

CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE:	Discussion and Update of the 2017 Surface Water Master Plan		
DEPARTMENT:	Public Works		
PRESENTED BY:	Uki Dele, Surface Water and Environmental Services Manager		
ACTION:	<input type="checkbox"/> Ordinance	<input type="checkbox"/> Resolution	<input type="checkbox"/> Motion
	<input checked="" type="checkbox"/> Discussion	<input type="checkbox"/> Public Hearing	

PROBLEM/ISSUE STATEMENT:

The purpose of this report is to update Council on the progress and elements of the 2017 Surface Water Master Plan (Master Plan) and to introduce and receive feedback on the prioritization process and management strategy being used in the plan development and financial analysis.

Staff are working with consultants, Brown and Caldwell and FCS Group (BC Team), to update the City's 2011 Surface Water Master Plan (2011 Master Plan). The purpose of the 2017 Surface Water Master Plan (Master Plan) is to address drainage and water quality challenges associated with growth, increasing regulations, and aging infrastructure. The Master Plan will guide the Surface Water Utility (Utility) for the next five to 10 years, including recommendations for capital improvements, programs, long-term asset management, and a financial plan that sustainably supports the Utility.

The Master Plan update scope consists of major components necessary to develop a comprehensive Master Plan, including defining levels of service for the Utility, consolidating information from the basin plans and condition assessment plans, preparing the Utility for anticipated requirements related to compliance with the 2018 - 2022 NPDES Phase II permit, providing recommendations for future CIP projects, developing rate structure and financial planning recommendations, developing policy recommendations for Council consideration where existing policies may need to be updated or do not exist, and developing an Operations and Maintenance Manual for the Utility.

RESOURCE/FINANCIAL IMPACT:

There are no resource impacts with this Council discussion. The Master Plan resource and financial impacts will be presented and discussed with Council at the August 7, 2017 Council meeting.

RECOMMENDATION

Staff is seeking council guidance and feedback on the information presented today for development of recommendations to be provided in the August 7th Council meeting.

Approved By: City Manager ***DT*** City Attorney ***MK***

INTRODUCTION

The Surface Water Master Plan (Master Plan) is a vision document that establishes a management strategy for the Surface Water Utility to help meet the established level-of-service goals and NPDES permit requirements. It also includes the development of both financial and policy processes for the Utility to implement the strategy.

Staff are working with consultants, Brown and Caldwell and FCS Group (BC Team), to update the City's 2011 Surface Water Master Plan (2011 Master Plan). The purpose of the 2017 Surface Water Master Plan is to address drainage and water quality challenges associated with growth, increasing regulations, and aging infrastructure. The Master Plan will guide the Surface Water Utility (Utility) for the next five to 10 years including recommendations for capital improvements, programs, and a financial plan for long-term asset management.

The 2017 Master Plan includes elements to ensure a comprehensive plan that addresses current and future anticipated needs including establishing Levels of Service and a mechanism for prioritizing existing and future projects and programs to meet the Levels of Service and provide information for the financial analysis and associated rates to support the Utility.

The purpose of this report is to update Council on the progress and elements of the 2017 Surface Water Master Plan (Master Plan) and to introduce and receive feedback on the prioritization process and management strategy being used in the plan development and financial analysis.

BACKGROUND

The Master Plan scope consists of major components necessary to develop a comprehensive Master Plan, including;

- defining levels of service for the Utility,
- developing policy recommendations for Council consideration where existing policies may need to be updated or do not exist,
- consolidating information from the completed basin plans,
- developing condition assessment plans,
- preparing the Utility for anticipated requirements related to compliance with the 2018-2022 NPDES Phase II permit,
- providing recommendations for future CIP projects and programs, and
- developing rate structure and financial planning recommendations.

On October 10, 2016 the Council reviewed the draft level of service and levels of service targets used in developing the Master Plan. The staff report documenting the levels of service and levels of service targets can be found at the following link: <http://cosweb.ci.shoreline.wa.us/uploads/attachments/cck/council/staffreports/2016/staffreport101016-8a.pdf>

Also, on May 15, 2017 the Council discussed and provided direction on four policy issues that are been incorporated into the draft plan. The staff report for the policy discussion can be found at the following link:

<http://cosweb.ci.shoreline.wa.us/uploads/attachments/cck/council/staffreports/2017/staffreport051517-8b.pdf>

Other major components for the Master Plan are being developed and some of the key outcomes from the evaluations are summarized in this report and will be incorporated in the Draft Master Plan document.

DISCUSSION

The 2017 Master Plan represents progress on many fronts in developing a comprehensive management plan for the Utility. The elements of this Master plan will help articulate the current activities of the Utility, identify gaps and resources needs to fill the gaps by developing a prioritized list of projects and programs that the Utility will focus on for the next 6 years. Below are brief summaries from several of the key plan elements, as well as an explanation of the methodology used to prioritize projects and programs and develop a management strategy for the Master Plan.

Plan Elements

- **Asset Management Program Updates**

Asset management is a major element of the Master Plan. An updated Asset Management Program will improve stewardship of the surface water system infrastructure and assure customers that funds are spent responsibly and effectively. A Utility Business Management Evaluation (UBME) was performed to examine current practices and identify specific actions for improving the Asset Management Program. Findings were used to develop an Asset Management Work Plan (AMWP) consisting of prioritized immediate, near-term, and long-term actions that will be included in the Asset Management Program recommendations. In addition, a conceptual framework was developed to guide the Utility on how to effectively manage assets and track operational activities and performance with respect to established levels of service.

- **Condition Assessment Management Plan**

A Condition Assessment Management Plan (CAMP) has been developed to document data-driven and risk-based methodologies for managing condition assessment activities through ongoing inspections and collection of maintenance information for input to Cityworks. The CAMP provides recommendations for condition assessment management strategies for six stormwater asset groups including pipes, catch basins, manholes, ditches, LID facilities, and pump stations. Each strategy addresses a range of management decisions including ongoing and routine maintenance activities, repair and replacement programs, and potentially increased inspection frequency where needed.

- **Stormwater Management Policy**

Four Key Stormwater management policies issues were evaluated and the issues and staff recommendations were discussed with Council on May 15, 2017. Prior Council guidance included support for three of the staff recommendations including affirmation of current practices of using utility funds on private property and outside the Right-of-Way when public infrastructure is threatened, implementing permitting for the surface water utility, and using hard surfaces as chargeable area for surface water management fees. Per Council direction, the Master Plan will further develop analysis for the recommended private property Self-Certification program and the current private stormwater facility maintenance and enforcement program.

- **Operations and Maintenance Manual**

An Operation and Maintenance (O&M) Manual was developed to provide thorough documentation of the Utility's current O&M activities. The manual describes general work methods and provides photographic documentation for most types of stormwater assets in the Utility. The O&M Manual also provides guidance on frequencies for routine inspections and maintenance activities, as well as identifying conditions that trigger non-routine maintenance. In addition to documenting current O&M activities, new activities are also recommended such as an inspection program for large culverts, an improved pump station O&M and updates to the Cityworks system for improved record keeping.

- **System Capacity Modeling**

A strategy for evaluating the stormwater system capacity was developed for this Master Plan. Capacity Models for limited areas of the stormwater system have previously been done to help address specific issues. A data review and needs assessment found that hydrologic and hydraulic (H&H) modeling of the city stormwater system would provide a valuable planning tool for evaluating drainage conveyance capacities under future development conditions, as well as analyzing existing deficiencies or capacity needs. However, infrastructure data (e.g., pipe size and elevations) will need to be collected. The evaluation completed for this Master Plan recommends a phased approach for data collection and future modeling activities, and prioritizes the phases based on areas with existing capacity needs and where development densities are expected to significantly increase. Based on this recommendation, System Capacity Modeling will be included as a new program targeted to be completed within the next 6 years, similar to the Basin Planning recommendation included in the 2011 Master Plan.

- **Stormwater Treatment Analysis**

An analysis of stormwater treatment options has been developed for this Master Plan, examining the drainage areas contributing to each of the City's 148 mapped stormwater outfalls. Although the current Phase II NPDES Permit (Permit) does not require existing stormwater systems be retrofitted to treat or control runoff, this could become a requirement in a future Permit cycle, especially in areas draining to water bodies with Total Maximum Daily Loads (TMDLs). Stormwater control and treatment can be accomplished with

centralized regional facilities or small distributed facilities (i.e., low impact development/green stormwater infrastructure like Rain Gardens). A high-level evaluation of these options was completed by dividing the areas contributing to the City's 148 outfalls into 53 discrete subbasins and examining development densities, potential constraints to infiltrating stormwater, and ballpark cost estimates. The cost comparison indicated that regional facilities may be less expensive than small distributed facilities in most subbasins, especially if significant infiltration can be achieved at the regional facility site. However, regional facilities can be more challenging to implement due to lack of suitable sites and the need for substantial up-front investment. Therefore, based on the high level analysis, system-wide stormwater treatment is not recommended.

Prioritization and Management Strategy

A major element of the 2017 Master Plan is prioritizing projects and program activities for the Utility and establishing a management strategy for implementing these activities within a corresponding financial strategy. This Master Plan compiled 116 recommended projects with a combined estimated cost of \$50 million from previous basin planning efforts. One of the tasks of the Master Plan was to assess these projects within the context of the Levels of Service (LOS) and consistent priorities for the Utility. The initial set of 116 projects were screened and combined where necessary to create a working list of roughly 40 capital projects, six new studies, and 15 new programs that address needs beyond existing programs.

Prioritization Process

A systematic process was developed for prioritizing the improvement projects and current and recommended programs, including a spreadsheet tool that applies a consistent set of criteria and procedure for scoring. **Attachment A** shows the prioritization process matrix and the steps in developing this process from the LOS to the scoring. Key steps are described below and summarized in Figure1:

- **Refine LOS Targets:** As discussed during the October 10, 2016 meeting, the levels of service (LOS) and the LOS targets are the basis for articulating customer expectations for the services provided by the utility. LOS Targets were refined to reflect key goals relating to flooding and erosion, water quality, aquatic habitat, responsible stewardship of assets, customer service and communications, and regulatory compliance. These targets were then carried forward to support project and program prioritization, as well as monitoring/tracking of operational activities.
- **Develop Evaluation Criteria and Scoring:** LOS Targets were further refined into specific evaluation criteria. For example, and as shown in **Attachment A** the target for "flooding and erosion" was divided into three separate criteria relating to drainage capacity, hazard reduction, and erosion control. Scores of 0, 1, or 2 are assigned to each criterion based on guidance provided in the spreadsheet tool. These scores are then multiplied by a weighting factor and added to the scores from the other criteria for a total project score.

- Develop Rankings:** After scoring was completed, the projects and programs were ranked highest to lowest by their total scores and tabulated with other key information such as estimated cost, type, location, and the primary issue addressed. For the Projects, the rankings table and supporting information were used to identify projects for the 6-year CIP, with the remainder moving to the 20-year horizon. Projects selected for the 6-year CIP were then examined in closer detail with respect to implementation. Several projects were divided into phases where pre-design/feasibility studies were needed or engineering and planning must be done well in advance of construction.

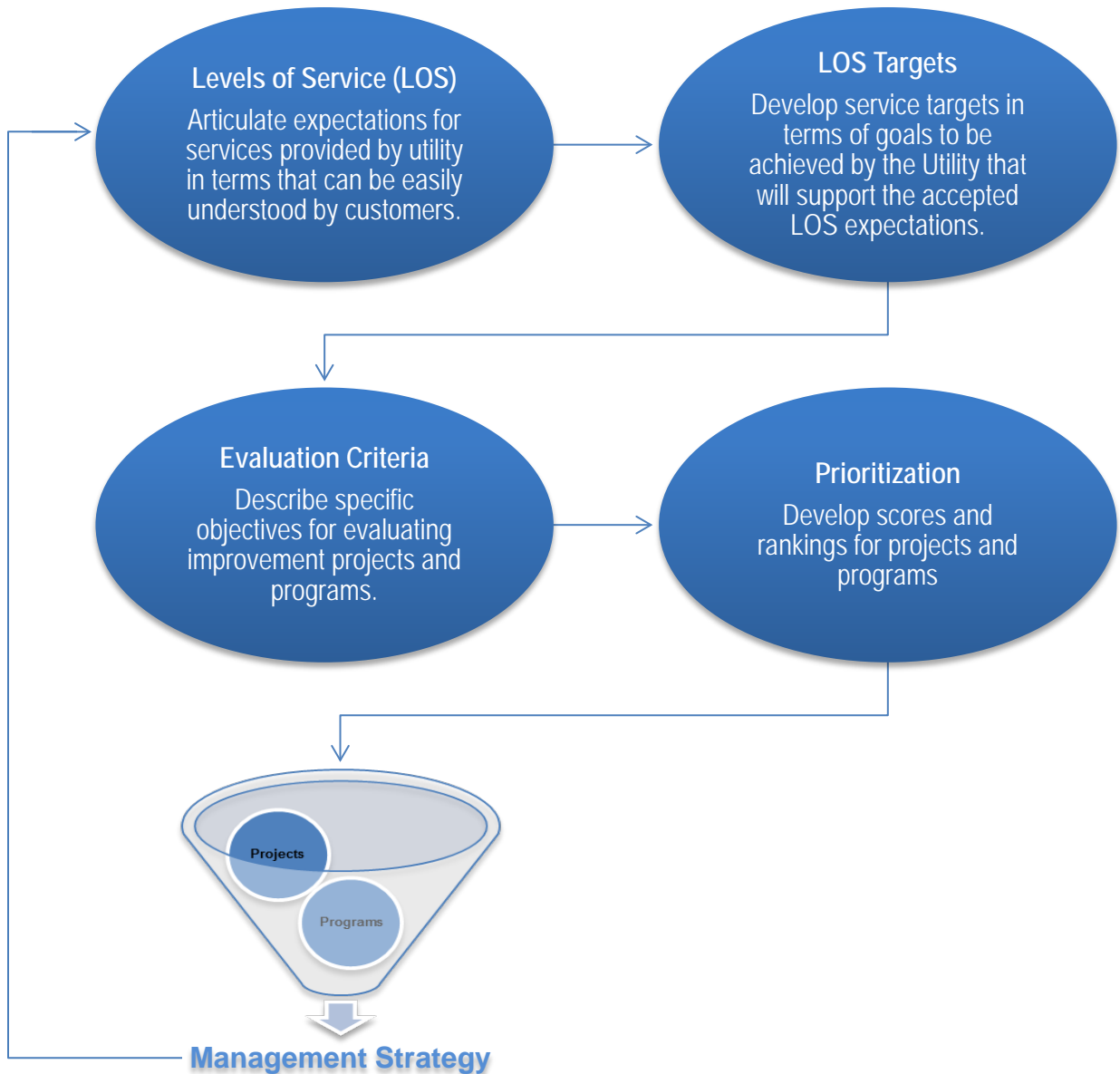


Figure1. Project and Program Prioritization Process

After the projects and programs are scored and ranked, they are then aligned within management strategies that will help facilitate discussion of timing and resources to accomplish the work.

Management Strategy

The prioritized projects and programs are being examined within the context of different management strategies to examine the long-term financial impacts. Projects (capital expenses) and programs (operational expenses) will be packaged into three options reflecting the different management strategies as shown in **Attachment B**. The intention is for management strategy options to range from “Minimum” (status quo) to Optimum based on how they address regulatory requirements, system needs, and levels of service. The following general management strategies are being proposed for consideration by the Council during project and program discussions:

- *Minimum*: Projects and programs that meet the minimum in terms of existing system needs and regulatory requirements
- *Proactive*: “Minimum” plus new high-priority projects and new/enhanced programs that address high priority long-term needs, as well as anticipated new regulatory requirements
- *Optimum*: “Proactive” plus additional priority projects and programs that enhance water quality and aquatic habitat

For illustration, draft lists of projects and programs selected by management strategy are presented in **Attachments C and D**. These lists will be further revised as we analyze the financial impacts and timing for implementing selected projects and program activities—which will be the topic for discussion with Council during the August 7, 2017 meeting.

The following items summarize preliminary (draft) projects and program selections, and how these will be used to develop the management strategies and financial recommendations:

- **Projects (Capital)**: Projects are being prioritized for inclusion in the 6-year and 20-year Capital Improvement Program (CIP) as shown in **Attachment C**. The projects identified for the 6-year CIP will be grouped into three management strategies as discussed above. Several of the existing projects (highlighted in **red font**) in the 2017-2022 CIP ranked high in the prioritization process and are being recommended for the “Minimum” management strategy. For example, #5 Hidden Lake Dam Removal is being recommended for design and construction in the 6-year CIP under the “Minimum” management strategy. New projects that ranked high in the prioritization process are being recommended for the “Proactive” management strategy. Several of these projects are recommended for planning/pre-design/studies in the 6-year CIP to allow for development of specific solutions and applicable construction cost estimate where needed. The “Optimum” management strategy includes all of the Proactive projects, plus some additional high priority projects that address water quality and habitat. Also note that the “Optimum” management strategy includes additional phases (i.e., construction) for some of the projects that only had initial phases included in

“Proactive” list. Projects that are not grouped within one of the three management strategy are recommended for the 20-year CIP.

- Program (Operational): As Illustrated in **Attachment D**, new programs are being recommended to address issues identified in the basin plans, fill historic gaps in utility management, or meet regulatory requirements. The “Minimum” management strategy includes three new maintenance programs needed in addition to existing programs and operational activities to ensure the City continues to meet the current requirements of the Phase II NPDES Permit (Permit). New programs and enhancements to existing programs (highlighted in **Blue font**) are included in the “Proactive” management strategy; these programs reflect best management practices for stormwater utilities and help address increasing requirements anticipated in the next Permit (2018-2022). Programs recommended in the “Optimum” management strategy will further enhance water quality and aquatic habitat.

The projects and programs lists will be further refined and recommendations will be presented in the August 7th council meeting.

Next Steps

Feedback received from Council on the prioritization process and management strategy will be used in refining the projects and programs to be recommended and presented to council at the August 7th meeting.

Upon receiving direction from Council on the Project and Programs to be incorporated in the 2017 Master Plan, the rates and financial impacts of the recommended management strategy will be further analyzed and a financial plan is scheduled for presentation to Council in October 2017.

The Draft 2017 Master Plan Document is scheduled for presentation for approval to Council in November 2017.

STAKEHOLDER OUTREACH

The first public open house was held on Thursday, September 8th, 2016 when a total of 23 Shoreline citizens attended. In addition, 177 Shoreline residents participated in a web-based survey and the findings from this outreach is being incorporated in developing the project and program recommendations.

A second open house will be held on July 13, 2017 and residents will be presented with an update on the master plan progress. In addition, a survey will be conducted to solicit feedback from the residents on the management strategies and findings from these outreach efforts will be presented in the July 17th presentation and the August 7, 2017 staff report.

COUNCIL GOAL ADDRESSED

This Master Plan project addresses City Council Goal #2: Improve Shoreline's Utility, transportation and environmental infrastructure.

RESOURCE/FINANCIAL IMPACT

There are no resource impacts with this action. The resource and financial impacts will be presented and discussed with Council at the August 7TH meeting.

RECOMMENDATION

Staff is seeking council guidance and feedback on the information presented today for development of recommendations to be provided in the August 7TH 2017 Council meeting.

ATTACHMENTS

Attachment A: Prioritization Matrix

Attachment B: Draft Management Strategy and Level of Service Ratings

Attachment C: Draft List of Projects by Prioritization Score and Management Strategy

Attachment D: Draft List of Programs by Management Strategy

Attachment A - Prioritization Matrix

Level of Service (LOS)			Prioritization System							
LOS	Expectations	Targets	Evaluation Criteria	Scoring			Weighting Factor	Maximum Scores		
				0	1	2				
A- Surface Water Impacts	<i>Manage public health, safety and environmental risks from impaired water quality, flooding, and failed infrastructure</i>	A. Flooding and Erosion No verifiable health and safety issues or environmental damage caused by flooding or erosion outside of an accepted risk tolerance	A.1 System Capacity Addresses capacity needs	No direct benefit	Provides moderate benefit	Provides substantial benefit	60	320		
			A.2 Hazard Reduction Addresses an apparent (observed and recurring) public safety hazard.	No direct benefit	Provides moderate benefit	Provides substantial benefit	60			
			A.3 Erosion Control Addresses erosion problems related to public stormwater conveyance.	No direct benefit	Provides moderate benefit	Provides substantial benefit	40			
		B. Water Quality Improve the quality of stormwater discharged to impaired receiving waters to mitigate environmental damage	B.1 Stormwater Treatment Addresses stormwater treatment in accordance with applicable regulatory standards.	No direct benefit	Provides moderate benefit	Provides substantial benefit	40	160		
			B.2 Low Impact Development (LID) Supports or encourages LID principles.	No direct benefit	Provides moderate benefit	Provides substantial benefit	5			
			B.3 Impaired Water Impacts Provides cost effective opportunity for stormwater treatment	No direct benefit	Provides moderate benefit	Provides substantial benefit	35			
		C. Habitat Protect aquatic habitat by reducing impacts to ecosystem health and biotic diversity in lakes, streams, and wetlands	C.1 Habitat Protection Protects aquatic habitat from degradation to minimize the loss of ecosystem function and diversity.	No direct benefit	Provides moderate benefit	Provides substantial benefit	25	100		
			C.2 Habitat Restoration Restores ecosystem function and diversity, is cost-effective, and provides multiple benefits.	No direct benefit	Provides moderate benefit	Provides substantial benefit	25			
		B- Equitable Service	<i>Provide consistent, equitable standards of service to the citizens of Shoreline at a reasonable cost, within rates and budget</i>	D. Responsible Stewardship Provide equitable services through cost-effective planning and management of utility assets, sound fiscal planning, and efficient operations.	D.1 System Preservation (Asset Management) Supports reliable service by maximizing the useful life of assets and reducing life cycle costs.	No direct benefit	Provides moderate benefit	Provides substantial benefit	80	460
					D.2 Operations and Maintenance Reduces and/or avoids operations, maintenance and administrative costs	No direct benefit	Provides moderate benefit	Provides substantial benefit	20	
D.3 Financial Planning Supports sound financial planning and/or helps the Utility qualify for alternative funding sources.	No direct benefit				Provides moderate benefit	Provides substantial benefit	20			
D.4 Future growth Supports future population and/or economic growth.	No direct benefit				Provides moderate benefit	Provides substantial benefit	30			
D.5 Customer service Improves customer service and addresses observed service issues	No direct benefit				Provides moderate benefit	Provides substantial benefit	20			
E. Internal Resources Manage internal resources to provide adequate resources, training, and support; maintain workforce diversity; and retain institutional knowledge.	E.1 Workforce Increases/retains the capabilities of City staff.				No direct benefit	Provides moderate benefit	Provides substantial benefit	60		
F. Customer Service and Communications Provide effective communication, public education, and outreach.	F.1 Communication and Education Provides opportunities to enhance public understanding of surface water issues and/or utility services.			No direct benefit	Provides moderate benefit	Provides substantial benefit	20	40		
C- Communication and Outreach	<i>Engage in transparent communication through public education and outreach</i>									
D- Regulatory Impacts	<i>Comply with regulatory requirements for the urban drainage system</i>	G. Regulatory Compliance Meet state and federal regulatory requirements for stormwater utilities.	G.1. Regulatory Addresses current and future regulatory requirements.	No direct benefit	Provides moderate benefit	Provides substantial benefit	200	400		

Maximum Score: 1480

Attachment B - Draft Management Strategy

Management Strategies	Projects (Capital Expenses)		Programs (Operating Expenses)			Levels of Service			
	Capital Project	Engineering and Planning	Operations	Maintenance	Public Involvement	A Surface Water Impacts	B Equitable Service	C Communications and Outreach	D Regulatory Compliance
						Manage public health, safety and environmental risks from impaired water quality, flooding, and failed infrastructure	Provide consistent, equitable standards of service to the citizens of Shoreline at a reasonable cost, within rates and budget	Engage in transparent communication through public education and outreach	Comply with regulatory requirements for the urban drainage system
Minimum - Projects and programs that meet the minimum system needs and regulatory requirements	Continue and complete ongoing projects that were identified as highest priorities during basin planning; continue with pre-design and feasibility studies for major ongoing projects.	Provide Utility engineering support for ongoing capital improvement projects (capitalized costs included within project estimates).	Continue with current operational activities to support ongoing programs; no increased effort in asset management activities. - NPDES Coordination - Floodplain Management - CIP Planning - Drainage Assessment (2018) - Water Quality Monitoring - Asset Management	Continue current levels of maintenance and postpone addressing new regulatory requirements; reactive approach to maintenance for aging infrastructure. - Street Sweeping - System Inspection - System Maintenance - System Repair (Ditch and Small Repairs) - Thornton Creek Condition Assessment - SW Pipe Replacement Program - Private Facility Inspection	Continue current activities that address regulatory requirements for public outreach. - Soak it Up LID Rebate - Adopt a Drain - Community Event Participation - Water Quality Publications (for Public) - Environmental Mini Grant Program - Local Source Control Program	Low	Medium	Medium	Medium
Proactive - Same as "Minimum" plus new high-priority projects, new and enhanced ongoing programs that address high priority long term needs and anticipated regulatory requirements	Add new high-priority projects including pump station repairs and known system deficiencies.	Provide Utility engineering support for ongoing capital improvement projects (capitalized costs included within project estimates). Plus studies: - System Capacity Modeling - 5-year Master Plan Update - Storm Creek Erosion Management Study - Climate Impacts and Resiliency Study	Add proactive programs to improve processes including asset management. - Drainage Assessment Program - Stormwater Permit - Asset Management (Enhanced) - NPDES Coordination (2019-2024 Permit)	Proactively address repairs and maintenance of aging assets. - Condition Assessment Program - Pump Maintenance Program - Utility Crossing Removal - Improper Connection Repair - Proactive CIP Asset Maintenance - SW Pipe Replacement Program (Enhanced)	Proactively address anticipated NPDES Permit requirement for - Business Inspection Source Control	Medium	High	High	Medium
Optimum - Same as "Proactive" plus additional Priority projects and programs that enhance water quality and aquatic habitat	Add new projects to improve water quality and aquatic habitat	Same as above	Same as above	Provide annual maintenance as necessary for new capital improvement programs.	Increase public outreach to address targeted areas - Thornton Creek Stewardship - Aquatic Habitat Program	High	High	High	Medium
Current	Current CIP projects that were identified as highest priorities during basin planning; continue with pre-design and feasibility studies for major ongoing projects.	Provide Utility engineering support for ongoing capital improvement projects (capitalized costs included within project estimates).	Current operational activities to support ongoing programs; no increased effort in asset management activities. - NPDES Coordination - Floodplain Management - CIP Planning - Drainage Assessment (2018) - Water Quality Monitoring - Asset Management	Current levels of maintenance and postpone addressing new regulatory requirements; reactive approach to maintenance for aging infrastructure. - Street Sweeping - System Inspection - System Maintenance - System Repair (Ditch and Small Repairs) - Thornton Creek Condition Assessment - SW Pipe Replacement Program - Private Facility Inspection	Current activities that address regulatory requirements for public outreach. - Soak it Up LID Rebate - Adopt a Drain - Community Event Participation - Water Quality Publications (for Public) - Environmental Mini Grant Program - Local Source Control Program	Low	Medium	Medium	Low

Attachment C - Draft List of Projects by Prioritization Score and Management Strategy

P Planning/ Pre-Design/ Study

D Design/Permitting

C Construction

No.	Management Strategy			20-year CIP	Project Name	Prioritization Score
	Minimum	Proactive	Optimum			
1	D	D	C	-	25th Avenue NE Flood Reduction and NE 195th Street Culvert Replacement	620
2	P	PD	PDC	-	Springdale Ct. NW and Ridgefield Rd. Drainage Improvements	560
3	PD	PDC	PDC	-	10th Ave NE Stormwater Improvements	515
4	P	PD	PDC	-	Heron Creek Culvert Crossing at Springdale Ct. NW	485
5	DC	DC	DC	-	Hidden Lake Dam Removal	480
6	P	P	P	DC	25th Ave NE Ditch Improvements Between NE 177th and 178th Street	480
7	P	PD	PDC	-	Pump Station 26	420
8	P	PD	PDC	-	Pump Station 30 Upgrades	420
9	P	P	P	DC	6th Ave NE and NE 200th St Flood Reduction Project	360
10	PD	PDC	PDC	-	Pump Station Misc Improvements (Linden, Palatine, Pan Terra, 25, Ronald Bog, Serpentine)	360
11	C	C	C	-	NE 148th Street Infiltration Facilities	355
12	P	P	PD	-	Boeing Creek Regional Stormwater Facility	315
13	-	-	PDC	-	Stormwater Upgrades NW 196th Street	310
14	-	P	P	-	System Capacity Modeling Study	300
15	-	PDC	PDC	-	NW 195th Place and Richmond Beach Drive Flooding	280
16	-	P	PD	C	Stabilize NW 16th Place Storm Drainage in Reserve M	260
17	-	P	P	DC	Storm Creek Erosion Management Study	250
18	-	-	P	DC	Flood Reduction in Linden Avenue Neighborhood	245
19	-	P	P	-	Climate Impacts and Resiliency Study	220
20	-	-	-	PDC	Culvert Improvements Near 14849 12th Avenue NE	205
21	-	-	PD	C	Convert Stormwater Conveyance Ditches to Bio-infiltration Facilities	190
22	P	P	P	DC	Boeing Creek Restoration	180
23	-	PD	PDC	-	NW 196th Place and 21st Avenue NW Infrastructure Improvements	175
24	-	-	PD	C	Echo Lake Biofiltration Swale	160
25	-	P	P	DC	18th Avenue NW and NW 204th Drainage System Connection	150
26	-	P	P	DC	NW 197th Pl and 15th Ave NW Flooding	150
27	-	P	P	DC	Lack of System and Ponding on 20th Avenue NW	150
28	-	P	P	DC	12th Ave NE Infiltration Pond Retrofits	140
29	-	P	P	DC	NE 177th Street Drainage Improvements	130
30	-	P	P	PDC	26th Avenue NE Flooding and Lack of System Study	110
31	-	-	-	PDC	NW 180th and 8th Avenue Ditch with Unknown Connection	80
32	-	-	-	PDC	NE 192nd St Ditch Modifications	60
33	-	-	-	PDC	Bioretention at N 199th St and Wallingford Avenue NE	50
34	-	-	-	PDC	Bioretention at NE 192nd St and Burke Ave NE	50
35	-	-	-	PDC	Hamlin Creek Daylighting	50
36	-	-	-	PDC	Thornton Creek Course-Grained Sediment Improvements	50
37	-	-	-	PDC	Enhance Ronald Bog Wetland Fringe Areas	50
38	-	-	-	PDC	Westminster Triangle Bioinfiltration Facility	45
39	-	-	-	PDC	NW 194th Place and 25th Ave NW Ditch Erosion	40
40	-	P	P	-	Master Plan Update	620
No.	13	26	30	24		

Note: Red font indicates Projects in the Current CIP (2017 -2022)

Attachment D: Draft List of Programs by Management Strategy

Program Category	Management Strategies		
	Minimum	Proactive	Optimum
Operations	NPDES Coordination	NPDES Coordination (2019-2024 Permit)	NPDES Coordination (2019-2024 Permit)
	Floodplain Management	Floodplain Management	Floodplain Management
	CIP Planning	CIP Planning	CIP Planning
	Drainage Assessment (2018)	Drainage Assessment Program	Drainage Assessment Program
	Water Quality Monitoring	Water Quality Monitoring	Water Quality Monitoring
	--	Stormwater Permit	Stormwater Permit
	Asset Management Program	Asset Management Program (Enhanced)	Asset Management Program (Enhanced)
Maintenance	Street Sweeping	Street Sweeping	Street Sweeping
	System Inspection	System Inspection	System Inspection
	System Maintenance	System Maintenance	System Maintenance
	System Repair (Ditch and Small Repairs)	System Repair (Ditch and Small Repairs)	System Repair (Ditch and Small Repairs)
	Thornton Creek Cond Assess (2018)	Condition Assessment Program	Condition Assessment Program
	SW Pipe Replacement Program (Existing)	SW Pipe Replacement Program (Enhanced)	SW Pipe Replacement Program (Enhanced)
	Private Facility Maintenance Enforcement Program	Private Facility Maintenance Enforcement Program	Private Facility Maintenance Enforcement Program
	Catch Basin R&R Program	Catch Basin R&R Program	Catch Basin R&R Program
	LID Maintenance Program	LID Maintenance Program	LID Maintenance Program
	--	Pump Maintenance Program	Pump Maintenance Program
	--	Utility Crossing Removal Program	Utility Crossing Removal Program
	--	Improper Connection Repair Program	Improper Connection Repair Program
--	Proactive CIP Maintenance	--	
--	--	Optimal CIP Maintenance	
Public Involvement	Soak-it-Up LID Rebate	Soak-it-Up LID Rebate	Soak-it-Up LID Rebate
	Adopt-a-Drain	Adopt-a-Drain	Adopt-a-Drain
	--	--	Thornton Creek Stewardship
	--	--	Aquatic Habitat Enhancement
	Local Source Control Program	Local Source Control Program	Local Source Control Program
	--	Business Inspection Source Control	Business Inspection Source Control
	Community Event Participation	Community Event Participation	Community Event Participation
	Water Quality Publications	Water Quality Publications	Water Quality Publications
Environmental Mini Grant Program	Environmental Mini Grant Program	Environmental Mini Grant Program	

Note: Blue font indicates new or enhanced program.