

City of Tigard
STORMWATER
MASTER PLAN



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Subject: Implementation Plan

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Introduction

The Tigard Stormwater Master Plan (Plan) is the first for Tigard in more than 30 years. As such, there are built up needs with respect to stormwater management. The Plan captures information about Tigard's existing flooding, water quality, erosion, and maintenance issues. The Plan provides several recommendations for programs and projects to address and prioritize stormwater management needs.

With so much to do, this Implementation Plan attempts to provide focus and priority for the near-term and for the next ten to 20 years. Some of the recommendations were built upon the good work already underway within the City. Other recommendations were early action items that were begun during the past year while the Plan was being created. Others were near-term recommendations to set the foundation for other actions and begin to address the backlog of stormwater management needs before problems get worse and become more expensive to deal with.

Stormwater Program Priorities

The Plan recommendations were compared against each other to determine relative priority. The priority assigned to any given program or project can be changed over time as partnership opportunities or changes in regulation or community values emerge. A summary comparison of all of the program recommendations is provided in Table 1. The five high priority programs should be the initial focus of City staff over the next couple of years. Additionally, the City should study existing revenues and potential funding sources to identify the resources needed to fully implement the recommended programs and projects.

TABLE 1 Summary of All Recommended Stormwater Programs

PROGRAM	TIME-SCALE	STATUS	PRIORITY	COST		RELATIVE BENEFIT			PARTNERSHIPS
				TOTAL	ANNUAL (20 Years)	EROSION	FLOODING	WATER QUALITY	
Tigard Triangle Stormwater Implementation Plan	One-time	New	High	\$150,000	\$7,500	High	High	High	ODOT/TriMet/ Private Development
Computerized Maintenance Management System Database Update	One-time	Work into City Staffing Plan	High	\$415,000	\$20,750	High	Medium	Low	
Culvert Rehabilitation, Maintenance, and Replacement Program	Ongoing	New	High	\$2,770,000	\$138,500	Low	High	Low	
Capital Improvement Plan (CIP) Program	Ongoing	Enhance Existing Efforts	High	\$31,050,000	\$1,552,500	High	High	High	Various
Storm Drainage Major Maintenance Program	Ongoing	Enhance Existing Efforts	High	\$4,600,000	\$230,000	High	High	High	
Greenway Restoration, Establishment & Maintenance	Ongoing	Enhance Existing Efforts	Medium	\$6,781,328	\$339,066	High	Medium	High	CWS, NGOs, Non-profits, HOAs
Public Outreach	Ongoing	Enhance Existing Efforts	Medium	\$800,000	\$40,000	Medium	Low	High	CWS, NGOs, Non-profits
Water Quality Facility Rehabilitation Program	Ongoing	Enhance Existing Efforts	Medium	\$1,207,500	\$60,375	Low	Medium	High	
Technical Assistance Program	Ongoing	New	Medium	\$3,565,000	\$178,250	Medium	Medium	Medium	NGOs, Non-profits, CWS
Summer Lake Water Quality Enhancement Program	One-time	Enhance Existing Efforts	Low	\$1,860,000	\$93,000	Low	Low	High	PSU / CWS / Private Homeowners
Washington Square Area Retrofit Plan	One-time	New	Low	\$90,000	\$4,500	Medium	High	High	CWS/ODOT/ Property Owner
Detention Pipe Retrofit Study & Pilot Project	Finite	New	Low	\$830,000	\$41,500	Low	Medium	Medium	HOAs
TOTAL (Rounded)				\$54,120,000	\$2,710,000				

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Waves of Implementation

Existing Stormwater Success

City staff involved during development of the Plan showed a great deal of care and concern for the public service they provide and a sense of urgency for responding to the stormwater management needs of the citizens of Tigard. This culture has resulted in many past and recent stormwater successes that should be celebrated.

Tigard created a stormwater web page and an interactive story map at www.tigard-or.gov/stormwater/ during the master planning process. The City should use the web page and the story map to share ongoing success stories and the status of projects. Additional public outreach and education with respect to stormwater management should continue to build upon these past successes in order to gain further support from the community in tackling the issues and recommendations presented in the Plan.

Early Action Items

Several early action items were initiated during the master planning process as immediate needs were identified.

Small Works Committee: The new Small Works Committee serves an important role in decision-making and implementation of stormwater management projects. Stormwater related problems are brought before the committee when a decision needs to be made about City responsibility or involvement in the problem. The committee is also tasked with determining whether a stormwater problem is properly solved through routine maintenance using Public Works Operations crews, by inclusion in the Storm Drainage Major Maintenance Program, or by proposing a capital project.

Green Team: The Green Team officially began July 1, 2017 and represents a consolidation of responsibilities between operations teams performing similar maintenance activities for green infrastructure and/or greenway areas. The Green Team is a group of operations staff that can specialize and focus their attention on operation and maintenance of green infrastructure best management practices. The Green Team is initially tasked with maintenance of stormwater quality facilities, right-of-way vegetation, and, to a limited degree, creeks and open spaces. A recommendation of the Plan is to use the Green Team in responding to citizen complaints,

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public education, and construction of smaller Storm Drainage Major Maintenance projects involving green infrastructure and greenways.

Outreach to Partners: Outreach to potential partners has already started and is ongoing. Stormwater management is an integral part of the community landscape and touches many different stakeholders, so forming and nurturing partnerships will be a very important part of successful implementation of the program and project recommendations contained in the Plan.

For example, the Tigard Triangle Stormwater Implementation Plan recommendation has a regional focus of supporting redevelopment and transportation improvements in the Tigard Triangle. Partnering with Oregon Department of Transportation (ODOT), TriMet, and Clean Water Services on future regional stormwater facilities will support improvements to Highway 217 and Interstate 5 as well as private redevelopment. Developing and building upon partnerships with local non-profits like Tualatin Riverkeepers and the Tualatin River Watershed Council will allow Tigard to implement programs such as the Technical Assistance Program by drawing on these agencies' skills.

Additional Proposed Early Actions

Additional early actions are recommended to be completed within the current stormwater program budget to support existing activities and Plan recommendations.

Update Agreement with Clean Water Services: Clean Water Services is a critical partner in stormwater management and greenway management. CWS is currently involved in restoration and establishment efforts along many of the streams and greenways in Tigard. However, the City's Intergovernmental Agreement with CWS does not identify roles and responsibilities for managing streams and associated greenways and riparian areas. The City should explore the opportunity to create an addendum to the existing stormwater IGA with CWS to clarify roles. The agreement might address relationship and partnering opportunities including the following: stream-by-stream, stream size, priorities, capital improvement projects (CIPs), restoration, and long-term maintenance and monitoring.

Updates to the IGA could influence implementation of several recommended programs, including the Greenway Restoration, Establishment & Maintenance Program, the Stormwater CIP, and the Computerized Maintenance Management System Database Update.

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Roof Drain Inventory: The recommended Technical Assistance Program includes a Roof Drain Extension component to reduce discharge of erosive runoff at the top of steep stream banks. A first step of the program is to inventory candidate roof drains. Identifying and inventorying pipes discharging roof runoff on steep and erosion-prone streambanks would be a prime partnership opportunity with Cascade Education Corp, an alternative high school program designed to teach youth through environmental projects. City interns could also be used to kick start this work and coordinate partnerships. This work will catch streambank erosion before it becomes a problem.

Creek Condition Inventory: Implement a creek condition inventory for prioritization of light touch grade control efforts that may then be added to routine work plans for the Green Team. This work will help ensure that moderate creek erosion problems do not increase over time.

Water Quality Facility Rehabilitation Plan: One program recommendation for the long-term is a new Water Quality Facility Rehabilitation Program to ensure continued operation of existing structural facilities that protect surface waters from the adverse impacts of stormwater runoff. A first step in this long-term operational activity is planning. A recommended additional early action item is to implement a plan to assess and prioritize water quality facilities that may need rehabilitation or repair. Include planning work in the current Green Team budget.

Near-term (Highest Priority)

Each recommended program is described in greater detail on its individual program fact sheet. The highest priority programs should be started or continued immediately to the extent possible with existing resources. The highest priority programs include the following:

- Tigard Triangle Stormwater Implementation Plan
- Storm Drainage Major Maintenance Program
- CIP Program
- Computerized Maintenance Management System Database Update
- Culvert Rehabilitation, Maintenance and Replacement Program

The Rest of the Plan (Medium-Low Priority)

The pace and timeline for implementation on the rest of the recommendations will depend on the ability of the City to fund the recommendations.

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Structural Projects

Although Tigard has lacked a current Stormwater Master Plan in recent years, the City continued to invest in structural solutions to stormwater problems as they arose. Both the Storm Drainage Major Maintenance Program and the annual City Capital Improvement Plan (CIP) address needed repairs to the municipal storm sewer system and problems of erosion and bank and channel instability in streams.

The Stormwater Master Plan documents numerous known issues and newly identified issues, and it proposes a long list of structural projects to address those erosion, flooding, and water quality issues identified.

Capital Improvement Projects

Many of the stormwater capital project recommendations require significant effort to plan, design, and permit before they can be constructed. These large and/or complex projects become part of the City's CIP. The City defines a CIP as a public facility project that improves or adds value to Tigard's infrastructure, and costs \$50,000 or more, and has a useful life or extends the useful life of a facility for five years or more.

Management and implementation of capital projects falls upon the City's Engineering division. In the past, staff has lacked a system for prioritizing CIP investments. An outcome of the master planning process is a repeatable methodology for rating, ranking, and prioritizing stormwater capital projects. The methodology uses criteria that reflect the City's values.

The rating and ranking method was applied to all potential projects identified for consideration in the Plan. The final ranking does not necessarily represent the expected order of implementation, but indicates a relative priority.

The final Stormwater CIP includes the top 18 project recommendations summarized in Table 2. The top third of the list has the highest priority.

Several factors can influence the actual implementation sequence. For example, a financial constraint or a partnership opportunity could emerge and influence project sequencing. The priority rankings are a relative guide.

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Multiple capital projects can be recommended within a given study area of the Plan. The actual order for project implementation within a study area might be influenced by other factors, including the following:

- Projects in a creek channel should be implemented between two established grade control locations. If not, then the grade control should be installed starting at the downstream end first so that a head cut does not migrate up channel and undermine previous efforts.
- Erosion should be stabilized from the top down, to reduce the source erosion and avoid silting-in projects at the downstream end.
- Flooding issues ought to be addressed by improving conveyance at the downstream end of a system first in order to reduce the backwater in upstream reaches.

The Plan includes a fact sheet for each of the top 18 capital projects.

Rank	ID	Name	Score	Cost
1	CIP304	Gallin Court Stream & Culvert Improvements	82	\$2,625,000
2	CIP305	Derry Dell West Stream Protection	76	\$2,050,000
2	CIP306	Derry Dell East Stream & Culvert Improvements	76	\$2,275,000
4	CIP702	SW 116th Avenue Property Acquisition & Floodplain Storage	73	\$1,175,000
5	CIP501	SW Dartmouth Regional Wetland Detention Pond	72	\$4,400,000
6	CIP302	Kruger Creek Ann Court Bank Stabilization & Wetland Enhancement	68	\$650,000
7	CIP308	Kruger Creek Knickpoint Stabilization & Stream Restoration	63	\$3,875,000
8	CIP410	Fanno Creek Stream Stabilization at Arthur Court	62	\$725,000
9	CIP101	Bagan Park Stream Restoration & Water Quality Enhancement	62	\$575,000
10	CIP310	Gaarde St Greenway Detention & Sewer Line Protection	62	\$250,000
11	CIP303	Hunter's Glen Pond Rehabilitation	60	\$1,225,000
12	CIP506	Red Rock Creek Channel Stabilization & Sanitary Sewer Protection	55	\$1,050,000
13	CIP403	North Dakota Street Stream Restoration & Detention	51	\$975,000
14	CIP106	Oak Street Property Acquisition & Floodplain Restoration	51	\$725,000
15	CIP505	Knez Wetland & Riparian Enhancement	48	\$1,900,000
16	CIP503	Red Rock Floodplain Reconnection	46	\$1,375,000
16	CIP504	Red Rock Grade Control & Culvert Improvement	46	\$1,150,000
18	CIP502	Red Rock Creek Daylighting & Riparian Restoration	43	\$4,050,000
Total				\$31,050,000

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Lower-ranked projects on the potential projects list could be reconsidered at a later date for inclusion in the Stormwater CIP. A list of projects is provided in Table 3 for future consideration.

TABLE 3 - Summary of Other Potential CIP Projects		
ID	Name	Score
CIP102	Washington Square WQ/Detention	43
CIP103	Upper Ash Creek Storm System Improvements	42
CIP104	SW Ventura Stabilization and WQ Facility	48
CIP105	SW Greenburg Rd WQ/Detention Facility	48
CIP201	I-5 & Hwy 217 Intersection Regional WQ/Detention Facility	50
CIP301	Jack Park Trail Improvements	28
CIP309	SW Raptor Place Stream Restoration and Culvert Replacement	36
CIP311	SW Fern St Pond Retrofit	40
CIP401	Edgewood Street Storm System Improvements	24
CIP404	Fanno Creek at SW Ashford St Revegetation and Constructed Wetland	51
CIP801	SW Kable Storm Pipe and Culvert Replacement	10
CIP802	Copper Creek East Stream and Bank Stabilization	38
CIP804	Copper Creek West Streambank Stabilization and Outfall Retrofit	40
1301	Ash Creek Wetland upstream of Hwy 217 Floodplain Reconnection	29
2201	Lower Ball Creek Stream Restoration	30
3104	SW Mistletoe Dr WQ Pond Retrofit	22
3107	SW Tallwood Ct Pond Retrofit	27
3110	SW Gaarde and SW Merlin Place Outfall Energy Dissipation	36
3304	Benchview and Hillshire Retrofit of Outfalls	37
4113	SW Hall and SW Wall Bank Stabilization	36
4206	SW 103rd between SW Amanda Ct and SW MacDonald - New Storm System	25
4307	Fanno Creek at Scholls Ferry Business Center Regional Facility	45
4309	Ash Drive - Install Storm System	24
4311	SW North Dakota St - Install Storm System	24
5307	I-5 and Haines St Intersection WQ/Detention Facility	30
5308	SW 72nd Ave and SW Dartmouth WQ/Detention Facility	22
7204	SW Karen St - Install New Storm Main	12
7301	Summerlake Park Regional WQ Facility	34
8101	Woodspring Apartments Culvert Outfall Retrofit and Bank Stabilization	37
8103	Golf Course Pond Retrofit for WQ Treatment	31
8202	Woodspring Apartments Stream Restoration	37

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Storm Drainage Major Maintenance

Many of the stormwater project recommendations are smaller in scale and do not meet the definition of a capital project. These smaller projects may become part of the City’s Storm Drainage Major Maintenance program.

The same rating and ranking methodology used to prioritize CIPs was used to prioritize major maintenance projects. They are shown in Table 4.

TABLE 4 – Summary of Storm Drainage Major Maintenance Program Projects

ID	Description	Score
CIP507	Library and Red Rock Trail Culvert Replacement	45
4110	Main Street Outfall Upgrades	39
3118	SW 118th Ct - Add Forebay Upstream of Culvert	37
4112	SW McDonald St Culvert Grate Removal	36
8111	Durham and 85th Ave Outfall Retrofit #185899	30
8110	Cook Park Trail Culvert Retrofit	29
4102	Fanno Creek Trail - Culvert Replacement	29
5204	SW 78th and Pfaffle St - Replace Storm System	28
7103	SW 128th Ave and SW Winterlake - Install WQ Manhole	26
1101	SW Summit Dr WQ Facility Retrofit	25
3105	SW Essex Dr Outfall Retrofit	25
4210	Storm Sewer Extension at 11445 Tiedman Ave	23
4119	Durham Rd WQMH Retrofit	23
7303	SW Burlcrest Dr - Install Storm System	22
3305	Howard Dr - Install Storm System	21
3307	SW Sunrise Ln - Install Storm System	21
3114	Fonner and 108th - Install WQ Manhole	19
3126	SW Rockingham Dr Water Quality Pond Retrofit	16
4115	SW 93rd Ave Improvements Upstream of Culvert	12

Other Programs

Some of the capital improvement project opportunities identified during the completion of the Stormwater Master Plan were determined to rightfully belong to other new programs recommended by the plan, including:

- Culvert Rehabilitation, Maintenance, and Replacement Program;

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- Detention Pipe Retrofit Study and Pilot Project;
- Greenway Restoration, Establishment & Maintenance Program; or
- Other City or partner programs.

These projects are listed in Table 5.

ID	Description	Score	Program
2203	Gerber Grate Retrofit	42	Culverts \ Private Partnership
4114	SW Frewing St CMP Culvert Replacement	36	Culverts
5112	SW Hunziker Rd Culvert Replacement	32	Culverts
4120	88th Ave & Reiling St Outfall Retrofit #185713	26	Culverts
4107	Ash Ave Outfall Retrofit	22	Culverts
7104	Fowler Middle School - Culvert Grate Removal	16	Culverts
3302	SW Pathfinder Way Beaver Management Strategy	36	Greenways
3206	Cach Creek Reference Stream Monitoring	34	Greenways \ CWS Partnership
4103	Fanno Creek Beaver Management Strategy	34	Greenways \ CWS Partnership
4106	Fanno Creek at SW Hall Blvd - Proposed Bridge Replacement	44	ODOT Project
3212	SW Aspen Ridge Dr - Detention Pipe Retrofit	19	Detention Pipes
7102	SW Katherine St and SW Morning Hill Dr Detention Pipe Retrofit	17	Detention Pipes

New Projects or Changing Priorities

The rating and ranking methodology was applied to the long list of projects identified during the master plan project, using understanding of opportunities and constraints in place at the time of the Master Plan. It is expected that new projects and changes to the current project assumptions will change over time. Via the rating and ranking spreadsheet, the City now has the ability to revise and re-prioritize stormwater projects as frequently as needed using the same methodology.

The formation of the Small Works Committee has given the City the management structure to address new projects and changing priorities as time passes.