

*City of San Bruno*

# **GREEN INFRASTRUCTURE PLAN**

**FINAL**



August 2019

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# ACKNOWLEDGEMENTS

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# ACRONYMS & ABBREVIATIONS

ABAG	Association of Bay Area Governments
ac-ft	Acre-Feet
BASMAA	Bay Area Stormwater Management Agencies Association
C/CAG	City/County Association of Governments of San Mateo County
Caltrans	California Department of Transportation
CASQA	California Stormwater Quality Association
CIP	Capital Improvement Program
EPA	Environmental Protection Agency
FY	Fiscal Year
GI	Green Infrastructure
GIS	Geographic Information System
LID	Low Impact Development
MRP	Municipal Regional Stormwater NPDES Permit
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
PDA	Priority Development Areas
PCBs	Polychlorinated Biphenyls
RAA	Reasonable Assurance Analysis
ROW	Right of Way
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board (Water Board)
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
SRP	Storm Water Resource Plan
SWRCB	State Water Resource Control Board (State Board)
TMDL	Total Maximum Daily Load

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ES

**EXECUTIVE  
SUMMARY**

Lotus Water

# EXECUTIVE SUMMARY

The City of San Bruno is committed to implementing green infrastructure and promoting its multiple benefits, including improving the water quality of San Francisco Bay, augmenting local water supplies, reducing flooding, and increasing green space. Green Infrastructure (GI) practices mimic natural watershed processes including slowing runoff by dispersing it to vegetated areas, harvesting and using runoff, and promoting infiltration and evapotranspiration. These practices slow down and clean polluted stormwater runoff before it reaches receiving water bodies. GI is one of the preferred stormwater management strategies of the Environmental Protection Agency and is rapidly being integrated into urban stormwater systems across the country because of its environmental and community benefits. The development of this GI Plan is required by the City's Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit which is issued by the San Francisco Bay Regional Water Quality Control Board. See Figure ES-1 for examples of GI technologies.

**BIORETENTION AREA**



**TREE WELL FILTER**



**PERVIOUS PAVEMENT**



**GREEN ROOF**



**INFILTRATION FACILITY**



**RAINWATER HARVESTING**



**Figure ES-1. Examples of Green Infrastructure Technologies**

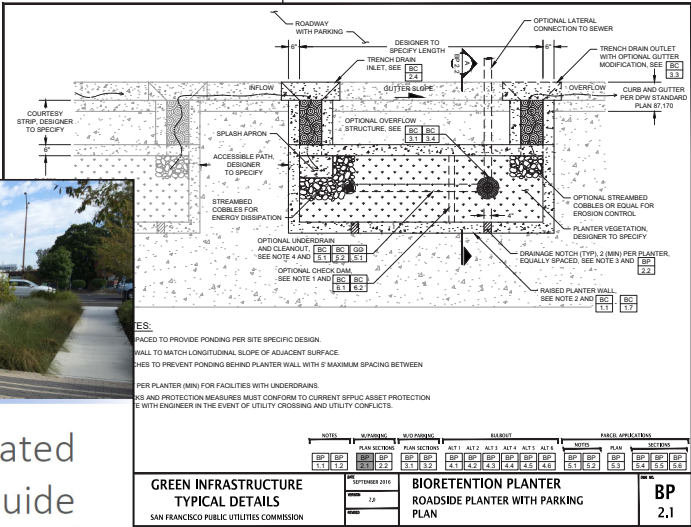
The GI Plan provides a roadmap for how the City of San Bruno can transform its urban landscape and storm drainage systems from a reliance on traditional “gray” stormwater infrastructure to an integrated approach that includes naturalized “green” infrastructure systems. In doing so, the GI Plan presents a path for the City to meet the NPDES Permit’s pollutant load reduction requirements through GI implementation by 2040.

The GI Plan is designed to facilitate systematic integration of GI into the City’s planning and development processes. The GI Plan describes how GI is addressed in current City policies and planning mechanisms and presents a work plan for integration of GI goals and strategies into future city and regional plans and policies. To ensure that designers and engineers have the tools they need for successful GI implementation, the GI Plan either defines or identifies the guidance materials for GI sizing, design, construction, maintenance, and post-construction performance tracking. Examples of these materials are shown in Figure ES-2.



# Green Infrastructure Design Guide

First Edition | 2019



NOTES	WORKING		REVISION				PAGE OPERATIONS	
	PLAN SECTION	PLAN SECTION	REV	DATE	BY	CHKD	PLAN	SECTION
GREEN INFRASTRUCTURE TYPICAL DETAILS	BP 2.1	BP 2.2	1	10/18/2016	BP	BP	2.1	2.1
BIORETENTION PLANTER	BP 2.1	BP 2.2	1	10/18/2016	BP	BP	2.1	2.1
ROADSIDE PLANTER WITH PARKING PLAN	BP 2.1	BP 2.2	1	10/18/2016	BP	BP	2.1	2.1



## C.3 Regulated Projects Guide

For use by developers, builders and project applicants to design and build low impact development projects

Version 6.0 | June 2019



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Figure ES-2. Tools Developed to Support GI Implementation

Development of the GI Plan included identifying and prioritizing opportunities throughout the City for GI implementation. This planning process focused on prioritizing project opportunities within three different categories: green streets to manage right-of-way runoff, LID retrofits to manage public parcel runoff on-site, and regional projects to capture runoff generated from large areas that span both streets and parcels. Descriptions of these project types are presented in Figure ES-3. Through the process, opportunities were identified and prioritized considering not only stormwater performance, but also project constructability constraints, social and environmental benefits, and synergies with other planned City projects and goals. A total of 716 green street, 93 LID, and 51 regional project opportunities were evaluated and bracketed into high, medium, and low priority categories. Prioritization results for green streets and LID retrofits are shown in Figure ES-4.

### GREEN STREETS

Green street projects are located in the public right-of-way and capture runoff from the street and adjacent drainage areas. Projects typically include bioretention (e.g., stormwater planters, stormwater curb extensions, or stormwater tree filters), pervious pavement, and/or infiltration trenches. These projects are designed to reduce runoff volume and pollutants while providing benefits such as traffic calming, greening, and habitat.



### LID RETROFITS

LID retrofit projects are stormwater capture facilities that treat runoff generated on a parcel. LID projects may include bioretention, infiltration trenches, retention areas in landscaping, pervious pavement, green roofs, and systems for stormwater capture and use. These measures mitigate stormwater impacts by infiltrating and/or capturing and treating stormwater on-site before it enters the storm drain system.



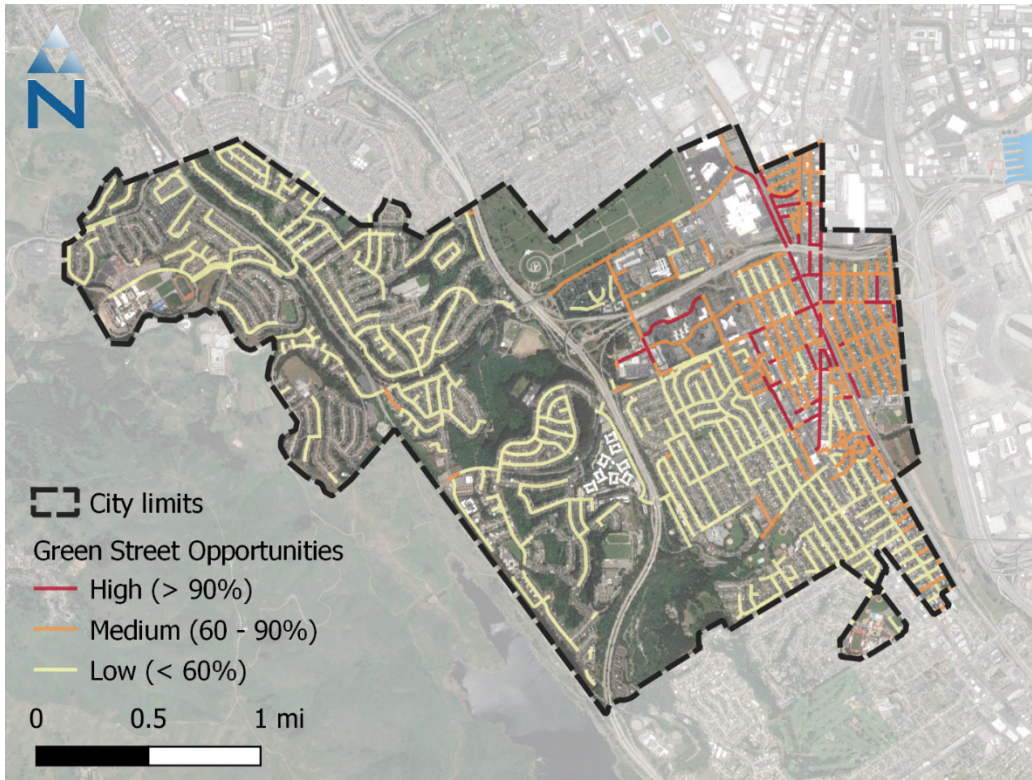
### REGIONAL PROJECTS

Regional projects capture and manage runoff from off-site sources through storm drains, channels, culverts, and streams. These projects can take a variety of forms such as detention and retention basins, infiltration galleries, and constructed wetlands. Site characteristics determine what type of projects are feasible.



Figure ES-3. GI Capital Project Types

GREEN STREET PRIORITIZATION



LID RETROFIT PRIORITIZATION

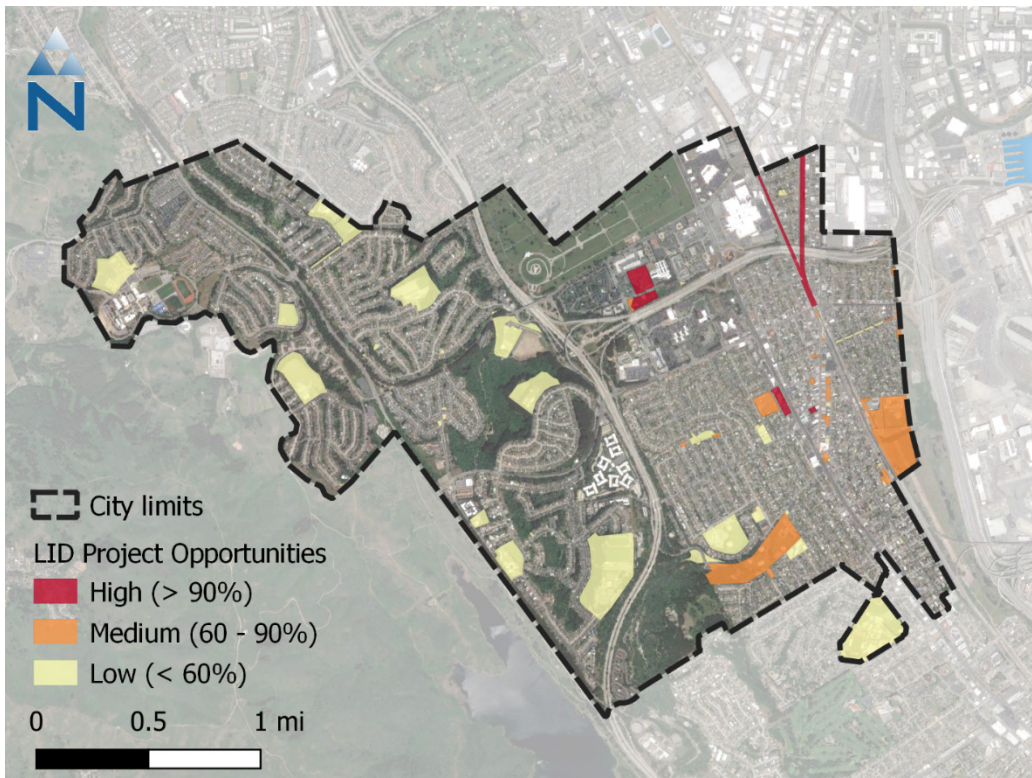
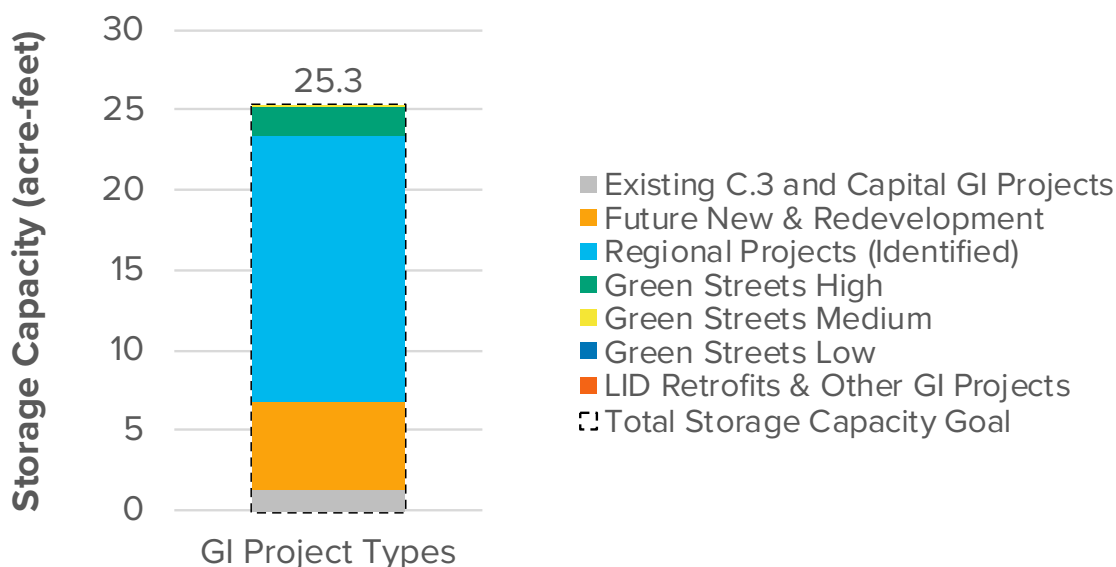


Figure ES-4. Green Street and LID Retrofit Prioritization Results

Based on the prioritization of GI project opportunities, a Reasonable Assurance Analysis (RAA) was conducted to determine the most cost-effective combination of GI projects needed throughout the city to address pollutant reduction targets established by the NPDES Permit. The RAA considered scenarios containing different combinations of the three capital project types, as well as projections of future GI on private parcels as part of regulatory compliance at development sites. The RAA modeling showed how the Permit’s pollutant load reduction requirements could be achieved using a combination of existing GI projects, future projected new and redevelopment projects required to have GI, regional GI projects, and green streets. The most cost-effective modeled scenario (shown in Figure ES-5) relies heavily on an identified regional GI project to capture a treat runoff from a large portion of the City. If that project concept is found to be infeasible during follow-up field investigation, then an alternate regional project would need to be identified or an increased amount of the prioritized green streets and LID retrofits would be needed to achieve the target. The scenario presented in Figure ES-5 captures and treats runoff from approximately 173 acres of impervious area in the City by 2040.



**Figure ES-5. GI Needed to Achieve the 2040 Pollutant Load Reduction Requirements**

Results of the RAA informed the development of a GI strategy that outlines future goals for GI project implementation. It also sets the stage for an adaptive management approach to GI implementation that can adjust over time as further field investigations are performed, project concepts and cost estimates are developed, and lessons are learned through GI project planning, design, construction, and assessment. The implementation plan identifies legal and funding mechanisms that can be used to support project implementation and describes the technical tools the City will use to document and track progress towards the citywide pollution reduction goals.

In summary, the GI Plan represents a commitment to further integrate green infrastructure into the City’s planning and capital delivery processes. It defines the quantity of GI implementation needed to meet the Permit’s 2040 water quality targets. It provides tools to facilitate GI implementation (e.g., GI Typical Details, GI Tracking Tool), and it recommends the GI project strategy to meet the water quality target. Although the GI strategy and 2040 target are subject to change and will be adaptively managed, the GI Plan provides the necessary guidance to enable consistent progress toward the target, while aligning with the City’s other environmental and sustainability goals.



Urban development has resulted in replacement of natural landscapes with impervious surfaces, resulting in an increased amount of stormwater runoff and pollutants into local streams and other waterbodies. Gray stormwater infrastructure—catch basins, pipes, and pumps—collect this runoff and convey it to receiving waters. In contrast, green infrastructure (GI) uses plants, soils, and pervious surfaces to slow, treat, and infiltrate the runoff in a way that mimics natural watershed processes. Bay Area cities and counties are required by state and regional regulatory agencies to gradually shift from traditional gray stormwater conveyance systems to integrated gray and green systems over time. This GI Plan serves as an implementation guide for the City of San Bruno (City) to integrate GI into streets and parcels over the next several decades in a manner consistent with regulatory requirements and the City’s planning and sustainability goals.

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## 1.1 BACKGROUND

### 1.1.1 City Description

San Bruno, founded as a railroad suburb in 1914, is located in northeastern San Mateo County, between South San Francisco and Millbrae.<sup>1</sup> The City is west of and adjacent to San Francisco International Airport (SFO) and approximately 12 miles south of downtown San Francisco. A regional context map is shown in Figure 1-1.

The City has a total area of 5.5 square miles, all of it land.<sup>2</sup> Its topography spans from the hilly open space around San Andreas Lake on the City’s western edge, to the flat, Bay fill areas at Highway 101 and SFO at the City’s eastern edge. Downtown stretches along San Mateo Avenue, from El Camino Real to San Bruno Avenue and the San Bruno Caltrain Station. The San Bruno BART station opened in 2003, when BART service was expanded to SFO. Major employers in San Bruno include YouTube’s headquarters, Walmart’s Online Retail headquarters, and Skyline College.<sup>3</sup>

As discussed more in Section 2, the City is engaged in several planning efforts to reshape its downtown core and improve connectivity. These plans, such as the Transit Corridors Plan, Walk n’ Bike Plan, and San Mateo Avenue Streetscape Plan, have goals that

align with the sustainability-focused objectives of the GI Plan. Other City planning efforts that include large-scale redevelopment, such as the Bayhill Specific Plan, may provide other synergistic opportunities for GI integration.

San Mateo County is divided into two major watersheds. San Francisco Coastal South Watershed drains to the Pacific Ocean, and the San Francisco Bay Watershed drains to the Bay. San Bruno is located within the San Francisco Bay watershed and consists of three smaller subwatersheds, as shown in Figure 1-2. Two major creeks are located in the City—San Bruno Creek and El Zanjón Creek. Underlying the City is the Westside Groundwater Basin, which is the water supply aquifer for the City and several other entities on the Peninsula, including the California Water Service Company, San Francisco Public Utilities Commission (SFPUC), Millbrae, Daly City, and Burlingame. GI may provide opportunities to recharge the groundwater basin through increased stormwater infiltration. It should be noted, however, that near San Bruno the upper strata soils of the basin are predominantly fine-grained materials, which may result in slower rates of infiltration (see Figure 1-3).



Skyline College at the City’s Western Boundary

1 City of San Bruno General Plan (Adopted March 24, 2009).

2 US Census Bureau. Profile of Population and Housing Characteristics – San Bruno. 2010.

3 City of San Bruno. 2011. Comprehensive Annual Financial Report.

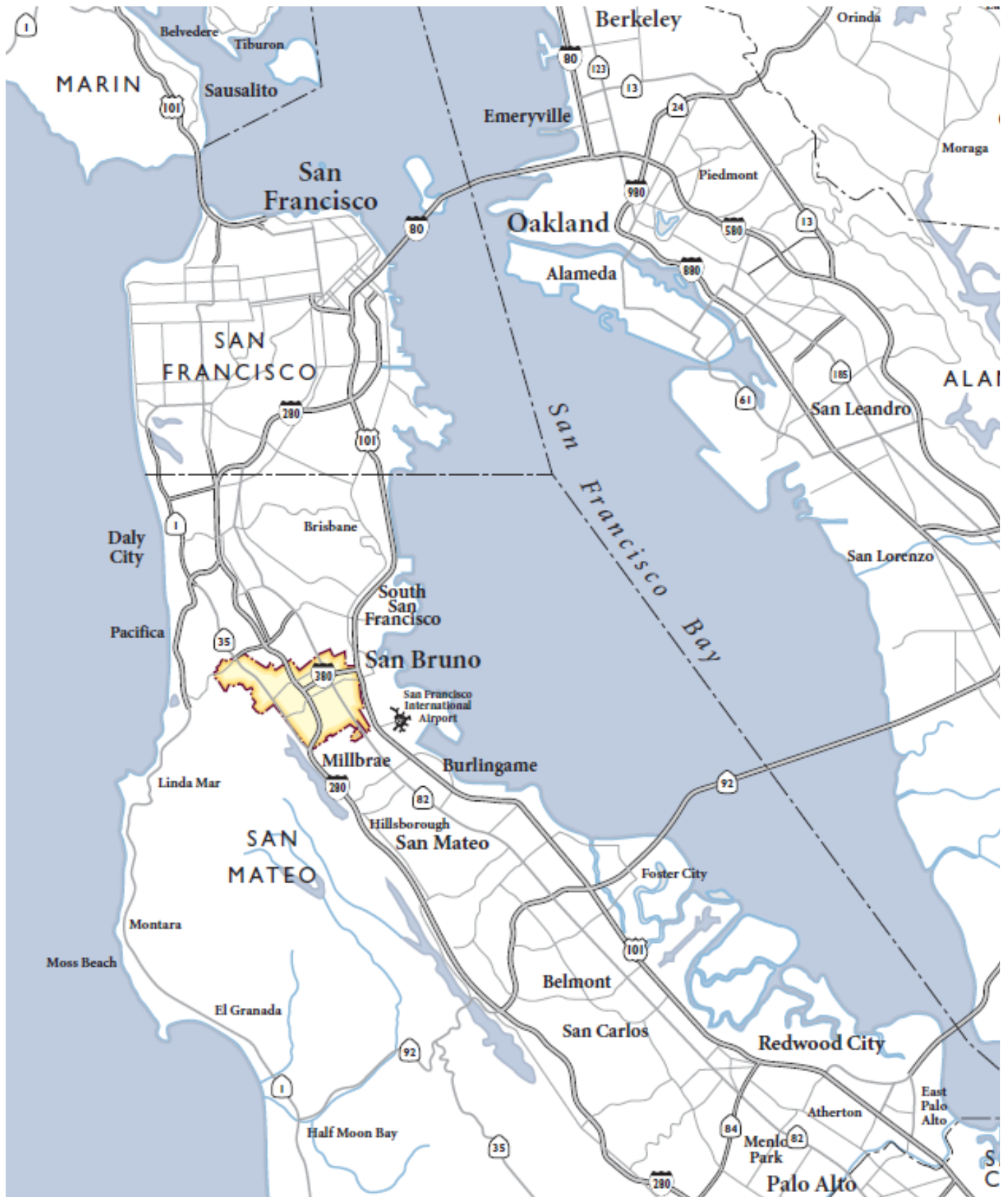


Figure 1-1. Regional Context

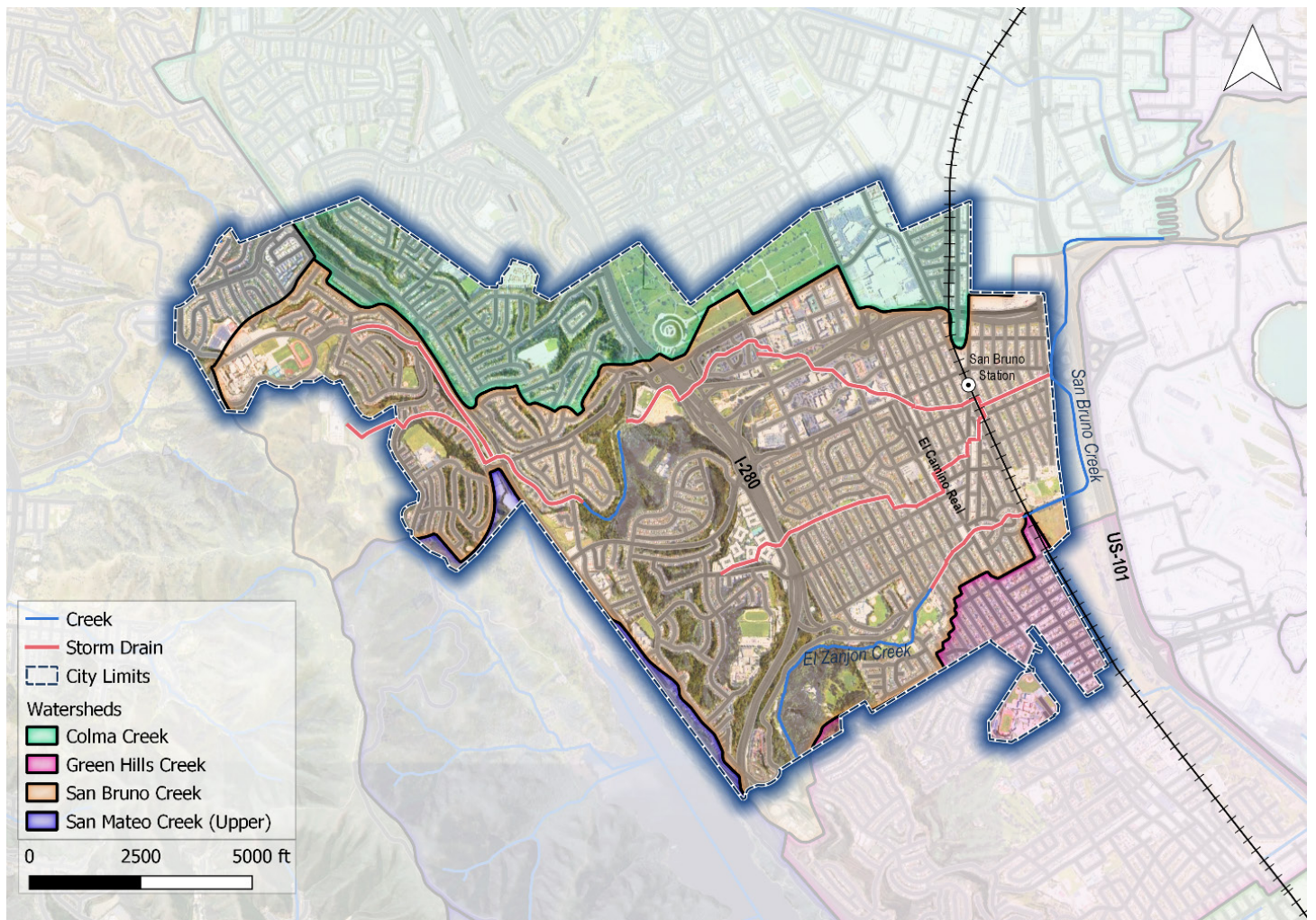


Figure 1-2. San Bruno Watersheds Map



### 1.1.2 Regulatory Context

#### *Federal & State Regulations & Initiatives*

The U.S. Environmental Protection Agency (EPA) has authority under the Clean Water Act to promulgate and enforce stormwater related regulations. For the State of California, the EPA has delegated the regulatory authority to the State Water Resources Control Board (State Water Board), which in turn, has delegated authority to the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) to issue National Pollutant Discharge Elimination System (NPDES) permits in the San Francisco Bay Region. Stormwater NPDES permits allow stormwater discharges from municipal separate storm sewer systems (MS4s) to local creeks, San Francisco Bay, and other water bodies as long as they do not adversely affect the beneficial uses of or exceed any applicable water quality standards for those waters. Since the early 2000s, the EPA has recognized and promoted the benefits of using GI in protecting drinking water supplies and public health, mitigating overflows from combined and separate storm sewers, and reducing stormwater pollution. The EPA has encouraged the use of GI by municipal agencies as a prominent component of their MS4 programs<sup>4</sup>.

The State and Regional Water Boards have followed suit in recognizing not only the water quality benefits of GI but the opportunity to augment local water supplies in response to the impacts of drought and climate change as well. The 2014 California Water Action Plan called for multiple benefit stormwater management solutions and more efficient permitting programs. This directive created the State Water Board's "Strategy to Optimize Resource Management of Stormwater" (STORMS). STORMS' stated mission is to "lead the evolution of stormwater management in California by advancing the perspective that stormwater is a valuable resource, supporting policies for collaborative watershed-level stormwater management and pollution prevention, removing obstacles to funding, developing resources, and integrating regulatory and non-regulatory interests."<sup>5</sup>

These Federal and State initiatives have influenced approaches in Bay Area municipal stormwater NPDES permits, as described below.

#### *Municipal & Regional Stormwater Permit*

The City is subject to the requirements of the Municipal Regional Stormwater NPDES Permit (MRP) for Phase I municipalities and agencies in the San Francisco Bay area (Order R2-2015-0049), which became effective on January 1, 2016. The MRP applies to 76 municipalities and flood control agencies that discharge stormwater to San Francisco Bay, collectively referred to as Permittees.

Over the last 16 years, under Provision C.3 of the MRP and previous permits, new development and redevelopment projects on private and public property that exceed certain size thresholds ("regulated projects") have been required to mitigate impacts on water quality by incorporating "Low Impact Development" (LID) measures, including site design, pollutant source control, stormwater treatment, and flow control measures, as appropriate. LID treatment measures, such as rainwater harvesting and use, infiltration, and biotreatment, have been required on most regulated projects since December 2011.

MRP Provision C.3.j requires Permittees to develop and implement long-term GI Plans for the inclusion of LID drainage design into storm drain infrastructure on public and private lands, including streets, roads, storm drains, parking lots, building roofs, and other elements. Much of the incorporation of GI is intended to be accomplished by retrofitting existing impervious areas in public rights-of-way (ROW) and on public property, in addition to continuing to implement LID on regulated projects.

<sup>4</sup> See: <https://www.epa.gov/green-infrastructure>

<sup>5</sup> See: [https://www.waterboards.ca.gov/water\\_issues/programs/stormwater/storms/](https://www.waterboards.ca.gov/water_issues/programs/stormwater/storms/)

## 1.2 PURPOSE & GOALS OF THE PLAN

The GI Plan provides a roadmap showing how the City of San Bruno can transform its urban landscape and storm drainage systems from a singular reliance on traditional “gray” infrastructure, where stormwater runoff flows directly from impervious surfaces into storm drains and receiving waters, to an integrated approach that includes naturalized “green” infrastructure systems. The GI Plan addresses GI planning and implementation within the City of San Bruno’s jurisdiction. The overall goal of the City’s GI Plan is to shift toward a more resilient, sustainable system that will disperse runoff to vegetated areas reducing and slowing flows, promote infiltration and evapotranspiration, collect runoff for non-potable uses, and treat runoff using biotreatment and other Green Infrastructure practices. The GI Plan also demonstrates the City’s long-term commitment to implement GI to reduce pollutants discharged to local waterways and meet regulatory requirements.

The GI Plan will be coordinated to achieve, assist, and align with the implementation of goals, policies and actions from various City planning documents. This includes the San Bruno General Plan goal to develop and implement a green streets plan, the Transit Corridors Plan goal to identify opportunities for “sustainable” infrastructure that beautifies the urban environment with ecological technologies, and the Walk n’ Bike Plan goal to capture and treat stormwater while enhancing the natural environment.

The GI Plan will serve as an implementation guide and reporting tool to provide reasonable assurance that pollutant reduction requirements in the City’s stormwater discharge permit will be met. This is a major citywide effort requiring close collaboration among City departments, especially those responsible for projects affecting future alignment, configuration or design of impervious surfaces that produce stormwater runoff, as well as those responsible for operation and maintenance of existing and future GI facilities.

### Goals of the GI Plan Include:

- 1 Align the City’s goals, policies, and implementation strategies for GI with the General Plan and other related planning documents
- 2 Identify and prioritize GI opportunities throughout the City
- 3 Establish projections of the amount of City area that can be converted to GI over certain timeframes
- 4 Provide a work plan and describe legal and funding mechanisms to implement prioritized projects
- 5 Establish a process for tracking, mapping, and reporting completed projects

### 1.3 WHAT IS GREEN INFRASTRUCTURE?

In natural landscapes of the Bay Area, most of the rainwater soaks into the soil or is taken up by plants and trees. However, in urban areas, building footprints and paved surfaces such as driveways, sidewalks, and streets prevent rain from soaking into the ground. As rainwater flows over and runs off these impervious surfaces, this “urban runoff” or “stormwater runoff” picks up pollutants such as motor oil, metals, sediment, pesticides, pet waste, and litter. It then carries these pollutants into the City’s storm drains, which flow directly to local creeks and San Francisco Bay, without any cleaning or filtering to remove pollutants. Stormwater runoff is a major contributor to water pollution in urban areas.

As urban areas develop, the increase in impervious surface also results in increases in peak flows and volumes of stormwater runoff from rain events. Traditional “gray” stormwater infrastructure, like most of the City’s storm drain system, is designed to convey stormwater flows quickly away from urban areas. However, the increased peak flows and volumes can cause erosion, flooding, and habitat degradation in downstream creeks, damaging habitat, property, and infrastructure.

#### 1.3.1 Definition & Purpose

A more ecologically sustainable approach to managing stormwater is to implement green stormwater infrastructure. GI uses vegetation, soils, and other elements and practices to capture, treat, infiltrate and slow urban runoff, thereby restoring natural ecological processes and creating healthier urban environments. GI facilities can also be designed to capture stormwater for uses such as irrigation and toilet flushing.

GI can be integrated into building and roadway design, complete streets, drainage infrastructure, urban forestry, soil conservation and sustainable landscaping practices to achieve multiple benefits. At the neighborhood or site scale, GI can beautify neighborhoods or calm traffic while mimicking nature and infiltrating and storing water. At the city or county scale, GI can create a patchwork of natural areas that provide habitat, flood protection, groundwater recharge, cleaner air, and cleaner water.<sup>6</sup> GI is capable of providing multiple benefits beyond

#### 1.3.2 Benefits of Green Infrastructure

just managing rainfall and runoff. These benefits include environmental, economic, and community improvements. GI can also be an important tool to increase a community’s resilience to climate change.

Implementation of GI measures can mitigate localized flooding and reduce erosive flows and quantities of pollutants being discharged to local creeks and the San Francisco Bay. Vegetated GI systems can beautify public places while helping to improve air quality by filtering and removing airborne contaminants from vehicle and industrial sources. Trees that capture stormwater runoff can also reduce urban heat island effect and provide habitat for birds, butterflies, bees, and other local species. Pervious pavement can be quieter<sup>7</sup> than conventional pavement and can be safer as faster infiltration of water can reduce hydroplaning. When GI facilities are integrated into traffic calming improvements such as curb extensions at intersections, they can help increase pedestrian and bicycle safety and promote active transportation, which in turn can result in improved human health and reduced carbon emissions.

GI facilities which are designed with extra storage can capture stormwater for later uses, including irrigation, toilet flushing and cooling tower supply, thus conserving potable water supplies.

Widespread implementation of GI potentially offers economic benefits, such as deferring, reducing size, or eliminating the need for some gray infrastructure projects. By providing more storage within the watershed, GI can help reduce the costs of stormwater conveyance and pumping. When cost-benefit life cycle analyses are performed, GI can be the preferred alternative due to the multiple benefits provided by GI as compared to conventional infrastructure.<sup>8</sup>

Conversely, there are some trade-offs of implementing green versus conventional gray infrastructure. The approach for conventional gray stormwater management is to increase pipe and storage tank capacity, while relying on large-scale end-of-pipe devices for treatment. While this does not provide as many benefits, it typically reduces stormwater capital costs, and centralizes maintenance in a few locations. Managing runoff with distributed GI features requires design and oversight of a greater number of projects,

6 See: <https://www.epa.gov/green-infrastructure/what-green-infrastructure>

7 See: [https://www.dot.state.mn.us/mnroad/projects/Pervious\\_Conc\\_Pavement/index.html](https://www.dot.state.mn.us/mnroad/projects/Pervious_Conc_Pavement/index.html)

8 See: <https://www.epa.gov/green-infrastructure/green-infrastructure-cost-benefit-resources>

with an increased amount of maintenance to sustain performance. It also requires additional training of City staff, contractors, and maintenance crews to successfully design, build, and maintain green infrastructure facilities.

### 1.3.3 Types of Facilities

Integrating GI into public spaces typically involves construction of stormwater capture and treatment measures in public streets, parks, and parking lots or as part of public buildings. Types of GI measures that can be constructed in public spaces include: (1) bioretention; (2) stormwater tree well filters; (3) pervious pavement, (4) infiltration facilities, (5) green roofs, and (6) rainwater harvesting and use facilities. Descriptions of these facility types are provided below.

#### *Bioretention Areas*

Bioretention areas are depressed landscaped areas that consist of a ponding area, a mulch layer, plants, and a special biotreatment soil media composed of sand and compost, underlain by drain rock and an underdrain, if required. Bioretention areas are designed to retain stormwater runoff, filter stormwater runoff through biotreatment soil media and plant roots, and either infiltrate stormwater runoff to underlying soils as allowed by site conditions, release treated stormwater runoff to the storm drain system, or both. They can be of any shape and size and are adaptable for use on a building or parking lot site or in the street right-of-way.

Bioretention systems in the streetscape have specific names: stormwater planters, bioswales, rain gardens, stormwater curb extensions, and stormwater tree well filters (described in the next section). A stormwater planter is a linear bioretention facility in the public right-of-way along the edge of the street, often in the planter strip between the street and sidewalk or in the street median. They are typically designed with vertical (concrete) sides; however, they can also have sloped sides depending on the amount of space that is available.



Bay Area Installation of Bioretention with Educational Signage

## INTRODUCTION

A stormwater curb extension (or bulb-out) is a bioretention system that extends into the roadway and involves modification of the curb line and gutter. Stormwater curb extensions may be installed midblock or at an intersection. Curb bulb-outs and curb extensions installed for pedestrian safety, traffic calming, and other transportation benefits can also provide opportunities for siting bioretention facilities. When feasible, implementing bulb-outs coincident with existing red curb areas can help reduce the impact of lost parking. Parking lots can accommodate bioretention areas of any shape in medians, corners, and pockets of space unavailable for parking.

### ***Stormwater Tree Well Filters and Suspended Pavement Systems***

A stormwater tree well filter is a type of bioretention system consisting of an excavated pit or vault that is filled with biotreatment soil media, planted with a tree and other vegetation, and underlain with drain rock and an underdrain, if needed. Stormwater tree well filters can be constructed in series and linked via a subsurface trench or underdrain. A stormwater tree well filter can require less dedicated space than other types of bioretention areas.

Suspended pavement systems may be used to provide increased underground treatment area and soil volume for tree well filters. These are structural systems designed to provide support for pavement while preserving large volumes of uncompacted soil for tree roots. Suspended pavement systems may be any engineered system of structural supports or commercially available proprietary structural systems.

Stormwater tree well filters and suspended pavement systems are especially useful in settings between existing sidewalk elements where available space is at a premium. They can also be used in curb extensions or bulb-outs, medians, or parking lots if surrounding grades allow for drainage to those areas. The systems can be designed to receive runoff through curb cuts or catch basins or allow runoff to enter through pervious pavers on top of the structural support.

### ***Pervious Pavement***

Pervious pavement is hardscape that allows water to pass through its surface into a storage area filled with gravel prior to infiltrating into underlying soils. Types of pervious pavement include permeable interlocking concrete pavers, pervious concrete, porous asphalt, and grid pavement. Pervious pavement is often used in parking areas or on streets where bioretention is not feasible due to space constraints or if there is a need to maintain parking. Pervious pavement does not require a dedicated surface area for treatment and allows a site to maintain its existing hardscape.

There are two types of pervious pavers: Permeable Interlocking Concrete Pavers (PICP) and Permeable Pavers (PP). PICP allow water to pass through the joint spacing between solid pavers, and PP allow water to pass through the paver itself and therefore can have tighter joints. Porous asphalt and pervious concrete are similar to traditional asphalt and concrete, but do not include fine aggregates in the mixture, allowing water to pass through the surface. All types are supported by several layers of different sizes of gravel to provide structural support and water storage.



Pervious Pavers in San Mateo County

### ***Infiltration Facilities***

Where soil conditions permit, infiltration facilities can be used to capture stormwater and infiltrate it into native soils. The two primary types are infiltration trenches and subsurface infiltration systems. An infiltration trench is an excavated trench backfilled with a stone aggregate. Infiltration trenches collect and detain runoff, store it in the void spaces of the aggregate, and allow it to infiltrate into the underlying soil.

Subsurface infiltration systems are another type of GI measure that may be used beneath parking lots or parks to infiltrate larger quantities of runoff. These systems, also known as infiltration galleries, are underground vaults or pipes that store and infiltrate stormwater while preserving the uses of the land surface above, such as parking lots, parks and playing fields. Storage can take the form of large-diameter perforated metal or plastic pipe, or concrete arches, concrete vaults, plastic chambers or crates with open bottoms.



Infiltration Columns Being Constructed on the Peninsula

### ***Green Roofs***

Green roofs are vegetated roof systems that filter, absorb, and retain or detain the rain that falls upon them. Green roof systems are comprised of a layer of planting media planted with vegetation, underlain by other structural components including waterproof membranes, synthetic insulation, geofabrics, and underdrains. A green roof can be either “extensive”, with 3 to 7 inches of lightweight planting media and low-profile, low-maintenance plants, or “intensive”, with a thicker layer (8 to 48 inches) of media, more varied plantings, and a more garden-like appearance. Green roofs can provide high rates of rainfall retention via plant uptake and evapotranspiration and can decrease peak flow rates in storm drain systems because of the storage that occurs in the planting media during rain events. One of the first of the Bay Area’s new generation of green roofs was installed in the late 1990s in San Bruno at the Gap headquarters building at 901 Cherry Avenue. The property is now owned by YouTube.



Green Roof at YouTube Headquarters at 901 Cherry Avenue in San Bruno (Formerly Gap Headquarters)

### *Rainwater Harvesting and Use Facilities*

Rainwater harvesting is the process of collecting rainwater from above-grade impervious surfaces (typically rooftops) and storing it for later use. Storage facilities that can be used to harvest rainwater include rain barrels, blue roofs, above-ground or below-ground cisterns, open storage reservoirs (e.g., ponds), and various underground storage devices (tanks, vaults, pipes, and proprietary storage systems). The harvested water is then fed into irrigation systems or non-potable water plumbing systems, either by pumping or by gravity flow. Uses of captured water may include irrigation, vehicle washing, and indoor non-potable use such as toilet flushing, heating and cooling, or industrial processing. The award-winning public artwork *Watershed* designed by artist Peter Richards is a good example of a rainwater harvesting system. This public artwork captures rainwater from the San Jose Environmental Innovation Center roof, and channels it into a 6,600-gallon water storage tank which is then used to irrigate a grove of 100-year-old olive trees.

Stormwater runoff from parking lots or other at-grade surfaces or water from storm drains can be diverted into large underground storage facilities below parking lots or parks. Underground storage systems typically include pre-treatment facilities to remove pollutants from stormwater prior to storage and use.



Rainwater Harvesting Cistern - Environmental Innovation Center, San José

## 1.4 OVERVIEW OF THE GI PLAN

### 1.4.1 GI Plan Development Process

#### *GI Workplan Development & Adoption*

The process of developing the City's GI Plan began with the preparation of a Green Infrastructure Work Plan (Workplan), a work plan describing the goals, approach, tasks, and schedule needed to complete the GI Plan. Development of the Workplan was a regulatory requirement to demonstrate the City's commitment to completing the GI Plan by September 30, 2019. The City Council adopted the completed Workplan in May of 2017.

The overall approach to developing the GI Plan consisted of three main components:

1. Identifying the type, location, and priority of potential GI measures to meet pollutant reduction targets
2. Reviewing City planning, policy, and ordinance documents for adequacy and consistency with GI Plan language, and updating them if needed to facilitate Plan implementation; and
3. Incorporating technical guidance and information on funding, tracking, and maintenance mechanisms to facilitate GI implementation.

#### *Regional & Internal Collaboration*

The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) recently completed a Stormwater Resource Plan (SRP) for the municipalities within San Mateo County. The SRP identified and prioritized potential multi-benefit GI opportunities on public parcels and street rights-of-way within San Bruno and other cities in the county. The SRP development process and methodology is described in detail in Section 4.3. San Bruno's GI Plan builds on the SRP output by further identifying, evaluating, and prioritizing potential stormwater improvements, while developing a comprehensive long-term GI implementation roadmap for the City. The goal is to identify cost-effective, multi-benefit projects that provide additional water quality, community, and environmental benefits.

The City worked with other SMCWPPP member agencies to review, approve and fund GI-related documents through participation in the SMCWPPP Stormwater Committee, New Development and Construction Subcommittee (NDS) and Green Infrastructure Technical Advisory Committee (GI TAC). These documents include the countywide GI Design Guide and typical GI details. The City, through SMCWPPP, also participated in the development of regional GI guidance documents through Bay Area Stormwater Management Agencies Association (BASMAA). This includes documents such as the Alternative Sizing Guidance for GI in the streetscape. BASMAA members include other countywide stormwater programs in Alameda, Contra Costa, and Santa Clara Counties, and area-wide programs in the Vallejo and Fairfield-Suisun portions of Solano County, whose participating municipalities are also permittees under the MRP.

#### *Adoption & Public Participation*

The process for developing the GI Plan involved coordination with several related agencies and includes ongoing efforts, including countywide and regional activities, between the City's GI Team and other stakeholders. The City completed a multi-departmental workshop in March 2019 to discuss development of the GI Plan and explain GI requirements and strategies for implementation. A Public Draft of the GI Plan was published to enable broader stakeholder feedback on the Plan. The City also gave a presentation to the City Council as part of the GI Plan approval process to educate elected officials on the elements of the GI Plan, requirements of MRP Provision C.3.j, and methods of implementation. An overview of the plan development process is shown in Figure 1-4. As a final step in the process, the City Council will review and approve a formal resolution to adopt the GI Plan.

**Reasonable Assurance Analysis**

To assist in selecting locations for GI measures, the City utilized SMCWPPP’s reasonable assurance analysis (RAA) model. The goal of the RAA is to provide reasonable assurance to the Water Board and non-governmental organizations that the City will meet water quality compliance deadlines. The RAA model was developed using hydrologic, hydraulic, pollutant loading, and cost data. The model was used to determine areas of the City with higher pollutant loading and the most cost-effective ways to implement GI measures to provide reasonable assurance of the reduction of pollutant loads. The model outputs were coordinated with the City’s other plans and departments to identify projects that can provide both flood protection and water quality improvement. The RAA model evaluated the benefits of different mixes

of several GI project types, including C.3 regulated projects, regional GI projects, green streets, and LID (on-parcel) retrofits.

The RAA model consists of a suite of modeling tools:

1. A watershed model for prediction of baseline hydrology and pollutant loading (Loading Simulation Program – C+ [LSPC]);
2. A model for simulating the performance of control measures in terms of flow and pollutant load reduction (System for Urban Stormwater Treatment Analysis and Integration [SUSTAIN]); and
3. A tool for running millions of potential scenarios and optimizing/selecting control measures based on cost-effectiveness (also within SUSTAIN).

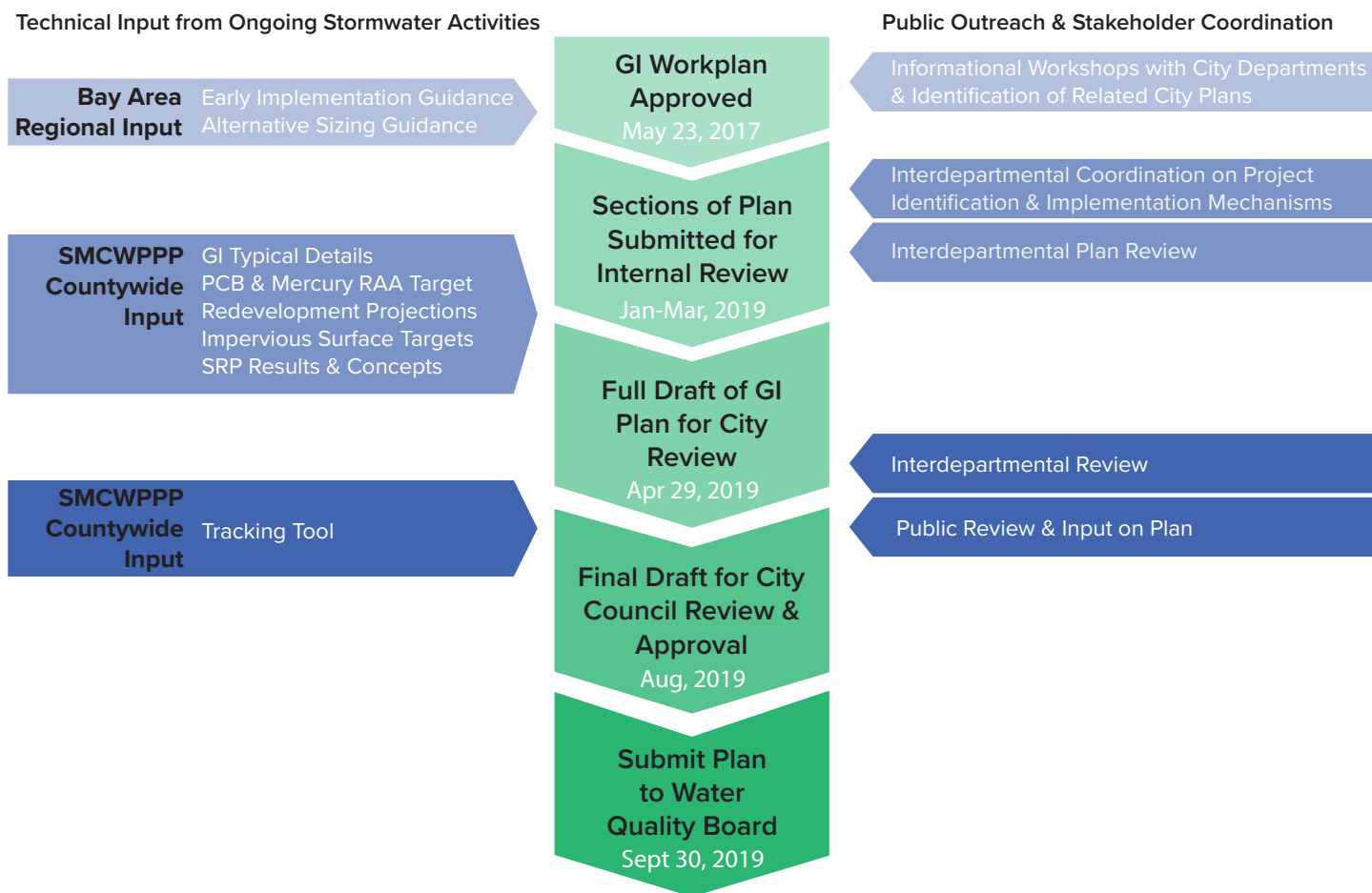


Figure 1-4. Plan Development Process

## 1.4.1 GI Plan Sections & Appendices

The remainder of the GI Plan contains the following information and appendices:

### ***Section 2 – Incorporating GI into San Bruno's Planning Documents & Processes***

Section 2 describes the relationship of the GI Plan to other planning documents and efforts within the City and how those planning documents have been updated or modified, if needed, to support and incorporate GI requirements. For documents whose desired updates and modifications have not been accomplished by the completion of the GI Plan, a work plan and schedule are laid out to complete them.

### ***Section 3 – GI Design Guidelines, Standards, & Specifications***

Section 3 outlines the materials developed by SMCWPPP and the City of San Bruno to provide guidelines, typical details, specifications and standards for municipal staff and others in the design, construction, and operation and maintenance of GI measures.

### ***Section 4 – GI Project Prioritization Methodology***

Section 4 presents the methodology used to identify priority candidate sites for GI projects. This starts at a countywide scale, as described in the SRP, and is then further refined based on the City's priorities.

### ***Section 5 – GI Citywide Strategy***

Section 5 outlines the mix of prioritized GI projects needed to achieve performance goals by 2020, 2030, and 2040.

### ***Section 6 – Implementation Plan***

Section 6 discusses the variety of mechanisms to be employed by the City in order to implement the GI Plan, including future planning and outreach, performance assurance, project tracking, and funding.

### ***Appendix A – GI Sizing Methodology***

MRP Provision C.3.j.i.(2)(g) states that, for non-regulated Green Street projects, "Permittees may collectively propose a single approach with their GI Plans for how to proceed should project constraints preclude fully meeting the C.3.d requirements." Appendix A describes the approach that has been developed.

### ***Appendix B – Reasonable Assurance Analysis***

This appendix describes the RAA conducted to quantify the amount and type of GI projects needed in the City to achieve stormwater quality improvement goals.

### ***Appendix C – Project Concepts***

This appendix includes concept fact sheets for potential regional GI projects within the City, including a description of potential benefits and planning-level cost estimates.

### ***Appendix D – Outreach and Education Plan***

This appendix describes the City's GI public outreach strategy and staff training plan.

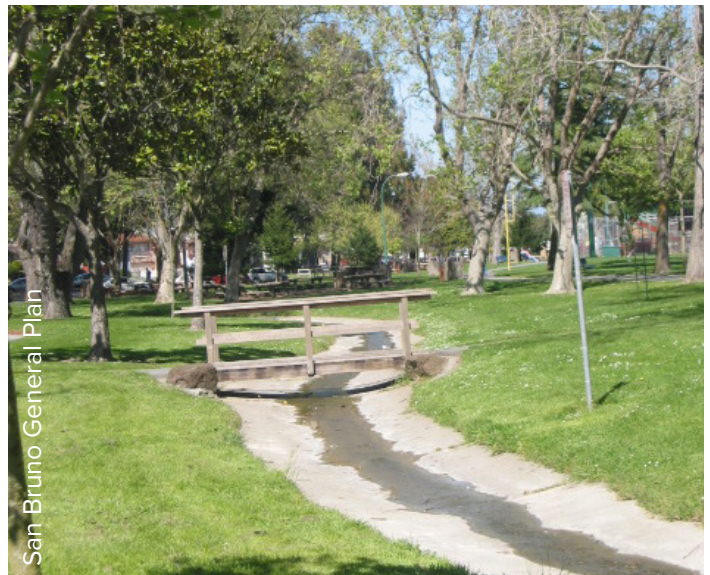
The GI Plan elements required by Provision C.3.j.i.(2) of the MRP and the section of the document in which each component can be found are summarized in Table 1-1.

**Table 1-1. Implementation GI Plan Elements Required by Provision C.3.j.i of the MRP**

MRP Provisions	GI Plan Elements	GI Plan Sections
C.3.j.i.(2)(a)	Project Identification and Prioritization Mechanism	Section 4
C.3.j.i.(2)(b)	Prioritized Project Locations	Section 4.4.3
C.3.j.i.(2)(c)	Impervious Surface Targets	Section 5.7
C.3.j.i.(2)(d)	Completed Project Tracking System	Section 6.5
C.3.j.i.(2)(e,f)	Guidelines and Specifications	Section 3
C.3.j.i.(2)(g)	Alternative Sizing Requirements for Green Street Projects	Section 3.1.2
C.3.j.i.(2)(h,i)	Integration with Other Municipal Plans	Section 2
C.3.j.i.(2)(j)	Work Plan to Complete Prioritized Projects	Section 6.1
C.3.j.i.(2)(k)	Evaluation of Funding Options	Section 6.2.2
C.3.j.i.(3)	Legal and Implementation Mechanisms	Section 6.2.1



San Bruno City Park



El Zanjon Creek Flowing through San Bruno City Park



To ensure the success of the GI Plan and its implementation, its goals, policies and implementation strategies should align with the San Bruno General Plan and other related planning documents. The MRP requires that municipal agencies review such documents and include in their GI Plans a summary of any planning documents updated or modified to appropriately incorporate GI requirements. The GI Plan must also include a work plan identifying how GI measures will be included in future plans. As described in this section, the GI Plan has been developed consistent with existing City planning documents and will be integrated into planning documents currently under development.

<b>IN THIS SECTION</b>	
2.1 Existing City Plans & Policies	24
2.2 Work Plan for Future Integration of GI into Related City Plans	28
2.3 Regional Plans	29

## 2.1 EXISTING CITY PLANS & POLICIES

The City of San Bruno has developed or is in the process of developing several planning documents that address different elements of City operations related to GI including land use, transportation, sustainability, conservation, urban forestry<sup>9</sup>, infrastructure, employment, and housing. The existing planning documents were reviewed to determine the extent to which GI-related language, concepts and policies can be incorporated. The plans that were reviewed are as follows:

- » General Plan
- » Residential Design Guidelines
- » Transit Corridors Plan
- » U.S. Navy Site Specific Plan
- » Walk n' Bike Plan

In the future, new plans and updates to existing plans will be considered for additions of appropriate language to further support the GI Plan as needed.

Plans currently under development include:

- » Bayhill Specific Plan
- » San Mateo Avenue Streetscape Plan
- » Downtown Parking Management Plan

A summary of the results of the review of each plan are presented in the sections below.

### 2.1.2 San Bruno General Plan

The General Plan is the overarching document used to govern the City's goals, policies and actions. The General Plan is updated in intervals with some sections, such as the Housing Element, being updated more frequently. San Bruno's General Plan currently includes significant references to stormwater management, pollution prevention, and GI implementation in various sections including Land Use and Urban Design (LUD) and Environmental Resources and Conservation (ERC).

The following provides examples of how the General Plan includes GI language and goals:

- » Assure that new development mitigates impacts on storm drainage systems (LUD-76, ERC-19, ERC-23);
- » Require and/or promote the use of GI measures, such as pervious pavement, bioretention and rainwater harvesting, on public and private land (ERC-20, ERC-24);
- » Continue programs to inform residents of environmental effects of water pollution into the San Francisco Bay (ERC-21); and
- » Protect and enhance local watersheds and reduce flood risk (ERC-D, HS-16).

The current General Plan sufficiently incorporates GI language and therefore updates are not presently needed in respect to GI. The General Plan may be updated in the future during annual or four-year major reviews to include additional policies to facilitate GI and reference the GI Plan. However, the General Plan and the GI Plan are currently complementary as the GI Plan builds upon and will significantly advance the stormwater goals, policies, and actions included in the General Plan.

### 2.1.2 Residential Design Guidelines

Some of the City's neighborhoods are experiencing substantial remodeling and expansion of existing homes and the construction of new houses.<sup>10</sup> The City of San Bruno design guidelines were developed to encourage and facilitate these changes in a manner that is respectful of the City's neighborhoods and supportive of enhancing San Bruno's housing to serve the needs of today's residents. The design guidelines will be applied by the City's planning staff, Planning Commission, and City Council in evaluating changes to existing homes, and for new single-family residential construction. The General Plan and Zoning Ordinance will continue to be followed as the primary regulatory documents. As evidence of the City's commitment to sustainability, the design guidelines include a chapter dedicated to sustainable design, including building techniques and available resources for information and assistance. Given that the design guidelines focus on single-family homes, for which GI does not commonly apply, no updates are recommended for this document.

<sup>9</sup> Urban Forestry policies are addressed in Chapter 8.24 and Chapter 8.25 of the City's Municipal Code.

<sup>10</sup> City of San Bruno Residential Design Guidelines, Page 5.

### 2.1.3 Transit Corridors Plan

The San Bruno Transit Corridors Plan outlines a new vision for the City and provides a road map for improving both the public and private realms in the vicinity of public transit hubs to transform the community. Specifically, the Transit Corridors Plan provides a vision for the Downtown core of San Bruno, historically represented by San Mateo Avenue and the surrounding streets including El Camino Real, San Bruno Avenue and Huntington Avenue. The Transit Corridors Plan is designed to facilitate new development and renovation through private investment. The plan was amended twice, in 2015 and in 2018. Because the plan already includes excellent language to support GI in its Vision & Design guidelines, no updates to the plan are recommended at this time. The following are examples of this language:

*Vision (Page 59): Walking in the Transit Corridors Area in San Bruno is a delight! Beautiful streetscape designs foster pedestrian-oriented streets and “green streets” that help the ecological sustainability of the Transit Corridors Area.*

*Vision Elements - Sustainable, Mixed-use development (Page 62): Explore opportunities for “sustainable” infrastructure that beautifies the urban environment with ecological technologies such as “green streets” and drought-tolerant plantings.*

*Sustainability Design – Stormwater Management, Guideline A13-1 (Page 121): Ensure that all projects comply with the Municipal Regional Stormwater Permit as required by the National Pollutant Discharge Elimination System (NPDES) program.*

### 2.1.4 US Navy Site Specific Plan

The U.S. Navy Site and its Environs Specific Plan provide the overall planning framework for the growth and redevelopment of the 52-acre Specific Plan Area emphasizing mixed-use transit-oriented development. The Plan Area is bounded by Cherry Avenue to the west, El Camino Real to the east, Sneath Lane to the north, and Interstate 380 to the south. The Plan was developed through a community planning process and adopted by the City Council in January 2001. The plan was amended in 2001, 2005 and 2015. The plan includes detailed development standards and design guidelines for the 52-acre Plan Area, of which 20 acres are the former U.S. Navy Site, now referred to as The Crossing.

The Crossing is a mixed-use master planned development. The project involved demolition of a former U.S. Naval administrative facility and installation of roads, utilities, open space, and a playground. The Crossing development includes a total of 1,063 multifamily rental units in five buildings, including 228 affordable senior units and 97 other affordable units, a recreation center and commercial building. The last remaining undeveloped portion of The Crossing is a 1.5-acre vacant site designated for a hotel. Since development is nearly completed and The Crossing development is subject to the General Plan policies and MRP Provision C.3 requirements, no updates to the plan are recommended at this time.



Redevelopment of Former U.S. Navy West Division Site

## 2.1.5 Walk n' Bike Plan

The Walk 'n Bike Plan, adopted in July 2016, is a long-range planning document intended to guide the City's decisions about walking and biking. Its ultimate goal is to make walking and biking in San Bruno safer, easier and more popular. Part I of the document, titled Background, consists of preliminary, background or context-setting material. Part II, titled Action Plan, is the heart of the document and represents the "actionable" part of the plan. In the Goals section of the plan, it states that "even more detailed policies, actions and practices will be developed and recommended, along with improvement projects and programs, during the next task in the planning process".

The planning and design of public pedestrian and cyclist facilities presents an opportunity for the City to incorporate GI into the public right of way and provide additional benefits. However, the existing Plan does not include any language to support GI.

Below are two examples of suggested language for sections that could be modified to support GI in the next phase of the planning process:

*Goals (page 58): The planning and design of public pedestrian and cyclist facilities present an opportunity for the City to incorporate green infrastructure to capture and treat stormwater and enhance the natural environment. In all transportation improvements, seek integrated "Sustainable Street" design solutions that achieve multiple benefits including stormwater capture and pollutant load reduction. See the SMCWPPP GI Design Guide (2019) for more information on Sustainable Streets.*

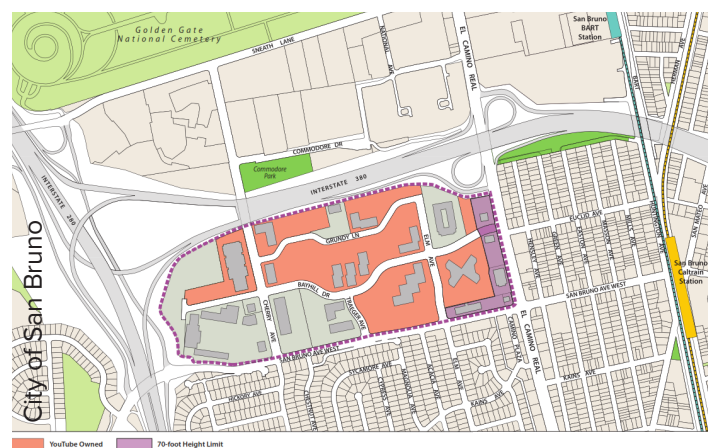
*Citywide Bikeway Network (page 80): Subsequent design efforts should seek opportunities for "Sustainable Streets" infrastructure and integrated design solutions that achieve multiple benefits such as stormwater capture and pollutant load reduction.*

## 2.1.6 Bayhill Specific Plan

The City is leading the preparation of a Specific Plan for the Bayhill Office Park which will guide anticipated development within the Plan Area over the next 20 years. The Plan Area is approximately 98 acres in total area and is bounded by Interstates 280 to the west and 380 to the north, El Camino Real to the east, and San Bruno Avenue West to the south. The northwest corner of the Bayhill Specific Plan area overlaps with the Transit Corridors Plan area.

The Bayhill Specific Plan area currently contains a total of about 1.6 million square feet of office space. The need for the Specific Plan is the result of a request by YouTube for the City to consider the company's proposed plans to accommodate its anticipated employment growth by building additional office space within the Bayhill Office Park. Preparation of the Specific Plan will allow consideration of appropriate uses of land, and land use intensities and densities (commercial square footage/number of units) for all properties, along with a full range of transportation, utility, financing and other considerations. Suggested language to support GI is included below:

*"Explore opportunities for "Sustainable Streets" infrastructure that beautifies the urban environment with ecological technologies such as "green streets" and sustainable landscaping such as Bay-Friendly Landscaping<sup>11</sup>."*



Proposed Bayhill Specific Area Plan

11 For more information on the principles and programs of Bay-Friendly Landscaping go to [www.ReScapeCa.org](http://www.ReScapeCa.org).

*“Implement stormwater management guidelines, such as:*

- » *Utilize Low Impact Development (LID) techniques to infiltrate, store, detain, evapotranspire, and/or biotreat stormwater runoff close to its source.*
- » *Minimize impervious surfaces such as concrete, asphalt and hardscaping, especially for surface parking lots. Utilize permeable joint pavers, porous concrete and asphalt, reinforced grass pavement, cobblestone block pavement, and other similar materials that allow water to infiltrate.*
- » *Utilize sustainable landscaping practices and principles that minimize irrigation and runoff, promote surface infiltration where possible and minimize the use of pesticides and fertilizers. The Bay-Friendly Landscaping program is an example of a local sustainable landscaping system. Bay-Friendly Landscaping is cited in the MRP<sup>12</sup> as a holistic approach to landscaping that works in harmony with the natural conditions in the Bay Area and utilizes seven key landscaping principles to foster soil health, reduce stormwater runoff, conserve water and other valuable resources while reducing waste and preventing pollution.”*

## 2.1.7 San Mateo Avenue Streetscape Plan

The City was developing the San Mateo Avenue Streetscape Plan concurrently with the preparation of this GI Plan. The Plan will establish a holistic design standard for all street features and reimagine the use of public spaces towards a destination San Bruno downtown. The project location and limits are within the public right-of-way on San Mateo Avenue between San Bruno Avenue at the Caltrain Station to the north and the intersection with El Camino Real to the south. San Mateo Avenue has a 60-foot right-of-way, with sidewalks approximately eight to ten feet wide, eight-foot-wide bulb-outs at intersections, parallel parking on both sides of the street, and 12-foot vehicle travel lanes.

The scope of work prepared by the City for the development of the Streetscape Plan includes the following green infrastructure guidelines:

- » Incorporate green and sustainable design features
- » Plant street trees in tree wells with grates rather than in pots
- » Discourage use of turf, grass or landscaping that requires high water usage
- » Install naturally drained, landscaped storm water planters where possible, including on sidewalks, medians, bulb outs, parks and plazas, and traffic circles
- » Develop landscaping and irrigation, including a drought-resistant tree and plant palette (i.e. number, size, and type of plants to be used) using green/sustainable features such as green walls, rain gardens, and bio swales

The Streetscape Plan provides an excellent opportunity to implement GI, consistent with the City’s GI Plan and the Transit Corridors Plan. Example language for GI can be found in the City’s Transit Corridors Plan and San Mateo County Pollution Prevention Program's Planning Document Update-Model Language (December, 2016)

<sup>12</sup> See MRP pages 13, 19, 70 and 92.

## 2.1.8 Downtown Parking Management Plan

The Downtown San Bruno Parking Management Plan was prepared as a part of the San Bruno Downtown Parking Study. The study included analyzing the existing parking supply and usage, projecting future parking demand, recommending parking management strategies, analyzing options for future new parking supply, and examining the potential costs and revenues of implementing the plan. The study area for the plan includes the portion of the City of San Bruno from San Mateo Avenue between Walnut Street to the north and El Camino Real and Taylor Avenue to the south, including two to three blocks to the east and west of this corridor. A set of phased parking management recommendations were developed to manage the parking demand, help users find and use available parking, improve parking availability for residents, and potentially increase the parking supply. Of these, two are potential construction projects:

- » Restriping San Mateo Avenue
- » New parking structure(s)

These projects, should they move forward, should be considered for GI, consistent with the City's process for evaluating capital improvement projects, and may be subject to MRP Provision C.3 requirements for LID site design, source control, and stormwater treatment measures. No updates to the plan are recommended at this time.

## 2.2 WORK PLAN FOR FUTURE INTEGRATION OF GI INTO RELATED CITY PLANS

### 2.2.1 Recommended Updates to Existing Plans

The City will review the GI Plan when revising or updating existing planning documents to ensure that GI requirements, policies, and elements are incorporated as feasible and appropriate. Although current City plans are generally aligned with and support the GI Plan, the City's Walk n' Bike Plan could benefit from additional GI-related language. An update to this plan is anticipated in 2020.

### 2.2.2 Plans Currently Under Development

The City will review plans currently under development to ensure that GI requirements, policies, and elements are incorporated in developing plans as feasible and appropriate. This includes the Bayhill Specific Plan and the San Mateo Avenue Streetscape Plan, both currently under development. Examples of GI related language can be found in existing City plans, as described in Section 2.1 above, and in reference documents such as SMCWPPP's *Planning Document Update – Model Language* (December, 2016).

## 2.3 REGIONAL PLANS

Ongoing regional efforts that are relevant to the development and refinement of the GI Plan include those described below.

### 2.3.1 San Mateo County Stormwater Resource Plan

The San Mateo County Stormwater Resource Plan (SRP) is a countywide evaluation of opportunities for stormwater capture, treatment and use, required by the State to allow stormwater capture projects to be eligible for State grant funds. Development of the SRP was led by the City/County Association of Governments (C/CAG) of San Mateo County and its Countywide Water Pollution Prevention Program (SMCWPPP), representing twenty cities and towns, the County of San Mateo, and the County Flood Control District. The SRP was prepared through a collaborative effort with stakeholders and the public and was tailored to the specific stormwater and dry weather runoff issues in the region. The main goals of the SRP are to identify and prioritize opportunities for stormwater and dry weather capture projects in San Mateo County through detailed analysis of watershed processes and surface and groundwater resources, input from stakeholders and the public, and analysis of multiple benefits that can be achieved. The GI prioritization analysis in the SRP forms the building blocks for the San Bruno-specific project prioritization in the GI Plan. The regional priorities addressed by the SRP were incorporated into the GI Plan and augmented with the local planning priorities of the City (see Section 4.3 for more details).

### 2.3.2 C/CAG Sustainable Streets Master Plan

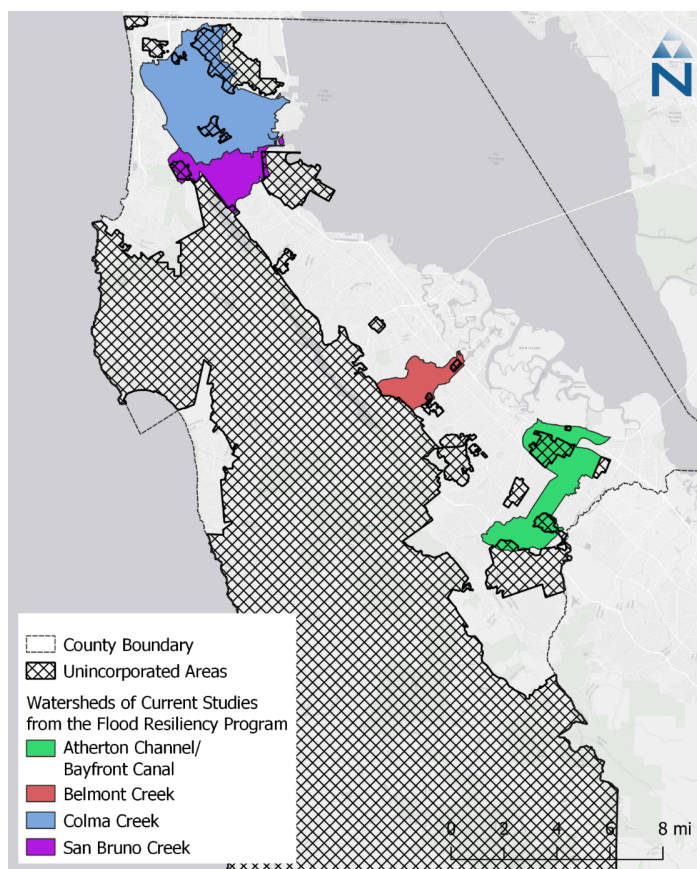
The Sustainable Streets Master Plan (SSMP) is a collaborative effort between Caltrans and C/CAG to further prioritize locations for integrating GI into roadway rights-of-way to capture and treat stormwater runoff. A significant portion of the effort includes assessing planned transportation projects for the potential to integrate GI components. As an additional objective, the SSMP aims to build upon current climate change planning efforts within the County to add resilience to vulnerable communities that may be disproportionately burdened by the effects of climate change. In addition to prioritizing sites and developing concepts for sustainable street projects, the SSMP effort will also result in the development of a Countywide GI Tracking Tool. This tool will be used to track completed GI projects, quantify key project benefits, and report progress towards GI implementation for multiple objectives, including meeting requirements of the MRP provisions.

### 2.3.3 Bay Area Integrated Regional Water Management Plan

The San Francisco Bay Area Integrated Regional Water Management Plan (IRWMP) (Kennedy/Jenks Consultants, 2013) is a nine county, multi-stakeholder regional effort to address major challenges and opportunities related to water and natural resource management in the Bay Area in four functional areas: 1) water supply and water quality; 2) wastewater and recycled water; 3) flood protection and stormwater management; and 4) watershed management and habitat protection and restoration. The IRWMP provides a collaborative and integrative framework to take action and address the major water-related challenges in the region through goals, objectives, selected resource management strategies, and prioritized projects. The IRWMP includes a list of over 300 project proposals, and a methodology for ranking those projects for the purpose of submitting a compilation of high priority projects for grant funding. The Bay Area IRWMP Coordinating Committee approved the inclusion of the San Mateo County SRP into the 2013 IRWMP on February 27, 2017. As SRP projects are proposed for grant funding, they will be added to the IRWMP list using established procedures.

### 2.3.4 Flooding & Sea Level Rise Resiliency Studies

Flooding and sea level rise studies conducted for SFO, Colma Creek, and San Bruno Creek<sup>13</sup>, as well as those conducted for the City's Storm Drain Master Plan<sup>14</sup>, may provide opportunities for future collaboration. While resiliency efforts generally focus on downstream improvements near the Bay interface, these studies have also identified possible detention areas further upstream. The City will continue to coordinate with local flooding and sea level rise resiliency efforts to identify potential synergies with GI Plan goals.



**Figure 2-1. Creek Watersheds from Flood Resiliency Program Studies**

<sup>13</sup> See: [https://seachangesmc.org/wp-content/uploads/2015/08/SanBruno\\_Colma-Resiliency-FINAL\\_Rpt\\_150820.pdf](https://seachangesmc.org/wp-content/uploads/2015/08/SanBruno_Colma-Resiliency-FINAL_Rpt_150820.pdf)

<sup>14</sup> GHD (2014). City of San Bruno Storm Drain Master Plan, Final Report. Prepared for the City of San Bruno. June 2014.



# GI DESIGN GUIDELINES, STANDARDS, & SPECIFICATIONS

Lotus Water

The first edition of the San Mateo Countywide Green Infrastructure Design Guide (GI Design Guide), dated April 2019, was developed by SMCWPPP to assist its member agencies, including San Bruno, with implementing green infrastructure within their jurisdiction. The GI Design Guide provides guidance for the design, construction, and maintenance of green infrastructure, and includes *Sustainable Streets Typical Design Details and Specifications* (Typical GI Details) within its appendix. The City of San Bruno references this GI Design Guide and Typical GI Details within its GI Plan while noting where the SMCWPPP guidance and details need to be tailored to align with the City's specific requirements, standard details, and/or site conditions. Additionally, the City has identified where their current city standard details need to be modified to align with the Typical GI Details.

## IN THIS SECTION

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3.3 Existing City Standard Details & Specifications	36

## 3.1 DEVELOPMENT PROCESS

The City of San Bruno worked with other C/CAG member agencies to develop the GI Design Guide. The GI Design Guide provides comprehensive design guidance and covers a broad range of project types spanning both public and private development. The document includes the following:

- » Thirteen GI measures
- » Opportunities for integration of GI applicable to San Mateo County
- » Key design and construction considerations
- » Key implementation strategies
- » Operations and maintenance guidance
- » Typical GI Details and Specifications.

More technical and specific requirements for the sizing and design of stormwater control measures for MRP regulated projects will be included in a companion document, the C.3 Stormwater Technical Guidance (C3TG). The two documents, the GI Design Guide and the C3TG, are commonly referred to as the “GreenSuite” and constitute design and sizing templates for the City’s GI Plan.

### 3.1.1 Green Infrastructure Design Guide

The GI Design Guide and its appendices provide comprehensive guidance on the planning, design, construction, and operations and maintenance of green infrastructure for buildings, parking lots, sites, and streets. The GI Design Guide addresses the requirements of the MRP, fulfilling Section C.3.j.i.(2)(e) requiring design and construction guidelines for streets and projects and C.3.j.i.(2)(f) for developing typical design details and specifications for different street and project types. The Design Guide also addresses the part of C.3.j.i.(2)(g) related to a regional approach for alternative hydraulic sizing for non-regulated and constrained street projects.

The GI Design Guide includes a range of information related to green infrastructure, such as provision of policies and definitions; identification of different types of treatment and site design measures; summation of various benefits including a range of community benefits provided beyond stormwater management; presentation of before and after images of integrating green infrastructure into projects; introduction of complete streets concepts and design; discussion regarding BASMAA’s regional approach for alternative sizing for non-regulated and constrained green street projects; design and implementation considerations; operations and maintenance; and provision of typical construction details and specifications. The Design Guide explains how these concepts, considerations, and guidance can be used to effectively integrate green infrastructure into communities in new and redevelopment projects whether they are C.3 regulated or not.

General guidelines for overall streetscape and project design, construction, and maintenance have been developed so that projects have a unified, complete design and implement the range of functions associated with the projects. The MRP emphasizes the need for guidance related to green streets functions. The Design Guide includes implementation guidance specifically for stormwater management and treatment within streets. The guidance supports safe and effective multimodal travel with a focus on the comfort of people walking and cycling; shared use as public space and an attractive and functional public realm; use of appropriate measures for different street and land use contexts and types; and the achievement of urban forestry goals and benefits. The Design Guide defines practices to give considerations to no missed opportunities and the efficient and effective coordination, review, and implementation of green infrastructure in public and private projects.

The City will use the Design Guide and future amended versions to provide support and guidance in implementing green infrastructure within the City. The Design Guide can be found on SMCWPPP’s website at <https://www.flowstobay.org/gidesignguide>. Due to local context and existing policies, however, some elements of the Design Guide are not consistent with all City policies, standards and/or guidelines. In particular, the City has identified changes to the Typical GI Details and Specifications that are needed to customize them for the San Bruno community. Refer to Section 3.2 for further information on these changes.

### 3.1.2 GI Sizing Guidelines

MRP Provision C.3.d specifies minimum hydraulic sizing requirements for stormwater treatment measures within Regulated Projects. Regulated Projects must treat the water quality design flow or volume (the “C.3.d” amount) of stormwater runoff through infiltration or biotreatment. Certain Regulated Projects must also meet the sizing requirements for Hydromodification Management (HM) in Provision C.3.g, depending on the location and amount of impervious surface created and/or replaced on the site. These criteria are hereby labeled the “Standard Sizing Methodology” and further described in Appendix A.

GI measures in public right-of-way must be designed to meet the same treatment and HM sizing requirements as Regulated Projects wherever feasible. However, if GI measures cannot be designed to meet the Standard Sizing Methodology due to constraints in the public right-of-way such as lack of space, utility conflicts, or other factors, the City may still wish to construct the measure to provide a more minimal level of treatment as well as achieve other benefits (e.g., traffic calming, pedestrian safety, etc.).

To address this situation, MRP Provision C.3.j.i.(2)(g) states that, for non-regulated green street projects, “Permittees may collectively propose a single approach with their Green Infrastructure Plans for how to proceed should project constraints preclude fully meeting the C.3.d requirements.” Such a regional approach has been developed by BASMAA<sup>15</sup> for use by the City of San Bruno and other Permittees in their GI Plans. This “Alternative Sizing Methodology” is described in Appendix A.

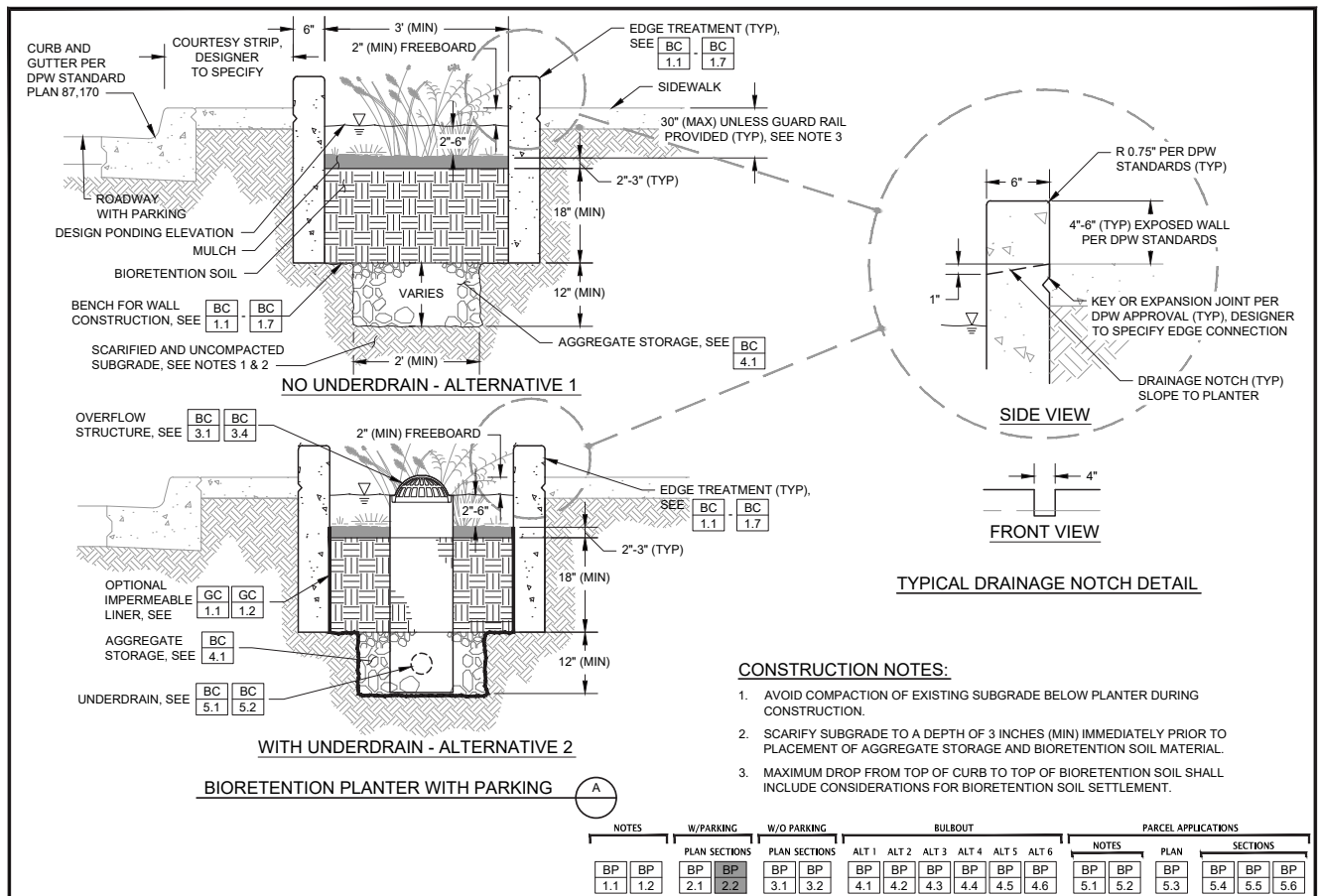
15 BASMAA, 2018. Guidance for Sizing Green Infrastructure Facilities in Street Projects.

### 3.2 TYPICAL GI DETAILS & SPECIFICATIONS

The Typical GI Details included within the Design Guide are the San Francisco Public Utilities Commission (SFPUC) Typical GI Details and Specifications (SFPUC GI Details) have been adapted for the City of San Bruno. These details show typical configurations, rather than required standard configurations, to address the need for GI to meet unique site-specific conditions. The detail set focuses on the most common types of GI within public streets, including permeable pavement and bioretention facilities, but also includes details for subsurface infiltration systems and general components that apply to various types of GI systems. With the exception of a few updates to single detail sheets and four new details, the original SFPUC GI Details have not been modified for SMCWPPP. For example, the Typical GI Details still include references to San Francisco-specific codes, requirements, and street conditions.

The GI Design Guide does acknowledge that member agencies will need to review the provided details carefully and make modifications to coordinate with their agency-specific requirements and conditions. An example of a typical detail included in the SMCWPPP GI Design Guide is shown in Figure 3-1.

The City has reviewed the entire set of Typical GI Details in the GI Design Guide and has identified where updates are needed to tailor them to projects within San Bruno. These comments are provided in the form of redlines. The City will incorporate these changes in order to create an updated set of details for San Bruno. Table 3-1 lists general comments that are applicable throughout and/or in several places within the set of details.



NOT FOR CONSTRUCTION - REFER TO USER GUIDE

Figure 3-1. Example of Typical GI Detail in SMCWPPP GI Design Guide

**Table 3-1. General Recommended Modifications of Typical GI Details**

Recommended Modifications	Applicable Typical GI Details
Replace SFPUC logo with City of San Bruno logo; update cover sheet.	All pages
Exchange all references to San Francisco-specific codes, requirements, standard drawings, policies, etc. to applicable San Bruno/SMCWPPP/utility provider references.	In multiple locations throughout the document, but in particular on Designer Notes pages.
Modify all GI terminology to match terms provided in GI Design Guide glossary, e.g. change “bioretention soil” to “biotreatment soil.”	In multiple locations throughout the document, but GEN 0.1 includes redline note that lists all recommended terminology changes required to align details with GI Design Guide.
<p>Remove all references and details that are specific to combined sewer systems, e.g. the following:</p> <ul style="list-style-type: none"> <li>» Revise callout “connection to sewer” to “connection to storm sewer”</li> <li>» Remove overflow structure detail that contains sand trap and water trap and all other references to sand trap requirements</li> </ul>	Bioretention Planter Layout and Overflow Structure Details: BP 2.1, BP 3.1, BP 4.1, BP 4.2, BP 4.3, BP 4.4, BP 4.5, BP 4.6, BC 3.4
<p>Modify bioretention/stormwater planter and subsurface infiltration system design criteria to be consistent with C.3 Technical Guide/Regulated Projects Guide, e.g. the following:</p> <ul style="list-style-type: none"> <li>» 12-inch minimum depth of Class 2 Permeable Material under biotreatment soil within stormwater planters; modify all sections that show a choking layer below soil.</li> <li>» 3-inch minimum depth of mulch.</li> <li>» 12-inch maximum depth of ponded water.</li> <li>» Different freeboard requirements for different drainage conditions per C.3.</li> <li>» 72-hour maximum (48-hour preferred) facility drawdown time; remove lesser drawdown times for surface and water and soil layer.</li> <li>» Reference to plant list provided in C.3 manual.</li> <li>» Underdrain placement of 6” above bottom of drain rock.</li> <li>» Subsurface infiltration system setbacks.</li> </ul>	<p>Bioretention Planter/Bioretention Basin Designer Notes and Section Details: BP 1.1, BB 1.1, BP 2.2, BP 3.2, BP 5.5, BP 5.6, BP 5.7, BB 2.2, BC 1.2, BC 1.2.1, BC 1.4, BC 1.5, BC 4.1, BC 5.1,</p> <p>Subsurface Infiltration Systems Designer Notes: SI 1.1, SI 1.2, SI 2.2</p>
Modify all curbs, gutters and sidewalks and references to City standard details for streetscape elements to align with Public Works Standard Details; e.g. replace keys between concrete curbs and adjacent sidewalk with expansion gaps and dowels.	In multiple bioretention and permeable pavement section and edge treatment details throughout the set.
Revise utility setback and protection requirements to be consistent with San Bruno and local utility provider requirements and remove all references to SFPUC Asset Protection Standards. Remove any utility crossing details for utility mains and/or services that show conditions that are not allowed by San Bruno.	All Designer Note sheets and Utility Crossing and Conflict Details: GC 2.1, GC 2.2, GC 2.3, GC 2.4, GC 2.5, GC 2.6, GC 2.7, GC 2.8, GC 3.1
Remove all detail sheets for outlet and end of block monitoring that were specifically developed for San Francisco capital projects in which flow rates (not water quality) are being monitored post-construction	BC 7.1, BC 7.2, BC 7.3, GC 6.1, GC 6.2

### 3.2.1 Utility Protection Guidance

In addition to the proposed modifications to the Typical GI Details, the City also identified a need for more specific utility setback and protection guidance related to green infrastructure than the high-level guidance provided in the GI Design Guide. The City reviewed the SFPUC Asset Protection Standards<sup>16</sup> that provide specific requirements for the avoidance or protection of water and combined sewer facilities for various streetscape improvements. This document includes requirements for the protection of utilities that cross under, though, and/or near bioretention planters, permeable pavement systems, and stormwater curb extensions. These specific conditions are not addressed directly in any of San Bruno's existing codes or standards. To address this need, the City developed new draft guidance based on the SFPUC standards regarding the protection of public utility assets near and/or under green infrastructure facilities. The finalization and ultimate adoption of this document will require additional coordination with and approval from other utility providers within the City limits and can be expanded to include any other utility crossings and/or conflicts not currently included. In parallel to the completion of the utility protection standards, the utility protection and crossing details included within the Typical GI Details should be modified to align with the new utility protection standards.

### 3.3 EXISTING CITY STANDARD DETAILS & SPECIFICATIONS

The City reviewed its standard detail drawings for all public roadway, storm drain, sanitary sewer, and water systems to identify any items that will need to be updated in the future to coordinate with the GI Typical Details. The review of the standard drawings yielded one item that includes conflicting design guidance. The Sewer Manhole Standard Detail, SS-01, specifies that plastic steps are required on manholes that are four (4) feet or deeper. Typical GI Detail, BC 3.4, for Bioretention Overflow Structures, specifies that a permanent bolted ladder and a minimum clear space of 30 inches by 30 inches is required for all structures that exceed five (5) feet in depth. Upon further review, the City determined that the Typical GI Details should be modified to be consistent with the City's standard drawings and the threshold for requiring steps and/or a bolted ladder should be 4 feet for all manholes and storm drain structures that are maintained by the City.

A comparison of the City standard drawings to the Typical GI Details also revealed instances where it might be advantageous to adopt the new GI details as standards in the public right-of-way. Because varying site conditions impact the overall layout, form, and design of GI facilities, it is more practical to make only certain key components of the GI "typical" details into standard designs. Examples of Typical GI Details in which the City may consider converting into standard detail drawings include the following:

- » Permeable pavement sections and specifications;
- » Bioretention outlet structure;
- » Bioretention planter curb cut inlet and outlet; and
- » Bioretention planter trench drain inlet/outlet.

<sup>16</sup> The SFPUC Asset Protection Standards can be viewed here: <https://sfwater.org/modules/showdocument.aspx?documentid=10873>



Don Ramey Logan

This Section describes the process followed to identify and prioritize the top GI project opportunities in San Bruno. This process considers not only stormwater performance, but also evaluates project constructability constraints, social and environmental benefits, and synergies with other planned City projects and goals.

**IN THIS SECTION**

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4.4 City-Specific GI Prioritization	45

## 4.1 INTRODUCTION & BACKGROUND

A process was developed to identify and prioritize GI project opportunities across the City that will inform GI planning efforts. This process focused on prioritizing opportunities for green streets to manage ROW runoff, LID retrofits to manage public parcel runoff on-site, and regional projects to capture runoff generated from large areas that may span both streets and parcels. The process developed for the GI Plan builds upon previous efforts in the County to prioritize opportunities for GI, namely, the Countywide Stormwater Resource Plan (SRP) developed by C/CAG. For the GI Plan, the prioritization methodology used in the SRP was refined to incorporate local criteria, including stormwater capture estimates from the RAA modeling output, site-level constraints, and other City planning priorities. The result of the prioritization process is a list of ranked potential project sites that forms the basis for the City’s GI strategy described in Section 5. In addition to providing guidance for the GI strategy, the output from the prioritization process can be used as a tool to understand the costs and benefits of the identified opportunities. It can also serve as a starting point for assessment of future candidate projects as they arise.

The prioritization process included the following three steps:

1. Countywide Screening – this step, completed as part of the SRP, included a comparison of sites to established screening criteria and removal of sites that were unlikely to be feasible for GI.
2. Countywide Prioritization – this step, also completed as part of the SRP, involved prioritization scoring of all street and public parcel sites that passed the screening criteria.
3. City-Specific Prioritization – this step updated the countywide prioritization using additional city-specific criteria to create the final prioritization results.

## 4.2 PROJECT TYPES

The assessed green infrastructure project types fall into the following categories: Regional Projects, LID Retrofits, and Green Streets. These are the types of GI capital projects that the City will implement to meet the water quality goals and multi-benefit objectives defined in the GI Plan. These capital project types are typically constructed on publicly-owned property or within public rights-of-way (e.g., along streets) and will often involve retrofitting an existing impervious area such that the area will drain to a pervious area and/or a GI treatment measure.

### 4.2.1 Regional Projects

Regional GI projects are large-scale stormwater projects that capture on-site and off-site runoff for treatment. Off-site runoff is typically routed to the project site via diversion from storm drains, channels, or streams. Regional projects can be designed for both subsurface (e.g., infiltration chamber) and above-ground (e.g., detention, constructed wetlands) applications. The site characteristics and uses will determine what types of regional projects are feasible, e.g., how much flow the project can divert from the storm drain network, whether the project is above ground or underground, and the size of the project. In addition to water quality benefits, regional GI projects may also provide flood attenuation, groundwater recharge, and nonpotable reuse. They are often more cost-effective than green streets or LID Retrofits due to their economies of scale.



Installation of Subsurface Storage for a Regional Project

### 4.2.2 LID Retrofits

LID retrofit projects mitigate stormwater impacts by reducing runoff through capture and/or infiltration and treating stormwater on-site before it enters the storm drain system. LID retrofit projects may include bioretention facilities, infiltration trenches, detention and retention areas in landscaping, pervious pavement, green roofs, and systems for stormwater capture and use. These measures help to protect water quality by filtering stormwater through plants and soil and allowing stormwater to infiltrate into the ground, thus mimicking the pre-urbanized natural hydrology of the undeveloped site. For the purposes of this GI Plan, LID retrofit projects are GI facilities that are built on a parcel to treat runoff generated from impervious surface on that parcel. These projects may or may not be regulated projects (see Section 5.3).



LID Retrofit Project in San Mateo County

### 4.2.3 Green Streets

GI roadway projects are typically called “Green Streets.” Green streets projects are located in the public right-of-way and capture runoff from the street and adjacent parcels. At a watershed or city scale, green streets are distributed, small-scale GI projects that provide localized treatment and flood reduction for relatively small drainage areas. Green streets can include facilities such as bioretention bulb-outs, stormwater planters, or permeable pavers along street rights-of-way.

There are often opportunities to include GI facilities in “Complete Streets” projects. This latter term refers to streets that incorporate all modes of travel equally and are designed to increase safety and access for cyclists and pedestrians regardless of age or ability. The integration of the goals of both Complete Streets and Green Streets has coined several new terms such as “Living Streets,” “Better Streets” and “Sustainable Streets.” This design movement recognizes the multiple benefits that environmentally and holistically designed streets can achieve.



Green Street Example

## 4.3 COUNTYWIDE STORMWATER RESOURCE PLAN PRIORITIZATION

The San Mateo County SRP process was led by C/CAG and followed the State of California’s guidance for developing a Stormwater Resource Plan. The SRP (completed February 2017) provided an ideal opportunity for the C/CAG member agencies, including the City of San Bruno, to proactively plan for GI and meet the MRP GI planning requirements while also meeting the California State Water Resources Control Board (SWRCB) requirements for future stormwater project funding. Per the SWRCB, in order to be eligible to receive most sources of future stormwater funding from the State, stormwater projects must be included in a SRP. This SRP must be generated following a specific set of guidelines. These guidelines specify that the SRP must employ quantitative methods to identify and prioritize stormwater and dry weather runoff capture projects, which includes the quantification of stormwater capture volumes and pollutant load reduction. The guidelines also require that potential projects must be assessed for multiple benefits. Fortunately, the SRP guidelines are similar and synergistic with the MRP requirements for GI planning, allowing C/CAG member agencies, including San Bruno, to utilize the SRP outputs both for the purposes of accessing state funding and for their GI planning processes. As described in Section 4.4, San Bruno’s process built upon the SRP effort by refining the prioritized project list for the City’s specific local conditions and goals.

### 4.3.1 Key Data Sources

The data used to analyze the San Mateo watersheds and prioritize GI projects included the landscape elements that most affect hydrology and pollutant transport. Natural hydrology is influenced by physical characteristics such as impervious cover, soil type, and land segment slope. Percent imperviousness is the predominant factor in determining the quantity of runoff generated from a given area. Hydrologic Soil Group (HSG) categorizes soils based on drainage characteristics, with Group A consisting of well drained soils and Group D consisting of poorly-drained soils. Slope is a factor in determining both the peak rate of runoff and the feasibility of implementing GI projects to capture and infiltrate runoff. Additional datasets used to identify potential projects include ownership and public right-of-way data as well as other special considerations. This data is summarized in Table 4-1.

Table 4-1. SRP Data Sources

Characteristics	Data Sources	Source Date
<b>Hydrology &amp; Pollutant Transport</b>		
Land Use	Association of Bay Area Governments	2005
Impervious Cover	National Land Cover Dataset (NLCD) - 30 meter resolution	2011
Hydrologic Soil Group	National Resource Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO)	2016
Percent Slope	Derived from National Elevation Dataset (NED) - 10 meter resolution	2010
<b>Ownership &amp; Public Right-of-Way</b>		
Parcels	San Mateo County Information Services Department	2016
Streets & ROW	San Mateo County Information Services Department	2016
<b>Special Considerations</b>		
Flood Prone Streams	Flood-prone streams and watersheds identified by C/CAG	2016
PCB Areas	C/CAG (land use pre-1980, SWRCB Industrial Permit Facilities, pavement conditions, and site violations)	2016

### 4.3.2 Opportunity Identification & Screening

Due to the differences in scale, GI types, and measures of effectiveness, project opportunities in the SRP were organized into the three categories summarized in Section 4.2 – regional stormwater capture, LID on public parcels, and green streets. These categories were evaluated separately and prioritized only in comparison to other opportunities within the same category.

Both regional and LID project opportunities were defined using the County Assessor's parcel dataset. The focus of the SRP was implementation of GI on publicly-owned or managed land, so public ownership was a primary screening factor. Parcels that were owned by a public entity or were associated with a public use (e.g., park, school, golf course) were selected. Because sites with steeper slopes present additional design challenges, parcels with average slopes greater than 10 percent were removed from the selection. The remaining parcels in the selection continued to the prioritization step. Parcel size was used to determine whether a project opportunity can be considered an LID opportunity only or both an LID and regional project opportunity. Sites less than 0.25 acres were considered an LID opportunity only while sites greater than or equal to 0.25 acres were considered both an LID and regional project opportunity. The set of regional project opportunities is a subset of the parcels that comprise the set of LID project opportunities.

Green street opportunities were defined as street segments (one block) using the County street centerline dataset. Public right-of-way, street functional class, and slope were used to screen street segments suitable for green street projects. Again, the focus of the SRP is on publicly-owned or managed land so public right-of-way was a selection criterion used in the screening of green street opportunities as well. Variables such as high traffic volumes and road speed limit can impact suitability in terms of both system performance and long-term operation and maintenance costs. Street segments were selected if they fell into functional classes of secondary roads (arterial streets), local neighborhood roads, city streets, alleys, and parking lot roads, based on classifications in the 2015 Census TIGER road line dataset. These classes typically exhibit characteristics of lower traffic volume and lower speed limits as opposed to highways. Site slope is also an important consideration in green streets, because it may affect project feasibility and effectiveness. Street segments with an average slope greater than 5 percent were removed from the selection. The remaining street segments in the selection continued to the prioritization step. Figure 4-1 shows the criteria used to screen both parcel and street-based opportunities.

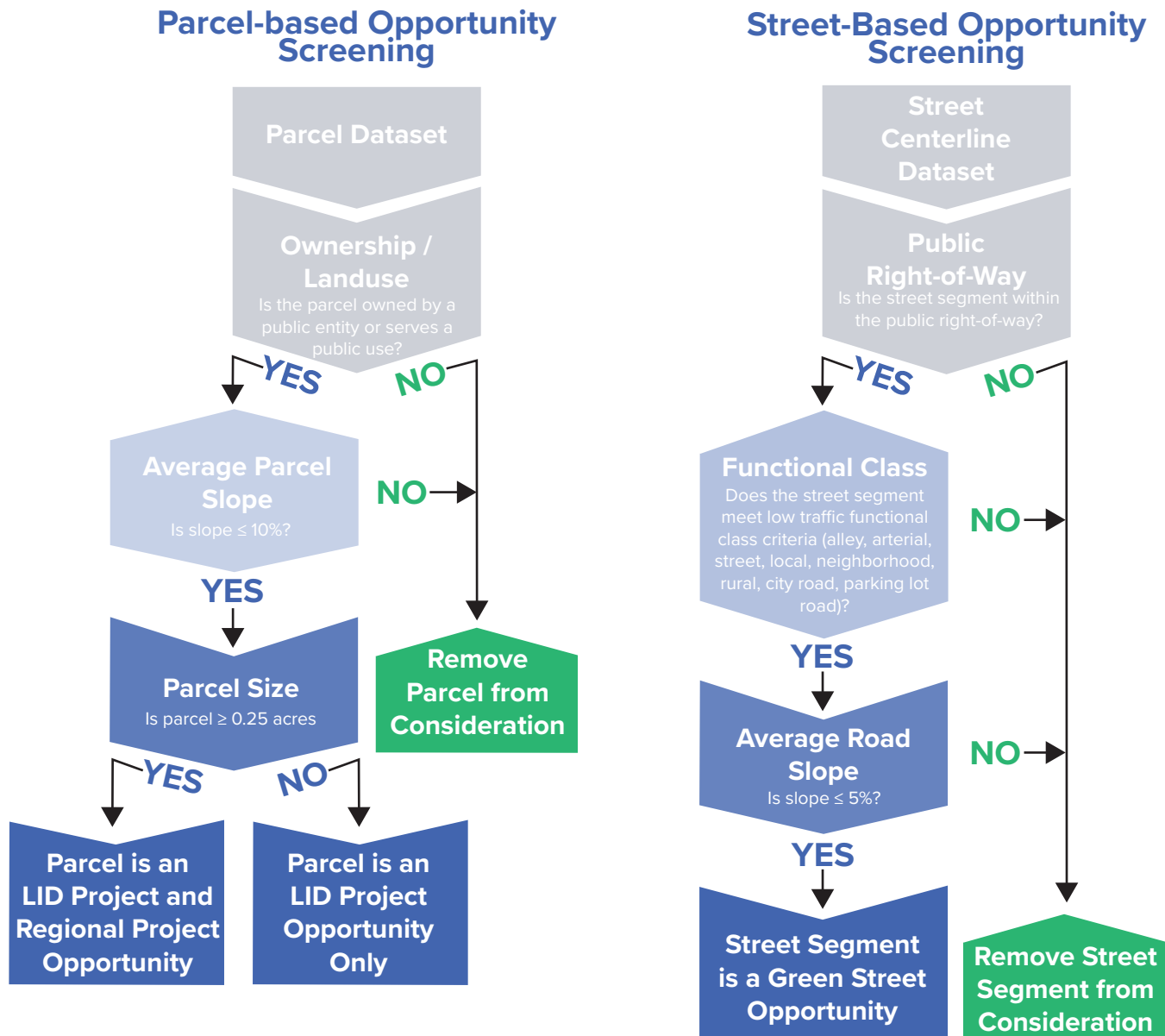


Figure 4-1. Flow Chart of Project Opportunity Screening Process

### 4.3.3 Opportunity Prioritization Scoring

After the identification of feasible project locations, screened streets and parcels were prioritized to aid in the selection of projects that would be most effective and provide the greatest number of benefits. In addition to physical characteristics, several special considerations were included in the prioritization methodology. Specifically, projects were prioritized through the lens of the following six categories:

- 1. Physical Characteristics** - Physical conditions include land use, impervious area, parcel size, hydrologic soil group, and/or slope. Characteristics for a suitable project differ between project type and a separate scoring system was developed for regional projects, streets and LID retrofit projects, as shown in Table 4-2.
- 2. Flood-Prone Streams and Watersheds** - Projects located within the subwatersheds of flood-prone streams and areas affected by flooding can help to mitigate flood risks and reduce flood and hydromodification impacts by limiting the volume of runoff that reaches the impacted streams.
- 3. PCB Interest Areas** - PCBs are one of the primary pollutants of concern within the Bay Area; therefore, siting stormwater capture projects in PCB interest areas can potentially address water quality issues.
- 4. Co-Located Planned Projects** - Consideration of other potential or planned City projects opens opportunities for cost-sharing and maximizes multiple benefits achieved by a single project. Co-located projects may come from capital improvement or master planning processes or Countywide programs like the Safe Routes to School program.
- 5. Drains to San Francisco Bay** - Project opportunities that drain to Total Maximum Daily Load (TMDL) waters (i.e., San Francisco Bay) have potential to contribute towards

the attainment of MRP requirements. The Bay is subject to several TMDLs that require reductions in pollutant loads, including PCBs and mercury, over the next several decades. Since stormwater is identified as the primary contributor of these pollutants to the Bay (SFRWQCB 2013), volume reduction from stormwater capture projects will result in reduction of these pollutants.

- 6. Multiple Benefits** - While the reduction of pollutant loads is one of the primary objectives of Green Infrastructure, several other benefits can be achieved to improve cost effectiveness and increase buy-in. The potential project benefits evaluated in the SRP are: augmentation of local water supply; source control of pollutants and runoff volume; reestablishment of natural water drainage treatment and infiltration; restoration of pre-development drainage; creation, enhancement, or restoration of habitat; and promotion of community enhancement.

Through the City's input and input from the other C/ CAG member agencies, the prioritization criteria were given weighting to arrive at the final project prioritization methodology. The result of the process was assigned prioritization scores for each identified GI opportunity within each of the three project categories (green streets, LID retrofits, and regional projects). These scores could then be further filtered or sorted to support ongoing prioritization of projects within a member agency's jurisdiction. The criteria and weighting are summarized for each project type in Table 4-2.

Table 4-2. SRP Countywide Prioritization Factors

Metric	Points						Weight Factor
	0	1	2	3	4	5	
<b>Regional Projects</b>							
Parcel Land Use			School / Golf Course	Public Building	Parking Lot	Park / Open Space	
Parcel Size (acres)	0.25 - 0.5	0.5 - 1.0	1 - 2	2 - 3	3 - 4	≥ 4	
Slope (%)	5 - 10	4 - 5	3 - 4	2 - 3	1 - 2	≤ 1	
<b>LID Retrofit Projects</b>							
Parcel Land Use			School / Golf Course	Park / Open Space	Parking Lot	Public Building	
Slope (%)	5 - 10	4 - 5	3 - 4	2 - 3	1 - 2	≤ 1	
<b>Green Street Projects</b>							
Street Type	Highway		Arterial	Collector	Alley	Local	
Slope (%)		4 - 5	3 - 4	2 - 3	1 - 2	≤ 1	
<b>All Projects</b>							
Impervious Area (%)	< 40	40 - 50	50 - 60	60 - 70	70 - 80	80 - 100	
Hydrologic Soil Group		D	Unknown	C	B	A	
Proximity to Flood Prone Channels (miles)	No					Yes	2
Contains PCB Interest Areas	None			Moderate		High	2
Co-located with Another Agency Project	No					Yes	2
Drains to TMDL Water	No					Yes	
Above Groundwater Basin	No		Yes				
Augments Water Supply	No	Yes					
Water Quality Source Control	No	Yes					
Reestablishes Natural Hydrology	No	Yes					
Creates or Enhances Habitat	No	Yes					
Community Enhancement	No	Yes					

Source: Prioritization metrics for green streets, LID retrofit projects, and regional projects from San Mateo County Stormwater Resource Plan (2017)

## 4.4 CITY-SPECIFIC GI PRIORITIZATION

The GI Plan leverages previous countywide planning efforts from the SRP to identify, evaluate, and prioritize potential opportunities for GI improvements. As with the SRP, the prioritization is broken out between regional projects, LID retrofit projects, and green streets. To properly weigh the criteria most critical to these project types, each has a slightly different prioritization process. The San Bruno-specific prioritization incorporates both updates to the original SRP prioritization metrics and new metrics specific to the local planning priorities of the City.

### 4.4.1 Adjustment of SRP Metrics to City Priorities

The City-specific prioritization builds on the SRP effort to refine, identify, evaluate, and prioritize potential GI improvements. The metrics utilized in the SRP were intended to evaluate available opportunity, potential project effectiveness, and expected co-benefits of GI opportunities on a regional-scale. The SRP focused on metrics that could be evaluated with widely-available regional datasets, while local priorities of individual municipalities were excluded from the analysis to make possible the comparison of GI opportunities across the heterogeneous and diverse communities in San Mateo County. The City-specific focus of the GI Plan allowed for reevaluation of the metrics utilized in the SRP and tailoring of the methodology with local considerations and datasets. The metrics that were included in the SRP but modified for the GI Plan are outlined below.

#### *Flood-prone watersheds*

The SRP considered proximity to flood-prone streams to represent the potential benefit of GI projects for peak flow and volume reduction in areas with frequent flooding issues. The list of flood-prone streams was identified by C/CAG staff during development of the SRP through known study watersheds of programs chartered to deal with flooding issues (e.g., County Flood Resilience Program, San Francisquito Creek Joint Powers Authority) and local flood reports received from C/CAG member agencies. The SRP evaluated not only the presence of opportunities in flood-prone watersheds but the proximity to the main stream reaches in those watersheds. The intent of the proximity consideration was an attempt to prioritize opportunities that were most likely to have the largest potential drainage areas. Projects nearest the main stem of a watershed's stream network would likely have larger drainage areas than those along a smaller branch.

However, recognizing that all opportunities upstream of flooded areas have potential benefit, the proximity to the stream was removed from consideration for the GI Plan. Instead, all GI opportunities that were located within a flood-prone watershed were given the same number of points.

#### *Co-located planned projects*

Co-located planned projects were evaluated in the prioritization for several reasons. Project opportunities that can be implemented in parallel with new development and redevelopment projects or other municipal capital improvement projects currently in the planning phase may increase opportunities for cost-sharing, unlock alternate funding mechanisms, and maximize multiple benefits that may not otherwise be achieved by a single project. During development of the SRP, each jurisdiction was given the opportunity to submit projects for co-location with stormwater capture. Through a survey (e-mail from Matt Fabry to C/CAG Stormwater Committee, February 29, 2016), the County and cities submitted planned projects with the project description, contact information, and multiple benefits expected to be achieved by each project. One project was submitted by the City for the SRP. The list was updated for the GI Plan to include currently-planned projects featuring both public and private development that may be opportunities for GI integration. Opportunities within 500 feet of a submitted project location were prioritized. Table 4-3 lists both the previous projects submitted under the SRP and new projects included in the GI Plan analysis.

Table 4-3. Near-term Planned Projects for Co-Located GI Opportunities

Project Title	Location	Description
<b>Identified in the Stormwater Resource Plan</b>		
Crestmoor Canyon Detention Basin	East of Crestmoor Canyon @ Fwy 280 and 380	Project from the San Bruno Storm Drain Master Plan, addressing existing undersized pipes currently served by a small detention basin. The proposed project is a large-scale detention basin that would capture a greater upstream area.
<b>Identified in the GI Plan</b>		
<b>Public Projects</b>		
Huntington Cycle Track	Huntington Ave – San Bruno Ave to Centennial Way Trail	This project will implement a component of the San Bruno Walk ‘N Bike Plan by improving the pedestrian and bicycle network on Huntington Ave from San Bruno Ave to the entrance of the Centennial Way Trail. Project improvements include converting the rightmost lane on northbound Huntington Ave to a two-way cycle track with a concrete barrier and installation of streetscape improvements such as pedestrian scale lighting.
Downtown Streetscape Plan	San Mateo Ave – San Bruno Ave to El Camino Real	The Streetscape Plan will include implementable improvements and amenities along San Mateo Avenue, that is consistent with the area character and public realm guidelines outlined in the San Bruno Transit Corridors Plan.
Recreation and Aquatics Center	San Bruno City Park	The proposed new Recreation and Aquatics Center will be located in the same general area as the existing Veterans Memorial Recreation Center. The new Recreation and Aquatics Center Project consists of three separate phases. The first phase of work included the conceptual design of the new Center. The second phase is to proceed with the development of schematic design plans and construction drawings, and the third phase is project construction.
Florida Avenue Park	Florida Ave	The City has been working to construct a new community park in the area known as the Heart Neighborhood. This park, which will be located along Florida Avenue, will be a welcome addition to a portion of the community that does not have a neighborhood park with playground equipment.
Commodore Park Dog Run Improvements	Commodore Park	The project will level the play surface and allocates space between the small and large dog play areas.
<b>Private Projects</b>		
YouTube HQ	901 Cherry Ave	Preparation of the Specific Plan will ensure that YouTube’s campus expansion needs are integrated into an attractive setting that benefits Bayhill’s other property owners, as well as the broader San Bruno community.
Glenview Terrace	2880-2890 San Bruno Ave W, 850 Glenview Dr	Proposal to construct 29 single family homes on the corner of San Bruno Avenue and Glenview Drive. The project site is 3.28 acres and consists of three parcels of land, which were formerly the location of a gas station on San Bruno Avenue and a church on Glenview Drive. Home sizes would vary between about 2,000 square feet and 3,000 square feet. The application requires review by the Architectural Review Committee and Planning Commission, and approval from the City Council.
Mills Park Plaza	715 El Camino Real	Proposal to construct two new 5-story, 70’ tall, mixed-use buildings, with approximately 400 dwelling units and 45,000 square feet of ground floor retail on a 5.38-acre site. The project would involve the demolition of the existing Camino Plaza commercial buildings. At least 15% of the residential units would be affordable.

### **Removal of “Drains to TMDL waters” metric**

Project opportunities that drain to Total Maximum Daily Load (TMDL) waters, i.e., San Francisco Bay, were given higher priority in the SRP. Since stormwater is identified as the primary contributor of the TMDL-regulated pollutants to the Bay (SFBRWQCB 2013), project opportunities that are in watersheds that drain to the Bay were given higher priority. However, because all of the drainage from the City of San Bruno discharges to the Bay, this metric is not a differentiator and was removed from the City-specific analysis.

### **Augments water supply**

The SRP evaluated an opportunity’s potential for augmenting water supply and its location above a groundwater aquifer as two separate metrics. Because these two considerations are related, these metrics were combined into a single metric for the GI Plan. Additionally, a project opportunity’s proximity to an active groundwater contamination cleanup site (from the Geotracker database) was also considered to avoid prioritizing infiltration-based GI projects in areas with potential to mobilize pollutants. For the GI Plan, opportunities that were located above a groundwater basin and at least 500 feet from an active cleanup site were given higher scores for this metric.

### **Community Enhancement**

In the SRP, the community enhancement metric was evaluated qualitatively and based upon the typical benefits associated with a specific project type. For example, almost all green street projects contain an element of community enhancement (e.g., neighborhood greening, increased walkability, bicycle/pedestrian safety) so all project opportunities in this category were assigned the same number of points in the SRP. However, GI has the potential for a greater impact in communities that are identified as disadvantaged. For instance, as a changing climate adds strain on local infrastructure, increased flooding may have a disproportionate impact on those dependent on walking, biking, or public transportation. GI may help to alleviate local flooding issues and buffer against climate change impacts. For the GI Plan, higher scores were assigned for this metric if an opportunity was located within or adjacent to a vulnerable community (SB 535 - Disadvantaged Community or AB 1550 - Low-income Community).

## **4.4.2 Consideration of Additional Local Priorities**

In addition to modifications to the SRP metrics, new metrics were devised for the GI Plan that consider the local priorities and GI planning goals specific to the City of San Bruno. These metrics are used to augment the prioritization analysis with local data that could not be considered on the countywide scale of the SRP. These metrics are described below.

### **Results of the San Mateo County Reasonable Assurance Analysis (RAA)**

C/CAG initiated a county-wide effort to develop a Reasonable Assurance Analysis (RAA) to estimate the baseline pollutant loads to the Bay and set goals for the amount of GI needed to meet the portion of pollutant load reduction assigned to GI through the San Francisco Bay Municipal Regional Stormwater Permit (MRP) (SFBRWQCB 2015). The RAA quantitatively demonstrates that proposed control measures will result in sufficient load reductions specified by the MRP. From the RAA, each jurisdiction received a tailored cost-optimized implementation strategy specifying the amount and type of GI (e.g., projected C.3-regulated new and redevelopment, existing GI projects, identified regional projects, green streets) in each subwatershed needed to meet water quality targets. The GI Plan prioritization includes an RAA metric that prioritizes opportunities where the RAA specified the greatest amount of GI is needed to meet permit requirements in the most cost-effective manner. The amount of GI in each subwatershed varies across the different project types and is reflected in each project type’s respective prioritization. Projects in subwatersheds that were identified as requiring greater investment in GI were given a higher score in the prioritization. Figure 4-2 shows the GI project capacities required in San Bruno to meet the load reductions specified by the MRP and provides a visual representation of how the City’s GI needs are distributed spatially. The darker blue subwatersheds represent areas that require more GI, while lighter blue subwatersheds are areas requiring less GI. Refer to Appendix B for additional discussion of the RAA modeling process and a detailed explanation of results.

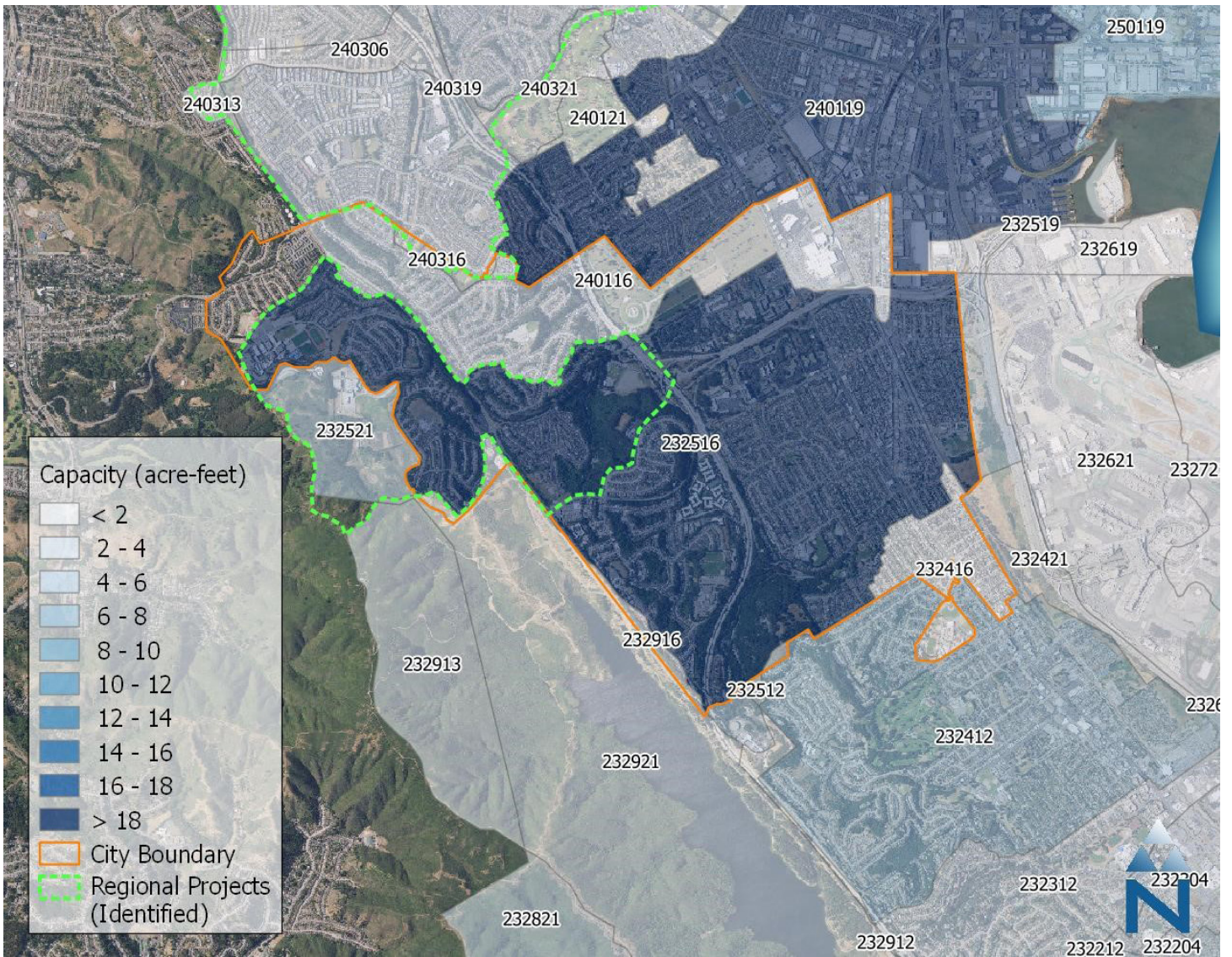


Figure 4-2. Spatial Distribution of GI Capacity Needs by Subwatershed

***FEMA flood zones***

FEMA flood zones were added to the metrics to prioritize opportunities with potential to alleviate flooding of the 100-year event (1% annual probability of flooding). Larger regional projects, especially, have greater potential to provide a flood reduction benefit because of the large capture volume relative to distributed GI projects (i.e., LID and green streets). While flooding is also considered in the “Flood-prone watersheds” metric, the FEMA flood zones provide additional detail on a sub-watershed scale to prioritize especially at-risk areas for flooding.

***Proximity to storm drains***

Regional projects often capture and treat runoff that is diverted from large storm drains. Projects that are sited close to a storm drain benefit from lower diversion and pumping requirements. Capital costs may increase substantially when captured runoff must be moved longer distances. Additionally, distributed GI projects are often connected to an existing storm drain via an underdrain, required in areas of low infiltration or high groundwater. Opportunities closer to the storm drain were assigned higher scores. Because regional projects often include pumping of water to or from the site, the distances to the storm drain may be farther than what is required for LID or green street underdrain connections. This is reflected in the prioritization metric.

***Proximity of existing irrigation connections***

Many vegetated GI practices require irrigation, especially during the establishment period which may last up to two years. It may be expensive to tap new irrigation lines and to install additional backflow devices and controllers. Sites that are close (within 500 feet) to a water meter designated for irrigation are given higher priority.

***Width of the right-of-way***

Right-of-way width is used to evaluate the amount of area that may be available for GI retrofits. Because of the multiple functions the public right-of-way typically serves (e.g., pedestrian walkways, bicycle lanes, transit loading zones, parking, etc.), they can be space-constrained. Segments of street that are in wider right-of-way are likely to contain more opportunity for GI and are given higher priority.

***Utility conflicts***

Utility conflicts are an important factor for GI project feasibility. Large utilities are often cost-prohibitive or infeasible to relocate or design around. Green street opportunities with the least aggregate length of utility conflict per length of street are given higher priority. A conflict is determined to be a utility main greater than 8 inches in diameter. Additionally, streets along PG&E gas lines, which are considered a high conflict utility, are given a lower priority.

***Vegetation density***

One common benefit of GI is increased greenery in urban areas. Associated benefits include beautification of neighborhoods, increased shading, and reduced urban heat island effect. Using the County’s vegetation mapping dataset, areas of low vegetation density are given higher priority to maximize the benefit achieved through urban greening. Using the County’s high vegetation level shapefile, the total area of vegetation is aggregated at the census tract level. Areas with a lower percentage of vegetated area are assigned the greatest number of points.

San Bruno-specific metrics for the GI Plan are outlined in Table 4-4 through Table 4-6.

Table 4-4. Metrics for Regional Stormwater Capture Project Opportunities

Metric	Points						Weight Factor
	0	1	2	3	4	5	
<b>Stormwater Resource Plan Metrics</b>							
Parcel Land Use			School / Golf Course	Public Building	Parking Lot	Park / Open Space	
Imperviousness (%)	< 40	40 - 50	50 - 60	60 - 70	70 - 80	80 - 100	
Parcel Size (acres)	0.25 - 0.5	0.5 - 1.0	1 - 2	2 - 3	3 - 4	≥ 4	
Hydrologic Soil Group		D	Unknown	C	B	A	
Slope (%)	5 - 10	4 - 5	3 - 4	2 - 3	1 - 2	≤ 1	
<b>Within a Flood-Prone Watershed<sup>1</sup></b>	<b>Not in Watershed</b>					<b>In Flood Prone Watershed</b>	<b>2</b>
Contains PCB Interest Areas	None			Moderate		High	2
<b>Currently Planned by City or Co-located with Other City Project<sup>2</sup></b>	<b>No</b>					<b>Yes</b>	<b>2</b>
<b>Augments Water Supply</b>	<b>No</b>					<b>Above Aquifer &amp; Not Near Cleanup Site</b>	
Water Quality Source Control	No	Yes					
Reestablishes Natural Hydrology	No	Yes					
Creates or Enhances Habitat	No	Yes					
<b>Community Enhancement</b>	<b>None</b>			<b>Within 1/2 mile of SB 535 or AB 1550</b>		<b>SB 535 Disadvantaged or AB 1550 Low Income Communities</b>	
<b>City Specific Metrics</b>							
Subwatershed Ranked by Highest Capacity in RAA (by Project Type) <sup>3</sup>	Not in RAA Subwatershed	Remaining Subwatersheds				Subwatershed ID 232516	
FEMA Flood Zones	Outside 100-yr Flood Zone					In 100-yr Flood Zone	
Proximity to Storm Drain (ft)	> 1,000	500 - 1,000		200 - 500		≤ 200	

**Bold** = metric was included in the SRP but modified for the GI Plan

1 Recognizing that all opportunities upstream of flooded areas have potential benefit, the proximity to the stream was removed from consideration for the GI Plan. Instead, all GI opportunities that were located within a flood-prone watershed were given the same number of points.

2 List of co-location opportunities with green infrastructure should be updated with projects and priority areas identified since the development of the Countywide Stormwater Resource Plan in 2017. Additional near-term planned projects from both public and private development were added to the list.

3 Map of subwatersheds can be found in Appendix B, Figure 5-3.

Table 4-5. Metrics for LID Project Opportunities

Metric	Points						Weight Factor
	0	1	2	3	4	5	
<b>Stormwater Resource Plan Metrics</b>							
Parcel Land Use			School / Golf Course	Public Building	Parking Lot	Park / Open Space	
Imperviousness (%)	< 40	40 - 50	50 - 60	60 - 70	70 - 80	80 - 100	
Parcel Size (acres)	0.25 - 0.5	0.5 - 1.0	1 - 2	2 - 3	3 - 4	≥ 4	
Hydrologic Soil Group		D	Unknown	C	B	A	
Slope (%)	5 - 10	4 - 5	3 - 4	2 - 3	1 - 2	≤ 1	
<b>Within a Flood Prone Watershed<sup>1</sup></b>	<b>Not in Watershed</b>					<b>In Flood Prone Watershed</b>	<b>2</b>
Contains PCB Interest Areas	None			Moderate		High	2
<b>Currently Planned by City or Co-located with Other City Project<sup>2</sup></b>	<b>No</b>					<b>Yes</b>	<b>2</b>
<b>Augments Water Supply</b>	<b>No</b>					<b>Above Aquifer &amp; Not Near Cleanup Site</b>	
Water Quality Source Control	No	Yes					
Reestablishes Natural Hydrology	No	Yes					
Creates or Enhances Habitat	No	Yes					
<b>Community Enhancement</b>	<b>None</b>			<b>Within 1/2 mile of SB 535 or AB 1550</b>		<b>SB 535 Disadvantaged or AB 1550 Low Income Communities</b>	
<b>City Specific Metrics</b>							
Subwatershed Ranked by Highest Capacity in RAA (by Project Type) <sup>3</sup>	Not in RAA Subwatershed	Remaining Subwatersheds		Subwatershed ID 240116		Subwatershed ID 232516	
FEMA Flood Zones	Outside 100-yr Flood Zone					In 100-yr Flood Zone	
Irrigation Connection	Not Near Irrigation Connection			Within 500 ft of Irrigation Water Meter			
Proximity to Storm Drain (ft)	> 500	200 - 500		100 - 2000		≤ 100	

**Bold** = metric was included in the SRP but modified for the GI Plan

- 1 Recognizing that all opportunities upstream of flooded areas have potential benefit, the proximity to the stream was removed from consideration for the GI Plan. Instead, all GI opportunities that were located within a flood-prone watershed were given the same number of points.
- 2 List of co-location opportunities with green infrastructure should be updated with projects and priority areas identified since the development of the Countywide Stormwater Resource Plan in 2017. Additional near-term planned projects from both public and private development were added to the list.
- 3 Map of subwatersheds can be found in Appendix B, Figure 5-3.

Table 4-6. Metrics for Green Street Project Opportunities

Metric	Points						Weight Factor
	0	1	2	3	4	5	
<b>Stormwater Resource Plan Metrics</b>							
Street Type	Highway		Arterial	Collector	Alley	Local	
Imperviousness (%)	< 40	40 - 50	50 - 60	60 - 70	70 - 80	80 - 100	
Hydrologic Soil Group		D	Unknown	C	B	A	
Slope (%)		4 - 5	3 - 4	2 - 3	1 - 2	≤ 1	
<b>Within a Flood Prone Watershed<sup>1</sup></b>	<b>Not in Watershed</b>					<b>In Flood Prone Watershed</b>	<b>2</b>
Contains PCB Interest Areas	None			Moderate		High	2
<b>Currently Planned by City or Co-located with Other City Project<sup>2</sup></b>	<b>No</b>					<b>Yes</b>	<b>2</b>
Safe Routes to School Program	No					Yes	2
<b>Augments Water Supply</b>	<b>No</b>					<b>Above Aquifer &amp; Not Near Cleanup Site</b>	
Water Quality Source Control	No	Yes					
Reestablishes Natural Hydrology	No	Yes					
Creates or Enhances Habitat	No	Yes					
<b>Community Enhancement</b>	<b>None</b>			<b>Within 1/2 mile of SB 535 or AB 1550</b>		<b>SB 535 Disadvantaged or AB 1550 Low Income Communities</b>	
<b>City Specific Metrics</b>							
Subwatershed Ranked by Highest Capacity in RAA (by Project Type) <sup>3</sup>	Not in RAA Subwatershed	Remaining Subwatersheds		Subwatershed ID 232516		Subwatershed ID 240116	
FEMA flood zones	Outside 100-yr Flood Zone					In 100-yr Flood Zone	
Irrigation Connection	Not Near Irrigation Connection			Within 500ft of Irrigation Water Meter			
Roadway Width (ft)	Narrowest 33% of Street Class			Middle 33% of Street Class		Widest 33% of Street Class	
Proximity to Storm Drain (ft)	> 500	200 - 500		100 - 200		≤ 100	
Utility Conflicts		High Conflict Utilities	> 1,000 ft of Conflict per 1,000 LF of Street	500 - 1,000 ft of Conflict per 1,000 LF of Street	100 - 500 ft of Conflict per 1,000 LF of Street	≤ 100 ft of Conflict per 1,000 LF of Street	
Vegetation Density by Tract		> 50%		20 - 50%		< 20%	

**Bold** = metric was included in the SRP but modified for the GI Plan

- 1 Recognizing that all opportunities upstream of flooded areas have potential benefit, the proximity to the stream was removed from consideration for the GI Plan. Instead, all GI opportunities that were located within a flood-prone watershed were given the same number of points.
- 2 List of co-location opportunities with green infrastructure should be updated with projects and priority areas identified since the development of the Countywide Stormwater Resource Plan in 2017. Additional near-term planned projects from both public and private development were added to the list.
- 3 Map of subwatersheds can be found in Appendix B, Figure 5-3.

### 4.4.3 Resulting City-Specific Prioritization List

The screening of parcels and street segments resulted in 51 regional, 93 LID, and 716 green street project opportunities across public parcels or right-of-way in San Bruno. For the purposes of comparison, project opportunities were bracketed into High, Medium, and Low priority categories based on the total score from the prioritization analysis:

- » High is defined as above the 90th percentile of project opportunities.
- » Medium is defined as between the 60th and 90th percentile.
- » Low is defined as below the 60th percentile.

The total scores represent the likelihood that a project opportunity would result in an effective GI project if implemented at that site. Projects with higher scores are the most likely to result in an effective GI project based on the multiple criteria evaluated. The brackets are a way to easily compare how well a project scored in relation to other projects of the same type.

### Potential Regional Projects

The City-specific prioritization process resulted in 51 total potential regional project opportunities within San Bruno. Based on the process, 5 projects are identified as high priority, 15 are medium priority, and 31 are low priority as summarized in Table 4-7.

This list can be used as a starting point for future evaluation of sites for potential regional projects. Future evaluation may include more detailed analysis of stormwater performance, constructability, and expected co-benefits. Criteria such as drainage area estimates, surrounding land use, parcel size, and an understanding of community needs can be considered to select sites for advancing projects through feasibility studies and conceptual development. Future regional projects identified from this list may contribute to the reduction of pollutant loads specified by the permit and may potentially lessen the burden of implementing other, less cost-effective projects.

Table 4-8 depicts an example score sheet for two regional project opportunities in San Bruno. Figure 4-3 shows a map of the regional project opportunities in San Bruno bracketed into High, Medium, and Low categories.

**Table 4-7. Summary of Prioritization Results for San Bruno**

Bracket	Criteria	Project Types		
		Regional	LID	Green Street
High	> 90%	5	8	67
Medium	60 - 90%	15	28	217
Low	< 60%	31	57	432
<b>Total</b>		<b>51</b>	<b>93</b>	<b>716</b>

Table 4-8. Example Scoring for Two Regional Project Opportunities

Project Opportunity Site Name	Commodore Park		San Bruno Water Corporation Yard	
Category	High		Low	
Total Score	68		45	
Characteristic	Value	Score	Value	Score
Parcel Land Use	Park	5	Public Building	3
Imperviousness (%)	58	2	66	3
Parcel Size (acres)	3.36	4	1.03	2
Slope (%)	3	3	1	5
Hydrologic Soil Group	Unknown	2	Unknown	2
Within a Flood-Prone Watershed	Yes	10	Not in watershed	0
Contains PCB Interest Areas	High	10	High	10
Currently Planned by City or Co-located with Other City Project	Yes	10	No	0
Augments Water Supply	Above Groundwater Basin and not near cleanup site	5	Above Groundwater Basin and not near cleanup site	5
Water Quality Source Control	Yes	1	Yes	1
Reestablishes Natural Hydrology	Yes	1	Yes	1
Creates or Enhances Habitat	No	0	No	0
Community Enhancement	AB 1550 Low Income Community	5	Within ½ mile of AB 1550 or SB 535	3
Subwatershed with Highest Capacity in RAA (by Project Type)	232516	5	232516	5
FEMA Flood Zone	No	0	No	0
Proximity to Storm Drain (ft)	198	5	71	5

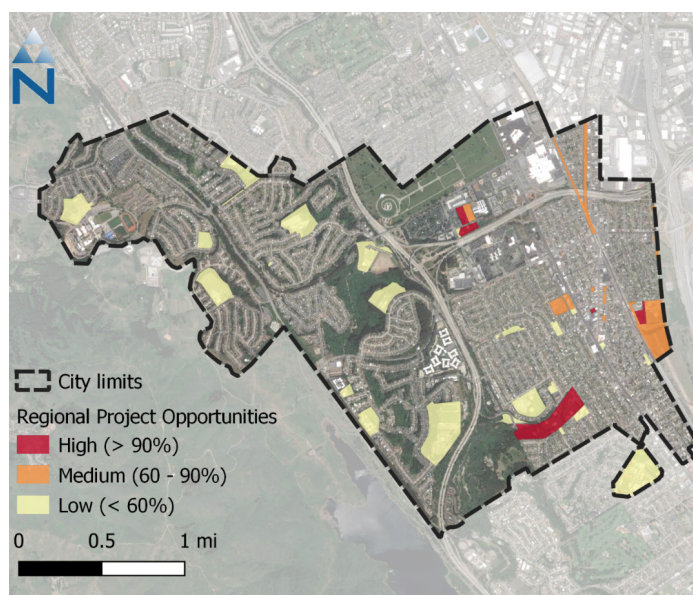
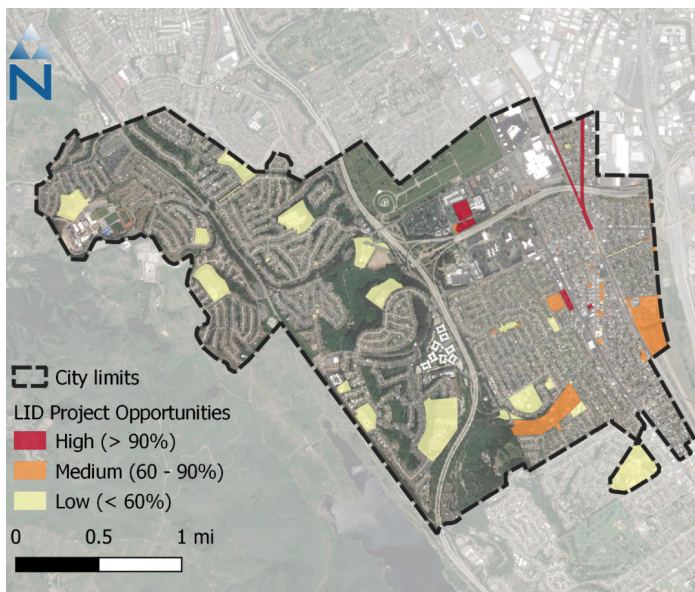


Figure 4-3. Regional Project Opportunities in San Bruno

**Potential LID Retrofits**

The City-specific prioritization process resulted in 93 total potential LID project opportunities within San Bruno. Based on the process, 8 projects are identified as high priority, 28 are medium priority, and 57 are low priority, as referenced in Table 4-7. These parcels mainly include public buildings, schools, parks, parking lots, and open spaces from land owned by the City, as well as several other public entities.

This list can be used as a starting point for future evaluation of sites for potential LID projects. LID on public parcels may serve as useful pilots that kickstart the City’s implementation efforts and provide educational opportunities for the public on GI and stormwater issues. Future evaluation may include more detailed analysis of stormwater performance, constructability, and expected co-benefits. Criteria such as surrounding land use, parcel size, and an understanding of community needs can be considered to select sites for advancing projects through feasibility studies and conceptual development. Future LID projects identified from this list may contribute to the reduction of pollutant loads specified by the permit and potentially reduce the number of green street projects needed to meet implementation goals. Table 4-9 depicts an example score sheet for two LID project opportunities in San Bruno. Figure 4-4 shows a map of the LID project opportunities in San Bruno bracketed into High, Medium, and Low categories.

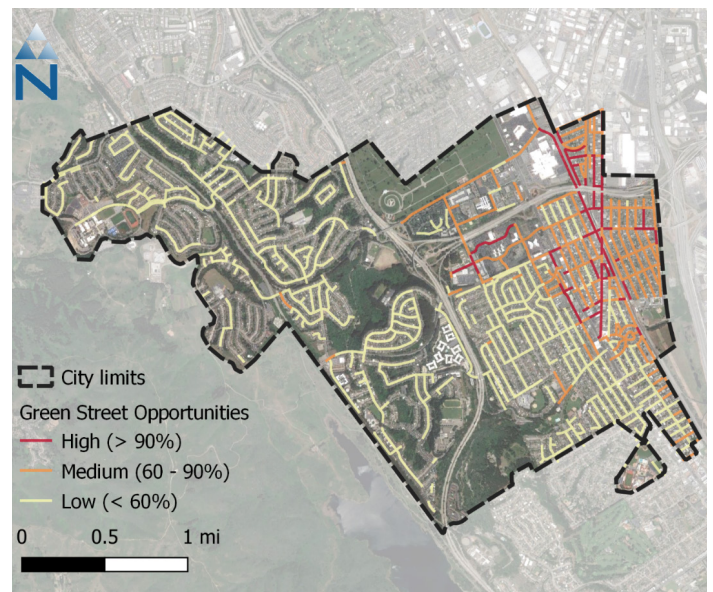


**Figure 4-4. LID Project Opportunities in San Bruno**

**Potential Green Streets**

The City-specific prioritization process resulted in 716 total potential LID project opportunities within San Bruno. Based on the process, 67 projects are identified as high priority, 217 are medium priority, and 432 are low priority, as referenced in Table 4-7. This list can be used as a starting point for future evaluation of sites for potential green street projects. Future evaluation may include more detailed analysis of stormwater performance, constructability, and expected co-benefits.

Table 4-10 depicts an example score sheet for two green street project opportunities in San Bruno. Figure 4-5 shows a map of the green street project opportunities in San Bruno bracketed into High, Medium, and Low categories.



**Figure 4-5. Green Street Project Opportunities in San Bruno**

Table 4-9. Example Scoring for Two LID Project Opportunities

Project Opportunity Site Name	Commodore Park		Parking Lot - Sylvan Ave & Mastick Ave	
Category	High		Low	
Total Score	51		33	
Characteristic	Value	Score	Value	Score
Parcel Land Use	Park	3	Parking Lot	4
Imperviousness (%)	14	0	86	5
Slope (%)	3	3	2	4
Hydrologic Soil Group	Unknown	2	Unknown	2
Within a Flood-Prone Watershed	Yes	10	Not in watershed	0
Contains PCB Interest Areas	None	0	No	0
Currently Planned by City or Co-located with Other City Project	Yes	10	No	0
Augments Water Supply	Above Groundwater Basin and not near cleanup site	5	Above Groundwater Basin and not near cleanup site	5
Water Quality Source Control	Yes	1	Yes	1
Reestablishes Natural Hydrology	Yes	1	Yes	1
Creates or Enhances Habitat	No	0	No	0
Community Enhancement	AB 1550 Low Income Community	5	Within ½ mile of AB 1550 or SB 535	3
Subwatershed with Highest Capacity in RAA (by Project Type)	232516	5	232516	5
FEMA Flood Zone	No	0	No	0
Irrigation Connection	Within 500 ft of irrigation connection	3	Not within 500 ft of irrigation connection	0
Proximity to Storm Drain (ft)	198	3	161	3

Table 4-10. Example Scoring for Two Green Street Project Opportunities

Project Opportunity Site Name	Linden Ave - between Jenevein Ave & Angus Ave W		N San Anselmo Ave	
Category	High		Low	
Total Score	73		45	
Characteristic	Value	Score	Value	Score
Street Type	Local	5	Local	5
Imperviousness (%)	74	4	65	3
Slope (%)	1	4	4	1
Hydrologic Soil Group	Unknown	2	Unknown	2
Within a Flood-Prone Watershed	Yes	10	Yes	10
Contains PCB Interest Areas	High	10	No	0
Currently Planned by City or Co-located with Other City Project	Yes, Mills Park Plaza	10	No	0
Safe Routes to School Program	No	0	No	0
Augments Water Supply	Above Groundwater Basin and not near cleanup site	5	Above Groundwater Basin and not near cleanup site	5
Water Quality Source Control	Yes	1	Yes	1
Reestablishes Natural Hydrology	Yes	1	Yes	1
Creates or Enhances Habitat	No	0	No	0
Community Enhancement	None	0	Within ½ mile of DAC	3
Subwatershed with Highest Capacity in RAA (by Project Type)	232516	3	232516	3
FEMA Flood Zone	No	0	No	0
Irrigation Connection	Yes	3	No	0
Roadway Width (ft)	50 ft, Narrowest 33%	0	50 ft, Narrowest 33%	0
Proximity to Storm Drain (ft)	8.4	5	429	1
Utility Conflicts	Not near PG&E main, 71 ft conflict per 1000 ft street	5	Not near PG&E main, 31 ft conflict per 1000 ft street	5
Vegetation Density by Tract	17.4%	5	8.3%	5

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# GI CITYWIDE STRATEGY



This section defines GI stormwater management goals based on the results of the RAA and presents the results of city-specific prioritization to demonstrate how GI project types (i.e., existing GI projects, C.3 regulated projects, regional projects, green streets, and public-parcel LID retrofits) can be combined to meet water quality goals by 2040.

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## 5.1 STRATEGY OVERVIEW

The City has been a partner on a number of countywide GI planning initiatives, including the San Mateo County Green Infrastructure Reasonable Assurance Analysis (RAA), completed in 2017 and updated in 2019. The RAA is defined as “the demonstration that the implementation of control measures will, in combination with operation of existing or proposed storm drain system infrastructure and management programs, result in sufficient pollutant reductions over time” (BASMAA 2017). The RAA quantifies the storage capacity from a combination of five types of GI projects to meet the pollutant reduction requirements of the MRP and forms the basis for the City’s GI strategy. The pollutant reduction goals for the City and the RAA-identified GI storage capacity needed to reach those goals are summarized in Table 5-1. For more detailed information on the RAA and its optimization results, refer to the RAA report in Appendix B.

The City’s GI strategy utilizes the RAA results to specify an optimal mix of five project types – including the three types prioritized in Section 4 – that would most cost-effectively achieve the GI storage capacity goal in each subwatershed. The five project types that are used in the RAA and form the basis of the City’s GI strategy include:

- 1. Existing Projects:** Stormwater treatment and GI projects that have been implemented since FY-2004/05. This primarily consists of all of the regulated projects that were mandated to treat runoff via Provision C.3 of the MRP, but also includes any public green street or other demonstration projects that were not subject to Provision C.3 requirements. For regulated

projects in the early years of C.3 implementation, stormwater treatment may have been achieved through non-GI means, such as underground vault systems or media filters.

- 2. Future New and Redevelopment:** All the regulated projects that will be subject to Provision C.3 requirements to treat runoff via LID. These estimates are based on spatial projections of future new and redevelopment tied to regional models for population and employment growth.
- 3. Regional Projects (identified):** C/CAG worked with agencies to identify five projects within public parks or Caltrans property to provide regional capture and infiltration/treatment of stormwater and developed conceptual designs to support further planning and designs.
- 4. Green Streets:** The SRP identified and prioritized opportunities throughout San Mateo County for retrofitting existing streets with GI in public rights-of-way. Green streets were ranked as high, medium, and low priority based on a multiple-benefit prioritization process developed for the SRP.
- 5. Other GI Projects (to be determined):** Other types of GI projects on publicly owned parcels, representing a combination of either additional parcel-based GI or other Regional Projects. The SRP screened and prioritized public parcels for opportunities for onsite LID and Regional Projects. These opportunities need further investigation to determine the best potential projects.

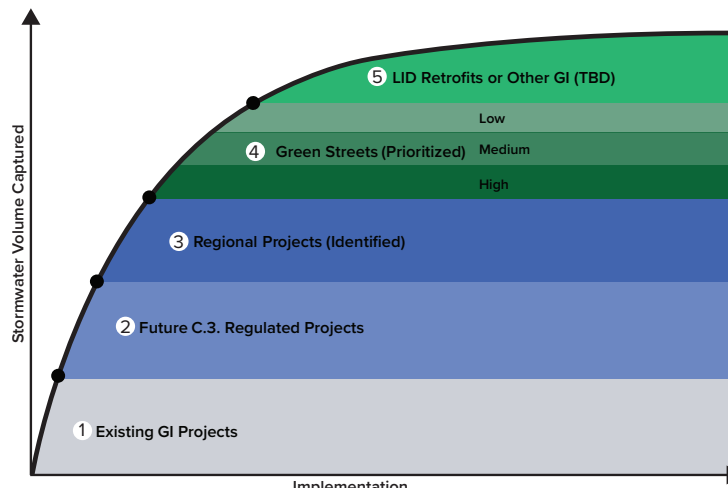


Figure 5-1. Multi-Faceted GI Strategy

**Table 5-1. Preliminary RAA Results – GI Storage Capacity to Meet Goals<sup>1</sup>**

Sub-watershed ID	Preliminary Runoff Capture Goals for GI (by 2040)		GI Storage Capacity to Achieve Goals
	% Load Reduction of PCBs (Annual)	Impervious Area Treated (acres)	Total GI Storage Capacity (acre-ft)
232416	4%	6.6	<b>0.6</b>
232516	20%	118.5	<b>22.1</b>
232916	5%	1.6	<b>0.1</b>
240116	16%	40.3	<b>2</b>
240316	19%	1.7	<b>0.4</b>
<b>Total</b>	<b>17.8%</b>	<b>168.7</b>	<b>25.3</b>

<sup>1</sup> Goals are preliminary and subject to change. The MRP requires the reasonable assurance analysis output to be submitted with the 2020 Annual Report (September 2020).

Figure 5-1 shows an example of how each of the project types builds upon each other in the GI strategy to achieve the City’s goals.

Given the relatively small scale of most GI projects (e.g., LID on an individual parcel or a single street block converted to green street), a significant number of individual GI projects will be needed to address the pollutant reduction goals. All the GI projects will require site investigations to assess feasibility and costs. Moreover, additional stakeholder outreach will be needed before any of the identified GI “opportunities” move forward as projects. As a result, the City’s GI strategy is based on the preliminary investigation of the amount of GI needed spatially (e.g., by subwatershed and municipal jurisdiction) to achieve the countywide pollutant load reduction target. The RAA sets the GI Plan “goals” in terms of the amount of GI implementation over time to address pollutant load reductions. As GI projects are implemented and more comprehensive municipal engineering analyses (e.g., masterplans, capital improvement plans) are performed, the adaptive management process will be key to ensuring that goals are met. The City’s strategy may be updated based on these considerations, and the amount of GI prescribed by the RAA for one project type may be met through any other type of GI. In summary, the RAA informs GI implementation goals, but the pathway to meeting those goals is subject to adaptive management and can potentially change based on new information or engineering analyses performed over time.

The citywide strategy presented in this section forms the core of the GI Plan by quantifying the pollutant reduction required and establishing performance goals for the City’s GI. The recommended strategy was selected based on achieving the GI stormwater management goals as cost-effectively as possible, while achieving the multiple benefits described in the prioritization criteria. For a more detailed cost-benefit analysis of the various project combinations evaluated, refer to the RAA in Appendix B. The amount of GI needed to achieve the goals represents a significant increase relative to the City’s current program. This increase will present several challenges in terms of staffing resources, training, funding needs, and project performance assurance. For a discussion of implementation challenges and proposed implementation mechanisms refer to Section 6 – Implementation Plan.

The GI Plan is intended to be continually updated as needed to capture changing conditions and the state of science. As methods for quantifying pollutant reductions evolve – from updated GI assumptions, improved data quality, or new accounting methods for the effects of non-structural programmatic controls – the GI Plan and strategy may be updated through an adaptive management process. The strategy presented in this section represents an initial strategy based on best available data that will be improved over time.

## 5.2 EXISTING GI PROJECTS

### 5.2.1 Current Requirements

Provision C.3 of the MRP requires new development and redevelopment projects that create and/or replace defined amounts of impervious surface to implement post-construction control measures to address stormwater runoff generated on-site and comply with other applicable elements of the provision. These projects are known as “C.3 Regulated Projects” or “regulated projects”. Regulated projects include private development or redevelopment projects, such as multi-family residential buildings, commercial office buildings, or shopping plazas, as well as public projects, such as libraries, police stations, and parking lots, exceeding the impervious surface thresholds identified in the MRP.<sup>17</sup> For most regulated projects, post-construction control measures must include LID site design, source control, and treatment measures, such as bioretention, pervious pavement and infiltration trenches. These are the same types of facilities described in the GI Plan for implementation in non-regulated projects on public parcels and rights-of-way. GI facilities on regulated projects help achieve multiple benefits within City watersheds and are considered part of the City’s total inventory of GI facilities.

### 5.2.2 Project Inventory to Date

Since 2003, development in the City has been subject to the Provision C.3 regulations. The City tracks the locations of the regulated projects, where C.3-required control measures have been installed, and conducts an operation and maintenance verification inspection program to ensure that they are maintained properly. The City will continue to require future regulated projects to incorporate appropriate GI measures, as part of the City’s long-term GI implementation strategy. A map of completed regulated projects is shown below in Figure 5-2.

### 5.2.3 Existing Capital GI Projects

Some street improvement projects already planned for design and construction can be modified to incorporate green infrastructure in addition to or in lieu of traditional drainage infrastructure to achieve multiple benefits while helping reach water quality goals. The City actively looks for these types of opportunities, which have resulted in a green street project being constructed, the 3<sup>rd</sup> Avenue Green Street Project, also known as the Belle Air School Vegetated Curb Extension or Belle Air/Third Avenue Street Creek. The location of the 3<sup>rd</sup> Avenue Green Street Project is shown in Figure 5-3.

The 3<sup>rd</sup> Avenue Green Street Project is located in the Belle Air neighborhood, near the south end of 3<sup>rd</sup> Avenue that leads to the Belle Air Elementary School and Lions Park. The project consists of a vegetated curb extension that collects runoff from the street and surrounding parking lots. Captured runoff passes through the plants and soil, absorbing water and filtering out some of the pollutants. Captured runoff ponds to about 4 inches before it spills from the outlet. Outflowing water leaves the system cleaner than when it entered. The plants were selected to withstand both wet and dry conditions, surviving intermittent periods of flooding and tolerating long periods without irrigation. The project was funded in 2009 by a “Sustainable Green Streets and Parking Lots” grant from SMCWPPP. The goal of this pilot project was to evaluate effectiveness and to determine if similar projects should be installed in other neighborhoods. Figure 5-4 shows before and after pictures of the project.

The contribution of these existing GI projects (both C.3 regulated projects and capital projects) toward the total capture goals is summarized in Figure 5-5. As shown, the projects contribute an estimated 1.2 ac-ft of storage capacity towards the total goal of 25.3 ac-ft.

<sup>17</sup> As of Order R2-2015-0049, which became effective on January 1, 2016, the threshold for most regulated project types is 10,000 square feet of impervious area created and/or replaced. For gas stations, restaurants, automotive shops, and uncovered parking lots, the threshold is 5,000 square feet.

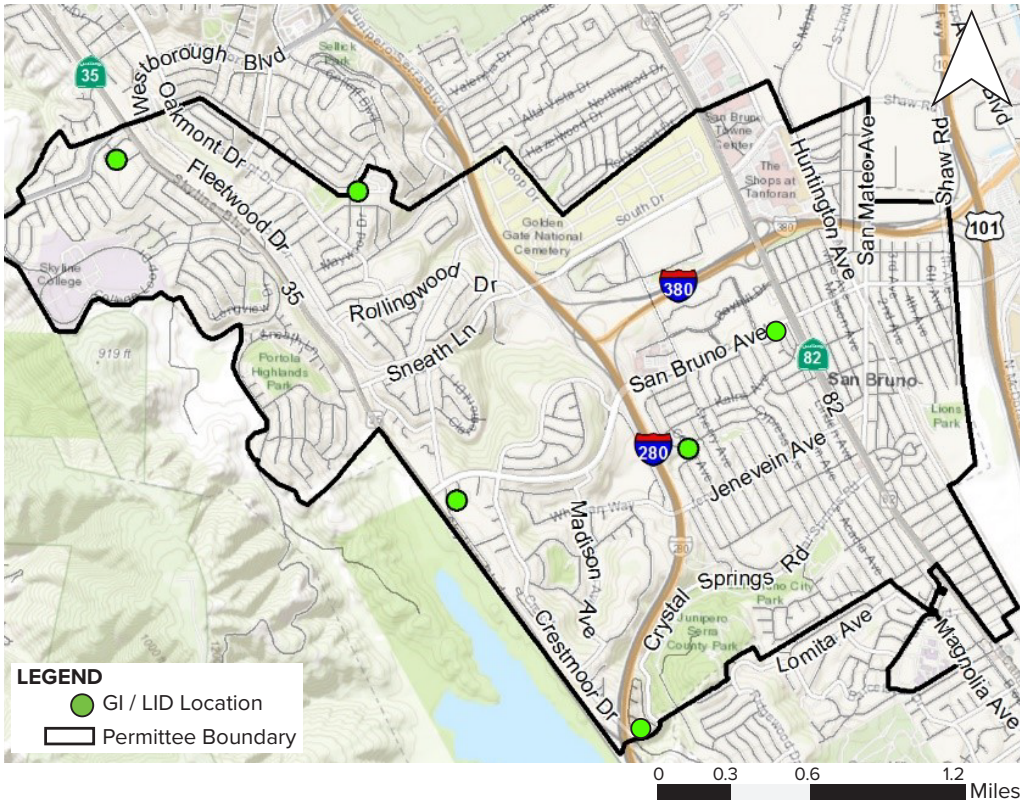


Figure 5-2. Regulated Projects Completed in San Bruno

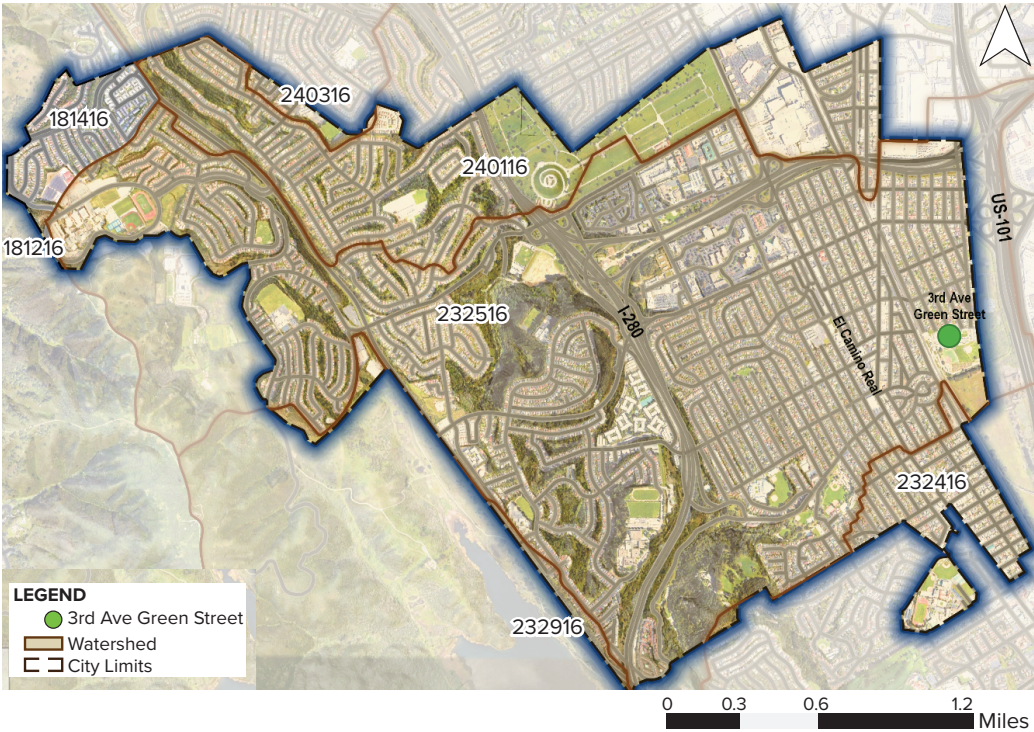
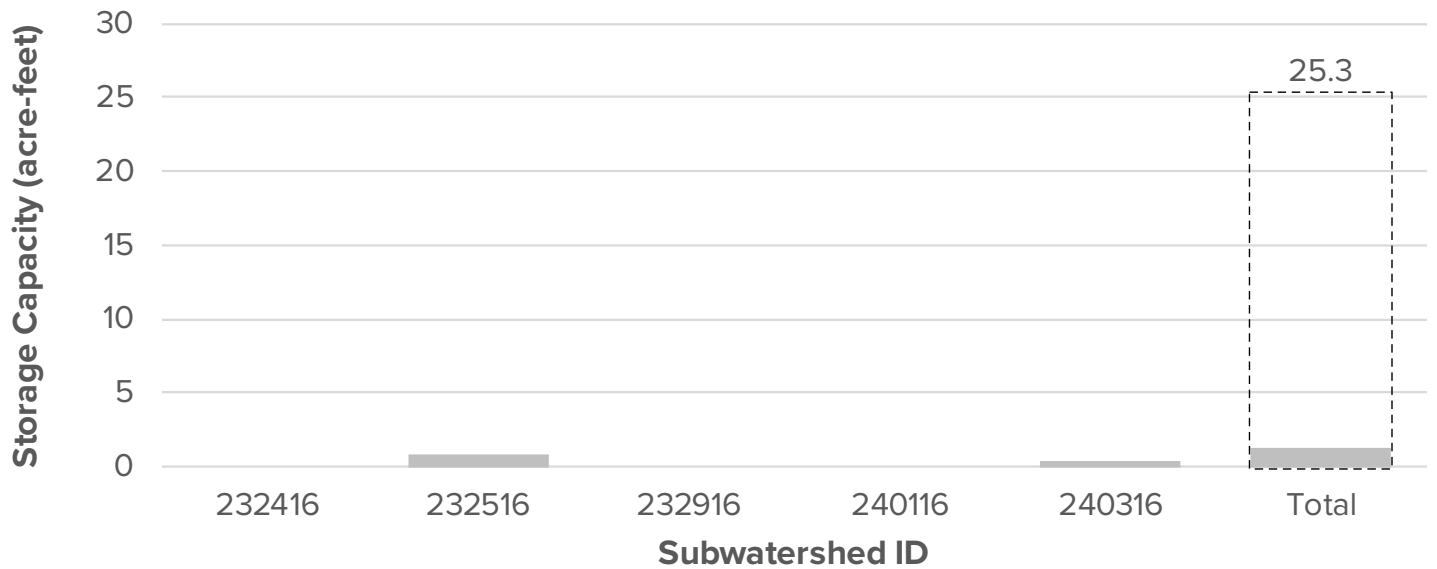


Figure 5-3. Location of Existing Early Implementation GI Project



Figure 5-4. 3rd Avenue Green Street Project - Before & After



Total Storage Capacity Goal  
 Existing C.3 and Capital GI Projects

Figure 5-5. Storage Capacity of Existing GI Projects

## 5.3 FUTURE C.3 REGULATED PROJECTS

The City is required to include in its GI Plan estimated projections of the amounts of impervious surface to be “retrofitted” (i.e., redeveloped with GI facilities to treat runoff from impervious surfaces) as part of C.3 projects by 2020, 2030, and 2040. To do this, the City worked with SMCWPPP to develop and apply a methodology to predict the amount of land area that will be redeveloped in the City and for which stormwater runoff will be addressed via GI facilities installed on privately owned parcels over these time horizons.

Establishing the projections required predicting the likely locations, extent, and land uses of the redeveloped areas. Growth patterns and time horizons for development in San Bruno’s growth areas along with algorithms to identify which parcels were likely to redevelop, resulted in estimates of the location and extent of land area that is predicted to be addressed by GI facilities by 2020, 2030, and 2040. Table 5-2 summarizes the projections to 2040 for all municipalities in the county. Table 5-3 breaks down the San Bruno projection into the amount of new and redevelopment land area to be retrofit to meet C.3 requirements by 2020, 2030, and 2040.

**Table 5-2. Revised Projection of San Mateo County Areas That Will Comply with C.3 New and Redevelopment GI Requirements by 2040**

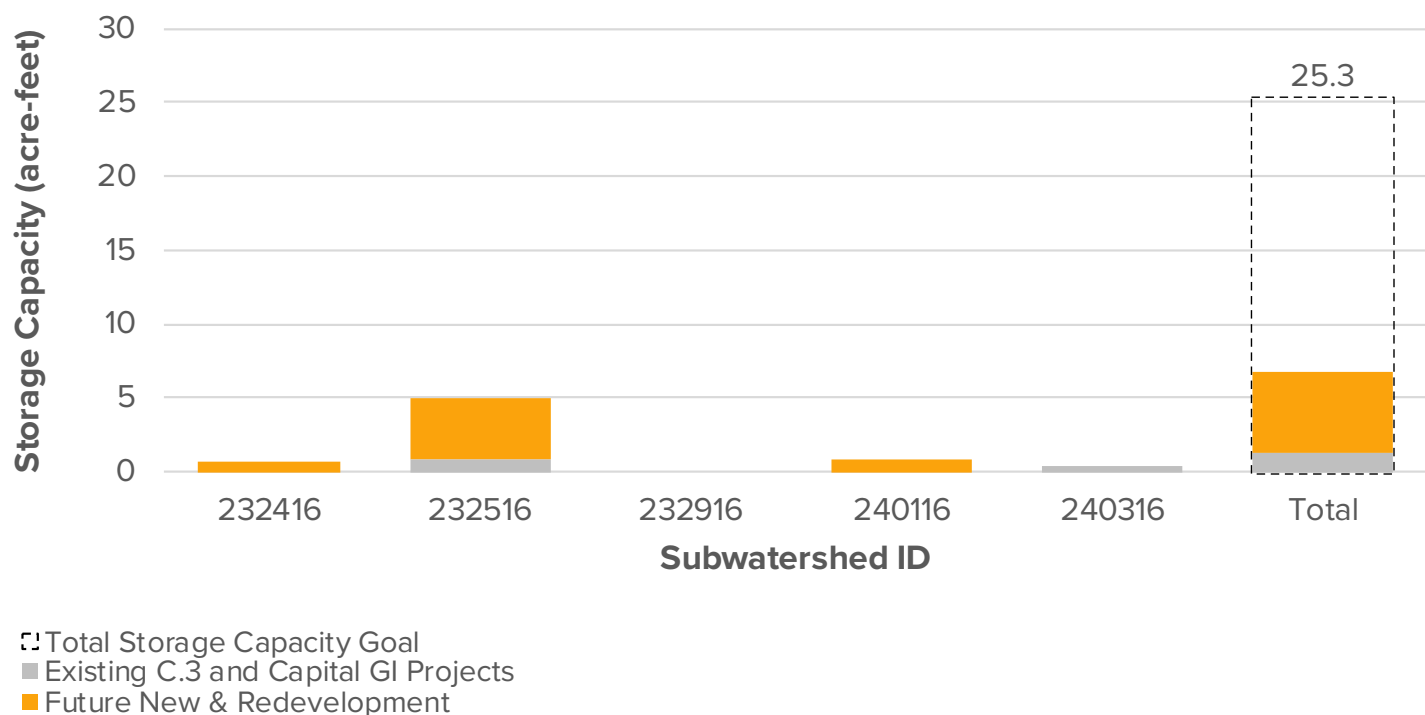
2015-2040 Projection of New and Redevelopment Area Complying with C.3 in Acres				
Jurisdiction	Housing		Employment	Total
	Single-family	Multi-family		
Atherton	0	0	0	0
Belmont	8	9.5	23.5	41
Brisbane	8.5	69.5	206	284
Burlingame	4	26.5	95	125.5
Colma	0	1.5	2.5	4
Daly City	13.5	23.5	26	63
East Palo Alto	11	8.5	63	82.5
Foster City	0	30	83	113
Half Moon Bay	30	7	13	50
Hillsborough	0	0	0	0
Menlo Park	7	14.5	300	321.5
Millbrae	13.5	19	14.5	47
Pacifica	22.5	1.5	10.5	34.5
Portola Valley	0.	0	0.5	0.5
Redwood City	10	115.5	129.5	255
<b>San Bruno</b>	<b>4.5</b>	<b>39</b>	<b>24</b>	<b>67.5</b>
San Carlos	10	14	34	58
San Mateo, City of	18.5	122	128	268.5
South San Francisco	17	39.5	67	123.5
Woodside	5.5	0.	4.5	10
San Mateo County	6	62.5	61.5	186
<b>Total All</b>	<b>245.5</b>	<b>603.5</b>	<b>1,286.0</b>	<b>2,135</b>

**Table 5-3. Projection of San Bruno Land Area that Will Comply with C.3 New and Redevelopment GI Requirements by 2040**

Time Period	Housing		Employment	Total New and Redevelopment
	Single-family	Multi-family		
2015-2020	4.5	8	8.5	21
2020-2030	0	20.5	11.5	32
2030-2040	0	10.5	4	14.5
<b>Totals</b>	<b>4.5</b>	<b>39</b>	<b>24</b>	<b>67.5</b>

After determining the total land area projections, the amount of this area that is impervious was estimated using the current land uses of the predicted locations and the associated impervious surface coefficients for each land use type. From this process, the amount of impervious surface that would be managed by

future C.3 regulated projects was estimated for each subwatershed. The corresponding GI storage capacity needed to manage these impervious areas was then added to the RAA model and included in the citywide GI strategy, as shown in Figure 5-6.



**Figure 5-6. Storage Capacity of Existing GI Projects and Future C.3 Regulated Projects**

### 5.4 REGIONAL GI PROJECTS

Based on the prioritization from the SRP, described in Section 4.3, five potential regional projects across the county were identified for preparation of project concepts. Of those projects, the drainage area of one project overlapped with area within the City of San Bruno. This project, consisting of a subsurface storage and infiltration gallery near the junction of Interstate 280 and 380 on Caltrans property, presents an opportunity for the City to partner on a multi-benefit, multi-jurisdictional stormwater capture project that

will make progress towards the City’s implementation goals. Through C/CAG, the Interstate 280/380 project has undergone conceptual design and is currently funded by an EPA grant to perform preliminary design. The project is estimated to provide approximately 14.7 acre-feet of storage capacity for the City (proportional to the percentage of San Bruno area within the drainage area). Approximately 660 acres (70%) of the total 942-acre drainage area is in San Bruno. A map of the proposed project location and drainage area is shown in Figure 5-7.

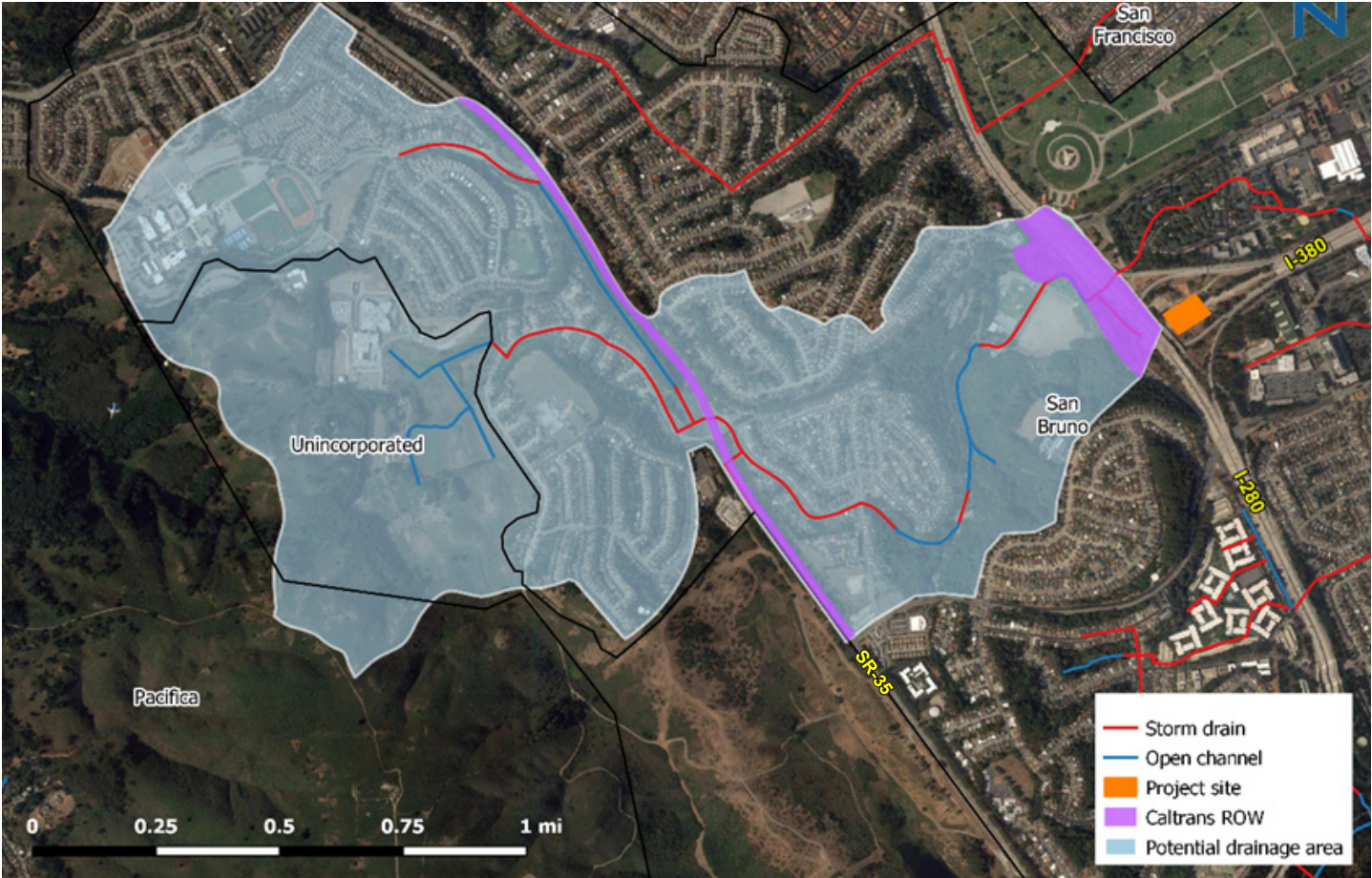


Figure 5-7. Location & Drainage Area of Identified Regional Project (I-280/I-380 Stormwater Capture Project)

The City will continue to evaluate additional regional project locations. The City-specific prioritization process resulted in a list of prioritized potential regional project locations that will serve as a starting point for identification of additional projects. High-ranking sites from the list may be further evaluated for feasibility and assessed based on additional considerations, such as community priorities, current site uses, and schedules for other capital improvement projects. Opportunity sites may then be advanced through conceptual design to determine the details necessary for estimating project performance and benefit.

Additional regional project sites identified in the future may be added to the current list. Regional projects tend to be more cost-effective than green street and

LID projects in terms of runoff volume managed due to economies of scale. Future regional projects would offset the number of green street and LID retrofit projects needed to meet pollutant reduction goals. Figure 5-8 summarizes the total estimated GI storage capacity inclusive of the identified regional project. With the regional project, the progress toward the capture goal is at 23.4 ac-ft, leaving less than 2 ac-ft of storage needed to reach the 25.3 total. However, as discussed in Section 6.1 - Work Plan for Prioritized Capital Projects, further evaluation is necessary and will be conducted to assess feasibility of the regional project.

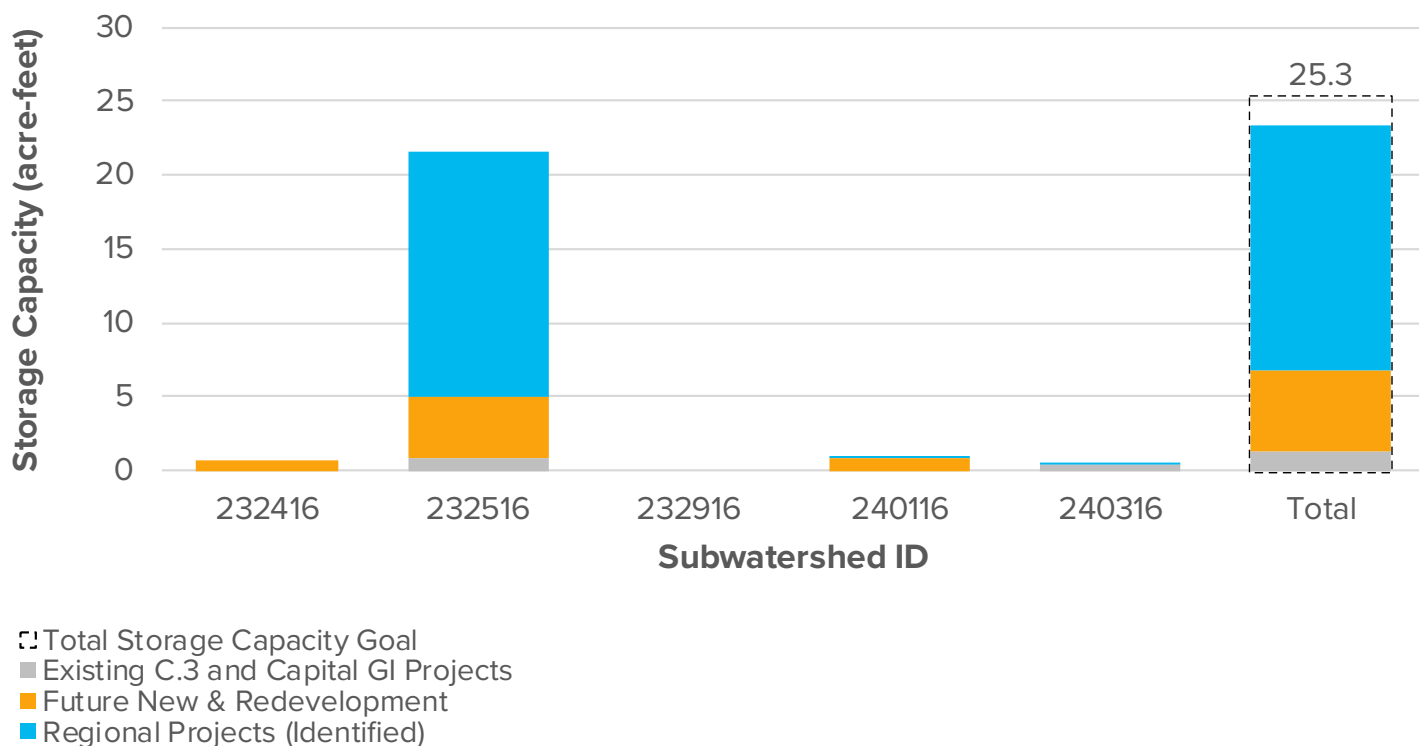


Figure 5-8. Storage Capacity of GI Opportunities

### 5.5 GREEN STREET PROJECTS

As with the completed early implementation green street project discussed in Section 5.2, the City will continue to explore opportunities for implementation of green infrastructure in the right-of-way. A significant portion of the City’s impervious area exists in the right-of-way and coupling GI with streetscape improvements is an effective way to increase treatment of stormwater runoff across the City.

Green street opportunities are especially necessary in areas where existing, regulated, and regional projects are not sufficient to meet GI implementation goals of

the City. The results of the prioritization coupled with the results of the RAA (Appendix B) form the basis of the green street portion of the City’s strategy. The prioritization identifies the highest-ranking sites considering feasibility and potential performance, while the RAA determines volume capture needs by subwatershed. The strategy can be refined as funding and grant opportunities are assessed and ongoing coordination with various City departments occurs. Figure 5-9 shows the potential green street projects from the prioritization alongside the total GI capacity needed per subwatershed as specified in the RAA.

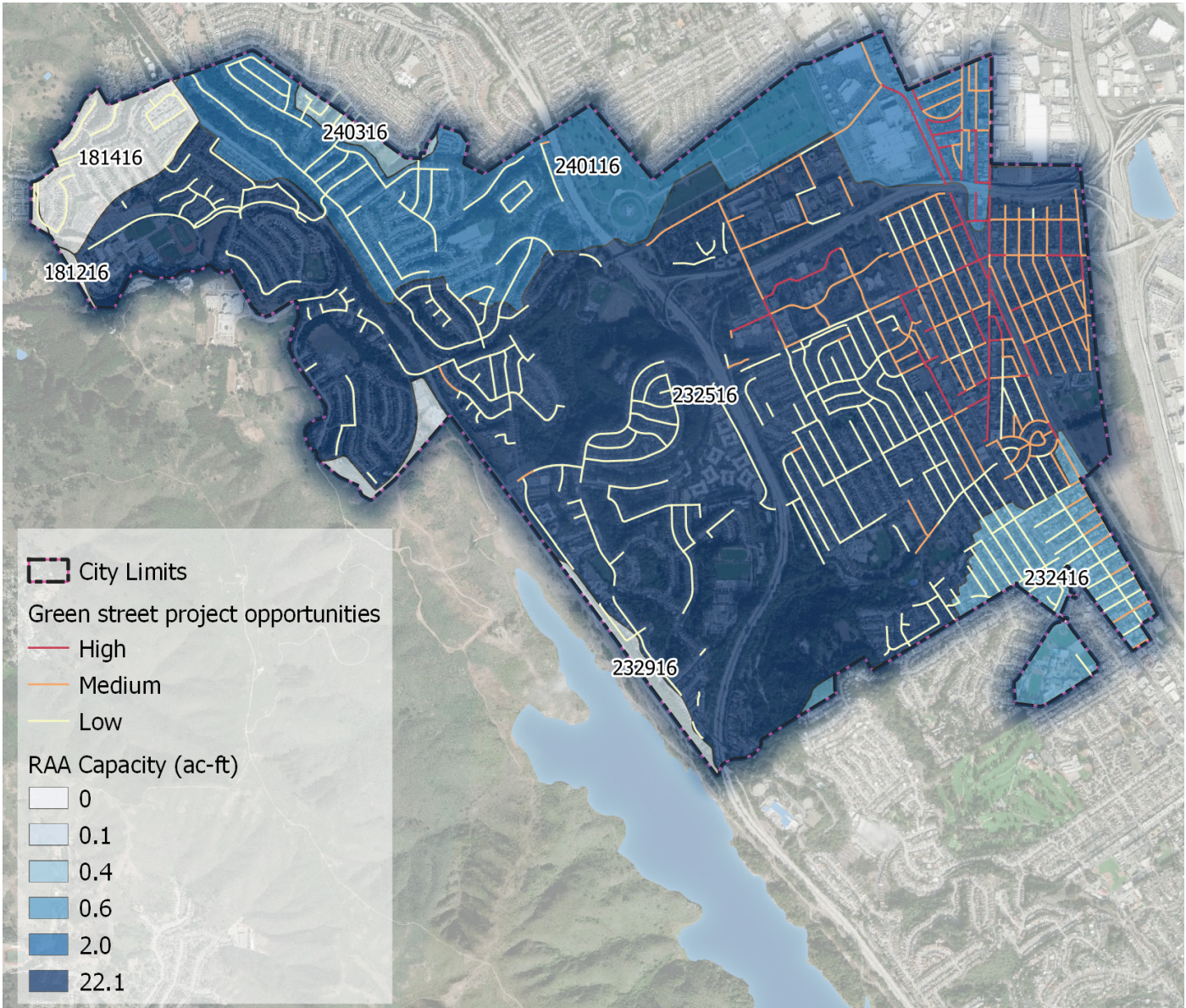


Figure 5-9. Prioritized Potential Green Street Projects & RAA-Specified Project Capacity by Subwatershed

As shown in Figure 5-10, coupling the prioritization results with an assessment of the remaining storage capacity needs reveals that 1.8 ac-ft of high rated green streets and 0.1 ac-ft of medium rated green streets are needed to reach the total capacity goal of 25.3 ac-ft. This corresponds to approximately 34 acres of impervious right-of-way being routed to and treated by GI. While this alone represents a significant increase in green streets relative to the City’s existing capital GI projects, it also assumes that the identified regional project—or a suitable replacement regional project—will be implemented as part of the City’s GI strategy.

If a feasible regional project cannot be found, then the amount of green streets or LID retrofits needed to reach the capture goals increases even more significantly. Poor soils conditions in the flatter areas of San Bruno, including the downtown core, will make infiltration challenging, likely requiring bioretention to be underdrained. For the storage capacity breakdown of the City GI scenario without a regional project, refer to Appendix B.

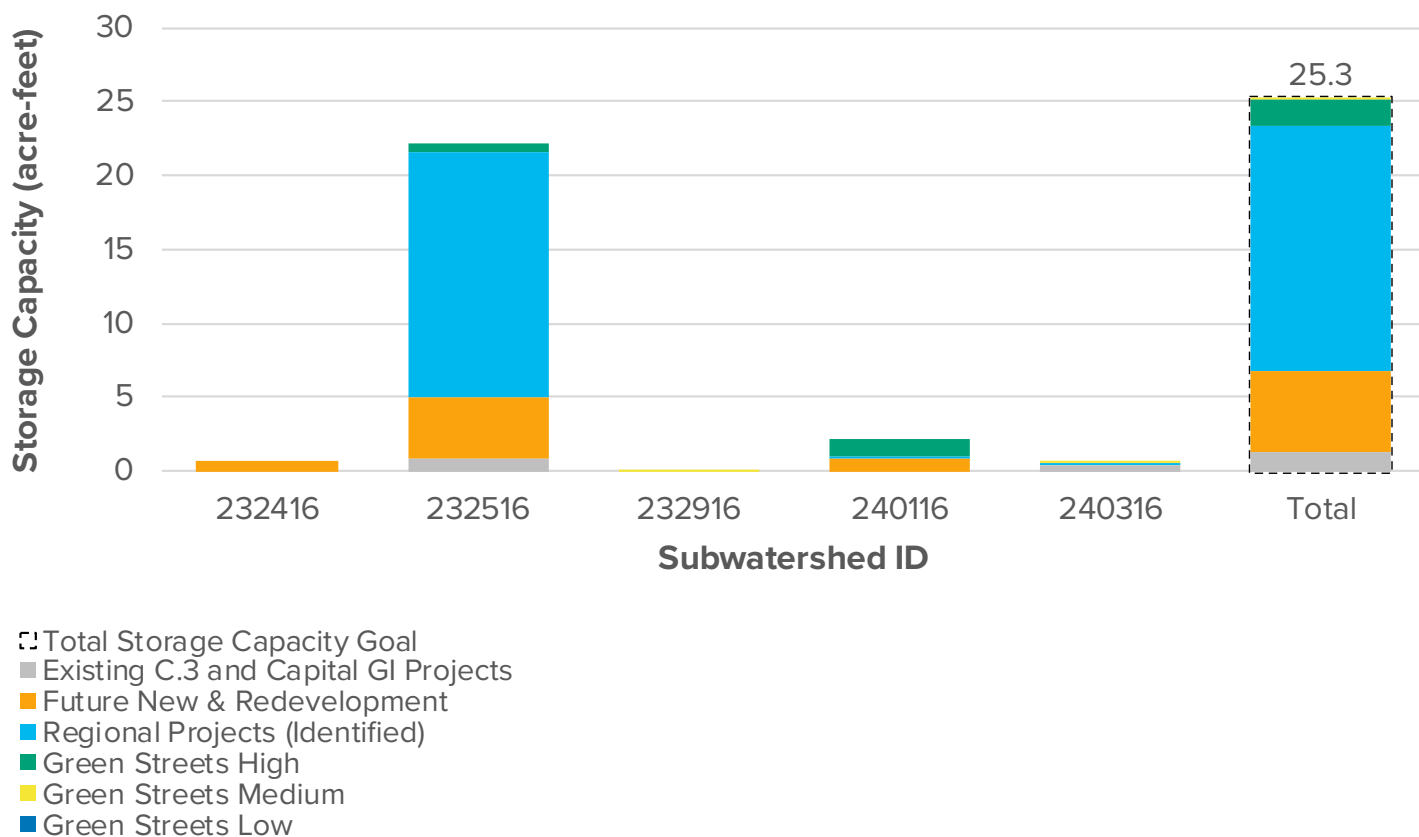


Figure 5-10. Storage Capacity of GI Opportunities

# 5.6 LID RETROFITS & OTHER GI PROJECTS

If the identified regional project is deemed feasible, then the City’s storage capacity needs are projected to be fully met through a combination of C.3 projects on private development, the identified regional project, and green streets. Under this scenario, no additional storage capacity is required through other GI projects. However, while the RAA sets goals for where and which types of GI projects should be implemented, further engineering analysis (e.g., feasibility studies, site evaluations) may result in implementation of project types different from those specified by the RAA. For example, future analysis may determine that certain LID projects on public parcels may be more favorable

than green streets. These LID projects would then be implemented to offset the volume from green streets specified by the RAA. Regional project opportunities that have not yet been identified may also offset the amount of green street project capacity specified by the RAA. Regional projects tend to be more cost effective than green streets due to scale. For this reason, the GI strategy will be subject to adaptive management.

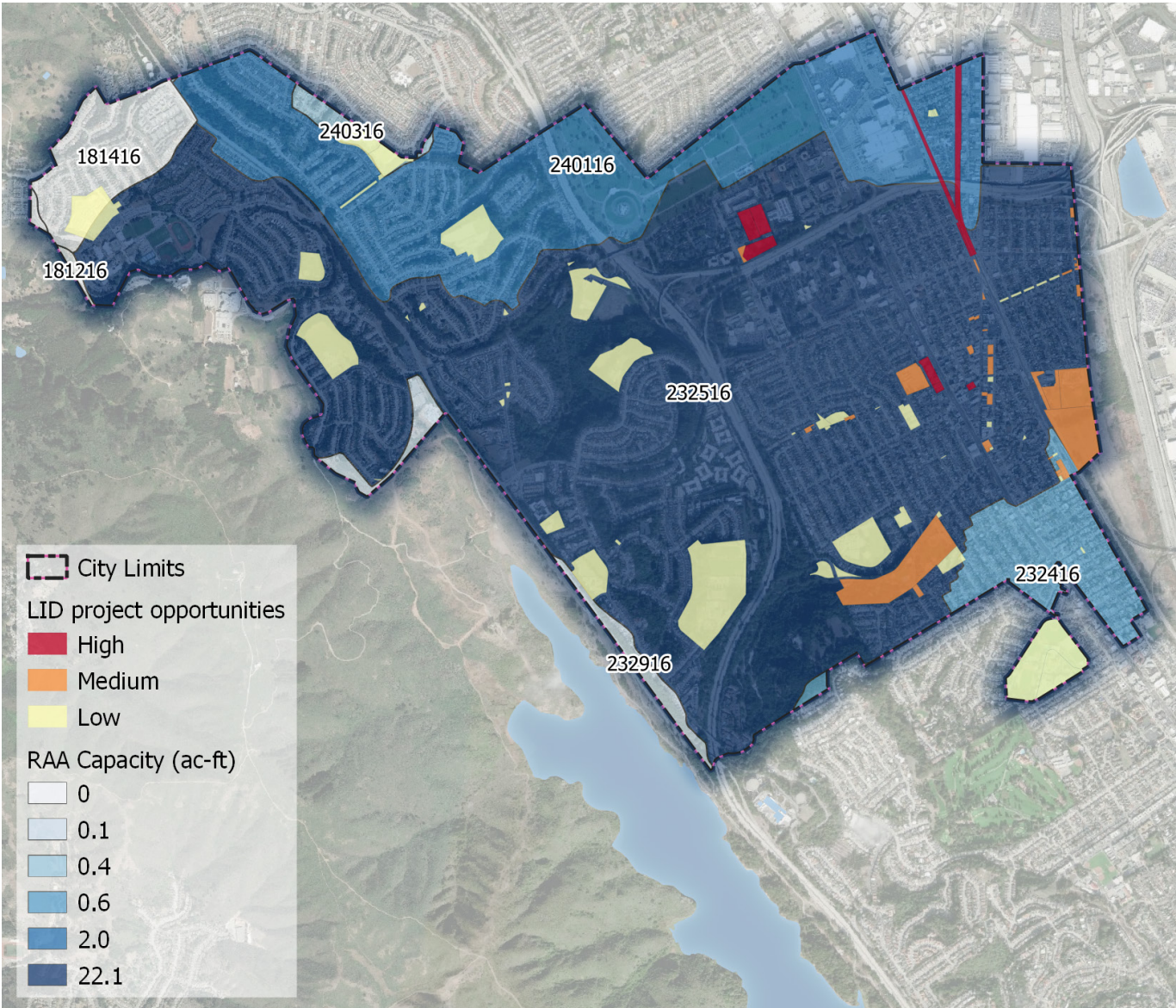


Figure 5-11. Prioritized Potential LID Projects & RAA-Specified Total Capacity Needed by Subwatershed

The City will continue to evaluate other project opportunities that may improve the cost-effectiveness of the strategy and ensure goals are met. The list of potential regional and LID retrofit projects from the prioritization may facilitate identification of other GI projects. The need for other GI projects will continue to be evaluated in future updates to the GI Plan. Figure 5-11 and Figure 5-12 show the potential LID retrofit and regional project sites, respectively, and subwatersheds with total GI capacities specified in the RAA.

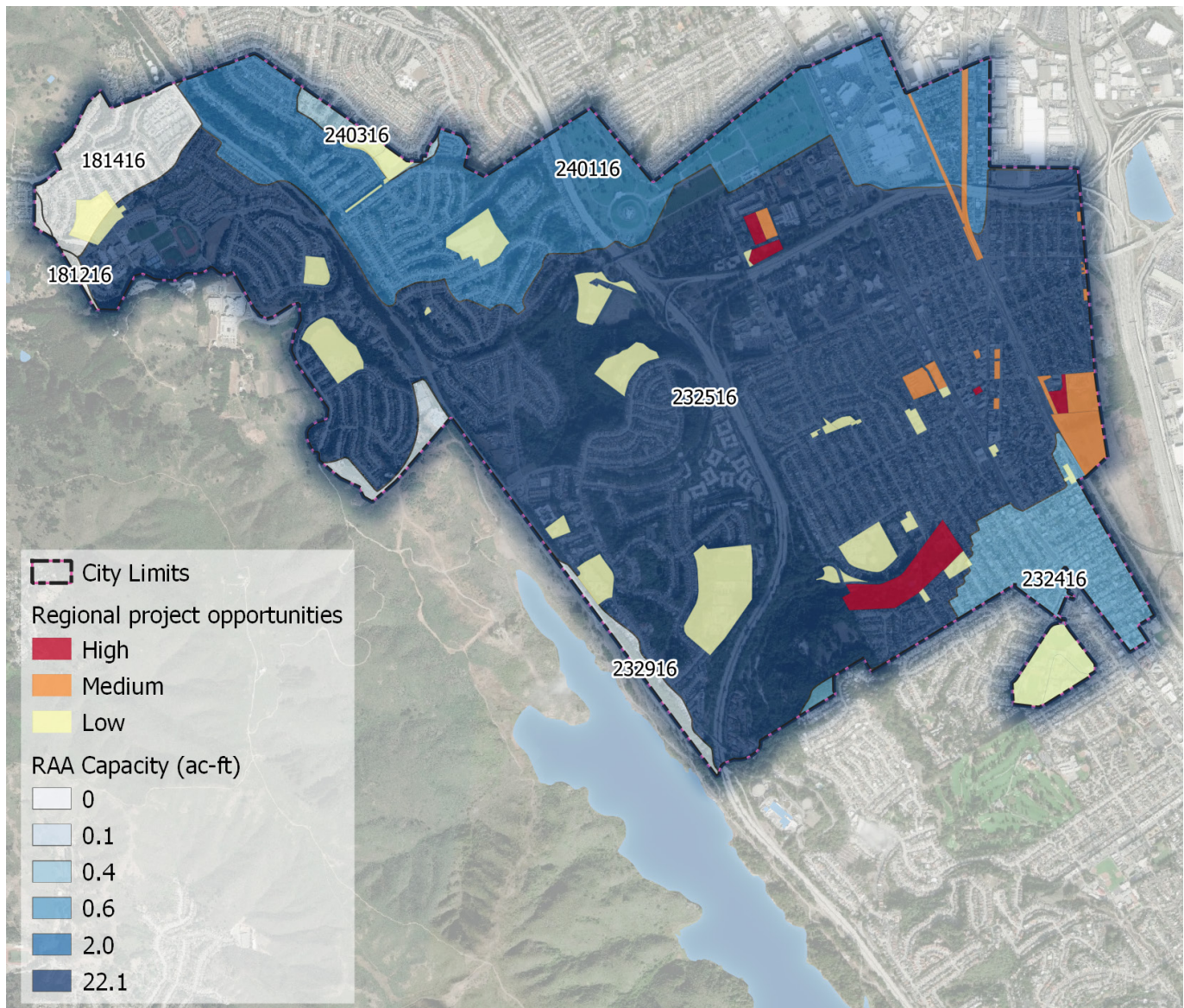


Figure 5-12. Prioritized Potential Regional Projects & RAA-Specified Total Capacity Needed by Subwatershed

## 5.7 IMPERVIOUS AREA & MILESTONE PROJECTIONS

To help estimate the pollutant load reductions that can be achieved by GI during the 2020, 2030, and 2040 timeframes, the MRP requires that Permittees include in their GI Plans estimated targets for the amounts of impervious surface to be “retrofitted” (i.e. redeveloped with GI facilities to treat runoff from impervious surfaces) as part of public and private projects during the same timeframes.

Impervious area treated by GI may be used as a gauge of progress towards implementation for achieving goals set in the GI Plan. For existing projects, the impervious area draining to stormwater treatment measures constructed at each project is tracked for annual reporting purposes and used to estimate existing total treated impervious area. Impervious area associated with future new and redevelopment projects was estimated using regional development projections developed by C/CAG, discussed in Section 5.3. For the remaining three GI project types, treated impervious area was estimated based on the RAA results, using

imperviousness land use assumptions and estimates of the amount of each land use that contributes to each project type.

Table 5-4 shows the goals for treated impervious area and project storage capacity that will be achieved through the County’s GI strategy and across the milestones specified in the MRP. The mix of project types is preliminary and is subject to change based on project feasibility, funding availability, and other factors.

The process of advancing project opportunities from the GI strategy through implementation is described in Section 6. GI projects will undergo feasibility analysis, site investigations, and funding evaluations before moving to the next phase of implementation. As the GI Plan is implemented, the strategy presented in this section can be refined using adaptive management to incorporate new information and sync with ongoing municipal planning, such as capital improvement planning and master planning.

**Table 5-4. GI Plan Implementation Projections**

Implementation Metrics		Milestone Projections		
		Total by 2020	Total by 2030	Total by 2040
Index	% Load Reduction	1.0%	16.5%	17.8%
	Volume Managed (acre-ft/yr)	10	188.6	202.4
	Impervious Area Treated (acres)	11	156	173
Storage Capacity (acre-ft)	Existing Projects	1.2	1.2	1.2
	Future New & Redevelopment	1.7	4.4	5.5
	Regional Projects (Identified)	--	16.7	16.7
	Green Streets (High)	--	1.1	1.8
	Green Streets (Medium)	--	--	0.1
	Green Streets (Low)	--	--	--
	Other GI Projects (TBD)	--	--	--
	<b>Total</b>	<b>3.0</b>	<b>23.4</b>	<b>25.3</b>
Impervious Area Treated (acres)	Existing Projects	6.0	6.0	6.0
	Future New & Redevelopment	4.6	11.8	14.8
	Regional Projects (Identified)	--	118.5	118.5
	Green Streets (High)	--	20	32.1
	Green Streets (Medium)	--	--	1.8
	Green Streets (Low)	--	--	--
	Other GI Projects (TBD)	--	--	--
	<b>Total</b>	<b>11</b>	<b>156</b>	<b>173</b>

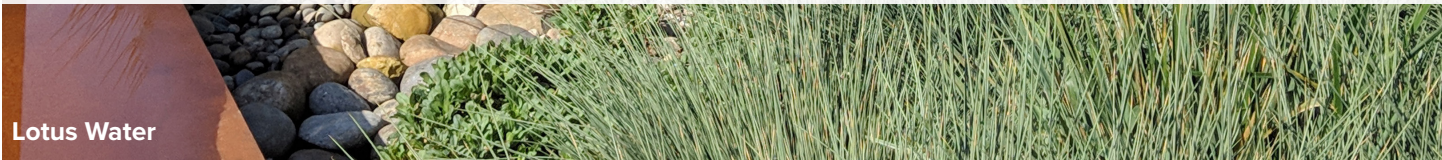
Note: The projections are contingent on the identified regional project—or comparable replacement—being implemented. The City applied and was selected for grant funding to conduct further feasibility evaluation of the identified regional project.

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# 6.0

# IMPLEMENTATION PLAN



Lotus Water

This section defines the process for implementing the prioritized projects to achieve the projections defined in Section 5. The implementation plan has three main components: (1) the work plan defining the steps to implement the prioritized capital projects, (2) the legal and funding mechanisms that enable implementation, and (3) the technical tools that ensure implemented projects perform and enable quantification of overall progress toward the citywide goals.

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## 6.1 WORK PLAN FOR PRIORITIZED CAPITAL PROJECTS

The work plan for prioritized projects defines the process for implementing the prioritized regional, green streets, and LID retrofit capital projects identified to meet citywide water quality goals. This includes describing the steps and schedule to move near-term projects into the design phase, as well as establishing the procedures for integrating prioritized projects into the City’s capital planning framework. The process is a collaborative effort between several City departments (e.g., Public Works, Community Services,

and Community Development, etc.) and—pending the scope of the GI project—may involve coordination with County-level agencies as well (e.g., SMCWPPP, Flood Resilience Program, and the new Flood and Sea Level Rise Resiliency Agency). Table 6-1 lists key near-term opportunities that have been identified to proceed with further evaluation as part of this process, and an overview of the GI project implementation stages is shown in Figure 6-1.

**Table 6-1. Key Near-Term Opportunities Proceeding with Further GI Feasibility Evaluation**

Identified Opportunity	GI Type	Status	Comments
I-280 and I-380 Regional Stormwater Capture	Regional Project	Site Evaluation	Large drainage area, which would represent substantial progress for the City toward stormwater capture goals
San Mateo Avenue Streetscape Improvements	Green Street	Concept Design	City’s main downtown corridor, which would be a highly visible GI location

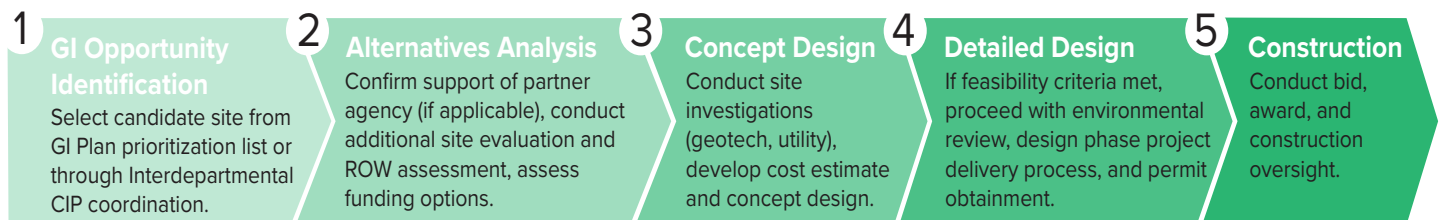
Note: Additional identified near-term opportunities are listed in Table 4-3.

The work plan defines the process for Steps 1 – 3, from GI opportunity identification through concept design. After Step 3, the concept enters the City’s standard capital project delivery process. A critical aspect of deciding whether a project should move to Step 4 is early evaluation of technical feasibility and stakeholder acceptance. For this purpose, at the end of Step 2 and Step 3 of the process, data for the GI candidate project is updated and evaluated against defined GI feasibility criteria. The criteria are used to evaluate the project’s ability to meet sizing and performance requirements given the updated information about local site constraints. Similarly, during Step 3 of the process, outreach is conducted to assess local stakeholder preferences. In order to recommend moving to Step 4, the concept design should address critical feedback from the outreach process to increase the likelihood of stakeholder support. The evaluation criteria are summarized below.

**Update Project Information During Step 2 and 3 and evaluate against GI Feasibility Criteria:**

- » Meets minimum impervious drainage area thresholds<sup>18</sup>
- » Meets minimum GI sizing ratios<sup>19</sup>
- » Meets infiltration feasibility criteria (or rainwater capture and use feasibility) for regional projects<sup>20</sup>
- » Addresses key feedback from outreach process and has community support

These criteria provide the City with guidelines to implement higher performing GI capital projects. However, if a project fails to meet one of the criterion above, the City may still elect to proceed due to the project’s overall benefits. Figure 6-2 depicts the overall flow chart for Steps 1 – 3, including where these criteria are applied as part of deciding when to progress the GI opportunity to the next step versus when to opt-out and select the next opportunity on the prioritization list.

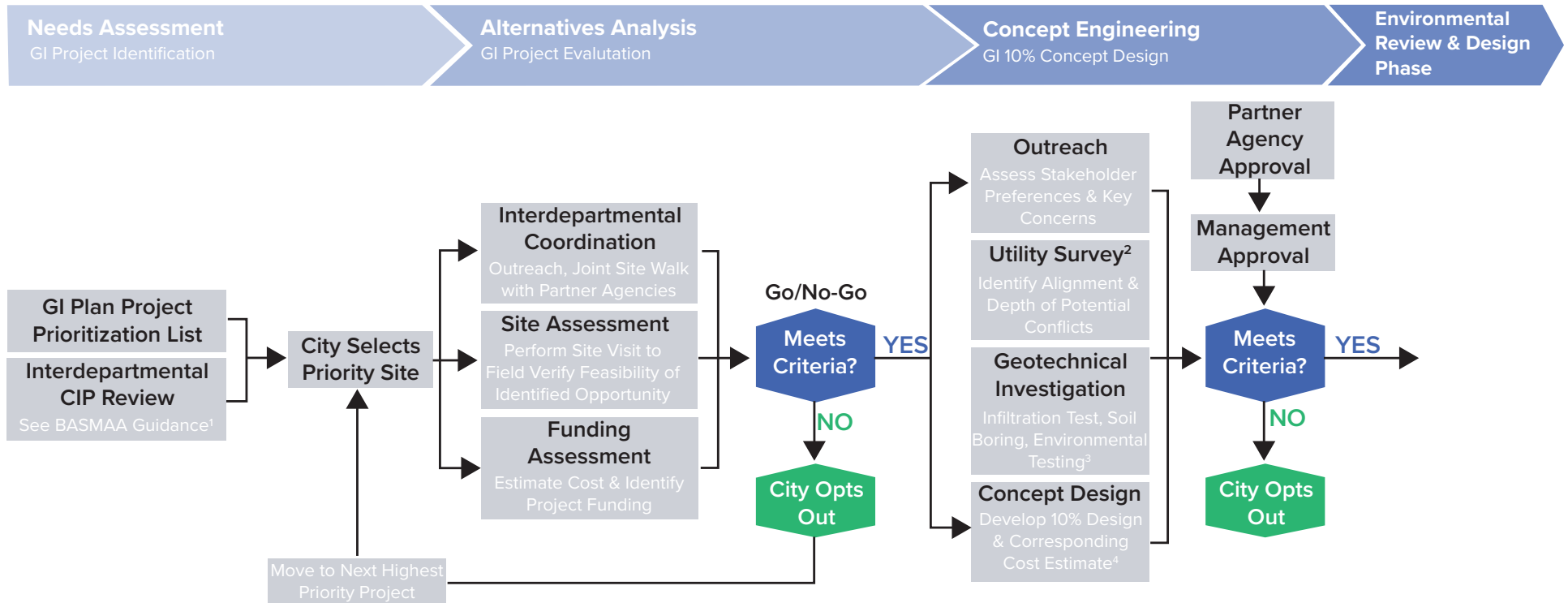


**Figure 6-1. Overview of Project Development Stages**

<sup>18</sup> Due to fixed costs associated with delivering capital projects, GI cost-effectiveness improves with larger scale projects. Minimum drainage area guidance will be set as more San Bruno projects are implemented. However, based on available local data, Bay Area capital GI projects with drainage areas of at least 1 acre have significantly better cost-effectiveness (correspondence with SFPUC 2019, cost data provided by SCVURPPP 2019, and Green Street Pilot Project Summary Report prepared for BASMAA 2013).

<sup>19</sup> Defined in the C.3 Stormwater Technical Guide (2016) and the Typical GI Details (2019).

<sup>20</sup> *ibid.*



1 BASMAA Development Committee. 2016. Guidance for Identifying Green Infrastructure Potential in Municipal Capital Improvement Program Projects. May 6, 2016.

2 If utilities are not expected to be a conflict, then only site survey is required.

3 Environmental testing if soil contamination is possible.

4 Consider structural testing if roof BMPs, such as green roofs, are central to the project.

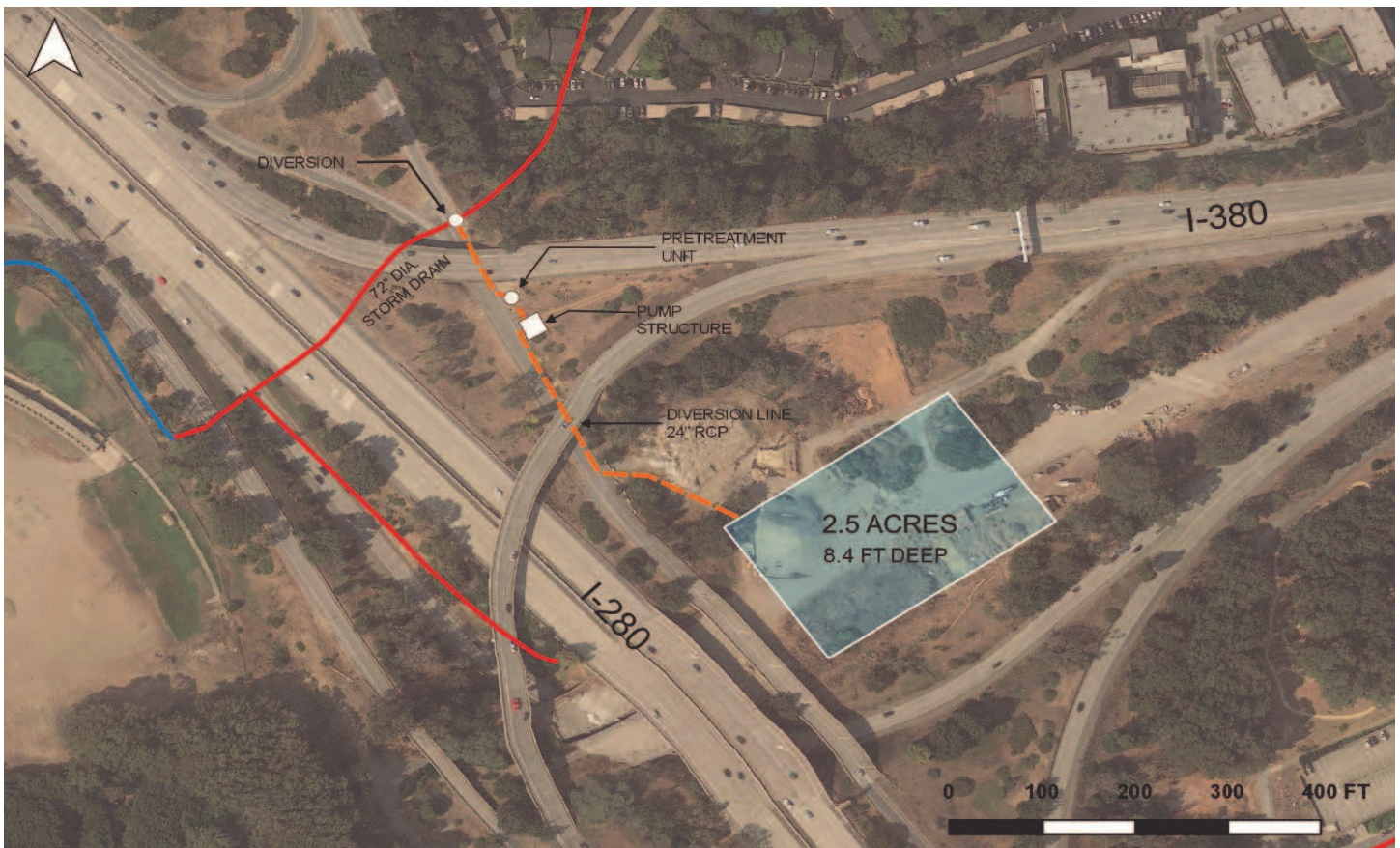
**Figure 6-2. Work Plan for Prioritized Projects**

## 6.1.1 Regional Projects

### Step 1: Opportunity Identification

As summarized in Section 5, the City developed a prioritized list of regional project opportunities. Although the regional project prioritization list will continue to be refined throughout the life of the GI Plan, one of the more promising opportunities—the I-280/I-380 Regional Capture Project—is currently included in the proposed GI strategy for the City. To further evaluate the feasibility and potential design of this opportunity, the City applied for and was awarded a grant from the EPA under the San Francisco Bay Water Quality Improvement Fund (SFBWQIF). The City received notice in the Spring of 2019 that the concept was selected for \$200,000 in funding<sup>21</sup>, which will enable the City and its project partners to proceed to the next steps of evaluating this GI opportunity. The site location and potential drainage area of the regional project opportunity were shown earlier in Figure 5-7. The potential location of the storm drain connection and GI footprint for this opportunity are shown in the preliminary concept diagram in Figure 6-3.

In addition to utilizing the results of the GI Plan, the City will continue to engage with potential regional project collaboration partners to identify new opportunities. Example potential partners include C/CAG and member agencies, Caltrans, the County of San Mateo Office of Sustainability, the Flood Resilience Program, and the new Flood and Sea Level Rise Resiliency Agency. Similarly, projects proposed by others as part of regional water management plans, such as the San Francisco Bay IRWMP, may provide collaboration potential. Although the scope of the evaluation conducted under the SFBWQIF grant may differ, the following sections outline the typical workflow to evaluate identified regional project opportunities.



**Figure 6-3. Identified Regional Project Opportunity**

<sup>21</sup> Notice of EPA Funding Status (#EPA-R9-SFBWQIF-18-01) on March 27, 2019.

**Step 2: Alternatives Analysis**

The alternatives analysis step evaluates which GI technologies could be integrated at the candidate site and conducts stage one feasibility assessment to select preferred technologies and develop the site layout that moves forward to concept design. The work plan for Step 2 includes:

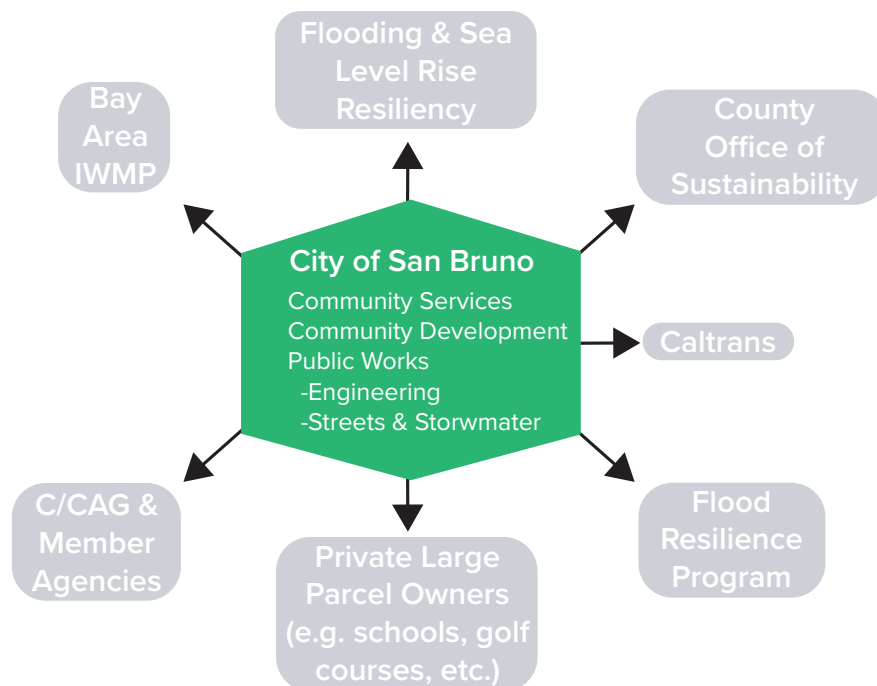
**Step 2a: Interagency Coordination** – The area draining to regional project sites often extends across multiple jurisdictions. Thus, after the City selects a prioritized regional opportunity to move forward, the next step is to reach out to related agency stakeholders and potential collaboration partners to discuss the opportunity.

In addition to interagency coordination, interdepartmental coordination should also be conducted. To have enough space for implementation, regional projects are often located in parks or open spaces within the City and involve coordination with the Community Services Department, Community Development Department, or others before proceeding with development of a concept.

Figure 6-4 provides a summary of potential project collaboration stakeholders.

**Step 2b: Funding Potential** – Critical to the feasibility of the identified opportunity is the assessment of project costs and funding sources. Due to the scale of regional projects, grants or contributing funds from other agencies may be needed to enable design and implementation. For example, as noted earlier, the City secured a grant from the SFBWQIF to enable further evaluation and preliminary design of the first prioritized regional project opportunity for the City. Similarly, a grant award from Caltrans enabled two additional regional project opportunities (outside of San Bruno) from the SRP to move forward to design. As with the other SRP projects, the I-280/I-380 regional project opportunity includes Caltrans ROW as part of its drainage area. Thus, pending the results of the initial feasibility analysis, the City may investigate the potential for Caltrans grant funding to support implementation. Section 6.2.2 provides a more detailed description of the GI funding options that should be evaluated as part of this process.

If the opportunity is proposed as a co-located project with another planned City project, the GI design and implementation schedule should be developed in this step to assess feasibility of project integration. During this step, any co-located project schedule constraints that would preclude including time to integrate GI into the design and construction should be noted. Similarly, any constraints on project schedule that would complicate aligning a separate funding stream for the GI elements should also be noted.



**Figure 6-4. Example of Potential GI Project Collaboration Stakeholders**

**Step 2c: Site Assessment** – During Step 1 Opportunities Identification, sites were prioritized primarily based on desktop analysis using best available spatial data. Within the alternatives analysis, this data should be updated and the site reassessed based on the following steps:

1. Information Collection – Compile as-built and private utility data to update the utility conflict assessment. Identify the most feasible location for a storm drain diversion to the proposed regional project site and identify the most feasible overflow or flow-through treatment discharge location. Confirm the drainage area to proposed storm drain tie-in and develop a site map for the field visit.
2. Site Visit Coordination – Coordinate a site walk with partnering agencies and City departments to review proposed GI locations, discuss potential concerns, and field-verify site constraints.
3. GI Integration Analysis – While on the site walk, field verify the location of storm drain connections, area drains, and drainage pathways. Identify the most feasible GI locations within the site and confirm the drainage area based on the proposed storm drain connection. Discuss key design parameters with agency stakeholders, such as: sources and quantity of dry-weather flows, site potable water irrigation demand, existing site drainage issues, local stakeholder preferences based on past projects, and planned site projects or masterplans.
4. Constraints Analysis – While on the site walk, update the site space constraints data based on visual assessment of utilities and mature trees. Discuss key design constraints with agency stakeholders, such as the predominant current site use and potential loss of use due to the regional project (e.g., types of sports played, frequency of use, parking demand, etc.). Assess the ability to access proposed GI locations for construction and maintenance. Consider key setback criteria when assessing constraints, such as vertical separation from high groundwater and horizontal separation from utilities, water supply wells, trees, hydrants, foundations, and steep slopes.

After updating site information, the opportunity should be compared against the criteria below. If the site still has GI potential, then the opportunity should proceed to the next step.

**GI Feasibility Criteria:**

- » Meets minimum drainage area thresholds
- » Meets minimum GI sizing requirements
- » Meets infiltration feasibility criteria (or rainwater capture and use feasibility)
- » Schedule development indicates that GI elements could be completed in time to meet any constraints associated with proposed co-located projects (if applicable) and in time to meet any required funding deadlines.

### Step 3: Concept Design

In addition to developing the concept design, Step 3 involves direct expenditures for site investigations, such as site surveys, potholing and geotechnical investigations. The objectives of this step are to further refine site data as well as gather information on public preferences. Conducting these analyses early-on enables the City to opt-out of sites with identified fatal flaws or poor cost-benefit in favor of moving to the next prioritized GI opportunity.

**Step 3a: Public Outreach** – To inform concept development, outreach should be conducted to gauge local stakeholder preferences and concerns. Educational-based outreach regarding GI types and benefits can be presented, along with general information about identified opportunities for GI integration compiled from Step 2. Outreach should attempt to assess local preferences related to GI technology types (below-ground vs. above-ground improvements, vegetated vs. low maintenance). Outreach should also gauge priority of site uses (e.g., playing field usage, parking demands) and perceived importance of stormwater issues relative to other community needs.

**Step 3b: Soils/Geotech Investigation** – Conduct subsurface investigations to confirm soil types and infiltration rates. The type and quantity of investigations will vary based on project scale and type (e.g., borings, infiltration tests, and environmental soils testing). Initiate USA North 811 ticket process to mark utility locations if there is any excavation/boring/potholing required for the investigations.

**Step 3c: Surveys** – Conduct a site survey to enable concept design development. Include an underground utility survey if the site is in the right-of-way or shows potential for utility conflicts based on existing conditions data or based on the site inspection conducted in previous phase. Request private utility data if not yet acquired.

**Step 3d: Concept Development** – Develop a 10% concept design showing existing and proposed conditions and an associated construction cost estimate. An example of information included in a concept plan is listed in Table 6-2.

Although the degree of concept design development may vary depending on the identified opportunity and available funding, a 10% design set for a GI project should consider the following:

- » Plan Sheets: Existing Conditions and Demo, Site Layout, Facility Layout, Grading and Stormwater, Civil Details, Landscape Planting, Landscape Details;
- » An evaluation of ADA, Fire, and other permit needs;
- » A constructability evaluation based on maintenance and construction access (e.g., City moratorium constraints, site access constraints, etc.);
- » Construction cost estimate and schedule; and
- » CEQA checklist.

After developing a concept that is informed by the data gathered in Steps 3a through 3c, the resulting concept should be compared against the criteria below. If the site still has GI potential, the concept can proceed to the design phase.

#### **GI Feasibility Criteria:**

- » Meets minimum drainage area thresholds
- » Meets minimum GI sizing requirements
- » Meets infiltration feasibility criteria (or rainwater capture and use feasibility)
- » Schedule development indicates that GI elements could be completed in time to meet any constraints associated with proposed co-located projects (if applicable) and in time to meet any required funding deadlines.
- » No critical flaws identified in public outreach conducted to assess concerns and preferences

**Table 6-2. Example Concept Design Information**

Existing Conditions	Proposed Site Plan
<ul style="list-style-type: none"> <li>» Impervious areas (e.g., roof, pavement, driveway)</li> <li>» On-site stormwater infrastructure (drains, downspouts, inlets, etc.), pipe and structure locations</li> <li>» Flow direction arrows for sheet/surface flow and pipe flow</li> <li>» Existing connections to the storm sewer</li> <li>» Utilities (e.g., water, sewer, gas, electric)</li> <li>» Trees (drip line and trunk diameter)</li> <li>» Existing contours</li> <li>» Road labels</li> <li>» Labels of existing uses (playground, parking, etc.)</li> <li>» North arrow and scale</li> <li>» Property and easement boundaries</li> </ul>	<ul style="list-style-type: none"> <li>» Project boundary</li> <li>» Stormwater management practices (BMPs): footprint of each, corresponding drainage areas, and drainage components (e.g., underdrain, outlet control structures)</li> <li>» Proposed connections to existing conveyance systems or storm drains</li> <li>» Proposed site drainage features (new drains, downspouts, etc.)</li> <li>» Flow direction arrows for sheet flow and pipe flow.</li> <li>» Changes to land cover, including impervious surfaces</li> <li>» Areas that require regrading or grading contours</li> <li>» Labels of proposed uses (playground, parking, etc.)</li> <li>» BMP Performance Summary Table                             <ul style="list-style-type: none"> <li>• BMP ID Number</li> <li>• Facility type and sizing information</li> <li>• Size of each drainage area</li> </ul> </li> </ul>

### 6.1.2 Green Streets & LID Retrofits

#### **Step 1: Opportunity Identification**

As described in Section 5 - GI Strategy, the prioritization results and capture requirements from the RAA establish the target quantity of high, medium, and low-priority green streets per subwatershed. While there is no current target for LID retrofit projects, the City will continue to look into possible LID retrofit projects as a mechanism for offsetting the number of regional and green street projects specified and meeting its water quality goals.

The City is currently participating in several processes to identify candidate green street projects. One is development of C/CAG's Sustainable Streets Master Plan (SSMP), which will identify locations where green infrastructure can be integrated into existing planned transportation projects. The SSMP is currently in development.

In addition, the City will continue to identify GI opportunities through ongoing CIP and interagency coordination, as well as through frontage improvement opportunities as part of private redevelopments. Through this process of reviewing plans and programs for potential synergies with GI objectives, the City has already identified several near-term projects to be evaluated for GI integration (see project list in Table 4-3).

The next steps for evaluating identified opportunities is outlined in the following sections. These steps are consistent with but further build upon the *BASMAA Guidance for Identifying GI Potential in Municipal CIP Projects*<sup>22</sup> to provide a descriptive workflow for moving projects from opportunities identification into the design phase.

#### **Step 2: Alternatives Analysis**

The alternatives analysis step evaluates which GI technologies could be integrated at the candidate site and conducts stage one feasibility assessment to select preferred technologies and develop the site layout that moves forward to concept design. The work plan for Step 2 includes:

**Step 2a: Interagency Coordination** – The first step after selecting a prioritized opportunity for further evaluation is to conduct interagency or interdepartmental coordination. Green street implementation typically requires collaboration between multiple City departments—such as Public Works and Community Development. Similarly, LID Retrofits on parcels may require the City's stormwater staff to collaborate with Community Services and/or Community Development. Coordination with stakeholder agencies and departments should be conducted prior to proceeding with development of a concept.

**Step 2b: Funding Potential** – Critical to the feasibility of the identified opportunity is the assessment of project costs and funding sources. Part of the role of the countywide SSMP is to identify potential implementation mechanisms and funding sources for prioritized green streets. This could include Safe Route to Schools projects and funding, bike/pedestrian projects and funding, etc. It may also include proposed policies or negotiated agreements with redevelopments, such as required frontage improvements at select developments. Several of the high-priority green street and LID Retrofit sites identified in the City's GI Plan overlap with already planned capital improvement projects. For these projects, in addition to developing a preliminary cost estimate of the GI opportunity, the GI design and implementation schedule should be developed to assess feasibility of project integration. During this step, any project schedule constraints that would preclude including time to integrate GI into the design and construction should be noted. Similarly, any constraints on project schedule that would complicate aligning a separate funding stream for the GI elements should also be noted. Section 6.2 provides a description of the GI funding options that should be evaluated as part of this process.

<sup>22</sup> BASMAA Development Committee. 2016. *Guidance for Identifying Green Infrastructure Potential in Municipal Capital Improvement Program Projects*. May 6, 2016.

**Step 2c: Site Assessment** – During Step 1 Opportunities Identification, sites were prioritized primarily based on desktop analysis using best available spatial data. Within the alternatives analysis, this data should be updated and the site reassessed based on the following steps:

1. Information Collection – Compile as-built and private utility data to update the utility conflict assessment. This should include an assessment of data on property boundaries, easements, and right-of-way boundaries. Delineate the drainage area based on best available data and develop a site map for the field visit.
2. Site Visit Coordination – Coordinate a site walk with partnering agencies and City departments to review proposed GI locations, discuss potential concerns, and field-verify site constraints.
3. GI Integration Analysis – While on the site walk, field verify the location of catch basins, area drains, downspouts, and drainage pathways. Identify the most feasible GI locations within the site and confirm the drainage area, including run-on to the street from adjacent parcels. Draw facility footprints and piped connections on the site map (i.e., document maximum footprint available and overflow/underdrain connections to storm drains). Discuss key design parameters with agency stakeholders, such as: available soils data, site ownership and easements, existing site drainage issues, local stakeholder preferences based on past projects, and planned site projects or masterplans.
4. Constraints Analysis – While on the site walk, update the site space constraints data based on visual assessment of utilities and mature trees. Discuss key design constraints with agency stakeholders, such as the predominant current site use and potential loss of use due to the regional project (e.g., types of sports played, frequency of use, parking demand, etc.). Assess the ability to access proposed GI locations for construction and maintenance. Consider key setback criteria when assessing constraints, such as vertical separation from high groundwater and horizontal separation from utilities, water supply wells, trees, hydrants, foundations, and steep slopes.

After updating site information, the opportunity is compared against the criteria below. If the site still has GI potential, then the opportunity proceeds to Step 3 – Concept Design.

**GI Feasibility Criteria:**

- » Meets minimum drainage area thresholds
- » Meets minimum GI sizing requirements
- » Meets infiltration feasibility criteria (or rainwater capture and use feasibility)
- » Schedule development indicates that GI elements could be completed in time to meet any constraints associated with proposed co-located projects (if applicable) and in time to meet any required funding deadlines.

### **Step 3: Concept Design**

In addition to developing the concept design, Step 3 involves direct expenditures for site investigations, such as site surveys, potholing, and geotechnical investigations. The objectives of this step are to further refine site data (e.g., utility constraints and infiltration assumptions) and include public preference information in order to develop a well-informed concept. Understanding utility constraints is especially critical for right-of-way projects like green streets. Conducting these investigations during this early step enables the City to opt-out of sites with identified fatal flaws or poor cost-benefit in favor of moving to the next prioritized GI opportunity.

**Step 3a: Public Outreach** – To inform concept development, outreach should be conducted to assess local stakeholder preferences and concerns. Educational-based outreach regarding GI types and benefits can be presented, along with general information about identified opportunities for GI integration compiled from Step 2. Outreach should attempt to assess local preferences related to GI technology types (below-ground vs. above-ground improvements, vegetated vs. low maintenance). Outreach should also gauge priority of site uses (e.g., sidewalk width, community spaces, parking demands) and perceived importance of stormwater issues relative to other community needs.

**Step 3b: Soils/Geotech Investigation** – Conduct subsurface investigations to confirm soil types and infiltration rates. The type and quantity of investigations will vary based on project scale and type (e.g., borings, infiltration tests, and environmental soils testing). Initiate USA North 811 ticket process to mark utility locations if there is any excavation/boring/potholing required for the investigations.

**Step 3c: Surveys** – Conduct a site survey to enable concept design development. Survey should verify site boundaries, ownership, and easement information. Include an underground utility survey if the site is in the right-of-way or shows potential for utility conflicts based on existing conditions data or based on the site inspection conducted in previous step. Request private utility data if not yet acquired.

**Step 3d: Concept Development** – Develop a 10% concept design showing existing and proposed conditions and an associated construction cost estimate. An example of information included in the concept plans was listed earlier in Table 6-2.

## 6.2 IMPLEMENTATION MECHANISMS

The GI Plan quantifies volume capture needs and develops a prioritized list of projects to meet City goals. However, implementation of these projects is contingent upon the City having the proper legal mechanisms to implement the Plan, and identifying sufficient funding sources for GI planning, design, construction, and maintenance.

### 6.2.1 Legal Mechanisms

Provision C.3.j.i.(3) of the MRP requires permittees to “Adopt policies, ordinances, and/or other appropriate legal mechanisms to ensure implementation of the Green Infrastructure Plan in accordance with the requirements of this provision.”

As described in Section 1.1.2, the City of San Bruno and other municipalities subject to Provision C.3 of the MRP must require post-construction stormwater control measures on regulated development projects. Post-construction stormwater controls reduce pollutants from flowing to streams, creeks, and the Bay and reduce the risk of flooding by managing peak flows.

The City’s Municipal Code and General Plan establish legal authority for the City to require regulated private development projects to comply with MRP requirements. Chapter 10.18 of the City’s Municipal Code includes stormwater management requirements that are consistent with the MRP. To further support implementation of the GI Plan, the City will submit a resolution to the City Council to formally adopt the GI Plan.

Although the appropriate legal mechanisms are already in place, in the future, the new and redevelopment sections of the code [sections 10.18.090 (C) and (D)] could be updated with current language from the MRP and the City’s GI Plan to provide additional details on regulations, requirements and guidelines related to GI, LID, sustainable landscaping programs such as Bay-Friendly Landscaping, integration with urban forestry and other City goals and policies. In addition, new requirements could be considered. For instance, private development activity can be leveraged with new conditions of approval that require installation and maintenance of GI measures in the public right of way that treat public right of way runoff, reducing the City’s burden to install and maintain those measures. More types of new and redevelopment projects can also be considered for compliance with C.3 regulations in the

MRP such as large commercial remodel projects that are not currently required to comply. Other jurisdictions in the Bay Area are currently using, or are considering using, some or all of these legal mechanisms to increase GI implementation.

GI capital projects are primarily public projects under control of the City. These projects are typically not regulated projects, except under certain limited circumstances (although they must conform to the sizing and design requirements contained in Provision C.3, and sizing guidance in Appendix A). The City’s General Plan and other plans described in Section 2 govern and direct the City’s actions in developing and implementing the GI Plan. The City also intends to use the SMCWPPP GI Design Guide and associated guidelines, details and specifications to assist with the design of GI projects (see Section 3).

### 6.2.2 Funding Options

The City intends to evaluate its implementation of public GI capital projects as part of this GI Plan and, as needed, may consider whether additional policies, ordinances, or updates to the City’s Storm Drain Master Plan or Urban Water Management Plan could help facilitate GI Plan implementation in the future.

Provision C.3.j.i.(2)(k) of the Municipal Regional Stormwater Permit (MRP) requires that the City’s Green Infrastructure (GI) Plan include:

*“An evaluation of prioritized project funding options, including, but not limited to: Alternative Compliance funds; grant monies, including transportation project grants from federal, State, and local agencies; existing Permittee resources; new tax or other levies; and other sources of funds.”*

Consequently, the City has reviewed its current funding sources and is evaluating improvements that can be made to increase funding and leverage new development activities pursuant to the goals and objectives of the Plan.

To aid this effort, SMCWPPP has developed a report for permittees entitled, “Green Infrastructure Funding Nexus Evaluation”<sup>23</sup> (GI Funding Report) that is intended to provide guidance on funding types, challenges and strategies. Sections of that report serve as a basis for the City’s GI funding mechanisms per the following sections below.

23 SMCWPPP – January 2019.

**Current Funding Sources for GI Program Elements**

The City of San Bruno has developed funding sources and revenue enhancements over the last few decades for its Stormwater Management Program. The City currently uses a mixture of funding sources including contribution from private development projects to fund the stormwater program. The City’s General Fund, permit fees, taxes and other revenue sources are used for public street, parking lot and building construction and maintenance; and maintenance of other landscaped areas (e.g., parks, medians, public plazas, etc.). Table 6-3 displays the various current funding sources that support the City’s Stormwater Program, as well as options that the City is further evaluating for potential future enactment.

Implementation of the GI Plan will create significant new costs for the City. The following tasks have costs related to achieving compliance with the MRP and other City goals:

- » Overall stormwater and GI program administration, reporting and planning
- » Public GI asset management - administration and planning
- » Public GI asset delivery - design, engineering, inspection and construction
- » Public GI asset maintenance - assessment, tracking, mapping, inspection, operations and maintenance (O&M), utility relocation, repair and replacement

- » Private GI (LID) program administration – design review, inspection, reporting, tracking and mapping
- » Public and Private GI outreach, training, education and communication
- » Other stormwater program components – municipal operations, illicit discharge detection and elimination, commercial and industrial control, pesticide monitoring, public information and participation, sustainable landscaping, construction site control, creek monitoring, and implementing controls on pollutants of concern such as trash, PCBs, mercury and copper.

Implementing the City’s GI Plan and maintenance of the resulting GI assets will be an on-going discussion for the City’s budget process. The funding of the City’s GI Plan and program will be considered a part of the City’s overall stormwater management program. The GI projects will be included in the stormwater program budget or integrated into other programs such as transportation or parks. GI will be included as a type of municipal asset and integrated into the other asset management programs that the City oversees. It is likely that no single source of revenue will be adequate to fund implementation of GI, therefore a portfolio of funding sources will be needed.

**Table 6-3. Funding Sources**

Current/Anticipated	Options for Further Evaluation
General Fund C/CAG Parcel Tax EPA FY18 SFBWQIF C/CAG State Budget Earmark	Stormwater Fee Parcel Tax Bond Measures Grants In-Lieu Fees Permit Fee Development Impact Fees Public Private Partnerships

### ***Funding Option Types and Information***

Recognizing that current revenue sources will not be sufficient to fund GI-related expenditures, the City is considering future enactment of the funding options summarized below. These are excerpted from the GI Funding Report. The first three are balloted approaches: stormwater fee, parcel tax and bond measures. The remaining options are Grants, In-Lieu Fees—which entails a fee that would be part of an alternative compliance program for private new and redevelopment projects—Permit Fees, Development Impact Fees, and Public Private Partnerships.

#### **Stormwater Fee**

A Proposition 218-compliant, property owner balloted, property-related fee is a viable revenue mechanism to fund stormwater programs. Property-related fees are decided by a mailed vote of the property owners with a simple majority (50%) threshold required for approval, with each parcel getting one vote. The property-related fee process is generally not as well known, and it is more time consuming and is more expensive than the special tax process, but it is much more common for funding stormwater management, and in many communities, more suitable to meet the voter approval threshold. One of the municipalities to successfully implement a property-related fee for stormwater services is Palo Alto, where they have succeeded twice.

As they pertain to GI, property-related fees remain a flexible and stout funding source. However, under Proposition 218, property-related fees must apply to defined services within a defined service area, and the costs of providing those services must be spread equitably over the properties that receive the services. The scope of GI is stretching the traditional boundaries of stormwater services, and great care must be taken when crafting a property-related stormwater fee structure.

#### **Parcel Tax**

Special taxes are decided by registered voters and require a two-thirds majority for approval. There are several types of special taxes, but the most common for stormwater services are parcel taxes. Parcel taxes are levied against real property and can be calibrated for some parcel metric such as acreage, size of building, impermeable area, type of use, or simply a flat rate where each parcel pays the same amount.

One characteristic that distinguishes taxes from fees is that taxes do not necessarily need to have a direct nexus between the amount of the tax and the service received.

The City currently has a parcel tax that contributes funds towards the stormwater program, but the tax amount has not increased since 2010. Therefore, the City is considering a proposal for an increase, but many details have yet to be discussed including the timing and amount of the increase.

#### **General Obligation Bond**

The voting public is familiar with general obligation (GO) bond measures, which typically come in the form of a general obligation bond and require a two-thirds majority for passage. Bonds are issued to raise funding up front and are repaid through a tax levied against property on the annual property tax bill. These levies are based on property value, so higher value properties pay a higher portion of these taxes. Because the rate of taxation is based on value, ballot measures cannot state an annual amount that would be paid by an individual. Instead the voter is presented with a bond amount (e.g., \$25 million bond measure) for a project or program, and votes based on that without knowing exactly what it will cost them or for how long.

One primary restriction on GO bonds is that they can only be used for capital projects. While that includes land acquisition, planning, design and construction, the costs for maintenance and operations cannot be paid from the bond proceeds.

Selling bonds for GI has become more viable this year with a clarification from the Government Accounting Standards Board (Statement #62, or “GASB 62”) that distributed infrastructure can be considered an asset upon which an agency can capitalize and therefore more easily be included in a bonded debt program. Distributed infrastructure is a term for smaller improvements that are often distributed around an area – sometimes on private property – like green roofs, rain barrels, bioswales, and pervious pavements. GASB goes so far as to include the cost of rebate programs for distributed infrastructure as well.

Examples of stormwater-related GO bonds successfully implemented include Berkeley’s Measure M (\$30 million – partly for GI, 2012) and Los Angeles’ Measure O (\$500 million, 2004).

### Challenges with Balloted Approaches

Ballot measures are inherently political and are often outside of the areas of experience and expertise of most stormwater managers. For any measure to have a fair chance, the community must be well informed, and their preferences and expectations must be woven into the measure. This requires significant outreach and research, which is something best handled by specialized consultants, and can take considerable time and resources.

Over the past 15 years, there have been fewer than two dozen community-wide measures attempted for stormwater throughout California, and the success rate is just over 50%. Very few attempts have been made to pass a stormwater ballot measure even though there may be over 500 agencies with stormwater needs, because success is not assured. Clearly this is a high bar to clear, and any agency considering a balloted approach must carefully weigh the pros and cons before proceeding.

Funding strategies are discussed in greater detail in the GI Funding Report, which also includes a list of balloted efforts throughout the State along with a discussion on why they succeeded or failed.

### Impacts of Senate Bill 231 on Stormwater Fees

Water and sewer fees are exempt from the voter approval requirements of Proposition 218. Senate Bill (SB) 231, signed by Governor Brown on October 6, 2017, provides a definition for sewer that includes storm drainage. This clarification would give stormwater management fees the same exemption from the balloting requirement that applies to sewer, water, and refuse collection fees, and would make stormwater property-related fees a non-balloted option – something very attractive to municipalities. Unfortunately, the Howard Jarvis Taxpayers Association, who authored and sponsored Proposition 218, is expected to file a lawsuit against any municipality that adopts a stormwater fee without a ballot proceeding. Therefore, the SB 231 approach must be given a very cautionary recommendation at this time. Any agency considering moving in that direction should consult with other agencies and industry groups to coordinate their efforts in a strategic manner and avoid setting an unfavorable legal precedent. C/CAG staff is keeping abreast of developments in this area and would be a good first point of contact.

### Grants

Federal, state, and regional grant programs have funding available to local governments to support GI efforts. These grant programs are listed in the GI Funding Report. As a result of Senate Bill 985, now incorporated into the California Water Code, stormwater capture and use projects must be part of a prioritized list of projects in a Stormwater Resource Plan in order to compete for state grant funds from any voter-approved bond measures. The San Mateo County Stormwater Resource Plan (SRP) was developed by C/CAG through SMCWPPP and includes projects in the City of San Bruno. The City's GI Plan will utilize the work completed for the SRP ensuring the projects are eligible for state grant funds.

Advantages of using grant funding may include the following:

- » Grants can fund programs or systems that would otherwise take up significant general fund revenues;
- » Grants often fund new and innovative ideas that a local agency might otherwise be reluctant to take on using general funds;
- » Grants can be leveraged with other sources of funding increasing the viability, benefits, and/or size of a project; and
- » Successful implementation of a grant-funded project can establish a record that can lead to other grants.

Challenges with using grants as a funding approach typically include:

- » Grants are opportunistic in that local governments have no control over when grant monies will become available. However, in some cases opportunities to apply for grants and the anticipated level and timeline of the funding are scheduled well in advance;
- » Grants are often available only once for the same purpose, which can lead to agencies creating ever “new” programs to qualify for funds. Other “strings” can be attached to the grant creating implementation or maintenance complexities;
- » Grants are competitive. Considerable resources may be required to apply for a grant with no guarantee of success;

While grant funding can help propel a GI program forward, it typically requires another source of funding to cover grant obligations such as matching funds or post-project maintenance. This understanding helps to underscore the importance of an underlying, dedicated and sustainable revenue source such as a stormwater fee or tax.

### **Development of an In-Lieu Fee as Part of an Alternative Compliance Program**

Establishment of an alternative compliance program with an in-lieu fee is a type of non-balloted approach to stormwater funding, which can be implemented without voter approval. Given the amount of development occurring within the City of San Bruno, approaches such as this one that leverage new and redevelopment will be seriously considered.

### **MRP Requirements and Allowance for Alternative Compliance**

Provision C.3 of the MRP requires new development and redevelopment projects above certain size thresholds to comply with stormwater regulations. One of the regulations requires low-impact development (LID) measures to be constructed and maintained in perpetuity for the management of on-site stormwater runoff. In some situations, on-site stormwater management can be difficult to design, expensive to construct, and/or costly to maintain. One option for the developer is the consideration of off-site alternative compliance with approval of the regulating municipality.

Provision C.3.e.i. of the MRP allows the following alternative compliance options:

- » Construction of a joint stormwater treatment facility for multiple developments;
- » Construction of a stormwater treatment system off-site (on public or other private property) that treats runoff from an equivalent amount of impervious surface;
- » Payment of an in-lieu fee for a regional project (on another public or private property).

Each option comes with obligations for municipal staff in addition to other pros and cons for the municipality and developer. Currently, qualified urban infill redevelopment projects in the Bay Area that have site constraints that limit use of LID treatment measures often take advantage of the Special Project option in MRP Provision C.3.e.ii. However, the Special Project option may not be included in future MRPs, and the City may want to start taking advantage of the alternative

compliance option to fund and/or construct municipal GI projects. The City is considering updating the stormwater section of its municipal code to allow for one or more of these alternative compliance options.

### **In-Lieu Fee Approaches and Challenges**

In-lieu fees are attractive in the GI arena as they could be a source of funding for regional projects that help an agency meet their GI Plan goals. There are two basic ways to collect in-lieu fees for alternative compliance: ad hoc approach; and structured approach.

The ad hoc approach is done on a case-by-case basis and is usually negotiated with an individual developer depending on the financial and logistical circumstances. This approach presents challenges and opportunities, and the agency's leverage is limited to its discretionary authority and compliance with local regulations and the MRP. One advantage is that the outcome can be customized to the project. For instance, compliance could be severed into any (or all) of three options: on-site construction; off-site construction; and in-lieu fee contribution. A City of Emeryville project is an example of this approach. In the Emeryville example, all three of the options were utilized: on-site LID for the majority of the site, off-site LID for five selected locations, and an in-lieu fee for the estimated 30-year O&M costs of the project. An ad hoc approach allows for out-of-the-box thinking. This is often the course followed for agencies that have few and sporadic development projects. But for agencies with a steady stream of development, it can be laborious and overwhelming.

A structured approach would typically follow the developer fee model (AB 1600). This would end up with a set of in-lieu fees adopted and published in the agency's master fee schedule. The San Francisco Public Utilities Commission (SFPUC) is exploring this approach and it appears that they have made a calculation of the amount of their in-lieu fee. The SFPUC recently announced a GI Grant program that may use future revenue from developer in-lieu fees, among other funding sources.

However, for MRP permittees, the path to set up a structured approach must include a comprehensive nexus study complete with goals, objectives, project lists, and a reasoned methodology linking development impacts or compliance needs to projects – possibly by geographic or watershed zones – and options for variations. If the City is anticipating numerous development projects (particularly small to midsized projects) in the near future, the effort to adopt in-lieu fees would be worthwhile. It allows staff to simply apply

the scheduled fees to each project as it comes around. At the same time, for larger projects that enter into a developer agreement, those adopted fees could be set aside for a more creative or appropriate ad hoc approach.

One key element to an in-lieu fee program is the identification of in-lieu projects. The development of the list of prioritized projects for the City's GI Plan coupled with the identification of GI opportunities in the City's CIP projects will go a long way toward meeting this challenge.

### **Permit Fees**

The City could raise funds for plan review and inspection costs through permit fees earmarked for stormwater and GI programs. Fees on new and redevelopment projects can be collected through a cost-recovery mechanism with a deposit of funds at the beginning of the project or through the use of a nexus study or other data sources to calculate the amount of a flat or graduated fee. A graduated fee can be based on the square footage of the construction, valuation of the construction project, the amount of impervious area being replaced or created or other such metrics.

### **Development Impact Fees**

Development impact fees are an option for cities that anticipate growth of any scale. "A development impact fee is a monetary exaction other than a tax or special assessment that is charged by a local governmental agency to an applicant in connection with approval of a development project for the purpose of defraying all or a portion of the cost of public facilities related to the development project." (Gov. Code § 66000(b).) The legal requirements for enactment of a development impact fee program are set forth in Government Code §§ 66000-66025 (the "Mitigation Fee Act"), the bulk of which were adopted as 1987's AB 1600 and thus are commonly referred to as "AB 1600 requirements." A development impact fee is not a tax or special assessment; by its definition, a fee is voluntary and must be reasonably related to the cost of the service provided by the local agency. If a development impact fee does not relate to the impact created by development or exceeds the reasonable cost of providing the public service, then the fee may be declared a special tax and must then be subject to a two-thirds voter approval. Development impact fees are exactions of either money or built improvements from a developer to mitigate the impacts to the public infrastructure of that development."

Development impact fees are typically done in one of two ways: 1) through predetermined fees tied to a nexus study and charged to applicable development projects; or 2) on an ad hoc basis drafted for a particular development. While the former requires a rigorous nexus study and is often based on the expectation of significant future development, it will apply to all future development and provides a known cost for developers as they plan projects. The latter method is often attractive for municipalities that have not adopted development impact fees and allows for flexibility in determining impacts and creative methods for mitigating them. However, the ad hoc method carries with it a higher burden for the agency to demonstrate the reasonable nexus and a rough proportionality to the impact created by the development project. It also deprives developers from knowing in advance the cost to their projects.

One of the impacts of new development that can be tied to a fee is that of stormwater quality. Most new development is already subject to C.3 requirements, which mitigate many of the direct stormwater pollution impacts for a particular site. Therefore, it may be difficult to demonstrate additional impacts that can be mitigated through planned GI. One way would be to tie local or regional GI needs to the community at large and include each project's fair share of the associated costs in a development fee structure for GI. Another way may be to develop an overall stormwater impact fee nexus (including GI) that can be applied to new development.

### **Public-Private Partnerships**

Public-Private Partnerships (P3s) are arrangements, typically through a contract, where a private entity agrees to perform certain functions that a public agency would typically take on, such as through a public bidding process for asset delivery and operation. There are several types of P3s with varying advantages and disadvantages that can be used for stormwater program implementation. One of the most well-known examples is that of Prince Georges County Maryland, where the County's stormwater fee is being leveraged through a 20-year P3, to design, construct and maintain GI assets on public property such as green streets. The private partner managing the program collects the stormwater fee funds from the County, obtains private financing leveraging the 20-year guarantee of stormwater fee income and uses the resulting funds to contract with another company to design, build and operate the GI assets on behalf of the County. The partnership is carefully detailed in the contract with the community using performance-based criteria for the GI asset delivery and operation. This type is known as a community-based P3 or CBP3. This kind of P3 could be of interest once the City has gotten voter or property-owner approval for a stormwater fee since that revenue source is key to its implementation.

### ***Other Potential Future Funding Options***

The City is joining other municipalities within San Mateo County in creating a new countywide agency. The Flood and Sea Level Rise Resiliency Agency would be created by modifying the existing San Mateo County Flood Control District through state legislation. The agency could, in the future, provide funding for GI to the City and the other SMCWPPP Permittees. One step in that process is establishing a nexus to support implementation of a stormwater infrastructure impact fee (stormwater fee). The GI Funding Report addresses that issue.

## 6.3 PERFORMANCE ASSURANCE

The success of the GI Plan is contingent upon the performance of implemented GI facilities meeting or exceeding expectations for stormwater volume capture and pollutant removal. To increase reliability that implemented projects perform as predicted, the City has compiled a suite of tools that set the standards for GI design, construction, inspection, and maintenance. These tools are summarized in Table 6-4 and image excerpts from the plans are shown in Figure 6-5.

### SMCWPPP C.3 Stormwater Technical Guidance

The C.3 Technical Guidance was written to help developers, builders, and project applicants to select and size appropriate post-construction stormwater controls for regulated projects. The handbook provides the regulatory background and requirements under the MRP, as well as guidance for stormwater control measure selection, sizing, design, and maintenance.

### SMCWPPP GI Design Guide

The GI Design Guide provides guidance on design and implementation of stormwater controls in the public right-of-way and on public property. This includes definitions of GI types, integration strategies per site type, operation and maintenance guidance, and construction considerations.

**Table 6-4. GI Performance Assurance – Technical Guidance Documents**

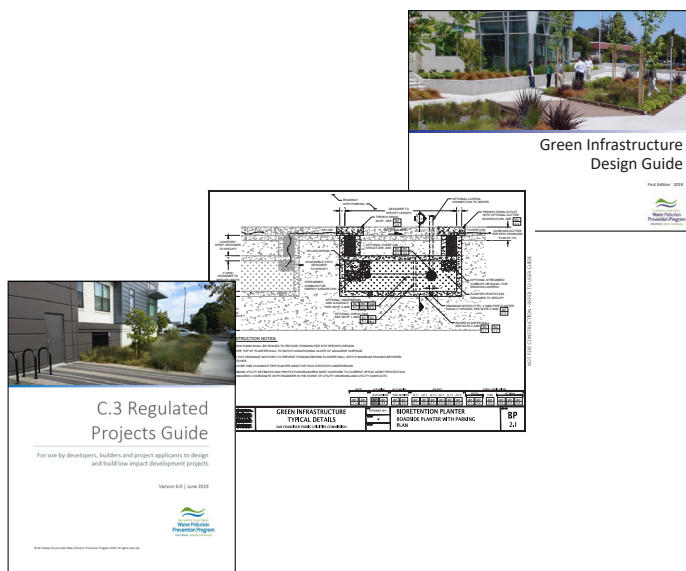
Guidance Topic	Project Phase	Guidance Document
<b>Sizing Requirements</b>	Planning and Design	SMCWPPP C.3 Stormwater Technical Guidance
		BASMAA Alternative GI Sizing Guidance (See Appendix D)
<b>Design Guidance</b>	Planning and Design	SMCWPPP GI Design Guide
		San Bruno Typical GI Details and Specifications
<b>Operation and Maintenance</b>	Operation and Maintenance	SMCWPPP GI Design Guide
		San Bruno GI Projects Database

### San Bruno GI Typical Details and Specifications

The GI Typical Details and Specifications refine the Sustainable Streets Typical Details included in the SMCWPPP GI Design Guide to make them suited for the City. GI projects in San Bruno will be designed and built in accordance or consistent with the typical details and specifications.

### Operation and Maintenance Plan

Once constructed in conformance to City standards, the GI projects will be inspected and maintained to provide assurance that the facilities will perform as intended over their lifespan. There are currently very few built GI projects in San Bruno, and therefore the existing City standards for GI maintenance are limited. However, the City is currently leveraging the countywide guidance provided by SMCWPPP, and the City’s Public Works Department will work with the Community Services – Parks Department to develop a city-specific GI Operation and Maintenance Manual. Once completed, staff and contractors will be trained to carry out responsibilities outlined in the manual. More information on planned training is included in the following section on outreach and education.



**Figure 6-5. Key Technical Tools**

## 6.4 OUTREACH & EDUCATION

The City of San Bruno prepared a GI Public Outreach Plan with an Outreach Strategy (Appendix D) to identify the City's target audiences, key messages, and the methods and materials for engagement and education needed to accomplish the GI outreach requirements in the MRP. Target audiences include City of San Bruno residents, property owners, and school age children, City staff and elected officials, and locally active stakeholder groups. Outreach to department staff, managers, and elected officials is crucial to getting their support for the GI Plan and the transition from traditional to green stormwater management. For residents, property owners and other stakeholders, outreach is important in order to achieve public acceptance of GI projects, particularly when these might cause a temporary inconvenience, and potentially also for support of funding efforts.

The City completed an internal multi-departmental workshop in March 2019 to explain GI requirements and strategies for implementation. The City also gave a presentation to the City Council as part of the GI Plan approval process to educate elected officials on the elements of the GI Plan, requirements of MRP Provision C.3.j, and methods of implementation requirements.

Future GI outreach efforts by the City may include the distribution of general or project-specific information via City social media sites, websites, events, neighborhood meetings, and/or press releases. Outreach efforts have been and will continue to be coordinated with SMCWPPP, who maintains a GI webpage (<https://www.flowstobay.org/content/about-sustainable-streets-and-green-infrastructure>), student stormwater pollution prevention outreach program, and rain barrel rebate program. On behalf of its member agencies, including San Bruno, SMCWPPP has produced a diverse set of outreach materials such as posters and fact sheets explaining GI, as well as interactive toolkits displaying the elements of sustainable streets.

In fiscal year 2019-2020, the City will assess training needs of internal staff who design, construct, and/or maintain city infrastructure. The City will also determine if contractors, such as those performing landscape maintenance, also need training and/or certifications to improve GI performance. Following the assessment, the City will train municipal staff on design, construction and maintenance of GI and LID, as needed, and will require contractors to obtain training and/or certifications. The City will utilize appropriate training tools and resources from local organizations such as BASMAA, SFPUC, and SMCWPPP and national organizations such as the National Green Infrastructure Certification Program and the Green Infrastructure Leadership Exchange.

# 6.5 PROJECT TRACKING PLAN

## 6.5.1 Current City Tracking Systems (Regulated & GI)

The City maintains a database of GI projects and associated project activities. Once the status of a project is updated to reflect that GI has been installed, then that particular installation enters an inspection cycle. From that point on, the database is updated with inspection data and facilities are adaptively managed to meet the observed needs of each project. Moving forward, the City's process of data tracking will be refined to integrate with the countywide tool that is being developed to further improve and standardize tracking and mapping of completed GI projects. This tracking tool is described in detail in the following section.

## 6.5.2 Proposed C/CAG Project Tracking System

C/CAG is in the process of developing a Green Infrastructure Tracking Tool (GI Tracking Tool) to document planned and completed GI projects countywide pursuant to the MRP. Ultimately, the GI Tracking Tool will document GI projects, quantify key metrics related to their performance, and compare those metrics to goals established by the MRP. The GI Tracking Tool will assist the City with the requirement to demonstrate with "reasonable assurance" that pollutant reductions will be met over defined periods of time (SFBRWQCB 2015). While the GI Tracking Tool is not scheduled for completion until the end of Fiscal Year 2019-2020, the GI Plan outlines protocols for incorporating completed projects into the system once developed.

### *Tracked Metrics*

The GI Tracking Tool will document projects and quantify performance metrics on a project and city/countywide basis. The MRP (Provision C.3.j) states that the GI Plan "shall include means and methods to track the area within each Permittee's jurisdiction that is treated by green infrastructure controls and the amount of directly connected impervious area", and a "process for tracking and mapping completed projects, public and private, and making the information publicly available."

The GI Tracking Tool will record the location of each project and can also be used to access the following information:

- » The locations of projects will be shown on a dynamic map along with key base layers (watershed boundaries, waterbodies, city boundaries, storm drains, etc.)
- » The user may click on any project and view information including its type (LID on a parcel, green street, regional facility, etc.) and other desired fields set by C/CAG members.
- » The user may also query the GI Tool to find projects based on keywords (as opposed to clicking through the map)

The GI Tracking Tool will also include algorithms to quantify performance metrics and track progress toward key goals, including the following:

- 1. Estimate of total area and impervious area treated with GI:** for each project, the user will provide information on capture area or the system will use 'default' values.
- 2. Stormwater volumes managed during the annual average year:** the GI Tracking Tool will include algorithms that estimate stormwater runoff volumes managed with GI using methods that are consistent with the RAA/GI Plans. The stormwater volume metrics will also be useful to the SRP (which encourages tracking of stormwater volume capture) and for engaging third parties who are interested in broader water resources programs such as water supply.
- 3. Progress toward implementation goals:** the GI Tracking Tool will include a user-editable database of compliance/implementation goals from the GI Plan (and/or other programs) and will visualize the progress toward those goals.

The GI Tracking Tool will be developed in a manner in which additional metrics could be added over time. For example, in future phases the tool could track metrics related to flood control such a peak flow reduction. The Tracking Tool could also quantify triple bottom line benefits that would highlight the multiple additional benefits provided to promote investment in projects, such as carbon sequestration, public health benefits, heat island reduction, and water supply augmentation.

**Tool Components**

The Tracking Tool will contain components to document GI projects across San Mateo County. The tool will be organized into several interfaces to support mapping, project details, and annual reporting. The components of the GI Tracking Tool are outlined in Figure 6-6 and further described in the following sub-categories of this section.

*Mapping*

A dynamic interactive map will be included as part of the Tracking Tool to support the visualization of planned and completed projects across the county. The mapping interface locates implemented projects and helps convey the scale of constructed efforts to-date. The map will be interactive and display pictures, renderings, project details, and key metrics on stormwater capture benefits. Base layers, such as administrative and planning boundaries, storm drains, creeks, and watersheds, will be overlaid to provide context with project locations.

*Dashboard/Visualization*

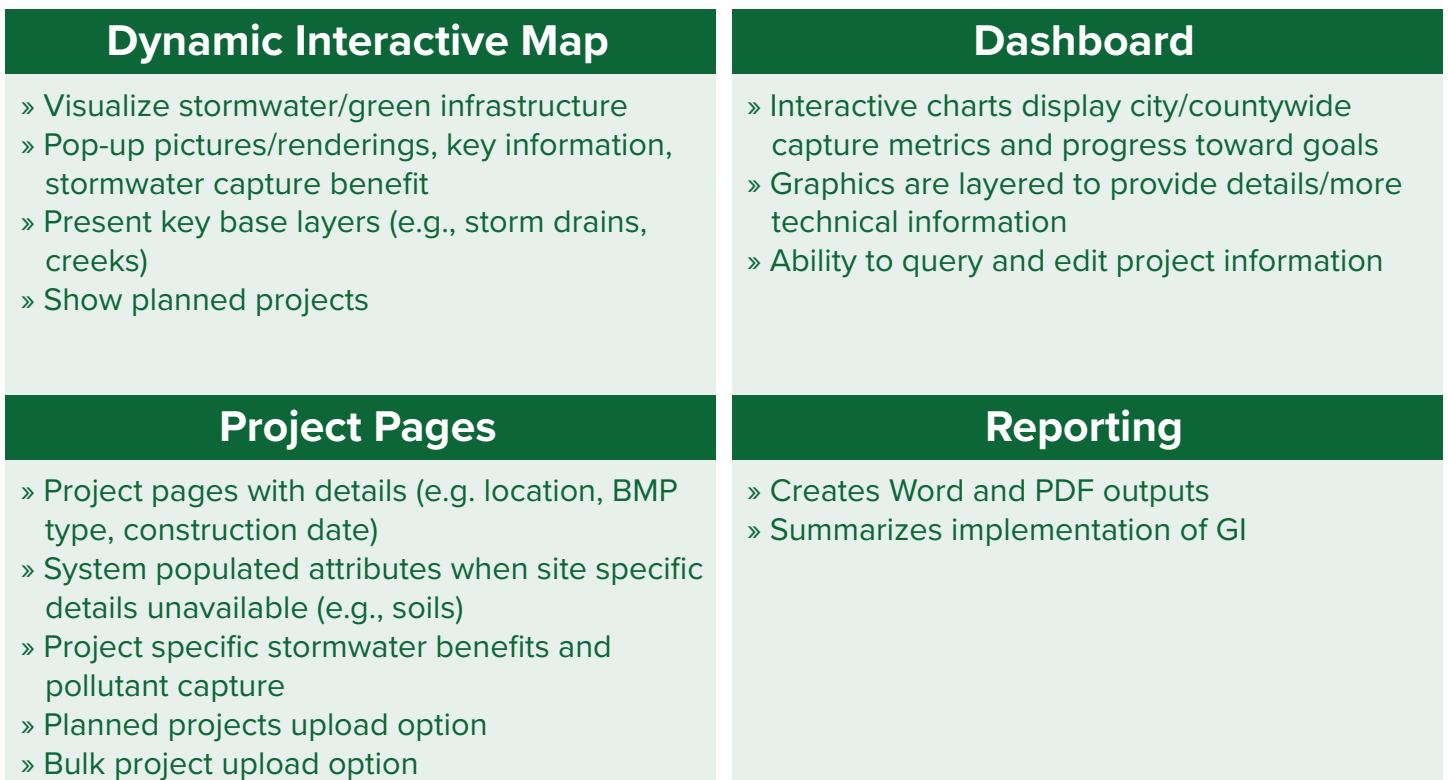
A dashboard of completed projects will be included to view dynamic charts displaying capture metrics and progress towards goals. Graphics will be interactive and intuitive, enabling users to gain supplemental details or more technical information by interacting with dynamic graphics. The user will also have the ability to query and edit project information.

*Project Pages*

In addition to the high-level visualization and analytics, the Tracking Tool will catalog project details as they are submitted to the system. Types of details that will be included are location, GI type, construction (or planned) date. In addition, the system will estimate key attributes (e.g., soils) using regional geospatial datasets when site-specific information is unavailable.

*Reporting*

The Tracking Tool also facilitates annual reporting of GI to meet MRP requirements. For example, the system allows for exporting project summaries into multiple formats (e.g., Word, PDF). These generated outputs include tables summarizing key project characteristics (such as location and drainage area) to supplement annual reports for regulatory agencies.



**Figure 6-6. Overview of GI Tracking Tool Elements & Functionality**

### 6.5.3 Proposed Process & Timeline for Tracking System Integration

The City’s current process for annual reporting will be updated to integrate with the Tracking Tool once completed. Currently, project information is compiled annually to C/CAG which in turn packages the data for annual reporting to the San Francisco Bay Regional Water Quality Control Board. Current methods typically utilize desktop applications (e.g., Microsoft Excel) to display project details, calculate benefits, and transfer information between users. The Tracking Tool’s web-based platform will streamline the City’s annual reporting process while providing the following benefits:

- » **System maintainability:** a web-based tool will be easier to maintain than existing desktop applications. Current project tracking utilizes Excel files for maintaining project information which is prone to multiple versions, unintended modifications, and accidental use of outdated or incorrect versions. The transition to a web-based tool will ensure users will only have access to the most recent version of the database.
- » **Incremental data entry:** the web-based system will allow for projects to be entered incrementally throughout the year in lieu of large-scale annual uploads. This may ease the burden on City staff by reducing data compilation into manageable blocks. Additionally, planned projects may be entered into the system and updated throughout different phases of development (e.g., design, construction). An inventory of planned projects may help provide a better picture of implementation progress, increase awareness of near-term projects, and creates a placeholder for project details prior to completion.
- » **Data consistency:** standardized data entry ensures that the same parameters are tracked for all completed projects. Furthermore, this promotes consistency in calculation outputs and streamlines annual reporting to the Water Board while minimizing errors. For example, missing or erroneous values (i.e., out of

reasonable bounds) may be flagged prior to submission of project information to the database.

- » **Bulk upload:** City staff may opt to upload projects completed prior to the Tracking Tool’s development in bulk using current reporting methods (e.g. Excel). This option accelerates an easy transition from existing processes to the new tracking mechanism.

The data and metrics tracked by the GI Tracking Tool will be based upon data provided by the C/CAG members, including the following:

- » **Base GIS layers:** the base layers for the dynamic map will be compiled and hosted through the GI Tracking Tool. Layers to be compiled and incorporated into the map include watershed boundaries, city boundaries, storm drains, soil types (to support infiltration estimates), rain gages (to support performance estimates), and aerial imagery and street map (from ESRI). Users will be able to toggle these layers off and on.
- » **Project data:** each C/CAG member agency will hold responsibility for uploading data for projects in its jurisdiction. Users will have both ‘bulk upload’ and manual (through browser) data upload options. The bulk upload Excel template will be similar to formats currently used for MS4 annual reporting. This Excel template will include required fields such as location, project type, and sizing information, along with optional fields set by C/CAG members. The GI Tracking Tool will also have an option to ‘assume typical values’ for pending field inputs that can be edited in the future once available.

The GI Tracking Tool is scheduled for completion at the end of Fiscal Year 2019/2020. At the time the tool is completed, existing projects will be uploaded to the system via bulk upload to transition to the new tracking system. The newly-tracked metrics (i.e., impervious area treated, capture volumes) will be calculated for the existing projects. New projects may be entered into the system as they are completed.



City of San Bruno General Plan

**APPENDICES**

- A** GI Sizing Methodology
- B** Reasonable Assurance Analysis
- C** Project Concepts
- D** Outreach & Education Strategy

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A

**GI SIZING**

**METHODOLOGY**

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## APPENDIX A

MRP Provision C.3.d specifies minimum hydraulic sizing requirements for stormwater treatment measures in Regulated Projects. Regulated Projects must treat the water quality design flow or volume (the “C.3.d” Amount) of stormwater runoff through infiltration or biotreatment. Certain Regulated Projects must also meet the sizing requirements for Hydromodification Management (HM) in Provision C.3.g, depending on the location and amount of impervious surface created and/or replaced on the site. These criteria are further described under the Standard Sizing Methodology section below.

GI measures in public right-of-way must be designed to meet the same treatment and HM sizing requirements as Regulated Projects wherever feasible. However, if GI measures cannot be designed to meet the Standard Sizing Methodology due to constraints in the public right-of-way such as lack of space, utility conflicts, or other factors, the City may still wish to construct the measure to achieve other benefits (e.g., traffic calming, pedestrian safety, etc.).

To address this situation, MRP Provision C.3.j.i.(2)(g) states that, for non-regulated Green Street projects, “Permittees may collectively propose a single approach with their Green Infrastructure Plans for how to proceed should project constraints preclude fully meeting the C.3.d requirements.” Such a regional approach has been developed by BASMAA for use by the City of San Bruno and other Permittees in their GI Plans and is described in the Alternative Sizing Methodology section below.

### Standard Sizing Methodology

Chapter 5 of the SMCWPPP C.3 Technical Guidance<sup>1</sup> contains detailed procedures for sizing specific stormwater treatment measures using volume-based sizing criteria, flow-based sizing criteria, or a combination flow and volume approach. In general, the treatment measure design standard is capture and treatment of 80% of the annual runoff (the small, frequent storm events.) There is also a simplified sizing method for biotreatment in which the surface area of the treatment measure is equal to 4% of the contributing impervious area, i.e., a sizing factor of 0.04<sup>2</sup>.

GI measures should be located and sized to treat the C.3.d Amount from the contributing impervious surface area from the public right-of-way (street and sidewalk) where possible. Similarly, for GI measures in parking

lots and public parks, every attempt should be made to locate and size GI measures to treat the C.3.d amount of runoff from the contributing impervious surface areas. Consideration should be given to the feasibility of treating impervious surface area from adjacent parcels, even if privately owned. If site constraints prevent locating and sizing GI measures to meet C.3.d requirements in public right-of-way, the alternative sizing methodology described below may be used.

### Alternative Sizing Methodology

To develop the alternative sizing methodology, BASMAA contracted with a consultant to model bioretention facilities using rainfall data from six Bay Area gauges to determine the smallest facility sizes that will treat the C.3.d volume, and what percentages of that volume are treated in smaller facilities. The hydrologic analysis report also provides minimum bioretention sizing criteria for projects to provide treatment of 80% of annual runoff (per MRP C.3.d) based on the mean annual precipitation (MAP) of the project site. The equation below was developed from the model results across the 10 rain gauges in the report.

$$\text{Sizing Factor} = 0.00060 \times \text{MAP} + 0.0086$$

Where: *Sizing Factor* is the ratio of the surface area of the bioretention facility to the impervious area contributing runoff

*MAP* is the mean annual precipitation of the project site.

For example, the MAP for San Bruno ranges from approximately 21 to 30 inches per year. Using the sizing factor equation, the sizing factor for non-regulated GI projects in San Bruno would range from 0.021 to 0.027 (2.1 to 2.7%). This indicates that GI facilities in the street right-of-way can be sized with reduced sizing factors and still meet the C.3.d sizing requirements.

There are typically more constraints on the placement and sizing of GI measures in a public right-of-way (street) than for parcel-based GI projects, and there may be GI opportunities for which even the lower sizing factors cannot be achieved. However, undersized GI measures or GI measures designed to only treat a portion of the runoff from the contributing drainage area may still have some water quality, runoff reduction, or other benefits.

<sup>1</sup> SMCWPPP C.3 Stormwater Technical Guidance V.5, 2016 – [www.flowstobay.org/newdevelopment](http://www.flowstobay.org/newdevelopment)

<sup>2</sup> This sizing factor is based on a permeability of 5 inches per hour (in/hr) through the biotreatment soil media and a rainfall intensity of 0.2 in/hr, as specified in MRP Provision C.3.d.

The BASMAA Development Committee developed regional guidance on how to use the modeling results and what design approaches to use in specific situations when the C.3.d sizing requirements cannot be met<sup>3</sup>. The regional guidance includes the following recommendations for sizing GI facilities in green street projects:

1. Bioretention facilities in street projects should be sized as large as feasible and meet the C.3.d Amount where possible. Constraints in the public right-of-way may affect the size of these facilities and warrant the use of smaller sizing factors. Bioretention facilities in street projects may use the sizing curves in the BASMAA GI Facility Sizing Report<sup>4</sup> to meet the C.3.d criteria. Local municipal staff involved with other assets in the public right of way should be consulted to provide further guidance to design teams as early in the process as possible.
2. GI Measures in street projects smaller than what would be required to meet the Provision C.3.d Amount may be appropriate in some circumstances. As an example, it might be appropriate to construct a GI measure where a small proportion of runoff is diverted from a larger runoff stream. Where feasible, such facilities can be designed as “off-line” facilities, where the bypassed runoff is not treated or is treated in a different facility further downstream. In these cases, the proportion of total runoff captured and treated can be estimated using the BASMAA GI Facility Sizing Report<sup>5</sup>. In cases where “in-line” bioretention systems cannot meet the C.3.d criteria, the facilities should incorporate erosion control as needed to protect the facility from high flows.
3. Pollutant reduction achieved by GI facilities in street projects can be estimated in accordance with the Interim Accounting Methodology or the applicable Reasonable Assurance Analysis [standard methodologies employed by SMCWPPP].

If it is determined that GI measures in a City green street project are unable to be designed to meet the C.3.d sizing requirements, the following steps can be taken:

- » Document the project constraints that preclude meeting the C.3.d sizing requirements. For example, if an underground utility is preventing installation at the appropriate depth, the sidewalk planter area is inadequate for ideal sizing, heritage trees and their root structures conflict with the desired GI location, document those constraints.
- » Use the sizing charts from the BASMAA GI Facility Sizing Report (BASMAA, 2017) to determine the smallest facility size that will meet the C.3.d sizing requirements.
- » If the minimum facility size is still infeasible, identify possible variations from the standard design. For example, determine whether the depth can be adjusted only in the area where a utility conflict exists. Using this alternative design, estimate the percent of the C.3.d volume that will be treated. Evaluate the cost-effectiveness of installing the GI measure given the other benefits realized (e.g., pedestrian safety, traffic calming, reduced local flooding, etc.) and the amount of pollutant removal achieved.

<sup>3</sup> BASMAA, 2018. “Guidance for Sizing Green Infrastructure Facilities in Street Projects.”

<sup>4</sup> BASMAA, 2017, “Green Infrastructure Facility Sizing for Non-Regulated Street Projects.”

<sup>5</sup> Ibid.

**B**

**REASONABLE**

**ASSURANCE**

**ANALYSIS**

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# Reasonable Assurance Analysis and Green Infrastructure Implementation Goals

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The Municipal Regional Stormwater Permit (MRP) (Order No. R2-2015-0049) requires the development of Green Infrastructure (GI) Plans (Provision C.3) and Polychlorinated Biphenyls (PCBs) and Mercury Control Measure Implementation Plans (Provisions C.11 and C.12) that provide the necessary pollutant load reductions to meet Total Maximum Daily Load (TMDL) wasteload allocations (WLAs) over specified compliance periods. A key component of these plans is a Reasonable Assurance Analysis (RAA) that quantitatively demonstrates that proposed control measures will result in sufficient load reductions of PCBs and mercury to meet WLAs for municipal stormwater discharges to the Bay. The City/County Association of Governments (C/CAG) of San Mateo County, via its San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), led a county-wide effort to develop an RAA to estimate the baseline PCB and mercury loads to the Bay, determine load reductions to meet WLAs, and set goals for the amount of GI needed to meet the portion of PCB and mercury load reduction the MRP assigns to GI (SFBRWQCB 2015). Documentation of the county-wide RAA can be referenced in the separate documents:

- Phase I Baseline Modeling Report – Provides documentation of the development, calibration, and validation of the baseline hydrology and water quality model, and the determination of PCB and mercury load reductions to be addressed through GI implementation (SMCWPPP 2018).
- Phase II Green Infrastructure Modeling Report – Provides documentation of the application of models to determine the most cost-effective GI implementation for each municipality, setting stormwater improvement goals for the GI Plan (SMCWPPP 2019).

The following sections provide an overview of the purpose of the RAA, and a summary of RAA results for San Bruno to serve as stormwater improvement goals that set the stage for an adaptive management approach.

## 1 PURPOSE OF THE RAA

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In 2017, the U.S. Environmental Protection Agency (EPA) Region 9 released *Developing Reasonable Assurance: A Guide to Performing Model-Based Analysis to Support Municipal Stormwater Program Planning* (EPA RAA Guide) (USEPA 2017), which provides guidance on the technical needs of the RAA and considerations for model selection. Building upon the EPA RAA Guide, the Bay Area Stormwater Management Agencies Association (BASMAA) prepared the *Bay Area Reasonable Assurance Analysis Guidance Document* (Bay Area RAA Guidance) (BASMAA 2017), which provides specific guidance on modeling to support RAAs performed in the Bay Area to meet MRP requirements, address TMDLs for PCBs and mercury, and support GI planning. The EPA RAA Guide and Bay Area RAA Guidance both outline essential steps for performing an RAA, as depicted in Figure 1-1.

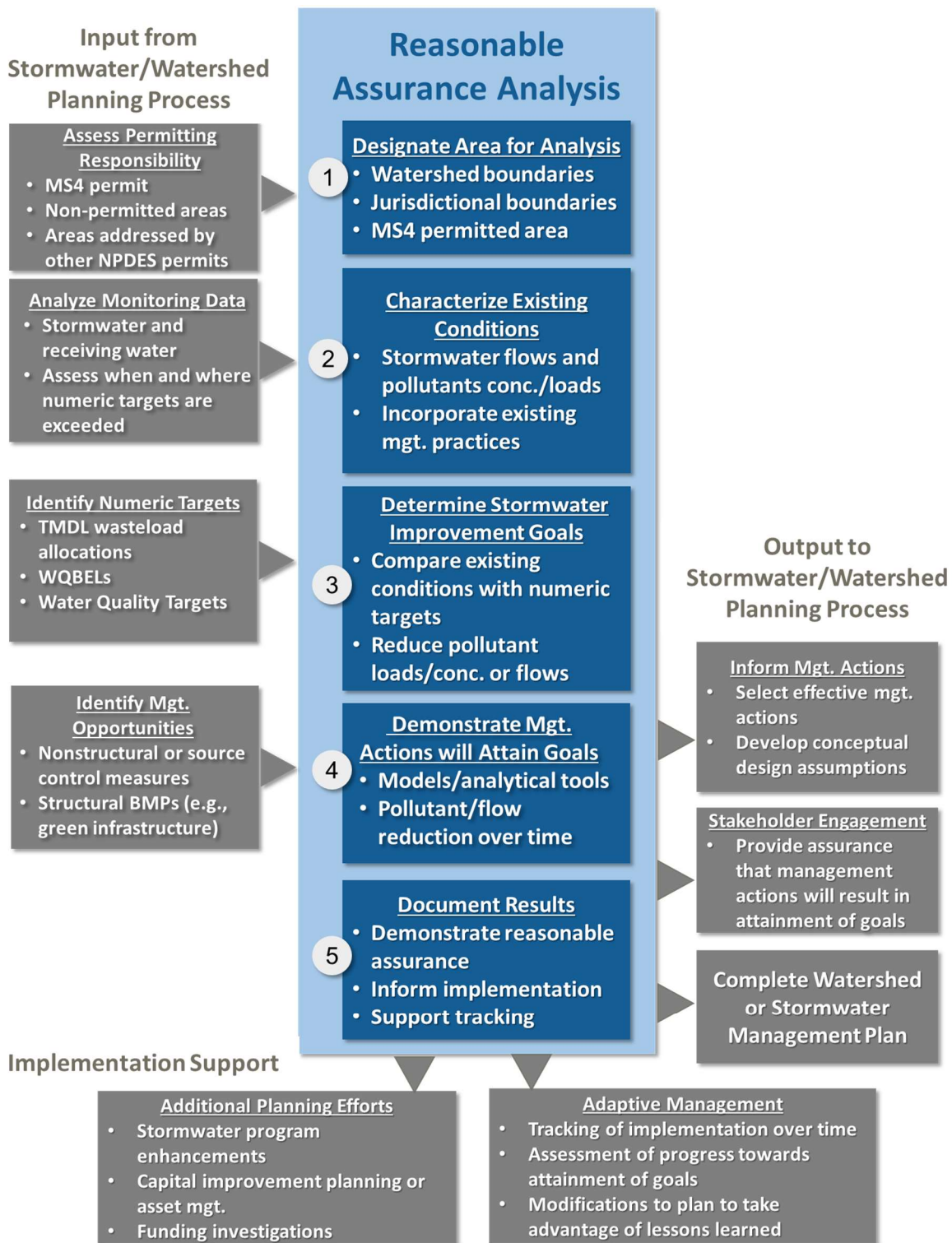


Figure 1-1. RAA Process Flow Chart (USEPA 2017).

Depending on the audience, the purpose of the RAA can vary in terms of what constitutes reasonable assurance. The EPA RAA Guide provides an example of three differing perspectives for defining reasonable assurance (USEPA 2017):

- **Regulator Perspective** - Reasonable assurance is a demonstration that the implementation of a GI Plan will result in sufficient pollutant reductions over time to address TMDL WLAs or other targets specified in the MRP.
- **Stakeholder Perspective** - Reasonable assurance is a demonstration that specific management practices are identified with sufficient detail, and implemented on a schedule to ensure that necessary improvements in water quality will occur.
- **Permittee Perspective** - Reasonable assurance is based on a detailed analysis of the TMDL WLAs and associated MRP targets themselves, and a determination of the feasibility of those requirements. The RAA may also assist in evaluating the financial resources needed to meet pollutant reductions based on schedules identified in the MRP.

The Phase I and Phase II Modeling Reports (SMCWPPP 2018; 2019) provide full documentation of the technical approaches and results of the RAA, which are consistent with the recommendations of the EPA RAA Guide and Bay Area RAA Guidance.

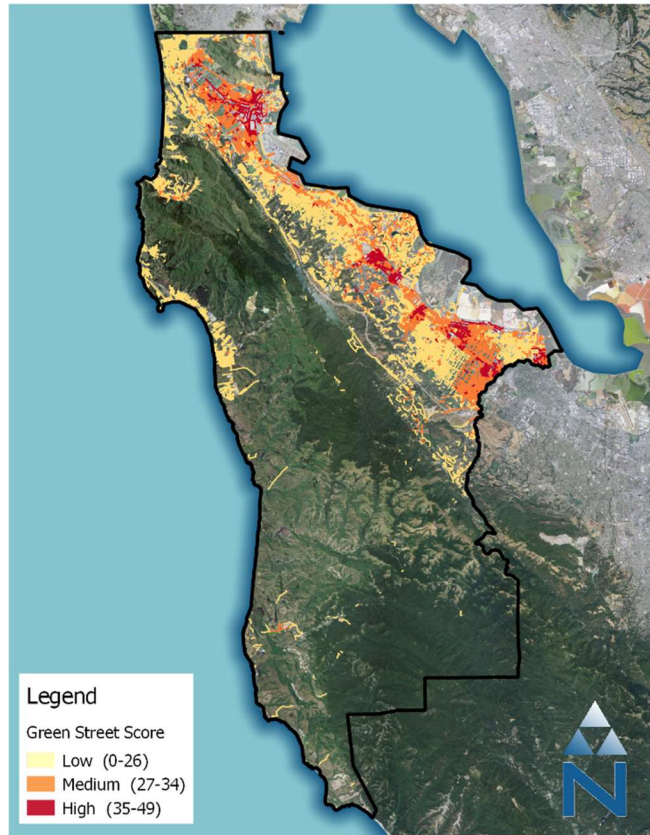
## 2 PRELIMINARY IDENTIFICATION OF OPPORTUNITIES FOR GI PROJECTS

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To support the RAA and GI Plans, C/CAG has initiated a number of planning efforts that identify opportunities for GI implementation. The following is a summary of those efforts:

- **LID for New Development and Redevelopment** – The MRP includes a Provision (C.3) for the integration of LID within new development and redevelopment. As LID techniques are implemented as new development and redevelopment occurs throughout the City, the benefits of such practices in terms of reducing urban runoff flows and associated pollutant loads can be considered as part of the pollutant load reductions attributed to implementation of GI. C/CAG worked with San Mateo County Permittees to compile information on LID practices that have been implemented within new development and redevelopment since water year 2003 (baseline year for the TMDL). C/CAG also performed an analysis to project the number of acres of future new development and redevelopment to be addressed by the Provision C.3 regulated development by 2040. The RAA considers existing LID practices and projections of LID in future new development and redevelopment areas to estimate anticipated PCBs and mercury load reductions from 2003 to 2040.

- Countywide Stormwater Resource Plan (SRP)** – The SRP is a comprehensive plan that identifies and prioritizes 1000’s of GI project opportunities throughout San Mateo County and within each municipal jurisdiction. Prioritized project opportunities include: (1) large regional projects within publicly-owned parcels (e.g., public parks) that infiltrate or treat stormwater runoff generated from surrounding areas (e.g., diversion from neighborhood storm drain system; diversions from creeks draining large urban areas); (2) retrofit of publicly-owned parcels with GI that provide demonstration of onsite LID designs; and (3) retrofit of public street rights-of-way with GI, or “green streets.” The SRP included a multi-benefit scoring and prioritization process that ranks GI project opportunities based on multiple factors beyond pollutant load reduction (e.g., proximity to flood prone channels, potential groundwater basin recharge). Figure 2-1 provides an example of green street opportunities identified, scored, and prioritized by the SRP throughout San Mateo County (SMCWPPP 2017).



**Figure 2-1. SRP Prioritized Green Street Opportunities.**

The above efforts and resulting technical products provide preliminary identification of opportunities for GI projects. These GI project opportunities serve as the foundation for the RAA and GI Plans as strategies are developed for implementation plans to meet the PCBs and mercury load reduction goals.

### 3 DESCRIPTION OF THE RAA MODEL

C/CAG performed a comprehensive, countywide modeling effort to provide: (1) simulation of baseline loads of PCBs and mercury for each of the County’s watersheds and municipal jurisdictions discharging to San Francisco Bay; (2) estimation of necessary load reduction goals to meet requirements of the MRP and TMDL WLAs; and (3) determination of the amount of GI needed to address load reduction goals based on project opportunities identified Section 0. The RAA also provides analysis of alternative implementation scenarios through cost-benefit optimization that can inform cost-effective GI implementation within each municipal jurisdiction. These results set goals for GI Plans developed by each Permittee.

The analytical framework selected to support the San Mateo Countywide RAA is based on a linked system of models (Figure 3-1). Component models of the linked system include:

- Loading Simulation Program C++ (LSPC)** – The hydrologic and water quality model selected for the baseline model of San Mateo County watersheds was the Loading Simulation Program in C++ (LSPC) (Shen et al., 2004), a watershed modeling system that includes Hydrologic Simulation Program – FORTRAN (HSPF) (Bicknell et al. 1997) algorithms for

simulating watershed hydrology, erosion, water quality, and in-stream fate and transport processes. The model can simulate upland loading and transport of sediment, mercury, and PCBs. LSPC is built upon a relational database platform, making it easier to collate diverse datasets to produce robust representations of natural systems. LSPC integrates GIS outputs, comprehensive data storage and management capabilities, the original HSPF algorithms, and a data analysis/post-processing system into a convenient PC-based Windows environment. The algorithms of LSPC are identical to a subset of those in the HSPF model with selected additions, such as algorithms to address land use change over time. LSPC is an open-source public-domain watershed model available from EPA.

- System for Urban Stormwater Treatment & Analysis Integration (SUSTAIN)** – Developed by EPA’s Office of Research and Development, SUSTAIN was primarily designed as a decision-support system for selection and placement of GI projects at strategic locations in urban watersheds. It includes a process-based continuous project simulation module for representing flow and pollutant transport routing through various types of GI projects. A distinguishing feature of SUSTAIN is a robust cost-benefit optimization model that incorporates dynamic, user-specified project unit-cost functions to quantify the costs associated with project construction, operation, and maintenance. The cost-benefit optimization model runs iteratively to generate a cost-effectiveness curve that is sometimes comprised of millions of GI project scenarios representing different combinations of projects throughout a watershed. Those results are used to make cost-effective management recommendations by evaluating the trade-offs between different scenarios. The “benefit” component can be represented in several ways: (1) reduction in flow volume (2) reduction in load of a specific pollutant or (3) other conditions including numeric water quality targets, frequency of exceedances of numeric water quality targets, or minimizing the difference between developed and pre-developed flow-duration curves (USEPA 2009, Riverson et al. 2014).

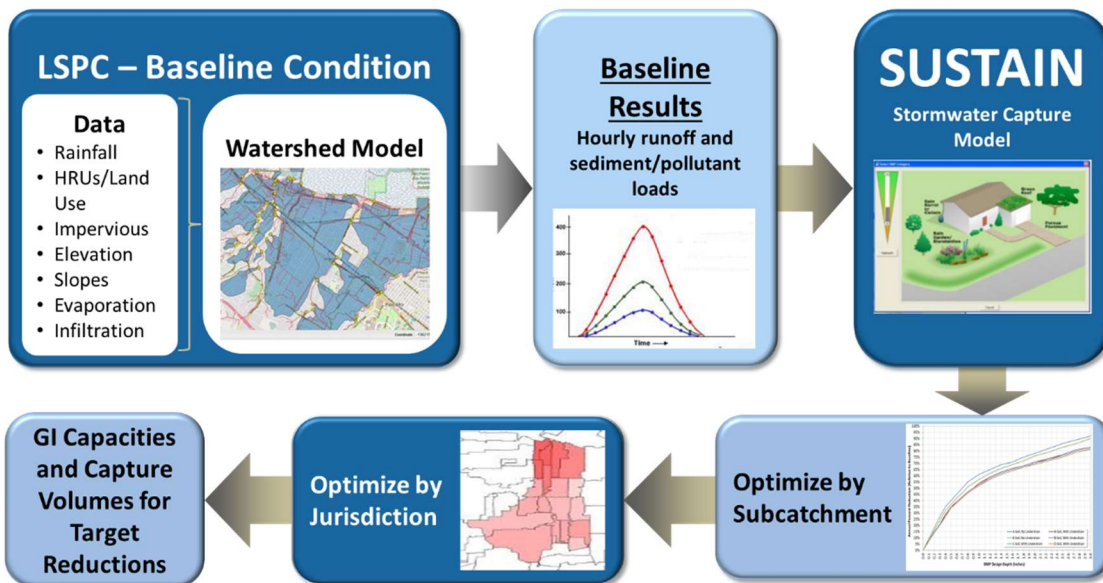


Figure 3-1. Modeling System Supporting the RAA.

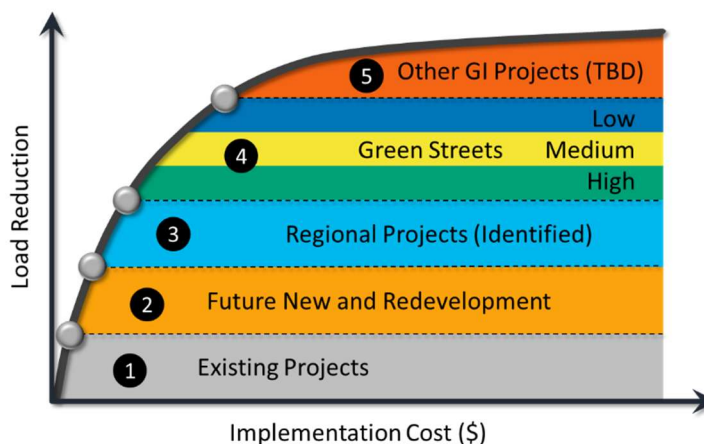
The LSPC model provides a characterization of existing conditions and determination of necessary pollutant load reductions to meet requirements of TMDLs and the MRP. SUSTAIN provides analysis of the amount of GI needed to provide the portion of the load reduction assigned to GI by the MRP.

## 4 MODEL CONSIDERATIONS TO INFORM GI PLANS

An important consideration for the RAA was the ability to track costs and benefits of different categories of GI projects within the model. This tracking was performed for GI project categories within each model subwatershed and municipal jurisdiction, and supports the selection of the most cost-effective implementation strategy to attain pollutant reduction goals. The RAA builds upon the previous planning efforts and utilizes the following categories of GI projects for model representation:

1. **Existing Projects:** Stormwater treatment and GI projects that have been implemented since FY-2004/05. This primarily consists of all of the regulated projects that were mandated to treat runoff via Provision C.3 of the MRP, but also includes any public green street or other demonstration projects that were not subject to Provision C.3 requirements. For regulated projects in the early years of C.3 implementation, stormwater treatment may have been achieved through non-GI means, such as underground vault systems or media filters.
2. **Future New and Redevelopment:** All the regulated projects that will be subject to Provision C.3 requirements to treat runoff via LID and is based on spatial projections of future new and redevelopment tied to regional models for population and employment growth.
3. **Regional Projects (identified):** C/CAG worked with agencies to identify five projects within public parks or Caltrans property to provide regional capture and infiltration/treatment of stormwater, and included conceptual designs to support further planning and designs.
4. **Green Streets:** The SRP identified and prioritized opportunities throughout San Mateo County for retrofitting existing streets with GI in public rights-of-way. Green streets were ranked as high, medium, and low priority based on a multiple-benefit prioritization process developed for the SRP.
5. **Other GI Projects (to be determined):** Other types of GI projects on publicly owned parcels, representing a combination of either additional parcel-based GI or other Regional Projects. The SRP screened and prioritized public parcels for opportunities for onsite LID and Regional Projects. These opportunities need further investigation to determine the best potential projects.

The RAA considers the numerous GI project opportunities that exist within each municipal jurisdiction, and selects a suite or “recipe” of projects that can most cost-effectively address pollutant load reductions. The amount and combination of those GI projects can be determined through analysis of estimated load reductions and implementation costs. Figure 4-1 presents an example GI recipe showing the distribution of selected GI project categories versus incremental reductions in pollutant loading and increasing cost. To build upon preliminary C/CAG planning efforts above, and to properly inform and set meaningful goals for GI Plans, it was determined to be beneficial for the countywide RAA approach to include the capability of performing cost-benefit optimization of GI project opportunities. For multiple combinations of GI projects, SUSTAIN provides an estimate of pollutant load reduction and



**Figure 4-1. Example Implementation Recipe Showing General Sequencing of GI Projects.**

implementation costs, allowing for the comparison of various GI implementation scenarios and the selection of the most cost-effective implementation plan to address pollutant reduction goals.

## 5 GOALS FOR GI IMPLEMENTATION

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As discussed in Section 0, depending on the perspective of the regulators, stakeholders, or Permittees, the purpose and expectations of the RAA can vary in terms of how reasonable assurance is demonstrated. As a result, the output from the RAA must consider multiple perspectives and strike the right balance between detail and specificity while still leaving ample opportunity to allow for future adaptive management. The following are key considerations for the RAA output:

- **Demonstrate PCBs and Mercury Load Reductions** – The primary goal of the RAA is to quantitatively demonstrate that GI Plans and Control Measure Implementation Plans will result in load reductions of PCBs and mercury sufficient to attain their respective TMDL WLAs and stormwater improvement goals associated with GI. Based on the baseline hydrology and water quality model, the RAA determined that a 17.6% reduction in PCB loads is needed to meet the GI implementation goals established by the MRP. Zero reduction in mercury loads was determined to be needed based on GI, as baseline loads are predicted to be below the TMDL WLA for San Mateo County. As a result, a 17.6% reduction in PCB loads is established as the primary pollutant reduction goal for the GI Plan. However, there is some uncertainty in terms of how PCB source areas are represented in the model, which will require more monitoring and analysis in the future to gain an improved understanding of PCB source areas and the ability to target these areas with GI. Since PCBs are generally understood to be transported with cohesive sediment (e.g., silt and clay), sediment load can serve as a surrogate on which to base a load reduction target. The RAA considers a 17.6% reduction of sediment load as a more conservative surrogate until a better understanding is reached in terms of specific PCB source areas within the County. Once PCB source areas are confirmed, these areas can be targeted for GI implementation, likely resulting in greater effectiveness for GI to reduce PCB loads, and thus reducing the amount of GI needed to meet the load reduction target based on sediment load.
- **Develop Metrics to Support Implementation Tracking** – The MRP (Provision C.3.j) also requires tracking methods to provide reasonable assurance that TMDL WLAs are being met. Provision C.3.j states that the GI Plan “shall include means and methods to track the area within each Permittee’s jurisdiction that is treated by green infrastructure controls and the amount of directly connected impervious area.”
- **Support Adaptive Management** – Given the relatively small scale of most GI projects (e.g., LID on an individual parcel, a single street block converted to green street), numerous individual GI projects will be needed to address the pollutant reduction goals. All the GI projects will require site investigations to assess feasibility and costs. As a result, the RAA provides a preliminary investigation of the amount of GI needed spatially (e.g., by subwatershed and municipal jurisdiction) to achieve the countywide pollutant load reduction target. The RAA sets the GI Plan “goals” in terms of the amount of GI implementation over time to address pollutant load reductions. As GI Plans are implemented and more comprehensive municipal engineering analyses (e.g., masterplans, capital improvement plans) are performed, the adaptive management process will be key to ensuring that goals are met. In summary, the RAA informs GI implementation goals, but the pathway to meeting those goals is subject to adaptive management and can potentially change based on new information or engineering analyses performed over time.

The RAA output, or goals for GI implementation, attempt to identify the appropriate balance in terms of detail and specificity needed to address the above considerations. The RAA also considered

multiple alternative scenarios that can inform implementation and the adaptive management process. These scenarios tested the underlining assumptions for GI implementation, and demonstrate the need for further research, collaboration among multiple Permittees, and incorporation of lessons learned in order to gain efficiencies and maximize the cost-effectiveness of GI to reduce pollutant loads over time. Four modeling scenarios were configured for this analysis (as summarized in [Table](#)):

**Table 5-1. Model scenarios objectives and cost-benefit evaluation.**

Load Reduction Objective	Percent of Total GI Cost to Achieve Reduction Objective		
	Jurisdictional	Countywide	<i>Total Savings (Jurisdictional vs. Countywide)</i>
<b><u>Cohesive Sediment</u></b> 17.6% Reduction	<b>Scenario 1</b>	<b>Scenario 2</b>	→ <i>Savings</i>
<b><u>Total PCBs</u></b> 17.6% Reduction	<b>Scenario 3</b>	<b>Scenario 4</b>	→ <i>Savings</i>
<i>Total Savings (Sediment vs. PCBs)</i>	↓ <i>Savings</i>	↓ <i>Savings</i>	↘ <i>Overall Savings</i>

The following factors are considered for each model scenario:

- **Load Reduction Objective** - With a cohesive sediment load reduction objective, Scenarios 1 and 2 represent the most conservative approaches. Those scenarios assume that given the uncertainties about PCB source areas, targeting an overall 17.6% load reduction of cohesive sediment in general (silts and clays) achieves the PCB load reduction objective for GI. Scenarios 3 and 4 assume that PCB sources are spatially distributed based on analysis of land use types. The cost-benefit optimization process targets those areas as having the highest likelihood of PCB sources. Scenarios 3 and 4 highlight the potential cost savings (relative to Scenarios 1 and 2) that could be realized if PCB sources are identified and targeted for GI implementation.
- **Jurisdictional versus Countywide** - There are many possible ways to achieve a 17.6% load reduction for all of San Mateo County. The “Jurisdictional” approach stipulates that each jurisdiction must individually achieve at least a 17.6% load reduction. On the other hand, the “Countywide” approach achieves the 17.6% load reduction countywide by allowing the management burden of GI implementation to vary freely across jurisdictional boundaries. The countywide approach can provide significant cost savings over the jurisdictional approach, especially where pollutant sources are spatially concentrated. Figure 5-1 conceptually illustrates the jurisdictional versus countywide optimization approaches. Where there is cooperation among jurisdictions, results from these two scenarios can provide a useful analytical framework for cost-sharing and implementation of the most cost-effective management scenarios.

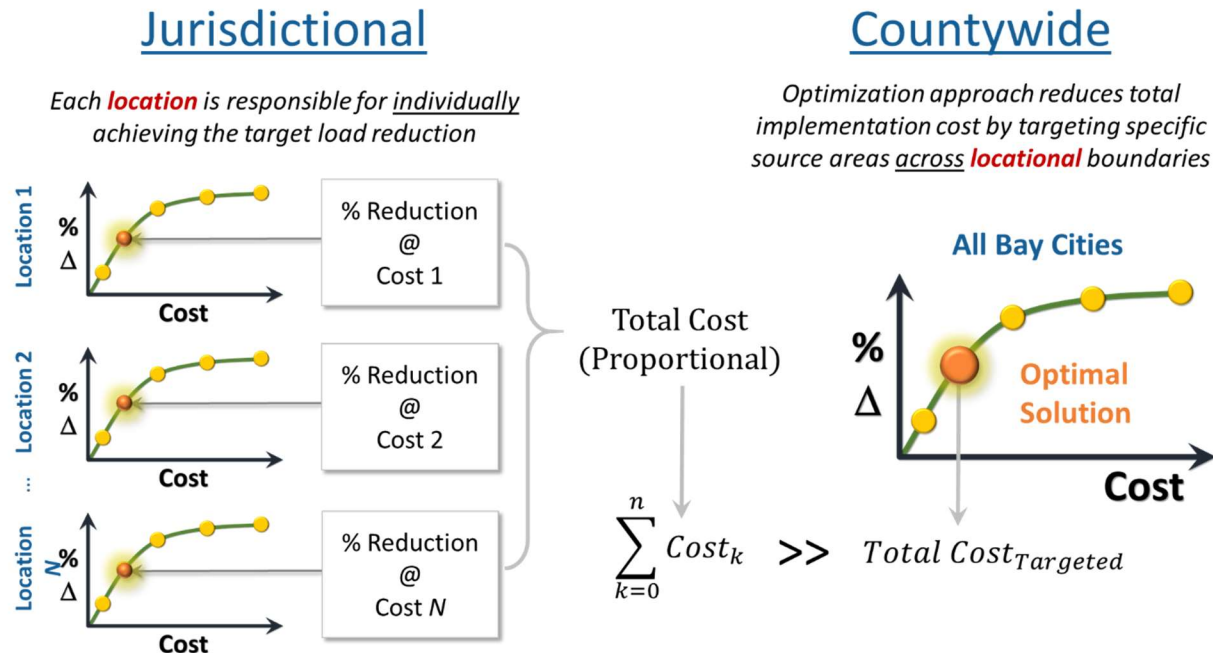


Figure 5-1. Jurisdictional vs. countywide approaches for cost-benefit optimization

Results of each of the four RAA scenarios are documented in the Phase II Modeling Report. These results can inform the adaptive management process for GI implementation, and help garner support for collaborative efforts for GI implementation or further research of PCB source areas that can seek more cost-effective implementation strategies over time. Figure 5-2, Table 5-2, and Figure 5-3 provide a summary of Scenario 1 RAA results for the City of San Bruno. The following steps outline how the process for formulating the scenario in the RAA model and utilizing results to set goals for GI implementation.

**First:** Based on GI project categories defined in Section 0, SUSTAIN was used to simulate effectiveness/load reductions and estimate planning-level costs for various combinations of GI projects within the City’s jurisdiction (along the x-axis of Figure 5-2, from low pollutant reduction/effectiveness to high reduction/effectiveness). “Existing Projects” were locked in the model and included those GI projects included in the FY 2016-17 MRP Annual Report to the Water Board. “Future New & Redevelopment” is an estimation of the LID that will likely be implemented in the future in redevelopment areas (based on Provision C.3). “Green Streets” were based on prioritized and ranked (High, Medium, and Low) street retrofit opportunities reported in the SRP. For San Bruno, the “Regional Project (Identified)” refers to the regional project located within the Caltrans right-of-way at the junction of Interstates 280 and 380, currently under consideration by the City. “Other GI Projects” refer to additional GI projects needed, but specific locations for project opportunities within certain subwatersheds yet to be determined.

**Second:** As depicted in Figure 5-2, a 17.6% reduction of PCBs was identified as the target reduction to be attained through the implementation of GI (for Scenario 1, cohesive sediment reduction is used as a surrogate to represent load reduction of PCBs).

**Third:** SUSTAIN is used to provide cost-optimization and selection of the most cost-effective combination of GI projects to attain the target reduction. In the Figure 5-2, this solution can be viewed

as the vertical slice that intersects the point on the x-axis at 17.8% reduction. The combination of GI structural capacities in that slice at the 17.6% load reduction represents the proposed GI implementation plan for San Bruno. Table 5-2 Table 5-2. provides details on that implementation plan for the 5 subwatersheds within the City’s jurisdiction (represented by each row in table). Optimization results recommend that varying amounts of GI capacity in different subwatersheds (different rows) are needed to achieve the most cost-effective solution, but the overall PCBs load reduction addresses 17.6% (bottom row of table). The relative amount of GI capacities (normalized by area) for each subwatershed are shown in the map in Figure 5-3.

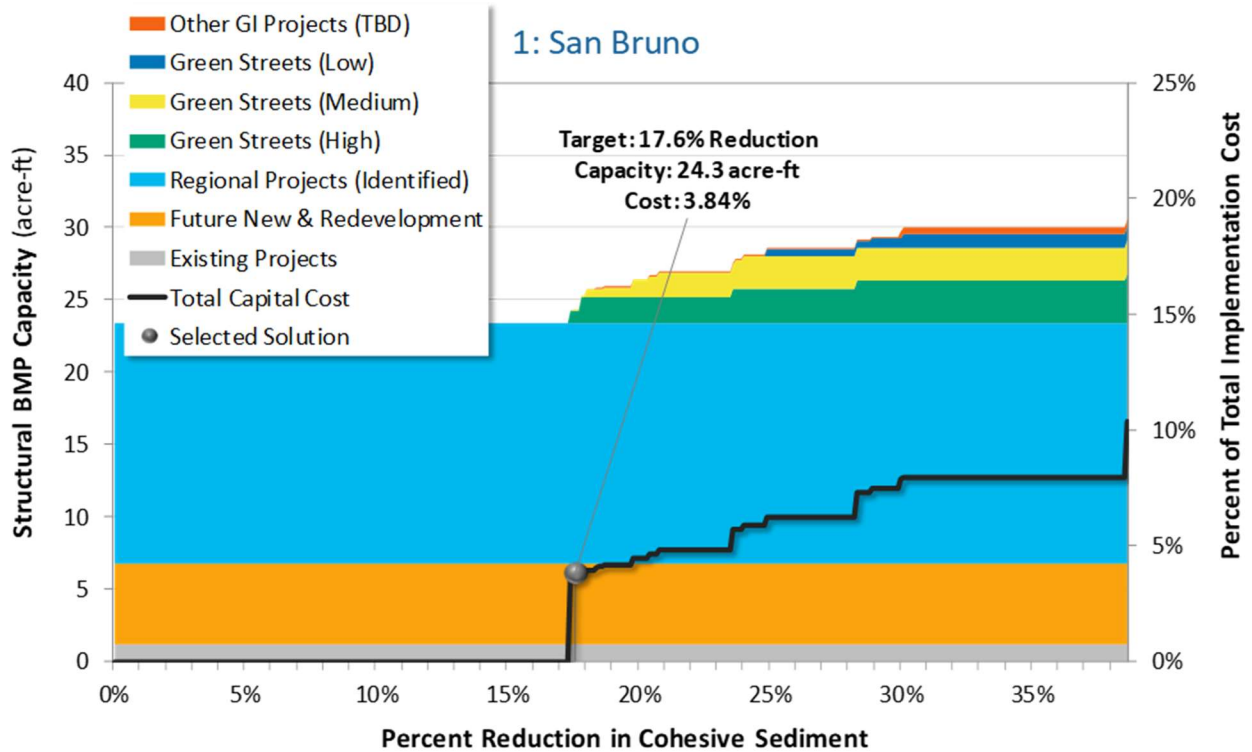
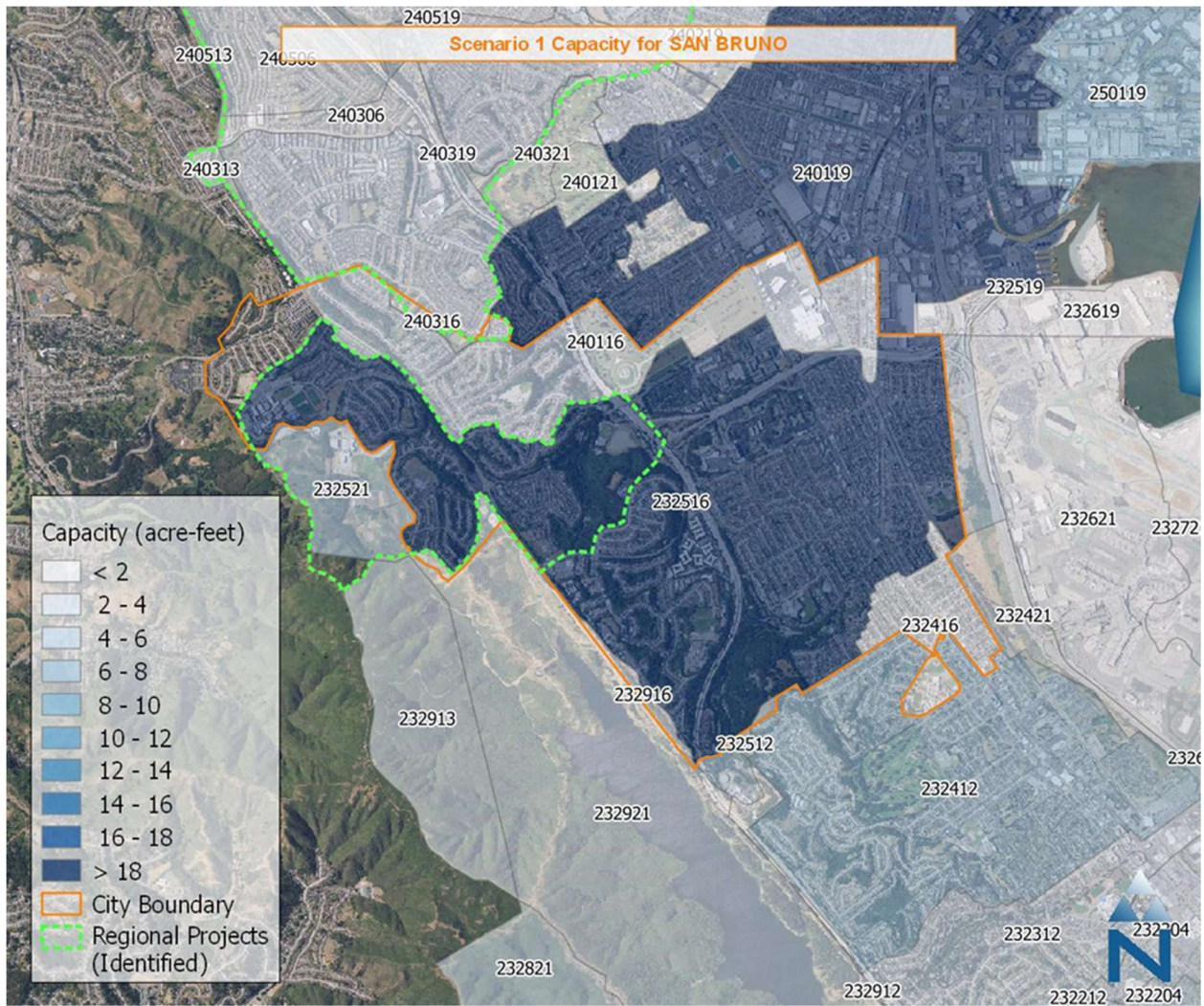


Figure 5-2. Scenario 1: Optimization summary for San Bruno (sediment target, with regional identified project).

**Table 5-2. Scenario 1: GI implementation strategy for San Bruno (sediment target, with identified regional project)**

Subwatershed ID	Management Metrics for GI			Green Infrastructure Capacity to Achieve 17.6% Reduction Target (Capacity expressed in units of acre-feet)							
	% Load Reduction PCBs (Annual)	Annual Volume Managed (acre-ft)	Impervious Area Treated (acres)	Existing/Planned			Green Streets			Other GI Projects (TBD)	Total BMP Capacity (acre-ft)
				Existing Projects	Future New & Redevelopment	Regional Projects (Identified)	High	Medium	Low		
232416	4%	5.10	6.56	--	0.62	--	--	--	--	--	<b>0.6</b>
232516	20%	191.40	118.47	0.84	4.08	16.65	0.55	--	--	--	<b>22.1</b>
232916	5%	1.67	1.60	--	0.00	--	--	0.07	--	--	<b>0.1</b>
240116	16%	1.53	40.32	--	0.82	0.01	1.22	--	--	--	<b>2.0</b>
240316	19%	2.68	1.72	0.40	0.00	0.01	--	0.02	--	--	<b>0.4</b>
<b>Total</b>	<b>17.8%</b>	<b>202.4</b>	<b>168.7</b>	<b>1.2</b>	<b>5.5</b>	<b>16.7</b>	<b>1.8</b>	<b>0.1</b>	--	--	<b>25.3</b>



**Figure 5-3. Scenario 1: Map of GI capacities within each subwatershed of San Bruno (sediment target, with regional identified project).**

Alternatively, the following second scenario demonstrates the capacity of the various GI project types needed if, upon further investigation, the identified regional project is determined to be infeasible. As shown in Figure 5-4, without a regional project, the City would need to rely on a much greater amount of Green Street and LID Retrofit implementation to meet the capture goals (approximately 7 ac-ft of Green Street and LID Retrofit capacity needed versus the 1.9 ac-ft needed under Scenario 1).

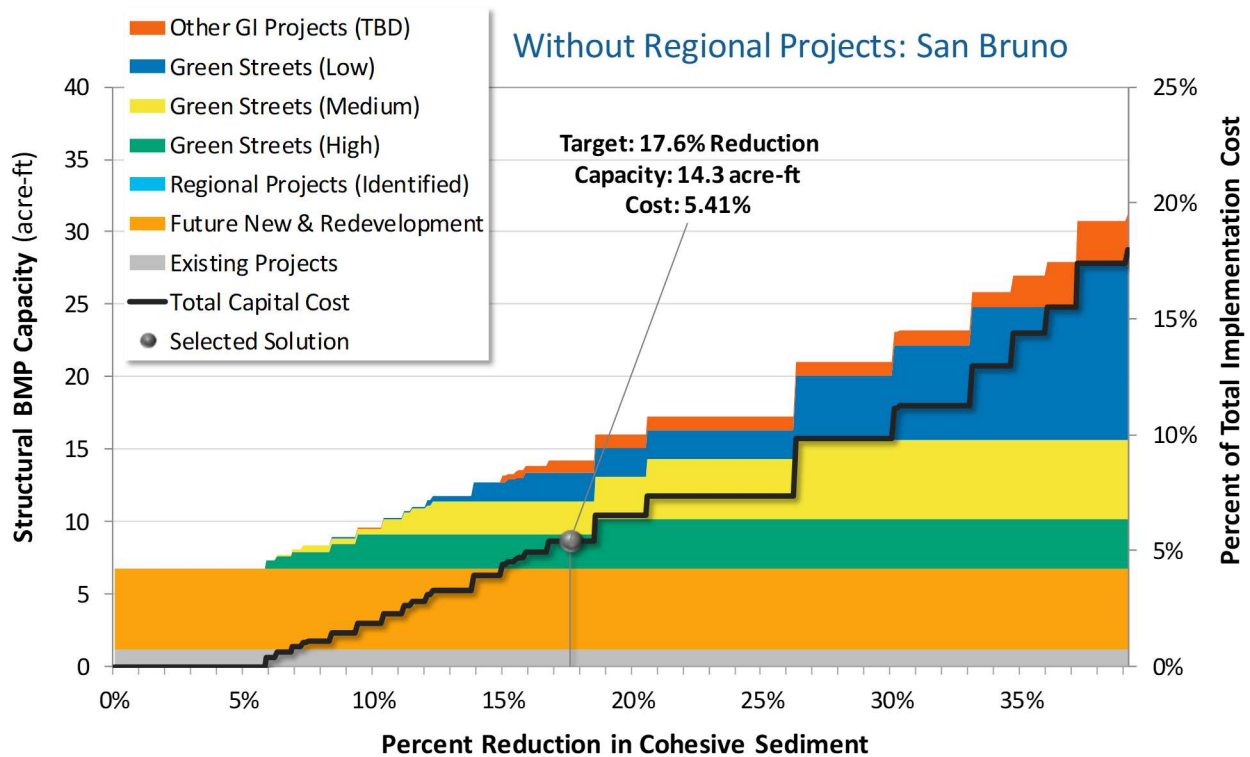


Figure 5-4. Optimization summary for San Bruno, sediment target (by jurisdiction) without regional projects.

As can be seen in the above results, the cost-optimization favored implementation of different combinations of GI projects within each subwatershed. These combinations were based on: (1) number and type of GI project opportunities identified within each subwatershed, and (2) cost-effectiveness given various characteristics associated with GI control measure efficiency (typically governed by infiltration rates), higher sediment (or PCBs) generation in upstream areas, etc. During implementation, it is almost certain that the actual implementation of GI will not follow the RAA output exactly. Dimensions and location of GI projects will vary based on on-the-ground feasibility and site-specific constraints. At the same time, all GI project capacity is not created equal in terms of effectiveness. For these reasons, it is not recommended that *GI capacity* serve as the focus for stormwater improvement goals for the GI Plan.

The RAA recommends management metrics for the GI Plan that are based on metrics that can be easily measured and tracked throughout implementation. At the left side of the table in Table 5-2 are columns under the header “Management Metrics for GI,” which include performance metrics for “% Load Reduction PCBs (Annual),” “Annual Volume Managed (acre-ft),” and “Impervious Area Treated (acres).” The “% Load Reduction PCBs (Annual)” and “Annual Volume Managed (acre-ft)” metrics are based on annualized results represented in the RAA modeling system that are directly comparable to TMDL WLAs. The “% Load Reduction PCBs (Annual)” provides a relative comparison of the load reduction to be achieved within each subwatershed. The “Annual Volume Managed (acre-ft)” shows the acre-feet of water captured and infiltrated and/or treated within each subwatershed, resulting in a total annual volume of 202.4 acre-feet of stormwater managed in San Bruno for an average year. This 202.4 acre-feet of stormwater managed could serve as the primary metric to be tracked for GI implementation. In other words, stormwater volume managed is being used as a unifying metric to evaluate GI effectiveness. “Impervious Area Treated (acres)” is an additional metric suggested by the MRP for implementation tracking. As a result of adaptive

management, the implementation plan may change over time and alternative GI projects can be substituted without having to re-run the RAA, as long as the “Management Metrics for GI,” representing the goals for the GI Plan, remain on track.

## 6 REFERENCES

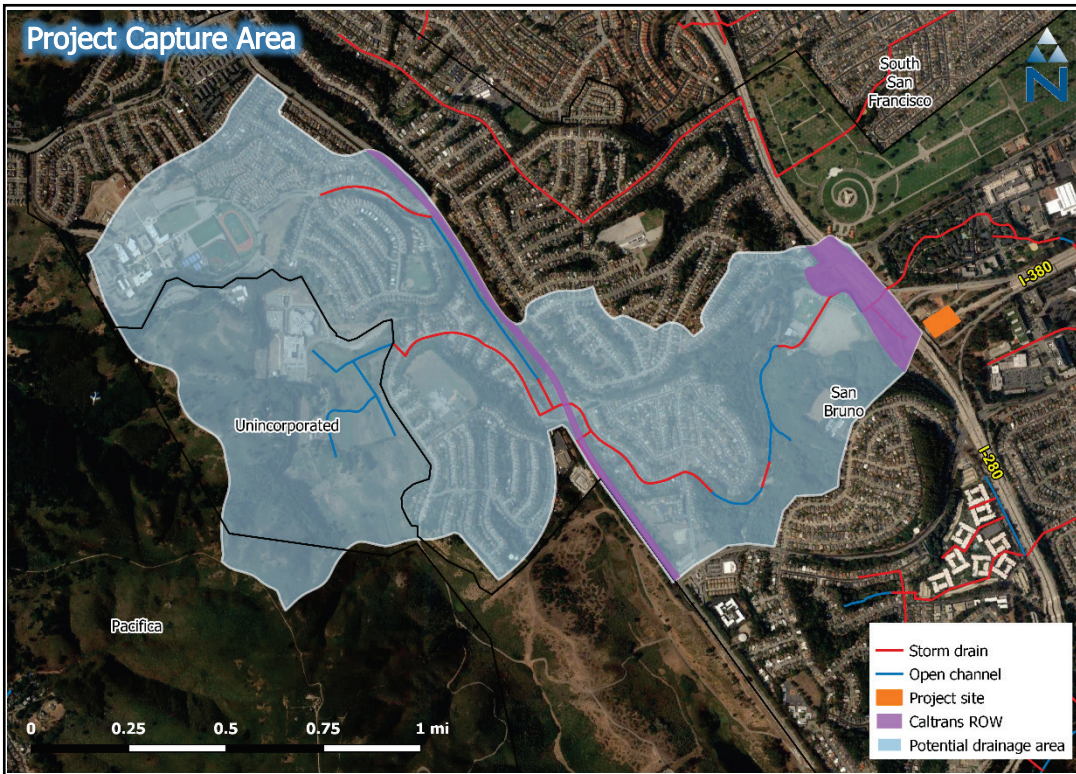
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C

**PROJECT  
CONCEPTS**

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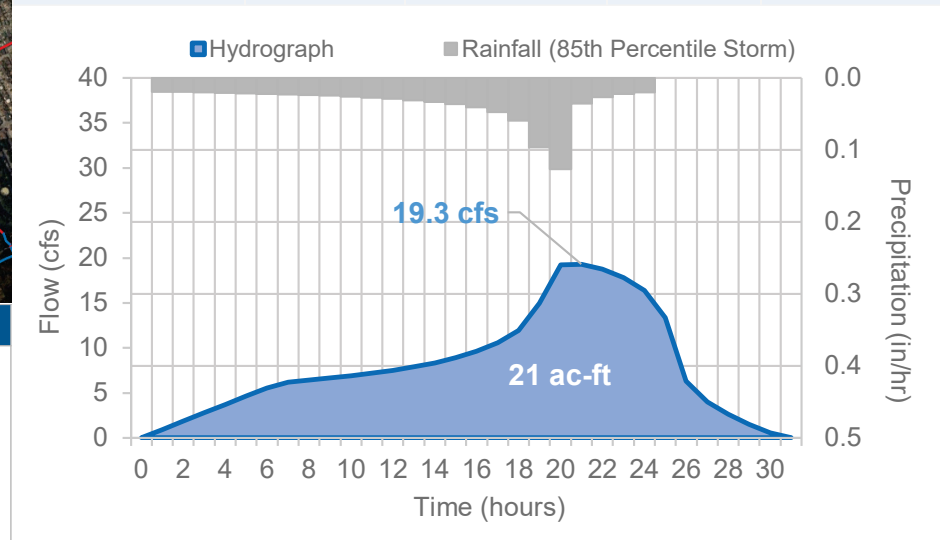


### Project Overview

This concept describes a regional stormwater capture project for San Bruno. The project is designed to be a subsurface infiltration gallery located at open space in the Caltrans right-of-way between the I-280/I-380 interchange (see map above). This project has the potential to supplement groundwater supplies, alleviate downstream flooding, and improve water quality in San Bruno Creek. The project will treat runoff from a total of 942 acres. Approximately 700 acres is in San Bruno (40 acres in Caltrans right-of-way), 220 acres is in unincorporated county, and 22 acres is in Pacifica. Residential impervious area in western San Bruno is the largest contributor of runoff. The project is sized to capture 21 ac-ft, 100% of the 85<sup>th</sup> percentile, 24-hour runoff volume that is typically used to meet water quality targets. This volume reduces the detention capacity needed in the Crestmoor Canyon to address flooding from the 25-year storm, according to the 2014 San Bruno Storm Drain Master Plan, by one-third. The project can reduce the PCBs load in the drainage area by 69%. This benefit may offset the amount of green streets that would otherwise need to be implemented to meet permit and TMDL requirements, reducing San Bruno's green street requirement by 84%. Project details and costs are outlined in the subsequent pages.

Site Information	
Project Lead	San Bruno
Location	Caltrans Right-of-Way @ I-280 and I-380
Land Owner	Caltrans
Receiving Water	San Bruno Creek

Jurisdiction	San Bruno	San Mateo County	Pacifica	Caltrans ROW
Capture Area (acres)	660	220	22	40
Percent of Capture Area	70.0%	23.4%	2.3%	4.3%



### Wet Weather Drainage Characteristics

Sizing Criteria	85 <sup>th</sup> percentile, 24-hour storm	
Total Capture Area	942 acres	
Imperviousness	27%	
Design Conditions for 85 <sup>th</sup> %-ile storm	Rainfall Depth:	0.85 inches
	Total Runoff Volume:	21.0 ac-ft
	Peak Flow Rate:	19.3 cfs

## Site Plan Description

The project consists of a subsurface concrete gallery that will be located beneath vacant space in the Caltrans right-of-way between the I-280 and I-380 interchange. The project would divert from a storm drain that serves portions of the Rollingwood, Crestmoor, Portola Highlands, and Pacific Heights neighborhoods of San Bruno. The storm drain eventually discharges to San Bruno Creek, which flows to the Bay. The drain runs underneath I-280 and crosses the frontage road along the northbound side of the freeway. The diversion structure will be constructed in the section of the drain that runs beneath the frontage road to minimize disruption to highway traffic while providing accessibility. A 650-foot length of diversion pipe will be required to route runoff to the facility. Captured runoff will be routed through a pretreatment system, such as a hydrodynamic separator, to remove solids and sediment, then routed to the facility. Due to the length of the required diversion line, a pump structure will likely be necessary to move captured runoff to the facility. However, a geotechnical analysis may show that a gravity-flow diversion alternative is feasible. A gravity diversion may increase excavation costs but will eliminate capital and O&M costs associated with operating a pump station. A pump system may also be beneficial for flood control downstream since diversions can be timed to manage the peak of storms. A passive system may potentially fill the facility before the peak occurs, effectively eliminating potential flood control benefits. Cost-benefit analysis should be performed to select a diversion alternative. The subsurface concrete gallery is designed to capture 21 ac-ft and will be 8.4-ft deep with a 2.5-acre footprint. Captured runoff will be removed from the storm drain system and treated through infiltration. Soil testing will need to confirm infiltration rates greater than 1.4 inches per hour in order to drain the facility within 72-hours, in compliance with local design standards. A shallower structure with greater footprint may be needed if a lower infiltration rate is found. All conceptual design details should be explored in greater detail during a feasibility analysis.

**Disclaimer:** Utilities were evaluated through GIS analysis using best available data. A utilities survey should be performed prior to construction to confirm the location of all utilities on site.



Budget-level Cost Estimates				
DESCRIPTION	UNIT COST	UNIT	QUANTITY	SUBTOTAL
Excavation/Removal	\$50	CY	40,000	\$2,000,000
Diversion Structure	-	LS	1	\$150,000
Pretreatment	\$6,000	CFS	20	\$120,000
Diversion Pump Structure	\$56,000	CFS	20	\$1,120,000
Diversion Pipe (24" RCP)	\$200	LF	650	\$130,000
Subsurface Gallery	\$300	CY	34,000	\$10,200,000
Restoration	\$5	SF	109,000	\$545,000
CONSTRUCTION SUBTOTAL				\$14,265,000
Mobilization (10% construction)				\$1,427,000
Contingency (15% construction)				\$2,140,000
Design (10% total)				\$1,783,000
<b>TOTAL COST</b>				<b>\$19,615,000</b>

### Subsurface Structure Design Values

Item Description	Value	Units
Footprint	2.5	acres
Design Height	8.4	ft
Depth of Excavation	10	ft
Pumping Requirements	20	cfs
Infiltration Rate	Needs further investigation	
Drawdown Time	Needs further investigation	
Infiltration Rate Needed for 72-hr Drawdown Time*	1.4	in/hr
<b>Capacity</b>	<b>21</b>	<b>ac-ft</b>
<b>Annual Capture Volume</b>	<b>226</b>	<b>ac-ft</b>
<b>% Design Storm Managed</b>	<b>100</b>	<b>%</b>

\*Maximum 72-hr drawdown time is recommended in the SMCWPPP C.3 Stormwater Technical Guidance. Using a larger footprint and a smaller design height, while keeping storage capacity constant, will lower the infiltration requirement for 72-hr drawdown.

Proposed Schedule	FY 21/22				FY 22/23				FY 23/24			
	2021		2022		2022		2023		2023		2024	
	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ
Design		X	X	X	X	X	X					
Environmental Documentation								X				
Bid & Award								X				
Construction									X	X	X	X

### Additional Considerations

**This project concept is planning-level and subject to review and revision during project design.** A variety of confounding factors, including geotechnical and environmental considerations, will need to be further investigated to inform project design. Factors to be considered include but are not limited to the following:

- **Drainage delineation:** the drainage was delineated using best available data in GIS analysis. Field examinations of the upstream storm drain network should be performed to confirm drainage area.
- **Utilities:** a utilities survey along the frontage road should be performed to minimize the disruption of utilities during construction.
- **Groundwater levels:** the distance between the bottom of the infiltrating structure and the seasonal high groundwater level should be at least 10 feet apart to allow for adequate infiltration. This should be confirmed during a feasibility study.
- **Pumping Requirements:** pumping is generally assumed for large-scale regional projects. However, gravity-flow diversion alternatives may be possible, reducing capital and O&M costs associated with pumping. Gravity diversions would require the structure to be placed below the storm drain invert, increasing the required excavation depth. As-builts for the storm drain will need to be examined to determine this depth. A break-even analysis should be performed to determine if a gravity-flow alternative is more cost-effective. All cost estimates are preliminary and will need to be reevaluated during a feasibility analysis when project details are developed further.
- **Infiltration rates:** the NRCS Soil Survey did not contain an infiltration rate estimate for the project area. Infiltration tests should be performed during a feasibility study to ensure the structure is sized appropriately. It is recommended that infiltrating structures drain within 72 hours. The infiltration rate may determine design components, such as structure depth and capacity.
- **Environmental factors:** with the exception of a voluntary cleanup at The Crossings over 0.5 miles away, the California Envirostor database shows no active cleanup sites near the project site. Additional investigation should be performed at the project site to assess the possibility of existing contamination interfering with stormwater infiltration.

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D

**OUTREACH &  
EDUCATION  
STRATEGY**

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## APPENDIX D

San Bruno's GI Outreach and Education Strategy includes four steps as defined below.

### ***Step 1 - Identifying Target Audiences for GI***

The City has identified the following categories as target audiences for their GI communication:

- » San Bruno residents
- » Property owners (homeowners and commercial property owners)
- » San Bruno school age children
- » City staff (Engineering, Planning Departments, etc.) and contractors
- » Elected officials (mayors, council members, etc.)
- » Stakeholder groups (City to expand definition and associated tasks, if desired).

### ***Step 2 - Identifying Communication Goals for the Target Audiences***

The City has the following goals for each target audience:

- » San Bruno residents and property owners
  - Increase general awareness of benefits from GI and Low Impact Development, including healthy neighborhood opportunities
  - Increase property owner support for local GI projects
  - Encourage property owners to use Low Impact Development (LID) techniques on their properties
- » San Bruno school age children
  - Increase awareness of basic stormwater drainage and water quality concepts and simple ways to collect and treat stormwater
- » Municipal staff and contractors
  - Increase general awareness of benefits from GI and Low Impact Development
  - Encourage/require identification and implementation of GI opportunities in upcoming capital improvement projects where feasible
  - Increase awareness of maintenance requirements for GI and Low Impact Development
- » Elected officials
  - Increase awareness of GI measures, benefits, and requirements
  - Build support for incorporating GI language into planning and policy documents.
  - Build support for the GI Plan
  - Build support for integrating GI features in capital improvement projects.

### ***Step 3 - Identify Key Messages and Outreach Mechanisms***

Outreach to department staff, managers, and elected officials is crucial to getting their support for the GI Plan and the transition from traditional to "green" stormwater management. For residents, property owners and stakeholders, outreach is important in order to achieve public acceptance of GI projects, particularly when these might cause a temporary inconvenience, and potentially also for support of funding efforts.

Broadly, outreach messages will inform the audience about the GI requirements, what local agencies are doing to implement the GI requirements, and the benefits from GI projects. Separate materials may be required for outreach related to specific GI projects within the City.

#### Step 4 - Identify Outreach Tasks

To the extent possible, the City will also utilize and leverage the outreach materials and efforts developed by SMCWPPP's 5-year Public Education and Outreach Strategic Plan. The SMCWPPP plan includes measurable activities that fall under one or more of the following general categories:

- » Social media
- » Online outreach, including website, blog and newsletters
- » Outreach campaign research and development
- » Outreach campaign implementation
- » Media relations (recognition from and coverage by local media outlets)
- » Community events and cleanups
- » Collateral material development
- » Partnership outreach and engagement
- » School education programs
- » Awards
- » Brand identification
- » Front counter interaction with public.

GI outreach and education materials produced to date by SMCWPPP include the following:

- » Green Infrastructure webpage (<https://www.flowstobay.org/content/about-sustainable-streets-and-green-infrastructure>), including a map of green infrastructure projects throughout San Mateo County
- » Flows to Bay high school contest including workshop opportunities
- » Stormwater Pollution Prevention Teacher Toolkit incorporating GI concepts
- » Workshop, web page, and social media posts related to rain barrels and the County rain barrel rebate program
- » A poster and fact sheet titled "Green Infrastructure for a Sustainable San Mateo County".

SMWCPPP is in the process of developing additional materials to support GI Plan outreach. The materials are being created for the purpose of educating elected officials and management in order to build support of GI Plan adoption and to position plans as an integrated solution to a number of problems. A model PowerPoint presentation for City Council and upper management audiences has been prepared and is available for member use. Additional materials are expected to be completed in 2019 and may include social media posts and other collateral as desired by SMCWPPP members.

Additional SMWCPPP resources that could be used for outreach include the San Mateo County Green Infrastructure Design Guide (May 2019), and two posters, titled "Introduction to sustainable streets and parking lots" and "Visual simulations of sustainable street opportunities" that were created to promote the 2009 version of the guidance, entitled "San Mateo County Sustainable Green Streets and Parking Lots Design Guidebook".



