



CITY OF
BAINBRIDGE ISLAND

STORMWATER CONTROL TRANSFER PROGRAM – FINAL ISSUE PAPER

*City of Bainbridge Island Watershed Assessment, Design, and Funding -
Task 3.0 Alternative Funding Options*

PRODUCED FOR CITY OF BAINBRIDGE ISLAND: PUBLIC WORKS – ENGINEERING

JAN 2023 (FINAL)

This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement PC-01J18101 to the Washington State Department of Ecology. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.



CONTENTS

1	Introduction.....	4
1.1	Study Context	5
1.2	Analysis Methods	7
2	Regulatory Context.....	7
2.1	Department of Ecology Minimum Requirements	7
2.2	Revised Code of Washington.....	9
3	Analogous Programs.....	10
3.1	Tacoma In-Lieu Fee Programs (In-lieu Fee, In-basin Transfer).....	10
3.2	Kingston Regional Facility (In-lieu Fee, In Contributing Area).....	11
3.3	WSDOT I-4.....	13
3.4	City of Bainbridge Island Transfer of Development Rights Program.....	14
3.5	Summary of Lessons Learned	15
4	Drivers for A Bainbridge Island SCTP.....	15
4.1	Workshop Discussion Summary: SCTP Drivers.....	15
5	SCTP Participation Analysis.....	16
5.1	Fee Estimates	17
5.2	Impervious Surface Area Projections.....	21
5.3	Program Scenarios	31
5.4	Participation and Revenue Projections by Scenario	32
5.5	Program Development and Implementation Considerations.....	38
6	Conclusions and Recommendations.....	40
6.1	Conclusions.....	40
6.2	Workshop Discussion Summary: Final Conclusions	42
6.3	Stormwater Control Transfer Program Conclusions Summary	42
7	References.....	42



Appendix A. “State of the Practice” Slides	44
Appendix B. Stormwater Management Manual for Western Washington – Guidance for Stormwater Control Transfer Programs.....	54
Appendix C. Analysis 1 GIS Results – Projected Acres Impervious by LCA Class, Zoning Category, and Watershed	62
Appendix D. Increase in Impervious Surface Percentages by Watershed.....	64

LIST OF FIGURES

Figure 1. Transfer Program Options	4
Figure 2. Out-of-Basin Transfer	8
Figure 3. City of Tacoma Stormwater In-Lieu Fee Program Locations.....	10
Figure 4. Kitsap County – Kingston Urban Growth Area Regional Facility Service Area	12
Figure 5. Capital Stormwater Cost per Acre Managed	18
Figure 6. Capital Stormwater Cost per Acre Managed – MR6 Treatment Facilities Only	19
Figure 7. Capital Stormwater Cost per Acre Managed – MR7 Flow Control Facilities Only.....	20
Figure 8. Relative Percentages of Total Projected New Impervious Surface at Citywide Buildout.....	26
Figure 9. Partially Utilized and Vacant Parcels.....	26

LIST OF TABLES

Table 1. RCW Provisions Relevant to Stormwater Control Transfer Programs.....	9
Table 2 Capital Stormwater Project Data	18
Table 3 Capital Stormwater Project Data – MR6 Treatment Facilities Only	19
Table 4 Capital Stormwater Project Data – MR7 Flow Control Facilities Only	20
Table 5. Estimated Fees by Minimum Requirement.....	21
Table 6 Development Data – Recent Growth Percentages	22
Table 7 Projected Distribution of New Impervious Surface by Watershed, All Zoning Categories.....	24
Table 8 Projected Distribution of New Impervious Surface by Watershed, Multifamily and Commercial Zoning Only	25
Table 9 Analysis 2 Results: Projected New Impervious Surface in Developable B/I Area at Build-Out.....	25
Table 10 Projected Impervious Surface Areas with the Potential to Trigger MR5, MR6, and MR7 by Watershed at Buildout	28
Table 11 Existing and Projected Replaced Impervious Surface by Watershed.....	29
Table 12 Past and Planned Impervious Surface Areas for City Bike Lane and Sidewalk Projects	30
Table 13 Program Scenarios Explored in this Study	32
Table 14 Total Subject Impervious Surface Areas (Acres), Associated Fee Revenue (2022\$) at Buildout, using Estimated Fees	33
Table 15 Total Subject Impervious Surface Areas (Acres), Associated Fee Revenue (2022\$) at Buildout, using Fees of \$50,000 per Subject Acre.....	34

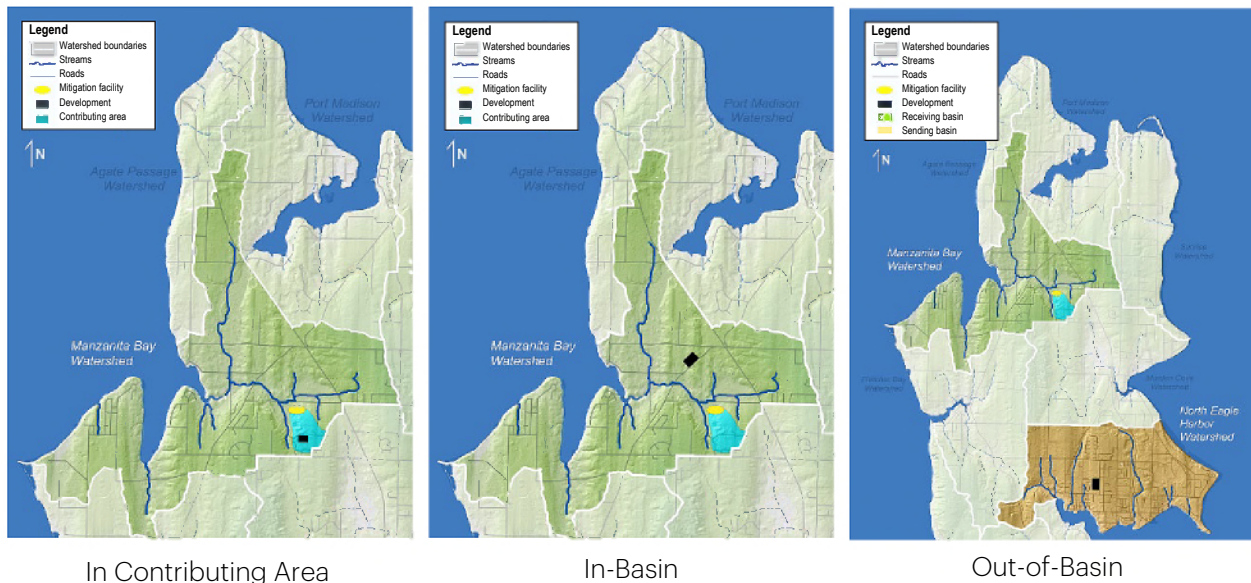


1 INTRODUCTION

This Issue Paper presents the findings of the Project Team’s analysis to explore potential stormwater funding alternatives, demonstrate how a Stormwater Control Transfer Program (SCTP) could work in the City of Bainbridge Island (City), and evaluate how useful such a program could be in helping the City achieve its stormwater management goals. This paper documents the data, methods, and results of an analysis to project potential SCTP outcomes for Bainbridge Island. It is the primary deliverable of this study, which is part of work being completed for a Puget Sound National Estuary Program grant that also includes Watershed Characterization and Location / Design of Stormwater Facilities on Bainbridge Island. In addition to this Issue Paper, the Project Team delivered a “State of the Practice” presentation in October 2021 and held a “Framework Options” workshop with City staff in November 2022.

The “State of the Practice” presentation familiarized City staff with transfer program options (governing where a stormwater mitigation facility can be built relative to the subject development project) and alternative compliance funding mechanism options (governing who will pay for and build the stormwater control facility). Transfer program options presented were: (a) in contributing area transfer, (b) in-basin transfer, and (c) out-of-basin transfer (see Figure 1 and Appendix A “State of the Practice” slides 10-22 for more information). Alternative compliance mechanism options presented were: in-lieu fee and credit trading programs (see Appendix A “State of the Practice” slides 24-43 for more information).

Figure 1. Transfer Program Options



Following the “State of the Practice” presentation, the “Framework Options” portion of the study evaluated potential SCTP frameworks and outcomes customized for Bainbridge Island. Through discussion at the “State of the Practice” presentation and responses to a follow-up questionnaire shortly thereafter, City staff provided the following direction for the “Framework Options” analysis:



- Focus on in-lieu fee as the alternative compliance mechanism¹
- Explore all three transfer program types
- Focus on program options in North Eagle Harbor watershed / Winslow area, Manzanita watershed, and citywide using out-of-basin transfer, for all private development projects and for internal (City) projects only.

The “Framework Options” workshop was used to present analysis findings to City staff and to facilitate discussion and generate feedback from City staff regarding drivers for pursuing an SCTP on Bainbridge Island, assumptions used in the analysis, projected SCTP outcomes, and City interest in further exploration / pursuit of SCTPs for Bainbridge Island.

For the purposes of this study, the term “Stormwater Control Transfer Program” (SCTP) will be used as an umbrella term for regional or equivalent facility-based programs that allow development projects triggering stormwater requirements to pay a fee, or a connection charge, in-lieu of building onsite stormwater management facilities. “SCTP” will also encompass all three transfer options described above.

1.1 Study Context

1.1.1 Study Objectives

The main objective of this study is to present the City with SCTP frameworks that are customized to Bainbridge Island: to “paint a picture” of what a successful program could look like on Bainbridge Island, how it would work, and what the expected outcomes would be. To answer these questions, the Project Team developed estimates for projected acres of new and replaced hard surface², fee program participation, and fee revenue, both annually and at buildout (i.e., when areas classified as “Partially Utilized” and “Vacant” are fully developed to their zoning limits, see Section 5.2.2 for more discussion).

Another important objective of this study is to respond to questions and requests raised in the questionnaire responses from City staff, which are summarized below. These questions were discussed at the November 2022 workshop and are addressed throughout the document.

Questions and requests posed in City Staff questionnaire responses include:

¹ Of the two options presented at the “State of the Practice” presentation, City staff preferred an in-lieu fee program. A city-run mitigation bank is a third alternative compliance mechanism that was identified in discussion following the “State of the Practice” presentation. A mitigation bank is a hybrid between a fee program and credit trading: developers pay the City to achieve compliance like in a fee program, but the fee revenue is disbursed to other entities (either private or other government departments) to build the mitigation facility like in a credit trading program. Because Washington State Department of Ecology requires that the mitigation facility be completed and operational before fees can be paid into it, a mitigation bank program would need to have a “starter supply” of projects built (either by the City or by private entities) before fees could be paid into the bank. If this option were of interest to the City, more investigation into the functioning of this mechanism would be needed, including an appropriate Revised Code of Washington (RCW) code for the program to operate under.

² SWMMWW and BIMC use “hard surface” in general threshold definitions for MR1-MR9 (SWMMWW Figures I-3.1 and I-3.2), but use “pollution-generating hard surfaces” for MR6 (Section I-3.4.6) and “effective impervious surface” for MR7 (Section I-3.4.7). Per the SWMMWW glossary, hard surface = impervious surface + permeable pavement + vegetated roof. The terms “hard surface” and “impervious surface” are used interchangeably in this document.



- Provide examples from other cities / programs: drivers, function, experiences, benefits
- For Bainbridge Island:
 - What is the need, what are the drivers, what are the benefits?
 - Paint a picture of how SCTP(s) could work:
 - What are potential program framework alternative(s) and projected usage and revenue? Specific requests for:
 - In-basin programs in Winslow / North Eagle Harbor and Manzanita watersheds
 - Citywide out-of-basin program for all development projects
 - Citywide out-of-basin program for City projects (e.g., bike lanes, sidewalks, and road shoulders that are currently exempt from certain stormwater requirements)
 - How could it support island-wide stormwater strategy?
 - How could it fit in with planned development?
 - How could it relate to stormwater fees?
 - Discuss anticipated administrative effort for:
 - Program development
 - Program administration

1.1.2 Adjacent Studies

The City is currently in the process of developing a Stormwater System Plan (SWSP). The SWSP will provide a complete assessment and strategic approach for managing stormwater and surface water on Bainbridge Island to help guide City staff, the public, and decision makers toward meeting City Council goals and regulations imposed by the Washington State Department of Ecology (Ecology). Among the many tasks of the SWSP, the two that are most relevant to this study are the Stormwater Management Action Plan (SMAP), including watershed prioritization, and the Preliminary Financial Evaluation. Other tasks include overall review of the stormwater management program, stormwater infrastructure asset management and mapping, preparing for climate change, stormwater infrastructure improvement prioritization, and community engagement.

The SMAP, now completed, was conducted in fulfillment of requirements in the City’s 2019-2024 Phase II National Pollutant Discharge Elimination System Municipal Stormwater Permit (NPDES Phase II permit). Through the SMAP, the City worked with consultants to complete a watershed inventory and assessment and a watershed prioritization. The prioritization process resulted in the selection of the Manzanita watershed as the City’s highest priority watershed in the Stormwater Management Action Planning process.

While this prioritization is required by the City’s NPDES permit, it should be noted that identifying a highest priority watershed does not imply that stormwater management facilities will not be built in other watersheds. Instead, this prioritization identifies the watershed where the City can focus its “proactive” retrofit efforts and which could potentially be used as a “receiving watershed” (i.e., watershed that can receive stormwater improvements funded by out-of-basin transfer fee revenue) if the City chooses to develop an SCTP. However, these proactive retrofits do not exclude the possibility



of the City building “opportunistic” retrofits in other watersheds as opportunities arise to work in collaboration with other partners, projects, agencies, and funders.

The goal of the Preliminary Financial Evaluation task is to determine if revenue collected through the City’s stormwater utility is sufficient to support the current and future program, including operations and maintenance (O&M), capital plans, and the implementation of the SMAP and SWSP. The alternative funding study presented in this Issue Paper will likely be referenced in the Preliminary Financial Evaluation as a potential tool for funding stormwater management retrofits and/or new facilities.

1.2 Analysis Methods

To gain an understanding of potential for development projects to participate in a Bainbridge Island SCTP, and the revenue that it could generate, the Project Team reviewed analogous programs in Washington state and analyzed Bainbridge planning and development data to estimate participation rates within Bainbridge Island for various program scenarios, listed in Section 4.3. “Participation” was evaluated in units of acres impervious surface area that could qualify for and choose alternative compliance.

Tasks included:

- Regulatory context review: Ecology’s Stormwater Management Manual of Western Washington (SWMMWW) Minimum Requirements (MRs) and Revised Code of Washington (RCW)
- Analogous program analysis of jurisdictions regulated by Ecology: City of Tacoma Stormwater In-Lieu Fee programs, Kingston (Kitsap County) Regional Facility, Washington State Department of Transportation (WSDOT) I-4 Program, and City of Bainbridge Island Transfer of Development Rights (TDR) Program
- SCTP Participation Analysis: Fee estimation, development trends and new impervious surface projections analysis, and synthesis of data inputs with program framework scenarios to project participation and revenue outcomes

2 REGULATORY CONTEXT

2.1 Department of Ecology Minimum Requirements

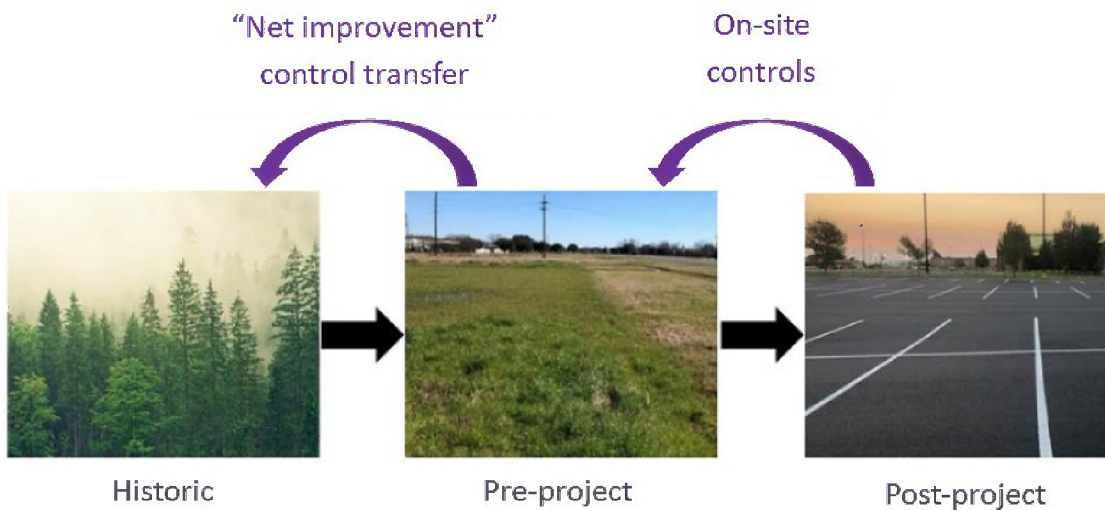
In Western Washington, SCTPs typically support compliance for a specific MR, as set forth in Ecology’s 2019 SWMMWW. The MRs under exploration in this study (and most commonly associated with SCTPs in Western Washington) are MR5 – On-site Stormwater Management, MR6 – Runoff Treatment, and MR7 – Flow Control. The City of Bainbridge Island’s Municipal Code (BIMC) adopts the SWMMWW MRs with amendments, including lowering the MR5 Threshold Discharge Area from 2,000 square feet (sf) new plus replaced hard surface down to 800 sf.

A more thorough description of SWMMWW MRs and appendices relating to SCTPs, excerpted from Herrera and Lotus (2021, pp. 4-11), is provided in Appendix B; a few key points are provided here. SWMMWW defines criteria and rules for STCPs primarily in Appendices I-D for regional facilities, applicable to all three transfer program types, and I-E, which includes additional guidance for out-of-basin transfer programs. One critical piece of information from the Appendix I-E guidance is that out-



of-basin transfers may only transfer the mitigation obligation associated with a net improvement in stormwater management relative to the existing conditions (i.e., the conditions that existed immediately prior to the project development). That is, stormwater control facilities must be installed on-site to mitigate any impacts associated with the project relative to existing (pre-project) conditions, but the project may transfer to an out-of-basin regional facility an equivalent mitigation associated with the difference between existing conditions and historical (typically forest on Bainbridge Island) conditions (see Figure 2). Appendix I-E Table I-E.2 provides specific examples regarding what part of the requirement must be achieved at the project site (i.e., onsite) versus at the transfer site for various pre-project land cover conditions including forested, pasture, impervious, and lawn / landscape. In summary, some portion of the requirement may be achieved at a transfer site for all development project sites except those with forested or prairie pre-project land cover.

Figure 2. Out-of-Basin Transfer



Also of note (excerpted from Herrera and Lotus, 2021, pp. 10-11): As of the 2019 SWMMWW, MR7 is the only MR that is specifically identified as available for “out-of-basin” transfer in Appendix I-E. However, Appendix I-D implies that other MRs may also be transferred out-of-basin. After discussing this discrepancy with Ecology, staff reported that Ecology limited the out-of-basin transfer guidance in the 2019 SWMMWW to MR7, but intended to “leave the door open” for consideration of transfers corresponding to MR5 and MR6 (Ryan Gardiner, pers. comm., 11/6/2020). Ecology stated they intend to clarify this intent in subsequent updates to the SWMMWW.

Lastly, Ecology’s documentation requirements differ between the three transfer program types (see Appendix B for more information):

- In contributing area transfer: No additional documentation
- In-basin transfer: Regional facility capacity calculations, capacity usage tracking
- Out-of-basin transfer: Regional facility capacity calculations, capacity usage tracking, watershed prioritization approval, and effectiveness monitoring

2.2 Revised Code of Washington

An SCTP on Bainbridge Island could operate under at least three potential RCW codes: RCW 82.02.020, RCW 35.91.060, and RCW 35.92.025. Table 1 provides a summary of selected RCW provisions relevant to an SCTP.

Table 1. RCW Provisions Relevant to Stormwater Control Transfer Programs

RCW	82.02.020	35.91.060	35.92.025
Description	Allowance of payment in lieu of a dedication of land or to mitigate a direct impact that is a consequence of a proposed development, subdivision, or plat.	Establishment of an assessment reimbursement area in locations where a municipality's ordinances require water or sewer facilities to be improved or constructed as a prerequisite to further property development or redevelopment.	Authorization to charge property owners seeking to connect to the water or sewerage system of the city or town as a condition to granting the right to so connect ... in order that such property owners shall bear their equitable share of the cost of such system.
Mandatory vs Voluntary	Voluntary	Mandatory or voluntary	Voluntary
Allowed use of payments	To fund a capital improvement agreed upon by the parties to mitigate the identified, direct impact	Costs associated with the construction or improvement that benefit property that will be connected to, and property owners will use, the water or sewer facilities within the assessment reimbursement area.	The equitable share of the cost of such system.
Timing requirements for expenditure of payments	Payments shall be expended within five years of collection (to be refunded to the developer if not expended within five years)	None specified	None specified

RCW 82.02.020 Interpretations:

- Pro's: Allows any type of transfer program (i.e., in contributing area, in-basin, out-of-basin; see State of the Practice presentation slides 10-16).
- Con's: Requires expenditures of payments within five years of collection.
- Question(s):
 - Can loan repayment be used to build the stormwater facility satisfy the 5-year expenditure requirement?



RCW 35.91.060 and 35.92.025 Interpretations:

- Results in a “connection charge” style program.
- Pro’s: No deadline for expenditure of payments.
- Con’s: Likely could not be used for an out-of-basin transfer program.
- Question(s):
 - Can out-of-basin transfer be applied to either of these RCWs? (I.e., Could meeting MRs in a prioritized basin be considered prerequisite to development in a different basin?)
The Project Team is assuming the answer is no until further clarified.

3 ANALOGOUS PROGRAMS

The Project Team analyzed four analogous programs to an SCTP on Bainbridge Island: SCTPs for City of Tacoma and the Kingston urban growth area of Kitsap County, the Washington State Department of Transportation (WSDOT) I-4 program, and the City of Bainbridge Island Transfer of Development Rights (TDR) program.

3.1 Tacoma In-Lieu Fee Programs (In-lieu Fee, In-basin Transfer)

The City of Tacoma is currently operating two stormwater in-lieu fee programs based on regional stormwater facilities: an MR7 flow control facility in the Flett watershed since 2016 and an MR6 water quality treatment facility in the Thea Foss watershed since 2018 (see Figure 3).

Figure 3. City of Tacoma Stormwater In-Lieu Fee Program Locations

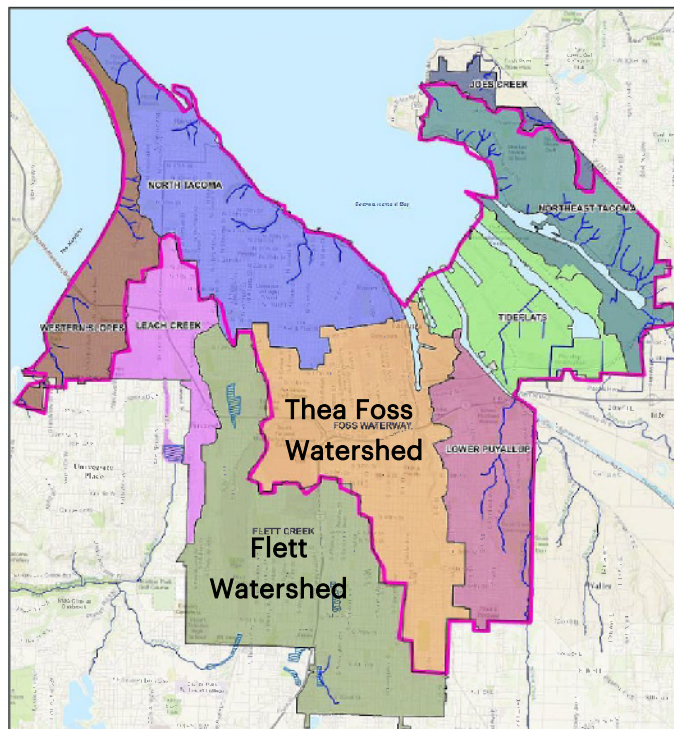


Image: City of Tacoma (2016)



Key features of the programs are described below, based on the 2016 City of Tacoma Regional Stormwater Facility Plan and attachments (City of Tacoma, 2016; City of Tacoma, 2017; City of Tacoma, 2018) and personal communications with Mieke Hoppin, City of Tacoma Environmental Programs Group (Mieke Hoppin, pers. comm., 10/5/2020, 8/15/2022, 8/19/2022):

- Program drivers: (1) accelerate environmental improvements by building stormwater facilities in advance of full buildout, (2) provide more reliable facility O&M – better for the receiving water, and (3) flexibility, streamlined permitting, stormwater management price guarantee for developers.
- Applicable code: RCW 35.92.025 Authority to make charges for connecting to water or sewerage system City (C. Bacha, pers. comm., 8/24/2022). Participation is voluntary and all subject projects are eligible.
- MR(s) to be met with SCTP: Thea Foss Watershed – MR6 treatment, Flett Watershed – MR7 flow control
- Fee basis:
 - Treatment – Total capital cost (3 facilities built): \$4.8M. Service area: 127 acres total, 59 acres PGIS. Fee: \$1.87/sf (\$81K/acre) requiring mitigation + \$0.02/sf annual maintenance surcharge with sewer bill.
 - Flow Control – Facility expansion capital cost: \$2.9M. Service area: 69 acres at 85% impervious at buildout = 59 acres impervious. Fee: \$0.97/sf (\$42K/acre) requiring mitigation (no maintenance surcharge).
- Program use and anticipated cost recovery: A portion of stormwater management capacity is allocated to existing untreated runoff, so fee payments are not expected to cover the full capital cost of the facilities. Annual fee revenue from the Flett Watershed Flow Control program has been ~\$350K from ~7 projects per year. The Flett program has seen more use than the Thea Foss program (~\$40K/year) due to relatively minimal development in the Thea Foss watershed. Fee payment revenue has not yet been expended.
- Stormwater facilities status: Both Flett and Thea Foss facilities are built. Of the 4 facilities, 3 were funded by grants and 1 was funded by an American Recovery and Reinvestment Act loan.
- Citizen concerns, developer sentiment: No citizen concerns. Developers like program.
- Program administration notes: 1/2 FTE to run program.

Note: The City of Tacoma has not considered an MR5-based in-lieu fee program because BMPs for MR5 are only required when feasible (per SWMMWW) and given the urbanized nature and soil conditions of Tacoma, infeasibility is fairly common.

3.2 Kingston Regional Facility (In-lieu Fee, In Contributing Area)

Kitsap County Public Works Stormwater Division developed a Regional Stormwater Facility Plan in 2019 (Kitsap County Public Works, 2019) for the central Kingston urban growth area (See Figure 4).



Figure 4. Kitsap County – Kingston Urban Growth Area Regional Facility Service Area



Image: Kitsap County Public Works (2019)

Under the Plan, Kitsap County would construct a regional facility to satisfy MR6 (and MR7 through marine discharge exemption, see below) for a 92-acre area primarily in the “Old Town” area of Kingston. Key features of the Kingston Plan are described below, based on the 2019 Plan and an interview with Kitsap County Stormwater Retrofit & Asset Manager Shawn Alire (Shawn Alire, pers. comm., 7/19/2022):

- Program drivers: (1) treat stormwater from pollution-generating surfaces that are not currently being treated, and (2) provide water quality treatment for future development and redevelopment so that stormwater facilities do not have to be built on parcels. This will allow development to take better advantage of their land, and lead to denser development near the ferry terminal and less sprawl in the outer rural areas.
- Applicable code: While not yet finalized, the intention is for the program to operate under RCW 35.91.060 – Assessment Reimbursement Area. Participation (use of payment for MR6 compliance) will likely be mandatory.
- MR(s) to be met with SCTP: MR6, will also provide exemption from MR7 flow control requirements since it discharges directly to Puget Sound.
- Fee basis: Stormwater facility estimated capital cost: \$2.6M. Service area: 92 acres at 75% impervious at buildout = 69 acres impervious (note that there is no discussion of pollution-generating impervious surface [PGIS]). Anticipated fee: capital cost / impervious service area =

\$876/1000 sf impervious area (\$0.876/sf). Program staff stated that O&M costs will be funded by existing county stormwater utility fees.

- Private developer stormwater costs: Per Kitsap County Public Works (2019)

Development Scenario	On-Site Facilities Capital Cost (\$ ₂₀₁₈ /sf impervious)	Source Cited
On-Site Existing Residential Lot or Small Plat	\$1.02	City of Tacoma (2016)
On-Site New Plat Residential Lot	\$4.05	Department of Ecology (2013)
On-Site Commercial or Multi-family	\$4.98	Department of Ecology (2013)

- Anticipated cost recovery: ~650,000 sf new impervious + ~500,000 sf redeveloped impervious surface at full buildout = 1.2M sf = ~\$1M at full buildout (~40% of capital cost)
- Stormwater facility status: 90% design, working with Ecology for approval, start of construction anticipated in Spring 2023.
- Citizen concerns, developer sentiment: No citizen concerns noted at two public meetings; seems well supported. Developers seem supportive.
- Program administration notes: Development permits are processed through Kitsap County Department of Community Development (DCD). If determined to require a fee, Public Works Stormwater Division will determine fee amount, to be paid through DCD, which will transfer money to Public Works.
- Stormwater fee notes: Parcels pay stormwater fee based on impervious surface, regardless of whether there are onsite BMPs or regional facility connections.

3.3 WSDOT I-4

The Washington Department of Transportation (WSDOT) operates an Environmental Retrofit program called I-4 that provides funds for stand-alone stormwater retrofits of highway segments with untreated runoff. Within the Puget Sound Basin, highway projects that trigger treatment or flow control requirements are also required to retrofit the amount of existing impervious surface and existing PGIS within project limits that equates to 20% of the cost to meet stormwater requirements for new surfaces (i.e., 20% cost obligation). However, these projects may choose to transfer an amount of money equal to the 20% cost obligation to the I-4 fund that is used to support high priority stand-alone retrofits, as long as the project itself is not within a high priority retrofit area (WSDOT, 2018).

- Program drivers: Lawsuit in 2009 from Puget Sound Keepers Alliance related to NPDES permit.
- Applicable code: Program operates under NPDES permit, not under a defined RCW. Program policies and operations are detailed in the WSDOT Stormwater Retrofit Program Management Plan Appendix 4 and in the WSDOT Highway Runoff Manual.
- MR(s) to be met with SCTP: MR6 or MR7



- Fee basis: 20% of stormwater management costs of new impervious surface. WSDOT is considering shifting to an acreage-based requirement in the future as it can be difficult to obtain accurate project costs.
- Program use and anticipated cost recovery: The program has been used thirteen times since it began in 2012, with \$850,000 paid into the program (excluding any projects or payments in 2022).
- Stormwater facility status: Money has not been spent on a facility at this time.
- Citizen concerns, developer sentiment: Used only for internal WSDOT projects. Concept is well received, but most projects are able to construct retrofits in the project area which is easier and encouraged. There are ideas to develop the program to work with other agencies to build regional facilities, and/or to move the program more towards a mitigation banking infrastructure option.
- Program administration notes: Program has been relatively easy to run, is not a large administrative burden. Report requirements are clear in the management plan. If change order requests occur in the new impervious stormwater management facility that change its total cost, the 20% obligation can change, but this is atypical.

3.4 City of Bainbridge Island Transfer of Development Rights Program

The City of Bainbridge Island Transfer of Development Rights (TDR) Program was initiated to increase affordable housing and maintain open space. TDR programs have three main components: sending area (rural or environmentally sensitive land), receiving area (urban growth area) and a transfer mechanism (TDR bank, real estate broker). Although the program has been running since 1996, it has rarely been used due to development criteria such as zoning, height restrictions, parking requirements, etc. While the specific challenges to use of the TDR program are unrelated to stormwater management, the TDR program does provide lessons learned that could be applicable for an in-lieu fee program.

- There must be a sufficient incentive for development projects to participate in the program. In the case of the City's TDR program, there is no incentive for urban projects to purchase development rights since City zoning restrictions do not allow for dense enough development to make these purchases worthwhile.
- There must be a supply of credits available to purchase.
- Development trends are not always reliable. New development on Bainbridge Island has increased but is still below predicted rates when the TDR program was established.
- There must be a functional administrative structure. The TDR program did not create an administrative structure which made participation difficult.
- The program should be accessible and shared with the community to garner interest.
- The TDR program is also considering using a fee in-lieu to allow the City to purchase development rights and conservation easements.



3.5 Summary of Lessons Learned

Lessons learned through examination of these analogous Western Washington SCTPs include:

- An SCTP may not be worth the expense and effort to develop without sufficient development and new impervious surface in its service area, as seen in Tacoma’s Thea Foss Watershed program, which is not getting much use.
- Both regional facilities examined allocate a portion of the facility’s capacity to manage existing untreated runoff (retrofit) and allocate the remaining capacity for new development as part of in-lieu fee / connection charge programs.
- An SCTP can operate under at least three RCWs: i.e., 35.91.060 Assessment Reimbursement Area, 35.92.025 Charges for Connecting to a Water or Sewerage System, and 82.02.020 Voluntary Payment. The different RCWs have implications for required timing of expending payment revenue.
- There is a western Washington precedent (i.e., the City of Tacoma’s Thea Foss MR6 Treatment In-lieu Fee program) for an in-lieu fee program framework that uses an upfront fee based on regional facility capital costs plus an ongoing annual maintenance fee based on regional facility O&M costs.
- A clear administrative structure for the program is needed to streamline and encourage use.

4 DRIVERS FOR A BAINBRIDGE ISLAND SCTP

In their questionnaire responses, several City staff members requested information and discussion regarding potential drivers for an SCTP on Bainbridge Island (i.e., what problems an SCTP would solve, how an SCTP would address these problems). As identified in the earlier “State of the Practice” portion of this scope of work, potential drivers for an SCTP include:

- To provide a local funding source to increase the City’s capacity for stormwater management projects including retrofits for unmitigated runoff
- To facilitate strategically located City-built and maintained stormwater facilities that can accelerate ecosystem recovery in specific targeted areas
- To provide an alternative compliance mechanism for highly constrained sites where onsite stormwater controls are challenging or infeasible
- To improve the efficiency of development permitting and/or inspection processes
- To improve the efficiency and reliability of stormwater facility operations and maintenance through City-owned and operated facilities

4.1 Workshop Discussion Summary: SCTP Drivers

At the November 2022 “Framework Options” workshop, City staff participated in a poll to prioritize the order of importance of these potential drivers on Bainbridge Island. Seven City staff members participated, identifying the following prioritized order of drivers:



- Highest priority: Acceleration of ecosystem recovery in targeted areas
- 2nd: Local funding source for stormwater management
- 3rd: Alternative compliance for constrained sites
- 4th: Reliability of stormwater facility O&M
- Lowest priority: Efficiency of permitting and/or inspection

City staff discussion following the poll indicated that while there are sites on Bainbridge Island with infiltration constraints such as steep slopes and poor soils, it is uncommon to come across a site that does not have space for onsite BMPs. However, for the relatively small number of sites that claim onsite infeasibility, staff discussed the possibility of requiring fee payment for compliance, which would involve amendments to current Municipal Code. It was noted that King County, which has adopted its own stormwater management manual, has stricter onsite stormwater requirements than Ecology MR5 (i.e., if implementing BMPs for the required impervious areas based on site/lot size is not feasible, either a fee must be paid upon establishment of a fee program, or the project must implement a “Reduced Impervious Surface Credit” or a “Native Growth Retention Credit,” as described in the 2021 King County Surface Water Design Manual Appendix C Sections C.2.9 and C.2.10). Per King County Stormwater Services Section, King County’s NPDES Permit allows the County to be more stringent than Ecology requirements, with code authority in the King County Code Title 9 – Surface Water Management (Mark Wilgus, pers. comm., 12/13/2022).

City staff expressed that parcel-by-parcel distributed MR5 facilities support the rural character of the island that the Comprehensive Plan and Planning decisions are trying to maintain. However, it was acknowledged that there are no follow up inspections for smaller distributed facilities that manage less than 5,000 sf of hard surface, while public facilities and private facilities constructed after 2007 would be inspected and maintained regularly.

If it is determined that drivers for an SCTP are not strong enough to warrant the development of an SCTP at this time, it may be useful to have evaluated framework options, should factors that change the usefulness of a SCTP arise in the future (e.g., an increase in development, changes in permit requirements, etc.), which could make an SCTP a more valuable stormwater management tool for the City.

5 SCTP PARTICIPATION ANALYSIS

The Project Team analyzed City of Bainbridge Island planning and development data to develop SCTP participation estimates in the form of new impervious surface, then applied estimated fees to obtain revenue estimates with the goal of demonstrating potential outcomes of an STCP on Bainbridge Island. The steps in the analysis included:

- Estimating typical fees by MR, based on capital stormwater project costs divided by drainage areas (costs and areas provided by the City).
- Projecting annual new impervious surface area citywide, based on Bainbridge Island and Kitsap County planning documents and development data. Note: This analysis did not project



replaced impervious surface area or converted vegetation area in the same way as new impervious surface area due to insufficient data that is tracked by the City (Christian Berg, pers. comm., 9/30/2022). However, a proxy annual rate of 0.1% replaced impervious surface (used in the absence of redevelopment data) was applied to existing impervious surface to facilitate revenue projection for replaced impervious surfaces (see Section 5.2.5).

- Distributing projected citywide new impervious surface area by watershed based on GIS data (Land Capacity Analysis [LCA] categories, zoning, and percent impervious by zoning type, provided by the City).
- Applying MR area thresholds to determine what portions of new impervious surface areas would be subject to the different MRs.
- Creating program scenarios and using fee estimates and projected impervious square footage to project fee revenue for various scenarios regarding geographic boundaries, MRs, and transfer program types.

5.1 Fee Estimates

City staff provided costs and area managed for six completed capital stormwater projects on Bainbridge Island built between 2001 and 2020, and one planned project scheduled for construction in 2023, shown in Table 2 and Figure 5. Cost data provided represents construction costs for the stormwater management portion of the projects.



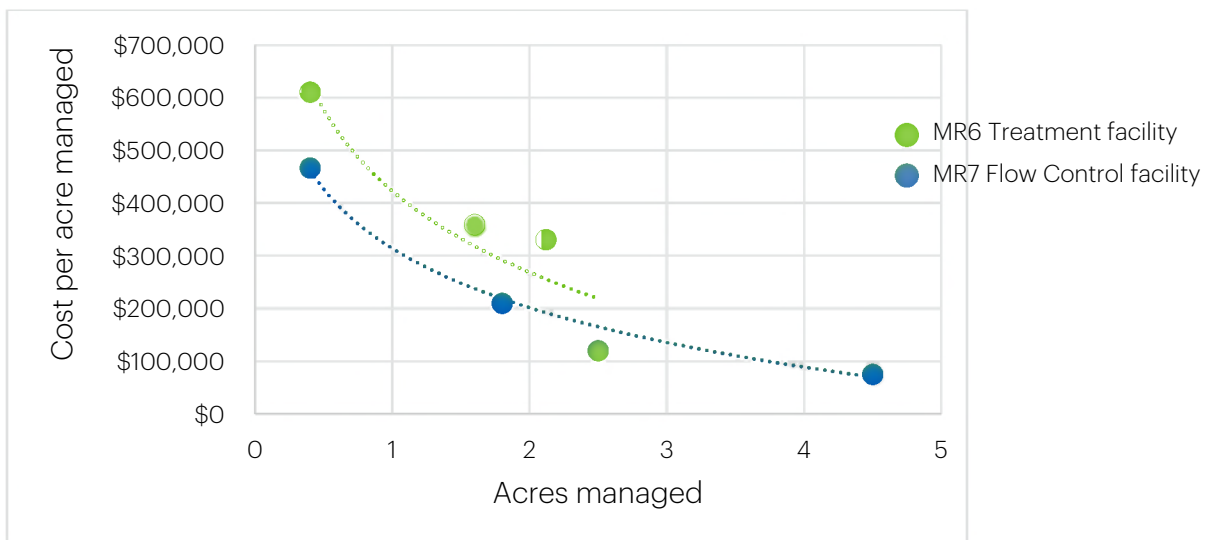
Table 2 Capital Stormwater Project Data

Project (year)	MR – facility type	Stormwater Facility Cost ¹ 2022\$	Acres Managed ²	Cost/Acre Managed
Wardwell Road (2017)	MR6 – bioretention	\$240,000	0.4	\$610,000
New Brooklyn Road (2005)	MR7 – tanks	\$190,000	0.4	\$466,000
Wyatt Way Road (2020)	MR6 – catch basins & media filters	\$570,000	1.6	\$359,000
Ericksen Avenue (2004)	MR7 – tanks & filter	\$380,000	1.8	\$210,000
Yeomalt Area Drainage Improvements (future)	MR6 – catch basins & media filters	\$700,000	2.1	\$330,000
Wing Point Way (2016)	MR6 – catch basins & media filters	\$300,000	2.5	\$120,000
High School Road (2001)	MR7 – tanks & filter	\$340,000	4.5	\$75,000

Notes:

1. Estimated stormwater portion of project
 2. Acres managed that are subject to MR6 (pollution-generating hard surface) or MR7 (effective impervious surface)
- Green rows are Water Quality Treatment facilities, blue rows are Flow Control facilities.

Figure 5. Capital Stormwater Cost per Acre Managed



To use this data to develop potential in-lieu fee estimates for specific MRs, the data were broken out into MR6 facilities in Table 3 and Figure 6, and MR7 facilities in Table 4 and Figure 7. Regional facilities, both completed and future, for City of Tacoma and Kitsap County Kingston urban growth area were also included in the tables and figures for reference.



Table 3 Capital Stormwater Project Data – MR6 Treatment Facilities Only

Project	Facility type	Stormwater Facility Cost ¹ (2022\$)	Acres Managed ²	Cost/Acre Managed
Wardwell Road ³ (2017)	Bioretention	\$240,000	0.4	\$610,000
Wyatt Way Road (2020)	Catch basins & media filters	\$570,000	1.6	\$359,000
Yeomalt Area Drainage Improvements (future)	Catch basins & media filters	\$700,000	2.1	\$330,000
Wing Point Way (2016)	Catch basins & media filters	\$300,000	2.5	\$120,000
Tacoma – Thea Foss Watershed	Vaults, media filters, bioretention	\$4.8M	59	\$81,000
Kingston Regional Facility	Conveyance & media filters	\$2.6M	69	\$38,000

Notes:

1. Estimated stormwater portion of project
 2. Acres managed that are subject to MR6 (pollution-generating hard surface)
 3. Not used in fee estimates because of smaller drainage area
- Green rows are Water Quality Treatment facilities on Bainbridge Island, gray rows are Water Quality Treatment facilities in other locations.

Figure 6. Capital Stormwater Cost per Acre Managed – MR6 Treatment Facilities Only

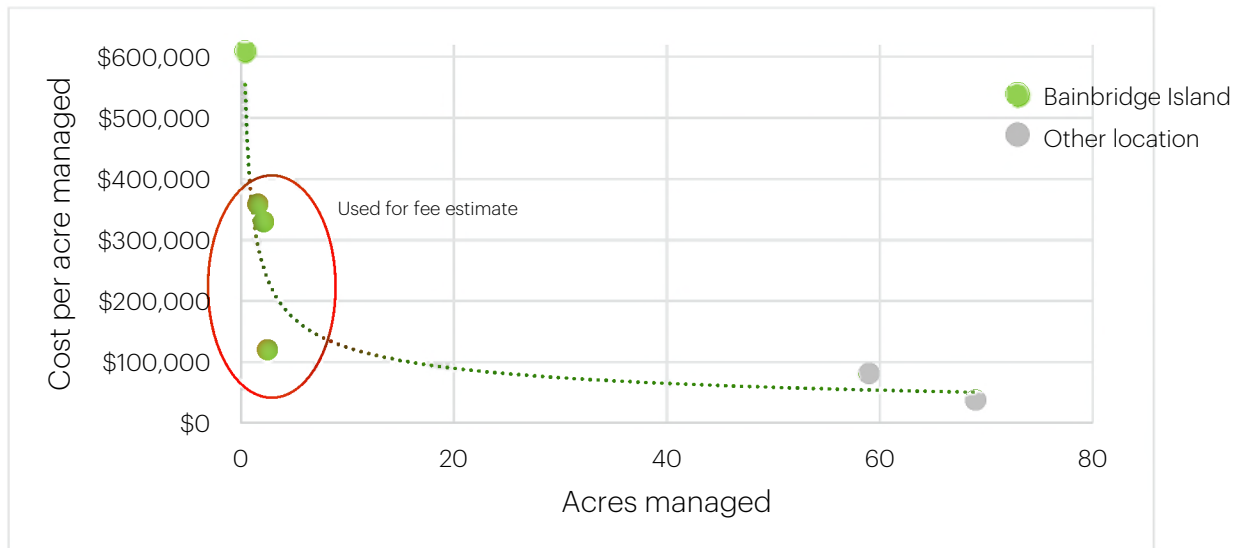


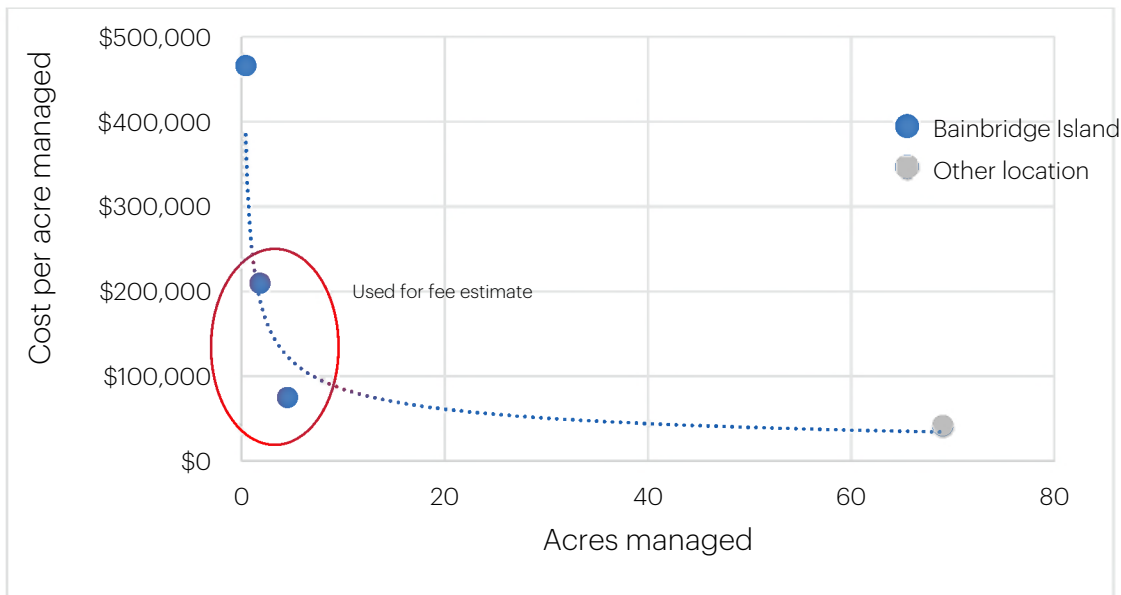
Table 4 Capital Stormwater Project Data – MR7 Flow Control Facilities Only

Project (year)	MR – facility type	Stormwater Facility Cost ¹ 2022\$	Acres Managed ²	Cost/Acre Managed
New Brooklyn Road ³ (2005)	Tanks	\$190,000	0.4	\$466,000
Ericksen Avenue (2004)	Tanks & filter	\$380,000	1.8	\$210,000
High School Road (2001)	Tanks & filter	\$340,000	4.5	\$75,000
Tacoma – Flett Watershed	Detention basin expansion	\$2.9M	69	\$42,000

Notes:

1. Estimated stormwater portion of project
 2. Acres managed that are subject to MR7 (effective impervious surface)
 3. Not used in fee estimates because of smaller drainage area
- Blue rows are Flow Control facilities on Bainbridge Island, gray rows are Flow Control facilities in other locations.

Figure 7. Capital Stormwater Cost per Acre Managed – MR7 Flow Control Facilities Only



Because Ecology requires facilities to be built and operational before an SCTP program is launched, fees would be based on the actual cost of a completed facility divided by the actual available stormwater management capacity of the facility. However, for the purpose of revenue projection in this analysis, estimated fees for MR6 Treatment and MR7 Flow Control SCTPs were developed from the capital costs³ divided by drainage areas from the provided City projects, respectively. For each MR, the fee estimates were based on averages of all City project data points excluding the smallest in each MR category since the cost per acre managed is sensitive to the drainage area and it is unlikely that the City

³ As required for SCTPs operating under RCW 35.19.060 and typical for programs operating under RCW 82.02.020 and RCW 35.92.025.



would build a regional facility with such a small drainage area. Further, if the City were to build a regional facility to serve as the basis for either an MR6 or MR7 SCTP, it would likely be built to serve a larger drainage area than any of these Right-of-Way projects listed above, and possibly more similar to the service areas of the Tacoma and Kingston regional facilities.

Estimated fees by MR are provided in Table 5. Because there were no MR5 capital projects on which to base an estimated MR5 fee, the MR5 fee below, to be used for revenue projection, is an average of capital costs/acre managed for all 5 projects used in the MR6 and MR7 fee estimates.

Table 5. Estimated Fees by Minimum Requirement

MR5 On-site Stormwater Management	MR6 Treatment	MR7 Flow Control
\$219,000 / acre hard surface	\$270,000 / acre P-GHS	\$142,000 / acre effective impervious surface

5.1.1 Workshop Discussion Summary: SCTP Fee Estimates

At the “Framework Options” workshop, City staff discussion of fee estimates indicated that the capital projects used for the fee estimates were constrained to right-of-way runoff and none were designed to be regional facilities. Staff agreed that regional facilities could be designed on Bainbridge Island to capture larger drainage areas (e.g., 5-10 acres or more). They mentioned an end-of-pipe solution on one of the major outfalls in Winslow as a possible MR6 Treatment example and Hiramawa Creek in the Strawberry Creek basin as a possible MR7 Flow Control example. Staff stated that land costs on Bainbridge Island are higher than many other nearby areas and that it is difficult to predict whether the cost per acre managed would be similar to the larger regional facility examples of Tacoma and Kingston (i.e., less than \$100,000 per acre managed). However, it is clear that some economy of scale would be achieved for larger facilities.

Staff also discussed that while the fee is based on the full drainage area, the anticipated fee-based cost recovery would be influenced by the relative portions of projected new and/or replaced impervious in the drainage area (that would pay the fee) versus existing impervious for which the regional facility would be a retrofit.

5.2 Impervious Surface Area Projections

New impervious surface area was estimated by projecting citywide development, distributing new impervious surface area among watersheds by land capacity (LCA class) and zoning, then applying a typical impervious percentage by zone. Finally, MR area thresholds were applied to project the amount of impervious surface citywide and by watershed that would be subject to each MR.

5.2.1 Citywide New Impervious Surface Projections

To develop impervious surface growth projections, the Project Team first evaluated historical population, housing, and impervious area growth data from approximately the past decade. Table 6 summarizes annual growth percentages over this time period:



Table 6 Development Data – Recent Growth Percentages

Metric / Category	Annual growth %	Years	Data Source
Population	1.1%	2010-2019	City of Bainbridge Island (2017), Kitsap County (2021)
Housing Units	0.8%	2010-2020	2010: City of Bainbridge Island (2017), 2020: City of Bainbridge Island (2017)
Impervious Surface Area	1.0%	2016-2021	Annual Impervious Surface Units Permitted: Chrstian Berg (pers. comm. 12/16/2021), Total Impervious Surface: Herrera (2022a)

The above data indicate that there has been approximately 1% growth in all three categories. The 1% growth in impervious surface area corresponds to an average of 197 Impervious Surface Units per year permitted by the City, equal to new impervious surface area of approximately 14 acres per year (Christian Berg, pers. comm., 12/16/2021). Similar results were obtained from the reported increase in developed area of 107 acres/year from 2013-2019 (Exhibit 14, Kitsap County, 2021) multiplied by the island-wide average impervious percentage of 10% (Herrera, 2022a), which results in 11 acres/year new impervious surface.

Of these three categories, *future* growth projections were only found for population, which was projected to continue growing at an annual rate of 1.0%, based on Growth Management Act population growth targets for 2036 (Kitsap County, 2021). Using projected annual population growth as a proxy, new impervious surface can also be projected to continue to grow at a rate of about 1% per year, assuming that future development patterns will be similar to those in the past decade. This growth percentage would result in 11 to 14 acres per year of additional impervious surface citywide. The more conservative of these numbers, 11, was used as the annual new impervious surface area for this analysis.

5.2.2 Spatial Distribution of New Impervious Surface

The Project Team then projected the spatial distribution of new development by intersecting LCA, zoning, and land cover / impervious surface GIS data provided by City staff. In the LCA data provided by the City, classifications included: Vacant, Partially Utilized, Under Utilized, Built Out, Pipeline, Excluded, Business/Industrial (B/I), and Water-Dependent Industrial (W-DI); Kitsap County (2021) provides class descriptions and classification methods. Because B/I and W-DI areas were separated out from classifications relating to the degree to which a parcel is fully developed (i.e., B/I and W-DI areas were not included in the Vacant, Partially Utilized, Under Utilized, and Built Out LCA data), two separate analyses were conducted to project new impervious at build-out: Analysis 1 for parcels with Partially Utilized and Vacant LCA classifications, and Analysis 2 for parcels with B/I and W-DI LCA classifications.



Analysis 1: New Impervious Surface in Partially Utilized and Vacant Areas

For Analysis 1, it was assumed that new impervious surface would be created through development of parcels with Partially Utilized and Vacant LCA classifications⁴, and that the majority of that development would occur on forested land, which makes up approximately 75% and 90% of developable land (i.e., land that is not classified as Water or IntertidalBare, Macroalgae, MarineWater in the landcover GIS data) in those LCA classes, respectively (Christian Berg, pers. comm., 9/30/2022). Partially Utilized and Vacant areas (with Critical Areas removed) were identified for each zoning category, and were multiplied by impervious surface percentages for the respective zoning categories to obtain anticipated new impervious areas at buildout under current zoning.

For example, there are 28 acres “Partially Utilized” in R-0.4 zoning of North Eagle Harbor watershed (excluding Critical Area). In these 28 acres, it was assumed that the existing impervious surface percentage was at least 2.5 times less than the average R-0.4 impervious surface percentage (R-0.4 average impervious percentage of 5.4%/2.5 = 2.2%). The increase in impervious surface would therefore be 28 acres times the delta between the existing and built-out impervious percent for R-0.4 (i.e., 5.4% - 2.2% = 3.2%): 22 acres x 3.2% increase in impervious surface = 0.9 acres new impervious surface. Similarly, there are also 88 acres “Vacant” in R-0.4 zoned land (excluding “Critical Areas”) in North Eagle Harbor. 88 acres x 5.4% impervious surface = 4.8 acres new impervious surface. The sum of these areas yields a total of 5.7 acres new impervious surface in R-0.4 zoned land in North Eagle Harbor.

Table 7 provides new impervious surface area at buildout for all zoning categories, and Table 8 provides new impervious surface area at buildout for multifamily (i.e., R-5, R-8, and R-14) and commercial only⁵, as generated from Analysis 1. Breaking out multifamily residential and commercial from other zoning categories was needed for estimating areas subject to MR6 and MR7, see Section 5.2.3 below. The data export from this GIS exercise is provided In Appendix C.

Analysis 2: New Impervious Surface in B/I and W-DI Areas

Because the B/I and W-DI classes were separated from the Partially Utilized and Vacant classes in the LCA data provided, the potential for new impervious surface in B/I and W-DI areas had to be determined through a different method. The B/I and W-DI LCA spatial data were first intersected with Critical Areas, from which it was determined that there was developable land (i.e., not in a Critical Area) in B/I area in three watersheds: Manzanita, Murden Cove, and North Eagle Harbor (see Table 9). All W-DI areas in the spatial data provided were within Critical Areas, meaning that there was no potential for new impervious surfaces in W-DI areas.

Next, land cover spatial data showing existing impervious surface was overlaid with developable B/I area to determine existing impervious surface area in those parcels. Projected new impervious surface

⁴ While development could also occur in Under Utilized parcels, these was a very small amount of these areas, and they were excluded from the analysis for simplicity.

⁵ Parcels zoned as CORE, CURR USE, ERICK, FTD, GATE, HS-1, HS-2, MAD, NC, NC-R-12 were categorized as “commercial” for Analysis 1. The analysis yielded 21 acres of Vacant land in North Eagle Harbor Watershed, primarily in the GATE zone, and 2 acres of Vacant land in the Pleasant Beach Watershed, from which 13 and 1 acres of impervious surface were projected, respectively. While categorized as “commercial” in Analysis 1, these areas were not part of the B/I LCA class.



in these areas was then calculated for B/I areas in these three watersheds as total impervious surface area at build-out minus existing impervious surface area, assuming an impervious surface percentage at build-out of 70% (Christian Berg, pers. comm., 1/19/2023); see Table 9.

Table 7 and Table 8 provide a summation of projected new impervious surface from both analyses, The tables also show the relative percentages of new impervious anticipated in each watershed as an indication of how the total citywide new impervious surface area may be proportionally distributed around the island. These percentages are then multiplied by the projected total annual new impervious from Section 5.2.1 to yield annual new impervious surface areas by watershed.

Table 7 Projected Distribution of New Impervious Surface by Watershed, All Zoning Categories

Watershed	Analysis 1 New Impervious Surface at Buildout (ac)	Analysis 2 New Impervious Surface at Buildout (ac)	Total New Impervious Surface at Buildout (ac)	Percent of Total New Impervious	New Impervious Surface per Year (ac/year)
Agate Pass	10	-	10	5%	0.6
Blakely Harbor	11	-	11	6%	0.6
Eagledale	12	-	12	6%	0.7
Fletcher Bay	17	-	17	9%	1.0
Gazzam Lake	9	-	9	5%	0.5
Manzanita	22	9	31	16%	1.8
Murden Cove	17	11	28	15%	1.6
North Eagle Harbor	29	1	29	15%	1.7
Pleasant Beach	11	-	11	6%	0.6
Port Madison	14	-	14	7%	0.8
South Beach	6	-	6	3%	0.3
Sunrise	13	-	13	7%	0.8
TOTAL	169	21	190	100%	11.0

Note: Numbers are summed prior to rounding.



Table 8 Projected Distribution of New Impervious Surface by Watershed, Multifamily and Commercial Zoning Only

Watershed	Analysis 1 New Impervious Surface Area at Buildout (ac)	Analysis 2 New Impervious Surface Area at Buildout (ac)	Total New Impervious Surface Area at Buildout (ac)
Agate Pass	-	-	-
Blakely Harbor	-	-	-
Eagledale	-	-	-
Fletcher Bay	-	-	-
Gazzam Lake	-	-	-
Manzanita	-	9	9
Murden Cove	-	11	11
North Eagle Harbor	13	1	14
Pleasant Beach	1		1
Port Madison	-	-	-
South Beach	-	-	-
Sunrise	-	-	-
TOTAL	14	21	35

Table 9 Analysis 2 Results: Projected New Impervious Surface in Developable B/I Area at Build-Out

Watershed	Developable B/I Area (ac)	Existing Impervious (ac)	Total Impervious at Build-Out (ac)	New Impervious at Build-Out (ac)
Manzanita	14	0.7	9.8	9.1
Murden Cove	19	2.9	13.6	10.7
North Eagle Harbor	1	0	0.8	0.7
TOTAL	34	3.6	24.1	20.5

Figure 8 shows the distribution of new impervious surface (at buildout, all zoning categories) as relative percentages by watershed. Figure 9 shows Partially Utilized, Vacant, and developable B/I parcels in gray to indicate where in the watersheds these parcels are located relative to streams and relative to the coast. While these developable parcels are generally dispersed throughout the watersheds, some watersheds, including North Eagle Harbor and Manzanita, appear to contain a number of parcels that may discharge directly to marine waters, which would make them exempt from MR7 (Flow Control) requirements.



Also note that while Table 7 and Figure 8 show the potential for new impervious surface area at buildout of Partially Utilized, Vacant, and B/I parcels, opportunities to build on these available lands may be taken advantage of more readily in some areas than in others based on a variety of factors.

Figure 8. Relative Percentages of Total Projected New Impervious Surface at Citywide Buildout

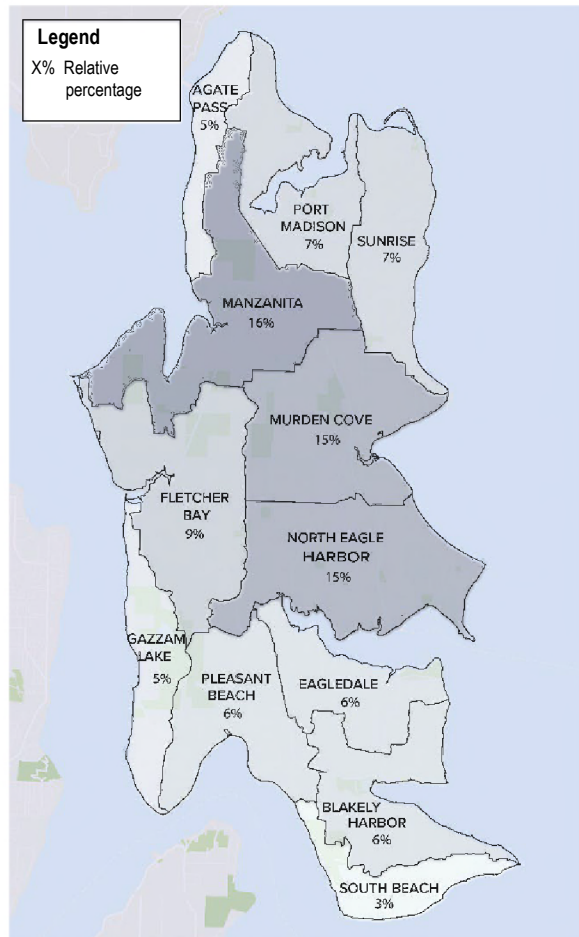
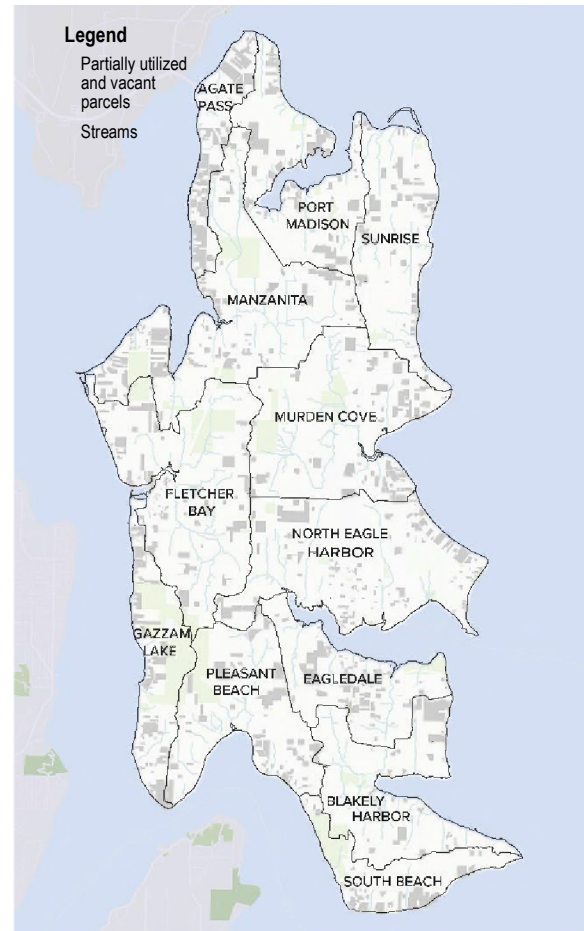


Figure 9. Partially Utilized and Vacant Parcels



A comparison of the new impervious surface area at **buildout** in Table 7 and the **annual** new impervious area projection from Impervious Surface Unit citywide permitting data in Section 5.2.1 provides a way to estimate the approximate number of years until buildout is complete. While both sets of data involve assumptions and extrapolations, 190 acres of new impervious at buildout divided by 11 acres per year annual projection results in an approximate time of 17 years until buildout is complete. This duration is used later in the analysis to translate results from buildout to annual and vice versa. This is useful for allowing comparison of new impervious surface areas (developed from buildout data) and replaced impervious surface areas (developed from an annual increase applied to existing impervious data).

Appendix D provides a tabulation of projected increases in impervious surface percentage by watershed. While these percentages are not used in the SCTP scenarios from which program participation and revenue are projected, they may indicate which watersheds may be most impacted from an ecosystem perspective.

5.2.3 Application of MR Thresholds to New Impervious Surface

Table 7 and Table 8 show projected acres of new impervious surface annually by watershed. However, only portions of these areas will trigger the various MRs of interest for an SCTP. The final step in the process is to determine the projected impervious surface areas that will trigger specific MRs.

- MR5: Historically, a majority (approximately 85-90%) of new impervious surface has been subject to MR5 (Paul Nylund, pers. comm., 1/21/2022). 90% of projected impervious surface will be considered subject to MR5 for fee revenue projections.
- MR6: The MR6 threshold is 5,000 sf PGIS. Since roof area is not considered a PGIS, impervious area subject MR6 will be mainly parking lots and roads. Projects triggering MR6 are fairly rare on Bainbridge Island, e.g., large subdivisions, commercial with large parking area, etc., typically 1 to 2 projects per year (Paul Nylund, pers. comm., 1/21/2022). For this analysis, projected impervious surfaces in commercial and multi-family residential areas (i.e., R-5, R-8, and R-14) were considered areas that could potentially trigger MR6. These areas were multiplied by an estimated 50% to represent the P-GHS portion (i.e., 50% roof impervious removed), since quantitative data identifying P-GHS versus other impervious surfaces were not available.
- MR7: The MR7 threshold is 10,000 sf effective impervious. Historically there have been less than about ten MR7 projects per year, but those that trigger MR7 are typically substantially larger than 10,000 sf threshold (e.g., multi-family residential projects, a hotel project, etc.), and are typically new development (Paul Nylund, pers. comm., 1/21/2022). Therefore, 100% of the commercial and multi-family residential impervious areas were considered potentially able to trigger MR7. Spatial analysis indicated that these commercial and multi-family residential areas are not along the shoreline, meaning that they are subject to MR7 (not exempted due to direct marine discharge). Lastly, it is possible that a very large single-family residence could be built with over 10,000 of effective impervious surface in a large vacant lot, but this situation is likely rare and has not been calculated as part of this study.

Table 10 provides projected impervious surface areas with the potential to trigger MR5, MR6, and MR7, by watershed, at buildout.



Table 10 Projected Impervious Surface Areas with the Potential to Trigger MR5, MR6, and MR7 by Watershed at Buildout

Watershed	MR5 Area (acres) ¹	MR6 Area (acres) ²	MR7 Area (acres) ³
Agate Pass	9	-	-
Blakely Harbor	10	-	-
Eagledale	10	-	-
Fletcher Bay	15	-	-
Gazzam Lake	8	-	-
Manzanita	28	4.5	9.1
Murden Cove	25	5.3	10.7
North Eagle Harbor	26	6.8	13.5
Pleasant Beach	10	0.4	0.8
Port Madison	12	-	-
South Beach	5	-	-
Sunrise	12	-	-
TOTAL	171	17	34

Notes:

1. 90% of total new impervious surface at buildout (from Table 7)
2. 50% of commercial and multi-family residential new impervious surface at buildout (from Table 8)
3. 100% of commercial and multi-family residential new impervious surface at buildout (from Table 8)

5.2.4 Replaced Impervious Surface

As described in the 2019 SWMMWW, development projects trigger MRs based on new impervious surface area, replaced impervious surface area, and converted vegetation area. Section 5.2.3 projects *new impervious surface* area subject to various MRs. As stated in the beginning of Section 5 above, the City does not have data that tracks *replaced impervious surface* (Christian Berg, pers. comm. 9/30/2022). To allow replaced impervious surface to be included in revenue projection, this analysis assumes a proxy annual rate of 0.1% replaced impervious surface in the absence of redevelopment data.

Table 11 shows existing impervious surface area and replaced impervious surface, annually and at buildout (assumed in 15 years) to allow comparison of SCTP outcomes that rely on new versus replaced impervious surface data. It is also assumed that replaced impervious surface is primarily subject to MR5 only, as City staff have indicated that most larger projects, i.e., that would trigger MR6 or MR7, are new development (Paul Nylund, pers. comm., 1/21/2022).



Table 11 Existing and Projected Replaced Impervious Surface by Watershed

Watershed	Existing Impervious Surface Area (ac) ¹	Projected Impervious Surface Area Replaced per Year (ac) ²	Projected Impervious Surface Area Replaced at Buildout (ac) ³
Agate Pass	48	0.05	0.8
Blakely Harbor	85	0.08	1.5
Eagledale	105	0.10	1.8
Fletcher Bay	145	0.14	2.5
Gazzam Lake	53	0.05	0.9
Manzanita	203	0.20	3.5
Murden Cove	204	0.20	3.5
North Eagle Harbor	459	0.46	7.9
Pleasant Beach	149	0.15	2.6
Port Madison	102	0.10	1.8
South Beach	65	0.06	1.1
Sunrise	142	0.14	2.4
TOTAL	1,761	1.7	30

Notes:

1. From Herrera (2022a)
2. Assuming 0.1% annual replacement rate
3. Assuming 17 years to buildout

5.2.5 City Projects – New Impervious Surface

City Staff requested investigation of the potential for SCTPs for mitigation of internal (City) non-motorized improvements, typically bike lane and sidewalk projects, and provided new impervious areas from projects built in the past 3 years and planned for the next 2 years (Table 12). The impervious surface areas in these projects are built either on existing gravel shoulders within the road prism or by enclosing existing ditches in pipes and building on top (Christian Berg, pers. comm., 9/28/2022), both of which would be considered new impervious surface per SWMMWW guidance. Currently, these surfaces are exempt from stormwater requirements (Christian Berg, pers. comm., 9/28/2022). Considerations relating to SCTPs for these and other similar projects will be discussed in Section 5.3 Program Scenarios.



Table 12 Past and Planned Impervious Surface Areas for City Bike Lane and Sidewalk Projects

Project	Watershed	Impervious Surface Area	Sidewalk/ Bikelane	Applicable MRs (discharge type)	Year
Miller Rd and Fletcher Bay Rd	Fletcher Bay and Manzanita	132,000 sf (3 ac)	Bike lane	MR5, MR6, MR7 (stream)	Past 3 years
Eagle Harbor Rd Phase 2	Eagledale	64,950 sf (1.5 ac)	Bike lane	MR5, MR6, MR7 (stream)	Past 3 years
Madison Ave Nonmotorized	North Eagle Harbor	8,000 sf (0.2 ac)	Sidewalk	MR5, MR6 (marine)	2023
Madison Ave Nonmotorized	North Eagle Harbor	32,000 (0.7 ac)	Sidewalk / bike lane	MR5, MR6, MR7 (stream)	2023
Eagle Harbor Rd Phase 1	Eagledale	25,000 sf (0.6 ac)	Bike lane	MR5, MR6 (marine)	2024
Bucklin Hill Rd	Eagledale	23,000 sf (0.5 ac)	Bike lane	MR5, MR6, MR7 (stream)	2024

Note: Gray rows are completed projects, white rows are planned projects.

5.2.6 Workshop Discussion Summary: New and Replaced Impervious Surface Projections

At the “Framework Options” workshop, City staff were asked for feedback about the various assumptions used in the analysis to project new and replaced impervious surface areas. Staff generally confirmed that there were no obvious red flags regarding analysis assumptions and discussed the following specific items.

Staff stated that there is a new 20-year population target, to be adopted in the 2024 Comprehensive Plan update, against which the citywide new impervious surface projections should be verified. Obtained after the workshop, the new population target of 29,349 by 2044 (per the Kitsap Regional Coordinating Council 9/29/2022 Board Meeting Agenda) shows a downward revision in projected annual growth from 1.0% (based on 2036 population target in 2021 Buildable Lands Report) to 0.8%, a 20% reduction. While this reduction would not affect projected new impervious areas at buildout, it would affect the projected citywide new impervious surface per year (described in Section 5.2.1) as well as the estimated time to buildout (described in Section 5.2.2). For example, a 20% reduction in citywide new impervious surface from 11 acres per year to 8.8 acres per year would result in an increase in time to buildout from the projected 15 years to almost 20 years. This increase in time to buildout would result in corresponding reductions projected annual revenue (see Section 5.4), although it would not affect total projected revenue at buildout.

City staff confirmed that while the estimated time to buildout should be taken in context with the many assumptions used in the analysis, the estimate is likely in the right ballpark and is reasonable to use in this rough decision-making tool to help evaluate if an SCTP is worth the time and effort.



Another topic discussed at the workshop was the subdivision code update to strongly favor smaller buildings, which could result in less impervious surface per project. The Winslow Subarea Plan update was also mentioned, which will include development regulation changes, potentially to parking and building style requirements, that could have significant implications for the amount of impervious surface for any particular project. Incorporation of longer-term development trends in the community, e.g., development may become more intensive in terms of units but less intensive in terms of impervious surface per unit, was recommended to further refine SCTP participation and revenue projections.

City staff shared that the state has draft language out for the next iteration of the NPDES Phase 2 stormwater permit with reductions to thresholds for MR6, possibly from 5,000 sf down to 2,000 sf for linear projects. Also, replaced hard surfaces could be included in the 5,000 sf threshold for all MRs⁶. If this happens, more projects would trigger these MRs and total areas subject to them could increase.

City staff also confirmed that proxy assumption of 0.1% replaced impervious surface per year is likely reasonable. This estimate is approximately 10% of the estimated annual increase for new impervious surface, and staff noted that between 10% and 20% of permit applications are for redevelopment.

5.3 Program Scenarios

To create program scenarios that illustrate potential outcomes of an SCTP on Bainbridge Island, various decisions must be made regarding the program framework. Program framework decisions that affect participation outcomes include: (i) which MR: MR5, MR6, or MR7, (ii) which transfer program type: in contributing area, in-basin, or out-of-basin, and (iii) what locations / watersheds. For the purposes of this Issue Paper, the fee will be based on the estimated capital cost of a typical stormwater facility for a given MR. Also, since there are few constrained sites on Bainbridge Island that have difficulty meeting MRs onsite (Paul Nylund, pers. comm., 1/21/2022), if onsite infeasibility was required to allow a project to pay the fee for compliance, there would be little to no program participation. Therefore, it was assumed that the program would allow all subject development projects to comply via fee payment. The decision regarding which RCW the program will operate under does not affect participation outcomes and is not part of this revenue projection exercise but is an important consideration for any SCTP because it would affect program administration and operation.

To build SCTP scenarios, the Project Team used City staff input to select watersheds that were of most interest to the City. As stated in the Introduction, the city requested investigation of SCTPs in North Eagle Harbor, Manzanita, and citywide. For a citywide program, staff requested evaluation both for all development projects and for internal (City) projects only. While the Project Team focused on these City preferences in this analysis, SCTPs could also be developed for any other watershed with sufficient potential for development to warrant a program, perhaps especially if successful programs in the preferred watersheds show that SCTPs can be a beneficial funding tool. For example, Murden Cove Watershed has similar projected new impervious surface areas for all MRs as Manzanita and North Eagle Harbor watersheds.

⁶ https://fortress.wa.gov/ecy/ezshare/wq/permits/MS4GP.PrelimDraftWWA_App1.pdf



Table 13 identifies program scenarios by location, MR, and transfer program type that were explored in this study.

Table 13 Program Scenarios Explored in this Study

Eligible Projects	Geographic Boundaries	Transfer Type	MR
All ¹	North Eagle Harbor Watershed	In Contributing Area / In-Basin ²	MR5, MR6, MR7
	Manzanita Watershed	In Contributing Area / In-Basin	MR5, MR6, MR7
	Citywide	Out-of-Basin	MR5 ^{3,4}
Internal ⁵	North Eagle Harbor Watershed	In Contributing Area / In-Basin	MR5, MR6, MR7
	Eagledale Watershed	In Contributing Area / In-Basin	MR5, MR6, MR7
	Citywide	Out-of-Basin	MR5, MR6, MR7

Notes:

1. All = any projects throughout the City, does not include the City bike lane and sidewalk projects referenced in "Internal," which are currently exempt from stormwater requirements.
2. In contributing area and in-basin programs were lumped together for this portion of the analysis because they both allow full mitigation requirements to be transferred to the regional facility.
3. Based on Project Team review of SWMMWW Appendix 1-E and past personal communications with Ecology, an out-of-basin transfer in-lieu fee program is likely allowed for MR5 compliance, although MR5 out-of-basin transfer is not explicitly discussed in Appendix 1-E.
4. Likely not enough replaced impervious surface to trigger MR6 and MR7, since large developments are typically new development, not redevelopment (Paul Nylund, pers. comm., 1/21/2022).
5. City bike lane and sidewalk projects

5.4 Participation and Revenue Projections by Scenario

To project the total amount of fee payment revenue that would be collected through an SCTP for each scenario above, the subject impervious surface area (i.e., subject to the relevant MR, within the relevant watershed boundary) at buildout was multiplied by the estimated fee for that MR.

5.4.1 Mitigation Transfer Rules Review

Before presenting the subject impervious surface areas and revenue amounts, it is useful to review the mitigation transfer rules for each transfer program type:

- For in contributing area or in-basin transfer, the full mitigation for all development (new impervious surface, replaced impervious surface, and vegetation conversion) can be transferred to the regional facility.
- For out-of-basin transfer:
 - If the development is in a forested area, no out-of-basin mitigation transfer is allowed.
 - If the development is in a cleared area (e.g., pasture, lawn / landscaping, etc.), only the mitigation for cleared to forested conditions can be transferred to an out-of-basin facility; mitigation for developed to cleared conditions must be achieved onsite.



- o If the development is in an area with existing impervious (meaning the development will result in replaced impervious), the full required mitigation can be transferred to an out-of-basin facility.

For the purposes of out-of-basin transfer program participation projections, the Project Team only included replaced impervious surfaces (Table 11), where the full mitigation requirements can be transferred. Since development projects typically can meet all MRs onsite without significant space constraints (Paul Nylund, pers. comm., 1/21/2022), it was assumed that projects that cannot transfer the full mitigation requirements to the out-of-basin facility would choose to meet the full requirement onsite rather than building onsite facilities for partial compliance and paying a fee for the remainder.

5.4.2 Participation and Revenue Projection Results

Table 14 shows total projected subject impervious surface areas and revenue amounts at buildout and annually. These revenue projections use the estimated fees from Section 5.1 and assume that 100% of development projects comply with applicable MRs by paying a fee.

Table 14 Total Subject Impervious Surface Areas (Acres), Associated Fee Revenue (2022\$) at Buildout, using Estimated Fees

Eligible Projects	Geographic Boundaries	Transfer Type	MR	Impervious Area (ac) <small>1, 2, 3, 4</small>	Associated Fee Revenue at Buildout (2022\$)	Associated Fee Revenue Annually (2022\$)
All	North Eagle Harbor Watershed	In Contributing Area / In-Basin	MR5	26	\$5.8 M	\$334 K ⁵
			MR6	7	\$1.8 M	\$106 K
			MR7	14	\$1.9 M	\$111 K
	Manzanita Watershed	In Contributing Area / In-Basin	MR5	28	\$6.0 M	\$350 K
			MR6	5	\$1.2 M	\$71 K
			MR7	9	\$1.3 M	\$75 K
Citywide	Out-of-Basin	MR5	30	\$6.7 M	\$386 K	
Internal	North Eagle Harbor Watershed	In Contributing Area / In-Basin	MR5	0.9	NA	\$201 K ⁶
			MR6	0.9	NA	\$248 K
			MR7	0.7	NA	\$104 K
	Eagledale Watershed	In Contributing Area / In-Basin	MR5	1.1	NA	\$241 K
			MR6	1.1	NA	\$298 K
			MR7	0.5	NA	\$75 K
	Citywide	Out-of-Basin	MR5	1.0	NA	\$221 K
			MR6	1.0	NA	\$273 K
			MR7	0.6	NA	\$90 K

Notes:

1. Impervious surface areas for All Project, In Contributing Area / In-Basin scenarios from Table 10 (assumes new impervious surface only; any replaced impervious surface area would be in addition to this)

2. Impervious surface areas for All Project, Out-of-Basin scenarios from Table 11 (replaced impervious surface only).

3. Impervious surface areas for Internal Project, In Contributing Area / In-Basin scenarios from Table 12 (new impervious surface).



4. Impervious surface areas for Internal Project, Out-of-Basin scenarios from Table 12 x 50% (new impervious surface x 50% to account for proxy assumption that gravel or ditch to forested mitigation to be transferred would be 50% of total mitigation).
5. All Project annual revenue = revenue at buildout / 17 years (expected time to buildout)
6. Internal (City bike lane and sidewalk) projects expected to be built in 2023 and 2024, more appropriate to compare with annual revenue than revenue at buildout.

Because the estimated fees that were developed in Section 5.1 are based on cost data from capital projects with smaller drainage areas that were not designed to be regional projects, it is likely that fees based on specific regional projects would be lower than the estimated fees, and would therefore result in lower revenue. Table 15 provides projected revenue for the same projected impervious areas as in Table 14, but using fees of \$50,000 per subject acre for all MRs, meant to be a lower bound of likely fees.

Table 15 Total Subject Impervious Surface Areas (Acres), Associated Fee Revenue (2022\$) at Buildout, using Fees of \$50,000 per Subject Acre

Eligible Projects	Geographic Boundaries	Transfer Type	MR	Impervious Area (ac) <small>1, 2, 3, 4</small>	Associated Fee Revenue at Buildout (2022\$)	Associated Fee Revenue Annually (2022\$)
All	North Eagle Harbor Watershed	In Contributing Area / In-Basin	MR5	26	\$1.3 M	\$76 K ⁵
			MR6	7	\$300 K	\$20 K
			MR7	14	\$600 K	\$39 K
	Manzanita Watershed	In Contributing Area / In-Basin	MR5	28	\$1.4 M	\$80 K
			MR6	5	\$200 K	\$13 K
			MR7	9	\$500 K	\$26 K
Citywide	Out-of-Basin	MR5	30	\$1.5 M	\$88 K	
Internal	North Eagle Harbor Watershed	In Contributing Area / In-Basin	MR5	0.9	NA	\$46 K ⁶
			MR6	0.9	NA	\$46 K
			MR7	0.7	NA	\$37 K
	Eagledale Watershed	In Contributing Area / In-Basin	MR5	1.1	NA	\$55 K
			MR6	1.1	NA	\$55 K
			MR7	0.5	NA	\$26 K
	Citywide	Out-of-Basin	MR5	1.0	NA	\$51 K
			MR6	1.0	NA	\$51 K
			MR7	0.6	NA	\$32 K

Notes: Repeat of Table 14 notes.

1. Impervious surface areas for All Project, In Contributing Area / In-Basin scenarios from Table 10 (assumes new impervious surface only; any replaced impervious surface area would be in addition to this)
2. Impervious surface areas for All Project, Out-of-Basin scenarios from Table 11 (replaced impervious surface only).
3. Impervious surface areas for Internal Project, In Contributing Area / In-Basin scenarios from Table 12 (new impervious surface).



4. Impervious surface areas for Internal Project, Out-of-Basin scenarios from Table 12 x 50% (new impervious surface x 50% to account for proxy assumption that gravel or ditch to forested mitigation to be transferred would be 50% of total mitigation).
5. All Project annual revenue = revenue at buildout / 17 years (expected time to buildout)
6. Internal (City bike lane and sidewalk) projects expected to be built in 2023 and 2024, more appropriate to compare with annual revenue than revenue at buildout.

5.4.3 Participation and Revenue Conclusions

The analysis above provides an estimate of projected impervious surface areas eligible for participation in various SCTP scenarios and associated projected fee revenue amounts. The purpose of this analysis is to provide a quantitative order of magnitude validation of whether the amount of revenue that might be collected for a given SCTP would justify the effort to develop, implement, and administer a program. The results are dependent on the assumptions made during the analysis; these variables include but are not limited to: the estimated fees, the acreage of new and replaced impervious surfaces, and the general interest of owners / developers in paying a fee in lieu of building onsite stormwater management facilities.

General Development Project SCTP Results

The projections presented in Table 14 and Table 15 demonstrate that the in-basin, MR5-based SCTPs for general development (associated with building out vacant or partially utilized lots) have the highest potential for use of all potential program frameworks evaluated, at roughly 25-30 acres of impervious surface at buildout and revenue ranging from approximately \$6M using the fee estimates based on non-regional capital project data, down to approximately \$1.5M using the lower fees of \$50K per subject acre impervious. The MR6 and MR7 programs in Winslow / North Eagle Harbor and Manzanita watersheds have somewhat lesser potential for use at 5-7 and 9-14 acres at buildout, respectively, since there is less new impervious area in projects large enough to trigger these MRs compared to MR5, with projected revenue of about \$1.5M based on the higher fees and about \$400K using the lower fees.

There are several potential SCTPs that could bring funds for stormwater management to the Manzanita watershed: a citywide MR5 program (30 acres at buildout, \$6.7M based on higher fees / \$1.5M based on lower fees) or in-basin programs in Manzanita watershed for all three MRs:

- MR5: 28 acres at buildout, \$6M based on higher fees / \$1.4M based on lower fees
- MR6: 5 acres at buildout, \$1.2M based on higher fees, / \$200K based on lower fees
- MR7: 9 acres at buildout, \$1.3M based on higher fees / \$500K based on lower fees

The citywide out-of-basin program assumes fee payment only for projects with impervious surface **replacement**, where onsite stormwater facilities would not be required. Also, while not prohibited, there is no specific written guidance in SWMMWW Appendix 1-E for out-of-basin MR5 programs.

Lastly, as discussed in Section 5.2.6, the downward revision in the projected annual population increase, on which annual new impervious surface projections are based, could result lower annual revenue numbers, although it would not affect projected revenue at buildout.



Internal Project SCTP Results and Discussion

Based on planned City improvements, the SCTPs for internal (City) bike lane and sidewalk projects would be applicable to a much smaller impervious surface area (0.5 to 1 acre at buildout) and would generate less fee revenue, on the order of 10% of the general development programs (\$100K to \$200K based on higher fees / \$40K to \$50K based on lower fees). However, there may be other improvements beyond the planning horizon that could continue to increase the financial return of these potential programs over time. Generally, significantly more participation and revenue would be needed to make an SCTP worth the cost of program development and implementation.

Given that the City currently exempts bike lane and sidewalk projects from stormwater requirements, the implications of SCTPs for these projects are worth careful consideration.

Single watershed (in contributing area or in-basin) program considerations:

- In contributing area and in-basin SCTPs allow the full mitigation requirement to be transferred to the regional facility.
- There are no additional Ecology requirements for documentation of an in contributing area program compared to onsite facilities. The City would be required to submit regional facility capacity calculations and capacity tracking for an in-basin transfer program.
- The City could consider SCTPs for any of the three MRs discussed above. It is possible that a single facility could be used for a fee program that could provide compliance for all three MRs.
- Based on the Kingston and Tacoma experiences, it seems that operating a program under either RCW 35.91.060 or RCW 35.92.025 may be preferable to RCW 82.02.020 to avoid the 5-year expenditure requirement.

Citywide program considerations:

- The specific request from City Staff was to investigate a citywide, out-of-basin SCTP that could be applied to bike lane and sidewalk projects. The fee revenue from this program can only be used for stormwater mitigation facilities in the Ecology-approved highest priority watershed, the Manzanita Watershed.
- An out-of-basin program would be applicable to projects throughout the island compared to an in-basin program for a single watershed, and thus have larger potential fee revenue. However, balanced against this larger area is the fact that only a portion of the mitigation requirement can be transferred, which leads to a reduction in the potential fee revenue. In the examples developed in this analysis, the reductions more or less balanced the larger program boundaries resulting in similar revenues for the out-of-basin programs compared to the in-basin programs, but this is because there were only two watersheds with planned improvements. The more bike lane / sidewalk projects there are in more watersheds, the more a citywide program would outperform single basin programs.
- If bike lane and sidewalk projects become subject to MRs, in addition to the fee payment, onsite mitigation could be required for the paved-to-existing portion of the mitigation requirement.



- While Ecology has indicated that out-of-basin transfer programs can be approved for MR5, MR6, and MR7, the only MR with formal written guidance for out-of-basin transfer is MR7. If the City were interested in a citywide SCTP for MR5 or MR6, it could be a less streamlined approval process.
- The question of RCW is more uncertain for citywide SCTPs than for single basin programs. While local jurisdictions are operating, or planning to operate, in-basin and in contributing area SCTPs under RCW 35.91.060 and RCW 35.92.025 (which are reimbursement type programs and do not impose timing requirements on expending fees collected), RCW 82.02.020, which includes the requirement for expenditure of fees within 5 years of receipt, may be needed for an out-of-basin transfer program.

5.4.4 Workshop Discussion Summary: Participation and Revenue Projections

Workshop discussion regarding SCTP outcomes for general development projects:

City staff participated in a second poll that asked attendees, “Would the development community be interested in paying a fee to reduce some of their stormwater components on site?” Seven staff members participated, with 3 answering “Yes,” 1 answering “No,” and 3 answering “Depends on the requirements.” Ensuing discussion indicated that the “No” response was based on the idea that developers would not pay the fee since it appeared to be more expensive than building onsite stormwater facilities based on documented costs of stormwater assets donated to the City (for assets costing over \$50,000 that are dedicated to the City) over the past several years. While these costs are useful to reference, the drainage areas of these assets were not available, so the costs per acre managed were unknown. Also, it was noted that actual fees could be significantly lower than the fee estimates, which could be more appealing to developers. Staff also noted that paying a fee could also be appealing to developers due to savings of time and effort as well as cost.

Staff also discussed how an SCTP could relate to stormwater fees. Opinions ranged from stormwater fees not changing for projects that paid an in-lieu fee to the possibility that fees could be reduced at sites that paid a “connection charge” for an in-contributing area or in-basin regional facility, similar to an existing program that allows reduction of stormwater fees for sites that treat stormwater onsite.

Staff noted that the Winslow Subarea planning process will include discussion of upzoning, and remarked that if an SCTP could provide the potential for lots to be denser in a regional facility’s contributing area, Winslow could be a place where this would make sense.

Staff also discussed whether the citizens of Bainbridge Island could accept an out-of basin SCTP where funds for stormwater mitigation would be transferred from development projects in Winslow to a regional facility in Manzanita Watershed. They felt that while it could be palatable in that environmental conditions would not be worsened, there could be frustration because of the perception that North Eagle Harbor ecosystem conditions are not improving as much as they could be. They noted that citizens are very astute about stormwater management on the island and have been participating in the SMAP and prioritization processes. They know that even though it is the most developed area on the



island, North Eagle Harbor is in better ecological health than many other areas along Puget Sound and is very recoverable, and there could be sensitivity about any programs that minimize its recovery.

Discussion also occurred about the Kingston Regional Facility idea coming out of retrofit planning, in search of a way to achieve ecosystem recovery faster than waiting for stormwater mitigation that would come with redevelopment. It would be a way to manage both existing runoff and runoff from new and redevelopment. A regional facility that is built before development and redevelopment occurs and also treats existing runoff and delivers benefits to receiving waters decades sooner than would happen from distributed onsite facilities.

Workshop discussion regarding SCTP outcomes for internal (City) projects:

City staff participated a third poll that asked attendees, “Should the city also go beyond the minimums for public development capital projects (similar to the City’s more protective requirements than the stormwater management manual for private development)?” Six staff members participated, with 1 answering “Yes,” 3 answering “No,” and 2 answering “Depends on the requirements.” Follow-up discussion indicated that Ordinance 2012-06 exempted City-owned facilities from paying stormwater management fees and the City’s Cost Allocation Manual also includes guidance about what City projects must pay stormwater management fees, both of which should be considered and coordinated with if there is an interest in changing stormwater requirements for City bike lane and sidewalk projects.

Staff also questioned whether the more stringent City requirements on private development (i.e., 800 square foot threshold set to target Accessory Dwelling Unit development) are appropriate and effective, suggesting that this requirement has created a lot of additional work for the city, possibly with little environmental gain. Others stated that public development already faces many obstacles in terms of costs and requirements, and going beyond the minimum is even further reducing the amount of public infrastructure that can be built with a given amount of dollars.

In response to a question asking whether current stormwater exemptions pit additional bike and pedestrian infrastructure against ecosystem and salmon health, staff discussed that while the science is clear that additional impervious surface results in more erosion and water quality impacts, the goal of these non-vehicular improvements is to reduce vehicular traffic, thereby reducing potentially more significant impacts to the receiving waters. Staff also mentioned that the discovery of 6-PPD pollutants is an emerging concern in Puget Sound and rules and regulations for pollutant-generating surfaces are somewhat in flux.

5.5 Program Development and Implementation Considerations

5.5.1 Program Development

The steps involved in developing an SCTP can be broadly broken down into program evaluation and program planning. Program evaluation includes any further evaluation needed to support deciding whether to move forward with program development and which program framework(s) to further develop. It includes setting specific program goals, more specific financial assessment, stakeholder vetting, and feedback / approvals from the City to move forward.

Program planning includes:



- Developing the specific program framework such as establishing the geographic limits, MR(s), transfer program type, and eligibility criteria;
- Conducting outreach such as presentations to stakeholders, mailings, posting plan on website, public hearing, etc.
- Plan adoption and code update as needed;
- Identifying, designing, and constructing the regional facility that will be the basis of the program;
- Developing City systems and processes for fee program application review and approval, payment, etc.;
- Developing City program administration procedures, including those that fulfill Ecology requirements such as capacity calculations, tracking systems, watershed prioritization, and monitoring programs, as applicable;
- Developing participation documentation to guide how development projects can pay the fee for stormwater compliance;
- Creating a staffing plan and budget.

In the City of Tacoma’s experience, SCTP development took between one and two years of part time effort (it was not someone’s full-time job) and the City had past in-lieu fee programs that staff could use for guidance (Mieke Hoppin, pers. comm., 10/5/2020). Tasks included program documentation, getting the program through council, and setting up accounting. Staff also noted that this timeline was possible since the City already had facility improvements on which it could base its programs, and that siting, designing, permitting, and building a facility would take many more years.

5.5.2 Program Implementation

Program implementation involves the day-to-day activities of administering the program, such as training plan review staff on new program procedures, providing compliance assistance to the development community, continuing outreach programs, maintaining the tracking system, annual reporting, etc. Based on the experience of Tacoma and Kitsap County, SCTPs can be designed to be simple to administer with relatively little additional administrative effort. Tacoma’s two SCTPs require one-half additional FTE to administer compared to before the programs were launched (Mieke Hoppin, pers. comm., 10/5/2020). In Tacoma, in-lieu fees are paid through the City’s permitting program (Accela) or through money transfer for internal projects. Fee payments are coded to the Environmental Services charge code, which only Environmental Services can use (Mieke Hoppin, pers. comm., 10/26/2022). Kitsap County anticipates administering the program with existing staff and that payments will be processed through the Department of Community Development (Shawn Alire, pers. comm., 7/19/2022).

5.5.3 Workshop Discussion Summary: Program Development and Implementation

City staff discussed how the fee would be developed and recalled that it would only need to be set one time, based on the regional facility cost and service area, versus a Traffic Impact Fee which must be revisited periodically. They indicated that like Accela for Tacoma, the City of Bainbridge Island’s



permitting program is capable of executing the fee component of an SCTP with minimal output and that the City probably would not need additional staff to manage the program, once the facility was built.

6 CONCLUSIONS AND RECOMMENDATIONS

This Issue Paper documents the Project Team’s evaluation of potential frameworks and outcomes of a Stormwater Control Transfer Program (SCTP) for the City of Bainbridge Island (City) as well as City discussion and feedback from the November 15, 2022 “Framework Options” workshop. This evaluation was achieved through review of the Western Washington regulatory context, review of analogous programs, and analysis of anticipated project participation and revenue generation from several potential SCTP frameworks that are customized to Bainbridge Island.

6.1 Conclusions

- Program drivers and benefits: The main drivers and benefits for an SCTP on Bainbridge Island are to:
 - Accelerate ecosystem recovery, by providing management for existing unmanaged impervious surface, and by building stormwater control facilities before development buildout.
 - Provide a local funding stream for stormwater retrofit projects. Depending on the program framework, revenue projections range from \$1.2M to \$6.7M at buildout for general development projects using higher fees (based on capital cost data for non-regional projects provided by the City) or \$200K to \$1.5M at buildout using lower limit fees. Annual revenue projections range from roughly \$50K to \$300K depending on fee levels for both general development projects and City bike lane and sidewalk projects.
 - Provide the development community flexibility in specific development scenarios such as denser site development projects in the Winslow area (while not a primary driver on Bainbridge Island, still a benefit to the development community)
- Regulatory context: Based on review of the existing SCTPs in Tacoma and the planned program for Kingston urban growth area in Kitsap County, it seems that RCW 35.91.060 and RCW 35.92.025 are good options the City to consider for in contributing area or in-basin programs since they do not include any requirements for the timing of expending fee payment revenue. For any out-of-basin programs under consideration, more research is likely required to determine if there are alternative RCWs that could be used to avoid the 5-year expenditure requirement that is included in RCW 82.02.020.
- Analogous program review:
 - An SCTP will only be a useful program tool if there is sufficient development in the program service area and if there is sufficient incentive for use (i.e., use of program is easier, cheaper, etc. than building onsite stormwater controls).
 - MR5 SCTPs may not have been undertaken by cities since MR5 includes a “maximum extent feasible” clause which makes it possible to achieve compliance by documenting



the infeasibility of meeting the requirement onsite. However, since few to no sites on Bainbridge Island are constrained, this clause would not reduce the usage of an MR5 fee program on Bainbridge Island.

- There is a western Washington precedent (i.e., the City of Tacoma’s Thea Foss MR6 Treatment In-lieu Fee program) for an in-lieu fee program framework that uses an upfront fee based on regional facility capital costs plus an ongoing annual maintenance fee based on regional facility O&M costs. This type of fee could help offset O&M costs for capital facilities that increase as new facilities are built.
- Participation and revenue projections:
 - Based on the assumptions used in this analysis, SCTPs for general development projects have the potential to bring in more revenue than SCTPs for currently planned City bike lane and sidewalk projects; more City bike lane / sidewalk projects in the future make them more similar.
 - SCTPs for MR5 appear to have the potential to bring in more revenue on Bainbridge Island than SCTPs for MR6 and MR7, given typical development patterns.
 - In-basin or in contributing area programs avoid potential concerns about improvements being taken away from one part of the island in favor of a different part. They also avoid Ecology effectiveness monitoring requirements and the need for a Watershed Prioritization, although both are already being conducted as part of the City’s NPDES requirements.
 - Out-of-basin programs have the potential to capture participation from projects in a larger area, but would probably only be used for projects with replaced impervious surface. Fee payment for the “net improvement” portion of development on cleared land would be unlikely because these projects would be required to build onsite stormwater controls for the “existing to post-project” portion the requirement, making it more likely that they would build onsite controls to comply with the full requirement. Of the scenarios evaluated, it appears that the only citywide, out-of-basin SCTP with potential for significant use would be an MR5 program for general development projects, although it has only slightly higher potential use than in-basin MR5 programs for North Eagle Harbor / Winslow and Manzanita watersheds.
 - Of the SCTPs evaluated for City bike lane and sidewalk projects, the in-basin programs have the potential to bring in approximately the same revenue as the citywide program for planned projects. If more non-motorized improvements are expected in other watersheds, a citywide program would allow pooling of fee payments from throughout the island and would likely outperform the individual in-basin programs. However, the initiation of any SCTP would also initiate a requirement for onsite controls, since the bike lanes and sidewalks are generally considered new impervious surfaces, and the “paved to existing” portion of the requirement must be met onsite.
- Ultimately, it will be up to the City to weigh costs and benefits of developing an SCTP as a funding mechanism for stormwater retrofit improvements.



6.2 Workshop Discussion Summary: Final Conclusions

In response to a question requesting whether the City would consider further advancement of a SCTP for Bainbridge Island, City staff discussed a hypothetical example project involving a regional facility for MR6 (treatment) compliance. City staff questioned whether runoff from a hypothetical development project would enter the Sound untreated, led to a general response that the City might consider an SCTP if (i) a site could be located that would make sense hydrologically and financially, and (ii) the program was an “in contributing area” program where development runoff would effectively be managed equally stringently by a regional facility as would occur under current requirements for distributed onsite facilities. City staff felt that an SCTP under which new or redevelopment runoff would be managed less stringently than under current regulations, even with additional fee payments supporting stormwater management in another watershed, would not be acceptable on Bainbridge Island.

Staff also discussed the question of whether an SCTP would support island-wide stormwater strategy, pointing out that island-wide stormwater strategy is currently being developed through the Stormwater System Plan. After being required by the Ecology grant to learn more about this tool, staff stated that given the right facility site, an SCTP is a tool that could be part of an overall stormwater strategy.

From the Capital Projects Division perspective, staff felt that a fee program could make capital projects easier and quicker to administer and build, allowing permitting requirements to be exported to another facility in a turnkey process. From the Finance perspective, staff remarked that there is only one stormwater revenue source (the Surface and Stormwater Management Fee charge), which increases a small amount with new Impervious Surface Units (ISUs). But since the City keeps gaining new assets which cost more to maintain, a new revenue source sounds like a good idea, as long as the program also improves ecological outcomes.

6.3 Stormwater Control Transfer Program Conclusions Summary

Based on the research and analyses conducted for this Stormwater Alternative Funding study and feedback provided by City staff at the “State of the Practice” presentation and “Framework Options” workshop, the Project Team concludes that certain SCTP frameworks on Bainbridge Island have the potential to generate enough revenue to justify program development and implementation costs and to provide an additional funding source for City stormwater management facilities, acceleration of ecosystem recovery, and streamlined stormwater compliance for capital projects.

7 REFERENCES

City of Bainbridge Island (2017). City of Bainbridge Island 2016 Comprehensive Plan.

City of Bainbridge Island (2021). Status of Bainbridge Island Housing, Biennial Report 2017-2018, 2019-2020.

City of Tacoma (2016). City of Tacoma Regional Stormwater Facilities Plan.

City of Tacoma (2017 revision). City of Tacoma Regional Stormwater Facilities Plan, Attachment 1 Flett Creek Watershed.



City of Tacoma (2018). City of Tacoma Regional Stormwater Facilities Plan, Attachment 2 Thea Foss Watershed.

Ecology (2013). Cost Analysis for Western Washington LID Requirements and Best Management Practices. State of Washington Department of Ecology, prepared by Herrera Environmental Consultants.

Ecology (2019). Stormwater Manual for Western Washington. Publication Number 19010-021.

Herrera Environmental Consultants (2022a). City of Bainbridge Island – Watershed Inventory and Assessment.

Herrera Environmental Consultants (2022b). City of Bainbridge Island – Watershed Prioritization.

Herrera Environmental Consultants, Lotus Water, and CPD Solutions (2021). Report on Feasibility of In-Lieu Fee, Credit Trading, and Basin Transfer Programs for Stormwater Management. Prepared for King County Water Had Land Resources Division, Stormwater Services Section.

King County (2021). King County, Washington, Surface Water Design Manual. King County Department of Natural Resources and Parks.

Kitsap County Public Works (2019). Kingston Regional Stormwater Facility Plan.

Kitsap County (2021). Buildable Lands Report, Final.

WSDOT (2021 revision). Management Plan Stormwater Retrofit Program.



APPENDIX A. “STATE OF THE PRACTICE” SLIDES

STORMWATER ALTERNATIVE FUNDING: STATE OF THE PRACTICE



FOR CITY OF BAINBRIDGE ISLAND OCT 18, 2021




'State of the Practice' Overview

1. Context: Grant, Watersheds, Current Funding
2. Alternative Funding Options
 - Stormwater Control Transfer Options
 - Alternative Compliance Options
3. Looking ahead to Framework Options

Breaks for questions after each Alternative Funding section

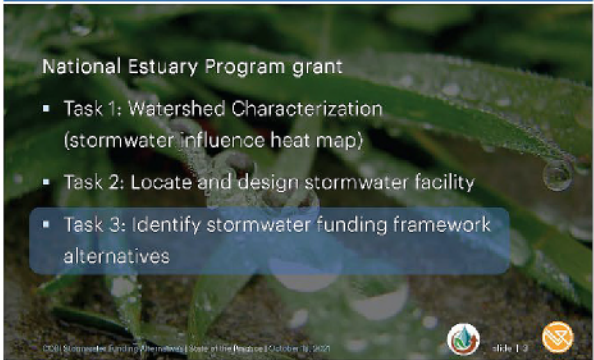
Ecology | King County | State of the Practice | October 18, 2021



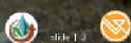
Context: **NEP GRANT**

National Estuary Program grant


- Task 1: Watershed Characterization (stormwater influence heat map)
- Task 2: Locate and design stormwater facility
- Task 3: Identify stormwater funding framework alternatives



Ecology | King County | State of the Practice | October 18, 2021




Context: **COBI WATERSHEDS**

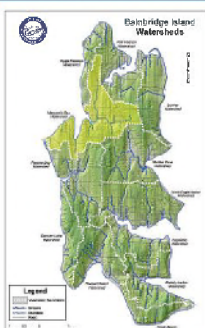


- 12 watersheds, 10 with ~75%+ "natural" land cover
- 2 watersheds more urbanized

Ecology | King County | State of the Practice | October 18, 2021




Context: **COBI WATERSHEDS**



- Manzanita: identified by Ecology as a priority stream ("fair" with potential to be "good")

Ecology | King County | State of the Practice | October 18, 2021



Context: **CURRENT RETROFIT FUNDING**

Most retrofit and regional facility projects currently funded through combination of *Ecology grants, utility funding, & loans*

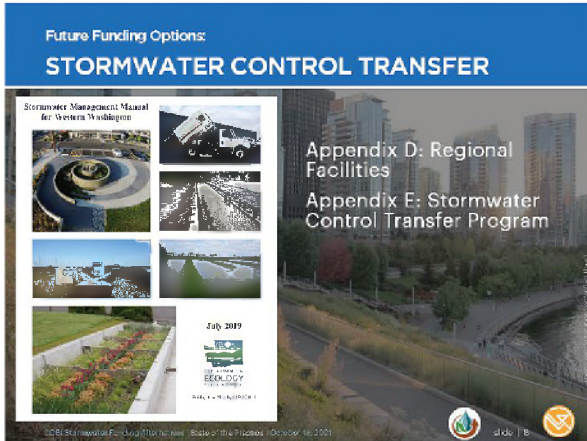
Limited local examples of facilities built to as part of alternative funding programs such as:

- City of Tacoma: 2 regional facilities
- City of Redmond: Started a transfer program
- City of Kingston: Currently building a regional facility



Ecology | King County | State of the Practice | October 18, 2021



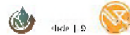



**Future Funding Options:
STORMWATER CONTROL TRANSFER**

Terminology

- **Development project:** Project that has triggered stormwater requirements
- **Mitigation facility:** Facility built to manage stormwater (not at development project)
 - Regional facility: Facility that provides stormwater mitigation for multiple development projects
 - Equivalent facility: Facility sized specifically to provide stormwater mitigation for the development project

COBI Stormwater Funding Alternatives | Background Report | October 16, 2023



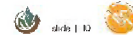
**Future Funding Options:
STORMWATER CONTROL TRANSFER**



(1) In Contributing Area

- Development Project is within contributing area of Mitigation Facility.
- No Ecology approvals, capacity calculations, tracking.
- Can transfer full requirement (post-project to historic).

COBI Stormwater Funding Alternatives | Background Report | October 16, 2023



**Future Funding Options:
STORMWATER CONTROL TRANSFER**

(1) In Contributing Area

Example:

- City of Kingston (Runoff Treatment)



COBI Stormwater Funding Alternatives | Background Report | October 16, 2023



**Future Funding Options:
STORMWATER CONTROL TRANSFER**

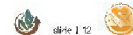


(2) In-Basin Area Transfer

- Development Project in same basin* as Mitigation Facility.
- Mitigation Facility must discharge to same point (or upstream) in receiving water.

* COBI: basin = watershed

COBI Stormwater Funding Alternatives | Background Report | October 16, 2023



Future Funding Options:
STORMWATER CONTROL TRANSFER



(2) In-Basin Area Transfer

- No Ecology approvals*, but capacity calculations, tracking / reports required.
- Can transfer full requirement (post-project to historic).

* No approvals for MR5 & MR7, approval required for MR6 & MR8

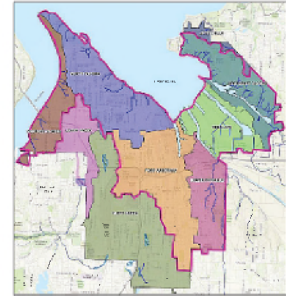


Future Funding Options:
STORMWATER CONTROL TRANSFER

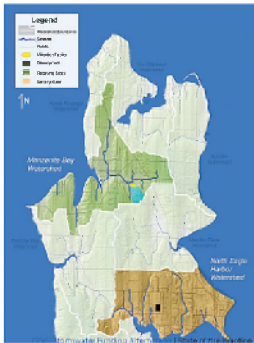
(2) In-Basin Area Transfer

Example:

- City of Tacoma (Runoff Treatment, Flow Control)



Future Funding Options:
STORMWATER CONTROL TRANSFER



(3) Out-of-Basin Area Transfer

- Development Project is in different basin than Mitigation Facility.
- Mitigation Facility must be in higher priority basin than Development Project.
 - Purpose: Accelerate improvements to beneficial uses



Future Funding Options:
STORMWATER CONTROL TRANSFER



(3) Out-of-Basin Area Transfer

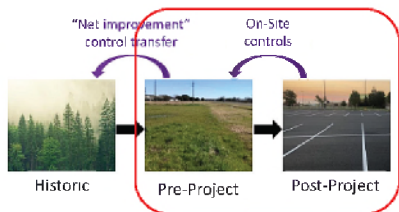
- Ecology requirements:
 - Prioritization approval (SMAP)
 - Effectiveness monitoring
 - Capacity calculations
 - Tracking / reports
- Can only transfer "net improvement" requirement



Future Funding Options:
STORMWATER CONTROL TRANSFER

Existing environmental conditions shall not be worsened by the transfer program.

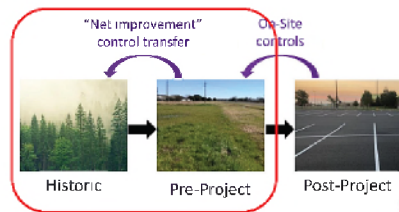
➢ Out-of-Basin Area Transfer:



Future Funding Options:
STORMWATER CONTROL TRANSFER

Existing environmental conditions shall not be worsened by the transfer program.

➢ Out-of-Basin Area Transfer:



STORMWATER CONTROL TRANSFER

(3) Out-of-Basin Transfer

Example:

- City of Redmond (Tosh Creek)



STORMWATER CONTROL TRANSFER

Appendix D: Regional Facilities

- Guidelines for all 3 types of stormwater control transfer
- All info needed for In Contributing Area, In-Basin Area Transfer

Appendix E: Stormwater Control Transfer Program

- Additional guidelines for Out-of-Basin Area Transfer

STORMWATER CONTROL TRANSFER

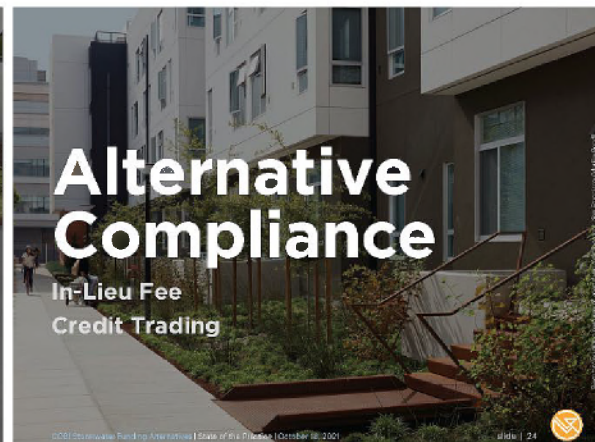
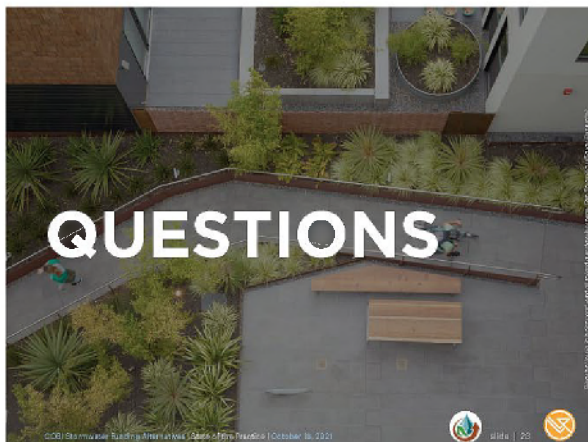
Ecology Min Req ¹	In Contrib Area	In-Basin	Out-of-Basin
MR5 On-Site SW Mgmt ²	Yes	Yes	Yes
MR6 Runoff Treatment	Yes ²	W/ approval ³	W/ approval ³
MR7 Flow Control	Yes	Yes	Yes
MR8 Wetland Protection	Yes ⁴	Unlikely	No

1. LID Performance Standard only
2. Ensures similar pollution characteristics
3. Must develop area-specific trading criteria to ensure equivalent or improved runoff treatment, to be approved by Ecology
4. "Acknowledges it is possible"

STORMWATER CONTROL TRANSFER

Timing

- Ecology: Mitigation facilities "must be operational prior to, and must have capacity for, new development and new surfaces in redevelopment projects."
 - Mitigation facility must be built before development projects can pay (pay fee or buy credits) to achieve compliance.
 - Exception: Replaced hard surfaces in redevelopment projects
- RCW 82.02.020 requires that revenue be spent within 5 years of receipt.



Alternative Compliance:

IN-LIEU FEE – PROGRAM DESCRIPTION

Nuts & bolts: 

- **Development projects pay** government agency to achieve compliance
- **Agency uses fee revenue** for stormwater benefits, typically for **capital project** construction and maintenance (e.g. retrofits)

Multiple purposes:

1. Create **centralized fund** that can be applied to address the most critical watershed needs. Agency can build facilities in **areas of greatest need** and/or **greatest cost-benefit**.
2. Provide **flexibility for the development community**.
3. Provide **price ceiling** for stormwater credit trading market.

CCB Stormwater Funding Alternatives | State of the Practice | October 16, 2021



Alternative Compliance:

IN-LIEU FEE – PROGRAM DESCRIPTION

When does an In-Lieu Fee program work well?

- Local government knows exactly what it needs to build to achieve goals, can more easily achieve goals through capital projects
- Agency has lots of unfunded runoff reduction project requirements / needs
 - Consent decree
 - Unfunded retrofit projects
 - Unfunded grant program

CCB Stormwater Funding Alternatives | State of the Practice | October 16, 2021



Alternative Compliance:

CREDIT TRADING – PROGRAM DESCRIPTION

Nuts & bolts: 

- **Development projects buy credits from private sector BMPs** to achieve compliance
- CSJ construction and maintenance **delegated to private sector**

Multiple purposes:

1. Leverage private sector to build BMPs with **greatest cost-benefit ratio**. Program rules can also focus BMPs in areas of greatest need or where development is not occurring.
2. Provide **flexibility for the development community**.
3. Take advantage of **private sector development** to build stormwater BMPs.

CCB Stormwater Funding Alternatives | State of the Practice | October 16, 2021



Alternative Compliance:

CREDIT TRADING – PROGRAM DESCRIPTION

When does a Credit Trading program work well?

- Lots of development + stormwater management ordinance
- Conditions:



CCB Stormwater Funding Alternatives | State of the Practice | October 16, 2021



Alternative Compliance:

NATIONWIDE SURVEY 2020

In-Lieu Fee Only (8)

- Prince George's County, MD
- Aspen, CO
- Portland, OR
- Seattle, WA
- North Carolina
- San Francisco, CA
- Tacoma, WA
- Redmond, WA



In-Lieu Fee + Credit Trading (5)

- Washington, DC
- Chattanooga, TN
- Grand Rapids, MI
- St. Paul, MN
- Lake County, IL

CCB Stormwater Funding Alternatives | State of the Practice | October 16, 2021



Alternative Compliance:

IN-LIEU FEE SURVEY

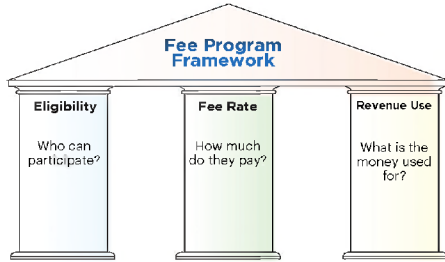
Program	Agency	Jurisdiction Type	Regulated Issue	Status	Launch Year
Washington, DC	Dept. of Energy and Environment	Large city	Stormwater quantity	Active	2013
Chattanooga, TN	Department of Public Works	Medium city	Stormwater quantity	Limited	2015
Grand Rapids, MI	Environmental Services Department	Medium city	Stormwater quantity	Future	2021
Prince George's County, MD	Dept. of Permitting, Inspection and Enforcement	County	Stormwater quantity	Active	2018
Aspen, CO	Department of Engineering	Small city	Stormwater quantity	Active	2011
Portland, OR	Bureau of Environmental Services	Large city	Stormwater quantity	Active	2000
St. Paul, MN	Capital Region Watershed District	Metropolitan	Stormwater quantity	Limited	2006
Lake County, IL	Stormwater Management Commission	County	Stormwater quantity	Future	2020
Seattle, WA	Seattle Public Utilities	Large city	Stormwater quantity	Future	TBD
North Carolina	Division of Program Services - Watershed Protection	State	Nutrient load	Active	2000
Tacoma, WA	Department of Environmental Services	Medium city	Stormwater quantity	Active	2018
Redmond, WA	Department of Public Works - Stormwater Utility	Small city	Stormwater quantity	Inactive	2013
San Francisco, CA	San Francisco Public Utility Commission	Large city	Stormwater quantity	Future	TBD

CCB Stormwater Funding Alternatives | State of the Practice | October 16, 2021

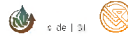
slide | 40



IN-LIEU FEE SURVEY



COP Stormwater Funding Alternatives | State of the Practice | October 1st, 2023



ELIGIBILITY

Prince George's County, MD

- A fee can be paid in lieu of attenuating the 100-year storm to prevent downstream flooding
- About 70% of redevelopment projects opt to pay ILF
- Funds strategic flood control measures

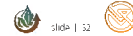
MUST DEMONSTRATE TECHNICAL INFEASIBILITY

St. Paul, MN

- ILF is the last option in the alternative compliance sequencing (on-site → off-site → fee)
- Only public agencies have been allowed to comply with in lieu fees

Tacoma: Allows all development to use fee option. Most projects that can, use fee

COP Stormwater Funding Alternatives | State of the Practice | October 1st, 2023



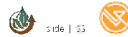
FEE BASIS

Fee = Cost / Drainage Area -or- Cost / Volume Managed

Most agencies surveyed based fee on:

- Public sector project costs to build facility with equivalent benefits
- Estimated project costs
HOWEVER: Tacoma (and WA cities in general) base fee on specific completed project cost.
- Full life cycle costs (recommended!)
Costs can include: Land acquisition, planning & design, construction, O&M, program management

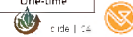
COP Stormwater Funding Alternatives | State of the Practice | October 1st, 2023



FEE RATES

Program	Fee Rate	Fee Unit	Standardized (\$/SF imperv)	Fee Frequency
Washington, DC	\$3.78	\$/gal retention	\$2.83/yr	Annual
Chattanooga	\$15	\$/CF retention	\$3.75	One-time
Grand Rapids	\$8.24 \$5.26	\$/gal retention \$/gal retention maintenance	\$21.54	One-time
Prince George's Co	\$16,000	\$/acre imperv	\$0.36	One-time
Aspen	\$70	\$/CF retention	\$4.89	One-time
Portland	\$3.70	\$/SF imperv	\$3.70	One-time
Saint Paul	Linear: \$75,000 Parcel: \$100,000	\$/acre imperv	\$2.28	One-time
Tacoma	\$0.97 (flow ctrl)	\$/SF imperv	\$0.97	One-time
San Francisco	\$920,000	\$/acre imperv	\$21.00	One-time

COP Stormwater Funding Alternatives | State of the Practice | October 1st, 2023



FEE REVENUE USE

- Timing:** Two models: (1) Build then collect vs. (2) Collect then build
 - Ecology requires "Build then Collect" in most cases (all other agencies surveyed can "Collect then Build").
 - RCW 82.02.020 requires that revenue be spent within 5 years of receipt.
- Activity:** Build new facilities vs. more flexible use (e.g. maintenance of existing facilities, project review staff time, etc.)
 - Ecology requires building / operating of facilities with equivalent or greater benefits (a minority of agencies surveyed have more flexibility).
- Location:** In-basin vs. out-of-basin
 - 8 of 12 require revenue to be spent in same watershed as regulated project, a few allowed stormwater controls to be built in more sensitive watershed

COP Stormwater Funding Alternatives | State of the Practice | October 1st, 2023



TAKEAWAYS

Program use

Out of 13 surveyed, 3 actively operating: Tacoma, Portland, Prince George's Co. (DC's fee program exists mainly as enforcement if credit trading not kept current)

Tacoma, WA

Fee Revenue Last Fiscal Year: **\$359,711**

- 7 projects: most who can, pay the fee
- No revenue expended to date

Portland, OR

Fee Revenue Last Fiscal Year: **\$362,818**

- Can be spent flexibly, mainly used for "% for Green" grant program
- Doesn't have to be spent in the same watershed

COP Stormwater Funding Alternatives | State of the Practice | October 1st, 2023



In-Lieu Fee Survey Results:
TAKEAWAYS

Successes

- Developers like fee option: cost guarantee, no maintenance
- Fee-funded capital projects preferable to private: targeted projects, guaranteed maintenance (Tacoma)
- In lieu fee can support other programs: e.g., grant programs, credit trading

Challenges

- Lack of viable projects to receive fee revenue
- Gaining stakeholder buy-in
- Initial effort to develop the program

OOB Stormwater Funding Alternatives | State of the Practice | October 16, 2023



In-Lieu Fee Survey Results:
TAKEAWAYS

Program Design

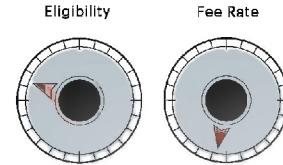
- Design to meet program goals, e.g., revenue stream vs developer flexibility

Minimal participation:

- Only infeasible projects can pay fee for compliance
- High fee

Maximum participation:

- All projects can pay fee
- Low fee



OOB Stormwater Funding Alternatives | State of the Practice | October 16, 2023

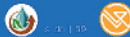


Alternative Compliance:

CREDIT TRADING SURVEY

Program	Agency	Jurisdiction Type	Regulated Issue	Status	Launch Year
Washington, DC	Dept. of Energy and Environment	Large city	Stormwater quantity	Active	2013
Chattanooga, TN	Department of Public Works	Medium city	Stormwater quantity	Limited	2015
Grand Rapids, MI	Environmental Services Department	Medium city	Stormwater quantity	Future	2021
St. Paul, MN	Capital Region Watershed District	Watershed	Stormwater quantity	Limited	2006
Lake County, IL	Stormwater Management Commission	County	Wetland Area	Active	2001

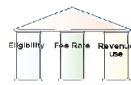
OOB Stormwater Funding Alternatives | State of the Practice | October 16, 2023



Alternative Compliance:

CREDIT TRADING SURVEY

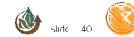
Fee Program Framework



Credit Trading Program Framework

- Credit unit
- Eligibility to use credits
- Eligibility to generate credits
- Trading boundaries
- Trading ratios
- Trading cycle
- Trading platform
- Credit supply support

OOB Stormwater Funding Alternatives | State of the Practice | October 16, 2023



Alternative Compliance:

CREDIT TRADING SURVEY

Program Framework Decisions

- **Credit unit:** stormwater retention capacity (gal or CF)
- **Eligibility to use credits:** all development projects vs only where onsite compliance infeasible
- **Eligibility to generate credits:** what stormwater facilities can generate credits (when built, voluntary vs overdesign)
- **Trading boundaries:** same watershed, priority watersheds, MS4 vs CSS, etc.
- **Trading ratios:** requirements to purchase credits at higher ratio in certain places or for certain project types

OOB Stormwater Funding Alternatives | State of the Practice | October 16, 2023



Alternative Compliance:

CREDIT TRADING SURVEY

Program Framework Options (cont.)

- **Trading cycle:** one-time vs annual
- **Trading platform:** online vs. paper voucher
- **Credit supply support:** how to generate credits for program start-up

OOB Stormwater Funding Alternatives | State of the Practice | October 16, 2023



Credit Trading Survey Results:
DC SUCCESS STORY

 **DC Dept of Energy & Environment**

Needed developer flexibility, credit trading was preferred value.


- Program rules push stormwater projects to areas of greatest need/benefit
- Market-based → government buy/sell
- Construction & maintenance delegated to private sector
- Satisfied developer demand for flexibility



CCB Stormwater Trading Alternatives | State of the Practice | October 10, 2023 | slide | 43

Credit Trading Survey Results:
DC SUCCESS STORY

Geography:



Program decisions:

- Stakeholder engagement: learned lesson!
- Made credit use easy, no off-ramps
- Aggressively pushed credit generation
 - Flexible entry for generators
 - Financing: Purchase guarantees, aggregator grants
- Aggressively pushed MS4 prioritization
 - Trading boundaries, High Impact Credits
- Planned for long-term
 - Annual credit cycle, maintenance pressure
 - Online platform: accessible, integrated with permitting

CCB Stormwater Trading Alternatives | State of the Practice | October 10, 2023 | slide | 44

Credit Trading Survey Results:
ANYBODY ELSE?

Other programs:

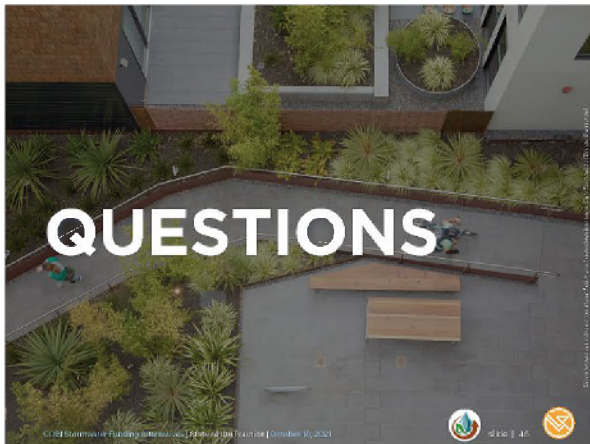
- St. Paul: Limited scope (public sector only)
 - Goals, compliance flexibility, not prioritization
 - Simple admin
- Lake County: Functional, well-used for wetland mitigation
 - Built to fill in gaps (isolated wetlands) for USACE system
 - Higher ratio for Impacts to higher value wetlands

Programs with potential:

- Grand Rapids: Engaged city agency, benefit from DC model
 - Hybrid model: upfront credit for simplicity with annual maintenance payment
 - Online platform: High usage, streamlined with permitting
 - TBD: Sufficient market? Trying to support credit generation, demand will come.

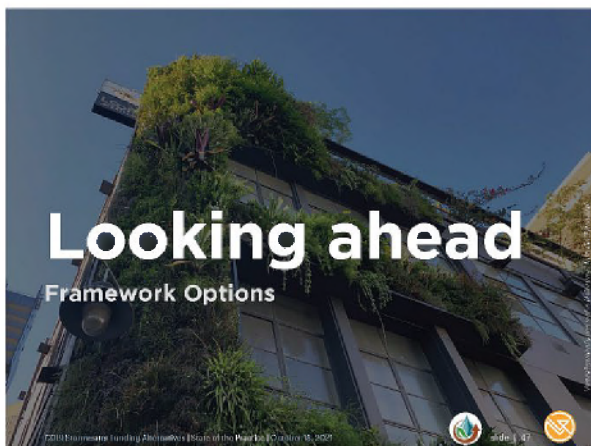
CCB Stormwater Trading Alternatives | State of the Practice | October 10, 2023 | slide | 45

QUESTIONS



CCB Stormwater Trading Alternatives | State of the Practice | October 10, 2023 | slide | 46

Looking ahead
Framework Options



CCB Stormwater Trading Alternatives | State of the Practice | October 10, 2023 | slide | 47

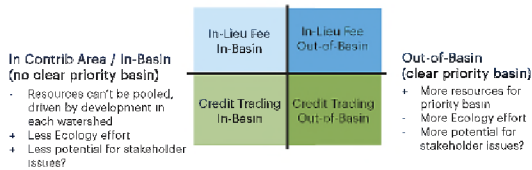
Looking Ahead:
QUESTIONNAIRE

Goal: Feedback to help focus Framework Options

- Confirm transfer option preference (i.e., assuming Out-of-Basin Area Transfer to Manzanita)
- Confirm alternative compliance preference (i.e., In-Lieu Fee, In-Lieu Fee + Credit Trading)
- Confirm MR focus (e.g., MR5-MR7, only MR5 & MR7, only MR7)
- Other questions, areas for more info?

CCB Stormwater Trading Alternatives | State of the Practice | October 10, 2023 | slide | 48

CONSIDERATIONS



CCRE Stormwater Funding Alternatives | State of the Practice | October 16, 2021

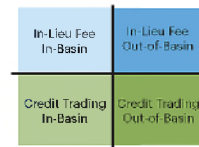


slide | 49

CONSIDERATIONS

In-Lieu Fee (emphasis on City projects)

- More project control
- Less program development effort
- City construction, C&M burden



Credit Trading (emphasis on private sector projects)

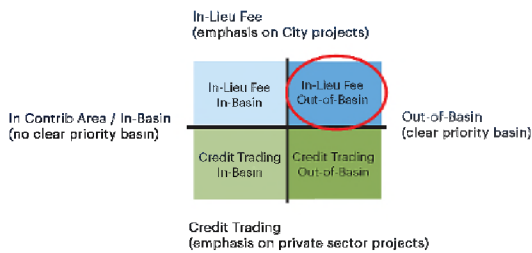
- Less project control
- More program development effort
- Private sector construction, C&M burden

CCRE Stormwater Funding Alternatives | State of the Practice | October 16, 2021



slide | 50

CONSIDERATIONS



CCRE Stormwater Funding Alternatives | State of the Practice | October 16, 2021



slide | 51

Looking ahead:

DATA REQUEST

To develop participation estimates:

- Stormwater compliance data for past several years (both projects that comply and those that cannot), specifically:
 - Total impervious area subject to each MR of interest
 - Area (or %) subject to MR5 only vs MR5 & MR7
 - Info indicating if projects subject to both MR5 & MR7 meet them separately or using the same stormwater control facilities
 - To understand impacts of requirement to demonstrate infeasibility: Impervious area or % of projects that cannot meet MRs of interest
- Development trend data – historical, future if available

To understand impacts of out-of-basin vs in-basin transfer on participation:

- Geospatial info on above compliance data
- Estimate of "net improvement" relative to full requirement

CCRE Stormwater Funding Alternatives | State of the Practice | October 16, 2021



slide | 52

DISCUSSION

Goal: Feedback to help focus Framework Options

- Confirm transfer option preference (i.e., assuming Out-of-Basin Area Transfer to Manzanita)
- Confirm alternative compliance preference (i.e., In-Lieu Fee, In-Lieu Fee + Credit Trading)
- Confirm MR focus (e.g., MR5-MR7, only MR5 & MR7, only MR7)
- Other questions, areas for more info?

CCRE Stormwater Funding Alternatives | State of the Practice | October 16, 2021



slide | 53

Thank you!

Katie.Pilat@LotusWater.com



APPENDIX B. STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON – GUIDANCE FOR STORMWATER CONTROL TRANSFER PROGRAMS



Stormwater Management Manual for Western Washington Guidance for Stormwater Control Transfer Programs

Excerpted from Herrera and Lotus (2021, pp. 4-11)

The SWMMWW outlines the measures necessary to control the quantity and quality of stormwater produced from new development and redevelopment in Western Washington. Volume 1 of the SWMMWW introduces the primary requirements applicable to development activity, including nine MRs designed to reduce the adverse impacts of runoff from project sites. Volume 1 has multiple appendices, including two that have direct significance to the programs discussed in this report: Appendix I-D: Regional Facilities and Appendix I-E: Stormwater Control Transfer Program.

Note that technically, the SWMMWW is considered “guidance” and is not an official state regulatory document. However, because the NPDES permit requires King County to adopt a manual that is equivalent to the major components of the SWMMWW, and because Ecology often refers to the SWMMWW as a baseline for their decisions on approval or rejection of any alternative approaches to stormwater management, for the purposes of this report the content of the SWMMWW is treated as a requirement.

SWMMWW Minimum Requirements

For the purposes of this report, only two MRs are addressed: MR5 On-Site Stormwater Management and MR7 Flow Control. These are the two primary flow control-related MRs in the SWMMWW and the two MRs for which Ecology provides direction as to how they can be met when using an In-Lieu Fee program (and by inference a Credit Trading program). While MR6 Runoff Treatment and MR8 Wetlands Protection can also feasibly be included in an In-Lieu Fee program, Ecology provides little guidance in the SWMMWW, and King County has indicated that for the purpose of this report, those MRs are not under consideration.

The primary purpose of MR5 (On-Site Stormwater Management) is to “reduce the disruption of the natural site hydrology through infiltration” (Ecology 2019). This is achieved by requiring projects to install small, parcel-scale low impact development (LID) stormwater best management practices (BMPs) designed to infiltrate, disperse, and retain stormwater runoff on site. The specific MR5 requirements for a given site are dependent upon the project location and size. Generally, any projects located inside the Urban Growth Area (UGA), or projects located outside the UGA on a parcel smaller than 5 acres, have two options for meeting MR5. The first option is to select from a list of pre-approved LID BMPs (i.e., the “List Approach”). The BMPs are listed in the SWMMWW in order of preference, and the first applicable BMP that is feasible for a project must be used on the site. The second option is to achieve a specified “LID Performance Standard.” This requires that hydrologic modeling is performed for the site, including any proposed flow control BMPs, to demonstrate that the flow reduction requirements specified as part of the LID Performance Standard will be achieved (specifics outlined below). For projects located outside the UGA on parcels 5 acres or larger, the only option is to achieve the LID Performance Standard.



Like MR5, MR7 (Flow Control) is also designed to reduce the impacts of development on site hydrology. However, instead of focusing on smaller sites and on-site infiltration, MR7 generally applies to larger projects and uses larger engineered facilities to handle greater quantities of stormwater runoff (instead of the smaller, parcel-scale BMPs used under MR5's List Approach). In addition, MR7 primarily targets discharge to streams and other waterways sensitive to erosion and other hydrologic disruptions.

Given that MR5 and MR7 address similar goals (flow control) and are both required for larger projects (i.e., projects with over 10,000 square feet of effective impervious area), it is worth summarizing a few additional details about these MRs:

- Though based on the same method of analysis, the modeling standard applied to MR7 is more stringent than the LID Performance Standard option of MR5. Specifically, the LID Performance Standard requires that runoff from development sites shall match predevelopment discharge durations for the range of pre-developed discharge rates from 8 percent of the 2-year peak flow to 50 percent of the 2-year peak flow, whereas MR7 matches flows from the 2-year peak flow up to the 50-year peak flow. In essence, MR5 applies to smaller and more frequent storm events while MR7 applies to the larger, less frequent events. Both are modeled to match pre-developed historical conditions (forested or prairie), except under a select few situations and in certain developed areas.
- In areas with “good” soils where stormwater infiltration is feasible, projects that trigger both MR5 and MR7 (e.g., larger projects) often choose to meet the MR5 LID Performance Standard rather than the MR5 List Approach. The reason for this common approach, is that an infiltration facility designed to meet MR7 can also typically meet MR5 (again, assuming good soils), thereby providing an efficient means of satisfying both MRs.
- As noted previously, MR7 primarily targets discharge to streams and rivers, and often does not apply to development discharging directly to marine waters, large lakes, and large rivers. MR5 applies to all of these receiving water types.

SWMMWW Appendices

There are two appendices in Volume I of the SWMMWW that are directly relevant to these programs: Appendix I-D: Regional Facilities and Appendix I-E: Stormwater Control Transfer Program. Both are summarized briefly in the bullets below, and described in more detail in the subsequent paragraphs:

- **Appendix I-D: Regional Facilities** provides guidance on how regional facilities can be used to satisfy some of the MRs in the SWMMWW. Regional facilities make up the core of most In-Lieu Fee, Credit Trading, and Basin Transfer programs, therefore the contents of this appendix will have considerable impact on any of these programs.
- **Appendix I-E: Stormwater Control Transfer Program** provides guidance on developing and implementing a program specifically designed to “direct stormwater management efforts to watersheds where reducing high stream flows is more likely to contribute to maintaining or restoring designated and existing beneficial uses” (Ecology 2019). In essence, the objective of a Stormwater Control Transfer Program is to transfer the stormwater improvements that are typically tied to a specific development project site (e.g., MR5 and MR7 discussed previously) to



a separate, higher-priority watershed (“out-of-basin”) where those improvements can be combined and focused to provide greater benefit. Appendix I-E applies specifically to Basin Transfer programs, which would rely on either a fee or credit trading program as the financial mechanism for the transfer.

Most flow control transfer programs rely upon use of regional facilities in-lieu of on-site facilities. Therefore, essentially all of Appendix I-D is highly relevant to these programs. The following list itemizes key points from Appendix I-D:

- For MR5, only the flow control requirement calculated using the LID Performance Standard is transferable from the development site to another regional site. If the List Approach is used, those requirements cannot be transferred to a regional facility.
- Regional facilities must be operational prior to, and must have capacity for, new development and new surfaces in redevelopment projects. King County may exempt redevelopment projects from meeting part or all of MR5 and MR7 prior to development (as well as MR6 Runoff Treatment and MR8 Wetlands Protection, if desired) if the County has adopted a plan and a schedule that fulfills those requirements in regional facilities. The basic intent is that existing environmental conditions shall not be worsened by the program, thus the reason redevelopment can provide mitigation after the redevelopment has occurred.
- For MR5 and MR7, different requirements apply to three distinct options related to the location of the development site in respect to the regional facility where the flow control is transferred:

In Option 1, the development project is located within the contributing area of the credit-generating facility (Regional Facility A in Figure 1). Ecology does not give this situation a name, but for this report it will be called “in contributing area.” For “in contributing area” mitigation, none of the Ecology requirements listed above apply, and the full MR5 and MR7 requirement (i.e., post-development to forested) can be transferred.

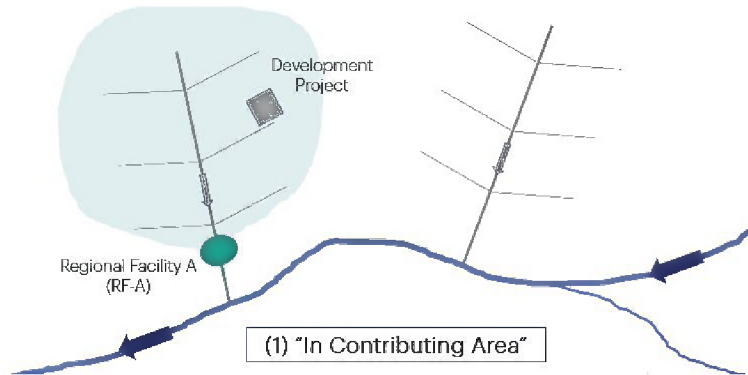


Figure 1. Option 1: In Contributing Area Flow Control Transfer.

In Option 2, the development project is located within the same basin as the regional facility (Regional Facility B in Figure 2), and the regional facility must discharge to the same point (or upstream) in the receiving water as the development project. This is referred to as an “In-Basin Transfer.” For In-Basin Transfer, the agency must submit facility capacity calculations and tracking to Ecology, but watershed prioritization approval and effectiveness monitoring are not

required. This option also allows transfer of the full requirement (MR5 and MR7) to the credit-generating facility. (Note that this simplified example assumes the conveyance system between the development project and the receiving water has capacity for any increased runoff.) If transferring to a regional facility that will discharge downstream of the project site, the County must submit a Basin Plan to Ecology for review and approval, and demonstrate how discharging downstream of the project site provides an equal or greater benefit.

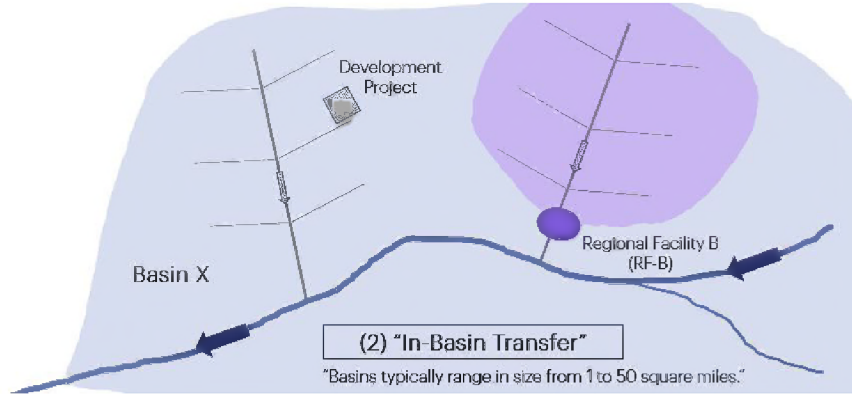


Figure 2. Option 2: In-Basin Flow Control Transfer.

In Option 3, the development project is located in a different basin from the regional facility (Figure 3). This is referred to as an "Out-of-Basin Transfer." Out-of-Basin Transfers trigger additional Ecology requirements, starting with selecting a priority watershed(s) to accept the flow control transfer. Out-of-Basin Transfers may only transfer the mitigation obligation associated with a net improvement in stormwater management relative to the existing conditions (i.e., the conditions that existed immediately prior to the project development). That is, flow control BMPs must be installed on-site to mitigate any impacts associated with the project relative to existing (pre-project) conditions, but the project may transfer to an out-of-basin regional facility an equivalent mitigation associated with the difference between existing conditions and historical (typically forest or prairie) conditions (Figure 4).

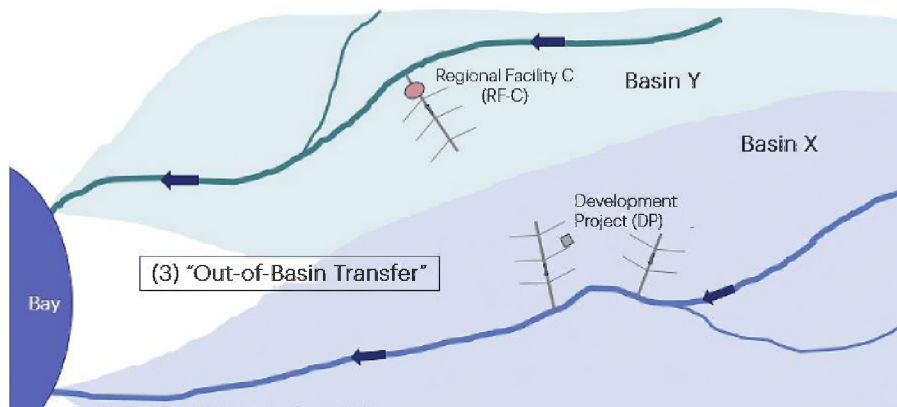


Figure 3. Option 3: Out-of-Basin Flow Control Transfer.

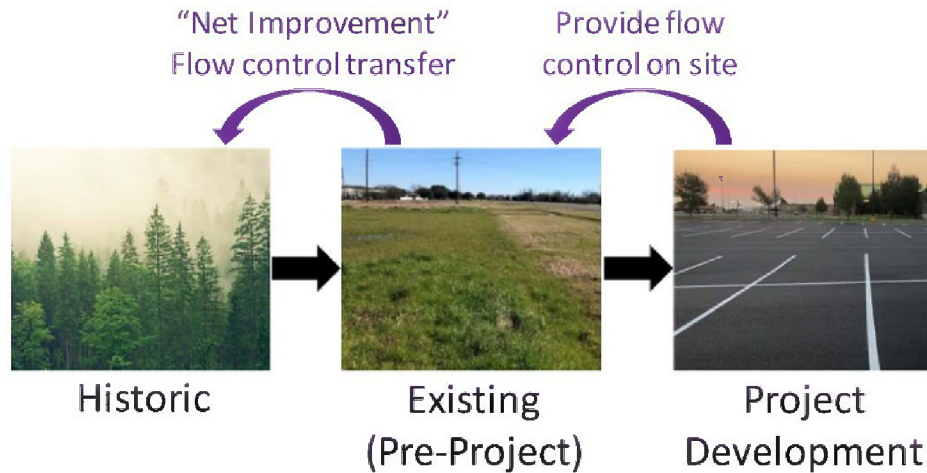


Figure 4. Flow Control Transfer as Applied to Option 3 (out-of-basin).

Appendix I-D also allows a project site to transfer mitigation requirements to an “equivalent facility” instead of to a regional facility. The intent being that a site does not necessarily have to have a large, regional facility available to accept a transfer of their mitigation requirements. A smaller, off-site facility that only provides mitigation equivalent to that required for the given project may also be used. Equivalent facility types may include various flow control BMPs (detention ponds, bioretention, etc.) or reforestation of impervious area, pasture, or lawn.

Appendix I-E: Stormwater Control Transfer Program builds on the concepts presented in Appendix I-D by outlining specific implementation requirements for transferring stormwater mitigation measures not only off-site, but into a separate basin altogether. The purpose of these out of basin stormwater transfers is to accelerate hydrologic improvements in higher priority watersheds by focusing stormwater mitigation efforts in these watersheds. With this goal in mind, Ecology developed detailed guidelines and requirements for implementation via Appendix I-E.

The key points from Appendix I-E are highlighted here:

In developing a Stormwater Control Transfer Program, the County must develop a plan and submit the plan to Ecology for approval. The plan must include:

- A science-based watershed prioritization scheme, including relative priority rankings. This is a substantial effort and Ecology provides detailed steps for performing this prioritization.
- A plan to measure effectiveness of improvements in the high priority watershed(s) where stormwater facilities have been constructed. This includes a minimum of 1 year of baseline monitoring prior to construction of any stormwater improvements.
- A tracking system to record each development/redevelopment project proposing a stormwater transfer. Annual reports must be submitted to Ecology.

- Documentation that the County has solicited input on the proposed plan from local tribes, state and federal natural resource agencies, and the public (through a public review and appeal process).

Other notable technical requirements of a Stormwater Control Transfer Program include:

- The program shall not increase pre-project flow durations (within the MR5 or MR7 performance standard ranges) to any receiving water. In other words, the program shall do no harm to any lower priority watershed related to the transfer of mitigation requirements. As illustrated in Figure 4 and described previously, this means that only the net improvement in stormwater management (i.e., the additional portion of flow control required to match historical conditions versus maintaining existing conditions) is eligible for transfer.
- The SWMMWW makes it clear that areas that are either forested or historical prairie (i.e., undisturbed from historical conditions) under current conditions may not utilize an out-of-basin transfer. Specifically, “projects that convert a forested (or historical prairie) land cover to any other post-developed land cover cannot make use of the Stormwater Control Transfer Program because the flow durations required to be matched at the project site are those of the forested (or historical prairie) condition.” (Ecology 2019).
- Ecology approval of the program does not shield the County from additional or more stringent requirements now or in the future.
- Off-site facilities must be fully functional before or concurrent with a flow credit transfer. (Note that this is slightly different than the guidance presented in Appendix I-D where redevelopment projects may be constructed prior to the off-site mitigation measures being installed if there is a plan and schedule in place. See the first bullet under the previous Appendix I-D discussion).
- Flow Control improvement transfers shall be based on land cover on an area basis for each type of land cover (i.e., impervious surfaces, other hard surfaces, lawn/landscape, and pasture).
- The County must verify long-term O&M of off-site facilities is planned. (As stated previously it is unclear the extent to which these costs can be covered by an in-lieu fee).

Finally, after detailed review of the guidance presented in Appendix I-E, several questions and/or inconsistencies were identified. If the County pursues a Basin Transfer program, the following should be clarified in order to more fully understand Ecology’s intent and the associated implications:

- As of the 2019 SWMMWW, MR7 is the only MR that is specifically identified as available for “out-of-basin” transfer in Appendix I-E. However, Appendix I-D implies that other MRs may also be transferred out-of-basin. After discussing this discrepancy with Ecology, staff reported that Ecology limited the out-of-basin transfer guidance in the SWMMWW to MR7, but intended to leave the door open for consideration of transfers corresponding to MR5 and MR6 (Ryan Gardiner, pers comm. 11/6/2020). Ecology stated they will clarify this intent in subsequent updates to the SWMMWW.



- Although Appendix I-E notes that Ecology approval of a stormwater control transfer program would not shield the County from future regulatory changes, it would be worthwhile to discuss what would happen if a basin is identified as “lower priority” during the watershed prioritization process, but then that basin is subject to a flow control related TMDL (or similar regulatory change) after the program is underway. This would affect basin prioritization and overall program implementation.
- It would be helpful to get clarity from Ecology regarding what they assume is the maximum size for a basin; this would be helpful for determining what would be considered out-of-basin in a transfer program. The term “basin” is not defined in the SWMMWW, aside from the guidance given in Appendix I-B for Basin Plans that states “Basins typically range in size from 1 to 50 square miles”.



APPENDIX C. ANALYSIS 1 GIS RESULTS - PROJECTED ACRES IMPERVIOUS BY LCA CLASS, ZONING CATEGORY, AND WATERSHED





Appendix C
Acres of LCA Class (Partially Utilized and Vacant) by Zone Excluding Critical Areas and Other Assumptions

Watershed	LCA Class	Existing ImperVIOUS by Zone, Watershed, LCA Class excluding Critical Areas (acres)											delta imperVIOUS %		Projected ImperVIOUS by Zone, Watershed, LCA Class -excluding Critical Areas (acres)								Total New ImperVIOUS at Buildout (ac)	Sum by WS (ac)	Multifamily and Commercial only (ac)
		Industrial (WDI only)	Commercial**	R-0.4	R-1	R-2	R-2.9, 3.5, 4.5, 6	R-5, 8, 14	Total	Industrial (WDI only)	Commercial**	R-0.4	R-1	R-2	R-2.9, 3.5, 4.5, 6	Multifamily/R-5, 8, 14	ImperVIOUS at Buildout (ac)								
Watershed	LCA Class	Industrial (WDI only)	Commercial**	R-0.4	R-1	R-2	R-2.9, 3.5, 4.5, 6	R-5, 8, 14	Total	Industrial (WDI only)	Commercial**	R-0.4	R-1	R-2	R-2.9, 3.5, 4.5, 6	Multifamily/R-5, 8, 14	ImperVIOUS at Buildout (ac)	Sum by WS (ac)	Multifamily and Commercial only (ac)						
AGNTE PASS	Partially Utilized	0	0	13	25	43	0	0	81	0	0	0	1	3	0	0	5	10	0						
	Vacant	0	0	13	18	24	0	0	55	0	0	1	2	3	0	0	5								
BLAKELY HARBOR	Partially Utilized	0	0	71	0	6	0	0	77	0	0	2	0	0	0	0	3	11	0						
	Vacant	0	0	123	4	9	0	0	136	0	0	7	0	1	0	0	8								
EAGLEDALE	Partially Utilized	0	0	24	50	9	1	0	84	0	0	1	3	1	0	0	4	12	0						
	Vacant	0	0	34	54	3	0	0	91	0	0	2	5	0	0	0	7								
FLETCHER BAY	Partially Utilized	0	0	134	13	27	0	0	174	0	0	4	1	2	0	0	7	17	0						
	Vacant	0	0	125	9	17	0	0	150	0	0	7	1	2	0	0	10								
GAZZAM LAKE	Partially Utilized	0	0	7	9	29	0	0	46	0	0	0	1	2	0	0	3	9	0						
	Vacant	0	0	22	30	15	0	0	67	0	0	1	3	2	0	0	6								
MANZANITA	Partially Utilized	0	0	90	58	43	0	0	191	0	0	3	3	3	0	0	9	22	0						
	Vacant	0	0	80	53	25	0	0	157	0	0	4	5	3	0	0	12								
MURDEN COVE	Partially Utilized	0	0	53	29	79	0	0	160	0	0	2	2	6	0	0	9	17	0						
	Vacant	0	0	54	17	30	0	0	102	0	0	3	2	4	0	0	8								
NORTH EAGLE HARBOR	Partially Utilized	0	0	28	0	28	29	10	96	0	0	1	0	2	4	2	9	29	13						
	Vacant	0	0	88	3	13	13	4	142	0	10	5	0	2	3	1	20								
PLEASANT BEACH	Partially Utilized	0	0	20	32	12	0	0	64	0	0	1	2	1	0	0	3	11	1						
	Vacant	0	0	37	44	8	0	0	90	0	1	4	4	1	0	0	8								
PORT MADISON	Partially Utilized	0	0	45	8	37	0	0	89	0	0	1	0	3	0	0	5	14	0						
	Vacant	0	0	92	20	18	0	0	130	0	0	5	2	2	0	0	9								
SOUTH BEACH	Partially Utilized	0	0	19	1	26	0	0	46	0	0	1	0	2	0	0	3	6	0						
	Vacant	0	0	14	1	16	0	0	32	0	0	1	0	2	0	0	3								
SUNRISE	Partially Utilized	0	0	38	42	45	0	0	125	0	0	2	2	3	0	0	7	13	0						
	Vacant	0	0	38	17	23	0	0	78	0	0	2	2	3	0	0	6								
Grand Total	Grand Total	0	23	1,263	536	584	43	15	2,465	0	10	56	40	53	6	3	169	169	14						

Data from spreadsheet: \\C:\Data\Watershed_LCA\ImperVIOUS_GeneralAssume.xls
**Commercial includes CORIE, CURR OSE, ERICA, FIB, GATE, H5-1, H5-2, MAD, NC, NC - R-2

APPENDIX D. INCREASE IN IMPERVIOUS SURFACE PERCENTAGES BY WATERSHED



Increase in Impervious Surface Percentages by Watershed

While the tables and figures in this appendix are not used in the SCTP scenarios from which program participation and revenue are projected, they show projected increases in impervious surface percentages in each watershed. These increases may indicate which watersheds may be most impacted from an ecosystem perspective. The watershed with the highest increase in percent impervious surface per this analysis is Agate Pass, with an increase of 1.7%. Increases for Manzanita and North Eagle Harbor are 1.3% and 1.4%, respectively.

Table D-1 Increase in Percent Impervious at Buildout by Watershed

Watershed	Percent Impervious, Existing	Percent Impervious, Buildout	Increase in Percent Impervious, Existing to Buildout
Agate Pass	8.1%	9.8%	1.7%
Blakely Harbor	6.2%	7.0%	0.8%
Eagledale	9.7%	10.8%	1.1%
Fletcher Bay	6.8%	7.6%	0.8%
Gazzam Lake	6.0%	7.0%	1.0%
Manzanita	8.9%	10.2%	1.3%
Murden Cove	10.1%	11.5%	1.4%
North Eagle Harbor	21.3%	22.7%	1.4%
Pleasant Beach	10.3%	11.1%	0.8%
Port Madison	7.4%	8.4%	1.0%
South Beach	9.2%	10.0%	0.8%
Sunrise	10.6%	11.6%	1.0%
Citywide Weighted Average	10.1%	11.2%	1.1%

