

# CIP White Paper

Department Name: SPU – Water Fund

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## Section 1 - Overview

SPU delivers an average of 120-130 million gallons of drinking water per day to more than 1.3 million people and businesses in Seattle and 22 surrounding cities and water districts. The water system infrastructure includes:

- The Cedar and South Fork Tolt supply sources
- Two wellfields
- Two primary water treatment plants
- 11 booster chlorination facilities
- 400 million gallons of treated water storage
- 30 pump stations
- Approximately 1,900 miles of transmission and distribution system pipelines
- Over 188,000 meters and service connections
- More than 21,000 distribution system valves
- About 18,000 hydrants
- Monitoring and control systems
- Various buildings and other related facilities

Planned spending in the Water Capital Improvement Program (CIP) is \$374 million over the next six years. Project work includes covering open reservoirs to ensure water purity as required by state regulations; changes to the Morse Lake Pump Plant, which will improve access to water stored in Morse Lake and help the utility respond to drought situations; water system improvements associated with construction projects in the City's streets, highways, and bridges; and, investments in the Cedar River watershed mandated by the federal government as embodied in the Habitat Conservation Plan (HCP).

The 2013-2018 Proposed CIP also includes many ongoing programs, such as improving the distribution system of watermains, valves, and pump stations. The capital program also includes investments in watershed stewardship projects, water conservation programs, vehicles, and heavy equipment. By 2018, however, the overall CIP will be reduced, and investments will be substantially focused on rehabilitating and replacing infrastructure for delivery of clean drinking water, with continued watershed stewardship.

Funding for Water capital projects comes predominantly from water rates charged to retail and wholesale customers in the region. In the spring of 2011, the Executive proposed new rates for the period 2012 through 2014, which the Council adopted in the fall of 2011. SPU is currently drafting the update of its Water System Plan, a Washington Department of Health (WDOH) regulatory requirement due every six years. The plan is expected to be finalized and approved by WDOH by April 2013.

## **Section 2 - Summary of Upcoming Budget Issues and Challenges**

Three important trends have converged to put financial pressure on the Water Fund and shape this proposed CIP.

The first is conservation. The City of Seattle and Seattle residents have worked together to reduce water consumption. As a result, water consumption has declined since 1990 and is projected to further decline. In 2010, consumption was 33% below 1990 levels, despite serving a larger population. Seattle currently has some of the lowest per capita water consumption in the nation. While this accomplishment helps contribute to a sustainable future for the region, it puts financial pressure on the utility because fixed costs, including the costs of the CIP, need to be distributed across fewer units of water sold. This trend also puts pressure on SPU management and employees to deliver services as efficiently as possible.

The second major trend is the recent history of major infrastructure investments. The Water Fund is transitioning from a period of constructing large capital projects responding to regulatory requirements to a period focused on the rehabilitation of physical infrastructure. Past investments include water treatment facilities on the Tolt and Cedar Rivers, coverings for five open reservoirs in response to federal/state regulations, and investments to meet federal requirements embodied in the Cedar River Watershed HCP. These investments helped secure the supply and distribution of high-quality drinking water and provide appropriate stewardship of the watersheds consistent with federal and state requirements. The City of Seattle is now better positioned than many water utilities in the nation in terms of regulatory compliance, and residents, businesses and rate payers will benefit from these investments for years to come. The financial implications of the major generational investments will likewise continue to be felt for several budget cycles, as the utility pays off the bonds that were issued to finance past investments.

The third major trend shaping the 2013-2018 Proposed Water CIP is recent economic history. Though there are some signs of recovery in the national economy, the overall economic downturn continues to impact new development, which is the main source of CIP-related Water Fund revenue via the New Taps program. When new housing is brought on line, new services (aka New Taps) are required to supply those units with water. Since 2008, annual revenue from New Taps has decreased 64% and shows only the slightest signs of uptick in 2012.

Against the backdrop of these trends, the 2013-2018 Proposed Water CIP has been developed to:

- Preserve the transmission and distribution systems, including stewardship of the watersheds, to ensure a reliable source of high-quality drinking water;
- Comply with federal and state regulations governing water quality, system reliability, and habitat protection in the watersheds in which SPU operates; and,
- Prioritize projects to deliver on infrastructure and regulatory requirements within the limited resources of the Water Fund.

Please see Section 8 for more information about projects in the 2013-2018 Proposed Water CIP.

## Section 3 - Thematic Priorities

The overarching goal of the Water CIP is to ensure that the water system is properly upgraded and expanded to reliably deliver high-quality, safe drinking water to customers, protect the environment, and comply with regulations. The primary themes driving the CIP in the next six years are asset preservation, health and human safety, environmental sustainability, and race and social justice.

- SPU is committed to making **asset preservation** investments to create or enhance operational efficiency. SPU uses asset management principles to determine the timing of rehabilitation or replacement of its infrastructure. Projects that fall into this category vary, ranging from water main replacement related to transportation projects to decommissioning of steel storage facilities.
- SPU's commitment to **health and human safety** is also addressed through SPU's reservoir covering projects. Consistent with Ordinance 120899 and required by state regulators, SPU is replacing its open finished drinking water reservoirs with underground structures that will improve water quality and system security. In 1990, there were ten uncovered distribution system reservoirs. As of 2012, there was one remaining reservoir under construction at Maple Leaf. SPU plans to decommission Roosevelt Reservoir, and further evaluate the possibility of decommissioning Volunteer Reservoir. However, permanent actions at these two reservoirs are not expected to occur until after Maple Leaf Reservoir is completed. At that point, the City will have an opportunity to take the Volunteer and Roosevelt reservoirs offline for a period of time to observe the water system's performance without them.
- SPU is committed to **environmental sustainability**. This can best be seen in the SPU's responsibilities as outlined in the 50-year Habitat Conservation Plan (HCP), an agreement between local, state and federal agencies. The HCP seeks to ensure the long-term ecological integrity of the Cedar River Watershed, which supplies the majority of the City's drinking water. It simultaneously addresses the needs of protected wildlife species in and along the Cedar River. Investments in the regional conservation and low-income conservation programs also help in management of our natural resources, while helping customers reduce their utility bills.
- SPU is also committed to **race and social justice**. One example of this commitment is the Low Income Water Conservation Program. This ongoing program provides water use efficiency resources to the City's low-income customers to implement water conservation measures. Typical improvements consist of, but are not limited to, installing water-efficient fixtures, such as aerating showerheads and faucets, low water-use toilets and efficient clothes washers. The program is cooperatively managed by SPU and the City's Human Services Department.

## Section 4 - Project Selection Criteria

SPU's capital planners identify candidate CIP projects through an awareness of ongoing planning processes (e.g., comprehensive plans, program plans), external projects and opportunities, and

emergencies or other unexpected events that indicate specific investments are possibly recommended.

SPU's Asset Management system then provides rigorous analysis of projects, by using a business case process that establishes whether a problem or opportunity is timely and important, and that the proposed solution is superior to alternatives based on a triple bottom line analysis (economic, environmental and social) of life cycle costs and benefits -- or is a "must do" project (e.g., required by regulation).

After candidate projects have been identified, SPU prioritizes the capital projects for inclusion in the CIP based on the following set of criteria:

- **Regulatory Mandates, Legal Agreements:** The degree to which the project is driven by federal, state, and local laws, permit and regulatory requirements, and consent decrees; as well as by legal agreements with public and private parties. Examples of highly ranked projects in this category include the Reservoir Covering programs and the Habitat Conservation Program.
- **External Drivers:** SPU's responsiveness to, or engagement with, the projects of other departments or jurisdictions, and the specific mandates of the City Council and Mayor. Examples of highly ranked projects in this category include the Alaskan Way Viaduct and Mercer Corridor projects.
- **Infrastructure:** How a project addresses infrastructure conditions or vulnerabilities. Examples of highly ranked projects in this category include the Watermain Rehabilitation, Distribution System Improvements and Tank Improvements programs.
- **Level of Service:** The importance of this project in providing or improving services to customers. Examples of highly ranked projects in this category include the Water Infrastructure – New Taps and Service Renewals programs.
- **Other Factors:** Other important factors include high net present value or cost-effectiveness, social or environmental benefits not otherwise captured, a project already in progress or near completion, limited time opportunity, demonstration projects, community visibility, outside funding. Examples of highly ranked projects in this category include the Cedar Moraine Improvements and Riverton Heights Drainage Improvements projects.

Every project is rated against each criterion. Criteria ratings are then considered in determining an overall project priority ranking, using expert judgment. Priority rankings for the CIP are determined by the leads for each Line of Business, with review by key internal stakeholders. The ranking scheme and criteria are the same for all Lines of Business, and are approved by the SPU Director and Asset Management Committee.

Project priority rankings are used to clarify and document which projects are most important and why, to help determine which projects at the margin will be included, excluded, or deferred from the CIP, and which projects should receive priority attention if a staff or financial resource

constraint should arise. This process can also result in project scope changes, as more cost-effective approaches to meeting the business need are identified.

In recent years, this prioritization process has resulted in decisions to retire or downsize some facilities, primarily finished water reservoirs, and defer some capital projects. Retiring facilities reduces capital expenditures since these facilities are in need of major improvements (such as seismic retrofits) that are avoided, as well as reduces annual operating costs since the level of maintenance is greatly reduced. Downsizing or retiring storage facilities is possible because the need for storage has changed over time as the system has been reconfigured, transmission and treatment has become more reliable, and demands, particularly for fire flows, have declined.

Some examples of retirements are:

- Richmond Highlands Tanks (decommissioning the smaller of two): \$1.8 million in capital cost savings
- Foy Standpipe: \$2 million in capital cost savings
- Myrtle Tank #1: \$900,000 in capital cost savings
- Roosevelt Reservoir: \$24 million in capital cost savings
- Volunteer Reservoir retirement is under consideration (\$25 million in potential capital savings since this reservoir would have to be buried if it were kept in service)
- Lincoln, Beacon and West Seattle Reservoirs were downsized based on demand analysis

Some examples of deferrals are:

- Landsburg Flood Passage Improvements to improve woody debris management and performance during high flood flows at Landsburg Diversion (\$5M): Moved to 2013 and scope downsized
- Cedar Falls Facilities Development to improve buildings and office space at Cedar Falls Headquarters: Shifted start of planning from 2009 to 2011. Construction shifted from 2012 to 2017.
- Desktop and laptop replacement frequency lengthened

## **Section 5 - Aligning Infrastructure with Planned Growth**

In its Water System Plan updates, SPU forecasts water demands to meet the growth projections as planned for in Seattle's most recent Comprehensive Plan and ensures that there will be adequate water supply for at least the next 20 years. These growth projections include expected residential and commercial growth into designated Urban Centers and Urban Villages. The 2007 Water System Plan indicated that new sources of supply would not be needed until sometime after 2060.

Growth-based infrastructure needs in Urban Centers and Urban Villages are addressed through specific programs in the Water CIP, including water main extensions, new water connections for new construction, fire flow improvements, and water main rehabilitations. The water distribution system in these areas is fairly robust, and needed improvements are generally located within areas where the land use is changed from single family zoning to a more intensive use needing higher flows for

firefighting. Projects containing these improvements are evaluated through a business case process and are prioritized among the other projects in the CIP.

## **Section 6 - Future Projects/What is on the Horizon**

The Water CIP is coming to the end of a 20-year period of investments in major infrastructure projects. These projects have positioned SPU to meet drinking water quality and environmental regulations. Projects have included the Tolt and Cedar Water Treatment Facilities, Reservoir Covering Program, the Cedar River Watershed HCP, and a new Water Quality Laboratory. SPU has also made a major reinvestment in the Supervisory Control and Data Acquisition System which is used to monitor and control the regional and retail water system. However, these investments have also led to increasing debt service payments that constrain future budgets.

There is only one remaining large project, Morse Lake Pump Plant, and a few special mid-range programs, such as those related to transportation projects and improvements to SPU facilities. The Morse Lake Pump Plant project provides for reliable release of water from Morse Lake into the Cedar River. This is necessary to maintain the supply of drinking water to the region and meet regulatory minimums for the amount of “in-stream flows” in the river to support aquatic habitat, wetlands, riparian vegetation, and water quality.

Beyond these projects, emphasis will be on asset management based rehabilitation and replacement of distribution system infrastructure (e.g. mains, valves, hydrants, meters). Example of such projects to date are the 3<sup>rd</sup> Ave West PRVs project, which installed new pressure reducing valves (PRVs) in the Ballard neighborhood, and the WM Ship Canal Crossing at 3<sup>rd</sup> Ave West project, which rehabilitates a failing watermain (WM) underneath the Ship Canal Bridge. There is significant planning and analysis work involved in applying asset management and determining the appropriate level of CIP versus operating and maintenance work needed for each asset, and shifting the workforce accordingly.

## **Section 7 - CIP Revenue Sources**

SPU’s Water CIP is funded largely by Water ratepayers. About 71% of the Water Fund’s overall revenues come from retail ratepayers, split approximately evenly between residential and commercial customers. Another 23% of the Water Fund’s overall revenues come from wholesale purveyors who serve surrounding jurisdictions. The remaining 6% consists of non-rate revenue, which includes such sources as tap fees received and developer watermain reimbursements. SPU issues bonds, serviced by ratepayers, which in the current rate period cover 59% of the CIP, with the remainder funded by cash, i.e. directly by ratepayer revenue.

SPU actively seeks grants, low interest loans, and other funding sources whenever possible. And, as mentioned above, SPU also receives payments from developers that are intended to offset the cost of installing new taps when they connect newly constructed buildings to the SPU watermain. These “tap fees” are a volatile revenue source, trending with the construction-related sectors of the economy.

## Section 8 - CIP Spending by Major Category

(in 000s)							
<b>Water Fund</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>Total</b>
Distribution	\$19,778	\$20,394	\$22,741	\$24,085	\$25,279	\$25,670	\$137,947
Transmission	\$1,703	\$3,076	\$3,137	\$3,195	\$3,253	\$3,314	\$17,678
Watershed Stewardship	\$3	\$2	\$2	\$2	\$2	\$2	\$13
Water Quality and Treatment	\$3,334	\$5,304	\$4,775	\$326	\$100	\$100	\$13,939
Water Resources	\$6,683	\$8,212	\$17,590	\$14,287	\$9,197	\$3,237	\$59,207
Habitat Conservation Program	\$2,507	\$2,491	\$2,030	\$1,927	\$2,718	\$1,262	\$12,934
Shared Cost Projects	\$15,795	\$19,403	\$18,513	\$13,418	\$16,429	\$6,560	\$90,118
Technology	\$9,174	\$8,596	\$6,355	\$5,933	\$5,965	\$6,114	\$42,137
<b>Total</b>	<b>\$58,977</b>	<b>\$67,477</b>	<b>\$75,142</b>	<b>\$63,174</b>	<b>\$62,943</b>	<b>\$46,259</b>	<b>\$373,972</b>

### Distribution

Projects and programs in this program category relate to rehabilitation and improvements to the City's water mains and appurtenances, pump stations, and other facilities that are part of the system that distributes treated water throughout the City of Seattle to retail customers.

In total, no changes are reflected in the **Distribution BCL** as compared to the same years in the Adopted 2012-2017 CIP. However there has been a shift from the creation of new assets to rehabilitation of existing ones. This results in a decrease in the Distribution System Improvements project in the near term and a commensurate increase in the Watermain Rehabilitation project. The total BCL amount remains unchanged.

### Transmission

The purpose of this program category is to rehabilitate and improve the City's large transmission pipelines that bring untreated water to the treatment facilities, and convey water from the treatment facilities to Seattle and to other local utilities that purchase a portion of SPU's supply for their customers.

Reductions in the **Transmission BCL** of \$1.3 million in 2013 compared to the same year in the Adopted 2012-2017 CIP were due primarily to a shift in the timing of the Business Case presentation for the Cathodic Protection program, which has affected the expected construction start date for that project.

### Watershed Stewardship

Projects and programs in this program category improve protection of SPU's sources of drinking water, provide habitat protection and restoration, sustain the environment, and enhance environmental quality, both locally and regionally. Most of the projects in this program category are

located within the Cedar and Tolt River municipal watersheds. Three of these projects are being carried out in response to the Endangered Species Act's designation of the Chinook salmon as a threatened species.

- The Cedar River Municipal Watershed is 90,638 acres of land owned by the City of Seattle and provides about 70% of the drinking water used by over 1.3 million people in the greater Seattle area. The City of Seattle is required by law to maintain a clean drinking water supply. To that end the City restricts public access and management is guided by a Habitat Conservation Plan. The Cedar River Watershed is an unfiltered surface water supply which produces some of the best water in the world.
- The South Fork Tolt River Watershed is the smaller and lesser known but still essential second supply watershed in SPU's freshwater supply system. Located in the foothills of the Cascades in east King County, it first came on-line in 1964, and since 1989 has also supported a small Seattle City Light hydro-electric facility. The Tolt Treatment Facilities can provide up to 120 million gallons of drinking water per day.

The **Watershed Stewardship BCL** decreased \$1 million in 2013 and \$700,000 in 2014 mostly due to elimination of the Kerriston Road project, within which SPU acquired land that is now part of the Cedar River Watershed. Further land acquisitions have been cancelled as SPU believes the benefit from additional property acquisitions does not justify the costs.

### **Water Quality & Treatment**

The purpose of this program category is to construct, rehabilitate or improve water treatment facilities, and cover the remaining open water reservoirs. State and federal drinking water regulations and public health protection are key drivers of investments in this program category. To comply with regulations, SPU has invested hundreds of millions of dollars in building two new treatment facilities and burying five reservoirs that contain already treated water that is distributed directly to Seattle residents and wholesale customers for drinking purposes.

The **Water Quality & Treatment BCL** decreases \$2 million in 2013 and increases \$3.8 million in 2014 due to a one-year shift in the projected timing of corrective actions that may need to be taken due to possible design flaws in at least three of the new reservoirs and an increase in cost projections for these actions.

### **Water Resources**

The purpose of this program category is to manage the City's water resources to meet anticipated demands and in-stream flow requirements – the amount of water provided to the river to support aquatic habitat, wetlands, riparian vegetation, and water quality – and to promote residential and commercial water conservation. The requirements for in-stream flows are detailed in agreements with state and federal agencies and include provisions for minimum stream flows in the Cedar and South Fork Tolt Rivers. Examples of the types of projects in this category include the Dam Safety Program and the Morse Lake Pump Plant. The Morse Lake Pump Plant is one of the last big investments contemplated in the Water CIP in this decade.

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Increases in the **Water Resources BCL** of \$1.1M in 2013 and reductions totaling \$531k in 2014 are a result of two factors. First, the Morse Lake Pump Plant (MLPP) project increases \$1.3M in 2013 and \$2.6M in 2014 as selection of the floating axial pump concept for the preferred solution resulted in changes to cost and schedule projections. The 2014 increase is mostly offset, however, by the second factor, which is an almost \$3M reduction in the Water Supply Flexibility project. This reduction occurred due to delays in the development of construction plans for overflow dike rehabilitation work because of staffing constraints.

### **Habitat Conservation Program**

This program category includes projects and programs directly related to implementation of the Cedar River Watershed Habitat Conservation Plan. The Habitat Conservation Plan benefits the utility and the ratepayers it serves by providing legal certainty under the Endangered Species Act for the City's continued operations within the Cedar River Watershed, which supplies 70% of the region's drinking water. The Habitat Conservation Program requires SPU to invest \$100 million over 50 years, with \$60 million in the first decade, on approximately 30 capital projects and 60 O&M activities in three areas: management of in-stream flows for people and fish, forest and land conservation activities, and mitigation for the blockage of salmon and steelhead fish as they return to the Cedar River to spawn. The Water Fund's CIP projects in this area are grouped into eight categories: road improvements and decommissioning, stream and riparian restoration, upland forest restoration, Landsburg fish passage, Cedar River sockeye hatchery, improvements to the Ballard Locks for fish passage and water conservation, fish habitat protection and restoration in the lower Cedar River below the municipal watershed boundary, and evaluation of Cedar permanent dead storage in Chester Morse Lake.

The size of the **Habitat Conservation Program BCL** decreases over the course of the six-year CIP as major capital projects required under the Habitat Conservation Plan agreement are completed and land-acquisition commitments are satisfied. This BCL will see decreases totaling \$865,000 in 2013 and \$1.2 million in 2014, primarily for this reason.

### **Shared Cost Projects**

This program includes individual capital improvement projects which typically benefit multiple lines of business (e.g. the water line of business and the drainage and wastewater line of business) and whose costs are "shared," or paid for, by more than one of SPU's utility funds. In 2012, the Water program includes funding for several transportation-driven projects (the Alaskan Way Viaduct & Seawall Replacement, First Hill Streetcar, Bridging the Gap), Heavy Equipment Purchases, and Security, Facilities and SCADA Improvements. The SCADA system is Supervisory Control and Data Acquisition program, which funds improvements to the centralized monitoring and control of the drinking water system and includes, but is not limited to, flow and pressure sensors, remote control pumps, and valves.

The **Shared Cost Projects BCL** decreases \$2.4 million in 2013 and increases \$1.7 million in 2014. The primary driver of the 2013 decrease is the Heavy Equipment Purchases project. Spending projections are adjusted in the fall of every year after detailed interviews with end-users and assessments of existing equipment are conducted, and the result of the most recent assessment is that less new equipment is needed in this year. In addition, as part of an overall effort the keep Water Fund

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expenditures within the level assumed in rates, efforts are being made to extend the useful life of heavy equipment and to downsize wherever possible. The key driver of the 2014 increase is the Regional Facility–Other project in which design is now underway for Landsburg Facility Upgrades and schedule adjustments are being made. Total project costs remain unchanged.

### **Technology**

The Technology capital portfolio is managed via six business-focused program areas, which provide an enterprise-wide view of technology investments in the context of SPU’s strategic, business, and City-wide priorities. These areas are: Customer Contact and Billing, Enterprise Information Management, IT Infrastructure, Project Delivery & Performance, Science & System Performance and Asset Information Management. Programmatic investments in 2013 and 2014 were prioritized within the context of SPU’s key initiatives, which focus on improving internal controls, improving productivity and performance, improving customer service, transitioning from data rich to knowledge rich environments, and improving project delivery.

This program category is presented in the separate “Technology CIP” section of SPU’s 2013-2018 Proposed CIP. The 2013-2018 Proposed CIP increases Technology CIP spending for all utility funds by \$4.29 million in 2013 and decreases it by \$261,000 in 2014 as compared to the 2012-2017 Adopted CIP. The Water Utility’s Technology CIP amount increased \$1.17 million in 2013 and decreased \$1.07 million in 2014 when compared to Endorsed levels. These amounts are based on the Water Utility’s share of benefit from these projects.