

City of Tacoma Urban Watershed Protection Plan

Implementing strategic stormwater management actions for our streams, lakes, wetlands, bays, and Puget Sound.



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by the City of Tacoma
Environmental Services Department

Land Acknowledgement

In Tacoma, we occupy the traditional homelands of the Puyallup Tribe of Indians and other Coast Salish people. We recognize that the Puyallup and other native tribes have lived on and stewarded these lands since the beginning of time. We further acknowledge the forced removal of these native communities and their continued fight today to live on their ancestral lands.

With this Plan, Tacoma Environmental Services Department is pledging to work in concert with the Puyallup Tribe of Indians and other native communities to protect the land, the waters, the plants, the animals, and the natural resources that sustain us.

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Special Thanks

City of Tacoma Environmental Services Department
Sustainable Tacoma Commission
Tacoma City Council's Infrastructure, Planning, and Sustainability Subcommittee



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1.0 EXECUTIVE SUMMARY

This Urban Watershed Protection Plan (UWP Plan or UWPP) was developed by the City of Tacoma's Environmental Services (ES) Department's Science and Engineering Division's Environmental Programs Group (EPG) as a framework to systematically identify and prioritize areas of the City for stormwater quality improvement actions. The goal of this current plan is to identify a list of actions to improve stormwater volumes and water quality in priority watershed areas to transform negative stormwater impacts into positive stormwater impacts, where water is a resource to restore critical areas and Tacoma's receiving waters. EPG evaluated each watershed in the City of Tacoma with this strategic and science-based framework to rank watersheds based on environmental conditions, neighborhood needs, and City goals and policies to find the areas of highest concern and to begin to build a list of actions to address the inadequate stormwater management in that area. The desired outcome of the UWP Plan is to improve how we focus our stormwater management actions to better protect our natural resources, focus our stormwater infrastructure investments, and support modernization of our urban neighborhoods.

This broad-scale watershed planning effort considered many different data sources the needs of various community groups, involved multiple City services, and crossed jurisdictional boundaries to ensure City stormwater resources meet the diverse needs of our neighborhoods. Development of this UWP Plan took several years to characterize the City's watersheds and environmental conditions. We now aim to integrate the UWPP with the City's comprehensive plan (One Tacoma Plan), Stormwater Comprehensive Plan, other long-range planning programs, and environmental policies. Coordination across City Departments will be critical to implement the plan recommendations and build a healthier

and more resilient Tacoma. A future opportunity to expand the UWPP and Watershed Tool will involve evaluating additional actions to protect, restore, and connect Tacoma's open spaces and urban forest areas. Actions to improve biodiversity and ecosystem health will likely be co-ordinated with stormwater management projects by re-establishing corridors, water cycle connectivity, and other key naturalization goals. The UWP Plan and associated ranking tools will be refined and further utilized to prioritize areas of the City for natural systems management protection and restoration.



To accomplish the stormwater management improvement goals of the UWP Plan, EPG built the Watershed Insights Tool (Tool), a GIS-based watershed model. The Tool was used to prioritize watershed areas with the highest stormwater needs based on the following goals: Clean Water and Healthy Ecosystems; Healthy Neighborhoods; Equity and Environmental Justice; Resilient Community; and Smart Government Spending. Tacoma's watersheds and drainage sub-basins were ranked based on a range of spatial data layers to identify those most in need of stormwater improvements that would also improve environmental outcomes and address community needs. The Tool and UWP Plan framework will be updated biennially to respond to changes in City policies and incorporate new or updated data and update the list of new priority areas and recommendations. Based on the current evaluation, EPG has identified 14 priority sub-basins most in need of stormwater management actions in the near-term (2024-2030). These actions include recommendations for potential stormwater treatment retrofit projects as well as recommendations for focused Stormwater Management Program

(SWMP) Plan enhancements. The City has identified approximate locations where these stormwater actions will occur. Identification of prioritized sub-basins helps City departments to work together, and leverage planned capital facilities projects and various City programs in each watershed to maximize water quality benefits to receiving waters.

The UWP Plan and the Watershed Insights Tool together provide the planning framework and prioritization mechanism to support future adaptive management and efficient use of City resources to address changing neighborhood priorities and watershed conditions. Proposed stormwater treatment retrofit projects that are dependent on timing of other planned City improvements will be prioritized first for feasibility analysis and conceptual design to benefit from funding partnerships. Stormwater program enhancements are dependent upon available budget and staffing levels, which are reviewed on a biennial basis through the City's budget planning process. Detailed project designs and program plans will be further developed during the implementation of the UWP Plan.

To date, the following outcomes were accomplished in developing this UWP Plan, and these are anticipated to continue to help better integrate Tacoma's stormwater planning efforts into planning activities across the City and region:

- **Outcome 1:** Compile and adapt a base of scientific information to evaluate the relative rehabilitation potential of the City's nine watersheds, Appendix C.
- **Outcome 2:** Build and use a GIS-based watershed model to guide the use of City resources to focus on areas with the greatest watershed needs, Appendix H.
- **Outcome 3:** Provide a watershed prioritization framework for City stormwater staff and habitat protection and restoration staff to work together to make cost-effective watershed planning decisions, included on the UWP Plan and Watershed Planning website - Watershed Planning - City of Tacoma.
- **Outcome 4:** Network to discuss watershed action plans in partnership with adjacent jurisdictions, the Puyallup Tribes of Indians, natural resource agencies, watershed partners, and residents, Appendix E.
- **Outcome 5:** Prioritized watersheds for actions, projects, or programs, to address water quality impacts resulting from urban growth and the increasing density of future development in Tacoma, Section 5.



2.0 INTRODUCTION

2.1 Historic Development and Stormwater Impacts

Nationally, urban stormwater runoff is recognized as a contributor to degraded water quality, loss of important aquatic habitat and marine and freshwater species. Urban stormwater studies in western Washington have shown that runoff with little to no stormwater management can lead to flooding and contribute high levels of pollutants to streams, lakes, and Puget Sound. Effective stormwater management is critical to protecting our waters and depends on sound decision-making, adequate funding, and support from the community.



Urbanized and fully developed watersheds, like those in the City of Tacoma (City), have unique challenges when building additional stormwater system capacity to address polluted runoff. These challenges are often related to historic development practices, limited undeveloped space, and aging stormwater systems. Over the past

century, developments were built to ensure rapid drainage to prevent flooding. Therefore, stormwater systems were engineered to carry water away from the site, but without treatment or flow controls before discharging to receiving waters. Today, the City's current stormwater management policies and design standards for new or significant redevelopment are far more protective of surface waters and groundwater. Stormwater permit regulations did not address water quality treatment or flow controls before 1992, therefore much of the City was developed under few to no runoff regulations. These areas with little stormwater treatment provide the great potential for environmental gains.

2.2 Growth Management Act and Future Development

The current Growth Management Act (GMA) approach of relying on developer-funded site-by-site stormwater management can only address stormwater pollution for existing development at the pace of redevelopment. Meeting increased stormwater management requirements across an urban expanse using only the pace of redevelopment will lead to failures in the stormwater system and further impact water quality. Annual flooding will increase. Redevelopment and densification will be challenging because upgrading smaller lot sizes with less available space for stormwater management will not only lead to higher development costs but can also unintentionally discourage development in the urban centers in Tacoma that are designated to accommodate projected population and employment growth and redirect development into lower-density areas of the county. Recognizing the pressing need to try to prevent stormwater system failures and address utility, environmental, and housing challenges, ES is presently in the process of writing the City's first Municipal Stormwater Comprehensive Plan in coordination with the larger One Tacoma Comprehensive Plan and other policy revisions underway for housing growth strategies to increase middle-housing development options within Tacoma's urban growth areas.

2.2.1 Adapting Tacoma's Stormwater Management Program

Over the last 30 years, the City has significantly improved water quality through enforcing

building permit requirements for new development and redevelopment, retrofitting and improving existing public stormwater infrastructure, building new regional stormwater treatment facilities, tracking down and cleaning up legacy pollution in the stormwater system, and developing behavior change programs to reduce pollution at the source. This UWP Plan explores areas in need of stormwater treatment that are likely not going to redevelop soon. As of 2024, approximately 10 percent of the City's watersheds now have stormwater runoff treatment. The existing pipe networks that are part of the City's stormwater system are aging, falling into disrepair, and not adequately sized for the more impervious surfaces coming with densification or the intense rainfall patterns occurring with climate change.

We recognize that stormwater management in urban areas will be expensive to fit treatment into smaller available spaces, and so we must look for opportunities to partner with all City-owned and privately owned spaces and community members to develop a watershed-based approaches that will meet the diverse needs of our neighborhoods when bringing new stormwater solutions into areas that are already fully developed.

2.3 Development of UWP Plan

Development of this UWP Plan was a multi-year effort to assess the City's watershed needs in the face of population growth and existing environmental impacts. This UWP Plan first lays out which watersheds or portions of those watersheds (called sub-basins) have the highest environmental need and then recommends a list of SWMP actions and proposed regional stormwater facility projects to consider based on the potential for partnerships and resource availability. To develop this plan, EGP's Watershed Planning staff utilized grant funds from the Washington State Department of Ecology (Ecology) and secured consultant support with Geosyntec to develop a GIS-based watershed modeling tool. Watershed Planning staff also consulted with a City inter-departmental team, the Puyallup Tribe of Indians, various watershed partners, and neighborhood and community groups in Tacoma to develop and refine the list of recommended stormwater actions.

A new watershed prioritization planning model called Tacoma Watershed Insights Tool (Tool) was developed to provide an objective and transparent method to evaluate by watershed the City's environmental conditions, stormwater BMPs, open spaces, climate adaptation, and City or community priorities. The Tool is a GIS-based spatial analytical framework to layer spatial data and rank different strategic priorities using metrics and criteria. The Tool was used to identify prioritized sub-basins where the City's programs can work together and leverage our current implementation work as well as future projects or programs in each watershed to maximize water quality benefits, green stormwater infrastructure, environmental health, and access to neighborhood green spaces.

The UWP Plan and use of the Tool provides a structured way to prioritize stormwater management activities and identify potential cost-effective strategies for further reducing stormwater volumes and pollutant loads to Tacoma's municipal separate storm sewer system (MS4), local freshwater systems, and the Puget Sound.

The UWP Plan and ongoing coordination by Watershed Staff will satisfy requirements of Tacoma's Phase I Municipal Stormwater Permit (Permit) for stormwater planning, Section S5.C.6, which is to develop policies and strategies to address water quality management in already developed areas. In addition, the recommended actions presented in this UWP Plan form a list of actions and projects that could be used to meet the Permit's Stormwater Management for Existing Development (SMED), Section S5.C.7, implementation requirements. These implementation projects need to add stormwater management such as water quality treatment, flow control or source control in areas with inadequate stormwater management.

Tacoma's UWP Plan includes a receiving water assessment and prioritization as well as a description of potential stormwater facility retrofits and targeted, enhanced, or customized stormwater program activities in each of the priority sub-basins identified throughout Tacoma's nine watersheds. The UWP Plan informs ES's implementation and planning documents including the Stormwater Management Program (SWMP), the Stormwater Comprehensive Plan, Stormwater Capital Facilities Plan. In addition, this UWP Plan aims to achieve the greatest possible gain in environmental health City-wide over the next 20 years through pro-active planning, investment, and stewardship by informing the Watershed Health Chapter of the One Tacoma Comprehensive Plan, including the following:

- planning at a watershed scale to improve watershed health,
- protecting water quality and environmental assets,
- preserving and restoring watershed functions,
- improving water quality,
- flooding prevention and increased neighborhood livability,
- climate resiliency,
- enhanced ecosystem services and benefits, and community engagement and stewardship.

2.4 Plan Goals and Strategies

In development of this plan, five overarching goals were identified as critical guides for the decision support process.

Watershed Planning staff gathered essential input on the priorities from community members, City staff, City leadership, and watershed partners throughout the planning process. Moving forward we plan to continue to engage these groups in our ongoing, iterative planning process that will evolve and grow over time. The goal is a transparent framework to prioritize and implement stormwater management actions throughout the City, taking into account other key City planning priorities and regional watershed goals. With identified sub-basin area to focus on, we can coordinate efforts, partners, and potentially shared funding opportunities within these watersheds.



Figure 1. Five guiding goals of Tacoma's Urban Watershed Protection Plan (UWP Plan)

The first four goals shown in Figure 1, Clean Water and Healthy Ecosystems, Healthy Neighborhoods, Equity and Environmental Justice, and Resilient Community, were the primary pillars guiding development of the Watershed Insights Tool's prioritization metrics and ranking criteria. The fifth goal, Smart Government Spending, is used when implementing the recommendations herein. To a certain extent costs are built into the Tool as well, but Smart Government Spending largely is applied in building or deploying the projects, coordinating for efficiency, and ensuring sustainability of the project, and ultimately stormwater management success.

All the UWP Plan goals provide the structure and direction for Tacoma's stormwater and environmental planning efforts overall and will continue to inform future iterations of this UWP Plan.

2.4.1 Goal 1 – Clean Water and Healthy Ecosystems

Strategically select stormwater management investments to minimize impacts of stormwater runoff on urban receiving waters to protect and restore clean water and ecosystem function in designated critical areas. Urban watersheds include streams, lakes, wetlands, bays, and Puget Sound. Goal 1 strategies include:

- **Provide a strategic approach** for stormwater management planning that reduces impacts to receiving waters and protects and restores ecosystem function in locations that are most needed.
- **Assess the City's receiving waters** to include existing ecosystem health, receiving water hydrology and water quality, and fish and wildlife habitat conditions.
- **Prioritize watersheds for stormwater management activities** to promote the recovery of healthy stream hydrology, pollution impaired waters, and sensitive aquatic habitat in urban areas.
- **Assess opportunities to protect and restore** aquatic habitats and biodiversity corridor

2.4.2 Goal 2 – Healthy Neighborhoods

Engage with community members and organizations to focus stormwater investments on solutions that will address needs identified by the community. Goal 2 strategies include:

- **Consult community members to identify potential co-benefits of stormwater and watershed management actions** that also address the key community needs identified by neighborhoods. Co-benefits may include community cohesion, positive mental health impacts, walkability, shade, lower temperatures, less urban flooding, cleaner streets, water conservation, more swimmable beaches, increased urban wildlife, and access to nearby nature.

2.4.3 Goal 3 - Equity and Environmental Justice

Provide equitable stormwater service delivery and improved access to green spaces to eliminate disparities caused by historic lack of investment. Goal 3 strategies include:

- Provide **a planning approach that supports** tribal subsistence uses and other designated beneficial uses and emphasizes improvements to receiving water quality and habitat under both existing and anticipated future development conditions.
- **Engage with community members, Puyallup Tribe of Indians, and watershed stakeholders**, including focused efforts that engage underserved and overburdened communities. This public engagement will inform the ongoing, iterative watershed plan development that will evolve and grow over time.
- **Use Tacoma's Equity Index** mapping data to **focus investments** in areas of the City to counteract historic disinvestment due to redlining and other inequitable policies.

2.4.4 Goal 4 – Resilient Community

Invest in stormwater management improvements to meet the needs of future growth, affordable housing, and preparing for climate change. Goal 4 Strategies include:

- **Strategically target stormwater control investments** to meet future population and density targets and plan for future climate change scenarios.
- **Encourage affordable development** through regional treatment in areas designated as growth centers.

2.4.5 Goal 5 – Smart Government Spending

Choose cost-effective stormwater management actions to achieve the greatest environmental and community benefits. Goal 5 Strategies include:

- **Inform** stormwater **asset management planning** and capital improvement **budget planning** to invest in storm system improvements in priority watershed sub-basins.
- **Realize** potential **cost efficiencies** of redirecting SWMP resources to priority sub-basins and retrofit existing stormwater infrastructure to provide additional water quality benefits.
- Coordinate with other City planning efforts and leverage those efforts to **prioritize stormwater management actions** required under the Phase I NPDES Stormwater Permit.
- Evaluate and prioritize project proposals to **address pollution caused by existing development** for funding opportunities such as the Ecology Stormwater Financial Assistance Program.

2.5 Plan Development Phases

The Watershed Planning staff used a four phased planning approach to develop this UWP Plan with guidance from a City-wide stormwater and watershed planning Interdisciplinary Team (IDT). This IDT ensured that other City planning priorities related to growth, watersheds, transportation, stormwater, urban forestry, open space, critical areas, and other long-term City plans were considered when developing this plan. These phases are discussed in more detail in the following chapters.

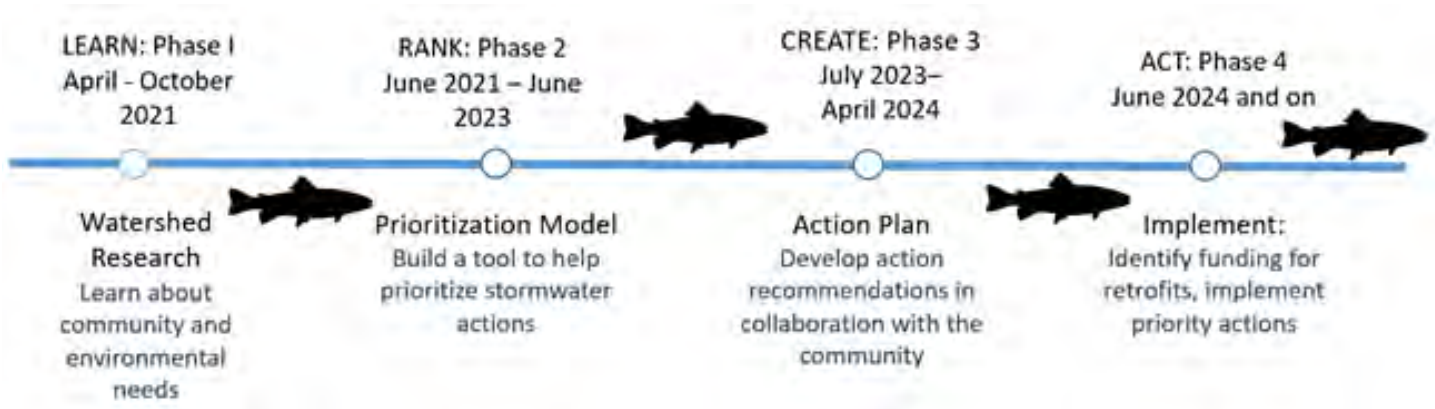


Figure 2. Timeline to develop this UWP Plan by the City of Tacoma

2.5.1 Policy & Watershed Research

We first gathered data from multiple departments and stakeholders on the influential environmental laws and policies and the physical conditions of the City's watersheds and conducted an initial assessment by watershed, see Section 3. This consisted of an evaluation of six planning tasks, including the development of the Interdisciplinary Team (IDT) and the Watershed and Receiving Waters Characterization Study, used to guide the watershed prioritization model development.

2.5.2 Prioritization Model

The Watershed Insights Tool was developed in two phases. First was development of a prioritization framework for stormwater management. Second was building the online ArcGIS based watershed model with cost versus benefit approach helps to identify stormwater solutions based on the watershed conditions and community needs, see Section 4.

2.5.3 Planning Stormwater Management Actions

Using the prioritization model outputs and subsequent conversations with partners, we identified an initial lists of stormwater management actions that are projects or stormwater program activities for the sub-basins. The UWP Plan recommendations in Section 5 incorporate other City planning priorities, along with watershed sub-basin needs and opportunities for potential partnerships. Recommendations focus on both water quality and habitat benefits and Tacoma community and neighborhood needs.

Section 5.2 lists projects that are physical retrofits or capital improvement projects for regional stormwater treatment facilities. Section 5.3 lists SWMP activities include making additional or focusing current activities like outreach, catch-basin marking, or sweeping, in the prioritized sub-basin.

2.5.4 UWPP Implementation

We have already begun to implement a couple of the UWP Plan recommended actions. Implementation by sub-basin and by proposed action will be pursued by Environmental Services staff in both the short-term (1 to 6 years) and the long-term (7-20 years), depending upon the availability of funding opportunities, staff resources, additional partnerships, and collaboration opportunities. Capital improvement projects require planning and ongoing commitment to secure space, funding, design, and construction. Projects and programmatic recommendations in this first UWP Plan will take into consideration site feasibility constraints and any future changes in conditions of the receiving waters.

2.5.5 UWP Plan Updates

Watershed Planning is an iterative process. As projects and programs are implemented, the City will revisit this UWP Plan on a biennial schedule to create an updated prioritized list of SWMP actions and capital projects. The planning process and Tool provide our Watershed Planning Team a means to re-evaluate conditions and decision-making parameters in the future to add new recommendations to improve water quality or meet other prioritized goals. Section 6.3 describes in more detail future community engagement strategies and other steps to update the UWP Plan.

3.0 GATHERING INPUT (PHASE I)

The Research Phase used relevant policy information and scientific data to build a watershed prioritization model to make meaningful recommendations and decisions on stormwater management actions and receiving waters protection throughout the City. This UWP Plan makes recommendations for stormwater management actions in areas most needed in the City based on these policies and data.

3.1 Regulatory Drivers

The purpose of this task was to determine the primary regulatory drivers related to the goals of this Plan and to ensure applicable stormwater requirements are met. Several different regulations require the City to maintain or improve surface and groundwater quality; manage stormwater runoff volumes to protect stream and marine habitat; preserve sensitive and critical areas that may include biodiversity areas, streams, and wetlands; and concentrate growth in highly developed areas. As part of this task the City reviewed the following regulations to ensure compliance with local, State, and federal regulations that guide development activities and help protect and restore the City's natural resources:

- The Growth Management Act
- The Shoreline Management Act
- The Clean Water Act
- NPDES Permit Requirements

The results of this analysis can be found in **Appendix A - Regulatory Framework Overview**.

3.2 Existing Policies and Plans

The purpose of this element was to align with the City's stormwater management actions with other City goals and policies and to ensure that the strategic direction of the Plan aligns with the broader goals of other City Departments and stakeholders. The City aims to prioritize the protection of Tacoma's surface water systems that are critical to achieving recovery of local freshwater systems and the Puget Sound. Because the broad-scale nature of watershed planning affects many different community groups, involves multiple City services, and crosses jurisdictional boundaries, we are striving to ensure Tacoma's Watershed Management Plan will reflect and incorporate the goals and priorities from a wide group of community stakeholders, City departments, and partner organizations throughout the Puyallup-White River and Chambers-Clover Creek Watersheds. A strategic plan without proper stakeholder support runs the risk of wasting resources and time and can jeopardize the success of plans that support the development of stormwater management actions and projects. Some areas of alignment with local policies and plans include:

- improving surface water and groundwater quality,
- managing stormwater runoff volume and intensity to protect downstream habitat,
- preserving sensitive and critical areas including biodiversity areas, streams, and wetlands, and
- concentrating growth in highly developed areas.

Internal Coordination – Watershed Planning staff reviewed a selection of City policies and plans to inform the development of this UWP Plan. By aligning watershed priorities with the programs, plans, and policies of other City departments, we can identify opportunities to collaborate on stormwater management projects and programs. Through this review, we also discovered potential co-benefits of

stormwater and watershed management actions that would address key community needs identified through community feedback provided to other City plans. This UWP Plan addresses many goals and priorities identified in City policies. For example, Chapter 4 of One Tacoma Comprehensive Plan, specifically calls out the need for proactive planning, investment, and stewardship to protect watershed health in Tacoma.

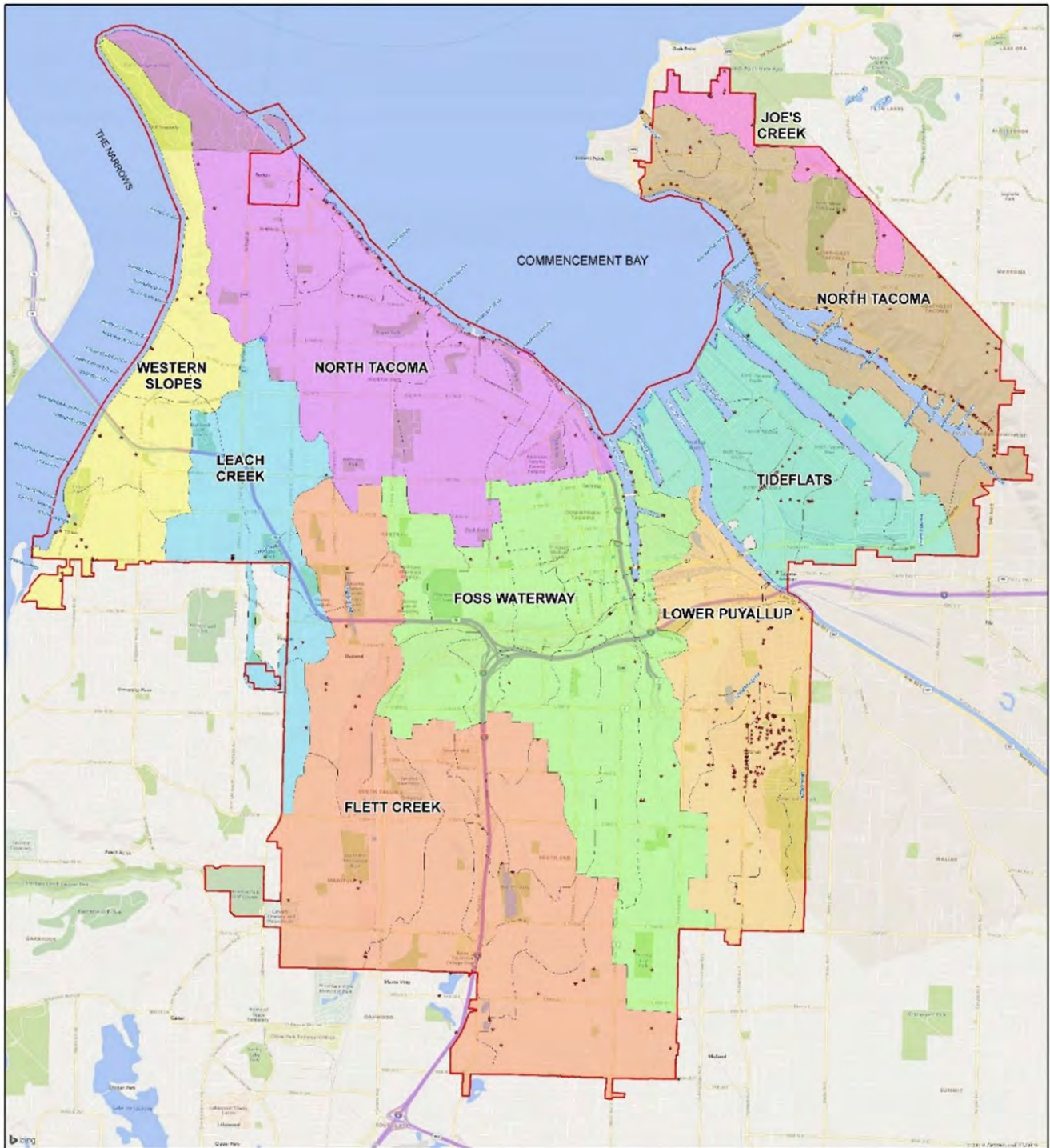
External Coordination - Another equally important focus in developing this UWP Plan was to identify and participate in regional watershed protection efforts. Tacoma contributes stormwater drainage to many waterbodies that cross jurisdictional boundaries (e.g., Puyallup River, Swan Creek, Leach Creek, Flett Creek, Joe's Creek, and Wapato Creek). Watershed Planning staff identified existing plans and policies through both targeted interviews with staff from neighboring jurisdictions, and members of other partner organizations that are active in the urban portions of the City's watersheds. These conversations highlighted where City and regional goals and priorities overlap and where our efforts can support regional priority outcomes. Ensuring alignment with future development and zoning under Home in Tacoma, stormwater management coordination with neighboring jurisdictions, and regional watershed plans will be an ongoing effort for Tacoma to successfully manage the often-competing outcomes of protecting water quality and encouraging urban growth.

Appendix B - Analysis of Related Policies and Plans provides the review of City and regional plans and policies related to watershed and stormwater planning.

3.3 Watersheds and Receiving Waters Characterization

The purpose of this task was to provide an assessment of historic and current stormwater assets and management of these systems, habitat and receiving water conditions, and general information about the watersheds and natural systems in the City of Tacoma. This information is needed to make data-driven recommendations and decisions related to stormwater management in Tacoma. The Watershed Characterization Report (WC Report) documents existing land use development and habitat conditions of the City's nine urban watersheds and summarizes the data and criteria that will be used to guide future stormwater management actions and policy decisions that best support natural systems management in each watershed. The WC Report also identifies criteria for prioritizing habitat restoration areas and other natural systems management strategies throughout the City.

City of Tacoma Watersheds



WATERSHEDS

- | | | |
|--|---|---|
| WESTERN SLOPES | LOWER PUYALLUP | FLETT CREEK |
| TIDEFLATS | LEACH CREEK | TACOMA CITY LIMITS |
| NORTH TACOMA | JOE'S CREEK | SUB-BASINS |
| NE TACOMA | FOSS WATERWAY | SUB-BASINS |



Map Date: 9/30/2019
 Source: Science and Engineering Division
 Environmental Services Department
 City of Tacoma
 326 East D Street, Tacoma WA 98421
 (253) 591-5588



Figure 3. Map of the nine watersheds in the City of Tacoma (excerpted from Appendix C)

Appendix C – Watershed Characterization Report provides the catalog of existing conditions for City watersheds related to stormwater conveyance, treatment and flow control, habitat conditions, land use, and other factors and criteria related to watershed health.

3.4 Interdisciplinary and Core Teams

The purpose of this task was to form an IDT to ensure the Watershed Planning staff were guided in understanding existing infrastructure and processes related to the City of Tacoma’s stormwater management programs and discuss the potential co-benefits or partnerships for stormwater management action recommendations. In the past, Environmental Services stormwater staff collaborated with other City departments in various capacities to meet NPDES stormwater management program requirements. Under the 2018-2023 NPDES Phase I Stormwater Permit, the City was required to formally convene an IDT to inform stormwater planning actions. In addition, the Watershed Planning staff recognized the need to collaborate with an IDT to develop a watershed-based approach to meet the diverse needs of our neighborhoods. By working together closely and aligning what we do across departments, we increase the likelihood of achieving our goals. The IDT was used to identify:

- data and related priorities needed to develop a stormwater prioritization model for Tacoma,
- areas of intersection with the existing SWMP and other policies, and
- potential conflicts, competing interests or unintended consequences of recommended actions.

Watershed Planning staff conducted surveys, meetings, and interviews with IDT staff to identify issues, needs, and data gaps and how these will be addressed in the watershed planning process. We were able to get an updated understanding of the current plans, programs, and key projects in other departments that relate to stormwater and share where the SWMP is headed and next steps in developing this UWP Plan.

City staff that indicated an interest during initial interviews were also invited to participate on a Core Review Team to work closely with watershed planning staff to further inform the development of the Tool, the prioritization process, and the UWP Plan recommendations. During this process, we identified synergies between work happening in other City departments and stormwater management. Our goal is to be more strategic operationally and in how we invest in stormwater infrastructure to address future development, housing needs, climate impacts, community priorities, and equitable service delivery.

Tacoma’s Core Review Team and Expertise

Desiree Radice	ES Open Space Management
Shannon Brenner	Critical Areas Preservation Ordinance and Permitting Regulations
Vanessa Simpson	GIS Data Analysis
Mike Carey	Urban Forestry Program and Management Plan
Karen Bartlett	Asset Management and Criticality Analysis
Mieke Hoppin	Stormwater Manual BMP Design Requirements
Steve Atkinson	Long-Range Planning
John Sunich	Environmental Services – Environmental Compliance & Business Inspections
Hugh Messer	Storm System Operation and Maintenance
Scott Hallenberg	Tacoma Public Utilities – Wellhead Protection Program

Appendix D – Interdisciplinary Team Key Findings provides the comments from the IDT interviews directed to the next steps in development of the Tool and this UWP Plan.

3.5 Community Interests and External Stakeholder Engagement

The purpose of this task was to identify key partners and underrepresented community groups who will be impacted by watershed plan outcomes and understand community interests and needs. Additionally, staff worked with stakeholders to identify co-benefits of stormwater management activities and how they can help to inform watershed goals and ranking priorities and craft City actions towards watershed health.

Watershed Planning staff conducted community meetings, online surveys, developed an interactive watershed map for community feedback, and reviewed existing community feedback from other City engagement efforts. Appendix E - Community Engagement Summary provides the feedback from these engagement efforts that were used to inform the City's watershed prioritization tool development. The Engagement Summary Report summarizes activities and feedback collected from the City's community engagement efforts. These engagement strategies and tactics were designed to reach city-wide audiences to learn about community experiences and priorities across Tacoma's nine watersheds and inform future stormwater investments. This summary includes public engagement efforts and feedback collected between May 2021 and October 2021 through the following key methods:

- Interactive online open house
- Online and printed surveys
- Social media campaign
- Presentations at external stakeholder meetings
- Online workshops
- Tabling events
- Watershed Council meetings

3.6 Data Analysis

The purpose of this task was to identify the scientific monitoring and spatial data needed for the watershed prioritization tool to make informed stormwater management decisions in Tacoma. In addition to the existing data, staff worked to identify GIS data gaps needed for watershed prioritization planning efforts, resourcing constraints and identify potential areas in the City for future stormwater related projects. These data needs were informed by the internal and external stakeholder input to determine what factors needed to be considered to develop a robust tool that looked at a wide range of City priorities related to stormwater management.

Appendix F - Monitoring and Spatial Data Review Summary describes data that was considered for the Watershed Insights Tool for this UWP Plan development, including spatial data, receiving water data, and metrological data that was compiled from several sources.

The technical basis and assumptions used for the Best Management Practice (BMP) Performance Module of the Tool is documented in **Appendix G - Technical Methods and Approach Document**.

4.0 PRIORITIZATION (PHASE 2)

The prioritization phase of this UWP Plan developed and tested a spatial mapping tool for the City. We needed a systematic and spatial method to layer and rank the information on established policies and watershed conditions gathered from the earlier phase. The City of Tacoma pursued and was awarded a grant from the Department of Ecology to develop a web-based watershed prioritization planning tool to help the City identify and prioritize stormwater management services and potential solutions based on watershed and community needs.

The Watershed Insights Tool (Tool) is a web application used to prioritize Tacoma's nine watershed conditions for stormwater management and water quality improvements as well as meeting State and local regulatory requirements and City policies such as advance equity and reduce and mitigate disparities. The Tool provides the City with insights on cost-effective decision making for stormwater management actions.

4.1 Development of the Watershed Insights Tool

The Stormwater Heatmap (<https://www.stormwaterheatmap.org>), an existing Puget Sound spatial decision support tool, provides the basis for our Watershed Insights Tool. Tacoma's city boundaries and interests included adding the ability to select and rank priority stormwater basin drainage areas based on weighting criteria, including water quality impacts, flooding concerns, and equity considerations in lower opportunity areas.

Watershed Planning Staff used multiple spatial data layers and guiding policies to identify areas in the City that are most in need of targeted stormwater management actions. The Tool uses western Washington-specific stormwater pollution monitoring data (including Tacoma data), the City's neighborhood imperviousness (hard surfaces), climate change predictions for future rain intensity in the Tacoma area, and several other neighborhood-specific concerns.

The Tool assists the City with making stormwater management decisions through the addition of modeling capabilities that assess Stormwater BMP performance, track potential retrofit locations, calculate the cost-benefits for specific stormwater management actions to develop an alternative analysis, provide detail comparison of land use and water quality data for each City watershed, and compare existing flow conditions to future conditions. The detailed technical approach used for Tool development can be found in Appendix G - Technical Methods and Approach Document, which is organized into the following chapters:

- Introduction: Project background
- Tool Components: Describes chemicals of concerns and Best Management Practices
- Hydrologic Simulation Methods: Includes details on data sources
- Hydrologic Performance: Includes details on long-term volume capture performance and the simplified treatment volume capture performance Water Quality Performance: Influent and Effluent performance curves
- Best Management Practice (BMP) Performance Module: Module for predicting the performance of BMP strategies
- Cost Module: A lifecycle cost calculator that analyzes capital costs, operations, and maintenance costs, with facility lifespan providing the net present costs of different facility types
- Watershed Prioritization Module: A graphic multi-criteria decision analysis (MCDA) interface that assists users in identifying and prioritizing areas of high priority for stormwater actions

4.1.1 Watershed Insights Tool User Experience

The purpose of this task was to ensure tool outputs were user-friendly and guidance for City use, management, and maintenance was documented in a manual for the City of Tacoma Watershed Insights web application. **Appendix H – User’s Manual** covers the following topics:

- How to access and log in to the Tool (Tacoma Watershed Insights web application)
- How to view and explore the map and data layers
- How to use the tools and features of the application
- How to export and share data and reports

Note: The Tool allows users to track stormwater infrastructure, assess stormwater BMP performance, and make informed decisions regarding stormwater actions and water quality in Tacoma.

The User Manual is focused on the usability of the web application. It does not provide technical details about the methodology behind calculations or modeling assumptions. The User Manual assumes that users have a basic familiarity with web browsers and GIS concepts and provides links to external resources for further information and learning. Additional information regarding the technical aspects of the Tool can be found in Appendix G.

4.2 Stormwater Prioritization Process

The purpose of this task was to develop a prioritized list of sub-basins in need of stormwater improvements based on the designated goals. The City prioritized these sub-basins while making equitable and cost-effective stormwater management decisions based on water quality, but also flooding, climate change impacts, and other environmental and community concerns.

4.2.1 Use of the Goals in the Watershed Insights Tool

This UWP Plan provides a strategic means to apply stormwater management to protect people, property, and habitats from stormwater flooding and pollution. Further, prioritization ranking was applied inside the Watershed Insights Tool.

The City ranked the criteria related to targeting stormwater pollution hotspots and known flooding issues and climate impacts with the highest weighting of a “3”. Next, the City Council aims to counteract negative health impacts and environmental justice disparities caused by redlining and other past practices that neglected infrastructure and utility services in low opportunity neighborhoods in Tacoma, therefore Health Equity is given a rank weight of a “2”. Focusing actions that benefit stormwater quality in these neighborhoods will also have the co-benefit of improving public health and livability in those areas. Finally, Sensitive Habitat Protection is given a ranking of a “1”, because although we do have areas of high habitat value within City limits that would benefit from better stormwater treatment, the most highly impacted sub-basins from imperviousness and most intensive polluting land uses typically aren’t collocated with the most sensitive habitat areas.

A notable exception is found in the Tideflats watershed where industrial, highly impervious development exists alongside a significant number of shoreline habitat restoration sites, which is discussed more in the results below.

The fifth UWP Plan goal outlined in Section 2.4 is Smart Government Spending and aims to ensure the City is choosing the most cost-effective stormwater management actions to achieve

the desired water quality and neighborhood quality benefits. While not explicitly included in the decision-making process for prioritized basins, this goal is threaded throughout the watershed prioritization process and is inherent in the Tool by ensuring the City builds stormwater facility projects in areas most needed and chooses the most cost-effective action for those areas. Table 1 shows the refined goals and subgoals used in the Watershed Insights Tool.

Table 1. Goals, Subgoals, Criteria, and Data Sources (Excerpted from Appendix G).

Goal 1: Improve Water Quality Outcomes (Clean Water Goal)		
Sub-goal	Criteria	Data Source
1.1 Prioritize areas based on pollutant concentrations	Total Nitrogen Concentration	TNC Stormwater Heatmap
	TSS Concentration	TNC Stormwater Heatmap
	Annual Runoff	TNC Stormwater Heatmap
	Imperviousness	TNC Stormwater Heatmap
1.2 Improve infrastructure in areas with inadequate stormwater management	Percent of Area Treated	Calculated in Tool
	Age of Development	TNC Stormwater Heatmap
Goal 2: Increase Resilience to Climate Change Impacts (Resilient Community Goal)		
2.1 Target areas most vulnerable to and at risk for climate change impacts	Urban Heat Island	City of Tacoma
	Capacity Issues Layer	City of Tacoma
Goal 3: Preserve and Restore Critical and Sensitive Habitat (Healthy Ecosystems)		
3.1 Preserve and improve Natural Spaces	ES Open Space/Natural Resource Areas	City of Tacoma
	Biodiversity Corridors	City of Tacoma
Goal 4: Implement Equity and Social Justice (Healthy Neighborhoods; Equity)		
4.1 Prioritize areas of overlapping equity needs as identified by other Tacoma programs	Equity Index Score	City of Tacoma
	Livability Index	City of Tacoma
4.2 Improve access to safe, high-quality roadway infrastructure (green infrastructure recommendation)	Pavement Condition Index	City of Tacoma

4.2.2 Results

The results of the prioritization by this UWP Plan are that each sub-basin in the City's nine watersheds received a metric score, with high values being sub-basins with the most need of stormwater services. The highest priority watershed neighborhoods are shown below as the yellow and green colors. Each of these priority areas designated on the map below are discussed in greater detail in Section 5.

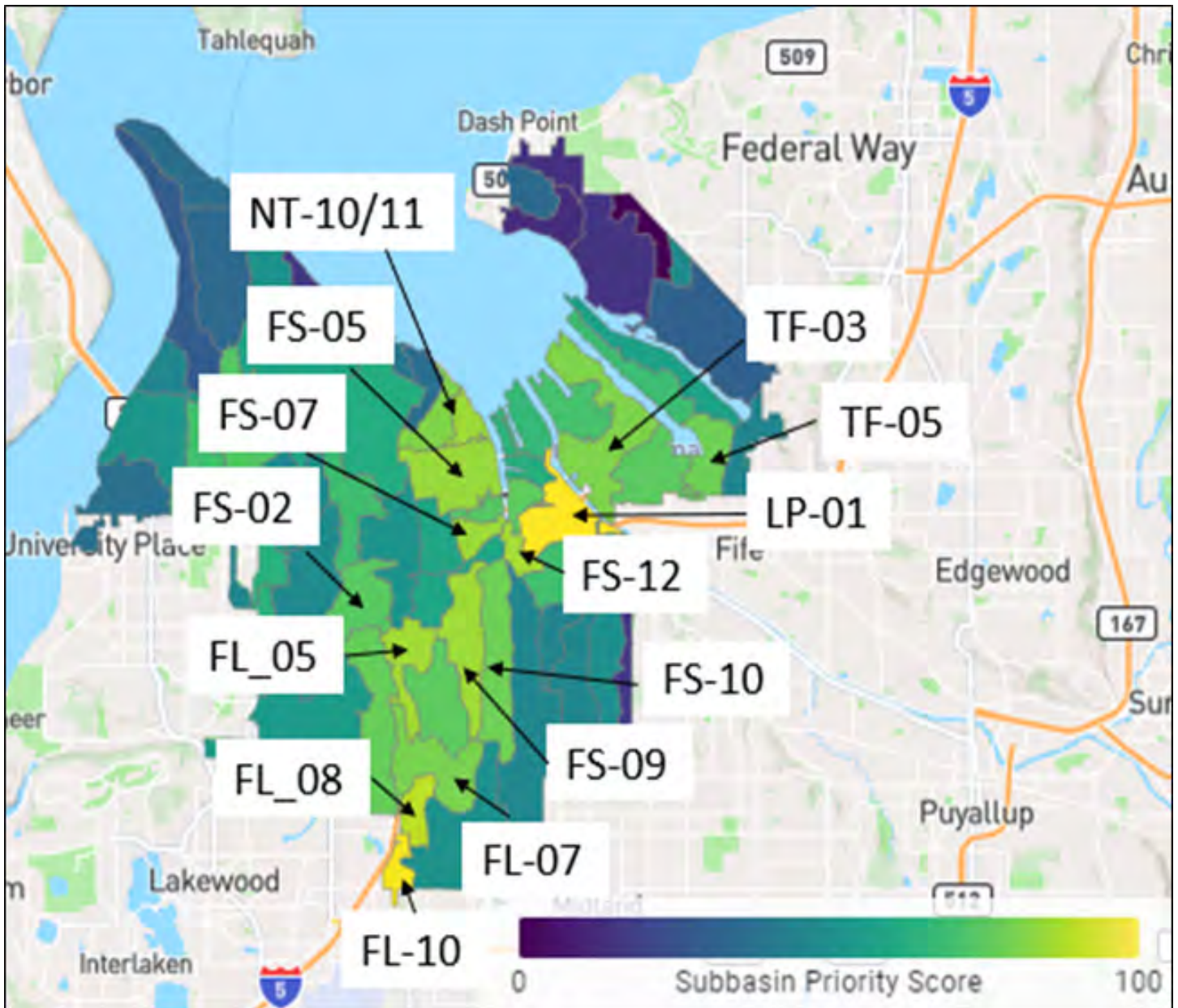


Figure 4. Map of the 14 prioritized sub-basins for stormwater management actions

The top 25 percent of the basins in most need of stormwater management project include:

- Lower Puyallup (east Tacoma) = LP-01
- Flett Creek (south Tacoma) = FL-10, FL-08, FL-07, FL-05
- Thea Foss Waterway (Tacoma Mall, Lincoln District & Downtown) = FS-12, FS-10, FS-09, FS-07, FS-05, FS-02
- North Tacoma (Schuster/Stadium) = NT-11, NT-10
- Tideflats = TF-05, TF-03

5.0 PLANNING STORMWATER MANAGEMENT ACTIONS (PHASE 3)

This UWP Plan provide transparency on how EPG will proceed in finding and deciding among a variety of stormwater management considerations throughout the City to develop projects and actions in priority sub-basins. The prioritized sub-basins shown in Figure 4, will be the focus for Watershed Planning staff to implement coordination efforts, projects, and actions in the 2025-2026 biennium.

This Section lists recommendations to date that could be implemented in the sub-basins. These actions included a list of potential stormwater system retrofits and facility locations and focus areas for enhancing stormwater management program activities such as focused street sweeping, public outreach and engagement, and business inspections. Based on the initial stakeholder engagement conducted during the Research Phase, the Team presented these actions to the City's IDT in August 2023. Subsequently, staff met with various stakeholder groups to further discuss the potential list of prioritized actions, get feedback, and develop the final action list. Many of these recommendations do not have funding and extensive coordination to implement the recommendations may still be needed, but they are a starting point for focusing EPG staff on seeking funding opportunities, partners, and coordinating across the City's departments.

To maintain transparency on UWP Plan activities, the City will coordinate internally and externally using the City of Tacoma's Watershed Planning webpage (www.cityoftacoma.org/healthywatersheds).

5.1 Collaborate with Partners on Results

Watershed Planning staff presented the results from the Tool to both internal and external partners. The goal of these meetings was to discuss possible partnerships for stormwater projects in the priority watershed areas and to further refine the potential list of prioritized actions, get stakeholder feedback, and develop the final action list. The following is a summary of outcomes from these meetings.

5.1.1 Stormwater Facility and Retrofit Recommendations

The Watershed Planning team met with multiple City departments and working groups that are responsible for developing, constructing, and maintaining stormwater related projects. Consulted groups included: Environmental Services Capital Development Group, Environmental Services Operations and Maintenance (O&M) Division, Natural Systems Management, Asset Management Group, Public Work Traffic Engineering and Transportation Planning, Planning and Development Services (PDS) Site Development Group, Natural Resources Program, Long-Range Planning, Tacoma Public Utilities (TPU), and Office of Environmental Policy and Sustainability Urban Forestry.

The stormwater system retrofit project recommendations were developed through conversations with both internal City Departments and external partners (i.e., Metro Parks Tacoma, the Puyallup Tribe of Indians, Port of Tacoma) to identify possible partnerships for stormwater projects in the priority watershed areas. Based on feedback from these meetings, the team developed the proposed Stormwater Management Facility and Capital Improvement recommendations.

Engagement not only helped identify current and proposed street and infrastructure improvement projects in the priority basins that could incorporate a stormwater facility, but they helped identify areas of intersection where other City priorities aligned with the watershed prioritization outputs. Based on these discussions, staff developed stormwater facility scenarios that are discussed in detail in **Section 5.2**.

5.1.2 Enhanced Maintenance and Programmatic Recommendations

In addition to the groups listed in above the Watershed Planning team also met with the NPDES Stormwater Permit Coordination group, Environmental Services Environmental Compliance inspectors, and Environmental Services Solid Waste Division to determine if existing stormwater management actions could be focused in areas most needed. Tacoma's SWMP Plan is updated annually and can be found on the City Stormwater Management Program website: Stormwater Management Program - City of Tacoma

These engagement efforts helped to determine what stormwater management activities could potentially be focused within the prioritized basins. These actions include public education, business inspections, Illicit Discharge, Detection, and Elimination (IDDE) investigations, retrofits, and enhanced maintenance projects. Based on these discussions, staff developed stormwater management action recommendations that are discussed in detail in Section 5.3.

5.1.3 Open Space and Habitat Considerations

The Watershed Planning team met with the key staff involved in urban forest and habitat protection and stewardship inside City limits, including Natural Systems Management, Urban Forestry, and PDS Natural Resources Program. The goal of this coordination was to identify how the Tool can be used to help highlight top priority locations in Tacoma for natural systems protection. Discussions centered around identifying shared opportunities where Natural Systems Management and Urban Forestry projects could be incorporated into this watershed planning effort. This work is still underway, and the current UWP Plan recommendations below do not yet include Natural Systems, Open Spaces, Urban Tree, or Biodiversity prioritized actions. Watershed planning will be an iterative process, the EPG team will work towards development of a prioritized list of areas in the City for both habitat restoration and protection of key receiving waters for the UWP Plan of Action update.



5.2 Proposed Stormwater Facility Projects

This section identifies proposed near-term (2024-2030) and long-term (2031-2044) stormwater management actions to improve water quality in the 14 prioritized basins. These actions included 1) a list of potential stormwater system retrofits/capital projects for new stormwater treatment facilities, and 2) recommendations for enhancing stormwater management program activities such as more frequent street sweeping, public outreach and engagement programs, and business inspections and technical assistance. These UWP Plan stormwater retrofit, and facility concept recommendations are shown in Table 2, and Appendix I - Example Project Summary Sheet contains a two-page example of project details. These are not shown in any ranked order and are considered at this point on an equal opportunistic basis. These are recommended concepts because the exact facility must be designed to fit site constraints, which will be done in the future.

Table 2. Recommended Stormwater Facility Capital Projects

Watershed	Sub-basin	Project Name	Location	Proposed Concept	Implementation Timeline	Potential Funding/Partners
Lower Puyallup River	LP_01	Puyallup Ave Green Streetscape Enhancement	Puyallup Avenue from South "C" Street to Portland Avenue	Filtterra Tree Boxes	Coordinate with Street Project Design and Construction by 2027-2031.	Tacoma Public Works
	LP_01, LP_02, LP_03, LP_04	Portland Avenue Green Streetscape Enhancement	Portland Avenue from I-5 to South 56th Street	Filtterra Tree Boxes	Coordinate with Street Project Preliminary Design Phase and Funding (2025)	Tacoma Public Works
Tideflats	TF_03	Lincoln Avenue Treatment Ditch	Lincoln Avenue - Milwaukee Avenue to Port of Tacoma Road	Bioswale retrofit and Sedimentation Pond	Coordinate with Ditch Maintenance Project Design and Construction 2025-26.	Tacoma Environmental Services O&M
Foss Waterway	FS_02	California Avenue Stormwater Park	66 South California Avenue	Bioinfiltration	Coordinate Planning with Parks Strategic Plan 2024.	Metro Parks Tacoma
	FS_02	Lincoln Heights Park Regional Treatment Stormwater Park	3591 South Steele Street	Bioinfiltration	Coordinate Planning with Parks Strategic Plan 2024.	Metro Parks Tacoma
	FS_07	I-705 Bridge Regional Treatment Vault Stormwater Park	Dock Street and East 23rd Street under I-705	Underground Filter Vault	Coordinate with WSDOT MTCA site cleanup currently in FEIS stage 2024-2031. Include new PDS Construction Inspector vehicle parking and field office.	Washington State Department of Transportation (WSDOT), Ecology, Tacoma PDS
Flett Creek	FL_10	Regional Stormwater Pond Smart Outlet Controls Retrofit	Regional Stormwater Holding Basins	Retrofit pond outlets with operable gates and pumps with Continuous Monitoring and Adaptive Controls	Apply for funding during next grant cycle 2025-26.	Ecology Streamflow Restoration Grant
	FL_02	TPU Southwest Tacoma Substation Regional Infiltration Pond	4102 South 74th Street	Infiltration Pond and Pretreatment Pond	Apply for funding during next grant cycle 2025-26.	TPU, Ecology Streamflow Restoration Grant
	FL_03	TPU Administration Regional Infiltration Gallery	3628 South 35th Street	Infiltration gallery on top of Sand Filter with Swirl Separator Pretreatment	Apply for funding during next grant cycle 2025-26.	TPU, Ecology Streamflow Restoration Grant

Bold = Priority Sub-basins

The development and construction of these potential projects is dependent on further analysis and resolution of several factors for each potential project, including but not limited to:

- agreements and/or easements with property owners on use and access for public stormwater facilities operation and maintenance,
- community and partner input and involvement to help inform design development, subject to engineering and maintenance feasibility,
- engineering alternative analysis and final design,

- project coordination with other public infrastructure and private development projects,
- permitting and environmental review conditions, and
- funding and staffing resources for design, construction, and long-term maintenance.

Further refinement is likely based on other City planning and budget priorities, potential external funding opportunities, and site feasibility considerations. At the current time there is little direct funding for these projects, therefore the City will largely rely on grant funding and opportunistic partnerships to implement these projects.

5.3 Proposed Stormwater Management Programmatic Actions

In addition to capital improvements, the City is proposing targeted, enhanced, or customizable actions from the SWMP in focus areas identified during the watershed prioritization process (Section 3.3). This section addresses customizing stormwater management actions under tasks of the City’s SWMP for possible program enhancements in the near-term (2024-2030), and depending on feasibility and effectiveness, that may be considered for inclusion in SWMP. Program expansion and customization are dependent on budget and staffing levels, which are reviewed on a biennial basis. Long-term (2031-2044) implementation recommendations would depend even more on necessary resources and staff allocation.



5.3.1 Public Education and Outreach

The City’s current public education and outreach program in the SWMP utilizes a variety of education and outreach campaigns on the impacts of stormwater runoff and actions they can take to address, reduce, or eliminate polluted runoff at their home, business, or within the community. **This UWP Plan recommends the following program enhancements to help improve public education and outreach behavior change programs, and potentially provide more support for future projects and actions:**

1. Public Art and Stormwater Pollution Prevention Campaign. In 2018, the “If It Hits the Ground, It Hits the Sound” marketing campaign was launched to bring awareness that about 90 percent of Tacoma stormwater is not treated to improve water quality before being released into local waterways and to encourage behavior changes that will reduce pollution to runoff. The campaign includes a variety of public art and education components in partnership with local artists, schools, and community members. The campaign artwork has been shared through a variety of media platforms including street murals, storm drain stencils, t-shirts, reusable bags, bumper stickers, City vehicle wraps, a film contest, and social media posts. The campaign has also caught the attention of Tacoma Public Schools.

Recommendations: Promote application of this campaign in priority watershed areas. Also, continue coordination with the school district by Environmental Services staff to develop a stormwater pollution prevention curriculum pilot in several fourth-grade classrooms. Through the campaign, the City is planning to install more murals in priority basins near pedestrian corridors and potentially along Safe Routes to Schools and looking into other opportunities to incorporate public art and education to highlight and bring awareness to this campaign in areas most needed. Also evaluate the feasibility of offering storm drain stencil painting to businesses following their business inspections, to schools participating in stormwater lessons, and to Adopt-A-Drain volunteers as an incentive for keeping their storm drains clear of litter and debris.

2. Education and Outreach Material Translation and Transcreation. A key finding is that many of the priority watershed basins are in Tacoma's most culturally diverse neighborhoods.

Recommendations: The City will continue to adapt stormwater outreach materials with input from overburdened community members, to translate and transcreate materials to better reach their communities. This can help spread the word about neighborhood assistance programs, including discount tree coupons, free street trees (Grit City Trees), Make A Splash small grants, Green Stormwater Mini-Grants, the Community Depave program, free neighborhood pet waste stations, and more. Also, continue to translate materials for source control inspections and IDDE activities to help increase overburdened community involvement and participation.

3. Neighborhood Pet Waste Stations. One of Tacoma's most popular stormwater pollution prevention programs allows adoption of a free Neighborhood Pet Waste Station by the public. Community members who want to do something to help their neighbors remember to pick up after their pets when they are out walking can volunteer to have a city-owned pet waste station installed in a public location near them. The City provides free refill pet waste bags, and the volunteer keeps the bags stocked and notifies the City if the station is damaged.

Recommendations: Evaluate interest across neighborhoods for adoption or addition of more pet stations. Promote this program further in priority watershed areas as an effective behavior change program to help community members choose to prevent water pollution.

4. EnviroChallengers School Programs. The EnviroChallengers educators are invited into the classroom to lead one-hour stormwater and watershed-based science and art lessons and special projects for students in K-12. They also lead an eight-week summer training program for high school age students to build job training skills for environmental jobs.

Recommendation: Support the EnviroChallengers program as they investigate opportunities for focused programming in schools in priority watershed areas.

5. Stormwater Small Grants and Community Depave Program. Environmental Services Department partners with the Pierce Conservation District in delivering small grants and City in-kind services to help community members complete projects on their property or street frontage to make their property more "rain friendly". Projects include 1) de-paving planter strips, traffic circles, or parking lots to increase landscaping areas, 2) building rain gardens, 3) installing rainwater cisterns, and 4) replacing turf grass with native and pollinator plants. These projects can all be built at no cost or very low cost to the property owner with free technical design assistance, contractor assistance, and small grants. The Make A Splash grants, Green Stormwater Mini-grants, and Depave program already focus on supporting projects in Tacoma's low- and very low-opportunity neighborhoods and working with overburdened community members.

Recommendation: Evaluate opportunities to deliver these programs in priority watershed areas.

6. Ash Street Open Space Site Stewardship. In response to community requests, Natural Systems Management staff and Washington Conservation Corps members are supporting community volunteers to improve the Ash Street Open Space property located in a priority sub-basin in the Hosmer neighborhood. Volunteers pick up litter, remove invasives and plant native plants, and build a trail to improve access.

Recommendation: Look for opportunities to engage the community in stewardship of other Environmental Services owned Open Spaces in the priority watersheds (and City-wide) following the Ash Street as an example.



5.3.2 Illicit Discharge, Detection and Elimination (IDDE)

The City's current IDDE Program in the SWMP Plan consists of field screening, stormwater monitoring, source control inspections, spill and complaint response, and construction inspections. This program provides guidelines for prohibited discharges to the stormwater system and best practices for reducing and eliminating non-stormwater discharges to the system. **This UWP Plan proposes the following additional program enhancements for priority watershed focus areas:**

1. Tidy-Up Tacoma crews. Tidy-Up Tacoma is a new program funded in 2023 through the Solid Waste Department to address litter and dumping in public spaces.

Recommendation: Continue the Tidy-Up Tacoma program and identify focus areas for Tidy-Up Tacoma litter truck routes in prioritized watershed basins.

2. Community litter pick-up campaigns. There are several community volunteer-driven campaigns and programs to pick up litter around Tacoma, including the City's annual litter pick-up day (Litterfree 253), Swan Creek clean-ups sponsored by the East Tacoma Community Leaders, Oscar's Enemies litter pick-up events, and Adopt-A-Spot program administered by the Neighborhood and Community Services Division.

Recommendation: Look for partnerships or opportunities for programs and community events like these to be created or sustained in the priority watershed areas.

3. Homeless encampment cleanups near waterways. Effective November 14, 2022, Second Amended Substitute Ordinance 28831 was passed to prohibit camping and the storage of personal belongings on all public property within 200 feet of Tacoma's mapped rivers, waterways, creeks, streams, and shorelines. With this ordinance in place, Environmental Services and Neighborhood and Community Services' Homelessness Outreach Teams are focusing on relocating and providing services to unsheltered individuals camping near water and expediting cleanups of those encampment areas.

Recommendation: Ensure that the priority watershed basins are included in these existing efforts.

4. Pilot homeless encampment mobile sanitation services. Environmental Services staff is leading a pilot program to provide mobile sanitary service to unhoused individuals as one of the most

overburdened segments of Tacoma's population to address current health and sanitation needs while Neighborhood and Community Services continues developing more temporary shelter and permanent housing solutions. The pilot is based on the existing Purple Bag Program that delivers purple bags to individuals at encampments on a weekly basis, which are then filled with campsite litter and garbage and can be left on the side of the road and picked up by a solid waste contractor. This program adds personal toilet kits with liners so the human waste can be bagged and left alongside the Purple Bags for regular pick up.

Recommendation: Evaluate pilot program effectiveness and consider expansion as needed citywide or in priority watershed areas.

5. Field Screening for illicit discharges. Field screening for illicit connections and ongoing illicit discharges to the stormwater system is done annually through base flow sampling at selected outfalls throughout the City. The NPDES permit requires 12 percent on average of the stormwater system to be screened each calendar year.

Recommendation: Ensure base flow sampling locations are selected in priority watershed areas first during the permit cycle.



5.3.3 Source Control

The City's source control program conducts inspections of pollution-generating activities at commercial and industrial properties and other locations based on inspector observations or complaints. Education and technical assistance are provided on stormwater pollution prevention actions and storm system maintenance requirements.

The following program enhancements are being investigated for the SWMP to help improve source control by improving communications and reviewing and updating the current list of potential pollution-generating sites. The City will review possible program enhancements and implement pilot programs in the near-term (2025-2031), and depending upon feasibility and effectiveness, incorporate recommended program changes through the annual budgeting process in the near-term or long-term (2031- 2044). Program expansion will depend on budget and staffing levels, which are reviewed on a biennial basis. **This UWP Plan proposes the following additional program enhancements for priority watershed focus areas:**

1. Enhanced language accessibility for business outreach. Inspectors currently use translation phone services for language assistance on source control inspections. Environmental Services currently has translated five separate, one-page BMP handouts most often handed out by our inspectors into the most frequently spoken languages in Tacoma, including English, Russian, Ukrainian, Spanish, Korean, Vietnamese, and Cambodian. These languages were chosen based on current City-wide demographics.

Recommendations: Evaluate if different languages and business types in priority watershed areas are available in existing materials, or if more outreach materials may be translated as well. Also, consider if NPDES Stormwater program staff can investigate opportunities to work with the Environmental Services Community Ambassadors program to get ambassador feedback and guidance on developing more effective messaging for specific business communities, such as grease trap maintenance for restaurants, and others. Consider asking

the community for recommendations on outreach videos or other online materials. Look for cost-effective ways to adapt outreach materials from other municipalities or Washington Stormwater Center or other local resources, in English and other languages, as well.

2. Pilot project for enhanced business inspections in priority watersheds. The City is planning a pilot business inspection project in the priority Flett watershed sub-basin FL_10, located in the Hosmer neighborhood which is densely developed with retail, commercial, and multi-family properties. The goal of this pilot project is to review and update the list of potential pollution-generating businesses that receive stormwater business inspections and to update the inspection format to increase efficiency and effectiveness. Meeting this goal can improve water quality, especially in areas most needed.

The retail and commercial areas have been found to have consistent business turnover, and though the City has a survey method for identifying businesses of concern, this method may not capture all businesses that could benefit from being part of the stormwater inspection inventory. Additionally, some multi-family properties may have potential sources of pollution and catch basin maintenance needs. The City will update the current inventory during 2024 in preparation to conduct targeted stormwater inspections during 2025-2026. These inspections will also include informing businesses of other assistance programs which may be of interest, including “Keep the lid closed” dumpster stickers, neighborhood pet waste stations, green stormwater mini-grants, and catch basin art stenciling opportunities, for example.

Recommendation: Proceed with this pilot in FL_10 to review and update the list of potential pollution-generating businesses that receive stormwater business inspections and to update the inspection format to increase efficiency and effectiveness. This pilot project will help determine the extent of additional potential pollutant-generating businesses that may be present in priority watersheds and the resources needed to expand this enhanced business inspection approach to other priority watershed areas.

3. EnviroStars Business Certification Program. Businesses certified in the EnviroStars program receive an annual technical assistance visit from the Tacoma Pierce County Health Department to perform an evaluation of stormwater practices and discuss additional best practices to continue to increase their certification level. Businesses gain marketing potential by displaying their EnviroStars certification.

Recommendation: Consider focused outreach on EnviroStars in a priority watershed, such as along Puyallup Avenue and in the Dome District. The goal is to help businesses complete their applications to become certified under the EnviroStars program, perform well in stormwater inspections, and implement more stormwater-related best practices.



5.3.4 Operations and Maintenance

The City's current operation and maintenance program requires maintenance of all regulated permanent stormwater treatment and flow control BMPs, facilities, and associated catch basins, in accordance with standards contained in the Tacoma Municipal Code and the City's Stormwater Management Manual. The City performs mapping, inspection, and validation services to ensure compliance with these maintenance standards. City departments carry out the responsibility of inspection and

maintenance for their owned or operated stormwater facilities/BMPs and catch basins.

The City will review possible program enhancements and implement currently funded studies in the near-term (2024-2030), and depending on feasibility and effectiveness, incorporate recommended program changes through the annual budgeting process in the near-term or long-term (2031- 2044). Program expansion will depend on budget and staffing levels, which are reviewed on a biennial basis.

This UWP Plan proposes the following additional program enhancements for priority watershed focus areas:

1. Street Sweeping Cost Benefit Study. The cost-effectiveness of street sweeping versus building a stormwater treatment facility in the sub-basins City-wide is unknown. A literature review focused on street sweeping efficacy and street dirt chemistry would advance our understanding on the frequency to utilize our street sweepers throughout the City and specifically in prioritized watershed basins.

Recommendation: A literature review focused on street sweeping effectiveness as a source-control BMP will be completed in the Fall 2024. This data will be used in conjunction with the stormwater sediment monitoring project outlined below and the City's existing street sweeping data, to provide future sweeping recommendations for Tool adaptation and programmatic activity in the City.

2. Stormwater Sediment Monitoring for Watershed Prioritization and Planning Grant. The City received a water quality grant from Ecology to characterize stormwater sediment chemistry in several locations around the City using passive in-line sediment traps. Two objectives are to validate the Pollutant Heat Map modelled 'hot spots' by testing actual pollutant concentrations at these locations. The second objective is to verify stormwater BMP effectiveness at reducing entrained sediments and pollutants; BMPs selected are both structural and non-structural such as street sweeping. The study will conclude in 2026 and findings will be used to update the Watershed Insights Tool, future UWPP projects and the SWMP.

Recommendation: Incorporate updated results from sediment traps into the Watershed Insights Tool to quantify the pollutant removal rates of these non-structural BMPs when comparing design scenarios of structural BMPs for water quality treatment.

3. Enhanced Street Sweeping Schedule. The City conducts street sweeping per the SWMP. The City will evaluate street sweeping routes to determine if additional sweeping in prioritized basins could occur with the existing program.

Recommendation: Consider different opportunities to conduct enhanced or increased frequency street sweeping schedules in the prioritized sub-basins. The City will also evaluate the current street sweeping frequencies City-wide based on the results of the studies discussed above.

4. Ditch Retrofits. Environmental Services routinely maintains ditches in all nine watersheds.

Recommendation: Consider adding retrofit enhancements when maintaining ditches and neighborhood stormwater holding ponds to provide additional water quality benefits. Retrofits could include regrading, berms, bioretention soil media, and additional plants and trees or other enhancements to better filter and absorb stormwater. A model ditch retrofit

program to consider is the Kitsap County Roadside Ditch and Shoulder Water Quality Enhancement Plan. Another channel naturalization method which may be useful in some cases is a Regenerative Stormwater Conveyance system design.

5. Stormwater Pond Naturalization. Environmental Services routinely maintains ditches stormwater ponds in all nine watersheds.

Recommendation: The pond naturalization program will be piloted by the Natural Systems Management group using plant stock from the Open Space Management Program. The program will be evaluated in the near-term over the next two years. If ditch retrofits and pond naturalization are determined to be beneficial and feasible, specific projects may be considered for inclusion in the Capital Improvement Plan (CIP) for near-term and/or long-term resource allocation and implementation, as appropriate.

6. Regional Holding Basin Retrofits. Environmental Services routinely maintains regional holding basins in all nine watersheds. An option for improving effectiveness of holding basins is to install smart controls in the outlet control structures, such as Continuous Monitoring and Adaptive Control (CMAC). Smart controls are an accepted best management practice across the country and has been approved by the Washington State Department of Ecology and implemented in various locations regionally (e.g., King County, City of Redmond, and Bellevue). CMAC has been primarily deployed to improve hydromodification of existing stormwater infrastructure and has the potential to help communities provide affordable solutions to localized flooding and water quality concerns, while meeting community needs of environmental justice and climate resilience.

Recommendation: Evaluate the Flett watershed holding basins for smart controls to improve flow control and improve water quality draining to streams. Focus on maximizing pond(s) functioning in series upstream of the Flett Creek/Chambers Creek system to provide additional flow control and water quality treatment for existing and future development conditions.



5.3.5 Summary of Programmatic Recommendations

Table 3 summarizes targeted, enhanced, or customized actions in the Stormwater Management Program. In all cases, the City will review and develop the possible program enhancements in the short-term (2024-2030), and depending on feasibility and effectiveness, program desirable enhancements through the budgeting process in the short- or long-term (2031-2044). Program expansion, however, will depend on budgeting and staffing constraints and allocations, which are reviewed on a biennial basis.

Table 3. Recommended Considerations for Programmatic Stormwater Management Actions

SWMP Program	Location	Proposed Action	Proposed Starting Timeframes
Public Education & Outreach	Priority Basins	Create public art with stormwater messaging	Proposed & looking for opportunities
	City-Wide	Adapt programs and create additional multi-lingual program materials & messaging to reach underserved communities	Development 2024-2025 Implementation 2026
	Priority Basins	Focused Behavior Change Program for Neighborhood Pet Waste Stations	Development 2024-2025 Implementation 2026
	Priority Basins	Promote the community Depave Program in priority areas	Development 2024 Implementation 2025-2026
	FL_10 Sub-basin	Organize community stewardship opportunities in the Ash Street Open Space Area	Development 2024 Implementation 2025-2026
Illicit Discharge, Detection & Elimination (IDDE)	Priority Basins	Identify focus areas for litter pick-up	Development 2024 Implementation 2025-2026
	City-Wide	Targeted assistance and cleanup for encampment areas near waterways	Implementation 2024
	Thea Foss Basin	Pilot encampment temporary sanitation services	Feasibility and Development 2024-2025
	Priority Basins	IDDE field screening	2024-2026
Source Control	City-Wide	Enhanced business outreach	Development 2024-2025 Implementation 2026
	Flett_10 Sub-basin	Conduct business inspection pilot with a focus on pollution identification and inspection efficiencies.	Development 2024; Implementation 2025-2026
	Lower Puyallup_01 Sub-basin	Pilot outreach program for EnviroStar Business Certification with businesses along Puyallup Avenue and in the Dome District	Development 2024; Implementation 2025-2026
Operations & Maintenance	City-Wide	Conduct a study to assess the cost effectiveness of street sweeping	Study and Analysis 2024-2025
	Priority Basin	The City received a water quality grant from Ecology to use simple passive in-line sediment sampling to help characterize stormwater sediment chemistry in one of the identified prioritized basins.	Project proposed timeline 2025-2026
	Priority Basins	Considering an enhanced or increased frequency street sweeping schedule in prioritized basins.	Development 2026

6.0 UWP PLAN IMPLEMENTATION (PHASE 4)

The purpose of this Phase is to develop an implementation strategy to identify funding opportunities, resources, and partnerships, and to develop collaborations to move forward with prioritized actions identified in Chapter 4.0. Strategies for projects will be dependent upon the type of action. For example, capital projects will be largely dependent upon grant funding and partnership opportunities, while programmatic changes may be implemented with current resources. This phase also includes developing an equitable process for community engagement and outreach to gather neighborhood feedback for design considerations of stormwater facility projects.

The UWP Plan is intended to set up an iterative process whereby adaptive management will routinely take place over time. The implementation of projects in the priority areas and learning about changing conditions, successes, and failures is the strategy described in this Chapter.



6.1 Project Feasibility & Development

Nine potential priority capital projects are presented in Section 5.2. The goal for ongoing coordination is that each potential project and new project idea will start with a summary starter page as shown in Appendix I – Example Capital Project Summary Sheet. Each Stormwater Facility Project identified or recommended in Section 5 will be further developed to ensure feasibility and funding. The City's Environmental Services staff will work to develop a detailed project implementation plan which will include the project plan with identified partners, conceptual ten percent project design for grant solicitation, and proposed stakeholder engagement and coordination strategies. The City is planning to initiate a feasibility analysis, to some degree, on each of the projects in the next couple of years. Any of the proposed capital water quality improvements that are linked to current existing City projects will be prioritized for feasibility analysis to benefit from opportunistic timing and partnerships.

Over time, project opportunities may arise that could substitute for one or more of the proposed capital projects. The City's goal is to achieve as many of these projects as practicable given capacity and funding, and in balance with other stormwater capital project needs throughout the City.

For example, pending further review and evaluation, the City may conduct pilot studies for ditch retrofits using available program resources or possibly grants. If ditch retrofits are determined to be beneficial and feasible, specific projects may be considered for inclusion in the City's stormwater CIP for long-term resource allocation and implementation, as appropriate.

6.2 Project Funding & Resources

Due to existing capital projects, much of the funding over the next six years is designated for repair and replacement of existing stormwater conveyance pipe infrastructure and the existing stormwater management program. The City is currently in the process of developing a Stormwater Comprehensive Plan to ensure the City has funds for future stormwater capital projects and long-term stormwater maintenance needs. Funding is essential to complete proposed capital recommendations or to increase Source Control or Operation and Maintenance efforts. The City currently relies on grant funding to build stormwater capital facilities and will continue to apply for funding for projects identified in Section 5.2 after the project feasibility analysis and ten percent conceptual designs are complete. The City identifies grant funding opportunities through the Puget Sound Funding Website: PS RAFT - Recovery Acceleration Funding Tool (arcgis.com).

6.3 Communication & Engagement

6.3.1 Stormwater Management Program (SWMP)

The Watershed Planning staff will coordinate with NPDES Program staff to update the SWMP communication and engagement plan to maintain ongoing communication with internal and **external** stakeholders and community members regarding updates to this UWP Plan as well as address the priority audiences listed in the Phase I Municipal Stormwater Permit under the Public Participation (Section S5.C.4) and the Education and Outreach (Section S5.C.11) requirements. The SWMP communications and engagement plan will 1) increase general awareness of the impacts of stormwater and impervious surfaces and actions community members can take to reduce polluted runoff, and 2) increase transparency around stormwater management activity recommendations and develop a better process for incorporating community feedback to guide the annual SWMP updates and implementation. The City may develop a communications plan to address capital project outreach for the community.

6.3.2 Capital project planning, design, and construction

Prioritized stormwater capital projects will be evaluated to see if they merit enhanced community engagement based on if they have significant impact on community or significant opportunity for the community to influence the project design. The following considerations will be used to determine if a public involvement is required:

- Are there tasks the public can influence (e.g., selection of trees or plants, suggestions for community access, selection between alignments that may have differing community impacts, etc.)?
- Is the location within a low or very low opportunity neighborhood?
- Is there potential to reduce or eliminate existing community assets (e.g., needs to remove mature trees or community gardens)?
- Is there high visibility in the community (very large project footprint or extended length of construction time impacting the neighborhood)?
- Are there other reasons the neighborhood may be impacted in a positive or negative way by the project?

Appendix J – CIP Project Public Engagement Plan Template is provided if it is decided that a project would benefit from enhanced community engagement. Environmental Services Department Communications and Engagement Team staff and Equity Team staff are available to help with public engagement.

6.4 Adaptive Management

Adaptive management ensures updates to this UWP Plan so that our priority actions reflect watershed conditions and City policies over time. This first UWP Plan was intended to develop the framework and process to iteratively make updates to the data, the Tool, and the recommendations over time as stormwater management actions are implemented and changes occur with both policies, plans, and development throughout the City. Adaptive management allows for modifications to strategies, incorporation of new information and new technologies, and changes to the City's level of effort. This UWP Plan may over time grow in its recommendations or shrink as targets and objectives have been reached.

Future updates to this UWP Plan and Tool will involve outreach and engagement to update criteria, select new priority sub-basins, and/or update the recommended lists of actions. We will reach out to multiple stakeholders in priority watershed areas including partner organizations, watershed councils, City staff, and community members. Engagement will involve reviewing community needs and presenting draft recommendations for stormwater management program actions or the list of proposed capital projects. Discussions may identify potential opportunities for partnerships or additional considerations or areas of concern that need to be evaluated prior to finalizing plan updates. Successful engagement will require development of additional communication materials (e.g., website, story maps, media, translated materials, etc.) and relationship building with overburdened community groups and other stakeholders who have not previously been involved in stormwater management decisions.

The City plans to revisit the UWP Plan, prioritized sub-basins, and proposed projects every two years to track with the City's biennial budget cycle. The model and planning data used in this UWP Plan and priority recommendations provided a best estimate of future build-out conditions. However, with development pressures and the new Home In Tacoma Project strategies, these assumptions may not prove accurate. As part of the iterative process, the City will 1) measure progress and effectiveness of selected structural and non-structural strategies, 2) incorporate new data and assumptions, 3) review the project list and recommendations based on new information and incorporated strategies, and 4) meet with stakeholders and partners to identify new opportunities in priority areas for stormwater improvements. In addition to the criteria discussed, the implementation process will include the following criteria:

- Cost benefit analysis. including a 20-year life cycle cost analysis and ease of implementation and maintenance.
- Available funding and timing for projects, including opportunities to collaborate on projects with other stakeholders.
- Bi-Annual evaluation of the recommendations and assessment of progress towards meeting goals and targets.
- Adaptive management to include re-evaluating the plan once every two years to correspond with the City of Tacoma biennial budget cycle.

The City will continue to work towards providing a structured way to prioritize stormwater management activities of existing programs, developing water quality capital projects, and identifying potential cost-effective strategies for further reducing stormwater pollutant loads in the Puget Sound region.