Section 2:
Project Planning

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Introduction

An important function of the Storm and Surface Water program is to identify and support projects that address the function and condition of both the built stormwater and natural surface water systems in Bothell. Project planning allows the Utility to identify needed projects and schedule the projects based on a combination of priorities and expected available funding.

Built System and Natural Environment Projects

This Plan Update groups its project needs into categories that reflect the purpose and potential funding sources for each type of project. Projects are grouped into Built and Natural categories to reflect the differences in how these types of projects are evaluated, funded, and managed. Typically, built system projects are fully the responsibility of the Utility (or private property owners). Natural environment projects often have a larger purpose and benefit and are funded through a combination of Utility revenues, grants, and other contributions.

1. Built Drainage System Projects

- Major projects (requiring long-term planning and significant funding)
- Small projects (can be programmed as needs arise within an existing budget cycle)
- System expansion (additions to the built system, normally provided by development)
- Rehabilitation/Retrofit (not associated with an urgent flood issue)
- Replacement (replacing deteriorated parts of the system)

2. Natural Surface Water Environment Projects

- Major projects (requires long-term planning and funding)
- Small projects (able to be programed as needed within an existing budget cycle)

Built Drainage System Projects

The built system generally includes the inlets, pipes, stormwater ponds, vaults, ditches, and other constructed stormwater features that are designed to collect, control, treat,

and convey stormwater from developed area to the natural surface water environment. It also includes culverts and constructed systems that convey creeks under roadways.

Built projects are true "Capital Projects:" Built system projects are capitalized. This means that the Utility recognizes that these improvements will age and will need to be replaced to continue to provide flood control and conveyance. Pipes, concrete structures, and similar improvements are investments that have a limited useful life. Good financial and management practice is to plan for the preservation and replacement of these "capital" assets.

Built projects are mostly a local and a Utility expense: Most of the built system projects are appropriately funded by local (generally citywide) sources because they usually affect and benefit the rate payers/property owners in the Utility. These projects mostly address the Utility's system and operations. Funding typically comes from a combination of rate payer-generated revenue, developer contributions, and connection charges. To a lesser extent, regional stormwater and flood control grants are sometimes available to help fund these projects.

Built system projects would typically address either existing problems or long-term needs in the stormwater system. These projects might address:

1. Flood Control

   Some parts of our existing drainage system are not adequate to handle storms without flooding. This normally include pipes or ditches that are too small or are regularly clogged by debris or sediment.

2. Expansion

   The Utility's built system needs to expand the drainage system to address growth through development and redevelopment. The projects associated with expansion of the system are typically needed to accommodate development, and most expansions are installed by developers.

   In some cases, the Utility may take on a large system expansion project and create a mechanism for developers to repay the Utility for the project. An example of this is the Horse Creek project.[6]

[6] The Horse Creek project addresses a variety of these issues. During the 2007 flood event, the capacity of the existing stormwater system was insufficient, resulting in downtown flooding.

3. Retrofit and Rehabilitation

The Utility performs some projects that restore or improve the function of existing systems, even though there is no associated flooding. This may be done to restore or improve the capacity of a pond to control the outflow and protect the downstream built and natural systems. It could also include improving the ability of a system to address water quality.

4. Replacement

The built system has a limited useful life and the Utility plans for replacement of deteriorated elements. To do this, the Utility assigns a certain portion of its revenues each year for system replacement based on a simple formula with some basic assumptions about useful life and replacement schedules for the Utility's built system.

The Utility worked in conjunction with the Sewer and Water Utilities to develop a more systematic approach to its replacement funding and project planning by putting in place an asset management system. This system tracks maintenance and useful life according to each asset.

Natural Surface Water Environment Projects

Natural environment projects mostly include systems of stream enhancement, sediment management, fish access, and associated wetlands and flood plains restoration. Needs for these types of projects focus on protecting, restoring, and enhancing water quality, fish and wildlife habitat, and human-to-nature interface. The considerations for ranking natural projects normally focuses on the environmental benefit, in contrast to "Built Drainage System" projects that focus on flood control benefits such as life, safety, and protection of property use.

Natural projects are not capitalized: Natural environment projects do not age like inlets, pipes and vaults. The Utility does not put aside money or assume that most natural projects will need to be replaced in the future.

Natural projects are often a regional expense: Many natural environment projects support a regional ecosystem and the benefits and reasons for these projects extend beyond the Utility rate payers. For this reason, the majority of funding for most natural projects comes from regional sources, including grants managed by counties, WRIA 8, Puget Sound groups, and State and Federal agencies.

Natural systems projects typically include restoration, protection, or enhancement of the natural surface water system. This might include enhancing flow management in stream systems, installing or improving natural water quality systems, providing or correcting fish access, and addressing stream characteristics.

Maintenance and Management of Natural Environment

Ongoing management of restored or enhanced surface water areas is not well-defined in Bothell. In part, this is because the Utility has performed very few restoration-related projects. As the number and extent of projects that the Utility takes on increases, the issue of managing and maintaining these areas will need to be addressed.

Identifying and Selecting Projects

Identification

Projects are initially identified by staff through routine maintenance, inspection, flood response, drainage requests, and development activities. These projects are mapped and put into the appropriate category for consideration. Staff then combine all utility and transportation project needs to determine whether projects and be combined for maximum efficiency. Project cost estimates are established and projects are placed on a timeline based on need, resources, and available funding. The projects are either bundled or created separately and placed on the Capital Facilities Plan for public consideration.

Outreach

The City Council adopts an updated Capital Facilities Plan (CFP) every two years. Prior to adoption, the City asks for community feedback to help identify previously unidentified project needs. The CFP prioritizes how the City spends money on Facilities, Parks and Open Spaces, Transportation, Water Utility, Storm Utility, and Sewer Utility projects.

Storm and Surface Water staff update the City's Surface Water Management Plan (SWMP) annually, and request community feedback to help identify and rank program needs.

For this Plan Update, which occurred during the COVID-19 pandemic commencing in the first quarter of 2020, in-person engagement was not an option. However, staff requested the community's feedback through a number of other channels:

- Month-long virtual open house in September 2020
- Article in *The Bridge* fall 2020 quarterly publication

- Article in September 2020 e-news
- Social media announcements
- Council meeting announcement for public engagement opportunities

A Pay-as-you-go Approach vs. Financing

Utilities often use a combination of cash and financing to build projects. Both methods have advantages and disadvantages.

With the exception of the Horse Creek and Downtown Revitalization projects, the Utility has generally built projects on a "pay-as-you-go" approach that uses accumulated unrestricted cash from rate revenues. This approach has the advantage of avoiding costs associated with financing.

This pay-as-you go method of funding projects means that the Utility has to schedule projects based on its cash flow. The pay-as-you-go option limits the Utility to construction of larger projects only when enough cash has accumulated. When several large projects are needed, this can mean the projects need to be delayed or rates need to be increased.

Financing (usually through the sale of revenue bonds or obtaining low interest loans) allows a utility to complete projects now and spread the cost out over time. This often improves the fairness to current and future rate payers who will benefit from the projects. Disadvantages of financing are the costs associated with interest and management of debt.

The approach assumed in this Master Plan is pay-as-you-go. The Utility could consider use of financing to spread out the cost of these projects over time.

Projects Planned for 2021-2025

The following projects are planned for 2021-2025:

Storm and Surface Water Projects 2021-2025	Total Project (Estimated) 2021-2025	Utility Funded (Estimated)
Combined Built/Natural Projects		
Horse Creek	$134,000	$134,000
Blyth Creek Erosion Control	$500,000	$300,000
35th Ave SE Drainage Improvements	$4,000,000	$4,000,000
Built Drainage System Projects		
Downtown Revitalization	$520,000	$520,000
Perry Creek Crossing near 19th	$10,000	$10,000
Norway Hill – 104th Ave NE from 16039 to 15949	$330,000	$330,000
Pioneer Hills and Pioneer Meadows	$1,161,550	$1,161,550
Transportation-Related Drainage Projects	$7,408,000	$7,408,000
Natural Environment Surface Water Projects		
Sammamish River Side Channel at 102nd Ave NE	$157,000	$157,000
Sammamish River and Waynita Creek Restoration	$1,300,000	$500,000
Retrofit Projects		
Stormwater Pond Retrofits	$500,000	$500,000
Other Projects		
Master Planning	$175,000	$175,000
Totals	**$16,195,550**	**$15,195,550**

PROJECT LOCATION	TIMEFRAME	SWMA
Sammamish River Side Channel	2021-2027	Upper Sammamish

PROBLEM DESCRIPTION/IMPACTS	SITE MAP
This project enhanced and reconnected riparian wetlands and remnant side channels on the left bank of the Sammamish River adjacent to 102nd Ave Bridge. Wetland mitigation on this project will require monitoring and maintenance through 2027. This goal of this project was to restore highly valuable salmon habitat, improve water quality, increase habitat diversity for wildlife (amphibians, insects, birds and mammals), and reduce potential of downstream flooding by adding water storage capacity to the Sammamish River floodplain.	

ACTIONS

Project is complete. Environmental permitting and grant reporting require monitoring and vegetative maintenance of stream creation and wetland restoration areas through 2027.

PLANNING LEVEL ESTIMATED COSTS

This project is currently identified in the City's 2021-2022 budget with an estimated cost of $103,000.

PROJECT LOCATION	TIMEFRAME	SWMA
Horse Creek Improvements	2021-2022	Lower Sammamish

PROBLEM DESCRIPTION/IMPACTS	SITE MAP
This project replaced the Horse Creek piped system with a hybrid open-channel/culvert system along 98th Ave NE. The system was designed to convey flows exceeding the 100-year storm event and meets the fish passage criteria established by the State Department of Fish and Wildlife. The project begins at NE 188th St, north of Pop Keeney Field, and extends along 98th Ave to the Sammamish River. The stream is within an open channel south of the realigned SR 522. The cost for the culvert beneath SR 522 was excluded from this project cost. The previous Horse Creek piped system through downtown did not adequately pass large storm event flows, which put downtown properties at risk for flooding.	

ACTIONS

This project is complete. An environmental permit requires monitoring and vegetative maintenance of stream restoration areas through 2022.

PLANNING LEVEL ESTIMATED COSTS

This project is currently identified in the City's 2021-2022 budget with an estimated cost of $67,000.

PROJECT LOCATION	TIMEFRAME	SWMA
Downtown Revitalization Utility Improvements	2021-2022	Upper Sammamish

PROBLEM DESCRIPTION/IMPACTS	SITE MAP
Capital projects to correct existing storm & surface water deficiencies, prevent flooding, and replace aging infrastructure in the Downtown Revitalization Area. The projects are identified in the April 2011 Downtown Revitalization Utility Phasing, Cost partitioning, and Financing Study by Gray and Osborne, Inc. The Downtown Study identifies the City Utility portion/share of the Storm & Surface Water System improvements (as well as identifying developer costs). These projects will reduce flooding and erosion and improve water quality, as well as maintain the integrity of the storm & surface water infrastructure.	

ACTIONS

Projects may be advanced to coincide with downtown developments' construction timing. The following projects are currently identified: NE 182nd St (96th Ave NE to 97th Ave NE), Ormbrek, and daylighting unnamed stream south of SR 522.

PLANNING LEVEL ESTIMATED COSTS

This project is currently identified in the City's 2021-2022 budget with an estimated cost of $520,000.

PROJECT LOCATION	TIMEFRAME	SWMA
Perry Creek & 228th Storm Improvements	2021-2023	Perry

PROBLEM DESCRIPTION/IMPACTS	SITE MAP
This project involved removing an existing access road culvert and reworking the stream just east of the 19th Ave SE culvert While the 2009 culvert replacement under 19th Ave SE addressed most of the flooding issues in this location, a short culvert under a maintenance access road continued to provide a restriction. This project eliminated the restriction.	

ACTIONS

The project is complete. An environmental permit requires monitoring and maintenance of plantings within the restoration areas through 2023.

PLANNING LEVEL ESTIMATED COSTS

This project is currently identified in the City's 2021-2022 budget with an estimated cost of $10,000.

PROJECT LOCATION	TIMEFRAME	SWMA
Norway Hill - 104th Ave NE	2024-2025	Lower Sammamish

PROBLEM DESCRIPTION/IMPACTS	SITE MAP
This project will improve roadside drainage flowing south along 104th Ave. This neighborhood has insufficient drainage causing a ditch to pond, overflow, and discharge onto private property. Drainage south along 104th is insufficient and outlets at the top of a landslide slope. In the past, King County would clear the ditch whenever it filled, but a more permanent solution to prevent flooding is needed to prevent water encroachment on the roadway and private property. Operations spent 24 overtime and regular hours at this location working to prevent flooding in 2019 and the first part of 2020.	

POSSIBLE ACTIONS

Design could include a combination of improved ditch and pipe conveyance and a more appropriate discharge point to reduce potential erosion and sloughing.

PLANNING LEVEL ESTIMATED COSTS

This project is currently identified in the budget and slated to begin in 2024 with an estimated cost of $330,000.

PROJECT LOCATION	TIMEFRAME	SWMA
Pioneer Hills	2023-2024	Parr

PROBLEM DESCRIPTION/IMPACTS	SITE MAP
This project will replace the existing corrugated metal pipe conveyance system in the Pioneer Hills neighborhood. The corrugated metal piping within the Pioneer Hills neighborhood has disintegrated to the point where stormwater is no longer being conveyed to the appropriate discharge point.	

ACTIONS

Design will replace the existing pipe conveyance system to reduce potential flooding and erosion.

PLANNING LEVEL ESTIMATED COSTS

This project is currently identified in the City's budget with an estimated cost of $1,161,550.

PROJECT LOCATION	TIMEFRAME	SWMA
Blyth Park Erosion Control	2021-2022	Lower Sammamish

PROBLEM DESCRIPTION/IMPACTS	SITE MAP
This project will reduce stream erosion in Blyth Creek by installing log structures and side slope stabilization and renovating the City-maintained sediment basin to improve capacity, reduce maintenance, and improve water quality of the Sammamish River. Stream erosion in Blyth Creek produces sediments which are captured in a downstream pond prior to discharge to the Sammamish River. The sediment overwhelms the pond and overflows into the Sammamish River despite the City's annual pond dredging. Citizens have voiced concern over the turbidity levels in the River and the enlarging sediment bar downstream of the confluence with the Sammamish River. The City identified sediment erosion as an issue in the Master Plan for Blyth Park in 2011.	

ACTIONS

Complete sediment pond redesign and include slope stabilization just upstream of the pond. Repair and replace pipes as needed to the outfall.

PLANNING LEVEL ESTIMATED COSTS
(SURFACE WATER UTILITY COSTS ONLY)

This project is currently identified in the City's 2021-2022 budget with remaining design and construction costs estimated at $500,000.

PROJECT LOCATION	TIMEFRAME	SWMA
35th Ave SE Drainage Improvements	2021-2027	Lower North Creek

PROBLEM DESCRIPTION/IMPACTS	SITE MAP
This project addresses an area-wide flooding issue along 35th Ave SE between Cole/Woods Creek and 240th St SE Design will include a combination of a new fish-passage culvert for Cole/Woods Creek under 35th Ave SE and selected downstream conveyance improvements, such as culvert and pipe upgrades. Flooding occurred over multiple years at the creek crossing at 23600 block of 35th Ave SE and along 35th Ave SE corridor between 228th St SE and 240th St SE overflowing from the north down the ditch lines. Culverts and inlets were clogged with debris and the culverts are undersized. During the December 3, 2007 storm, the ditch overtopped 35th Ave SE and flowed into Monte Villa Business Park.	

ACTIONS

The design calls for water to flow to its natural discharge location so this portion of the project seeks to restore Cole/Woods Creek to its channel. In addition, a couple of restriction points in the 35th Ave SE and 240th St SE stormwater conveyance system will be upsized to reduce the future potential of flooding.

PLANNING LEVEL ESTIMATED COSTS
(SURFACE WATER UTILITY COSTS ONLY)

This project is currently identified in the City's 2021-2022 budget with remaining design and construction costs estimated at $4,000,000.

PROJECT LOCATION	TIMEFRAME	SWMA
Sammamish River – Waynita Creek	2021-2027	Lower Sammamish

PROBLEM DESCRIPTION/IMPACTS	SITE MAP
This project includes stream and wetland habitat restoration for the east side of the former Wayne Golf Course property. It includes 1,000 linear feet of the south bank of the Sammamish River along with the mouth and lower reach of Waynita Creek and reconnection with unnamed tributaries and wetlands in the confluence area to address fish refuge and water temperature. The Sammamish River channel has been modified from its historic conditions and the habitat suffers from a combination of fish passage issues, disconnected and degraded riparian habitat and side channels, and lack of cool-water refuge pools. Fish habitat and water quality are impacted by the current conditions. US EPA and the State Department of Ecology have identified concerns with water temperature and dissolved oxygen in the Sammamish River through Bothell.	

POSSIBLE ACTIONS

Restoration and reconnection of wetlands and tributaries within the project area to address fish refuge and water temperature.

PLANNING LEVEL ESTIMATED COSTS
(SURFACE WATER UTILITY COSTS ONLY)

Costs for this project will be developed as part of the feasibility study. Project is currently estimated to cost $1,300,000. This planning assumes that the majority of the project will be funded through grants and that the utility would provide $500,000 in 2021-2022 as matching funds.