

Appendix A

Investment Strategy

This appendix contains a capital Investment Strategy for the Bureau of Environmental Services, Portland Water Bureau, and Bureau of Transportation. The projects and programs included in the Investment Strategy are intended to maintain existing assets, comply with regulatory mandates, and provide key levels of service to existing and future residents and businesses. More information on how each Bureau's draft Investment Strategy was developed can be found in the relevant chapter of this Plan.

As part of the update to the Comprehensive Plan and to meet public facility planning requirements, the City must also adopt a List of Significant Projects. The List of Significant Projects is intended as a long-term plan for meeting the infrastructure needs of residential and employment growth allowed and planned for by a city's land use designations. The List of Significant Projects includes a subset of projects included in the Citywide System Plan's Investment Strategy. The List of Significant Projects for transportation, water, sewer and stormwater is included as a separate component of the Comprehensive Plan.

Project Maps

Explore interactive maps of the infrastructure projects included in Appendix A through the online **Comprehensive Plan Map App** at <http://www.portlandoregon.gov/bps/mapapp/>

Bureau of Environmental Services

The Bureau of Environmental Services (BES) project list is based on existing system plans and includes programs for treatment plant upgrades for capacity and regulatory compliance; programs for maintenance of the treatment plants, pump stations, collection system pipes; pipe capacity projects by sanitary and combined sewer basins; watershed programs for each of the major watersheds; a stormwater program area to address system connectivity and water quality; and a sanitary sewer extension program.

The Bureau focuses efforts on comprehensive, multi-purpose solutions in the highest priority areas for work in all four program areas of the Investment Strategy. The Bureau anticipates approximately \$2 billion in investment in these programs over the next twenty years. The list assumes that rates are set at a level that is sufficient to meet agreed upon levels of service.

For more information on how this Investment Strategy was developed, please see Chapter 6. Bureau of Environmental Services.

Project ID	Project Title	Project Description	Location	Area	Project Objective	Driver	Estimated Cost by Time Period								Grand Total FY 2013-33	Funding Source	Facility Provider (Partner)
							FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	Total FY 2013-18	FY 2018-23	FY 2023-33			
Sewage Treatment																	
Map SS-1 E10245	CBWTP Improvements	This program includes a number of mid-size improvements at the Columbia Boulevard Wastewater Treatment Plant. CBWTP such as: Seismic Improvements, Outfall Diffuser Extension, Access / Egress Improvements, Bio-Solids Dryer, Dewatered Sludge Hopper, TWAS Piping Upgrade, Centrifuge. Also includes expansion to Secondary Treatment, if required. All are consistent with the Facilities Plan and the Conditional Use Master Plan.	Columbia Blvd Wastewater Treatment Plant	All	Efficiency & Expansion	Population growth/regulations	10,950,000	4,325,000	11,513,000	10,540,000	8,516,000	45,844,000	45,964,000	80,000,000	171,808,000	Bonds	BES
Map SS-2 E10234	TCWTP Improvements	Improvements, as identified in the updated facilities plan. Anticipated projects include property acquisition, new headworks/screenhouse, upgrades to the primary clarifier, and construction of an additional secondary clarifier.	Tryon Creek Wastewater Treatment Plant	SW	Efficiency & Expansion	Population growth/regulations	216,000	210,000	3,000,000	3,500,000	9,000,000	15,926,000	30,000,000	10,000,000	55,926,000	Bonds	BES
Map SS-3 E04661	Pump Station Improvement Program	Program to refurbish or upgrade pump stations not in compliance with current codes, not operating reliably, need improvements because of growth in the receiving sewage basin, and/or are over 20 years old with out-of-date equipment. The Pump Station Improvement Plan guides the selection of projects. This program was developed to ensure the 97 pump stations are maintained in accordance with a scheduled plan to increase pump station reliability. Program will also address the 57 miles of force mains.	Citywide	All	Maintenance & Efficiency	Level of Service	13,810,000	12,091,000	4,000,000	4,000,000	4,000,000	37,901,000	30,000,000	65,000,000	132,901,000	Bonds	BES
Map n/a E04891	Rehab, Repair, and Modifications	This project provides for annual reinvestment in the treatment facilities to protect capital investment and enhance system reliability. It provides best management practice to prevent probable violations of NPDES permit. The aging Columbia and Tryon Creek plants require regular investment. Projects include equipment replacement, capacity upgrades, and restoration of a facility to its original condition and renewal of useful life for more than 10 years, and regulatory mandates.	Columbia Blvd and Tryon Creek Wastewater Treatment Plants	All	Maintenance & Efficiency	Level of Service	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	10,000,000	15,000,000	30,000,000	55,000,000	Bonds	BES
Maintenance & Reliability																	
n/a	Sewage Pipe Rehabilitation	Based on regular inspection, this program rehabilitates the highest risk pipes.	Citywide	All	Maintenance	Level of Service	49,895,000	51,869,000	42,924,000	31,285,000	19,583,000	195,556,000	160,000,000	300,000,000	655,556,000	Bonds	BES
n/a	Sewer Capacity Upgrades	Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized based on risk and benefit/cost. Work may also include high priority pipe rehabilitation. Work will occur in small areas within the combined sewer system that are not addressed by basin specific projects.	Citywide	All	Maintenance	Level of Service	0	0	0	0	0	0	0	50,000,000	50,000,000	Bonds	BES
Map SS-4	Holladay/Stark/Sullivan - capacity upgrades	Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized based on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area.	Between Fremont & Stark to NE 24th. South of I-84 to I-205	NE/SE	Capacity	Level of Service	500,000	1,000,000	3,000,000	3,000,000	3,200,000	10,700,000	12,000,000	12,000,000	34,700,000	Bonds	BES
Map SS-5	Beech/Essex - capacity upgrades	Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized based on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area.	Willamette River east to Grand b/w Knott and Alberta.	NE	Capacity	Level of Service	0	100,000	900,000	4,500,000	4,000,000	9,500,000	9,000,000	0	18,500,000	Bonds	BES
Map SS-6	Oak - capacity upgrades	Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized based on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area.	Willamette River to NE 24th, b/w Irving and Stark.	NE/SE	Capacity	Level of Service	2,000,000	100,000	0	0	500,000	2,600,000	20,000,000	0	22,600,000	Bonds	BES
Map SS-7	Taggart/Insley - capacity upgrades	Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized based on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area.	Willamette River to NE 60th; Stark to south city limit	SE	Capacity	Level of Service	7,700,000	6,200,000	2,200,000	900,000	3,800,000	20,800,000	30,000,000	10,000,000	60,800,000	Bonds	BES

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							FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	Total FY 2013-18	FY 2018-23	FY 2023-33			
Map SS-8	Wheeler - capacity upgrades	Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area.	Willamette River, Grand, Prescott, 24th, Hancock	NE	Capacity	Level of Service	400,000	1,300,000	4,300,000	4,300,000	0	10,300,000	0	0	10,300,000	Bonds	BES
Map SS-9	Lloyd District - capacity upgrades	Based on the Systems Plan and extensive redevelopment activity, program adds capacity by creating a separated stormwater system and/or upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area.	Lloyd District	NE	Capacity	Level of Service	0	500,000	1,500,000	1,500,000	5,000,000	8,500,000	10,000,000	0	18,500,000	Bonds	BES
Map: SS-10	Alder - capacity upgrades	Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area.	Willamette River to SE 42nd bw Stark & Hawthorne; inc. Ladds Addition	SE	Capacity	Level of Service	0	100,000	1,600,000	5,200,000	11,600,000	18,500,000	22,500,000	0	41,000,000	Bonds	BES
Map: SS-11	NE 13th Ave Basin - capacity upgrades	Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area.	Vancouver, Columbia Blvd, NE 42nd, Prescott	NE	Capacity	Level of Service	500,000	1,300,000	1,400,000	5,000,000	8,000,000	16,200,000	1,200,000	0	17,400,000	Bonds	BES
Map: SS-12	Northwest Neighborhoods - capacity upgrades	Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area.	NW inc. hills to ridgeline, excluding downtown	NW	Capacity	Level of Service	2,700,000	2,100,000	1,300,000	3,400,000	3,500,000	13,000,000	23,000,000	5,000,000	41,000,000	Bonds	BES
Map: SS-13	North Portland - capacity upgrades	Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area.	West of Peninsular Ave.	N	Capacity	Level of Service	0	0	0	0	0	0	0	5,000,000	5,000,000	Bonds	BES
Map: SS-14 E10034 E10035 E10474	Sanitary Sewer Collection system capacity (Infiltration & Inflow)	A series of projects are proposed to address infiltration and inflow in the sanitary sewer system in SW Portland. Projects typically involve rehabilitation of main lines and laterals and disconnecting storm inlets from the sanitary sewer.	SW	SW	Capacity	Level of Service / Regulatory mandate	2,425,000	1,955,000	4,695,000	7,015,000	7,150,000	23,240,000	18,100,000	15,000,000	56,340,000	Bonds	BES
Surface Water Management																	
Map SM-1 E10040	Johnson Creek Willing Seller Ph. 2	Based on the Johnson Creek Restoration Plan, acquisition of land in four target areas for floodplain restoration. Properties are purchased at fair market value and used to implement restoration projects detailed in other capital projects on list.	Johnson Creek Target Areas	SE	Flood management, water quality, habitat	Level of Service	500,000	500,000	500,000	500,000	500,000	2,500,000	2,500,000	5,000,000	10,000,000	Bonds	BES
Map SM-2 E06941	West Lents Flood Mitigation	Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the West Lents target area for flood storage and water quality, stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations.	West Lents target area	SE	Flood management, water quality, habitat	Level of Service, regulatory	0	0	300,000	545,000	2,757,000	3,602,000	2,815,000	0	6,417,000	Bonds	BES
Map SM-3 E07383 E08382	East Lents Area Flood projects	Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the East Lents target area for flood storage and water quality, stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations.	East Lents target area	SE	Flood management, water quality, habitat	Level of Service, regulatory	70,000	70,000	1,800,000	2,300,000	1,000,000	5,240,000	3,000,000	0	8,240,000	Bonds	BES

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							FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	Total FY 2013-18	FY 2018-23	FY 2023-33			
Map SM-4 E08406 E08247 E07158	Other Johnson Creek Target Area Floodplain Projects	Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the Tideman Johnson and Powell Butte target areas, and smaller target areas, in partnership with creek-side property owners for flood storage and water quality. Stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations.	Tideman and Powell Butte Target areas plus CRP	SE	Flood management, water quality, habitat	Level of Service, regulatory	806,000	1,506,000	1,306,000	1,427,000	0	5,045,000	0	0	5,045,000	Bonds	BES
Map SM-5 E07466 E06947	Johnson Creek Restoration Program Projects	Priority projects along the main stem and tributaries of Johnson Creek to mitigate flooding, improve water quality and wildlife habitat, address stormwater outfalls and culverts, and sanitary sewer protection. Includes restoration of floodplain and wetlands, construction of stream enhancements, and partnership projects with other agencies to meet the objectives of the 2001 Johnson Creek Restoration Plan. Projects address TMDL requirements, ESA plans and other regulations.	Johnson Creek Watershed, various	SE	Flood management, maintenance, water quality, habitat	Level of Service, regulatory	500,000	3,000,000	650,000	875,000	0	5,025,000	2,000,000	2,000,000	9,025,000	Bonds	BES
Map SM-6 E10563 E05564	Columbia Slough Outfalls	Design and construction of pollution control facilities for separated stormwater areas flowing through 220-city owned outfalls to the Columbia Slough to address DEQ Sediment Order. Program prioritizes outfalls draining Columbia Boulevard and other high traffic City roadways.	Columbia Boulevard area	N/NE	Water quality	Regulatory	150,000	100,000	1,000,000	1,000,000	2,000,000	4,250,000	10,000,000	0	14,250,000	Bonds	BES
Map SM-7 E10377 E07177 E10176	Columbia Slough Restoration Projects	Culvert replacement, water quality facilities and wetland and habitat restoration and enhancement to improve water quality, habitat and hydrology. Projects address TMDL requirements, infrastructure deficiencies, ESA plans and other regulations and may include partnership with other agencies. Includes in-stream restoration as well as stormwater system improvements.	Columbia Slough Watershed, various	N/NE	Water quality, hydrology, maintenance, habitat	Level of Service, Regulatory	5,152,000	1,144,000	0	500,000	325,000	7,121,000	2,000,000	2,000,000	11,121,000	Bonds	BES
Map SM-8 E08676 E08675 E08677	Fanno Creek Stormwater System Improvements	Projects to address TMDLs, recommended by the Fanno/Tryon TMDL predesign. 1-5 year projects include stormwater retrofits along the Beaverton-Hillsdale Highway, addressing deficient stormwater outfalls, and other stormwater system improvements.	Fanno Watershed: Beaverton-Hillsdale corridor and various	SW	Water quality, capacity, conveyance	Level of Service, Regulatory	551,000	1,616,000	533,000	0	0	2,700,000	0	0	2,700,000	Bonds	
Map SM-9 E08679 E08687	Tryon Creek Stormwater System Improvements	Projects to address TMDLs, recommended by the Fanno/Tryon TMDL predesign. 1-5 year projects include stormwater retrofits along the I-5 and Barbur Blvd. corridors, addressing deficient stormwater outfalls, and other stormwater system improvements.	Tryon Watershed: I-5/Barbur area, and various	SW	Water quality, capacity, conveyance	Level of Service, Regulatory	2,000,000	100,000	35,000	270,000	270,000	2,675,000	0	0	2,675,000	Bonds	
Map SM-10 E10373 E10131	Fanno/Tryon Drainage Shoulder Improvements	Drainage improvements for high priority City maintained roadside ditches along arterials in the Fanno and Tryon watersheds. Projects address water quality, as recommended by Fanno/Tryon TMDL predesign. Includes SW Hamilton and SW Stephenson and future projects.	Fanno and Tryon Creeks watersheds (various)	SW	Water quality, capacity, conveyance	Level of Service, Regulatory	100,000	463,000	1,448,000	1,195,000	1,195,000	4,401,000	1,000,000	0	5,401,000	Bonds	
Map SM-11 E08682 E08680 E09105	Fanno/Tryon Restoration Projects	In-stream restoration and improvements to address water quality, hydrology and habitat, including TMDL requirements, ESA plans and other regulations. Includes culvert replacement, stream daylighting, sanitary sewer protection and other restoration in both the Fanno and Tryon creek watersheds. Projects recommended by the Fanno/Tryon TMDL predesign and watershed plans.	Fanno and Tryon Creeks watersheds, various	SW	Water quality, hydrology, maintenance, habitat	Level of Service, Regulatory	231,000	250,000	1,602,000	1,179,000	295,000	3,557,000	2,000,000	2,000,000	7,557,000	Bonds	
Map SM-12 E10498	Willamette River Restoration Projects	Projects to improve water quality, habitat and hydrology along the main stem river and tributaries (subwatersheds) to address TMDL requirements, ESA plans and other regulations. Includes in-stream and floodplain restoration and enhancement.	Willamette River Watershed	All	Water quality, hydrology, habitat	Level of Service, regulatory	0	0	800,000	3,400,000	3,400,000	7,600,000	5,000,000	5,000,000	17,600,000	Bonds	
Map SM-13 E10488	Stephens Creek Stormwater System Improvements	Address stormwater issues in the Stephens Creek subwatershed, including unmanaged stormwater discharge, pollution reduction and detention facilities, restoration of riparian and wetland functions, erosion and sediment loading at outfalls.	Stephens Creek Subwatershed	SW	Capacity, conveyance, water quality, habitat	Level of Service, regulatory	965,000	1,162,000	996,000	800,000	200,000	4,123,000	10,200,000	0	14,323,000	Bonds	BES

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							FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	Total FY 2013-18	FY 2018-23	FY 2023-33			
n/a	Stormwater Management Program Implementation	Improvements to the stormwater management system resulting from Stormwater System Planning. Areas of particular concern include parts of SW (in addition to Stephens Creek), outer east, and the Columbia Slough. Specific improvements have not been identified as of FY14.	Various/Citywide	City	Capacity, conveyance, water quality, habitat	Level of Service, regulatory	0	0	0	300,000	1,000,000	1,300,000	15,000,000	40,000,000	56,300,000	Bonds	BES
Map n/a E08967 E10372	Culvert Replacement Program	Replace or improve stream culverts citywide to improve fish passage and water quality, and address flooding and maintenance needs. Includes completion of culvert replacements on Crystal Springs Creek and other priority projects to address ESA plans and other system needs.	Various/Citywide	City	Habitat, flooding, water quality, maintenance	Level of Service, regulatory	1,364,000	1,507,000	1,431,000	0	0	4,302,000	5,000,000	5,000,000	14,302,000	Bonds	BES
Map: n/a E08905 E10486	Watershed Land Acquisition Ph. 1 & 2	Program targets acquisition of medium to high functioning natural resource lands in support of watershed health and stormwater management.	Various/Citywide	City	Water quality, habitat, hydrology	Level of Service, regulatory	2,000,000	2,000,000	2,500,000	1,500,000	2,000,000	10,000,000	6,000,000	0	16,000,000	Bonds	BES
Systems Development																	
Map: n/a	Sewer Extensions	Sewer extensions are proposed to relieve septic systems at risk of failure, to correct party sewer situations, and to provide service where development will be occurring soon and service is currently not available.	Various	City	Replacement; Efficiency	Level of Service	6,776,000	3,594,000	4,017,000	4,725,000	4,350,000	23,462,000	20,000,000	40,000,000	83,462,000	Bonds	BES
Total All Projects							114,261,000	102,162,000	103,250,000	106,656,000	109,141,000	535,470,000	513,279,000	683,000,000	1,731,749,000		

Flood Management																	
Map: FM-1	Columbia River Levee Improvement Project	Identify and implement necessary improvements to the levees within the Multnomah County No 1, Peninsula No 1 and Peninsula No 2 Drainage Districts, so that they are certified as being protective of a 1% chance flood.	MCDD No. 1, Peninsula No. 1 and No. 2 drainage districts	N, NE	Repair/ Rehabilitation/ Replacement	Level of service, Regulatory	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	\$100 - \$200 million	District rates and bonds; Local, State, and Federal funds	MCDD 1, PEN 1, PEN 2

Portland Water Bureau

The Portland Water Bureau (PWB) project list is based on existing system plans and includes projects and programs to address longer term infrastructure replacement and maintenance needs, while addressing short-term water system infrastructure needs to ensure compliance with drinking water regulations. The project list focuses on regulatory compliance, improving the condition of aging infrastructure, and addressing operations and maintenance needs.

The Bureau anticipates approximately \$1.6 billion in investment in these projects and programs over the next twenty years. The list assumes that rates are set at a level that is sufficient to meet agreed upon levels of service.

For more information on how this Investment Strategy was developed, please see Chapter 7. Portland Water Bureau.

Project ID	Project Title	Project Description	Location	Area	Project Objective	Driver	Estimated Cost by Time Period								Grand Total FY 2013-33	Funding Source	Facility Provider
							FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	Total FY 2013-18	FY 2018-23	FY 2023-33			
Customer Service																	
n/a	Automated Meter Reading (AMR) Implementation	This project provides for the Installation of automatic water meter reading equipment throughout the City.	Various	All	Efficiency	Service Level	0	0	0	0	0	0	45,000,000	0	45,000,000	Bonds	PWB
n/a	Dodge Park	Improvements will continue to address security and visitor amenities at the site, trespass/hazard warning signs, alternative park management arrangements, and visitor management. The bureau is committed to improving the maintenance of the park including preservation of existing infrastructure, repairs, replacements and upgrades. New uses for the park include an amphitheater, camping, training area, facility upgrade to the existing building, and special needs assistance for using the park amenities.	Dodge Park	E	Expansion	Service Level	0	0	0	0	0	0	400,000	800,000	1,200,000	Bonds	PWB
Map W-1 W01401	Emergency Coordination Center	This project designs and constructs the City's Emergency Coordination Center. The bureau will locate its emergency response and security staff at the location. The project location is adjacent to the City's 911 Call Center at SE 99th Ave and Powell Blvd. The total project cost is \$19.85M and PWB is a contributing bureau.	Emer. Coord. Center (SE 99th and Powell)	E	Maintenance	Service Level	1,807,000	0	0	0	0	1,807,000	0	0	1,807,000	Bonds	PWB (POEM)
Map: n/a WBCSSE	Security and Emergency Management	The bureau is committed to increasing flexibility and preparedness to meet future security challenges, to enhance security throughout the water system and to modernize security practices and infrastructure. Projects funded by this budget will include physical security improvements to major and smaller facilities as well as improved security in the overall water distribution system and control/communications system.	Various	All	Maintenance	Service Level	0	0	250,000	500,000	500,000	1,250,000	2,500,000	5,000,000	8,750,000	Bonds	PWB (BTS)
Distribution																	
Map W-2 W01632	Bertha Service Area Improvements	This project will connect the Bertha 962 pressure zone with the 937 pressure zone with new 8-inch and 4-inch main and a new regulator. This work will allow for the abandonment of the existing main that passes through steep, unimproved right-of-way while maintaining an adequate level of service to the Bertha Service Area.	Bertha Service Area	SW	Replacement Efficiency	Service Level	430,000	426,000	0	0	0	856,000	0	0	856,000	Bonds	PWB
Map W-3	Burnside Pump Station Replacement	This project will decommission the old undersized pump station and modify the nearby Verde Vista pump station to serve the Burnside pumping needs for the next 50 years. The project will also acquire property for the future Burnside pump station to be built 50 years from now.	Burnside Pump Station	NW	Maintenance	Service Level	0	0	0	0	0	0	2,000,000	0	2,000,000	Bonds	PWB
Map W-4 W01674	Carolina Pump Main Extension, Phase II	This project will connect the existing Carolina Pump Main (Westwood Tanks) and the Fulton Pump Main (Burlingame Tanks) together. This will be a pump main from the intersection of SW Capital Hwy and SW Terwilliger Blvd to the Burlingame Tank site.	SW Capitol Hwy – SW Terwilliger	SW	Expansion	Service Level	690,000	2,494,000	0	0	0	3,184,000	0	0	3,184,000	Bonds	PWB
Map: n/a WBDIDM	Distribution Mains	This program includes rehabilitation and replacement of substandard mains, expansion due to applications from private developers, increasing supply for fire protection, improving water quality and water system upgrades due to local improvement districts (LIDs), and street improvements. Water main replacements also include appurtenances such as fire hydrants, valves, pressure regulators, service branches, and other facilities.	Various	All	Replacement	Service Level	11,717,000	13,911,000	15,875,000	16,775,000	17,460,000	75,738,000	75,000,000	150,000,000	300,738,000	Bonds	PWB
Map W-5 W01652	Division Street Piping	This project will design and construct improvements located in the ROW for the Tabor Reservoir Adjustments project. Improvements will be made to the distribution and transmission systems as well as to Conduits 2 and 3 in SE Division St.	SE Division St	SE	Replacement	Service Level	1,480,000	200,000	0	0	0	1,680,000	0	0	1,680,000	Bonds	PWB

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Map n/a WBDIFS	Field Support	This project funds vehicles and major equipment purchases, including heavy construction equipment such as dump trucks and backhoes, and Bureau owned computer software with a unit cost greater than \$5000.	Various	All	Replacement Efficiency	Service Level	3,755,600	3,501,500	3,388,900	3,460,138	3,459,338	17,565,476	17,500,000	35,000,000	70,065,476	Bonds	PWB
Map W-6 W01359	Forest Park Low Tank	This project will plan, design and construct a single 1.3 million gallon AWWA D110 type 1 tank. This storage is to augment regular system capacity and increase fire flow.	Forest Park Low Tank	NW	Growth	Service Level	2,210,000	0	0	0	0	2,210,000	0	0	2,210,000	Bonds	PWB
Map: n/a WBDIFO	Fountains	The bureau has responsibility for 27 decorative fountains, including repairs, replacements and upgrades. Funding includes provisions for repair of drain lines and valves, replacement of liners, repair and replacement of electrical equipment and lighting systems, repair and replacement of pumps, addition of telemetry, and various improvements to exterior surfaces.	Various/ Citywide	All	Maintenance	Service Level	150,000	150,000	150,000	150,000	150,000	750,000	750,000	1,500,000	3,000,000	Bonds	PWB (PP&R, RACC)
Map W-7 W01358	Fulton Pump Station	This project will replace the Fulton Pump Station with a new pump station located in Willamette Park.	Fulton Pump Station	SW	Replacement Efficiency	Service Level	2,220,000	6,740,000	100,000	0	0	9,060,000	0	0	9,060,000	Bonds	PWB (PPR)
Map W-8	Greenleaf Pump Station	This project will plan, design and construct a replacement Greenleaf pump station at the existing site. Flow upgrades will remove the Penridge tank from the system. The new pump station will pump directly to the distribution system.	Greenleaf Pump Station	NW	Replacement Efficiency	Service Level	0	0	0	0	0	0	3,500,000	0	3,500,000	Bonds	PWB (PPR)
Map: n/a WBDIHY	Hydrants	The bureau maintains about 16,000 fire hydrants. These hydrants allow Portland the flexibility and preparedness to meet the challenge of a fire emergency through coordination with the Fire Bureau. This project provides for the replacement of fire hydrants that are no longer repairable. Replacements may also occur as part of the bureau's ongoing efforts to standardize hydrant types for more efficient and effective management of maintenance and repair activities.	Various/ Citywide	All	Replacement Efficiency	Service Level	1,100,000	1,200,000	1,200,000	1,200,000	1,200,000	5,900,000	6,000,000	12,000,000	23,900,000	Bonds	PWB (PFB)
Map W-9 W01400	Interstate Facility Renovation	The bureau's System Control Center and Operations and Maintenance Facility, located on North Interstate Avenue, serves as the hub for maintenance and construction crews, vehicles, equipment and materials, and the emergency operations center. This project consists of a comprehensive plan of reconstruction and improvements that will address seismic and other site vulnerabilities, and bring the facility up to current safety and building codes.	Interstate Facility (NE Interstate)	All	Efficiency; Maintenance	Service Level	12,377,000	16,248,390	6,138,422	560,000	0	35,323,812	0	0	35,323,812	Bonds	PWB (OMF)
Map: W-10 W01348	Portland-Milwaukie Light Rail Project	This project consists of planning, design and construction for relocation of over 5,000 feet of main required for the Portland-Milwaukie Light Rail project. PWB Construction crews and Construction Management Team will assist during the construction phase of the project.	PMLR alignment, SW/SE	SW, SE	Replacement	Service Level	1,100,000	0	0	0	0	1,100,000	0	0	1,100,000	Bonds	PWB (PBOT, TriMet)
Map: n/a WBDIME	Meters	This project funds the purchase and installation of water meters. The Bureau objective is to maintain meter accuracy to within 3% of actual values.	Various/ Citywide	All	Replacement Efficiency	Service Level	1,700,000	1,590,000	1,800,000	1,800,000	1,800,000	8,690,000	9,000,000	18,000,000	35,690,000	Bonds	PWB
Map: n/a WBDIPT	Pump Stations and Tanks	This program maintains a large variety of infrastructure consisting of water storage tanks, pumps, and pump and control facilities. The bureau uses a reliability centered maintenance (RCM) analysis to prioritize projects in these areas. A key focus of the next five years will be to replace the remote telemetry units at over 140 remote sites. The existing units are over 15 years old, and are becoming obsolete. The servers are at the end of their service cycle, and must also be replaced.	Various/ Citywide	All	Replacement Efficiency; Growth	Service Level	500,000	510,000	1,480,000	1,098,000	1,415,000	5,003,000	5,000,000	10,000,000	20,003,000	Bonds	PWB
Map: W-11 W01581	Rose City Sewer Rehabilitation	The project will install 1207 feet of 8 inch DI, 2 new hydrants and 39 new water services 2 inches or smaller.	Rose City area	NE	Replacement	Service Level	2,000	0	0	0	0	2,000	0	0	2,000	Bonds	PWB

Project ID	Project Title	Project Description	Location	Area	Project Objective	Driver	Estimated Cost by Time Period								Grand Total	Funding Source	Facility Provider
							FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	Total FY 2013-18	FY 2018-23	FY 2023-33	FY 2013-33		
Map: W-12 W01651	Raymond Tank Supply Improvements	This project will design and construct improvements at Raymond Tank Site and at an intersection of SE Holgate Boulevard and SE 136th Avenue.	Raymond Tank, vicinity	SE	Efficiency	Service Level	125,000	410,000	0	0	0	535,000	0	0	535,000	Bonds	PWB
Map:W-13	Sam Jackson Pump Station	This project will add multiple capital improvements including seismic improvements, replacement of RTU and motor controllers, installation of pump control and check valves, extension of the crane rail, a concrete pad, and installation of a security fence and gate.	Sam Jackson Pump Station	SW	Replacement ; Efficiency	Service Level	0	0	0	0	0	0	1,400,000	0	1,400,000	Bonds	PWB
Map n/a WBDISV	Services	This project constructs replacement and customer requested water services. A water service is the connection between the water main and any given customer's service meter. Service connections are always performed by Water Bureau crews directed by a certified Water Service Mechanic. An ongoing budget of approximately \$4 million per fiscal year provides for installation of about 1,000 water service connections annually and other upgrades to existing water services.	Various/ Citywide	All	Expansion	Service Level	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	20,000,000	20,000,000	40,000,000	80,000,000	Bonds	PWB
Map: W-14 W01590	Willamette River Pipe Crossings	The project replaces major pipelines to strengthen the transmission link between Powell Butte and the service areas west of the Willamette River, including downtown and the storage reservoirs at Washington Park. It includes construction of a new seismically strengthened river crossing to replace the first one of potentially two Willamette River crossings, and new transmission piping on both sides of the river.	Various, Powell Butte – Wash. Park	CC	Expansion	Service Level	460,000	2,600,000	5,000,000	20,000,000	28,540,000	56,600,000	0	55,000,000	111,600,000	Bonds	PWB
Regulatory Compliance																	
Map: n/a W01355	Bull Run Dam 2 Tower	The Water Bureau plans to install steel multi-level intake structures onto the North Dam 2 Tower located in the Bull Run watershed. Modifications are designed to allow selective water withdrawal, proper operation during flood conditions, and enable the towers to better withstand seismic loadings.	Bull Run	Bull Run	Maintenance	Service Level	5,975,000	475,000	0	0	0	6,450,000	0	0	6,450,000	Bonds	PWB
Map: n/a W01534	HCP Alder Creek Fish Passage	This project will design and install two fish passage facilities as planned in the Habitat Conservation Plan (HCP). The project is in Alder Creek, a tributary to the Sandy River. There will be a fish ladder at the waterfall and a fish ladder at a water diversion.	Bull Run	Bull Run	Maintenance	Service Level	458,000	0	0	0	0	458,000	0	0	458,000	Bonds	PWB
Map: n/a WBRCRC	Water Quality and Regulatory Compliance	The bureau recognizes the Bull Run watershed as a diverse ecosystem. The bureau is committed to preserving this habitat and complying with federal regulations using practical, locally driven solutions. Many of the projects in this subprogram respond to the Endangered Species Act (ESA), including the implementation of the Bull Run Habitat Conservation Plan (HCP) as adopted by City Council and approved by the National Marine Fisheries Service. Consistent with HCP commitments, this program funds easements, purchases land, and also supports projects jointly conducted with other watershed partners.	Bull Run	Bull Run	Efficiency	Service Level	1,304,000	3,642,000	9,300,000	2,350,000	2,000,000	18,596,000	10,000,000	20,000,000	48,596,000	Bonds	PWB (EPA, OHHS)

Project ID	Project Title	Project Description	Location	Area	Project Objective	Driver	Estimated Cost by Time Period								Grand Total FY 2013-33	Funding Source	Facility Provider
							FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	Total FY 2013-18	FY 2018-23	FY 2023-33			
Supply																	
Map: n/a WBSUBR	Bull Run Watershed	The bureau is committed to updating the Bull Run watershed protection and maintenance procedures and agreements based on the 2007 Bull Run Agreement with the Mt. Hood National Forest. The function of this program is to allocate funds for the capital projects necessary to maintain, improve, and protect the watershed facilities that are not directly related to the water supply system facilities. This includes Bull Run Watershed road reconstruction to ensure continuous, reliable, and safe access to all facilities, as well as maintenance of other city-owned infrastructure within the watershed.	Bull Run	Bull Run	Maintenance	Service Level	380,000	780,000	2,500,000	2,750,000	2,000,000	8,410,000	10,000,000	20,000,000	38,410,000	Bonds	PWB (USFS)
Map: n/a	Dams and Headworks Repair and Rehabilitation	This program provides for assessment of the condition and rehabilitation of dams and other facilities at Headworks. As many of these facilities are between 50 and 70 years old, their safe and reliable operation requires ongoing investment. The program includes preliminary engineering and design of needed repairs, rehabilitation of these facilities, and actual repair work.	Bull Run	Bull Run	Maintenance	Service Level	0	0	0	0	0	0	1,000,000	2,000,000	3,000,000	Bonds	PWB
Map: n/a WBSUGW	Groundwater Improvements	The Columbia South Shore Wellfield (CSSW) is Portland's alternative supply of water should the Bull Run watershed supply be interrupted for any reason. Projects funded in this program improve the maintenance of this aging infrastructure, including repairs, selective replacements and upgrades.	CSSW	NE	Maintenance	Service Level	300,000	450,000	450,000	500,000	500,000	2,200,000	2,500,000	5,000,000	9,700,000	Bonds	PWB
Map:W-15	Groundwater Collection Main Hardening	Much of the piping connecting the wells to the Groundwater Pump Station is located in liquefiable soils which are vulnerable during a seismic event. This project would design and install measures to "harden" the piping and reduce this vulnerability.	CSSW	NE	Maintenance	Service Level	0	0	0	0	0	0	0	20,000,000	20,000,000	Bonds	PWB
Map: W-16 W01371	Groundwater Electrical Supply Improvements	This project designs and constructs a new 115kV/4160V transformer and other components to complete a double-ended electrical substation at the Groundwater Pump Station. It will also design and construct a 5kV main breaker replacement and purchase selected spare components.	CSSW	NE	Efficiency	Service Level	79,000	1,992,000	0	0	0	2,071,000	0	0	2,071,000	Bonds	PWB
Map: W-17	Groundwater Pump Station Expansion	As water demand increases, the bureau will need to increase the available flows from the groundwater system. The system expansion will include upgrade of the Groundwater Pump Station to provide additional capacity.	CSSW	NE	Expansion	Population	0	0	0	0	0	0	0	10,000,000	10,000,000	Bonds	PWB
Map: W-18	Groundwater Wellfield Expansion	As water demand increases, the bureau will need to increase the available flows from the groundwater system. The system expansion will include additional well development and collection mains in the Columbia South Shore area.	CSSW	NE	Expansion	Growth	0	0	0	0	0	0	2,000,000	10,000,000	12,000,000	Bonds	PWB
Map: W-19	Groundwater Wellfield Reliability Enhancement	The bureau is attempting to increase the flexibility and preparedness to meet the future challenge of an interruption of Bull Run water. The bureau is improving its emergency preparedness by evaluating electrical vulnerability for the pumping system, reviewing the flood inundation vulnerability of the site, and development of a Groundwater Intertie that would reduce transmission system vulnerability. The inundation review may be partially completed through a partnership with Multnomah County Drainage District.	CSSW	NE	Efficiency	Service Level	0	0	0	0	0	0	1,000,000	2,000,000	3,000,000	Bonds	PWB
Map: W-20	Powell Valley Well Improvements	The project includes upgrade of the facilities in the previous Powell Valley Road Water District area and connection and integration of these facilities to the PWB water system.	CSSW	NE	Efficiency	Growth	0	0	0	0	0	0	1,000,000	2,000,000	3,000,000	Bonds	PWB
Map: n/a W01669	Road 1008	This project will design and construct an overlay for the Bull Run 1008 road.	Bull Run	Bull Run	Maintenance	Service Level	60,000	650,000	0	0	0	710,000	0	0	710,000	Bonds	PWB
Map: n/a W01670	Road 10 MP 0.6-1.8	Design and construct walls, widening, culverts and repave this portion of the Bull Run 10 road.	Bull Run	Bull Run	Maintenance	Service Level	60,000	840,000	0	0	0	900,000	0	0	900,000	Bonds	PWB

Project ID	Project Title	Project Description	Location	Area	Project Objective	Driver	Estimated Cost by Time Period								Grand Total FY 2013-33	Funding Source	Facility Provider
							FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	Total FY 2013-18	FY 2018-23	FY 2023-33			
Support																	
Map: n/a	Building Maintenance	The bureau maintains hundreds of structures from the Bull Run watershed to Downtown Portland. These structures range in size from small pump houses to the maintenance hub on Interstate Avenue. The necessary work involves structural repairs and maintenance.	Various/ Citywide	All	Maintenance	Service Level	0	0	0	0	0	0	1,000,000	2,000,000	3,000,000	Bonds	PWB (OMF)
Map: n/a	WBASPL	Planning	Various/ Citywide	All	Efficiency; Maintenance	Service Level	1,500,000	1,500,000	2,000,000	2,500,000	2,500,000	10,000,000	12,500,000	25,000,000	47,500,000	Bonds	PWB
Map: n/a	Sandy River Station Upgrade	This project consists of upgrades to the Sandy River Station facilities including an evaluation of a potential move to a different site.	Sandy River station	E	Efficiency Maintenance	Service Level	0	0	0	0	0	0	0	5,000,000	5,000,000	Bonds	PWB (OMF)
Map: n/a	West Side Maintenance Facility	A hub is needed on the west side of the Willamette River for maintenance and construction crews, vehicles, equipment and materials, and emergency operations. This project includes construction of the facility within the next 20 years.	West of Willamette River, tbd	W	Efficiency; Maintenance	Service Level	0	0	0	0	0	0	5,000,000	0	5,000,000	Bonds	PWB (OMF)
Transmission & Terminal Storage																	
Map: n/a	Conduit 5	This project would include installation of sections of a new Conduit 5 as growth occurs and the condition of the existing conduits worsens.	Conduit 5, east of city limits	E	Maintenance Expansion	Service Level; Growth	0	0	0	0	0	0	0	75,000,000	75,000,000	Bonds	PWB
Map: n/a	WBTTCT	Conduits and Transmission Mains	Various/-C itywide	E	Maintenance	Service Level	425,000	8,500,000	12,600,000	5,000,000	7,000,000	33,525,000	10,000,000	20,000,000	63,525,000	Bonds	PWB
Map W-22	W01424	Kelly Butte Reservoir	Kelly Butte	SE	Replacement	Service Level; Growth	35,000,000	27,000,000	4,970,000	0	0	66,970,000	0	0	66,970,000	Bonds	PWB
Map: n/a	New Conduit Intertie	This project would address concerns about the capability of the conduit system to withstand hazards and deliver an uninterrupted supply to the City. The project will improve reliability of flow during emergency conditions and for maintenance by providing additional isolation and interconnectivity.	Conduit, east of city limits	E	Maintenance Efficiency	Service Level	0	0	0	0	0	0	0	10,000,000	10,000,000	Bonds	PWB
Map W-23	W01343	Powell Butte Reservoir 2	Powell Butte	SE	Replacement	Service Level; Growth	27,520,000	7,700,000	0	0	0	35,220,000	0	0	35,220,000	Bonds	PWB
Map W-24	Powell Butte Reservoir 3	This project constructs a third reservoir at Powell Butte and possible bypass piping around the Butte.	Powell Butte	SE	Expansion	Growth	0	0	0	0	0	0	0	100,000,000	100,000,000	Bonds	PWB
Map: n/a	Sandy River Conduit Relocation, Phase II	The bureau is committed to increasing the flexibility and preparedness to meet the future challenge of a natural disaster. This project will relocate the Sandy River crossings of Conduit 3. The crossings of Conduit 2 and 4 have already been completed. These conduits were identified in the system vulnerability study as vulnerable to seismic, volcanic, flooding, and other natural and manmade hazards.	Sandy River crossing	E	Replacement	Service Level	0	0	0	0	0	0	5,000,000	0	5,000,000	Bonds	PWB

Project ID	Project Title	Project Description	Location	Area	Project Objective	Driver	Estimated Cost by Time Period								Grand Total	Funding Source	Facility Provider
							FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	Total FY 2013-18	FY 2018-23	FY 2023-33	FY 2013-33		
Map W-25 W01524	Tabor Reservoir Adjustments	This project includes adjustments to piping, structures and other features at Mt. Tabor in order to move storage elsewhere and physically disconnect the open reservoirs from the public water system for compliance with LT2. Project does not include disposition of the reservoirs after they have been disconnected from the public water system.	Mt. Tabor	SE	Replacement	Service Level	225,000	1,140,000	1,990,000	0	0	3,355,000	0	0	3,355,000	Bonds	PWB
Map W-26 W01402	Washington Park Reservoir 3	The project will plan, design and construct a new buried reservoir to replace open reservoir No. 3. This project is one solution toward compliance with LT2 replacement of the open reservoirs. It is assumed that Reservoir # 4 will be used as the overflow detention structure. We envision that the buried reservoir would be topped with a reflecting pond and historical features would be protected to retain its visual appeal.	Washington Park	SW	Replacement	Service Level	3,600,000	2,300,000	2,900,000	19,300,000	24,000,000	52,100,000	0	0	52,100,000	Bonds	PWB
Map W-27	West Side Transmission Main Improvements	These mains include the Sam Jackson to Downtown Pipeline and the Jefferson Street Supply mains. These large transmission mains are needed to strengthen the supply to terminal storage located on the west side of the Willamette River.	Various, SW Portland	E	Maintenance Expansion	Service Level; Growth	0	0	0	0	0	0	10,000,000	10,000,000	20,000,000	Bonds	PWB
Map: n/a	Wholesale Connections	This project provides for facilities servicing wholesale customers including repairs, replacements, and upgrades of pump stations and meters. Additional interties may be needed in the future.	Bull Run	All	Efficiency	Service Level; Growth	0	0	0	0	0	0	0	2,000,000	2,000,000	Bonds	PWB
Treatment																	
Map: n/a W01582	Headworks Flow Meters	This project would install new flow meters on the Primary Intake conduits; install new flow meters and flow control valves on Screen house #3 conduits; and, address the sump pump drainage system in Bailey PRV vault.	Bull Run	Bull Run	Maintenance	Service Level	2,500,000	0	0	0	0	2,500,000	0	0	2,500,000	Bonds	PWB
Map: n/a	Treatment Facilities Improvements	Treatment of Portland's drinking water is the most complex activity the bureau engages in while operating the water system. This project would include several related projects for the Bull Run water supply, at Bull Run Headworks and the Lusted Hill Facility. Projects would likely be driven by State and Federal regulations	Bull Run	Bull Run	Maintenance	Service Level; Growth	0	0	0	0	0	0	50,000,000	100,000,000	150,000,000	Bonds	PWB (EPA, OHHS)
Total All Projects							125,209,600	110,949,890	76,092,322	81,943,138	96,524,338	490,719,288	309,050,000	767,300,000	1,567,069,288		

Bureau of Transportation

The Portland Bureau of Transportation project list includes planned transportation projects, based on the Portland's Transportation System Plan (TSP) and the Regional Transportation Plan (RTP). These multi-modal projects address the needs of pedestrian, bicyclists, transit users, freight movers, and motorists. Investments in the City's transportation system are needed to maintain existing facilities and to ensure the system meets the needs of Portlanders for decades to come. Anticipated funding is not adequate to support completion of all projects identified in the Investment Strategy.

The City is updating the Transportation System Plan along with the Comprehensive Plan Update. This update of the Transportation System Plan will include refining the list of projects included here to reflect anticipated funding, project timing; recent plans, new goals and policies, and proposed centers, corridors, and greenways.

For more information on the TSP update project, visit <http://www.portlandoregon.gov/transportation/63710>.

To review the Recommended Transportation Investment Strategy, please see the project list included in the Recommended Transportation System Plan. A copy of the final Transportation Investment Strategy will be inserted here in the final Adopted Plan.