Conduits/Transmission

Program Description & Goals

The Conduits/Transmission Mains Program is responsible for bringing water from the city's two water sources, the Bull Run Watershed and Columbia South Shore Well Field, to reservoirs at Powell Butte, then to other in-town reservoirs and tanks at Kelly Butte, Washington Park, Sam Jackson, and Mayfair.

Measure Name	2017 PM Actuals	2018 PM Actuals	PM Goal	PM Target	PM Total AP

Explanation of Services

Program efforts are focused on the capital infrastructure planning, design and construction, operations, maintenance, repair, and rehabilitation of the assets in this program, as well as improving operability, reducing risk, and hardening the supply to meet seismic resilience goals. This program also makes sure the conduits and transmission mains are regularly inspected and are protected from corrosive soil. Staff in this program protect the bureau's right of way where conduits cross non-bureau property and have laid out a protected path for a potential future conduit.

Equity Impacts

The Conduits and Transmission Mains program does not have any clear equity implications.

Staff in this program do not work with the public and do not receive requests for accommodations.

There are no changes to this budget, and there is no likely equity impact of the unchanged budget.

Changes to Program

There are no program changes planned for next fiscal year.

Program Budget

	2016-17 Actuals	2017-18 Actuals	2019 Revised Budget	2019-20 Request - V52 -No DP
Bureau Expense				
Personnel	1,260,367	1,211,655	1,119,168	1,316,165
External Materials and Services	1,121,493	2,149,021	842,005	305,222
Internal Materials and Services	655,553	875,472	207,919	226,980
Capital Outlay	144,336	208,756	624,600	2,291,655
Sum:	**3,181,749**	**4,444,903**	**2,793,692**	**4,140,022**

Resources: Resources come from ratepayer charges for water and water-related services. Capital investments in water system infrastructure may also be funded with proceeds from issuance of Water Revenue Bonds and capital revenues. Capital revenues include sales of assets and System Development Charges from installations of new mains and services.

Expenses: The operating budget totals $1.2 million and the capital budget totals $2.9 million. The operating budget's main expenses are staffing, repair and maintenance services, supplies, and vehicle fleet. The capital budget covers conduit assessments.

Staffing: Nine full-time equivalent (FTE) positions support this program. These positions include engineers, watershed specialists, and operating engineers (staff who operate the water system in the field), among others.

Assets and Liabilities: Major assets in the program include 60.5 miles of conduit (in three conduits) and 50 miles of transmission pipe, as well as supporting trestles and bridges, cathodic protection, Willamette River crossings, and intertie facilities. Conduits 2, 3, and 4 were built in 1911, 1925, and 1953, respectively. The conduits and transmission mains has a total replacement value of $1.4 billion. About 50% of the assets are in very good or good condition, with 40% in fair condition, and 10% in poor or very poor condition.

Program Information

Bureau: Portland Water Bureau

Website:

Program Contact: Felicia Heaton

Contact Phone 971-940-8933

Terminal Reservoirs

Program Description & Goals

Five in-town reservoirs and tanks serve as primary water storage points for distribution to both retail and wholesale customers. These terminal storage facilities are at Powell Butte (outer Southeast Portland), Kelly Butte (also outer Southeast), Washington Park (Southwest), Mayfair (Northwest), and Sam Jackson (Southwest). Portland's terminal storage facilities are managed to maintain the gravity-based delivery of water and water availability for firefighting and emergencies.

Measure Name	2017 PM Actuals	2018 PM Actuals	PM Goal	PM Target	PM Total AP

Explanation of Services

Activities of this program include the capital infrastructure planning, design and construction, operation, and maintenance of the terminal storage facilities. Maintenance includes draining, inspecting, and cleaning these facilities as well as repairing and replacing their equipment.

Equity Impacts

Natural disasters that cause water outages can disproportionately impact communities of color, and terminal storage reservoirs are critical to the City's emergency preparedness. The Terminal Storage program also includes the bureau's funding of visitor facilities at Powell Butte, which is in an area of the city with higher than average percentages of people of color and people with low English proficiency.

Staff in this program generally do not work directly with the public and do not receive requests for accommodations.

There are no changes to this budget, and there is no likely equity impact of the unchanged budget.

Changes to Program

No program changes are planned for next fiscal year.

Program Budget

	2016-17 Actuals	2017-18 Actuals	2019 Revised Budget	2019-20 Request - V52 -No DP
Bureau Expense				
Personnel	2,175,277	1,924,466	2,360,552	2,275,651
External Materials and Services	532,208	864,535	1,201,926	774,974
Internal Materials and Services	2,195,469	2,118,365	472,215	623,257
Capital Outlay	21,338,968	28,805,402	30,749,376	34,434,000
Sum:	**26,241,921**	**33,712,767**	**34,784,069**	**38,107,882**

Resources: Resources come from ratepayer charges for water and water-related services. Capital investments in water system infrastructure may also be funded with proceeds from issuance of Water Revenue Bonds and capital revenues. Capital revenues include sales of assets and System Development Charges from installations of new mains and services.

Expenses: The operating budget totals $0.8 million and the capital budget totals $37.3 million. The operating budget's main expenses are staffing, supplies, and vehicle fleet. The major capital project is the Washington Park Reservoir.

Staffing: Sixteen full-time equivalent (FTE) positions support this program. These positions include engineers, operating engineers (employees who operate the water system in the field), and CADD (Computer-Aided Design and Drafting) technicians, among others.

Assets and Liabilities: Powell Butte has two 50-million-gallon buried reservoirs, one completed in 1981 and the second completed in 2014. Kelly Butte Reservoir was built in 2015 with buried storage of 25 million gallons, replacing an older tank on the site. Washington Park Reservoir is scheduled for completion in 2020 and will have 12.6 million gallons of buried storage, replacing two open reservoirs on the site. Sam Jackson and Mayfair, built in 1964 and 1967 respectively, have total storage of 8.5 million gallons. Each terminal storage facility includes piping, mechanical control buildings, vaults, pumps, and electrical infrastructure. The total replacement value of terminal storage is $436 million. 93% of terminal storage is in very good, good, or fair condition.

Program Information

Bureau:	Portland Water Bureau	**Program Contact:**	Felicia Heaton
Website:		**Contact Phone**	971-940-8933

Meters

Program Description & Goals

Portland's distribution system includes about 178,000 small meters and 9,000 large meters. Meters allow for accurate measurement of residential, commercial, and fire line water use, which allows for accurate billing. Water meters also enable customers to track their water use.

Inventory of all meter sizes is maintained by the meters program.

Measure Name	2017 PM Actuals	2018 PM Actuals	PM Goal	PM Target	PM Total AP

Explanation of Services

This program includes capital infrastructure planning, design, and installation, operations, maintenance, testing, and repair of both small and large meters. The Water Bureau uses a state-certified test bench, calibrated twice each year, to measure meter accuracy. Other water providers, private entities, and other bureaus can use the test bench as needed. All meters 1½ inches and larger are tested before being installed in the ground.

Small meters are often replaced when they are not measuring accurately or are highly used, as replacement is more cost effective than repair.

The bureau routinely tests large meters, given the high consequence of their failure. Meters for recording usage on wholesale customer accounts are tested twice each year, and other users of large amounts of water are tested once a year. Additional testing on large meters is conducted based on the amount of water usage through the meter.

The program has installed and currently maintains about 2,000 automated metering devices, which allows meter readers to collect reads more efficiently and avoid dangerous reading situations.

Equity Impacts

The bureau continues to explore how automated metering infrastructure (sometimes called smart meters) could enable more equitable customer access to water use data.
Staff working in the field have access to interpretation services.

This year's budget changes have no clear equity impacts.

Changes to Program

Two Customer Service Representative positions will be reallocated from the Customer Service Program and reclassified as Water Meter Technician positions. These positions will perform meter repair and maintenance, backflow work, and other meter tasks.

Program Budget

	2016-17 Actuals	2017-18 Actuals	2019 Revised Budget	2019-20 Request - V52 -No DP
Bureau Expense				
Personnel	1,382,961	1,530,216	1,776,707	1,910,822
External Materials and Services	345,737	348,879	655,557	477,734
Internal Materials and Services	308,127	410,275	260,373	232,189
Capital Outlay	382,671	415,863	70,000	300,000
Sum:	**2,419,496**	**2,705,233**	**2,762,637**	**2,920,745**

	2016-17 Actuals	2017-18 Actuals	2019 Revised Budget	2019-20 Request - V52 -No DP
NA	0	0	17	0
Sum:	**0**	**0**	**17**	**0**

Resources: Resources come from ratepayer charges for water and water-related services. Capital investments in water system infrastructure may also be funded with proceeds from issuance of Water Revenue Bonds and capital revenues. Capital revenues include sales of assets and System Development Charges from installations of new mains and services.

Expenses: The operating budget totals $1.8 million and the capital budget totals $1.1 million. The operating budget's main expenses are staffing, meter parts, and vehicle fleet. The capital budget covers meter replacement.

Staffing: Eighteen full-time equivalent (FTE) positions support this program. These positions include water meter technicians, water operations mechanics, and construction equipment operators, among others.

Assets and Liabilities: This program's major assets are the bureau's 178,000 small meters and 9,000 large meters. The total replacement value of meters is $103 million. About 77% of the meters are in very good, good, or fair condition.

Program Information

Bureau: Portland Water Bureau

Website:

Program Contact: Felicia Heaton

Contact Phone 971-940-8933

Pump Stations/Tanks

Program Description & Goals

Portland's water distribution system includes 36 pump stations and 58 tanks. Most of Portland's water is delivered by gravity, and storage tanks both store water and help maintain system pressure. For parts of the city at higher elevations, the Water Bureau pumps water through mains to storage facilities at higher elevations.

Tanks provide needed storage for daily demand fluctuations and for short-term demand spikes such as fire flow. Pump stations are distributed throughout the system to lift water to higher elevations.

Measure Name	2017 PM Actuals	2018 PM Actuals	PM Goal	PM Target	PM Total AP

Explanation of Services

This program includes capital infrastructure planning, design, construction, operation, maintenance, and repair of pump stations and tanks in the distribution system. Also included in this program are the operation, maintenance, and replacement requirements of the Supervisory Control and Data Acquisition system (SCADA), which monitors, archives, and manages the water system.

This program includes the seismic upgrade and protection of these critical assets, as well as regular cleaning that protects public health.

Equity Impacts

Tanks are critical for emergency water supply; natural disasters that cause water outages can have greater impacts on communities of color. Pump stations tend to benefit higher-elevation areas of the city, which have lower than average percentages of people of color and people with low English proficiency.

Staff in this program do not work directly with the public and do not receive requests for accommodations.

This year's budget change does not have any clear equity impacts.

Changes to Program

This budget adds one-time funding of $230,000 to disconnect Fulton Pump Station, now that the Hannah Mason Pump Station is complete.

Program Budget

	2016-17 Actuals	2017-18 Actuals	2019 Revised Budget	2019-20 Request - V52 -No DP
Bureau Expense				
Personnel	5,085,811	4,872,893	4,927,483	5,171,928
External Materials and Services	2,457,726	1,944,514	4,189,563	3,176,194
Internal Materials and Services	2,284,265	1,519,085	678,632	741,413
Capital Outlay	4,342,760	1,508,648	2,808,300	281,000
Sum:	**14,170,562**	**9,845,141**	**12,603,978**	**9,370,535**

	2016-17 Actuals	2017-18 Actuals	2019 Revised Budget	2019-20 Request - V52 -No DP
NA	0	0	53	0
Sum:	**0**	**0**	**53**	**0**

Resources: Resources come from ratepayer charges for water and water-related services. Capital investments in water system infrastructure may also be funded with proceeds from issuance of Water Revenue Bonds and capital revenues. Capital revenues include sales of assets and System Development Charges from installations of new mains and services.

Expenses: The operating budget totals $7.7 million and the capital budget totals $1.6 million. The operating budget's main expenses are staffing, utilities, repair and maintenance services, supplies, communication services, and vehicle fleet. The capital budget covers major maintenance of pump stations and tanks.

Staffing: Thirty-seven full-time equivalent (FTE) positions support this program. These positions include engineers, operating engineers (staff who operate the water system in the field), and applications analysts (who run the SCADA system), among others.

Assets and Liabilities: This program's assets include 36 pump stations and 58 tanks with replacement value of $534 million. 70% of the assets are in very good or good condition and 26% in fair condition.

Program Information

Bureau: Portland Water Bureau

Website:

Program Contact: Felicia Heaton

Contact Phone 971-940-8933

Distribution Services

Program Description & Goals

Portland's water system includes about 179,000 domestic services, 1,700 irrigation services, and 3,900 fire lines, all of which transport water from the distribution or supply main to the customer's meter or private fire line connection. The provision of water is an essential need that is delivered by the Distribution Services Program, as no building without water may be occupied. Service lines connect the water system to homes, businesses, and institutions such as hospitals and schools. Many larger buildings require built-in fire suppression systems, which are served by larger-diameter fire services that protect life safety and property of high-intensity use structures.

Larger services include the installation of underground meter vaults in the right of way for ongoing access and maintenance of meters, which is particularly challenging in the utility-dense areas of the central city.

Measure Name	2017 PM Actuals	2018 PM Actuals	PM Goal	PM Target	PM Total AP

Explanation of Services

This program includes capital infrastructure planning, design and construction, operations, maintenance, and repair of services and service lines from the distribution or supply main to the meter. This includes service installations, removals, repairs, and replacements.
Maintenance of the system of services prevents leaks that can cause damage and waste water. Some of Portland's service lines are made of older copper, galvanized steel, or plastic, and these require replacement due to the high failure rate of those material types.

Asset Management analysis suggests that in the coming decades, the bureau will face increasing service failures as large sections of the system reach the end of their expected useful life. The bureau's goal is to strategically replace these service lines as soon as possible.

Equity Impacts

The Water Bureau has data about the condition of services in the city; it has not overlaid this information onto demographic data that could suggest whether service condition varies by community.

Staff in this program have access to interpretation services.

There are no changes to this budget, and there is no likely equity impact of the unchanged budget.

Changes to Program

There are no program changes planned for next fiscal year.

Program Budget

	2016-17 Actuals	2017-18 Actuals	2019 Revised Budget	2019-20 Request - V52 -No DP
Bureau Expense				
Personnel	4,030,210	4,603,611	4,859,371	5,396,607
External Materials and Services	2,453,916	3,143,566	1,202,709	1,413,441
Internal Materials and Services	5,206,811	6,353,132	2,292,371	2,006,641
Capital Outlay	21,334	16,774	0	0
Sum:	**11,712,271**	**14,117,083**	**8,354,451**	**8,816,689**

Resources: Resources come from ratepayer charges for water and water-related services. Capital investments in water system infrastructure may also be funded with proceeds from issuance of Water Revenue Bonds and capital revenues. Capital revenues include sales of assets and System Development Charges from installations of new mains and services.

Expenses: The operating budget totals $2.4 million and the capital budget totals $6.4 million. The operating budget's main expenses are staffing, materials, and vehicle fleet. The capital budget covers service line installation and replacement.

Staffing: Forty-eight full-time equivalent (FTE) positions support this program. These positions include utility workers, mechanics, automotive and construction equipment operators, and surveyors, among others.

Assets and Liabilities: The 179,000 domestic services, 1,700 irrigation services, and 3,900 fire lines have a total replacement value of $1.1 billion. About 90% of the assets are in very good, good, or fair condition.

Program Information

Bureau: Portland Water Bureau **Program Contact:** Felicia Heaton

Website: **Contact Phone** 971-940-8933

Valves/Gates/Regulators

Program Description & Goals

The Water Bureau uses valves to isolate segments of the distribution system for maintenance; the availability of valves enables isolation of limited sections of the system to minimize the number of customers affected when isolation is necessary. Portland's water distribution system includes 1,800 large valves, 60,000 small valves, and 600 pressure-regulating valves.

Regulator valves allow the Water Bureau to maintain appropriate system pressures. Valves also perform a key safety function for crews by providing isolation that is a sufficient distance from where crews are working underground, protecting them from the potential force of water.

Large valves are critical to controlling the flow of water in large-diameter pipes, where breaks can generate significant damage to surrounding areas. Of the approximately 1,800 large valves in the system, approximately 1,200 are deemed critical because their failure could result in significant consequences (for example, critical valves include valves near hospitals).

Measure Name	2017 PM Actuals	2018 PM Actuals	PM Goal	PM Target	PM Total AP

Explanation of Services

This program includes capital infrastructure planning, design, construction, operation, maintenance, and repair of system valves and pressure-regulating valves and stations. Maintenance of these valves is essential to ensure their proper operation when they are needed. The bureau operates each of these critical 1,200 valves once every two years to make sure they are functional and do not seize up due to lack of use. Bureau staff also inspect and exercise valves at 75 critical crossings at least once every seven years and rebuild regulator valves on a seven- or ten-year cycle based on criticality.

Equity Impacts

The Water Bureau maintains data about valve condition; it does not currently overlay those data onto demographic data to understand whether valve condition correlates with demography.

Staff in this program have access to interpretation services.

There are no changes to this budget, and there is no likely equity impact of the unchanged budget.

Changes to Program

There are no program changes planned for next fiscal year.

Program Budget

	2016-17 Actuals	2017-18 Actuals	2019 Revised Budget	2019-20 Request - V52 -No DP
Bureau Expense				
Personnel	468,210	465,028	786,846	801,402
External Materials and Services	286,794	380,260	408,300	400,300
Internal Materials and Services	161,099	167,969	228,711	245,372
Sum:	**916,103**	**1,013,257**	**1,423,857**	**1,447,074**

Resources: Resources come from ratepayer charges for water and water-related services. Capital investments in water system infrastructure may also be funded with proceeds from issuance of Water Revenue Bonds and capital revenues. Capital revenues include sales of assets and System Development Charges from installations of new mains and services.

Expenses: The operating budget totals $1.4 million. The operating budget's main expenses are staffing, repair and maintenance services, supplies, and vehicle fleet.

Staffing: Six full-time equivalent (FTE) positions support this program. These positions include utility workers, water operations mechanics, and construction equipment operators, among others.

Assets and Liabilities: Program assets include 1,800 large valves, 60,000 small valves (including regulator valves), and 600 pressure-regulating valves. The total replacement value of vales and regulators is $738 million. 80% of the assets are in very good or good condition, and 13% are in fair condition.

Program Information

Bureau: Portland Water Bureau

Website:

Program Contact: Felicia Heaton

Contact Phone 971-940-8933