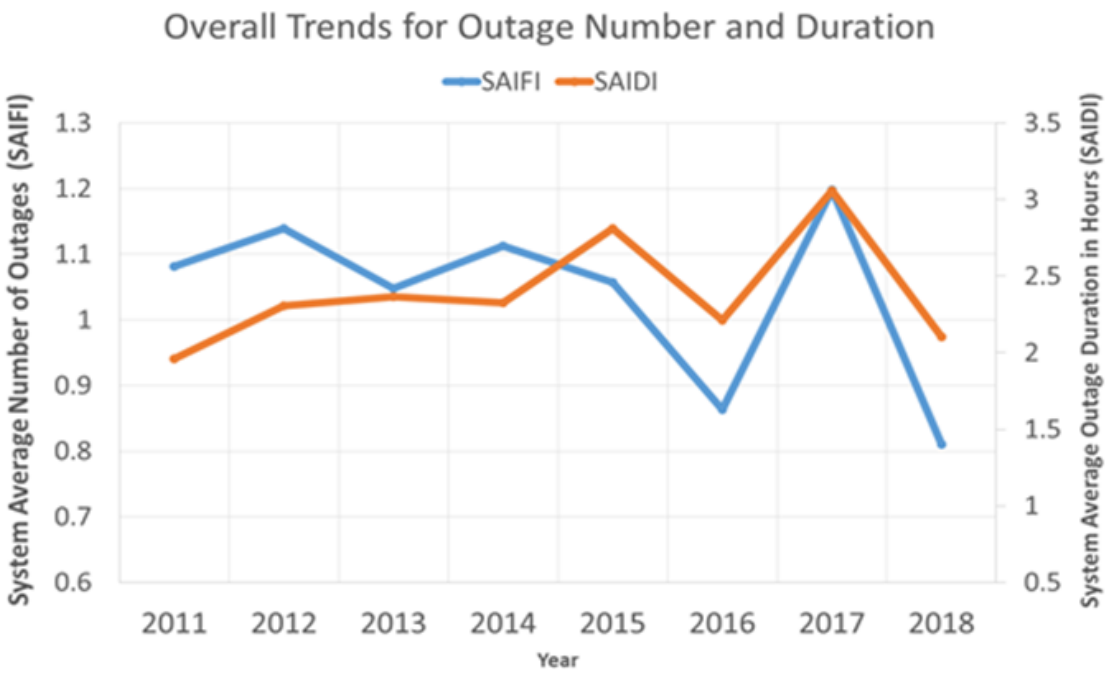
Q. Please comment on recent trends in Avista's electric system reliability.

A. In recent years, the Company has generally aimed to maintain and uphold its current overall reliability performance. Avista's system average number of outages has been trending toward slight improvement, and for 2018, was the lowest recorded in recent years, as shown in Illustration No. 1, below.[3] While the average duration of outages on our system was also much lower in 2018 than in 2017, the overall trend for this measure has been increasing slightly over the same period.[4]

[3] This measure is the System Average Interruption Frequency Index, or SAIFI, which is the average number of sustained interruptions per customer in a year.

[4] This measure is the System Average Interruption Duration Index, or SAIDI, which is the average sustained outage time per customer for the year.

Illustration No. 1



Q. Would you describe the Company's current focus on reliability?

A. Yes. The Company has been engaged with Commission Staff[5] working toward improved ways to understand and assess the utility's reliability performance from the perspective of providing customers the right level of service at the right cost. The Commission has recently opened a new docket seeking comments on Staff's recent "Reliability Reporting Inquiry" report.[6] Avista generally concurs with the findings in Staff's report and is supportive of their recommendation to form a "stakeholder workgroup" to continue this reliability investigation and discussion. For the Company's part, we have recently created a new workgroup focused on helping Avista develop refreshed recommendations for high-level

[5] Comprised of staff from the UTC's regulatory services, policy, and consumer protection sections assembled to evaluate the complexities of reliability.
[6] Docket Number U-190027.

reliability objectives, an overall plan to support meeting them, and tactical work plans to guide the investments to be made each year. The Company looks forward to working on this initiative over the next year in consultation with Staff and the stakeholder workgroup.

Q. Does Avista have a Service Quality Measures Program?

A. Yes. In early 2015, Avista along with representatives from Commission Staff, Public Counsel Unit of the Washington Office of the Attorney General, and The Energy Project developed and recommended a set of service quality measures to be reported to the Commission and Avista's customers each year. The Company is pleased to report that all six customer service measures, including their respective requirements (benchmarks), and the Company's performance results have been achieved in 2018, even improving upon its 2017 results for 4 of the 6 measures. Among several improvements in service for 2018 was a significant increase in customer satisfaction, based on both customer survey results as well as a decrease in the number of complaints filed. Table No. 1 below depicts Avista's 2018 Customer Service Measures results:

Table No. 1 – 2018 Results for Avista's Customer Service Measures

Customer Service Measures	Benchmark	2018 Performance	Achieved
Percent of customers satisfied with our Contact Center services, based on survey results	At least 90%	96%	✓
Percent of customers satisfied with field services, based on survey results	At least 90%	97%	✓
Number of complaints to the WUTC per 1,000 customers, per year	Less than 0.40	0.11	✓
Percent of calls answered live within 60 seconds by our Contact Center	At least 80%	81.5%	✓
Average time from customer call to arrival of field technicians in response to electric system emergencies, per year	No more than 80 minutes	39.9 minutes	✓
Average time from customer call to arrival of field technicians in response to natural gas system emergencies, per year	No more than 55 minutes	42 minutes	✓

Q. Would you please summarize the need for continuing investments in electric transmission infrastructure?

A. Our nation's electric utilities are facing times of unprecedented challenge when it comes to the forces driving the need for new investment in our transmission infrastructure, and Avista is no different. This growing demand for new investment has challenged our ability to fund all of our high-priority needs for electric transmission, which, themselves, are out of proportion to the investment requirements of our other infrastructure. Drivers for new investment include:

- System improvements needed to meet the myriad and expanding federal regulations governing nearly every aspect of our transmission business. Priority among these are the growing requirements to meet more restrictive transmission operations and planning standards, accompanied by the assessment of financial penalties for noncompliance.

- Timely replacement of end-of-life assets based on condition. This need is at an all-time high across the industry and will continue to increase year-over-year for at least the next two decades. This need is tied to the major expansion of new electric infrastructure built during the economic boom following the end of World War II. Because these assets are now at or near the end of their useful lives, a substantial boost in new investment is required, compared with previous years, just to maintain existing systems.

- External demands on our transmission system, including new transmission interconnections for third parties to integrate new, variable energy resources, particularly wind and solar. These interconnections require significant capital investment to extend or reinforce our transmission system in order to provide for these non-load-service uses of our system.

- A further driver is related to supporting development of the new energy services grid of the future. Emerging technologies are driving increasing digitization, distributed generation, energy storage, and other technologies that require adapting and upgrading the existing system, including new ways of engaging with our customers. Though primarily focused at the distribution level, these changes in our energy delivery business model are expected to impact transmission investments.

- Siting, permitting and constructing transmission assets has become more complex, time-consuming, and expensive due in part to increasing environmental, property rights, and land-use requirements. Permitting can extend over several years and typically includes conditions constraining how utilities site, design, construct and maintain these assets.

When it comes to the impact for our customers, who must ultimately pay for these requirements and investments, an exacerbating factor is our relatively stagnant load growth due to relatively low increases in population and declining use-per-customer. This translates into nearly flat revenues, which means that new capital investments must be covered by higher customer rates. Historically, annual increases in customer loads produced new revenues that were often sufficient to cover the costs for new investment and inflation without the need to increase rates.

Q. Please describe the Company's process for ensuring it is making timely investments in electric transmission to maintain compliance with mandatory federal standards.

A. The Company's process follows several steps in determining which projects should be recommended for funding each year to the Capital Planning Group. Projects are initially developed through planning studies, engineering and asset management analyses, and scheduled upgrades or replacements identified in the operations districts or in engineering groups. These projects undergo internal review by multiple stakeholders, who help ensure all system needs and alternatives have been identified and addressed. Projects advanced for funding enter a formal review process referred to as the "Engineering Roundtable" (ERT). This group carefully reviews the need for each project, the primary business driver, the alternatives considered, and the justification for the approach recommended. During the review, the potential benefits of any cross-business-unit synergies that could better optimize project benefits and scope are also identified and evaluated. The result of this process is a prioritized list of recommended projects that serves as a roadmap of investments sequenced by year for at least a ten-year time horizon. Using this roadmap, each department can plan ahead for the work they will be responsible to execute once the projects are approved for funding and implementation. Once evaluated, prioritized and sequenced, these projects move to the Capital Planning Group for final review and funding allocation. Representatives from eleven business units participate in the ERT process.

Q. Please summarize the need for ongoing investment in Avista's <u>natural gas distribution</u> system.

A. Natural gas is a foundational resource for Avista's customers and across the United States. It generates 36% of the nation's electricity (and growing) and heats more than half of America's homes, as well as provides feedstock, cooling and heating to commercial and industrial customers. The Company has experienced steady growth in natural gas customers, increasing our customer base nearly 20% since 2004. The Company has made substantial investments in natural gas infrastructure over this time frame, both to connect new customers as well as to reinforce existing supply lines to provide for the increased demand. The other substantial driver for new investments is maintaining compliance with federal and state regulatory requirements and effectively managing the continuing safety risks associated with our natural gas distribution system.

Q. Please summarize the need for ongoing investment in Avista's operations facilities and fleet resources.

A. Adequate operating facilities are a critical ingredient to the success of all organizations, especially those like Avista that are both asset and field-operations intensive. Our business requires diverse facility and fleet infrastructure to support our operations, including office and operations facilities, trucks, heavy equipment, tools, and material and supply storage areas. Though it is easy to take for granted, this infrastructure is at the heart of our ability to effectively and efficiently serve customers. In addition to employees associated with heavy infrastructure, our facilities are required to support a broad range of technical and administrative staff, including accountants, engineers, attorneys, customer service representatives, and information technology experts. Besides the facilities themselves, our operations depend on information technology and communication systems, and a myriad other support systems.

As would be expected for a Company that has been in business for 130 years, many of our facilities are quite dated. A few were built in the early years of our operations, while many, like our energy delivery infrastructure, were built during the economic expansion of the 1950s, placing them now in the range of 60 to 70 years old. Many are inadequate for the Company's current needs; given their age and condition, they require increasing levels of maintenance to keep them serviceable. In order to continue to cost-effectively serve our customers and provide adequate support for our employees going forward, buildings must be upgraded and updated to meet our current and future operating requirements. These requirements include a steady increase in the number of customers we serve, growing regulatory and technology complexity in our business, and the need to care for aging infrastructure, to name a few. All of these factors drive the need for more employees, new workspace, supporting infrastructure and related equipment. Trucks and vehicles have increased in size and complexity to operate more efficiently, but requiring larger service space and specialized maintenance and support.

We have also reorganized our business to respond more quickly to outages and equipment failures by locating stocks and supplies in closer proximity to crews, and storing parts and equipment in organized and efficient spaces for quick access. Common sense and good stewardship require caring for old buildings that need increasing levels of maintenance to keep them going – or at times complete replacement – even if they are still minimally functional. These investments are needed not only to keep up with current service requirements, but they also save money for our customers over the long term. The Company goes through systematic procedures and protocols to determine how to best manage its facilities. Part of this evaluation includes industry best practices as determined by national

organizations that specialize in this area, including Building Owners and Managers Association (BOMA) and the International Facility Management Association (IFMA).

III. MAJOR INVESTMENTS IN THE COMPANY'S ELECTRIC AND NATURAL GAS ENERGY DELIVERY SYSTEMS, FLEET, AND OFFICE AND OPERATIONS FACILITIES FOR 2017 AND 2018

Q. Please provide an overview of the significant electric and natural gas infrastructure and operations facilities and fleet investments made in 2017 and 2018.

A. As discussed by Company witness Ms. Schuh, for projects included since our last general rate case and through the 2018 test year, Avista's capital witnesses, including myself, will describe the "major projects" completed. For these major projects, I describe the need for the investments and explain how these projects benefit our customers. The determination of major project was based on any project, on a Washington-allocated basis, that was greater than $5 million for electric distribution and transmission, and greater than $2 million for natural gas, facilities, and fleet investments. Ms. Schuh will explain how these levels were arrived at. Please note that Ms. Schuh provides the Washington-allocated values, but for my testimony I discuss projects, and their costs, at a system level.

Table No. 2 below lists the projects and dollars transferred to plant in 2017 and 2018 for major projects in my area of responsibility. Business cases supporting each of these projects are provided in Exh. HLR-8 (please note that I will describe each of these projects, and reference the "Project #" before each item, which is meant to reference back to Table No. 2 below).

Table No. 2 – Major Projects for 2017 and 2018

Project #	Business Case	2017	2018	Exh. HLR-8 Page #
Electric				
1	Wood Pole Management	$ 9,584,384	$ 10,999,184	2
2	Distribution Grid Modernization	16,541,615	14,519,118	10
3	Electric Distribution Minor Rebuild	13,752,649	9,272,548	18
4	Electric Distribution Line Transformers	7,574,651	8,037,015	24
5	Westside 230 kV Substation - Rebuild		9,559,989	34
6	Devils Gap-Lind 115kV Transmission Rebuild	(349,451)	8,747,341	37
	Total Electric	$ 47,103,848	$ 61,135,195	
Natural Gas				
7	Aldyl-A Pipe Replacement	$ 18,371,496	$ 21,914,044	40
8	North Spokane - Hwy 2 HP Gas Main Reinforcement	2,633,799	42,168	47
9	NSC Greene St HP Gas Main Project		2,905,791	53
10	Natural Gas Non-Revenue Program	9,670,341	8,811,389	55
	Total Natural Gas	$ 30,675,636	$ 33,673,392	
General Plant				
11	Dollar Rd Service Center Addition and Remodel	$ 3,195,906	$ 17,195,902	60
12	Central Office Facility - Phase 2 (Fleet Services Bldg)	4,557,762	12,304,512	71
	Total General Plant	$ 7,753,669	$ 29,500,413	

Q. For 2017 and 2018 capital additions, for which you are responsible, is the Company seeking to include all of those investments in general rates in this case?

A. Yes. While we are providing more detailed information in testimony and exhibits related to the major projects in 2017 and 2018, Ms. Schuh addresses in her testimony that the Company has included all 2017 and 2018 capital projects, especially given that they are already embedded in our 2018 test year. Exh. HLR-7 provides a summary listing of all program and project investments in my area of responsibility for 2017 and 2018, not just "major" projects.

Q. Please describe the major projects and programs exceeding $5 million for electric and $2 million for natural gas and operations facilities.

A. As shown in Table No. 2, twelve major investments in these categories were transferred to plant during 2017 and 2018.

Q. Please describe Avista's approach to project management for these major project and program investments.

A. Proposals for individual projects and programs are initially reviewed and evaluated within each responsible business unit, often followed by review, evaluation and prioritization by higher-level review committees, such as Avista's Engineering Roundtable, the Aldyl A Pipe Advisory Group, and the Facilities Steering Committee. In this review, projects are evaluated for completeness of the problem statement, identification of alternatives, risks, and other elements. Finalized proposals are submitted to the Company's Capital Planning Group for consideration of funding. The Project Engineer or Manager identifies critical project milestones and the resources needed to achieve them. Major equipment may be purchased in this phase, necessary permitting carried out, and contracting processes initiated.

During execution, the Company's Project Managers establish inspection, monitoring, safety, environmental, and invoicing protocols. They apply standard project management practices to effectively guide the work, track and report out on status. Examples of tools that may be used, depending upon the size and scope of a project, includes Earned Value Measurement, cost-loaded scheduling, and Cost Performance Index (CPI) and Schedule Performance Index (SPI) to track budget and schedule.[7] Project results are generally reviewed

[7] Cost Performance Index (CPI) is computed by Earned Value / Actual Cost. A value of above 1 means that the project is doing well against the budget. Schedule Performance Index (SPI) represents how close actual work is being completed compared to the schedule. SPI is computed by Earned Value / Planned Value.

monthly, including budget allocations and variances, internal resource demands, customer care results and issues, and contractor performance. These results and potential program risks and shortfalls are reviewed monthly with the responsible Department Manager, applicable committee, or Director.

Q. Are alternatives vetted for these projects, before approvals are given?

A. Yes. Where there are alternatives, those are discussed within each business case (the major project business cases that I support have been included as Exh. HLR-8).

Q. How is Avista's leadership informed of the program status?

A. As described above, project and program information and results are communicated up departmental lines, through various committees, and to me via my Director-level direct reports. Program and project results are also reported directly to Avista's Capital Planning Group, and the Company's senior leaders, including myself, through steering committees, various business meetings, and presentations.

Project #1 - Distribution Wood Pole Management

Q. Would you please describe the Company's Distribution Wood Pole Management Program?

A. Yes. Avista has approximately 240,000 wood poles in its electric distribution system and a portion of these must be replaced each year based on asset condition, i.e., replacement of assets that have reached the end of their useful service life. Our wood poles are inspected on a 20-year cycle, resulting in our inspection of approximately 12,000 poles

each year.[8] Individual poles that don't meet our inspection requirements are replaced as part of capital follow-up work. In addition to the poles, the program also covers distribution transformers, cutouts, insulators, wildlife guards, lighting arresters, cross arms, pole guying, and grounds.[9]

Q. Did Avista consider alternatives to this pole inspection and replacement program?

A. Yes, the primary alternative to this proactive inspection and replacement program is to simply replace poles as they fail and fall down (asset strategy known as "run to fail"). Sub-alternatives evaluated include inspecting the pole population on a cycle time either shorter or longer than the current 20-year cycle.

Avista analyzed the option of replacing poles as they fail, as well as a range of inspection cycle intervals ranging from 5 to 25 years. The customer value of the 20-year cycle, as measured by customer rates of return, is superior to both the run-to-fail option and the 25-year cycle time. Cycle times shorter than 20 years do produce slightly better results as measured by their respective rates of return. This incremental increase in value is the result of avoiding failures in poles that would otherwise occur with longer inspection cycles. The Company is continuing with its 20-year inspection cycle. However, any reduction in cycle time requires an up-front increase in expenses to pay for the increased number of poles inspected each year, and a corresponding increase in requirements for capital replacements. Avista believes this incremental increase in costs would put too much near-term price pressure

[8] Avista's Wood Pole Inspection Program is funded as an expense.
[9] For a more in-depth description of this program, please see pages 57-63 of Avista's Electric Distribution Infrastructure Plan for 2017, provided as Exh. HLR-2.

on our customers, considered in combination with the margin of benefit and Avista's many other infrastructure investment needs.[10]

Q. How does this program benefit Avista's customers?

A. Absent this program, the Company would perform emergency replacements of wood poles on the system as they failed. Allowing the poles to fail often results in a service outage for customers on the line (29% of pole failures result in customer outages). The cost of replacing each pole as it failed would be greater than the programmatic repair and replacement of poles that fail to pass inspection. In short, customers would experience higher costs and less reliable service absent this program. A "run to fail" strategy also puts the safety of Avista's customers and employees at higher risk.

Q. Does the wood pole inspection program have any target completion date?

A. No, this is an ongoing infrastructure renewal program that maintains our always aging infrastructure in reasonable service condition at a reasonable cost.

Q. What capital additions for this program did Avista make in 2017 and 2018?

A. The total capital investment was $9,584,384 and $10,999,184 in 2017 and 2018, respectively, on a system basis.

Project #2 - Distribution Grid Modernization

Q. Please describe the Company's Distribution Grid Modernization Program.

[10] Please see Avista Utilities Infrastructure Investment Plan, Exh. MTT-4.

A. The purpose of this program is to cyclically rebuild and upgrade every electric feeder in Avista's distribution system, with the objectives of improving service reliability, capturing energy efficiency savings, and improving operational ability, code compliance and safety. These objectives are accomplished through the systematic replacement of aging equipment that has reached the end of its useful life, such as old poles, conductor, and transformers, with new and more energy-efficient equipment that ensures the long-term, efficient operability of the system. Other issues addressed on each feeder include pole re-alignment to address accessibility issues, rights of way concerns, potential feeder undergrounding, coordination of joint use facilities, and clear zone compliance. On qualifying feeders, additional system reliability value is captured by installing distribution line automation devices to help isolate outages and reduce the number of customers that experience a sustained outage (feeder automation).[11]

Q. Did Avista consider alternatives to this approach?

A. Yes, the primary alternatives to this program are to replace distribution assets[12] as they fail in service or to continue funding work under the various operational initiatives designed to treat individual aspects of each feeder, including the Wood Pole Management Program, Polychlorinated biphenyls (PCB) Transformer Change-out Program, Vegetation Management Program, Segment Reconductor and Feeder Tie Program, Overhead to Underground Conversion, and various other budgeted maintenance programs. Combining the work of these individual programs into one is not only more efficient, but it also enables the

[11] For a more in-depth description of this program, please see pages 64-69 of Avista's Electric Distribution Infrastructure Plan for 2017, provided as Exh. HLR-2.
[12] Such as an individual pole, cross arm, transformer, or conductor.

entire feeder to be evaluated for beneficial changes in design, alignment, and in other ways not possible when individual elements of the line are simply replaced in an "as is" configuration.

Q. Does the Grid Modernization program have any target completion date?

A. No, this is an ongoing infrastructure renewal program. This program, originally based on a 60-year cycle interval, maintains and improves our always aging infrastructure to best meet the contemporary and future needs of our customers in a least-cost manner.

Q. What capital additions for this program did Avista make in 2017 and 2018?

A. The total capital investment was $16,541,615 and $14,519,118 in 2017 and 2018, respectively, on a system basis.

Q. How does this program benefit Avista's customers?

A. Absent this program, the Company would continue to treat every feeder in its system under individual maintenance programs. The value created by opportunities to improve the design, construction and operation of the feeder would be missed. Further, bundling the work of these individual programs for targeted feeders into one coordinated effort improves the cost efficiency by reducing redundant travel costs and capturing labor productivity. In short, customers would experience higher costs for a less robust system absent this program.

Project #3 – Electric Distribution Minor Rebuild

Q. Please describe the Company's Distribution Minor Rebuild Program.

A. The purpose of this program is to replace assets that have failed and respond to a range of operations needs in order to provide public and employee safety and the continuity and adequacy of service to our customers. In addition to needed work that is ancillary to customer-requested changes, minor rebuilds and replacement of individual assets are required across the distribution system to maintain system integrity, reliability, and safety.[13]

Q. Did Avista consider alternatives to this approach?

A. There are no traditional alternatives to the work completed under this program since it consists of many, small unplanned projects[14] across the entire electric distribution system. These small, unplanned projects are responsive to a range of factors generally beyond the control of the Company. Examples of these factors include: ancillary work required by customer-requested rebuilds,[15] "trouble work" – like the repair of damage from a car-hit-pole, investments needed to support joint use of our facilities, replacement of deteriorated or failed equipment that is not scheduled for planned asset condition replacement, and small general rebuilds required to meet National Electric Safety Code (NESC) requirements, remediate failed, under-sized or unsafe equipment, and install needed switches, regulators, line reclosers, etc. There are instances among the small rebuild projects where limited alternatives are evaluated in the design phase by the individual project designer. In general, however, there is

[13] For a more in-depth description of this program, please see pages 80-82 of Avista's Electric Distribution Infrastructure Plan for 2017, provided as Exh. HLR-2.

[14] For example, the average cost of each of these small projects is approximately $4,500, which translates to over 2,000 individual projects in a given budget year.

[15] These investments include work required to properly maintain the system, but that are not reasonably covered by the tariffed financial contribution required of the customer.

no reasonable alternative to timely making these investments once the need has been identified.

Q. Does the distribution minor rebuild program have any target completion date?

A. No, this is an ongoing infrastructure renewal and maintenance program that ensures our always-aging infrastructure is maintained in proper condition to provide for the needs of our customers and the safety of the public and our employees.

Q. What capital additions for this program did Avista make in 2017 and 2018?

A. The total capital investment, on a system basis, was $13,752,649 and $9,272,548 in 2017 and 2018, respectively.

Q. How does this program benefit Avista's customers?

A. The investments made under this program allow the Company to continue to provide electric service that meets the needs of our customers in a safe, reliable, compliant and affordable manner.

Project #4 - Electric Distribution Line Transformers

Q. Please describe the Company's investments in Distribution Line Transformers.

A. Avista purchases new distribution line transformers each year that are used to support several programs meeting a range of customer needs. Although these transformers are installed under different programs, each with their own individual business case, their cost is accounted for in the New Revenue Growth business case, which is provided in Exh. HLR-8.

Approximately half of these new units are installed in applications to serve customers that are new to Avista under the customer requested investment driver (New Revenue Growth). The balance is used to replace end-of-life units based on Asset Condition through the various maintenance programs, some of which I have already described above, including Wood Pole Management, Grid Modernization, Electric Distribution Minor Rebuild, and the PCB Transformer Replacement Program.

Q. Does the Company's purchase of distribution line transformers have any target completion date?

A. No, this investment is responsive to the ongoing need to respond to our customers' requests for service and to support the infrastructure renewal programs that maintain and improve our always aging infrastructure to best meet the contemporary and future needs of our customers in a least-cost manner.

Q. What capital additions for this program did Avista make in 2017 and 2018?

A. The capital investment for new transformers was $7,574,651 and $8,037,015 in 2017 and 2018, respectively.

Q. How does this program benefit Avista's customers?

A. Absent this annual investment, the Company would not be able to respond to customers' requests for service, nor be able to replace PCB transformers on the system, replace end-of-life transformers as part of the Wood Pole and Grid Modernization programs, or make emergency replacements of failed transformers necessary to restore electric service to our customers. Allowing the transformers to fail, in instances where the unit leaks oil, creates a hazardous spill that poses a health and environmental hazard and results in an

expensive remediation effort. Avoiding the health, environmental, and financial impacts of these spills through proactive replacement is cost-effective for customers, when combined with the associated improvement in service reliability and the energy savings provided by the new transformers.

Project #5 - Westside 230 kV Substation Rebuild

Q. Please describe the Company's investments in the Westside 230 kV Substation (Westside).

A. Westside is a multi-phase project: Phase 1 was completed in 2018, and a portion of the work scheduled as part of Phase 2 was also completed that year. Phase 1 consisted of extending the existing 115 kV and 230 kV buses to allow for the replacement of the 250 MVA Autotransformer Number 1, while Phase 2 involves replacing Autotransformer Number 2 with a new, larger 250 MVA unit.

Q. Does the Westside 230 kV Substation have any target completion date?

A. As noted above, Phase 1 and portions of Phase 2 were completed in 2018. An additional portion of Phase 2 work went into service in March 2019, and the remaining portions of Phase 2 will go into service from December 2019 through the first three quarters of 2020.

Q. What capital additions for this project did Avista make in 2017 and 2018?

A. The investment made for the plant placed in service in 2018 was $9,559,989, on a system basis.

Q. How does this program benefit Avista's customers?

A. The capacity of this substation had to be substantially increased in order to eliminate overload of the existing autotransformers under certain operating contingencies. This investment was mandatory to meet North American Electric Reliability Corporation (NERC) compliance obligations to not exceed facility and equipment ratings. It was also a prudent investment for Avista to make to continue providing adequate load service to its customers while not impacting equipment life or capability due to potential overloading.

Project #6 - Devil's Gap – Lind 115 kV Transmission Line Rebuild)

Q. Please describe the Company's investments in the Devil's Gap – Lind 115 kV Transmission Line Rebuild Project.

A. The Devil's Gap – Lind transmission line was commissioned in 1916 and was built in part to interconnect with the transmission system of Pacific Power & Light, creating the very first interconnection between utility systems in the Pacific Northwest. Some of the wood poles on this line today remain in service from its original construction. This line runs from Devils Gap (near the Company's Long Lake and Little Falls Projects) in Lincoln County, south to the town of Lind in Adams County, and consists mainly of "H-Frame" structures constructed of western red cedar, douglas fir, and western larch. Rebuilt structures were repaired or replaced with steel poles and crossarms, and the work also included placing the original copper conductor in sheaves and re-sagging and re-clipping the lines as needed. This project, which was the third phase of this line rebuild, focused on approximately 20 miles of this 74-mile long circuit.[16]

[16] The need for these and other types of electric transmission investments is further described in the Company's Electric Transmission Infrastructure Plan for 2018, provided as Exh. HLR-6.

Q. When was this project completed?

A. The work was completed in the first quarter of 2018.

Q. What capital additions for this project did Avista make in 2017 and 2018?

A. The capital transfers to plant in 2018 totaled $8,747,341, on a system basis.

Q. How does this program benefit Avista's customers?

A. Absent this project, the Company would perform emergency replacements of elements of the line as they failed in service. While this approach can be used for managing these types of assets, the emergency repairs and replacements are more expensive than when performed in a programmatic approach, and customers will be prone to experience more service outages, which can require substantial time to repair on this remote transmission line. Transmission infrastructure failure also increases wild fire risk. The selected alternative was financially better for our customers, with all factors considered.

Project #7 - Aldyl A Pipe Replacement Program

Q. Please describe the Company's investments in the Priority Aldyl A Pipe Replacement Program.

A. The Aldyl A Pipe Replacement Program[17] is a 20-year structured pipe replacement effort with dedicated internal and external resources focused on reducing natural gas system risk, on a prioritized basis, by replacing priority Aldyl A pipe throughout Avista's

[17] This pipe replacement program is managed by the Company's Gas Facility Replacement Program, which is the organizational program responsible for managing all aspects of replacement planning and execution of all individual replacement projects. Multiple individual projects are typically underway across multiple jurisdictions each year.

natural gas distribution system. The program was initiated in 2011 and is slated to be completed by year 2032.[18]

Q. Does the Priority Aldyl A Pipe Replacement Program have a target completion date?

A. Yes, it does. Under the current plan, Avista expects to replace all of the priority Aldyl A piping in its system in all jurisdictions by year 2032.

Q. What capital additions for this program did Avista make in 2017 and 2018?

A. The capital investment for this program, on a system basis, was $18,371,496 and $21,914,044 in 2017 and 2018, respectively.

Q. How does this program benefit Avista's customers?

A. Absent this program, the Company would perform emergency replacements of sections of priority Aldyl A pipe as it failed in service. Failures in the piping result in underground leaks that have the potential to migrate into homes and businesses, creating a significant risk for our customers, citizens, first responders, and our employees. As noted below, this approach would eventually result in a number of failures each year that would be unacceptable. Replacing this pipe in our system in the manner undertaken will help the Company shield our customers from this unreasonable risk and help optimize and levelize the costs they pay for the work to be done.

Q. Please describe the alternatives evaluated and how this program approach was selected.

[18] For a more in-depth description of this program, please see Avista's Natural Gas Infrastructure Plan for 2019, provided as Exh. HLR-3.

A. As noted above, the primary alternative to this proactive replacement program was to simply replace sections of the subject pipe as it failed in service over time. The Company's asset management analysis, however, revealed that this approach would eventually lead to a failure rate that would be unacceptable to Avista, our customers, the general public, and regulators.[19] The question, then, was to determine the time horizon over which a replacement program should be conducted. The analysis showed that a replacement interval in the range of 25 to 30 years would likely still result in an unacceptable increase in the number of annual leaks, while an interval in the range of 10 to 15 years would result in substantially-greater cost pressure on customers, exacerbate the complexities and demands of the project, and fail to produce enough of a reduction in annual leaks to overcome these burdens. A time interval in the range of 20 years was determined to be optimal. The Company has continued to re-evaluate the analysis since the initial work was completed, which has confirmed Avista's approach and timeline for managing this issue. I have provided the most recent report on this analysis, conducted in 2018, as Exh. HLR-5.

Project #8 - North Spokane Highway 2 High-Pressure Main Reinforcement

Q. Please describe the Company's investments in this natural gas system reinforcement project.

[19] In February 2012, Avista's Asset Management Group released its findings in the report titled "Avista's Proposed Protocol for Managing Select Aldyl A Pipe in Avista Utility's Natural Gas System." The report documents specific Aldyl A pipe in Avista's natural gas pipe system, describes the analysis of the types of failures observed, and the evaluation of its expected long-term integrity. The report proposed the undertaking of a 20-year program to systematically replace select portions of Aldyl A medium density pipe within its natural gas distribution system in the States of Washington, Oregon, and Idaho. This report is provided as Exh. HLR-4.

A. This project installed an extension of the existing high-pressure main to relieve a capacity deficiency on this portion of the Company's natural gas distribution system.[20] Beyond the service risk to many residential and commercial customers, this deficiency also included our inability to serve one large firm-service customer during periods in the spring and fall months. Approximately 12,000 feet of 8-inch high-pressure gas main and one new regulator station were installed as part of this project.[21]

Q. What was the timeline for completing the North Spokane Highway 2 High Pressure Main Reinforcement Project?

A. The long-term need for this project was identified well prior to the initiation of construction in 2016. The pipeline route was cleared of large vegetation and graded, and construction of the 8" steel gas main commenced in August 2017. Construction of the new line was completed in December 2017.

Q. What were the capital additions required for this major project?

A. The capital investment for this Washington project was $2,633,799 in 2017, with a trailing amount of $42,168 in 2018.

Q. How does this project benefit Avista's customers?

A. Without this investment, the Company would not have been able to reliably serve a portion of our firm customers in the North Spokane area. Avista's system modeling showed that approximately 4,100 customers would lose natural gas service during a cold

[20] This portion of Avista's system was unable to reliably serve customers on a modeled "Design Day."
[21] For more background on the need for these types of reinforcement programs, please see Avista's Natural Gas Infrastructure Plan for 2019, provided as Exh. HLR-3.

weather Design Day.[22] Not only can Avista now serve its existing customer loads reliably, but the project also provides capacity for expected future load growth in the area.

Project #9 - NSC Green Street High-Pressure Main Project

Q. Please describe the NSC Green Street High-Pressure Main Project.

A. In preparation for the next phase of the Washington State Department of Transportation's North Spokane Corridor Freeway Project, Avista was required to relocate approximately 1,760 feet of 20" diameter high-pressure gas pipeline and a district regulator station. The original line was installed in 1956 and is a main source of natural gas for our Spokane customers. The new pipeline section and regulator station were installed adjacent to the future freeway route in a dedicated utility easement.

Q. Did Avista consider alternatives to the selected project?

A. Yes. Avista evaluated different potential routes for the new pipeline. The route chosen, adjacent to the future freeway, had the least pipe footage and was the most economical of the options. An added benefit of the route selected is that the dedicated easement protects Avista's customers from bearing the costs associated with any potential future road work.

Q. What was the timeline for completing the NSC Green Street High-Pressure Main Project?

A. This main pipe project had to be completed before spring 2019 to accommodate the next-scheduled construction phases of the North-South freeway project.

[22] Natural gas utilities are expected to provide a firm level of service to customers on an extreme cold weather day referred to as the Design Day. The Design Day is measured in heating degree days (HDD), where the ambient air temperature is translated into heating degree days.

Additionally, the existing pipeline could only be taken out of service in July and August without dropping load service to our customers in the City of Spokane. Accordingly, the work was completed in early September of 2018.

Q. What were the capital additions required for this project?

A. The total investment was $2,905,791, which occurred in 2018. This was a Washington-specific capital expenditure.

Q. How does this project benefit Avista's customers?

A. This project allows Avista to continue providing our customers with adequate, safe and reliable natural gas service, which would not have been otherwise possible without relocating this major supply line.

Project #10 - Natural Gas Non-Revenue Program

Q. Please describe the Company's investments made under the Natural Gas Non-Revenue Program.

A. This annual program, which is part of the Company's Failed Plant and Operations capital investment driver, includes investments to replace obsolete facilities, pipe and equipment at the end of their useful life or that have failed, equipment and/or technology to enhance gas system operation and/or maintenance, projects to improve public safety, and improvements ancillary to customer requested work.[23] These investments, while necessary for safe and reliable operation of our system, are not part of our programs to fund new customer

[23] Work requested by customers is generally, by tariff, performed at the customer's expense. Under certain circumstances, however, Avista may choose to perform additional work needed on the system not related to the customer's request. An example is to replace an existing steel service with polyethylene pipe to eliminate the possibility of future deficiencies in cathodic protection and to reduce future maintenance related to that steel service. The cost of this conversion are assigned to this Program.

connects, increase performance or capacity, or make systematic replacements based on asset condition.[24]

Q. Does this Program have any target completion date?

A. No, this is an ongoing infrastructure renewal program that maintains our always aging infrastructure in safe and reliable service condition at a reasonable cost.

Q. What capital additions for this program did Avista make in 2017 and 2018?

A. The capital investment for this program, on a system basis, was $9,670,341 and $8,811,389 in 2017 and 2018, respectively.

Q. How does this program benefit Avista's customers?

A. Remediating issues on our natural gas system in the manner undertaken helps the Company: meet operating and compliance requirements, provide our customers reliable service, shield them from unreasonable risk, and optimize and levelize the costs they pay for work that needs to be done.

Project #11 - Dollar Road Natural Gas Service Center Project

Q. Please describe the Company's investments in the Dollar Road Natural Gas Service Center Project.

A. Avista's Dollar Road Service Center (Service Center), constructed over 60 years ago, is approximately 22,000 square feet in size, and serves as the primary natural gas operations center for the greater Spokane metropolitan area, including support for natural gas

[24] For additional information on this program, please see Avista's Natural Gas Infrastructure Plan for 2019, provided as Exh. HLR-3.

operations in our outlying communities. The building was constructed in 1956 and at the time Avista acquired the Spokane Natural Gas Company operations in 1958, this facility served 9,962 natural gas customers. The overall site has been improved in prior years by asphalting exterior yards for gas pipe, material, and equipment storage. Adjacent properties have also been acquired to provide needed storage capacity, and vehicle storage and Fleet Services buildings were also constructed.

Many of the elements of the Service Center building itself were in end-of-life condition and in need of replacement. There were a range of other objectives the Company was meeting with this Project. Thus, the selected strategy was to remove the existing Service Center facility and replace it onsite with a new Service Center. The project scope also included an increase in the size of the outdoor storage yard for needed equipment, vehicles, and materials.

Q. What capital additions did Avista make in 2017 and 2018?

A. On a system basis, the capital investment for this project was $3,195,906 and $17,195,902 in 2017 and 2018, respectively.

Q. How does this program benefit Avista's customers?

A. As noted above, the Dollar Road Service Center is Avista's primary natural gas operations facility in the greater Spokane area, staffed by approximately 70 field crew and administrative and support employees. The Service Center also supports our local natural gas crews for the communities of Ritzville, Colville, and Davenport. The service center now provides direct and ancillary support for the service of 167,000 natural gas customers. The new Service Center allows the Company to continue providing our customers reasonable natural gas service, and at lower, long-term cost than keeping the existing facility.

Project #12 – Central Office Facility - Phase Two (Fleet Services Building)

Q. Please describe the Company's investments in its Spokane Central Office Facilities.

A. Avista has taken a holistic approach to address wide-ranging needs at its Central Office Facility, included under the "Campus Repurposing Phase 2" Business Case. Primary among the needs addressed were: 1) create needed workspace for an increasing employee population; 2) improve the safety and efficiency of employee, service-related and service provider traffic on campus; 3) create new fleet management and maintenance facilities to replace outdated and inadequate work space and processes; 4) provide adequate materials storage space and create more flexibility in space for emergency operations, and 5) provide safe and adequate parking for our customers, visitors, and our employees.

The Avista Central Office Facility or "corporate campus" was developed in the 1950s to consolidate all utility operations, which were at that time spread throughout the City of Spokane. At the time Avista constructed its Central Office Facility, the Company served a total of 102,685 electric, and 9,962 natural gas customers. While the original footprint of the campus was adequate at the time it was built, there has been a nearly continuous need to expand its size to keep up with the growing needs of our business. From the late 1980s through 2014, the Company strategically acquired land parcels as they became available to the north of the campus. Today, the campus encompasses 36 acres, constrained on the east by the Spokane River, to the west and south by Mission Park, the Burlington Northern Railroad, and developed residential neighborhoods, and to the north by residential housing and assisted living facilities. Today, the Company serves a total of 387,662 electric and 354,955 natural gas customers.

Avista made the decision in 2011 to approach its current and future facility needs through a comprehensive planning process. The result of this approach was a comprehensive campus plan that anticipated and planned for our service needs for the next 50 years. Our focus was to minimize the need to provide reactive solutions to emerging service needs and to invest in the best long-term plan for the benefit of our customers. In the current phase of this major project, Avista completed construction of a new Fleet Services building in 2018, which I describe and discuss in more detail, below.

Q. Does the Campus Office Facility Phase 2 have a target completion date?

A. Yes. Because this is a long-term, comprehensive business case, several major projects, like the Fleet Building, have been completed in earlier phases in prior years. The overall business case for the Phase 2 projects is slated for completion mid-year 2020.

Q. What capital additions in this project did Avista make in 2017 and 2018?

A. On a system basis, the capital investment for this project was $4,557,762 and $12,304,512, in 2017 and 2018, respectively.

Q. How does this program benefit Avista's customers?

A. As noted earlier in my testimony, having adequate office and operations facility space is at the heart of our ability to effectively and efficiently serve customers. Our customers today and in the future will benefit directly as we are able to better serve them more efficiently and cost effectively than if we had not chosen to make these strategic investments.

IV. 2019 PRO FORMA ELECTRIC AND NATURAL GAS ENERGY DELIVERY SYSTEMS, FLEET, AND OFFICE AND OPERATIONS FACILITIES

Q. Are you supporting pro forma 2019 capital additions as a part of your testimony in this case?

A. Yes. Table No. 3 below provides a listing of the 2019 pro forma capital additions that fall under my areas of responsibility.

Table No. 3 – Pro Forma Capital Additions for 2019

			Exh. HLR-8
Project #	**Business Case**	**2019**	**Page #**
1	Wood Pole Management	$ 10,520,971	2
2	Distribution Grid Modernization	9,531,914	10
3	Electric Distribution Minor Rebuild	9,018,730	18
4	Electric Distribution Line Transformers	5,300,126	24
7	Aldyl-A Pipe Replacement	24,043,893	40
10	Natural Gas Non-Revenue Program	5,979,037	55
13	South Region Transmission Voltage Control	7,416,136	92
14	Substation Rebuilds	7,215,000	95
15	Substation Asset Management	5,000,000	95
16	Lind-Warden 115kV Transmission Line Rebuild	8,795,004	98
17	CDA-Pine Creek 115kV Transmission Line Rebuild	6,215,983	101
18	Central Office Facility-Phase 2 (Campus Parking)	16,052,331	71
19	Deer Park Service Center	6,165,985	105
20	Fleet Operations Equipment	8,582,123	114
Total 2019 Capital Additions		$129,837,233	

Q. How did you determine the capital investment threshold used for pro forma 2019 inclusion?

A. As Ms. Schuh discusses in more detail in her testimony, the Company used a $5 million capital investment threshold, on a system basis, for purposes of inclusion of pro forma capital projects.

Q. It appears that Project #s 1, 2, 3, 4, 7 and 10 listed in Table No. 2 above are duplicative of projects previously listed in Table No. 1 and fully described in the previous section of your testimony. Is that the case?

A. Yes, Project #s 1, 2, 3, 4, 7 and 10 are what we term "programs" in that they are ongoing, year over year projects, rather than being a distinct project. As such, the investment in these areas that occurred in 2017 and 2018 will occur again in 2019.

Q. Is all of the support for those programs in 2019 the same as what you previously described for 2017 and 2018?

A. Yes, the support is the same, and therefore I will not repeat that same information for those programs again in this section of testimony.

Project #13 - South Region Transmission Voltage Control

Q. Please describe the Company's investments in the South Region Transmission Voltage Control Project.

A. This project was developed to resolve an ongoing issue with high voltage on the 230 kV transmission system in the Lewiston/Clarkston area. This voltage problem is persistent most months of the year, peaking generally during the overnight hours (with the exception of heavy loads in summer months). This high-voltage condition results when long, lightly-loaded transmission lines produce large amounts of line charging current, which leads to the generation of more reactive power (VARs). This increase in reactive power increases the operating voltage on the system. This project addresses this issue by installing two 50 MVAR shunt reactors to the existing 230 kV bus at North Lewiston substation. Shunt reactors are used in high-voltage electric transmission systems to absorb reactive power to stabilize

the system voltage and increase energy efficiency during periods of high load variability. Shunt reactors are the most compact device commonly used for reactive power compensation in long, high-voltage transmission lines.

Q. Does the South Region Transmission Voltage Control project have any target completion date?

A. The project is scheduled to be completed in early 2019.

Q. What capital additions for this project does Avista expect to make in 2019?

A. The expected investment is $7,416,136, on a system basis.

Q. How does this program benefit Avista's customers?

A. Our customers will benefit from investments that support our prudent and compliant operation of our facilities in a sound financial manner. The alternative, operating at a higher voltage condition, does not mitigate expected capacity constraints and is not in compliance with NERC operating regulations.

<u>Project #14 - Substation Rebuilds Project</u>

Q. Please describe the Company's investments in the Substation Rebuilds project.

A. Projects to rebuild the Company's aging electric substations involve replacing and upgrading structures, fencing, grounding, apparatus and equipment as it approaches end-of-life, becomes obsolete, or is necessary to maintain safe and reliable operation of Avista's transmission and distribution systems. While asset condition of the overall substation, including major apparatus and equipment, is the primary driver for these investments,

additional factors may broaden the scope of a station rebuild project. These factors include operational and maintenance requirements, updated design and construction standards, SCADA communications, future customer load-service needs, and other programs such as Grid Modernization. This program differs from the Substation Asset Management program (described below) in that the latter is focused on replacing aging apparatus and equipment, and not rebuilding or refurbishing the entire substation.

Q. Does the Substation Rebuilds program have any target completion date?

A. No, this is an ongoing infrastructure renewal program that maintains our always aging electric substations in reasonable service condition at a reasonable cost.

Q. What capital additions does Avista expect to make in 2019 for this project?

A. The planned investments for substation rebuilds in 2019 is $7,215,000, on a system basis.

Q. How does this program benefit Avista's customers?

A. If Avista's electric substations are not timely refurbished or rebuilt then the risk of equipment failure increases, potentially resulting in an outage for a large number of customers, as well as, the added cost of performing emergency repairs or replacements. Our customers benefit from prudent investments that support the reliable operation of our facilities in a sound financial manner.

Project #15 Substation Asset Management

Q. Please describe the Company's investments in Substation Asset Management.

A. The Substation Asset Management project focuses on replacement and upgrade of major substation apparatus and equipment as it approaches end-of-life or becomes obsolete. Substation major apparatus include high-voltage circuit breakers, lower voltage circuit breakers and reclosers, circuit switchers, capacitor banks, power transformers, and step voltage regulators. Associated equipment includes relays, meters, surge arrestors, station rock and fencing, panel houses, instrument transformers, high-voltage fuses, air switches, autotransformer diagnostic equipment, and batteries and chargers. Failure to timely replace old and obsolete equipment increases the risk of more frequent and/or extended duration outages. Substation outages can have significant consequences as they have the potential to impact a large number of customers.

Q. Does the Substation Asset Management program have any target completion date?

A. No, this is an ongoing infrastructure renewal program that maintains our always aging electric substations in reasonable service condition at a reasonable cost.

Q. What capital additions for this project does Avista expect to make in 2019?

A. The expected investment in 2019 is $5,000,000, on a system basis.

Q. How does this program benefit Avista's customers?

A. If major apparatus and equipment in Avista's electric substations is not timely replaced, then the risk of equipment failure increases, potentially resulting in an outage for a large number of customers, as well as, the added cost of performing emergency repairs or replacements. Our customers benefit from prudent investments that support the reliable operation of our facilities in a sound financial manner.

Project #16 - Lind – Warden 115 kV Transmission Line Rebuild Project

Q. Please describe the Company's current investments in the Lind - Warden 115 kV Transmission Line Rebuild Project.

A. The Lind – Warden Project includes both the rebuild and reconductor of 21.7 miles of 115 kV transmission line connecting the Company's Lind and Warden substations. While this line has been evaluated in the past for rebuild based on asset condition, the current driver for this investment is the requirement to provide a transmission interconnection for the 144 MW Rattlesnake Flats Wind Generation Project. This proposed wind facility is located southeast of Lind, Washington, and the energy from the project will travel from the Lind substation across the upgraded Lind – Warden line. This interconnection project also requires the Company to build a new 115 kV switching station at the point of interconnection.

The Lind – Warden Rebuild Project will replace existing H-frame wooden structures with a combination of single pole and H-frame steel structures, as required, and replace the original copper conductor and install new fiber communications. Approximately 255 structures will be replaced, and where possible, eliminated, by changing the structure locations using single-pole structures to accommodate distribution underbuild[25] and optimizing span lengths.

Q. Did this project have a target completion date?

A. Yes, this work was completed in the first quarter of 2019.

Q. What capital additions for this project did Avista make in 2019?

[25] Attaching distribution feeder circuits where possible to electric transmission structures, below the transmission lines, is referred to as distribution "underbuild." Having one set of structures do double duty saves customers money.

A. The capital investment already transferred to plant for 2019 totaled $8,795,004.

Q. How does this program benefit Avista's customers?

A. Avista is required to provide transmission interconnections and services to requesting customers. The cost of the necessary investment is defrayed by the interconnection customer who pays for this service over the life of the contract.

Project #17 - Coeur d'Alene – Pine Creek 115 kV Transmission Line Rebuild Project (Phase 3)

Q. Please describe the Company's current investments in the Coeur d'Alene – Pine Creek 115 kV Transmission Line Rebuild Project.

A. The Company has identified the need for additional transmission capability to support load service in the Coeur d'Alene area and the alternative selected requires the Coeur d'Alene – Pine Creek 115 kV line to be rebuilt, increased in transfer capacity, and be operated in the "closed" position. Originally constructed in 1930 as the Beacon – Burke Number 4 line, the Coeur d'Alene – Pine Creek 115kV transmission line is composed of wood poles and structures, and a mix of conductor sizes. This line supports four substations (Coeur d'Alene 15th St., Blue Creek, Mission, and Pine Creek) throughout its 30-mile length. The existing conductor has a relatively low power transfer capability. Due to low power capability, the line is normally operated in an "open" position on the Pine Creek side of the Blue Creek Substation, where an auto-sectionalizing scheme is deployed for operational reliability. Phase 3 of this Project includes both the rebuild and replacement of structures and the reconductor of approximately 9 miles of the line. To increase its transfer capacity, the line will be equipped with larger, heavier

conductor, which requires the aging poles and crossarms to be rebuilt or replaced.[26] New construction will consist of steel poles and structures supporting new conductor with an approximate 250 MVA capacity. The project will also include installation of an optical ground wire (OPGW) to provide fault and lightning protection and support digital communications.

Q. Does this project have a target completion date?

A. Phase 3 construction is scheduled to begin in early summer 2019, with an expected completion date of November, 2019.

Q. What capital additions for this project does Avista expect to make in 2019?

A. The Engineering Level Estimate for Phase 3 is $6,215,983, on a system basis.

Q. How does this program benefit Avista's customers?

A. Avista's transmission system assessment process supports the requirements of NERC Reliability Standards and Federal Regulatory Energy Commission Order 890. The Company's System Assessment conducted in 2011 identified performance issues in the Coeur d'Alene area during peak summer-load scenarios; certain operating contingencies resulted in transmission lines exceeding applicable facility ratings. Subsequent to the studies performed in 2011, more stringent performance criteria were applied, consistent with NERC and Avista's standards, which included evaluating two concurrent transmission line outages. Avista's analysis showed it could meet required performance standards in the Coeur d'Alene Area under these conditions by providing an additional transmission source to the area. Our customers will benefit directly from this investment, since it will allow the Company to meet its load-service obligations in the area in a compliant, prudent, and cost effective manner.

[26] The reconductoring of the line is to meet performance and capacity needs, however, much of the rebuild of the line itself is supported by the asset condition driver.

Project #18 – Central Office Facility - Phase Two – Campus Parking Structure

Q. Please describe the Company's investments in its Spokane Central Office Facility.

A. Under Project #12, I provided an overview of the Phase 2 Spokane Central Office Facility Projects, which for that project included the new Fleet Services building. In the current phase of this major project, Avista has commenced construction of a Campus Parking Structure needed to accommodate vehicle parking for employees working at the Company's central office. Nearly 1,300 employees currently report to work at the main campus, which has a parking capacity of 728 spaces available to employees.[27] The new structure will add up to 500 additional parking spaces in a relatively small footprint (0.71 acres) versus the 10 acres that would have been required for surface-level parking. This solution frees up valuable campus space (as I've noted earlier in my testimony) for more efficient uses such as equipment and material storage areas, staging areas, truck parking and maneuvering, and future growth.

A primary concern for Avista in determining how to address the need for more employee parking was the safety of employees themselves. According to the National Safety Council, potholes or cracks in parking lot surfaces, debris, poor lighting, puddles, snow, and ice can lead to pedestrian injuries (not to mention crossing the railroad tracks and right-of-way during the darkness). Slips, trips and falls are common in parking lots, and they are also highly-vulnerable areas for crime, according to the Urban Institute Justice Policy Center.[28]

[27] This number does not include gravel parking areas used by employees on the right-of-way of the Burlington Northern Railroad across the tracks from the campus.

[28] Urban Institute Justice Policy Center, https://www.urban.org/sites/default/files/publication/31261/1001193-Preventing-Car-Crimes.PDF

Avista employees experience these issues, having been confronted, chased and threatened and having their vehicles vandalized, burglarized or stolen from remote Company parking areas. Having to search for twenty minutes for a parking space, walk a mile or more to get to the office building from remote parking (potentially in icy and snowy conditions), or fear the potential of threats related to parking in risky areas has had a real impact on employee job satisfaction.

Q. Does the Campus Parking Structure have a target completion date?

A. Yes, the Campus Parking Structure is slated for completion in 2019.

Q. What capital additions in the Campus Parking Structure does Avista expect to make in 2019?

A. The expected capital investment for this facility in 2019 is $16,052,331, on a system basis.

Q. How does this program benefit Avista's customers?

A. As noted earlier in my testimony, having adequate office and operations facility space is at the heart of our ability to effectively and efficiently serve customers. Please see my response to this question for Project #12, discussed earlier in my testimony.

Project #19 - Deer Park Operations Service Center Project

Q. Please describe the Company's investments in the Deer Park Operations Service Center Project.

A. Avista's Deer Park Operations Service Center serves as the main electrical and gas operations facility for approximately 16,500 customers in the Deer Park and surrounding area, such as Colbert, Chattaroy, Elk, and Loon Lake. This facility also supports our local

operations during storms and power outages in the north Spokane County and Stevens County regions to help serve an additional 34,000 customers. The existing Deer Park Service Center was constructed in about 1971 and many of its building components, systems, and equipment have naturally deteriorated over time. Improvements to the site made over time include new and replacement asphalt for exterior storage yards, new roofing, a vestibule addition, and a new pole-structure building for service vehicle, equipment, and truck parking.

In addition to the deteriorating condition of the facility, the original service center was designed to support half the number of customers we are now serving. This increase in customers has resulted in a corresponding increase in the number of employees, construction and service equipment, and material storage based at this facility. There are also environmental concerns with the existing site that have required remediation, proper material removal and clean up. Besides having inadequate storage area, the existing service building is very cramped for modern line truck and service vehicles, which have grown considerably in length and size in the last 50 years. Several of our very expensive trucks must currently be parked outside, because they cannot be fit inside the service building.

Q. Does the Deer Park Service Center Project have a target completion date?

A. Yes, the Service Center Project was completed in the first quarter of 2019.

Q. What capital additions in the Deer Park Service Center Project does Avista expect to make in 2019?

A. The capital investment for this facility in 2019 is $6,165,985, on a system basis.

Q. How does this program benefit Avista's customers?

A. As noted earlier in my testimony, having adequate office and operations facility space is at the heart of our ability to effectively and efficiently serve customers. Please see my response to this question for Project #12, discussed earlier in my testimony.

Project #20 - Fleet Operations Equipment

Q. Please describe the Company's investments in its Fleet Operations Equipment.

A. Like all assets, fleet equipment requires an increase in costs through its lifecycle to maintain it in safe and efficient operating condition. These costs, resulting from the need to replace worn parts and rebuild components, steadily accelerate as the average age of your fleet increases. Put simply, as fleet equipment ages, it requires more complex repairs requiring more parts and more hours to perform the work. Those increasing costs are not just the burden of Fleet; the users will see the impact in lost productivity and downtime. In a 2011 analysis of Avista's class 46 vehicles, and a comparative analysis performed in 2016, the Company documented a 52% reduction in labor hours required per truck resulting from reducing the average age of the fleet from 9.5 years to the industry average of 5.5 years.

Q. Does the Fleet Operations Equipment Purchases program have a target completion date?

A. No, this is an ongoing infrastructure renewal program that maintains our always aging fleet operations equipment in reasonable service condition at a reasonable cost.

Q. What capital additions in this program does Avista expect to make in 2019?

A. The expected capital investment in 2019 is $8,582,123, on a system basis.

Q. How does this program benefit Avista's customers?

A. Having adequate fleet operations equipment is at the heart of our ability to effectively and efficiently serve customers. Making these investments helps ensure our customers receive more prompt and cost effective service, compared with letting the average age of our equipment increase over time.

V. CONCLUSION

Q. Is the plant investment presented in your testimony necessary to provide safe, reliable service to customers?

A. Yes. The investments in Avista's energy delivery infrastructure and office and operations facilities included in this case, represent a prudent balance of maintaining the integrity of our natural gas and electric systems, meeting compliance requirements for reliability and safety, providing the capacity to meet current and future service needs, while being sensitive to the rate impacts to customers resulting from these investments. Overall, these investments provide Avista the ability to continue to provide safe, reliable, and cost-effective service to our customers.

Q. Does this conclude your pre-filed direct testimony?

A. Yes.