2023-2029 Adopted
Utilities Capital Investment Program (CIP) Plan

Executive Summary:

The 2023-2029 Adopted Utilities Capital Investment Program (CIP) is a plan and budget for critical utility system infrastructure improvements that will be implemented in the next seven years. The Utilities CIP totals $317 million for the water, sewer, and storm and surface water utilities.

Key drivers for the 2023-2029 CIP are:

- Renewing and replacing aging infrastructure
- Preserving the natural environment
- Adding system capacity to support anticipated growth
- Enhancing operational efficiencies

Overview

The City's utility infrastructure is aging, and increased maintenance and capital investments are inevitable. The 2023-2029 Utilities CIP, summarized in the chart below, will enable Utilities to responsibly maintain and replace aged assets and avoid an increase in system failures and degradation of service to customers, provide capacity to support economic growth, meet regulatory requirements, support environmental preservation, and enhance operational efficiencies.

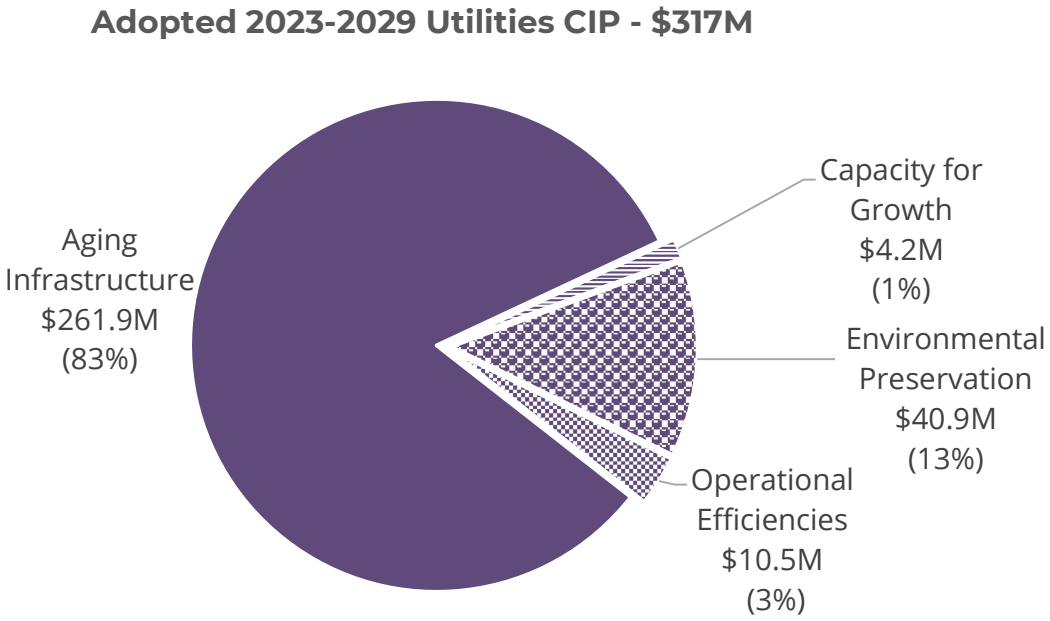

Figure 10-1 Description: A pie chart showing the Adopted 2023-2029 Utilities CIP of $317 million. $261.9 million is for Aging Infrastructure projects, $40.9 million for Environmental Preservation projects, $10.5 million for Operational Efficiencies projects, and $4.2 million for Capacity for Growth projects.

Alignment with Strategic Target Areas

Development of the 2023-2029 CIP budget was guided by aligning utility system needs with City Council's strategic direction, including:

- Supporting the City's economic development by ensuring that utility infrastructure provides reliable capacity for growth;
- Protecting, renewing, and enhancing utility infrastructure and natural resources, as part of the City's high quality built and natural environment; and
- Continuing to be a high-performing organization by leveraging innovation and technology to improve service delivery and achieve cost efficiencies.

Additionally, Bellevue Utilities coordinates with other city departments and WSDOT in order to lower overall costs and minimize customer impacts.

Aging Infrastructure

Utilities owns, operates, and maintains over $3.5 billion of infrastructure assets, with over 1,600 miles of pipeline, 24 water reservoirs, 68 pump and flush stations, and 73 pressure zones. The pipeline infrastructure was primarily constructed in the 1950s - 1970s, and most of the assets are well past midlife. As the infrastructure ages, it becomes less reliable and more failures occur. As a result, the cost to operate, maintain, rehabilitate, and replace the various assets increases. System renewal is the most significant driver of the Utilities CIP.

Utilities has a strategic asset management plan in place to minimize system failures and to mitigate future rate spikes through proactive planning focused on optimal infrastructure life cycle costs.

Each utility is in a different stage of system replacement; therefore, the size of the CIP differs for each utility. The water utility is in active system replacement and 65 percent of the aging infrastructure project costs are for this utility. The sewer utility and storm and surface water utility are both beginning systematic infrastructure replacement. Additional condition assessment to determine future infrastructure renewal and replacement needs is also being conducted.

Environmental Preservation

Bellevue's storm and surface water utility was established in 1974 — one of the first in the nation. The City's philosophy emphasizes storm water management to reduce the risk of flooding, and to protect and enhance Bellevue's streams, lakes, and wetlands. This is accomplished primarily by restoring streams, improving culverts and fish passage, and reducing flood hazards through storm water infrastructure projects.

Capacity for Growth

Bellevue's downtown was rezoned in 1981 to create an urban core, and since that time, multifamily and commercial growth continues to transform this area. In addition, the City's

BelRed area was rezoned in 2009 to allow increased density. This area will continue to undergo significant redevelopment with accompanying infrastructure needs in all three utilities.

Operational Efficiencies

The CIP includes several programs for improving operational efficiencies and service delivery to our customers.

Building an additional operations and maintenance facility in the North End of Bellevue will better serve our customers by maximizing efficiencies and improving emergency response. The current operations and maintenance facilities are operating at or near capacity and will not meet all of Utilities operational needs to service the community into the future.

Procuring and implementing an advanced portfolio and project management system will enable the Utility to more efficiently deliver the Utilities CIP.

Infrastructure Renewal and Replacement Account

Recognizing that the cost to replace Utilities aging infrastructure is significant, the City Council established the Renewal and Replacement (R&R) Account in 1995 for future system infrastructure needs as identified in the Utilities CIP. Bellevue's long-term infrastructure funding strategy is to build rate revenues gradually over time to achieve a pay-as-you-go capital program and use the R&R funds to address peak capital needs. Proactive planning consistent with council-adopted policies allows for funding of infrastructure now and into the future while managing utility rate impacts and maintaining intergenerational equity. By establishing the R&R Account strategically and continuing to update and refine a 75-year financial model, Bellevue Utilities is better prepared than many utilities to meet increasing infrastructure investment to maintain continuity of service to customers.

Water System

Over 600 miles of pressurized water pipeline, 24 reservoirs, 21 pump stations, 73 pressure zones, and 5,950 fire hydrants comprise the backbone of Bellevue's water system. Most of the pipe network was built 50 -70 years ago and is past its midlife. About 40 percent of the pipes are asbestos cement (AC), which are at higher risk for sudden failure, especially the small diameter AC pipes. The rest of the water system pipes are predominantly ductile or cast iron, with an average expected life of 125 years.

Although the water system will not need to expand very much because the City is essentially built out geographically, some areas of the City have been rezoned for higher density development – including downtown and the BelRed area. Because these areas are experiencing significant growth and we expect growth to continue in the future, new water system infrastructure with increased capacity (e.g., reservoir storage) will be needed.

2023-2029 Water Utility CIP: $178.2 million

What type of projects are needed and why?

- A significant portion of the water utility CIP addresses the replacement of aging infrastructure and rehabilitation of systems. Through its asset management program, Utilities actively assesses whether each component of the entire system needs replacement, rehabilitation, or just continued maintenance to preserve service life. A good example is when a pump needs replacing, but the pump station that houses it does not. A total of $170 million is budgeted for replacement and rehabilitation of aging infrastructure in the water fund. Major programs include the following:

    - Replacement of aging water pipe, especially asbestos cement pipe, is a key ongoing annual program to address age-related degradation and risk of failures. Based on pipe age and life cycle assessments, the Utility determined about 10 years ago that a ramp-up of the water main replacement rate was necessary to maintain system functionality and meet customer service levels for the future. The Utility is budgeting a total of $111.5 million over the 7-year CIP period, to continue proactive replacement of water pipe with the goal of 5 miles of water pipe replacement per year.

    - Similarly, reservoirs and pump stations experience age and use-related degradation and regularly require structural upgrade or replacement, retrofitting for earthquakes, and replacement of system components (such as lining systems, pumps, and control systems). With 24 reservoirs and 21 pump stations in the system, Utilities is spending $21.9 million to ensure water is consistently available, even after emergencies, for peak demands and to fight fires.

    - The Bellevue drinking water system is complex due to Bellevue's topography which ranges from 20 feet above sea level on the shores of Lake Washington to over 1,400 feet above sea level near Cougar Mountain. Sometimes gravity is all that is needed to deliver water to residents and businesses. In other areas, pumps are required to move water to reservoirs or directly to customers. To equalize the water pressure through the system, pressure reducing valves may be needed to ensure that water is delivered to neighborhoods with appropriate pressure. Like all mechanical devices, these valves wear out and need to be replaced. Utilities has budgeted $8.9 million for this effort.

- New growth brings with it many challenges, including increased water needs. Utilities continually assesses and meets these demands, either through expansion of existing storage, pipelines, and supply inlet facilities or by optimizing system operation. The cost is estimated to be $4.2 million in new or improved infrastructure.

- As Bellevue continues to grow, there is a critical need for utility operational facilities to meet the current and future needs in an efficient and timely manner. The current operational facilities are operating at or near capacity and will soon be unable to meet our service needs. Utilities is looking to add a new maintenance facility in the North End which will provide needed space for continued growth, improved efficiencies through reduced travel times and improved emergency response. The cost estimates to construct the new facility is $10.0 million, of which $3.9 million will be provided by the Water Utility CIP.

The following table shows the Water Utility CIP Plans included in the 2023-2029 Budget:

Figure 10-2
Water CIP Overview

CIP Plan Number	Description	2023-2029 Adopted Budget ($000)
W-16	Water Main Replacement	111,530
W-67	Pressure Reducing Valve (PRV) Station Rehabilitation	8,932
W-69	Minor (Small) Water Capital Improvement Projects	209
W-85	Reservoir Rehabilitation or Replacement	11,718
W-91	Water Pump Station Rehabilitation or Replacement	10,180
W-98	Replacement of Large Commercial Meter Vaults	3,206
W-99	Water Service Line and Saddle Replacement Program	1,857
W-103	Increase Drinking Water Storage Availability for West Operating Area	4,216
W-110	Water Supply Inlet Rehabilitation	304
W-111	Maintenance and Operations Yard - Water	3,867
W-112	Water System Capital Planning	890
W-115	SCADA Upgrade – Water	1,162
W-117	170th Pl. SE Pressure Improvements	1,367
W-118	Somerset Highlands Pressure & Flow Improvements	5,781
W-119	Groundwater Well Improvements	12,835
W-120	Project and Portfolio Management System - Water	167
Water Utility CIP Total		**$178,221**

Sewer System

Bellevue's sewer system, comprised of over 630 miles of pipes, 47 pump and flush stations, and 34 major connections to the King County regional wastewater system, is more than halfway through its useful life. Ongoing condition assessments coupled with monitoring of sewer overflows help in planning for replacement of sewer system assets. Much of the system will need significant repair or replacement; the timing of this work is determined through proactive asset management assessments.

For the sewer system, replacement of pipeline infrastructure is only just beginning. In many cases, repair of pipe defects has been and will continue to be a cost-effective way to extend the life of sewer pipes. However, to continue to deliver safe, reliable sewer service, a significant increase in capital investment for pipeline replacement will be necessary. Pipes that convey sewage along the shores of Lake Washington and Lake Sammamish (lake lines) will be particularly difficult and expensive to replace.

Typically, sewer systems rely on gravity sewers to pass flows to major regional lines known as "trunklines." In some locations, pump stations are needed to lift the sewage to higher levels to again take advantage of gravity flow. For the lake lines, low-pressure flush stations periodically "flush" the sewer lake lines with lake water to keep sewerage flowing in the pipes. Pump and flush stations have electrical and mechanical components that must be replaced every 25-40 years.

As with the water system, increased system capacity (larger pipes and pump stations) will be needed to meet new growth in the downtown and BelRed areas as these areas develop to higher density zoning.

2023-2029 Sewer Utility CIP: $77.5 million

- A major portion of the work for the Sewer Utility CIP addresses the need for rehabilitation or replacement of aging sewer pipelines and other system infrastructure, such as pump stations and supervisory control and data acquisition (SCADA) systems. These upgrades or replacements can have significant costs associated with them; proactive planning is performed to ensure these investments are made to meet customer needs at the lowest life cycle cost. Utilities has budgeted $54.7 million for replacement of pipe infrastructure and rehabilitation of sewer systems.

- The replacement of sewer pipelines submerged along the shores of Lake Washington is a significant infrastructure program. These lake lines comprise about 15 miles of infrastructure and will require replacement over the next 20 years or more. Utilities also owns and operates 4 miles of lake lines in Lake Sammamish; however, replacement is not expected in the next thirty to forty years. Utilities has budgeted $4.3 million for the Lake Washington Lake Line program in this 7-year CIP to initiate the program, and anticipates increasing funding over the next 20 years.

- As our infrastructure continues to age and the service area continues to expand and develop, our current maintenance facilities will soon be unable to meet our service needs. Utilities is looking to add a new maintenance facility in the North End which will provide needed space for continued growth, improved efficiencies through reduced travel times and improved emergency response. The cost estimate to construct the new facility is $10.0 million, of which $6.1 million will be provided by the sewer utility CIP.

The following table shows the Sewer Utility CIP Plans included in the 2023-2029 Budget:

Figure 10-3
Sewer CIP Overview

CIP Plan Number	Description	2023-2029 Adopted Budget ($000)
S-16	Sewage Pump Station & Force Main Improvements	23,297
S-24	Sewer System Pipeline Repairs and Replacement	26,844
S-32	Minor (Small) Sewer Capital Improvements and Projects	258
S-58	Lake Washington Sewer Lake Line Program	4,304
S-66	Sewer System Pipeline Repair and Replacement	1,954
S-111	Maintenance and Operations Yard	6,094
S-112	Sewer Planning Program	1,763
S-115	SCADA System Upgrade - Sewer	4,567
S-116	Permit Compliance Monitoring	291
S-117	Septic Systems Sewer Extensions	7,989
S-120	Project and Portfolio Management System – Sewer	167
Sewer Utility CIP Total		**$77,528**

Storm and Surface Water System

The Storm and Surface Water Utility is unique in that drainage is a combination of publicly and privately-owned system components working together to manage storm water, prevent flooding, improve water quality, and carry this water to streams, wetlands, and lakes. Additionally, the storm and surface water system is made up of both the built and natural environment, working in tandem. Both the ownership of components and the type, either built or natural, transition repeatedly throughout the system. This creates unique challenges for planning and implementing capital improvements for the Storm and Surface Water Utility. Preservation of the City's natural environment is a core value in the management of the Storm and Surface Water Utility.

The publicly-owned portion of Bellevue's storm and surface water system comprises over 480 miles of pipes and open trenches, 92 miles of open streams, over 20,000 storm water catch basins and inlets, and over 2,000 other facilities including culverts, local detention facilities, and large regional detention and water quality facilities. Because much of the infrastructure was built by King County and private developers before the Storm and Surface Water Utility was created in 1974, information is limited regarding the system's condition.

Increasing capital investments will be needed to replace infrastructure prior to failure to prevent property damage and protect the environment. To date, infrastructure investment has consisted primarily of storm pipe repairs and replacing some major culverts in danger of failure and known to be barriers to fish migration. Additional information is being collected to determine asset inventory and condition, which will result in a more complete and accurate forecast for predicting appropriate timing for asset replacement. Preventing flood damage from storms is integral to the Storm and Surface Water Utility's mission. Flood protection and projects to restore stream health and environmental habitat are key components of the Storm & Surface Water Utility CIP program.

2023-2029 Storm and Surface Water Utility CIP: $61.7 million

- Flood control is a vital component of Bellevue Utilities stormwater management work. The Factoria Boulevard Conveyance Improvement Project is budgeted at $7.3 million in the 7-year CIP, with $5.7 million funded by the King County Flood Control District. It will mitigate flooding in the Factoria business corridor by increasing flow capacity and improving collection and distribution of stormwater. In addition to the Factoria project, $11.7 million is budgeted for other flood control projects in the next 7 years, with $3.7 million funded by the King County Flood Control District.

- Utilities rehabilitates or replaces defective drainage pipelines and rehabilitates roadside ditches annually. With close to 400 miles of piped system alone, this is an ongoing program that will continue into the future. The 7-year CIP planning horizon allocates $19.8 million toward this effort.

- The stream channel modification program includes work on public land to stabilize stream banks, improve stream channels, in-stream habitat, and sediment movement. The budget for this work is $10.9 million.

- Bellevue Utilities evaluates all of its culverts to determine fish passage improvement needs, and works closely with State Department of Fish and Wildlife regulators to implement new designs that allow for fish passage. The budget for this effort is $2.7 million.

The following table shows the Storm & Surface Water Utility CIP Plans included in the 2023-2029 Budget:

Figure 10-4
Storm and Surface Water CIP Overview

CIP Plan Number	Description	2023-2029 Adopted Budget ($000)
D-64	Storm Water System Conveyance Infrastructure Rehabilitation	19,792
D-81	Fish Passage Improvement Program	2,724
D-86	Stream Channel Modification Program	10,926
D-94	Flood Control Program	11,676
D-104	Stream Restoration for Mobility and Infrastructure Initiative	258
D-109	Stormwater Quality Retrofit Program	5,118
D-112	Storm and Surface Water Planning Program	1,421
D-114	Factoria/Richards Creek Flood Reduction	7,296
D-115	SCADA Upgrade – Storm	865
D-116	Post-Construction Monitoring and Maintenance Program	1,456
D-120	Project and Portfolio Management System – Drainage	166
Storm & Surface Water Utility CIP Total		**$61,698**

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2023-2029 Utilities CIP Project Expenditures ($000s)

City of Bellevue 2023-2024 Adopted Budget

CIP Plan No.	Project Name	2022 Approp. To Date	2023 Budget	2024 Budget	2025 Budget	2026 Budget	2027 Budget	2028 Budget	2029 Budget	2023-2029 Total	Total Project Budget
WATER CIP											
W-16	Water Main Replacement	127,537	11,954	12,525	19,447	16,158	17,351	16,329	17,766	111,530	239,067
W-67	Pressure Reducing Valve (PRV) Station Rehabilitation	10,072	800	823	1,093	1,348	3,124	948	796	8,932	19,004
W-69	Minor (Small) Water Capital Improvement Projects	8,722	-	-	-	-	-	-	209	209	8,931
W-85	Reservoir Rehabilitation or Replacement	28,749	750	3,488	1,257	1,086	794	3,633	710	11,718	40,467
W-91	Water Pump Station Rehabilitation or Replacement	18,781	4,462	2,682	1,786	410	422	-	418	10,180	28,961
W-98	Replacement of Large Commercial Meter Vaults	4,149	503	389	541	1,311	45	417	-	3,206	7,355
W-99	Water Service Line and Saddle Replacement Program	3,526	552	796	337	-	-	19	153	1,857	5,383
W-103	Increase Drinking Water Storage Availability for West Operating	5,229	-	-	400	1,099	1,755	962	-	4,216	9,445
W-110	Water Supply Inlet Rehabilitation	2,314	175	129	-	-	-	-	-	304	2,618
W-111	Maintenance and Operations Yard - Water	5,333	-	-	2,466	1,401	-	-	-	3,867	9,200
W-112	Water System Capital Planning	-	-	286	404	200	-	-	-	890	890
W-115	SCADA Upgrade – Water	80	614	316	232	-	-	-	-	1,162	1,242
W-117	170th Pl. SE Pressure Improvements	750	617	477	273	-	-	-	-	1,367	2,117
W-118	Somerset Highlands Pressure & Flow Improvements	-	440	906	2,435	2,000	-	-	-	5,781	5,781
W-119	Groundwater Well Improvements	-	-	-	360	1,919	923	1,734	7,899	12,835	12,835
W-120	Project and Portfolio Management System - Water	-	134	33	-	-	-	-	-	167	167
TOTAL WATER CIP		**215,242**	**21,001**	**22,850**	**31,031**	**26,932**	**24,414**	**24,042**	**27,951**	**178,221**	**393,463**
SEWER CIP											
S-16	Sewage Pump Station & Force Main Improvements	24,096	1,478	5,937	3,577	3,032	5,531	1,725	2,017	23,297	47,393
S-24	Sewer System Pipeline Repairs and Replacement	31,576	3,590	2,799	7,330	3,773	3,281	3,370	2,701	26,844	58,420
S-32	Minor (Small) Sewer Capital Improvements and Projects	3,879	258	-	-	-	-	-	-	258	4,137
S-58	Lake Washington Sewer Lake Line Program	3,236	675	41	119	219	945	1,159	1,146	4,304	7,540
S-66	Sewer System Pipeline Repair and Replacement	17,018	558	71	270	839	216	-	-	1,954	18,972
S-111	Maintenance and Operations Yard	2,667	-	-	3,315	2,779	-	-	-	6,094	8,761
S-112	Sewer Planning Program	-	-	-	1,366	397	-	-	-	1,763	1,763
S-115	SCADA System Upgrade - Sewer	1,710	1,120	-	2,190	1,257	-	-	-	4,567	6,277
S-116	Permit Compliance Monitoring	-	51	37	38	39	41	42	43	291	291
S-117	Septic Systems Sewer Extensions	-	-	211	1,226	4,505	1,463	292	292	7,989	7,989
S-120	Project and Portfolio Management System – Sewer	-	133	34	-	-	-	-	-	167	167
TOTAL SEWER CIP		**84,181**	**7,863**	**9,130**	**19,431**	**16,840**	**11,477**	**6,588**	**6,199**	**77,528**	**161,709**
STORM & SURFACE WATER CIP											
D-64	Storm Water System Conveyance Infrastructure Rehabilitation	24,405	3,822	1,840	2,772	2,843	2,909	2,660	2,946	19,792	44,197
D-81	Fish Passage Improvement Program	6,396	290	296	1,912	111	57	29	29	2,724	9,120
D-86	Stream Channel Modification Program	7,829	-	-	6,072	3,963	145	346	400	10,926	18,755
D-94	Flood Control Program	18,251	-	2,574	2,927	1,299	4,260	580	36	11,676	29,927
D-104	Stream Restoration for Mobility and Infrastructure Initiative	2,631	-	258	-	-	-	-	-	258	2,889
D-109	Stormwater Quality Retrofit Program	437	65	342	1,473	260	1,406	1,224	348	5,118	5,555
D-112	Storm and Surface Water Planning Program	1,190	25	645	451	300	-	-	-	1,421	2,611
D-114	Factoria/Richards Creek Flood Reduction	9,320	720	4,290	1,398	500	388	-	-	7,296	16,616
D-115	SCADA Upgrade – Storm	600	100	-	-	765	-	-	-	865	1,465
D-116	Post-Construction Monitoring and Maintenance Program	430	372	263	175	197	216	147	86	1,456	1,886
D-120	Project and Portfolio Management System – Drainage	-	133	33	-	-	-	-	-	166	166
TOTAL STORM & SURFACE WATER CIP		**71,489**	**5,527**	**10,541**	**17,180**	**10,238**	**9,381**	**4,986**	**3,845**	**61,698**	**133,187**
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TOTAL UTILITIES CIP		**370,912**	**34,391**	**42,521**	**67,642**	**54,010**	**45,272**	**35,616**	**37,995**	**317,447**	**688,359**

Reserves are excluded from the table above.