CITY OF BURLINGAME
GREEN INFRASTRUCTURE PLAN

SEPTEMBER 2019

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Acronyms

BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practice
C/CAG	City/County Association of Governments of San Mateo County
CIP	Capital Improvement Projects
City	City of Burlingame
Design Guide	Green Infrastructure Design Guide
FY	Fiscal Year
GI	Green Infrastructure
GI TAC	Green Infrastructure Technical Advisory Committee
GIP	Green Infrastructure Plan
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
PCBs	Polychlorinated Biphenyls
PIP	Public Information and Participation
RAA	Reasonable Assurance Analysis
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
SSMP	Sustainable Streets Master Plan
SRP	Stormwater Resource Plan
TMDL	Total Maximum Daily Load
Water Board	State Water Resource Control Board

EXECUTIVE SUMMARY

Urban stormwater pollution is one of the biggest contributors to water pollution in the San Francisco Bay. The City of Burlingame (City) has been an early adopter of using rain gardens to harvest, filter, and treat stormwater runoff. This stormwater management system is one of many green infrastructure (GI) measures and utilizes vegetation, soils, and natural processes to absorb and store stormwater in order to create healthier urban environments.

GI is a resilient approach to managing stormwater runoff since it allows the water to soak into the ground, thereby reducing localized flooding, naturally removing pollutants, replenishing groundwater supplies, and increasing vegetation and tree canopy. Because of these multiple benefits, the City's Municipal Regional Stormwater Permit (MRP) requires its Permittees to develop a Green Infrastructure Plan to show how the City will transition from traditional "gray" infrastructure to green infrastructure. In addition to the community and social benefits of green infrastructure, one of the environmental benefits GI can provide is the reduction of harmful pollutants in stormwater runoff. In the San Francisco Bay Area, prioritized pollutants of concern are polychlorinated biphenyls (PCBs) and mercury. The MRP has specific requirements for Permittees to reduce the amount of these pollutants entering the Bay. These requirements can be satisfied by utilizing various strategies, such as the implementation of GI.

The GI Plan describes the targets for meeting environmental compliance deadlines in 2020, 2030, and 2040. These targets are based on a reasonable assurance analysis (RAA) which demonstrates quantitatively that pollutant load reductions will be achieved by 2040 through implementation of GI throughout the permit area. The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) led a countywide effort to develop an RAA to estimate the baseline load reductions. Once the goals were established to meet the PCBs and mercury load reduction requirements, the plan discusses two specific approaches for meeting the water quality goals: a citywide and a countywide approach. The citywide approach indicates that each agency is solely responsible for meeting the pollutant load reductions as required by the MRP. The countywide approach is a collaborative effort in which municipalities work together to install GI in areas that have a higher concentration of pollutants and therefore lead to significant cost savings overall. However, further discussion is warranted in order to ensure all agencies that benefit from this approach are also equitably sharing the costs of this approach.

The GI Plan discusses how GI projects will be prioritized, identified, and tracked to meet compliance deadlines. The majority of the prioritization effort was completed in 2017 through the San Mateo County Stormwater Resource Plan. That plan describes a number of prioritization criteria to help agencies determine which projects should be selected based on several benefits it provides. The City then identified multiple public projects that can incorporate GI. Completed and future potential projects are all tracked internally and communicated externally through a publicly-accessible map. The City has also worked across departments to ensure that the GI Plan is integrated in key city planning documents, such as the General Plan and Climate Action Plan, and ensured that there is legal authority to implement the plan.

The City continues to collaborate with other San Mateo County Permittees through the SMCWPPP Green Infrastructure Technical Advisory Committee (GI TAC). Deliverables from the GI TAC include the GI Design Guide, a countywide design guidance and standards for GI implementation in public and private projects. The GI TAC has also created a funding evaluation that lists several strategies for how cities can fund prioritized GI projects, such as grants, ballot measures, or partnerships with other entities.

Lastly, the GI Plan discusses the various platforms where outreach was conducted to educate the public about green infrastructure and how the City will incorporate GI in future projects. The GI Plan is a living document and contents of this plan may change and adjust as necessary to achieve our milestones.

For more information, please visit www.burlingame.org/GI

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1. INTRODUCTION

Stormwater runoff is rain that flows over driveways, parking lots, sidewalks, streets, rooftops, or any other surface that cannot absorb water. As water travels over these surfaces, it picks up dirt, trash, oil, pesticides, pet waste, and other pollutants and carries them all into a storm drain system. Storm drains in Burlingame are separate from the sanitary sewer system, which means anything that enters the storm drain will flow directly into our creeks and, ultimately, the San Francisco Bay untreated.

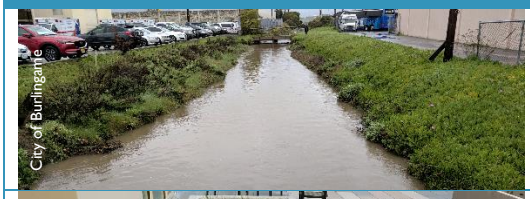
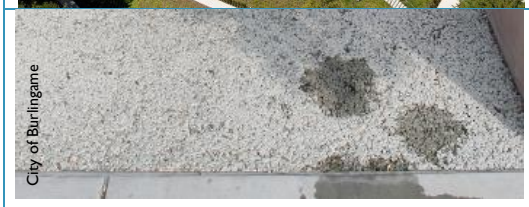
Roads, parking lots, and other impervious surfaces provide important opportunities for managing rainwater because they constitute a majority of the total impervious land area in urban landscapes. In most cases, streets and roads are a major part of delivering stormwater from our communities into local creeks and the San Francisco Bay. Rather than treating stormwater as a nuisance by directing it to receiving local waterbodies as quickly as possible through pipes and culverts, what if there was a way to harvest that resource? In addition, what if such an approach could not only soak up the rainwater but could also remove harmful pollutants and replenish the groundwater?

1.1. The Green Infrastructure Approach

Green Infrastructure (GI) is an approach that uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city or county, green infrastructure refers to the patchwork of natural areas that provide habitat, flood protection, cleaner air, and cleaner water. At the scale of a neighborhood or project site, green infrastructure refers to stormwater management systems and features that mimic nature by absorbing and storing water. This reduces the quantity of water and pollutants flowing into the storm drains and the San Francisco Bay.

GI projects are resilient, sustainable systems that slow, filter, harvest, infiltrate, and/or evapotranspirate precipitation runoff. See **Table 1** for examples of GI or refer to the Green Infrastructure Design Guide available at www.flowstobay.org/gidesignguide.

Table 1. Examples of Green Infrastructure

Image	Description
	**Creek Daylighting** – the process of uncovering and restoring creeks, streams, and rivers previously buried in underground pipes and culverts.
	**Flow-Through Planter Boxes** – contained landscape areas designed to capture and retain stormwater runoff and is connected to a stormwater system through an underdrain.
	**Green Roofs** – a vegetated roof system that captures rainfall and allows it to evaporate back into the air before runoff is created.
	**Pervious Pavement** – a pavement system (such as interlocking concrete pavers, porous asphalt, or pervious concrete) that is designed to allow rainwater to either pass through the system itself or through joint openings between the pavers into an underlying gravel bed designed to store and infiltrate rainfall.
	**Rain Gardens** – also referred to as bioretention or bioinfiltration areas, these landscape-based systems have sloped sides and use soil and plants (ranging in size from grasses to trees) to collect, filter, and treat stormwater runoff.
	**Rainwater Harvesting Systems** – cisterns and rain barrels which are used to harvest and store rainwater for later use. Storage facilities can be above or below ground. Water stored in this way can be used to supplement onsite irrigation needs or for toilet flushing.

Another term related to street design is "Complete Streets". This term comes from the transportation field and deals with the designing of streets that incorporate all modes of travel equally, particularly to increase safety and access for cyclists and pedestrians. 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 movement recognizes that environmentally and holistically designed streets achieve many benefits: increased multi-modal travel and safety; clean water and air; climate change resilience and mitigation; place making and community cohesion; habitat and energy savings; and higher property values.

1.2. Why Use Green Infrastructure?

Regulatory Water Quality Requirements

The City of Burlingame (City) is subject to the requirements of the recently reissued Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit for Phase I municipalities and agencies in the San Francisco Bay Area (Order R2-2015-0049), also known as the Municipal Regional Permit (MRP), which became effective on January 1, 2016. The MRP applies to 76 large, medium, and small municipalities (cities, towns, and counties) and flood control agencies that discharge stormwater through Municipal Separate Storm Sewer Systems (MS4) and into San Francisco Bay. These municipalities are collectively referred to as Permittees.

Over the last 13 years, under 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 site design, pollutant source control, stormwater treatment, and flow control measures as appropriate. Low Impact Development (LID) treatment measures, such as rainwater harvesting and use, infiltration, and biotreatment, have been required on most Regulated Projects since December 2011. Construction of new roads is covered by these requirements, but projects related to existing roads and adjoining sidewalks and bike lanes are not regulated unless they include creation of an additional travel lane.

A new section of the MRP requires Permittees to develop and implement long-term Green Infrastructure (GI) Plans for the inclusion of LID measures in storm drain infrastructure on public and private lands, including streets, roads, storm drains, parking lots, building roofs, and other elements. The GI Plan must be submitted along with the 2019 Annual Report to the State Water Resources Control Board (Water Board) by September 30, 2019.

Other sections of the MRP include requirements for municipalities to control pollutants of concern to water quality in stormwater discharges, including polychlorinated biphenyls (PCBs), mercury, trash, and pesticides. LID measures incorporated into green infrastructure can help remove these pollutants from stormwater runoff. For this reason, the MRP establishes a new linkage between public infrastructure retrofits and required reductions in discharges of certain pollutants, specifically PCBs and mercury. Over the next few decades, Permittees must reduce the loads of PCBs and mercury in stormwater discharges through various means, with a portion of these load reductions achieved through the installation of GI systems. Permittees in San Mateo County, collectively, must implement GI on public and private property to reduce mercury loading by 6 grams per year and PCB loading by 15 grams per year by 2020.

A key component of the GI definition in the MRP is the inclusion of both private and public property locations for GI systems. This has been done in order to plan, analyze, implement, and credit GI systems for pollutant load reductions on a watershed scale, as well as to recognize all GI accomplishments within a municipality's jurisdiction. However, the focus of the GI Plan is the integration of GI systems into public property, such as the public streets, parks, and facilities. The GI Plan is not intended to impose retrofit requirements on private property, outside the standard development application review process for projects already regulated by the MRP, but may provide incentives or opportunities for private property owners to add GI elements if desired. These private property owners may find it beneficial to add GI on their property to resolve flooding issues, conserve water, or improve outdoor landscaping aesthetics.

Benefits of Green Infrastructure

Multiple studies show that green infrastructure provides many benefits for water quality, air quality, habitat and wildlife, and community benefits. See **Table 2** for a summary of how green infrastructure projects provide these benefits for the community.

Table 2. Benefits of Green Infrastructure[1]

Water Quality Benefits	Air Quality Benefits	Habitat and Wildlife Benefits	Community Benefits
• Reduce the amount of pollutants that enter the San Francisco Bay. • Mitigate flood risk by slowing and reducing stormwater discharges. • Harvest rainwater to irrigate landscape.	• Reduce ground-level ozone or smog by absorbing and filtering air pollutants such as particulate matter.	• Increase habitat for birds, insects, and other pollinators. • Reduce erosion and sedimentation which can impair the ecology of local waterbodies.	• Create green jobs for construction and/or maintenance of GI projects. • Increase publicly available recreation areas. • Reduce noise pollution. • Increase vegetation and tree cover, resulting in an increase in property values.

[1] "Benefits of Green Infrastructure." *EPA*, Environmental Protection Agency, 5 Dec. 2018, https://www.epa.gov/green-infrastructure/benefits-green-infrastructure.

2. BACKGROUND

Incorporated in 1908, the City of Burlingame is located in San Mateo County which is on the San Francisco Peninsula. The City has a jurisdictional area of about 6 square miles, of which 76 percent consists of developable land and the remaining 24 percent is waters of the San Francisco Bay and the Mills Canyon Preserve (see **Figure 1**). The primarily land uses in Burlingame are commercial, industrial, residential, public facilities, and open space. According to 2016 data from the California Department of Finance, Burlingame has a population of 29,724 people, with a population density of 4,954 people per square mile. The San Francisco Bay Area is expected to experience continued population growth through 2040.

Figure 1. Map of the City of Burlingame

The City of Burlingame lies within the San Francisco Bay Hydrologic Region and primarily within the Westside groundwater basin. The City's watershed contains natural creeks, impacted creeks (e.g., straightened or concrete channels), culverts (concrete tunnels under roads or bridges), and storm drain pipes. Stormwater runoff enters the City's storm drains and flows into the San Francisco Bay, untreated.

Burlingame's Mission Vision and Values

The Public Works Department's mission is to provide quality services with commitment, courtesy, and pride. In partnership with the Burlingame community, the Department strives to offer cost-effective and environmentally responsible services in the areas of design, construction, operation, and maintenance of public works infrastructure critical to the health and safety of the community and to making Burlingame a beautiful and vibrant city in which to live and work.

2.1. Existing Conditions of Watersheds and Storm Drainage

The City is located within six sub-watersheds with seven major creeks: Millbrae Creek, Mills Creek, Easton Creek, Sanchez Creek, Terrace Creek, Ralston Creek, and Burlingame Creek (**Figure 2**). Creeks in Burlingame convey stormwater from the hills to the San Francisco Bay. These creeks have existed long before Burlingame's incorporation in 1908 and constitute a critical natural stormwater conveyance system that protects homes, businesses, and transportation networks from flooding during storm events. Creeks west of El Camino Real that run through the side or rear of private properties are owned and maintained by those property owners. The majority of creeks east of El Camino Real have been constructed to run underground in storm drain pipes and box culvert structures.

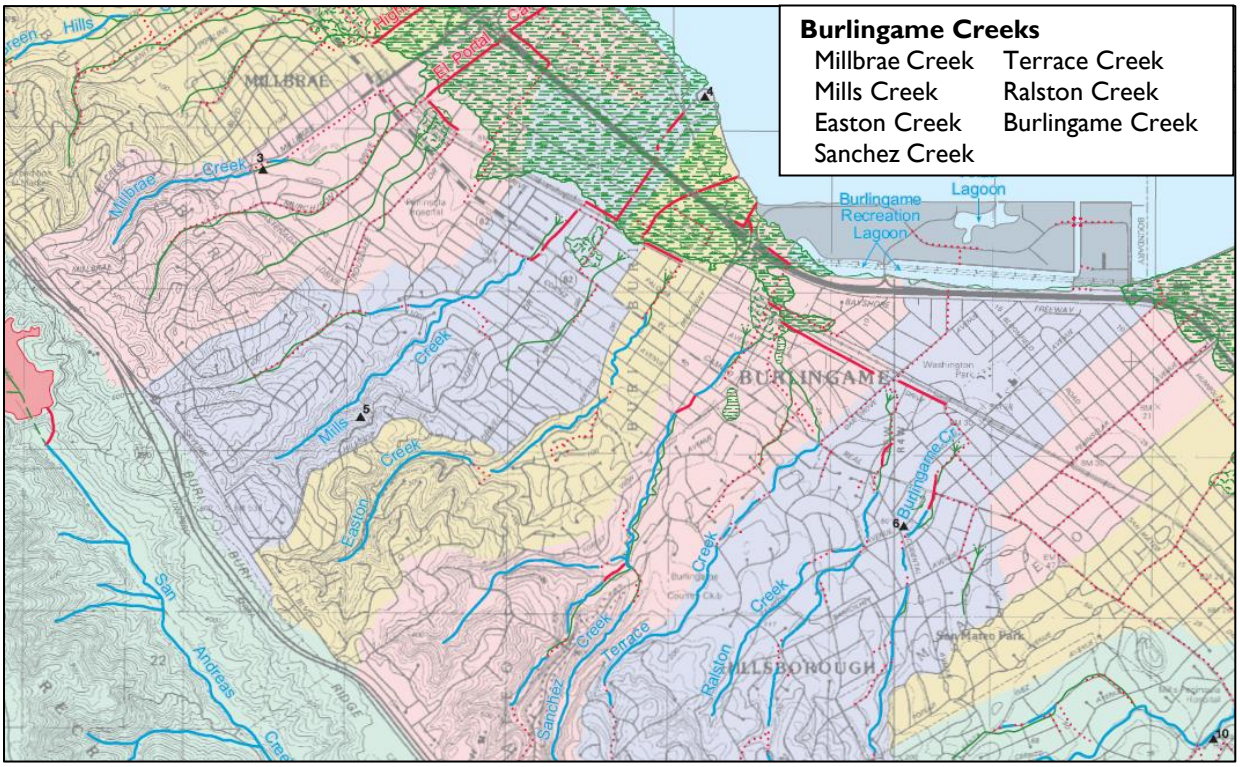


Figure 2. Creek & Watershed Map of San Mateo & Vicinity[2]

[2] Tillery, A. C., Sowers, J.M., and Pearce, S., 2006, Creek & Watershed Map of San Mateo & Vicinity: Oakland Museum of California, Oakland, CA.

The seven creeks provide over eleven miles of natural storm drainage to the City. Some of the creeks naturally daylight through residential and commercial neighborhoods and provide a habitat for wildlife, improve water quality to the bay, and enhance the aesthetic beauty of the community. In other locations, these creeks flow beneath the City in pipes or above ground in concrete lined open channels. In total, these man-made lines add an additional 45 miles to the City's storm drain system.

The MRP requires monitoring of several pollutants of concern, including polychlorinated biphenyls (PCBs), mercury, copper, emerging contaminants[3], and nutrients.[4] Monitoring reports for these pollutants are submitted annually to the Regional Water Board as part of MRP Provision C.8.h. requirements.

2.2. New Development and Redevelopment Trends

The City of Burlingame recently adopted an updated version of the General Plan in January 2019 which identified regional issues, population trends, and rezoning of specific neighborhoods. The San Francisco Bay Area has experienced economic and population growth which is expected to continue through at least 2040. This translates to more infill development and housing projects for the City. Two notable modifications in the General Plan are the "Live/Work" land use designation for North Rollins Road Mixed Use Zone and "North Burlingame Mixed Use" land use designation for North Burlingame Zone. Previously industrial zones, these areas have been rezoned to expand the number of uses for these neighborhoods. The City envisions creating a completely new neighborhood where future residents and businesses can easily access the nearby multimodal transit center. As a result of being in an historically industrial area, the parcel sizes are generally larger than those in residential or light commercial zones. The zoning change for these two neighborhoods is expected to create new development projects which would likely be C.3 Regulated Projects (projects that would create and/or replace at least 10,000 square feet of impervious surface). With more C.3 Regulated Projects comes additional green infrastructure.

2.3. Purpose of this Green Infrastructure Plan

The purpose of the GI Plan is to describe how the City will shift its impervious surfaces and storm drain infrastructure from "gray" to "green". That is, the GI Plan will describe how the City will shift from traditional storm drain infrastructure, where stormwater runoff flows directly from impervious surfaces into storm drains and receiving waters, to a more resilient, sustainable system that reduces and slows runoff by dispersing it to vegetated areas, promotes infiltration and evapotranspiration, collects runoff for non-potable uses, and treats stormwater runoff using bioretention and other GI practices. The Green Infrastructure Plan will also provide guidance to demonstrate the City of Burlingame's long-term commitment to implementing green infrastructure to help reduce pollutants of concern, particularly mercury and PCBs, from entering into the San Francisco Bay. This will include a process for identifying, implementing, tracking, and reporting green infrastructure projects in order to provide reasonable assurance that urban runoff total maximum daily loads (TMDL) allocations for mercury and PCBs (required in Provisions C.11 and C.12 of the MRP) will be met.

The GI Plan identifies means and methods to prioritize particular areas within the City for implementation of GI projects. This GI Plan is a *living document* and will be updated as new information arises, such as significant modifications to the Municipal Regional Stormwater Permit or changes to milestones as projects are completed over time. The GI Plan will be updated by staff with approval from the City Manager or designee.

[3] Includes perfluorooctane sulfonates (PFOS, in sediment), perfluoroalkyl sulfonates (PFAS, in sediment), and alternative flame retardants.
[4] Ammonium, nitrate, nitrite, total Kjeldahl nitrogen, orthophosphate, and total phosphorus.

3. GREEN INFRASTRUCTURE TARGETS

The Municipal Regional Stormwater Permit (MRP) requires the development of Green Infrastructure Plans and Polychlorinated Biphenyls (PCBs) and Mercury Control Measure Implementation Plans to ensure that necessary pollutant load reductions meet Total Maximum Daily Load (TMDL) wasteload allocations (WLAs) are met over specified compliance periods.

Specifically, Provisions C.11 and C.12 in the MRP require San Mateo County Permittees to reduce estimated mercury loading by 6 grams per year and estimated PCBs loading by 15 grams per year using green infrastructure by June 30, 2020. *Regionally*, Permittees must also prepare a Reasonable Assurance Analysis to demonstrate quantitatively that their share of the load reductions achieved through green infrastructure will amount to 10 kg per year of mercury and 3 kg per year of PCBs by 2040.

A key component of this GI Plan 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 countywide effort to develop an RAA to estimate the baseline PCB and mercury loads to the Bay, determine load reductions to meet WLAs among San Mateo County Permittees, and set goals for the amount of GI needed to meet the portion of PCB and mercury load reduction the MRP assigns to GI. Documentation of the countywide RAA can be found in the following reports:

- **Phase I Baseline Modeling Report** [5] – 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.
- **Phase II Green Infrastructure Modeling Report** [6] – 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.

[5] SMCWPPP (San Mateo Countywide Water Pollution Prevention Program). 2018. *San Mateo County-Wide Reasonable Assurance Analysis Addressing PCBs and Mercury: Phase I Baseline Modeling Report*. Prepared by Paradigm Environmental and Larry Walker Associates for San Mateo Countywide Water Pollution Prevention Program, Redwood City, CA.
[6] SMCWPPP (San Mateo Countywide Water Pollution Prevention Program). 2019. *San Mateo County-Wide Reasonable Assurance Analysis Addressing PCBs and Mercury: Phase II Green Infrastructure Modeling Report*. Prepared by Paradigm Environmental and Larry Walker Associates for San Mateo Countywide Water Pollution Prevention Program, Redwood City, CA.

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

3.1. Purpose of the Reasonable Assurance Analysis

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), 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), 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 3**.

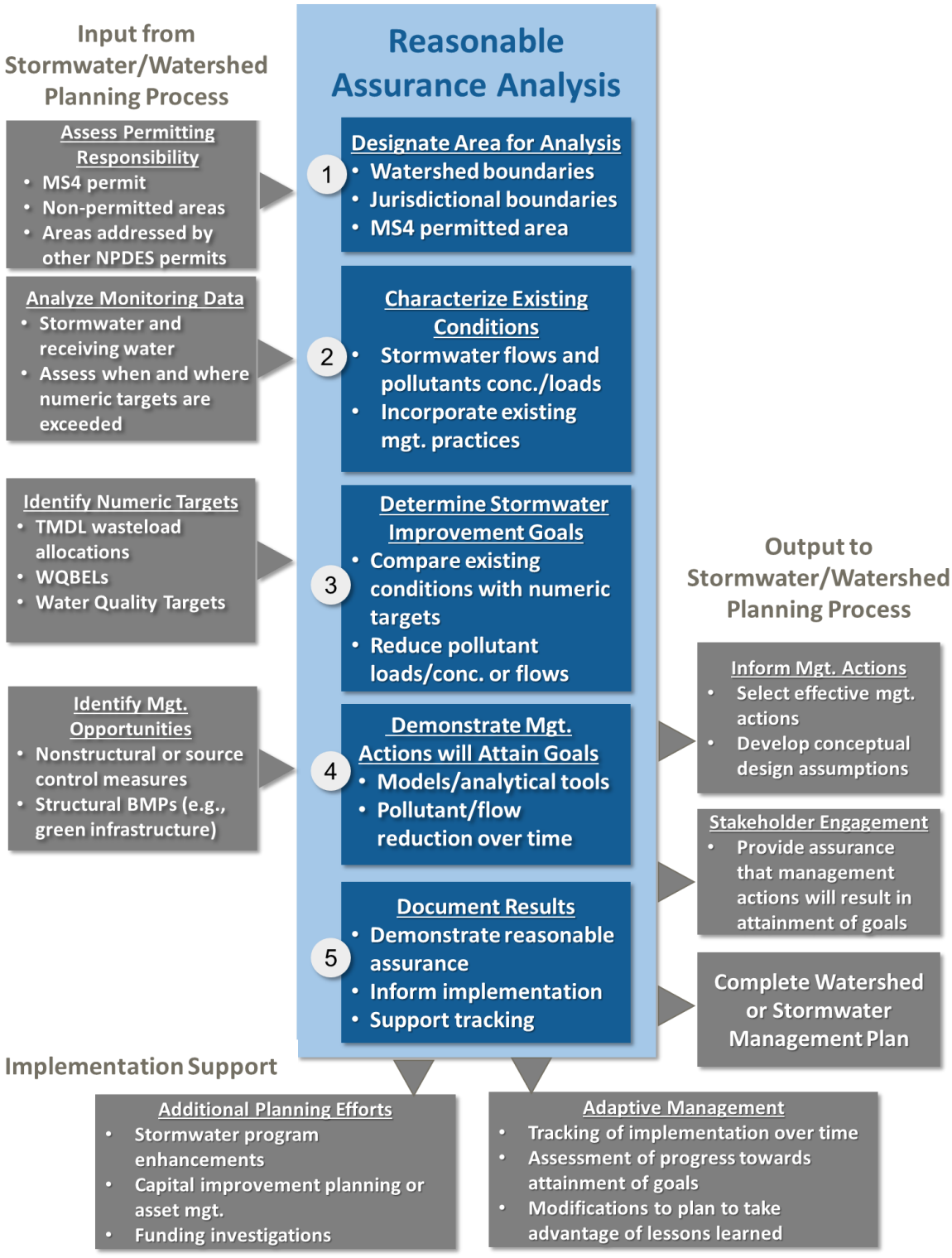


Figure 3. Reasonable Assurance Analysis Process Flow Chart

Depending on the audience, the purpose of the RAA can vary in terms of what constitutes reasonable assurance, and it is important to consider not just the targets for pollutant load reductions, but also the effectiveness of information management and engineering and economic feasibility. The EPA RAA Guide provides an example of three differing perspectives for defining reasonable assurance:

- **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.

Phase I Baseline Modeling Report and Phase II Green Infrastructure Modeling Report provide full documentation of the technical approaches and results of the SMCWPPP RAA, which is consistent with the recommendations of the EPA RAA Guide and Bay Area RAA Guidance.

3.2. Preliminary Identification of Opportunities for GI Projects

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:

- **Low Impact Development (LID) for New Development and Redevelopment** – The MRP Provision C.3 describes integration of LID within new development and redevelopment projects. As LID techniques are implemented in new development projects, the benefits of such practices in terms of reducing urban runoff flows can be considered as pollutant load reductions attributed to implementation of GI. C/CAG has 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 through Provision C.3 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 thousands of GI project opportunities throughout San Mateo County and within each municipal jurisdiction. Prioritized project opportunities include the following:
    - 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 or diversions from creeks draining large urban areas);
    - Retrofit of publicly-owned parcels with GI that provide onsite LID designs; and
    - 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 or

potential groundwater basin recharge). **Figure 4** provides an example of green street opportunities identified, scored, and prioritized by the SRP throughout San Mateo County.

The above efforts and resulting technical products provide preliminary identification of opportunities for GI projects. Those 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 per the TMDL.

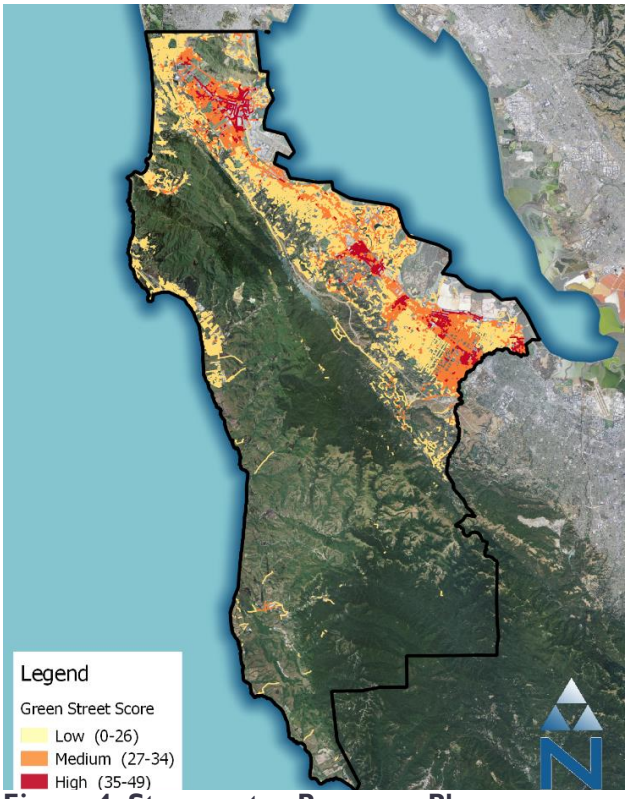


Figure 4. Stormwater Resource Plan Prioritized Green Street Opportunities

3.3. Description of the RAA Model

C/CAG performed a comprehensive, countywide modeling effort to provide the following:

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 MRP and TMDL WLAs requirements; and
3. Determination of the amount of GI needed to address load reduction goals based on project opportunities identified in Section 3.2. 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 5**).

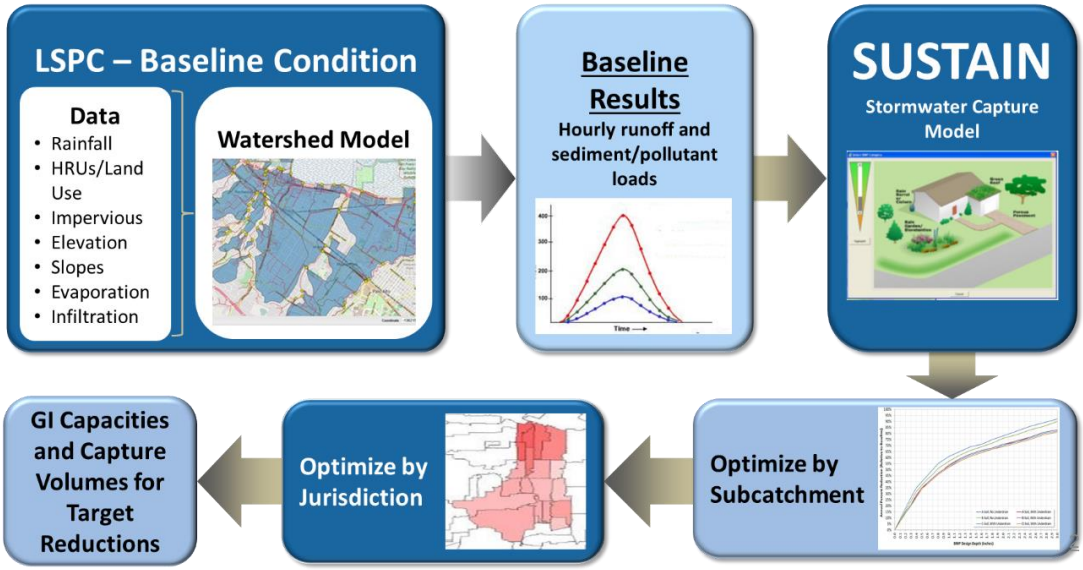


Figure 5. Modeling System Supporting the RAA

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)[7], a watershed modeling system that includes Hydrologic Simulation Program – FORTRAN (HSPF)[8] algorithms for simulating watershed hydrology, erosion, water quality, and instream fate and transport processes. The model can simulate upland loading of sediment, mercury, and PCBs and instream delivery and transport. LSPC is built upon a relational database platform, making it ideal for collating 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-

[7] Shen, J., A. Parker, and J. Riverson. 2004. A New Approach for a Windows-based Watershed Modeling System Based on a Database-supporting Architecture. *Environmental Modeling and Software*, July 2004.
[8] Bicknell, B. R., , J. C. Imhoff, A. S. Donigian, R. C. Johanson. 1997. *Hydrological Simulation Program – FORTRAN (HSPF), User's Manual For Release 11*. EPA – 600/R-97/080. U.S. Environmental Protection Agency, Athens, GA.

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. [9,10]

For this analysis, model cost functions were developed from literature, including an inventory of projects in the Los Angeles region. Because of uncertainty regarding the true costs to C/CAG member agencies, results were normalized for relative comparison—the relative costs between project types is well represented for the optimization of project types in the RAA. In other words, although it is not recommended to use the RAA costs to project countywide or city-wide implementation costs, they are sufficiently resolved for comparing alternative implementation scenarios and selecting the most cost-effective strategies and combination of GI, LID, and regional stormwater capture projects to meet pollutant reduction targets.

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. Phase I Baseline Modeling Report and Phase II Green Infrastructure Modeling Report provide more detailed discussion of the models and application to the San Mateo County watersheds.

3.4. 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 sub-watershed 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 represents the following generalized GI project categories in the model:

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 MRP 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 regulated projects that will be subject to Provision C.3 requirements to treat runoff via LID and 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 included conceptual designs to support further planning and designs. The model can be updated to include future identified projects to support adaptive management.

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[9] EPA (U.S. Environmental Protection Agency). 2009. *SUSTAIN—A Framework for Placement of Best Management Practices in Urban Watersheds to Protect Water Quality*. EPA/600/R-09/095. U.S. Environmental Protection Agency, Office of Research and Development, Edison, NJ.

[10] Riverson, J., K. Alvi, J. Zhen, R. Murphy. 2014. *SUSTAIN Application User's Guide for EPA Region 10*. U.S. Environmental Protection Agency Region 10, Office of Water and Watersheds, Seattle, WA.

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, or low priority (within each sub-watershed) 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 these GI projects can be determined through analysis of estimated load reductions and implementation costs. **Figure 6** presents an example GI recipe showing the distribution of selected GI project categories versus incremental reductions in pollutant loading and increasing cost. Cost-benefit optimization of GI project opportunities was included to build upon the preliminary C/CAG SRP planning efforts above, and to properly inform and set meaningful goals for GI Plans. For each optimized combination of GI projects, SUSTAIN provides an estimate of the resulting pollutant load reduction and implementation costs, allowing for the comparison of GI implementation scenarios and the selection of the most cost-effective implementation plan to address pollutant reduction goals, whether at the scale of an individual jurisdiction or across municipal boundaries.

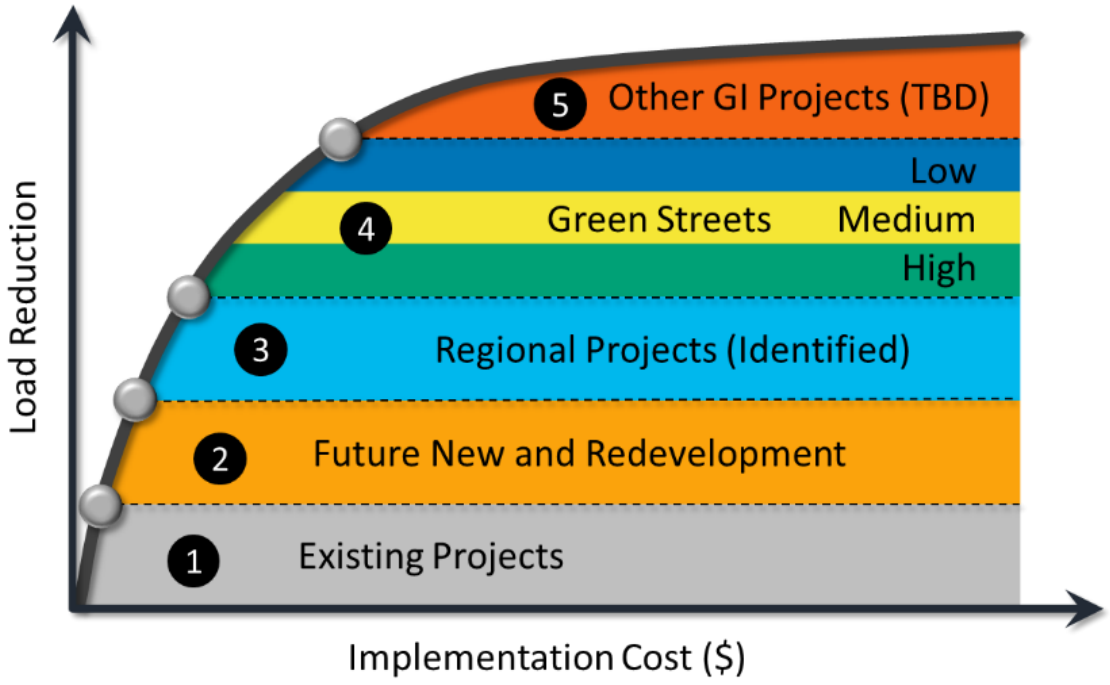


Figure 6. Implementation Recipe Showing General Sequencing of GI Projects

3.5. Determining Water Quality Goals

As discussed in Section 3.1, 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.

Demonstrate PCB 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 PCB and mercury sufficient to attain respective TMDL WLAs and the component stormwater improvement goals to be achieved with GI. Based on the baseline hydrology and water quality model (Phase I Baseline Modeling Report), 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 from MRP areas because baseline loads were 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), cohesive sediment load can serve as a surrogate on which to base a load reduction target. The RAA considers a 17.6% reduction of cohesive sediment load as a more conservative surrogate until a better understanding is reached in terms of specific PCB source areas within the County. If additional PCB source areas are confirmed, these areas could be targeted for source control measures or additional GI implementation, likely resulting in greater effectiveness for GI to reduce PCB loads in those areas, and thus redistributing or reducing the overall amount of GI needed to meet the load reduction target based on sediment loading estimates.

3.6. Meeting Water Quality 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), 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 sub-watershed 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., master plans, 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 these 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.

Citywide vs. Countywide Approach

There are two potential approaches that the municipalities within San Mateo County may consider. The first is a citywide approach (Scenario 1) in which each municipality in San Mateo County would be responsible for at least a 17.6% reduction in PCBs. The second is a countywide approach (Scenario 2) in which each municipality agrees to reduce overall PCBs within San Mateo County by focusing on cities that have more PCBs.

Goal: 17.6% Reduction in Cohesive Sediment	**Scenario 1: Citywide Approach**	**Scenario 2: Countywide Approach**
Description	Each city must individually achieve at least a 17.6% sediment load reduction within their jurisdiction.	The entire county must achieve at least a 17.6% sediment load reduction countywide.
Costs	Requires more GI in all cities, regardless if there are concentrated pollutant sources. Though this scenario is more costly for the jurisdiction, the jurisdiction's investment will allow the City to attain the many benefits of GI (increased habitat, mitigated flood risk, and neighborhood greening).	Can provide significant cost savings, especially where pollutant sources are spatially concentrated, or where opportunities are more numerous and efficient.

The countywide approach is expected to have greater cost savings than the citywide approach because it aims to install GI in areas with more pollutants (e.g., old industrial areas). A countywide approach is not only more cost effective but also provides a vehicle for collecting funding for regional projects, the costs of which can be shared by multiple jurisdictions since they will benefit from the cumulative load reductions. This also provides an opportunity for credit trading between agencies. Refer to the Green Infrastructure Funding Nexus Evaluation[11] for more information about the concept of credit trading. It is important to note that although a countywide approach would result in significant cost savings, there are notable challenges with pursuing this route. These challenges include the following:

- **Cost-sharing regional green infrastructure projects in a fair and equitable manner** – For cities that do not have a heavy concentration of pollutants, it may be difficult to quantify how much they should contribute to fund the regional project, especially if the project is not located within their jurisdiction.
- **Ongoing maintenance for the project** – Agencies that have a regional project within their jurisdiction are expected to maintain that project in perpetuity. This effort can be difficult to split among several municipalities in terms of costs of maintenance, including staff time.

As the GI program develops, further discussions about collaborations will occur. The RAA has allowed for the possibility of credit trading by providing multiple management metrics for green infrastructure, such as impervious area to be treated in acreage and green infrastructure capacity in acre-feet. **Figure 7** conceptually illustrates the citywide 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.

[11] SMCWPPP (San Mateo Countywide Water Pollution Prevention Program). 2019. *Green Infrastructure Funding Nexus Evaluation*. Prepared by SCI Consulting Group and Larry Walker Associates for San Mateo Countywide Water Pollution Prevention Program, Redwood City, CA.

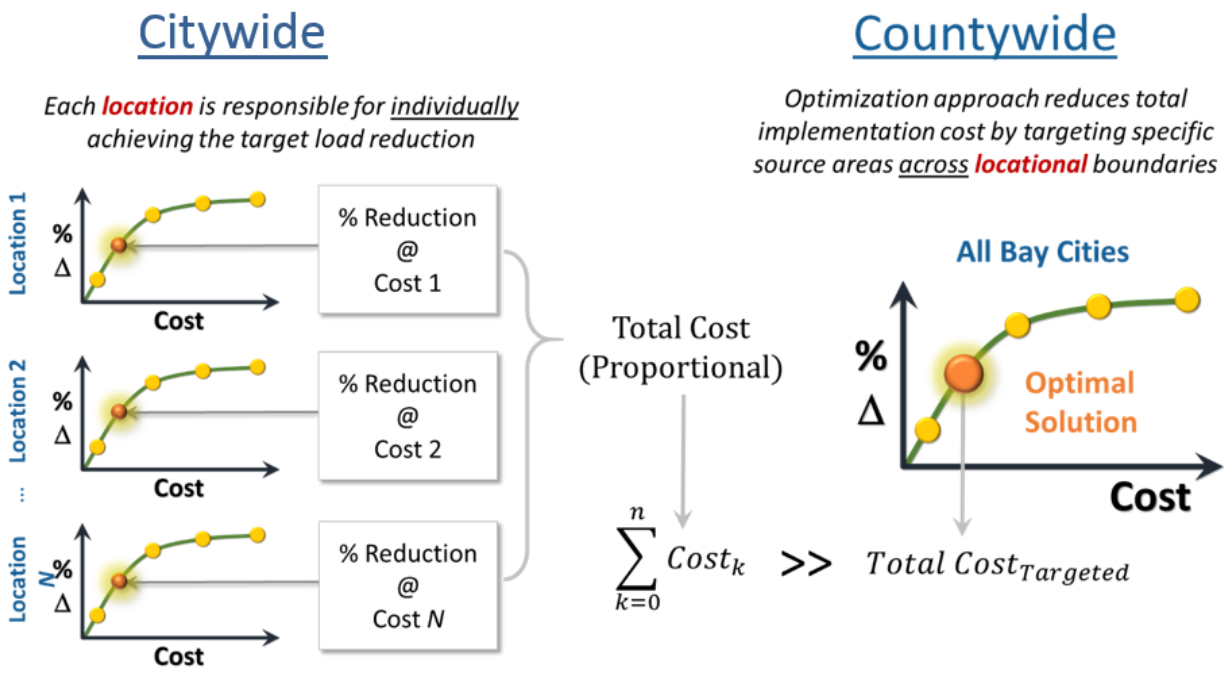


Figure 7. Citywide vs. Countywide Approaches for Cost-Benefit Optimization

Results of each of these RAA scenarios are documented in the Phase II Green Infrastructure Modeling Report. These results can inform the adaptive management process for GI implementation, as well as 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.

Citywide Approach

Scenario 1, citywide approach, represents the most conservative scenario for GI implementation. Because there are noteworthy challenges when pursuing a countywide approach (i.e., Scenario 2) as discussed above, this GI Plan will focus primarily on the citywide approach. **Figure 8**, **Figure 9**, and **Table 3** provide a summary of Scenario 1 RAA results for the City of Burlingame. **Table 4** is a summary of Scenario 2 RAA results included for comparison to Scenario 1.

Interpreting the Optimization Summary

Using the GI project categories defined in Section 3.4 (e.g., Existing Projects, Future New and Redevelopment, Regional Projects, Green Streets, and Other GI Projects), the model was used to simulate effectiveness or load reductions and estimate planning-level costs for various combinations of GI projects within Burlingame's jurisdiction (see the x-axis, from low pollutant reduction/effectiveness to high reduction/effectiveness).

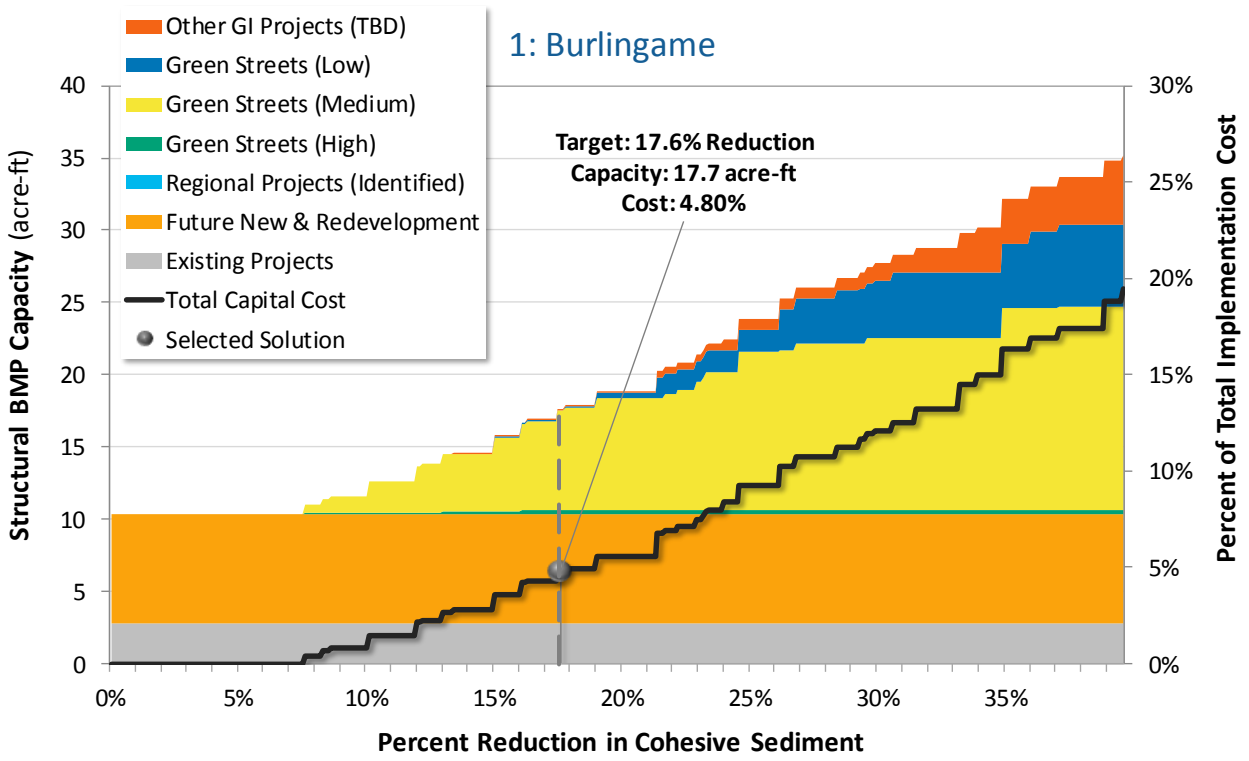


Figure 8. Scenario 1: Optimization Summary

- "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. There may be additional existing GI projects which were not listed in this Annual Report which are not reflected in the RAA model, but which municipalities may claim credit for later in the GI implementation process.
- "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.
- "Other GI Projects" refer to additional GI projects needed, but specific locations for project opportunities within certain sub-watersheds are yet to be determined.
- "Selected Solution" is the 17.6% reduction of modeled PCB loads that the RAA identified was needed to meet the GI implementation goals established by the MRP.
- Additionally, the model shows cost-optimization and selection of the most cost-effective combination of GI projects to attain the target reduction. In the figure above, this solution can be viewed as the cross-section (i.e., vertical slice) that intersects the point on the x-axis at 17.6% reduction (see grey dashed line). The combination of GI structural capacities at the 17.6% load reduction represents the proposed GI implementation plan for the City of Burlingame as produced by the model. Specifically, the following project categories: Existing Projects, Future New & Redevelopment, Green Streets (High), Green Streets (Medium), Green Streets (Low), and Other GI Projects (TBD).

Interpreting the GI Implementation Strategy by Sub-Watershed

The relative amount of GI capacities (normalized by area) for each sub-watershed is shown in the map in **Figure 9**.

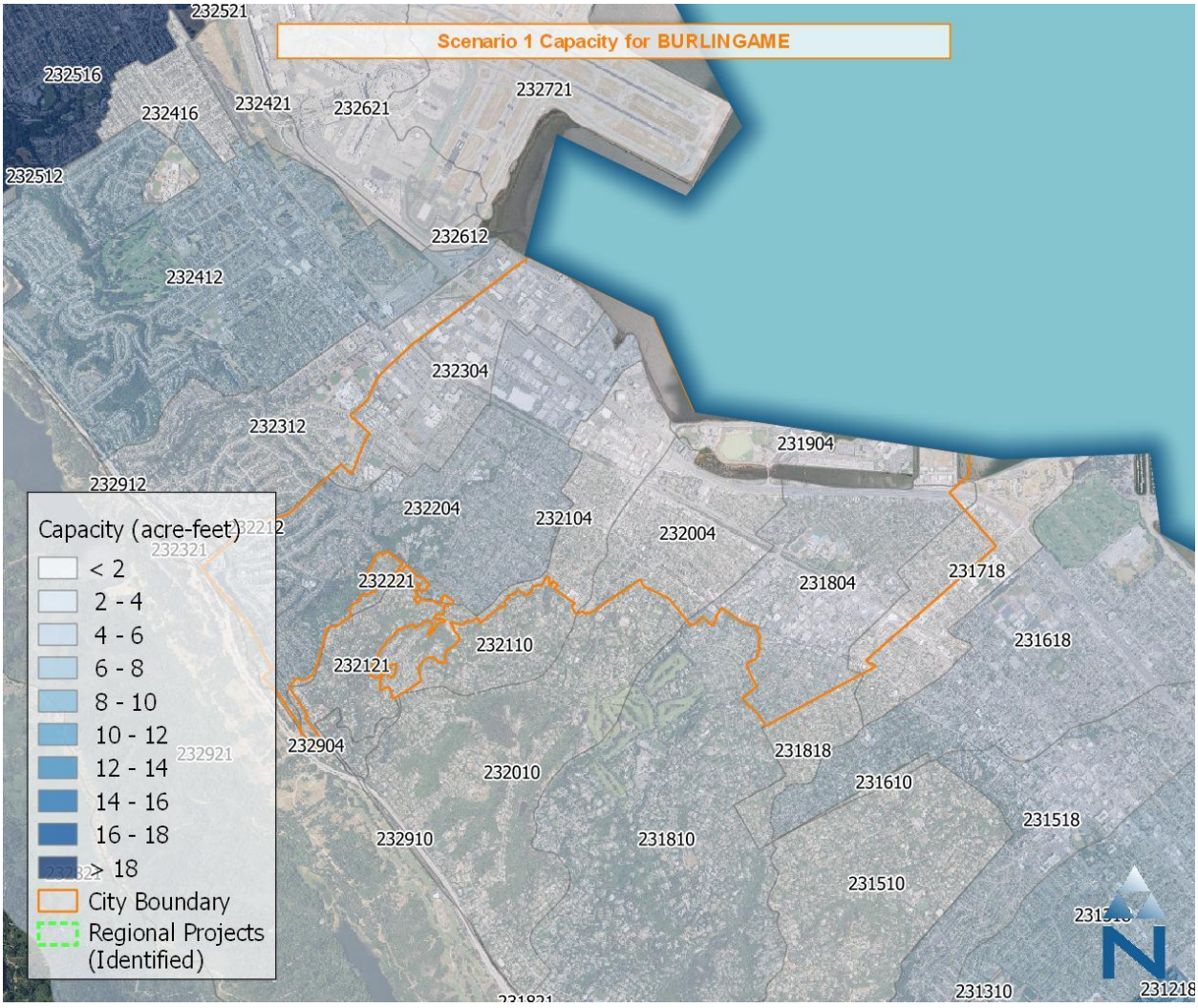


Figure 9. Scenario 1: Map of GI Capacities by Sub-Watershed

Table 3 and **Table 4** details the citywide implementation plan for the eight sub-watersheds within the City (represented by row). Optimization results recommend varying amounts of GI capacity in these sub-watersheds to achieve the most cost-effective solution. The overall PCBs load reduction for Scenario 1 is 17.7% (see bottom row). However, the overall PCBs load reduction for Scenario 2 is 6.7%. This is because the RAA favors the implementation of GI projects in cities outside of Burlingame (such as cities with older industrial areas that have more PCBs) because there is a greater opportunity for pollutant removal.

Table 3. Scenario 1: Citywide GI Implementation Strategy

Sub-watershed ID	Management Metrics for GI			Green Infrastructure Capacity to Achieve 17.6% Reduction Target (Capacity expressed in units of acre-feet)							
				Existing/Planned			Green Streets				
	% Load Reduction PCBs (Annual)	Annual Volume Managed (acre-ft.)	Impervious Area Treated (acres)	Existing Projects	Future New & Redevelopment	Regional Projects (Identified)	High	Medium	Low	Other GI Projects (TBD)	Total BMP Capacity (acre-ft.)
231704	18%	10.79	7.25	0.03	0.10	--	--	0.53	--	--	**0.7**
231804	13%	48.88	23.42	0.40	0.78	--	0.17	1.39	--	--	**2.7**
231904	37%	22.86	19.87	0.80	0.02	--	--	0.76	0.07	0.08	**1.7**
232004	15%	26.14	12.56	0.30	0.48	--	--	0.79	--	--	**1.6**
232104	12%	20.31	17.97	0.44	1.52	--	0.04	--	--	--	**2.0**
232204	23%	97.01	59.46	0.09	2.30	--	--	3.24	--	--	**5.6**
232304	16%	55.16	50.36	0.78	2.34	--	0.01	0.41	--	--	**3.6**
232904	38%	0.05	0.01	--	--	--	--	--	--	0.00	**0.0**
Total	**17.7%**	**281.2**	**190.9**	**2.8**	**7.5**	**--**	**0.2**	**7.1**	**0.1**	**0.1**	**17.9**

Table 4. Scenario 2: Countywide GI Implementation Strategy

Sub-watershed ID	Management Metrics for GI			Green Infrastructure Capacity to Achieve 17.6% Reduction Target (Capacity expressed in units of acre-feet)							
				Existing/Planned			Green Streets				
	% Load Reduction PCBs (Annual)	Annual Volume Managed (acre-ft.)	Impervious Area Treated (acres)	Existing Projects	Future New & Redevelopment	Regional Projects (Identified)	High	Medium	Low	Other GI Projects (TBD)	Total BMP Capacity (acre-ft.)
231704	2%	1.00	1.48	0.03	0.10	--	--	--	--	--	**0.1**
231804	3%	11.67	10.56	0.40	0.78	--	--	--	--	--	**1.2**
231904	10%	7.49	5.91	0.80	0.02	--	--	--	--	--	**0.8**
232004	4%	6.42	6.60	0.30	0.48	--	--	--	--	--	**0.8**
232104	11%	19.38	17.53	0.44	1.52	--	--	--	--	--	**2.0**
232204	5%	20.32	18.12	0.09	2.30	--	--	--	--	--	**2.4**
232304	14%	43.97	43.23	0.78	2.34	--	--	--	--	--	**3.1**
232904	0%	0.00	--	--	--	--	--	--	--	--	**0.0**
Total	**6.7%**	**110.3**	**103.4**	**2.8**	**7.5**	**--**	**--**	**--**	**--**	**--**	**10.4**

3.7. Green Infrastructure Interim Milestone Targets

Regulatory Targets for 2020, 2030, and 2040

The MRP requires reporting of goals for implementation of GI for interim milestones 2020 and 2030, in addition to the final milestone of 2040. In order to estimate the amount of GI to be implemented at these milestones, various assumptions were made in terms of the pace of implementation for various GI project types. Separate analyses determined the projected amount of LID associated with new development and redevelopment by 2020, 2030, and 2040. The resulting schedule presented in **Figure 10** demonstrates anticipated interim and final milestones for GI implementation in terms of structural capacity (corresponding to the capacities presented at the right side of **Table 3** and **Table 4**). These interim and final GI capacities are subject to adaptive management, however the 2040 Management Metrics for GI column (left side of **Table 3** and **Table 4**) sets the ultimate goal for GI planning efforts and tracking. See **Figure 10** for a summary of milestones for Burlingame.

Interpreting the Summary GI Capacity for Interim and Final Implementation Milestones

The first GI milestone is in 2020, which the City is projected to meet by leveraging existing and future new and redeveloped projects. The structural BMP capacity is approximately 5 acre-feet. The second GI milestone is in 2030, which would include the creation of green streets (high and medium priorities). The third GI milestone is in 2040. For Scenario 1 (i.e., citywide approach), this would include additional green streets (high, medium, and low priorities). For Scenario 2 (i.e., countywide approach), this would indicate that the City can use existing and future development projects to meet the countywide load reduction goal. See **Table 5** for a breakdown of the structural BMP capacity by project category.

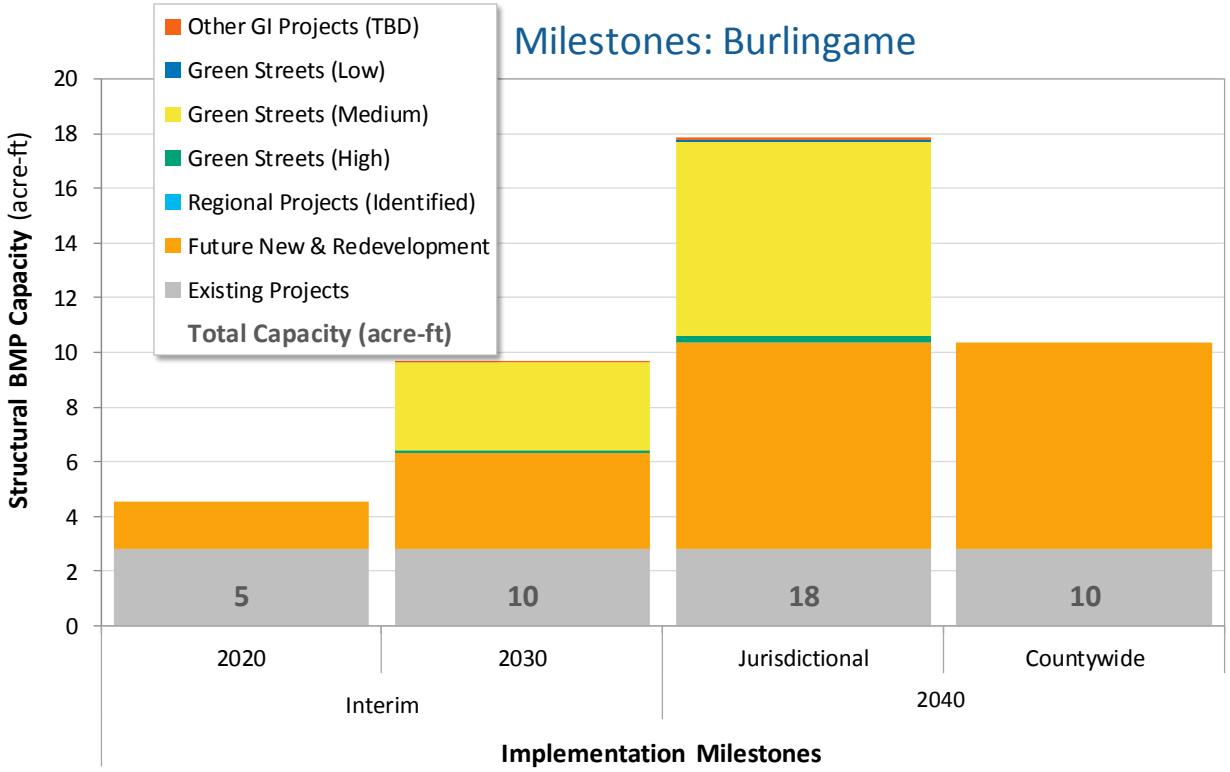


Figure 10. Summary GI Capacity for Interim and Final Implementation Milestones

Table 5. Implementation Milestones

Implementation Metrics		Implementation Milestones: Burlingame					
		Incremental		Cumulative		Final 2040	
		2020-2030	2030-2040	2020	2030	Jurisdictional	Countywide
Index	% Load Reduction	4.4%	9.9%	3.4%	7.8%	17.7%	6.7%
	Volume Managed (acre-ft./yr.)	67.7	151.8	61.7	129.4	281.2	110.3
	Treated Impervious (acres)	19.3	132.0	39.6	58.9	190.9	103.4
Capacities (acre-ft.)	Existing Projects	0.0	0.0	2.8	2.8	2.8	2.8
	Future New & Redevelopment	1.8	4.0	1.7	3.5	7.5	7.5
	Regional Projects (Identified)	--	--	--	--	--	--
	Green Streets (High)	--	0.2	--	0.1	0.2	--
	Green Streets (Medium)	--	3.9	--	3.2	7.1	--
	Green Streets (Low)	--	--	--	--	0.1	--
	Other GI Projects (TBD)	--	0.1	--	0.0	0.1	--
	Total	**1.8**	**8.2**	**4.5**	**9.6**	**17.9**	**10.4**

Preferred Scenario for Meeting Targets

Figure 10 and **Table 5** provide a comparison of the amount of GI capacity estimate to be needed in Burlingame to address 2040 goals for Scenario 1 (jurisdictional) and Scenario 2 (countywide). Results demonstrate that if the 17.6% sediment load reduction target is met countywide, the RAA favors Scenario 2, i.e., the implementation of GI Projects *outside* of Burlingame over the amount needed if Burlingame only addressed the 17.6% sediment reduction *within* the City jurisdiction. The countywide scenario would require significant additional discussion among San Mateo County Permittees in order to provide cost-share agreements that would result in more GI implementation outside of Burlingame, likely resulting in more GI implemented in other cities or unincorporated County areas. However, comparison of these scenarios further demonstrates the need for an adaptive management framework to further investigate the most cost-effective approach to countywide GI implementation.

4. PUBLIC PROJECT PRIORITIZATION, IDENTIFICATION, AND TRACKING

Essential to the GI Plan is the prioritization criteria for identifying opportunities to treat runoff from public right-of-way, specific outputs that identify projects to be incorporated into the City's long-term planning and capital improvement processes, and a tracking tool that maps the locations of these projects when completed. Public rights-of-way have been screened to identify locations for stormwater management. These public rights-of-way projects are referred to as green streets, which consist of stormwater capture infrastructure that is intended to capture only runoff generated from the street and adjacent land uses that drain to the street. There are several types of improvements that can be utilized in a green street, including permeable pavement, bioretention (rain gardens), and planter boxes.

The prioritization criteria below focused on these publicly-owned areas since they are within the City's jurisdiction. Although the City recognizes that a significant opportunity for stormwater capture may include projects located within privately-owned parcels, it is challenging to ensure that projects on these private parcels would be built without approval or funding from property owners. However, the City acknowledges that future efforts may result in partnerships with private property owners, which will further support the City's goals for pollutant load reduction.

4.1. Public Project Identification

The City uses a combination of countywide and citywide prioritization processes to develop a list of future GI projects.

San Mateo Countywide Stormwater Resource Plan

In February 2017, the San Mateo Countywide Water Pollution Prevention Program prepared a Stormwater Resource Plan (SRP)[12] on behalf of its member agencies. The SRP is a comprehensive document that represents a significant transformation in watershed resource planning and stormwater runoff management. The SRP was prepared through a collaborative effort with stakeholders as well as 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 stormwater and dry weather capture projects in San Mateo

[12] The San Mateo County Stormwater Resource Plan is available at http://ccag.ca.gov/srp.

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.

Prioritization Criteria

The SRP developed a screening and prioritization method for green streets. Street type, ownership, and slope were used to screen rights-of-way suitable for green streets. Street use 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. Selection of streets was focused on local neighborhood roads, city streets, parking lots, and alleys as these functional classes typically exhibit characteristics of lower traffic volume and lower speed limits as opposed to major arterials, collector roads, and highways. The complete prioritization criteria description is presented below.

1. **Street type** – used to prioritize sites that are most suitable for green street retrofit. Heavily-used streets can require increased maintenance and reduce system performance. Highest priority was given to local neighborhood roads, city streets, parking lot roads, and alleys. Lower priority was given to major arterials, collector roads, and highways.
2. **Impervious area** – averaged over the representative drainage area – was included in the prioritization due to the connection between highly impervious areas and large runoff potential. Because the primary goal is to reduce runoff via stormwater capture, green streets were prioritized to maximize implementation in areas that produce high runoff. Higher priority was given to streets with representative drainage areas with high imperviousness.
3. **Hydrologic Soil Group** – categorized based on drainage properties, with Group A representing the most well-drained soils and Group D representing the least well-drained soils. Because infiltration is one of the benefits of green streets, highest priority was given to Soil Group A, with each subsequent group assigned fewer points. Projects that fall within the "Unknown" category were assumed to be Group C, the dominant soil group in the county, and was given higher priority than Group D.
4. **Slope** – averaged over the length of street segment. Sites with mild slopes are ideal for green streets because it allows for street design that captures more volume and reduces maintenance requirements.
5. **Flood-prone channel –** green street projects were given higher priority according to proximity to flood-prone streams, with the assumption that more upstream area could be potentially be captured. Project opportunities located within sub-watersheds of flood-prone streams will help mitigate flood risks and reduce hydromodification impacts by limiting the volume of runoff that reaches the impacted streams.
6. **PCB risk areas –** PCBs are one of the primary pollutants of concern within the Bay Area. Therefore, siting of stormwater capture projects in PCB interest areas can potentially address water quality issues.
7. **Co-located planned projects** – higher priority scores were given to project opportunities that may be implemented in parallel with new development and redevelopment projects or other municipal capital improvement projects currently in the planning phase. Co-locating stormwater capture and treatment projects with other priority projects increases opportunities for cost-sharing and maximizes multiple benefits achieved by a single project.
8. **"Safe Routes to School" program** – C/CAG, in coordination with the San Mateo County Office of Education, supported walk audits at schools throughout San Mateo County to identify recommended improvements for the Safe Routes to School program. These walk audits provide recommendations on projects that would increase safety for children walking or biking to school, and include infrastructure improvements such as new crosswalks, pedestrian bulb-outs, sidewalks, and ADA-compliant curb ramps.
9. **Drains to TMDL water** – the San Francisco Bay is subject to several TMDLs that require reductions in pollutant loads over the next several decades since stormwater is identified as the

primary contributor of pollutants (e.g., PCBs and mercury) to the Bay. Volume reduction from stormwater capture projects will also result in reduction of these pollutants.

10. **Groundwater basin** – an auxiliary benefit of stormwater capture projects is infiltration and potential groundwater. All stormwater projects can include infiltration as a major element and help to restore natural watershed processes. Because details for most projects have not yet been developed and regional data on groundwater depth is limited, this could not be considered in the prioritization framework. Instead, groundwater depth must be considered on a site-specific basis during a feasibility assessment of planned projects.
11. **Water quality source control** – includes design practices that treat or prevent stormwater runoff or pollutants on-site before it is able to enter a storm drain system or waterbody. These design practices can include considerations for landscape planning, roof runoff controls, efficient irrigation, and signs that alert the public about the effects of and prohibition against waste disposal in storm drain systems.
12. **Natural hydrology restoration** – the primary goal of GI is to either reestablish natural drainage and infiltration systems or to mimic natural system functions to the maximum extent feasible. The reduction of overland flow will improve water quality in downstream waterbodies, as pollutants that are conveyed by runoff will be removed and treated when captured by a project.
13. **Habitat and open space enhancement** – vegetated treatment types often provide the auxiliary benefit of habitat enhancement. Vegetation supports local insect, aquatic, and bird populations while enhancing open space and providing opportunities for recreation.
14. **Community enhancement** – projects that would introduce urban green space and connectivity. Green street projects would create the most opportunity for additional urban green space as these projects will replace impervious areas with vegetation.

Prioritization Method

A project's priority score was determined by summing all of the points assigned from the evaluated physical characteristics, proximity to areas of interest, potential for co-locating projects, as well as various other benefits. A factor is assigned to each individual category to modify the weight given during the prioritization step. The scoring criteria and associated weighting factors were established based on discussions with C/CAG member agencies regarding their importance to the community (e.g., reduce flood risk), regulatory drivers (e.g., TMDLs for PCBs), and ability to leverage other funding opportunities to increase likelihood of implementation (e.g., co-location with currently planned projects). See **Table 6** for the prioritization criteria scoring and **Appendix A** for the Green Infrastructure Prioritization Maps.

Table 6. Right-of-Way Prioritization Criteria for Green Streets[13]

	Points						Weight Factor
	0	1	2	3	4	5	
Street Type	Highway	-	Arterial	Collector	Alley	Local	-
Imperviousness (%)	X < 40	40 ≤ X < 50	50 ≤ X < 60	60 ≤ X < 70	70 ≤ X < 80	80 ≤ X ≤ 100	-
Hydrologic Soil Group	-	D	Unknown	C	B	A	-
Slope (%)	X > 5	4 < X ≤ 5	3 < X ≤ 4	2 < X ≤ 3	1 < X ≤ 2	0 ≤ X ≤ 1	-
Proximity to Flood-prone Channels (miles)	Not in sub-basin	3 < X	-	1 < X ≤ 3	-	X ≤ 1	2
Contains PCB Risk Areas	None	-	-	Moderate	-	High	2
Co-located with currently planned City project	No	-	-	-	-	Yes	2
"Safe Routes to School" program	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	-	-	-	-	-

See **Figure 11** for the results of the SRP screening and prioritization process.

[13] Source: San Mateo County Stormwater Resource Plan (2017)

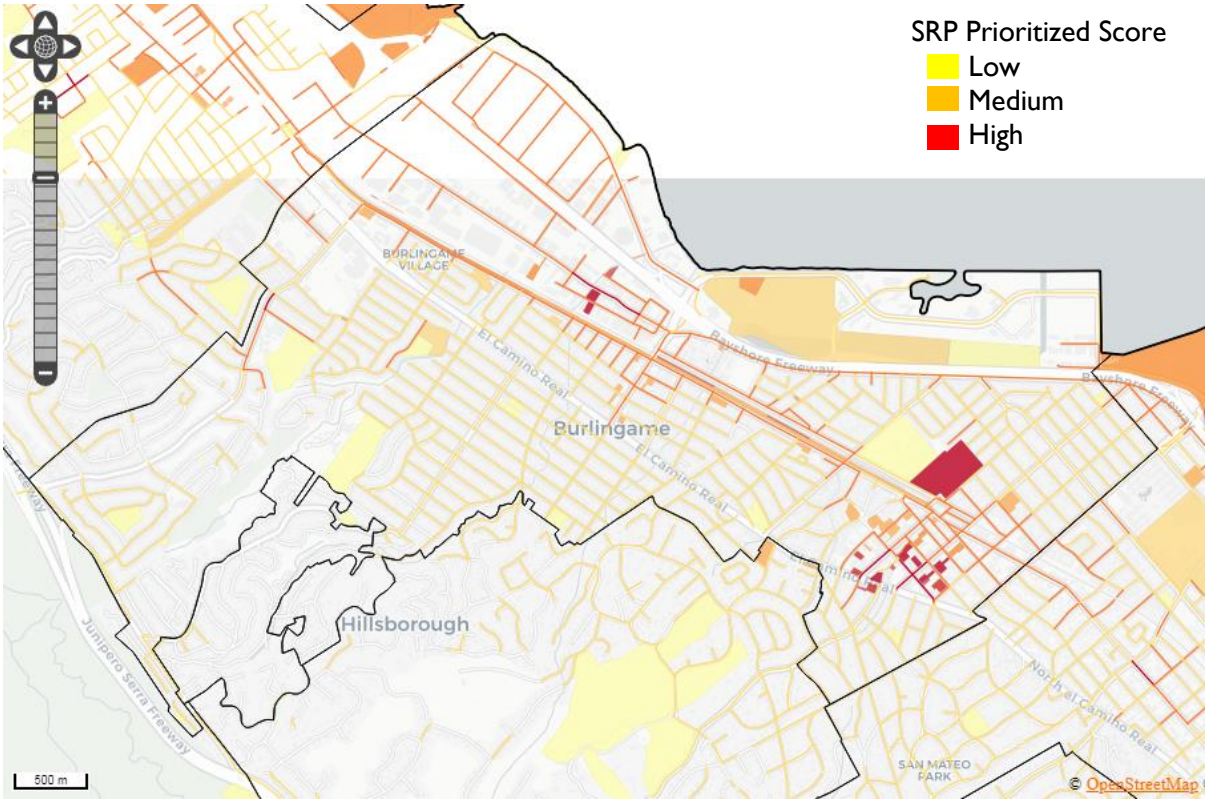


Figure 11. Map Displaying Results of the SRP Screening and Prioritization Process for Burlingame[14]

Capital Improvement Program (CIP)

The City's Public Works Department is responsible for implementing the City's Capital Improvement Program. Projects identified and prioritized in the capital improvement program consist of:

- Upgrades to aging water, sewer, and storm drain infrastructure;
- Street resurfacing projects;
- Bicycle and pedestrian street improvements, including ADA; and
- City facilities and public park improvements.

The City also follows BASMAA's May 2016 *Guidance for Identifying Green Infrastructure Potential in Municipal Capital Improvement Program Projects* to identify candidate projects that have the potential to integrate GI. This process involves an initial screening of CIP projects, followed by an assessment of GI potential, followed by a preliminary design of those projects which are shown to have GI potential. This screening process is summarized in **Appendix B**. For projects which are shown to have GI potential, the City undertakes the following preliminary design process:

- **Step 1: Information Collection/Reconnaissance** – for street projects, evaluate potential opportunities to include pervious pavements, as well as identify and locate drainage structures and pathways.

[14] The map is publicly-accessible by visiting http://54.183.214.51/maps/SMC_project_prioritization.

- **Step 2: Preliminary Sizing and Drainage Analysis** – begin with potential LID facility locations that seem most feasible, then identify possible pathways to direct drainage from roofs and/or pavement to potential LID facility locations. Delineate the drainage area tributary to each potential LID facility location. Use a preliminary sizing factor for the potential facility location and determine which of the following could be constructed within the existing right-of-way or adjacent vacant land.
- **Step 3: Barriers and Conflicts** – note issues such as confirmed or potential conflicts with subsurface utilities, issues with property ownership, availability of water supply for irrigation, and extent to which GI is an "add on" vs. integrated with the rest of the project.
- **Step 4: Project Budget and Schedule** – consider sources of funding that may be available for GI.
- **Step 5: Assessment** – consider the ancillary benefits of GI, including opportunities for improving the quality of public spaces, providing parks and play areas, providing habitat, urban forestry, mitigating heat island effects, aesthetics, and other valuable enhancements to quality of life.

4.2. Tracking Project Implementation

In addition to prioritizing and identifying GI projects, the MRP 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." Through C/CAG's current effort preparing a Sustainable Streets Master Plan for San Mateo County, a tracking tool will be developed that will enable calculation of metrics consistent with the results of the RAA and additional metrics relevant to sustainable street implementation. Although this tracking tool is planned for completion in 2021, the City already tracks completed green infrastructure projects in the following ways:

- Cloud-based stormwater application – the City uses CloudCompli, which is a cloud-based stormwater application to track C.3 Regulated Projects that are either under review, under construction, or completed.
- ArcGIS Map - the City of Burlingame has developed a Green Infrastructure Map that includes a publicly-accessible tracking tool for mapping completed and upcoming projects. This Green Infrastructure Map can be viewed by visiting www.burlingame.org/GI. The map provides a photo and a brief description about each green infrastructure project, see **Figure 12**.

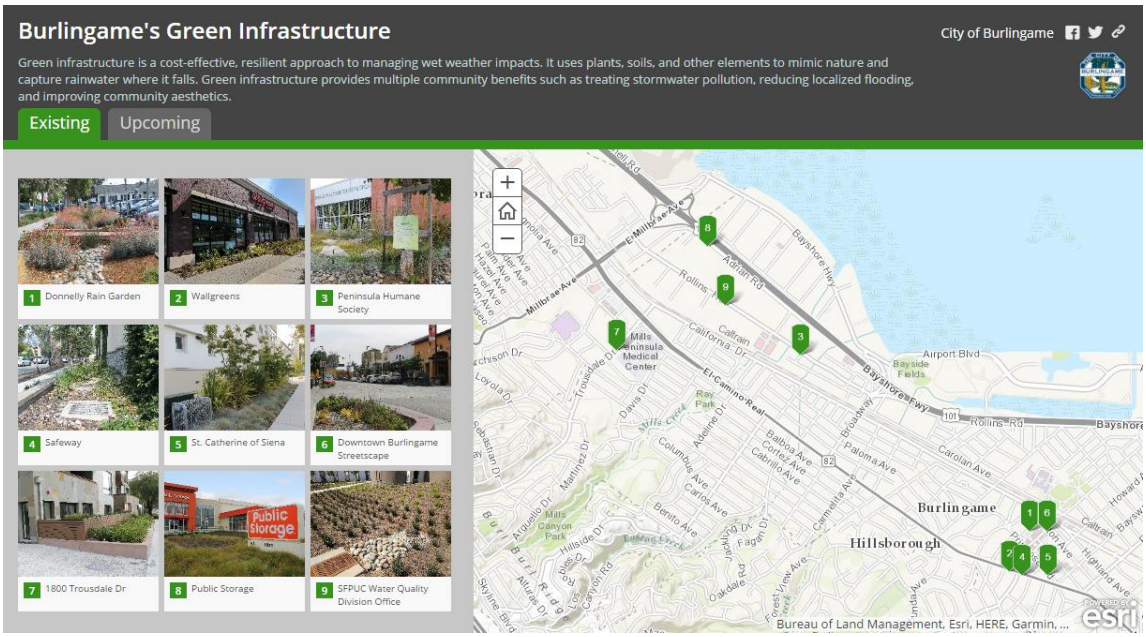


Figure 12. Screenshot of Burlingame's GI Map

4.3. Adaptive Management

Throughout the adaptive management process, the City of Burlingame will continue to verify feasible opportunities for GI projects to meet the final load reduction goals for 2040. The process will include the tracking of management metrics and continued re-evaluation of GI project opportunities considered for the RAA. For instance, the RAA assumed projected amounts of LID associated with new and redevelopment, which are subject to change based on factors that are outside the control of the City of Burlingame. If less development occurs over time or if private construction is not created as planned, more green streets or regional projects on public land may be needed to provide equivalent volume management. For the RAA and GI Plan, a preliminary schedule was developed in order to chart a potential course for GI implementation, which considered the various project opportunities.

5. IMPLEMENTING THE GI PLAN

MRP Provision C.3.j.ii requires that Permittees must prepare and maintain a list of public and private green infrastructure projects planned for implementation during the 2015- 2020 permit term, and public projects that have potential for green infrastructure measures. The Permittee submitted an initial list with the FY 15-16 Annual Report to the RWQCB and updated the list in the FY 16-17 and FY 17-18 Annual Reports.

The creation and maintenance of this list is supported by guidance developed by BASMAA's *Guidance for Identifying Green Infrastructure Potential in Municipal Capital Improvement Projects* published May 6, 2016.

5.1. Implementation Strategy

Standard Operating Procedures

The City will continue to use its planning, zoning, and building authorities to require proposed new development and redevelopment projects to incorporate LID features and facilities in accordance with the New Development and Redevelopment (MRP Provision C.3) requirements and the latest edition of the San Mateo County Water Pollution Prevention Program C.3 Guidelines.

The City's development review process is summarized in flowcharts in **Appendix C** for each of the following project phases:

- Entitlement Pre-Application Review
- Development and Redevelopment C.3 Applicability Review
- Entitlement Review
- Plan Review
- Construction Oversight
- Closeout / Acceptance / Occupancy

These flowcharts summarize the process by which both Provision C.3 Regulated and Non-C.3 Regulated Projects are reviewed, and at what level of detail, at each project phase. They show the coordination efforts needed between City departments and external agencies. Documenting this process and integrating key information from the MRP helps to avoid information or department "siloing", where the requirements or process are only understood by a few key individuals. The City hopes to use these flowcharts to train new staff. The process will periodically be updated as necessary to reflect new MRP requirements.

5.2. Legal Mechanisms to Ensure Implementation of GI Plan

Storm Water Management and Discharge Control Ordinance

In 1994, the City of Burlingame has adopted the Storm Water Management and Discharge Control Ordinance into the Municipal Code Chapter 15.14 (Ord. 1503 § 1, (1994)). This ordinance allows the City to ensure the future health, safety, and general welfare of Burlingame citizens by performing the following:

b) Eliminating non-storm water discharges to the municipal separate storm sewer.
c) Controlling the discharge to municipal separate storm sewers from spills, dumping, or disposal of materials other than storm water.
d) Reducing pollutants in storm water discharges to the maximum extent practicable.

The Storm Water Management and Discharge Control Ordinance grants the City to comply with the requirements of the Federal Clean Water Act and acts amendatory thereof or supplementary thereto, applicable implementing regulations, and NPDES Permit No. CAS0029921 and any amendment, revision, or reissuance thereof. Since the Green Infrastructure Plan is a requirement within the Municipal Regional Stormwater NPDES Permit, the City has the authority to implement the GI Plan.

Conditions of Approval

The City's Community Development Department requires approved new development and redevelopment projects to comply with Conditions of Approval, which allows the City to enforce implementation of GI in private developments in compliance with MRP Provision C.3. The Conditions of Approval are summarized in a letter which is issued upon project entitlement. C.3 Regulated Projects are required to comply with the City's Storm Water Management and Discharge Control Ordinance and the MRP to prevent stormwater pollution during and after construction. In addition, the project developer must provide all documentation relating to compliance with the MRP, such as civil and landscape designs that show biotreatment measures have been incorporated and hydraulically sized to meet the stormwater runoff requirements as set by MRP Provision C.3.d.

Maintenance Programs and Policies

Proper operations and maintenance (O&M) is essential to maximizing the environmental, social, and economic benefits of GI, as well as ensuring that projects perform as expected. Written maintenance plans and procedures ensure proper long-term maintenance and are critical components to the success of any GI measure. Compared to conventional "gray" pipe-based stormwater facilities, GI measures are much more maintenance-intensive, and the performance depends on the level of maintenance effected. A successful maintenance program has three key elements:

- Consideration of maintenance issues during design of GI measures;
- Development of an O&M agreement, in which the project proponents accept responsibility for the O&M of the installed GI measures until such responsibility is legally transferred to another entity; and
- Implementation and enforcement of this O&M agreement.

Property owners with C.3 Regulated Projects are required to record an O&M agreement between the property and the City prior to the issuance of a final construction inspection. Many stormwater facilities in Burlingame are owned and maintained by private property owners and not the City. These property owners include entities such as property management companies, private schools, and commercial/industrial site owners. These property owners are responsible for the care and management of their facilities, while the City conducts regular stormwater inspections of these facilities to verify that maintenance procedures are adequate to ensure proper functioning of the stormwater treatment systems.

The City's goal is to ensure that all public, private, regulated, and non-regulated GI measures are maintained sufficiently to perform as designed. Maintenance issues on private property will follow the protocol outlined in the City's Enforcement Response Plan (ERP).

5.3. Integration with Existing Plans and Policies

During the development of the GI Plan, the City of Burlingame also went through the process of updating its General Plan. References to the GI Plan have been incorporated into the Burlingame General Plan to ensure that green infrastructure requirements are being addressed within existing City documents.

City of Burlingame Documents

- **General Plan** – Starting in 2015, the City of Burlingame embarked on a multi-year process to update its General Plan. The General Plan is a long-range planning document that allows a community to envision and articulate how it will adapt to change over time. The new General Plan was adopted at a public hearing by City Council on January 7, 2019 and covers a variety of issues based on the community's specific needs, including chapters that focus on infrastructure, public health, natural and open spaces, and water resources. Green infrastructure, stormwater management, and the Green Infrastructure Plan are referenced in the following chapters of the new General Plan:
    - Chapter I. Introduction
    - Chapter 4. Community Character, CC-1.8, CC-6.7
    - Chapter 7. Infrastructure, IF-1.4, IF-2.13, IF-4.1, IF-4.2, IF-4.3, IF-4.4, IF-4.5, IF-4.7, IF-4.8, IF-4.9
    - Chapter 9. Healthy People and Healthy Places, HP-4.16, HP-5.4. HP-5.5, HP-5.10, HP-5.12, HP-6.1, HP-6.2, HP-6.5, HP-6.6, HP-6.7, HP-6.8, HP-6.9 HP-6.10, HP-6.11
    - Chapter 10. Engagement and Enrichment, EE-1.7
- **2030 Climate Action Plan** – As part of the General Plan update, the City has updated and approved the 2030 Climate Action Plan. This Climate Action Plan was reviewed by the public, the Planning Commission, and the City Council prior to approval. References to GI are included in the adopted Climate Action Plan.
- **Bicycle and Pedestrian Master Plan** – The City of Burlingame is currently updating its Bicycle and Pedestrian Master Plan. Green infrastructure can be incorporated into this plan since it promotes traffic calming such as reduce motor vehicle speeds and reduce the pedestrian crossing distance at street intersections.

Countywide Plans and Initiatives

- **San Mateo Countywide Sustainable Streets Master Plan (SSMP)** - The City/County Association of Governments of San Mateo County (C/CAG) is working with its 21 member agencies and Caltrans to develop the SSMP. This plan will prioritize locations for integrating green infrastructure into roadways to capture, treat, and infiltrate stormwater runoff to better adapt the transportation network to precipitation-based climate change impacts while simultaneously helping local agencies achieve state mandates for treating runoff.
- **SMCWPPP C.3 Regulated Projects Guide** – Previously called the C.3 Technical Stormwater Guidance, this guide will be updated and available to the public in late 2019. More information about this document is in Chapter 6, Green Infrastructure Guidelines, Specifications, and Typical Design Details.
- **SMCWPPP GI Design Guide** – This guide was developed to provide countywide design guidance and standards for GI implementation in public and private projects. More information about this document is described in Chapter 6, Green Infrastructure Guidelines, Specifications, and Typical Design Details.

- **Countywide Flood Resiliency and Sea Level Rise Efforts** – San Mateo County is proposing a new flood and sea level rise resiliency agency which would aim to address sea level rise in San Mateo County. The proposed agency would be funded by each of the 20+ municipalities in San Mateo County as well as the County itself. Some of the proposed projects that this new agency would work on include coordinating regional stormwater projects across multiple cities and maintenance of a regional park. As of May 2019, the project team has completed their stakeholder outreach to the governing boards of the municipalities within San Mateo County. The City Council of the City of Burlingame unanimously endorsed this new agency at its April 1, 2019 meeting. The road show is expected to conclude by summer 2019, with a final verdict in fall 2019. More information about this effort can be found at https://resilientsanmateo.org.

5.4. Integration with Future Plans

Currently, the City has either undergone or is in the process of updating planning documents relevant to the GI Plan, specifically the General Plan, Climate Action Plan, and Bicycle and Pedestrian Master Plan. Because the City recently concluded a multi-year effort to update the General Plan and adopted it in January 2019, a workplan for incorporating the GI Plan in future planning documents is not needed at this time. The GI Plan is a *living document* and will be updated as new information arises that impact the plan, such as the re-issuance of the MRP. A comprehensive evaluation of this GI Plan will be considered in future updates.

5.5. Staff Responsibilities

The following describes roles and responsibilities of key municipal staff involved with implementing public green infrastructure projects.

- Community Development Department – Planning Division
  - Receives application forms for new development and redevelopment projects, including C.3 Regulated Projects
- Community Development Department – Building Division
  - Routes building plans to departments for comments
  - Issues building permits for new development and redevelopment projects, including C.3 Regulated Projects
- Parks and Recreation Department – Parks Division
  - Reviews landscaping plans for building permit issuance
  - Conducts operations and maintenance of public GI projects
- Public Works – Engineering Division
  - Oversees the Capital Improvement Program
  - Conducts construction site inspections
  - Ensures regulatory compliance with the MRP

5.6. Early Project Implementation

The City of Burlingame has taken a proactive role in implementing green infrastructure projects on public right-of-way. In 2008, the City was awarded a grant from the San Mateo Countywide Water Pollution Prevention Program to design and build a rain garden on Public Parking Lot C, which is located at Donnelly Avenue between Primrose Road and Lorton Avenue in downtown Burlingame. This project provided a demonstration garden for low impact development by demonstrating how these types of systems could address both localized flooding and stormwater pollution issues. This project paved the way for future green infrastructure projects in the city.

During the development of this GI Plan, the City has also begun exploring various green infrastructure opportunities which are appropriate to the context and character of the City.

These opportunities include the following:

- **Chapin Avenue Streetscape and Stormwater Treatment Improvements**. This project was identified as part of the San Mateo Countywide Program Stormwater Resource Plan effort. It is not yet funded, but the City plans to actively seek grant funding for this project, which consists of green streets improvements along Chapin Avenue between El Camino Real and Primrose Road. Green infrastructure improvements may include stormwater curb extensions and permeable pavement.
- **Parking Lot K Improvements and Parking Lot G Improvements**. These projects involve rehabilitation of public parking lots K and G. As with other recent parking lot improvement projects, the City will aim to install green infrastructure concurrent with the planned improvements to filter and reduce runoff leaving the parking lot. Stormwater planters can be located in areas that would otherwise consist of traditional landscaping or diagonally striped buffer areas / "dead zones".
- **Railroad Grade Separation at Broadway**. Caltrain and the City of Burlingame are cooperating on this project targeted at separating the tracks from the road at Broadway as a safety improvement measure. During the project design development, the project C.3 regulation status and potential for the incorporation of green infrastructure will be assessed.

Concept sheets for selected projects, including a description and approximate schedule for completion, are included in **Appendix D**. These concept sheets and the City's Capital Improvement Program serve as the City's workplan to complete prioritized projects (required per Provision C.3.j.i.(2)(j)). The City's list of prioritized projects will be continuously updated and will eventually include projects identified through the San Mateo Countywide SSMP.

6. GREEN INFRASTRUCTURE GUIDELINES, SPECIFICATIONS, AND TYPICAL DESIGN DETAILS

The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), with input and feedback from its member agencies, including the City of Burlingame, has developed the San Mateo County GreenSuite which consists of two documents: Green Infrastructure Design Guide (Design Guide) and the C.3 Regulated Projects Guide. These documents provide a comprehensive guidance for planning, designing, constructing, and maintaining green infrastructure for buildings, parking lots, sites, and streets. The Design Guide addresses the following requirements of the Municipal Regional Stormwater Permit (MRP):

- Section C.3.j.i.(2)(e) – requires design and construction guidelines for streets and projects,
- Section C.3.j.i.(2)(f) – requires developing typical design details and specifications for different street and project types, and
- Section C.3.j.i.(2)(g) – requires a regional approach for alternative hydraulic sizing for non-regulated constrained street projects.

6.1. Green Infrastructure Design Guide

The Green Infrastructure Technical Advisory Committee has been working with SMCWPPP staff and its consultants to develop a countywide design guidance and standards for GI implementation in public and private projects. The Design Guide is a comprehensive document in regards to planning, designing, and maintaining GI in San Mateo County, and it includes the following components:

- 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 projects that integrate GI;
- Introduction of complete streets concepts and design;
- Discussion regarding BASMAA's regional approach for alternative sizing for non-regulated constrained green street projects;
- Design and implementation considerations;
- Operation 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 GI into communities in new and redevelopment projects whether they are C.3 Regulated Projects or not.

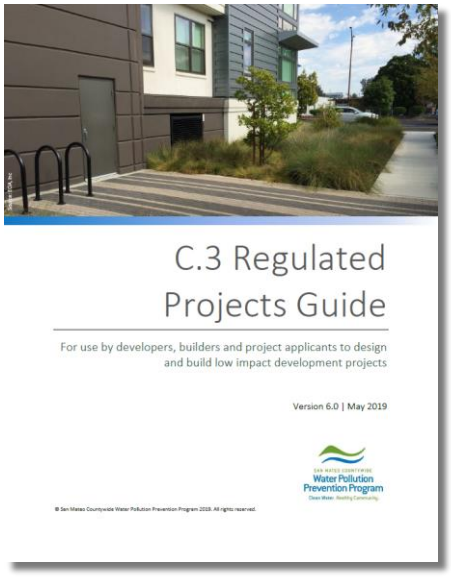
General guidelines for overall streetscape and project design, construction, and maintenance have been developed so that projects have a unified, complete design and implement the range of functions associated with the project. The MRP emphasizes the need for guidance related to green street functions. 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 a 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 Appendices of the Design Guide include typical design details and specifications for the design and construction of green infrastructure applicable to a variety of applications whether street or site-based projects.

The City of Burlingame will use the Design Guide and future amended versions to provide support and guidance in implementing green infrastructure within the City. As additional green infrastructure projects are implemented in Burlingame, portions of the Design Guide may be superseded by Burlingame-specific updates or modifications based upon lessons learned and other factors experienced in or determined by the City.

The Design Guide will be periodically updated to reflect new information, findings, and experience. The Design Guide can be downloaded at www.flowstobay.org/gidesignguide.

6.2. C.3 Regulated Projects Guide



Formerly known as the C.3 Stormwater Technical Guidance, the C.3 Regulated Projects Guide provides technical information and guidance to help developers, builders, and project sponsors include stormwater control measures in parcel-based regulated projects in order to meet local municipal requirements and requirements in Provision C.3 of the MRP.

The current version of the MRP requires projects that create and/or replace 10,000 square feet or more of impervious surface to treat the project's stormwater runoff with low impact development techniques. This threshold was lowered from 10,000 to 5,000 square feet of impervious surface for the following project categories: uncovered parking areas (stand-alone or part of another use), restaurants, auto service facilities, and retail gasoline outlets. LID treatment consists of evapotranspiration, infiltration, rainwater harvesting and use, and/or biotreatment. All treatment measures must be hydraulically sized as specified in MRP Provision C.3.d.

The C.3 Regulated Projects Guide can be downloaded at www.flowstobay.org/newdevelopment.

6.3. Sizing Approaches

C.3. Regulated Projects are required to be designed to meet the treatment and hydromodification sizing requirements in Provisions C.3.c and C.3.d. In order for GI projects to function as intended (i.e., either reestablish natural drainage and infiltration systems or mimic natural system functions to the maximum extent feasible) they should also be designed and sized to meet the same requirements. Those requirements state that the stormwater treatment system must meet at least one of the following hydraulic sizing design criteria:

1. Volume Hydraulic Design Basis – stormwater treatment systems shall be designed to treat stormwater runoff equal to either the maximum stormwater capture volume for the area or the volume of annual runoff required to achieve 80 percent or more capture.
2. Flow Hydraulic Design Basis – stormwater treatment systems shall be sized to treat either 10 percent of the 50-year peak flow rate; flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity; or the flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.
3. Combination Flow and Volume Design Basis – stormwater treatment systems shall be sized to treat at least 80 percent of the total runoff over the life of the project using local rainfall data.

For non-regulated street projects, the City is deferring to the Green Infrastructure Design Guide (see Chapter 6) which uses a countywide approach for how to proceed should project constrains preclude fully meeting the C.3.d sizing requirement. Refer to GI Design Guide, Chapter 4: "Key Design and Construction Considerations" for guidance on these types of projects.

7. FUNDING OPTIONS

Provision C.3.j.i.(2)(k) of the MRP states that the Green Infrastructure (GI) Plan shall contain the following:

> *"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."*

To undertake an evaluation of potential funding options and sources, the City:

- Reviewed the GI program elements and associated costs;
- Participated in the development of a Countywide Green Infrastructure Funding Nexus Evaluation, which identified and evaluated the feasibility of various funding strategies through the GI Technical Advisory Committee (TAC);
- Assessed the funding strategies of the Nexus Funding Evaluation for local applicability;
- Discussed opportunities for public and private cooperation; and
- Developed a process for funding GI through integration into the City's existing Capital Improvement Program (CIP).

A single source of revenue for GI is unlikely to cover all the various elements of a GI program. Instead, implementation of GI will require a range of funding sources. This chapter is a starting point to both gauge funding needs and develop a suite of funding options for use with GI. As the program develops, the funding needs and opportunities may change. This chapter and the City's approach to funding may be revisited in the future as more information becomes available and more awareness is brought to GI policies and requirements.

7.1. Local Funding Achievements

Soon after MRP 2.0 was adopted, the City of Burlingame worked to garner support and funding for GI opportunities through presentations City staff provided to City Council. Presentations were coordinated with approval of the "Workplan for Developing the Green Infrastructure Plan" on May 15, 2017 and an update on the Green Infrastructure Plan development on November 19, 2018. These presentations enabled the City Council to gain an understanding of the green infrastructure requirements. During the City's Annual Goal Setting Session on January 26, 2019, the Council discussed many City goals, including providing funding to support green infrastructure implementation. In addition, the Council agreed that Sea Level Rise Shoreline Protection Improvements were a priority, and the City should work with neighboring

cities and San Mateo County on long-term funding for them. Furthermore, the City Council expressed unanimous support for the San Mateo County Flood and Sea Level Rise Resiliency Agency Proposal on April 1, 2019, which could provide a means of funding regional green infrastructure projects.

The City of Burlingame has successfully funded several GI projects, as noted in **Table 7**.

Table 7. Successfully Funded Existing GI Projects in Burlingame

Project Funding Type	Project Name
Capital Improvement Program-Funded	• Broadway / US 101 Interchange Reconstruction Project • California Drive Roundabout • Carolan Avenue Complete Streets Project • City Parking Lot H • Downtown Burlingame Streetscape
Grant-Funded	• Donnelly Rain Garden
Private Projects (Parcel-Based Green Infrastructure)	• Walgreens (Burlingame Ave / El Camino Real) • The Peninsula Humane Society • Safeway (Howard Ave / El Camino Real) • 1600 Trousdale Drive • 1800 Trousdale Drive • Public Storage • St. Catherine of Siena
Other Projects	• San Francisco Public Utilities Commission (SFPUC) Water Quality Division Landscape Renovation

The City is continuously working to update and maintain its storm drain system, which includes storm drain inlets, gutters, pipes, and outfalls to creeks and the San Francisco Bay. In January 2009, the City Council authorized a voter-approved storm drain fee ballot measure to provide $39 million dollars' worth of infrastructure improvements to the City's aging system. The ballot measure specified that the storm drainage fees would be used to replace the City's aging levees, pipes, and pumps to provide long-lasting flood protection, improve public safety, and reduce stormwater pollution. The CIP was developed by Public Works staff who worked with the community to evaluate and prioritize storm drain needs. A total of ten major areas of improvement were identified across the City. In May 2009, Burlingame residents approved of this storm drain fee to improve, upgrade, and maintain the storm drainage system.

The Public Works Department has been focusing on funding areas throughout the City that have experienced flooding and public safety issues in the past. CIP Projects funded by the storm drain fee include city-wide storm drain construction, channel rehabilitation, and pump station retrofits. In addition, the City Council has established a Citizens Oversight Committee to ensure that storm drain fees are used only for the City's storm drain program. The Citizens Oversight Committee helps to ensure that storm drain fees are only used for the City's storm drain program. The storm drain fee was assessed based on each property's impervious area which contributes to storm drain runoff.

Because the storm drain fee is a voter-approved ballot measure, there are stringent requirements on how this funding can and cannot be used. As a result, these fees have not historically been used to fund voluntary public green infrastructure projects. However, the City can use this funding for projects that are considered C.3 Regulated Projects.

Green infrastructure is a means of both restoring water quality and reducing the amount of runoff that enters the traditional piped storm drain system, thereby providing localized flooding protection. By recognizing green infrastructure as a stormwater improvement strategy, the City began incorporating green infrastructure into the Capital Improvement Program whenever feasible. For example, the public parking lot resurfacing program provides an opportunity for the City to install rain gardens since the parking lot would undergo construction.

Dry wells have been included on several neighborhood improvement projects to help reduce stormwater flow rate and volume and recharge the groundwater (for example, the Neighborhood Storm Drain Improvements #9 Project). The EPA generally does not consider dry wells a green infrastructure practice because they offer little treatment prior to infiltration into the soil; however, they are considered green infrastructure in some areas, such as the Los Angeles Region.[15]

7.2. GI Program Elements and Funding Needs

The implementation of GI measures is expensive. It is estimated that the cost to install the GI required to be in place by 2040 per the MRP ranges in the tens of millions of dollars for the capital (construction) costs alone. Additional costs include management of the GI program, planning, design, tracking of completed projects, and maintenance.

One of the challenges of developing funding for GI is that few funding sources are available which can be used for all the elements of a GI program throughout its lifecycle. For example, grants can be used to fund design and construction costs, but not overall management of the GI program or maintenance costs.

GI costs may include the following:

- **Program Management:** Though the City has managed MRP compliance for many years, GI implementation will take additional staff time beyond permit compliance activities which occurred prior to 2016. In addition to reviewing CIP projects for GI potential, City staff will track GI projects and monitor progress toward the milestones for green infrastructure implementation for 2030 and 2040. Participation in the SMCWPPP GI TAC (now merged with New Development Subcommittee (NDS)) will continue to be necessary past the date when the GI Plan is submitted in September 2019 to assist in developing the Countywide Sustainable Streets Master Plan and to coordinate with other San Mateo County agencies on GI implementation and tracking efforts. Interdepartmental meetings among the Public Works, Planning, and Parks and Recreation Departments will also likely continue to be necessary to ensure that GI is implemented successfully on private and public projects.
- **Capital Costs:** GI capital costs depend on the type of measure to be implemented, the size of the facility, the ease with which the measure(s) can be incorporated on a project that includes other elements, and the local context (such as the ease of connecting to existing drainage systems, how steep the area is sloped, space limitations, and nearby existing utilities).

  Because of the limited construction cost data available for public GI projects in San Mateo County, it is difficult to estimate the cost. Several private projects have been constructed in San Mateo County, but often the City does not have access to cost data for the GI components. Private project and public project costs differ in key ways: public projects must contend with the removal and modification of existing street infrastructure, utility conflicts, space limitations, pedestrian safety and grade limitations, and must be constructed with prevailing wage labor forces. San Mateo County also tends to have higher construction costs than other Bay Area counties, and California

[15] "Green Infrastructure Opportunities and Barriers in the Greater Los Angeles Region". EPA 833-R-13-001. August 2013.

in general has higher construction costs than the nationwide average. In addition, GI detailing can vary widely from jurisdiction to jurisdiction, making it difficult to make cost comparisons among projects.

Current (2019) capital costs for a bioretention area can range from $100 to $150 per square foot, which is highly dependent on local context, grading (if necessary), water and power sources, storm drain connection proximity, plant palette, and irrigation system installation. Permeable paving can range from $25 to $100 per square foot, depending on the depth of the section and whether it is necessary to work around existing utilities or trees. Capital costs of $129,000 to $187,000 per acre of impervious area managed[16] were quoted for projects in Onondaga County, New York, which would work out to roughly $258,000 to $374,000 for construction costs of curb extensions installed at an intersection which treats 2 acres. Limited recent bid result data in San Mateo County suggest that the same size project here would cost in excess of $500,000 to construct.

- **Planning and Design Costs:** Planning and design costs for CIP projects are typically around 10 to 20% of the capital costs. Integrating GI into other capital programs can reduce both the construction costs for GI as well as the design costs. The SMCWPPP GI Design Guide (GI Design Guide) clarifies the application of GI on public projects. As GI becomes more common on public projects and GI designs are standardized, GI projects will become less expensive to plan and design.
- **Operation and Maintenance (O&M) Costs:** Limited data are available on maintenance costs, because maintenance is often performed by City staff as part of regular course of business, making it difficult to separate time spent on maintenance of standard City landscaping and streets versus GI. It is possible that due to the specialized nature of the maintenance of GI measures, or if staff are otherwise at capacity on maintenance of other City infrastructure, the City may need to contract maintenance work to an outside vendor. Vendors may in the future have special GI maintenance certifications not held by staff, such as the ReScape Qualified Professional (formerly the Bay-Friendly Landscaping Certification) or the National GI Certification by the Water Environment Federation. In Onondaga County, New York, maintenance costs for bioretention areas were approximately $2,000 per acre of impervious area managed per year.[17] This would be $4,000 per year for curb extensions installed at an intersection which treats 2 acres, or $200,000 in total over a 50-year life of the system. Again, these costs may be lower than what would be anticipated in San Mateo County, and do not reflect inflation or the rising cost of labor and materials. The GI Design Guide further clarifies GI maintenance needs, which ideally will lead to standardized maintenance practices and lower maintenance costs.
- **Inspection Program Costs:** The City inspects private GI projects in accordance with its Enforcement Response Plan and Provision C.3.h of the MRP. The City's O&M agreement template allows for the City to seek reimbursement of the inspection costs. A typical inspection, including time for coordinating with the site representative and writing the report, takes approximately three (3) to four (4) hours per site. If follow-up inspections are required, an additional four (4) hours is often required for each follow-up visit, including coordination time to work with the property owner to address identified issues. The frequency of inspections is specified in the City's ERP, but generally sites are inspected on a five (5)-year interval or more frequently, and 20% of the City's private GI projects are inspected each year. It is estimated that on average four (4) sites

[16] "The Real Costs of Green Infrastructure", Stormwater Report. December 2, 2015. https://stormwater.wef.org/2015/12/real-cost-green-infrastructure/
[17] Ibid.

are inspected per year, at a cost of approximately $3,500 to $6,000 per year, depending on the time necessary for the City to re-inspect these sites and for the property owner to correct any issues. As additional GI projects are constructed on private properties, this cost will increase.

- **Outreach and Education Costs:** The City will continue to participate in outreach and education for stormwater quality through the SMCWPPP Public Information and Participation (PIP) subcommittee. However, due to the subcommittee's limited budget and various priorities (e.g., trash and litter reduction as well as outreach to businesses and construction sites to coordinate with the stormwater inspection programs), the PIP subcommittee may have limited ability to offer GI-related outreach. However, ongoing outreach and education is an important facet of GI implementation, because it can lead to not only a better understanding of the measures being installed, but also could build support for a dedicated GI or environmental protection funding source. This may result in the construction of GI elements within individual homes and businesses on a voluntary basis.

Figure 13 below demonstrates the estimated relative costs of the GI program elements for a GI project with an assumed $500,000 construction cost consisting of stormwater curb extensions at an intersection. Limited data are available to ascertain these relative costs, so they have been assumed until more data becomes available.

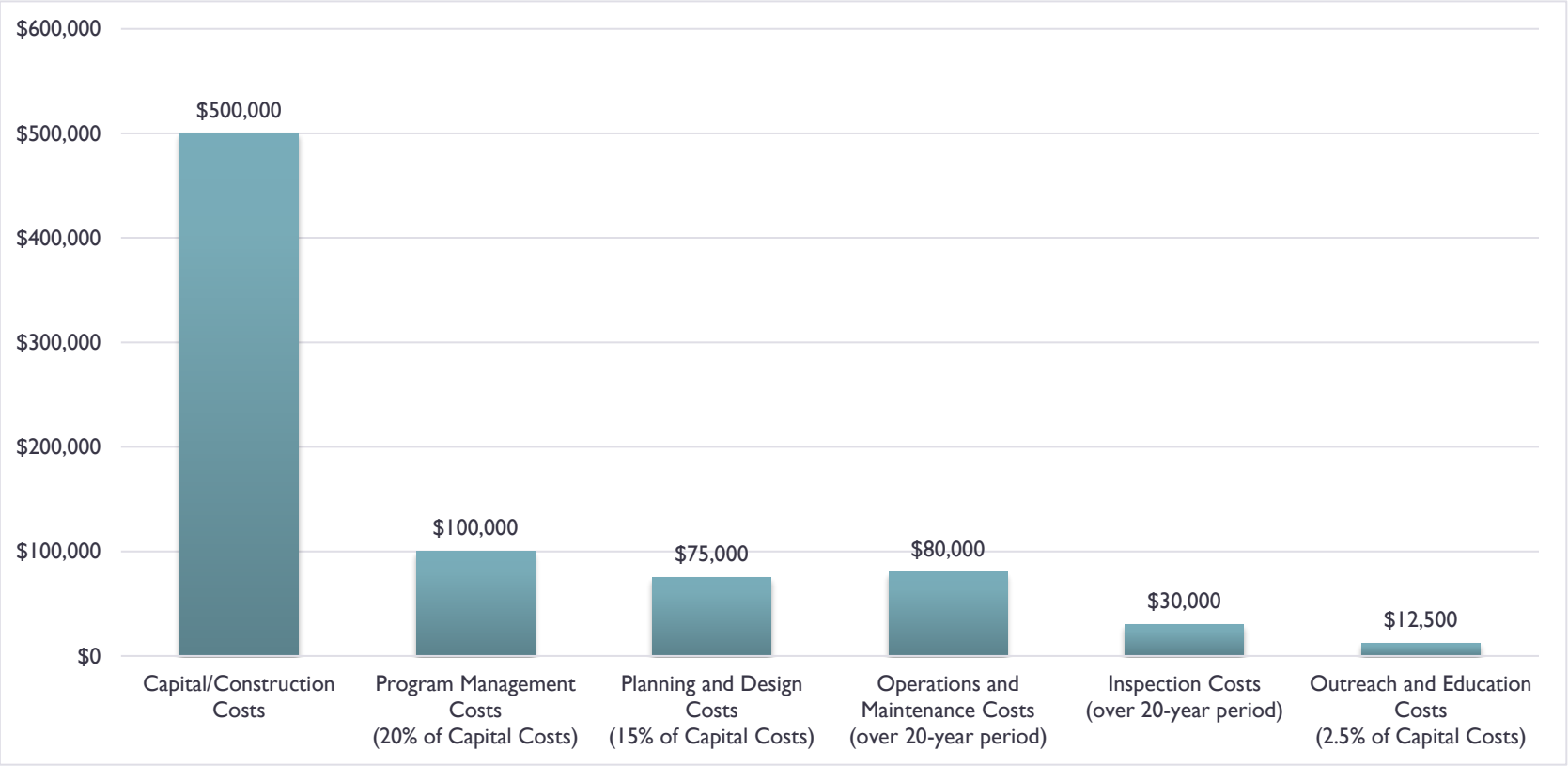


Figure 13. Estimated Relative Costs of Green Infrastructure Program Elements

7.3. Future Assessment of GI Costs

Section 7.2 describes the costs associated with the various elements of a GI program based on limited funding information available in San Mateo County and in other areas of the United States. Estimated costs for GI will be improved over time with agency-specific and County-specific knowledge. Future sources of cost estimating data will include bid results from GI projects; proposals received from designers and construction management firms to design and inspect GI projects; actual consultant and staff time spent providing program management, planning, and outreach services; public works maintenance staff time performing maintenance on GI systems; and time spent performing inspections.

The City may also draw from other published resources available to estimate the costs of GI. For example, the SFPUC has made its cost estimating model available to other municipalities to use for planning-level analyses. This Excel-based model can be used as a planning tool to plan and budget for GI maintenance obligations for labor and costs. The user will be able to input user-defined project attributes (e.g., BMP type, size, date), and the model will yield long-term maintenance costs and staffing obligations as outputs.

7.4. Economic Vitality Benefits and Public Private Partnerships

It is sometimes necessary to balance GI goals and objectives with competing design guidelines and goals, such as encouraging high density, zero-lot line setbacks, density bonuses, reduced landscape requirements, and maximizing the structure footprint. Establishing additional requirements for the installation and lifetime maintenance of GI on private properties may create a hardship on private property owners and developers. At the same time, the costs to comply with the GI milestones will be significant, and it may be necessary to shift some of those costs to the private sector at some point in the future.

By communicating the benefits of GI to local businesses, the City hopes to encourage voluntary implementation of GI and/or build support for a special financing district to avoid needing to resort to additional blanket-style requirements on developers. On a project-by-project basis, the City can assess opportunities to meet water quality goals, and scale implementation to fit the project constraints. The City will continue to explore public and private cooperation opportunities as the GI program develops.

GI can help support economic vitality by providing access to landscape and green spaces, which results in the following direct economic benefits to residential and commercial areas[18]:

- Higher property values and rent value
- Increased consumer spending in commercial districts
- Increased building energy savings
- Reduced life-cycle and maintenance costs (for some treatment measures)
- Lower possibility of flood damage
- Lower water bills, if rainwater harvesting is used
- Reduced crime
- Improved health and job satisfaction for office employees
- Healthier and more sustainable communities
- Community place-making
- Improved worker productivity
- Increased potential that patrons will linger longer on retail main streets
- Higher occupancy rates for apartments and shorter periods between leases

[18] "Green Infrastructure Design Guide", First Edition. San Mateo County Water Pollution Prevention Program. April 2019.

7.5. Funding Strategies

Through the GI TAC, the City and SMCWPPP developed a GI Funding Nexus Evaluation document for jurisdictions within San Mateo County with the goal of expanding on existing stormwater funding sources and supplementing them with strategies in line with GI implementation goals. The Nexus Funding Evaluation describes and evaluates funding mechanisms, outlines funding needs, and provides strategies to procure such funding for design and construction of new GI. This subsection is intended to describe the City-specific approach to the funding strategies discussed in the Nexus Funding Evaluation. Rather than repeating the information available in the Nexus Funding Evaluation, this section can be used in conjunction with the evaluation to further explore funding options that align with the City's priorities. It is anticipated that the evaluation of funding options for GI is an ongoing process and will be revisited as the program develops.

BALLOTED APPROACHES

The most sustainable and formative funding approach, but also the most challenging. Successful balloted approaches are most inclined to provide significant funding for stormwater management and stormwater-related projects. The two biggest challenges for balloted approaches are planning the strategy for the proposed project/program and effectively presenting the project and vision to the voting community.

Examples of balloted approaches include the following:

- Parcel Taxes
- Other Special Taxes
- Property-Related Fees
- General Obligation Bonds

City-Specific Approach: At this time, the City does not plan to pursue GI-specific parcel taxes, other special taxes, property-related fees, or general obligation bonds, but may revisit these funding approaches as the program develops. Other local agencies may implement these funding strategies in the coming years. By delaying implementation of these funding strategies, the City can build upon the efforts of these early adopters.

The City already has a storm drain fee which was approved by Burlingame residents in May 2009 to fund improvements to the City storm drain system, as discussed in Section 7.2. The City will look for opportunities to use GI as a stormwater improvement strategy and therefore pair GI with the City's storm drain capital improvement program on C.3 Regulated Projects.

NON-BALLOTED APPROACHES

These include funding strategies that do not require a ballot or voter approval. Non-balloted approaches may encounter lack of support from the general public; therefore, a nexus study or cost analysis is required to determine the middle ground cost that would not be considered a tax to the payer of the fees.

Examples of non-balloted approaches include the following:

- Senate Bill 231
- Regulatory fees
- Developer Impact Fees
- Re-Alignment
- Grants
- Loans

City-Specific Approach: The City has already successfully pursued and received grants for GI and will continue to pursue grant opportunities as they arise. At the Countywide level, the City will help to lobby for the inclusion of GI funding in transportation grants, stormwater grants, and other grants for capital programs that lend to integration with GI.

The City currently does not have regulatory or developer impact fees but may revisit these funding approaches later as the program develops. On January 7, 2019, the City Council adopted an interim zoning ordinance for the North Rollins Road Mixed Use District and North Burlingame Mixed Use District because both areas had significant land use changes in the updated General Plan. The interim zoning ordinance was recommended by staff to ensure consistency with the updated General Plan goals with respect to the two mixed use districts as well as to allow the City to approve new projects in these areas. Planning staff will review and update the City's current zoning ordinance, including residential impact fees which can help fund streetscape improvements and GI.

SPECIAL FINANCING DISTRICTS

Financial frameworks that were constructed by the local government to levy fees, taxes, and assessments for any improvements and services conducted. Most special financing districts are required to conduct a ballot that includes affected property owners, but in most cases, these affect small areas or an individual land owner.

Examples of special financing districts include the following:

- Benefit Assessments
- Community Facilities District
- Business Improvement Districts
- Enhanced Infrastructure Financing Districts (EIFD)

City-Specific Approach: The City used a business improvement district on Burlingame Avenue to fund streetscape improvements, which included rain gardens and decorative (non-permeable) pavers. The businesses which fronted Burlingame Avenue shared the project costs, resulting in a highly functional, pedestrian-focused, and attractive streetscape which improves pedestrian safety, raises property values, and attracts business from both residents and visitors.

The City is interested in additional business improvement district opportunities as they arise. Currently, the City is in the process of rezoning Rollins Road Mixed Use District, which creates a potential for creating an improvement district to help fund streetscape improvements and GI.

PARTNERSHIPS

Partnerships are effective strategies to acquire additional funds and resources needed for GI improvement projects. Collaborative efforts do not guarantee direct additional funding, but they can establish alternative benefits that will supplement the overall resources necessary to complete proposed GI projects. By distributing resources and funding throughout different entities, GI improvement projects and programs are capable of being delivered more cost-effectively.

Examples of partnerships include the following:

- Multi-Agency Partnerships (includes Regional Projects)
- Transportation Opportunities
- Caltrans Mitigation Collaboration
- Public-Private Partnerships (P3)
- Financial Capability Assessment
- Volunteers

City-Specific Approach: The City will investigate opportunities to partner with other agencies to construct regional projects which help improve water quality Countywide and contribute to the City's GI implementation goals. The City will pursue transportation funding which can be used to mitigate transportation challenges as well as construct GI. The City is interested in collaborating with Caltrans for a project in the vicinity of El Camino Real and US 101, which pass vertically through the City.

The City will explore opportunities to organize a volunteer workforce for maintenance of GI measures as a way of collaborating with the public and building community support for GI measures.

The City will continue to work with SMCWPPP to advertise how GI can bring economic vitality to the surrounding areas, and through this outreach, may be able to convince local businesses of the benefit of GI. As the program develops, the City will continue to look for opportunities to promote public and private partnerships to support GI implementation.

ALTERNATIVE COMPLIANCE

Previously, the Regional Water Quality Control Board has provided alternative compliance options in Provision C.3.e.i of the MRP 2.0 which can be utilized on Special Projects that meet certain criteria and cannot feasibly install the required amount of LID treatment onsite. The alternative options include the following:

- Construction of a joint stormwater treatment facility with the ability to treat combined runoff from two or more regulated projects
- Construction of a stormwater treatment system off-site
- Payment of an in-lieu fee for regional projects

These and other alternative compliance options can also be used on non-regulated projects, but with more flexibility than what could be used on regulated projects. On C.3 Regulated Projects, the alternative compliance site must be within the same watershed as the site to be mitigated and must be constructed within three (3) years of the site to be mitigated. Regional project timelines may be extended up to five (5) years. These same restrictions do not apply to non-regulated projects.

Examples of alternative compliance include the following:

- In-Lieu Fees
- Credit Trading

City-Specific Approach: The City is interested in instituting a future credit trading program and will continue to work with SMCWPPP and the GI TAC to explore this option further. The City is exploring opportunities for credit trading with the Town of Hillsborough, which is located upstream of Burlingame. Hillsborough is zoned non-commercial, so the Town has no Provision C.3 "Regulated Projects" and few GI opportunities within the Town limits.

C/CAG is exploring the possibility of creating a new public agency for sea level rise and flood resiliency. If approved, the City (along with all the other cities in San Mateo County) would be expected to finance this agency. The City of Burlingame is interested in working with SMCWPPP and the GI TAC to explore this option further.

Under the terms of the current MRP, in-lieu fees cannot be implemented simply enough to ensure successful funding of GI projects. If the regulations change to offer more flexibility, the City may reassess opportunities for in-lieu fees on regulated projects. As more GI projects are identified through the capital improvement program screening process, there will be more opportunities to utilize alternative compliance.

7.6. Integration with the Capital Improvement Program

One obstacle to funding a GI program is that the City must balance the many needs of its community to both keep the City operational and well-maintained while working toward the goals and vision set forth in the City's General Plan. Pavement maintenance, replacement and repair of underground utilities, transportation improvements, performing facility needs assessments and making facility upgrades, and parks improvements are all key facets of the City's Capital Improvement Program. The City can creatively work within the framework of the existing CIP to plan and budget for GI.

Though GI is primarily an outgrowth of a stormwater or environmental program, green infrastructure can be considered an expansion of many different CIP projects because it provides benefits beyond simply improving water quality, as shown in **Figure 14**.

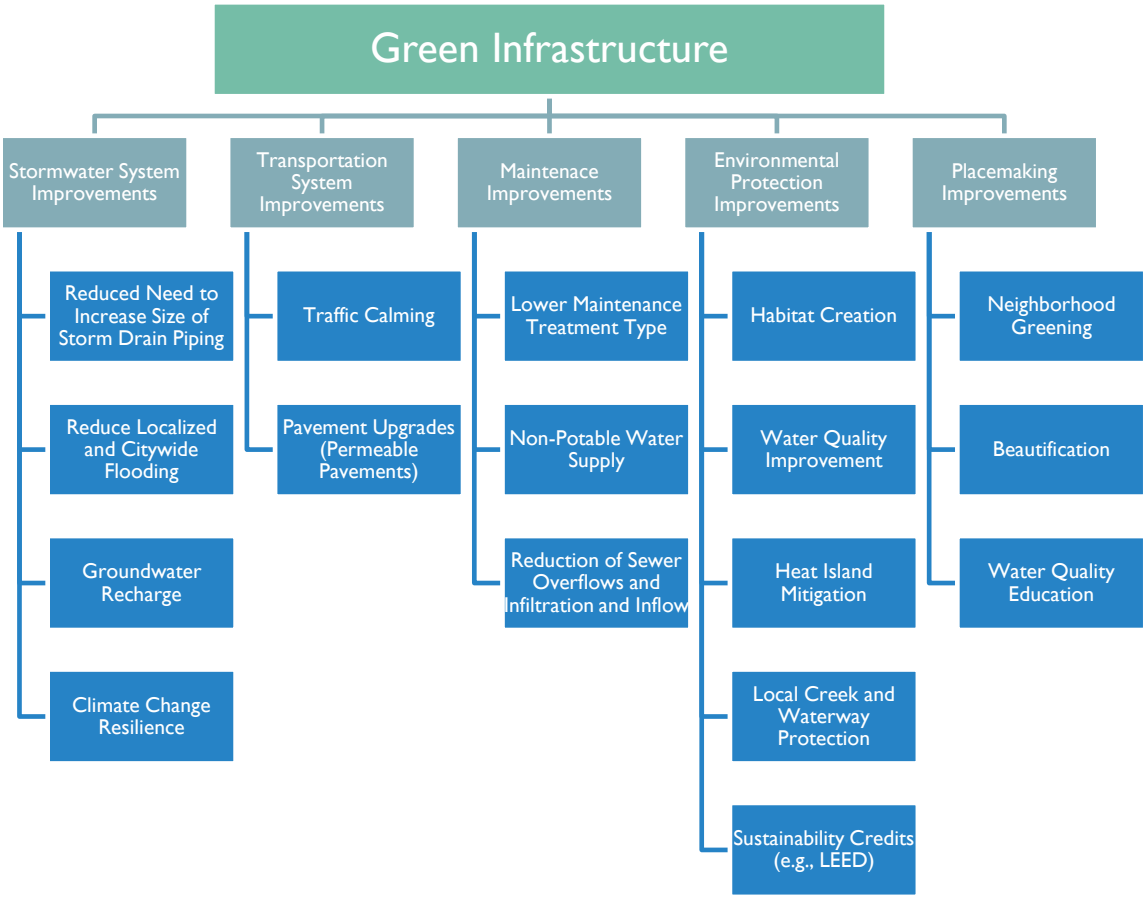


Figure 14. Integration of Green Infrastructure with Other Types of Improvements

By recognizing the many direct and ancillary benefits of GI, it becomes possible to integrate GI on several CIP projects if the project goals align with the GI benefits. Examples of projects that potentially lend to integration with GI include the following: park or facility upgrades, pavement rehabilitation, storm drain repairs, and complete streets projects.

By integrating GI into the project scope early, the project can incorporate it more seamlessly, and in a way that does not greatly increase project costs. Prioritization and early screening of CIP projects is discussed in Chapter 4, Public Project Prioritization, Identification, and Tracking

7.7. Integration of Green Infrastructure with Adopted Budget

The City of Burlingame has several key funds in its FY 2018-2019 Adopted Budget. The funds which could potentially be used for GI include the following:

- General Fund
- Special Revenue Funds: Measure A, Measure M, Measure I, Gas Tax, Storm Drain Fees, SB-1, and Grants
- Capital Project Fund

In order to facilitate the future integration of GI in the capital improvement program, the City prepared a sample matrix of potential GI measures which may be integrated into the various types of projects identified in the City's current adopted budget, see **Table 8**.

Table 8. Sample Integration of Potential GI Measures with the Adopted Budget.

TYPES OF PROJECTS	FUNDING SOURCES	POTENTIAL GREEN INFRASTRUCTURE MEASURES										OTHER TREATMENT MEASURES
		Stormwater Planter / Rain Garden	Stormwater Curb Extension	Tree Well / Stormwater Tree / Interceptor Tree	Infiltration System	Pervious Pavement	Green Roof	Rainwater Harvesting	Vegetated Swale	Green Gutter	Green Wall	Hydrodynamic Separator Media Filter High-Flow Rate Tree Well Filter
Private Projects • Burlingame Point Development (Facebook) • North Rollins Road Projects (after re-zoning) • Other Future Potential Projects	Private Funding	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Private – Public Partnership Projects • Burlingame Avenue Streetscape/Downtown Improvements* • Other Future Potential Projects	Private Funding General Fund Gas Tax Measures A, M, and I SB-1 Grants Capital Projects Fund	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pavement Rehabilitation • Parking Lots Resurfacing and Upgrades • Citywide Parks Paving, Courts and Pathway Improvements • Other Future Potential Projects	General Fund Gas Tax Measures A, M, and I SB-1 Grants Capital Projects Fund	✓	✓	✓	✓	✓			✓	✓		

* = Completed Project

TYPES OF PROJECTS	FUNDING SOURCES	POTENTIAL GREEN INFRASTRUCTURE MEASURES										OTHER TREATMENT MEASURES
		Stormwater Planter / Rain Garden	Stormwater Curb Extension	Tree Well / Stormwater Tree / Interceptor Tree	Infiltration System	Pervious Pavement	Green Roof	Rainwater Harvesting	Vegetated Swale	Green Gutter	Green Wall	Hydrodynamic Separator Media Filter High-Flow Rate Tree Well Filter
Transportation • Broadway Caltrain Grade Separation • Old Bayshore Highway Streetscape Improvements • Bay Trails Gap Design and Development • Traffic/Pedestrian Study Improvements – City Hall • Residential Traffic Calming Program • Bike Boulevard Implementation Feasibility Study • Bicycle Pedestrian Master Plan Update • Lyon Hoag Neighborhood Traffic Calming • California Drive Class II Bike Lane Project* • Pedestrian & School Safety Improvement • California Drive Roundabout* • Other Future Potential Projects	General Fund Gas Tax Measures A, M, and I SB-1 Grants Capital Projects Fund	✓	✓	✓	✓	✓			✓	✓		

* = Completed Project

TYPES OF PROJECTS	FUNDING SOURCES	POTENTIAL GREEN INFRASTRUCTURE MEASURES										OTHER TREATMENT MEASURES
		Stormwater Planter / Rain Garden	Stormwater Curb Extension	Tree Well / Stormwater Tree / Interceptor Tree	Infiltration System	Pervious Pavement	Green Roof	Rainwater Harvesting	Vegetated Swale	Green Gutter	Green Wall	Hydrodynamic Separator Media Filter High-Flow Rate Tree Well Filter
Stormwater • Downtown Burlingame Avenue Streetscape Storm Drain Improvements* • Summit Drive Culvert Rehabilitation*	Storm Drain Fees	✓	✓	✓	✓							✓
Park Improvements • Annual Tree Replacement Program • Parks Safety Maintenance and Improvements • Skyline Park • Murray Field Renovations* • Cuernavaca Park Improvements • Athletic Fields Renovation (Citywide Parks) • Bayview Park Improvements (State Lands) • S.P. Circle Plaza Improvements • City Parks Master Plan • Other Future Potential Projects	General Fund Capital Projects Fund	✓		✓	✓	✓		✓	✓			

* = Completed Project

TYPES OF PROJECTS	FUNDING SOURCES	POTENTIAL GREEN INFRASTRUCTURE MEASURES										OTHER TREATMENT MEASURES
		Stormwater Planter / Rain Garden	Stormwater Curb Extension	Tree Well / Stormwater Tree / Interceptor Tree	Infiltration System	Pervious Pavement	Green Roof	Rainwater Harvesting	Vegetated Swale	Green Gutter	Green Wall	Hydrodynamic Separator Media Filter High-Flow Rate Tree Well Filter
Non-Stormwater / Facilities • New Community Center Project • Other Future Potential Projects	General Fund Special Fund Capital Projects Fund	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

7.8. Additional Funding Sources

The City of Burlingame will pursue additional funding sources and grant programs as projects become eligible and as funding becomes available. Specific examples of federal, state, and county funding programs for GI projects are summarized in the tables below.

In addition, the EPA has developed a Water Finance Clearinghouse[19] that provides communities with a searchable online database of more than $10 billion in water funding sources and over 550 resources to support local water infrastructure projects.

Table 9. Federal Grant Programs to Fund GI Projects.

FEDERAL GRANT PROGRAMS	
Sponsoring Agency and Grant Name	**Description and Website**
U.S. Federal Emergency Management Agency Hazard Mitigation Grant Program	The purpose of the HMGP program is to help communities implement hazard mitigation measures following a Presidential major disaster declaration. Hazard mitigation is any action taken to reduce or eliminate long term risk to people and property from natural hazards. Mitigation planning is a key process used to breaking the cycle of disaster damage, reconstruction, and repeated damage. www.fema.gov/hazard-mitigation-grant-program-guide-state/local-governments
U.S. Environmental Protection Agency Nonpoint Source Implementation Grants (319 Program)	Under Section 319, states, territories, and tribes receive grant money that supports a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects. www.epa.gov/nps/319-grant-program-states-and-territories
U.S. Federal Emergency Management Agency Pre-Disaster Mitigation Program	The PDM Program is designed to assist States, U.S. Territories, Federally-recognized tribes, and local communities in implementing a sustained pre-disaster natural hazard mitigation program. The goal is to reduce overall risk to the population and infrastructure from future hazard events, while also reducing reliance on Federal funding in future disasters. www.fema.gov/pre-disaster-mitigation-grant-program

[19] Website can be accessed at https://www.epa.gov/waterfinancecenter/water-finance-clearinghouse

Table 10. State Grant Programs to Fund GI Projects.

CALIFORNIA GRANT PROGRAMS	
Sponsoring Agency and Grant Name	**Description and Website**
California Natural Resources Agency Environmental Enhancement and Mitigation Grant	The Environmental Enhancement and Mitigation Program provides funding for projects that are one of the following: urban forest projects designed to offset vehicular carbon dioxide emissions, projects for the acquisition or enhancement of lands, or projects that mitigate the impact of Transportation Facilities. http://resources.ca.gov/grants/environmental-enhancement-and-mitigation-eem
California Natural Resources Agency Trails and Greenways Grant	The Trails and Greenways grant program, funded by Proposition 68, funds projects that provide non-motorized infrastructure development and enhancements that promote access to parks, waterways, outdoor recreational pursuits, and other natural environments to encourage health-related active transportation and opportunities for Californians to reconnect with nature. http://resources.ca.gov/grants/trailsandgreenways
California Natural Resources Agency Urban Greening Grant	The Urban Greening Program funds projects with a specific focus of achieving greenhouse gas reductions by sequestering carbon, decreasing energy consumption, and reducing vehicle miles traveled. http://resources.ca.gov/grants/urban-greening
Coastal Conservancy Climate Ready Grant	The Climate Ready Program provides funding for multi-benefit projects that use natural systems to assist communities in adapting to climate change. http://scc.ca.gov/climate-change/climate-ready-program
Coastal Conservancy Proposition 68 Grants	Prop 68 provides funding for projects that create parks, enhance river parkways, or protect coastal forests and wetlands. Prop 68 also funds outdoor access, lower cost coastal accommodations, and climate adaptation projects. http://scc.ca.gov/grants/proposition-68-grants
State Water Resources Control Board Storm Water Grant Program	The purpose of the Storm Water Grant Program is to fund storm water and dry weather runoff projects that best advance the Water Board's policy goals of improving water quality and realizing multiple benefits from the use of storm water and dry weather runoff as a resource. www.waterboards.ca.gov/water_issues/programs/grants_loans/swgp

Table 11. Potential Countywide Grant Programs to Fund GI Projects.

POTENTIAL COUNTYWIDE GRANT PROGRAMS	
Sponsoring Agency	**Description and Website**
Flood and Sea Level Rise Resiliency Agency	The County of San Mateo is in the process of forming a Flood and Sea Level Rise Resiliency Agency which could help to fund GI projects, especially regional projects which will benefit multiple jurisdictions. https://resilientsanmateo.org
City/County Association of Governments (C/CAG)	C/CAG periodically issues calls for projects which are eligible for C/CAG funding. In 2017, C/CAG sponsored a grant for combination Safe Routes to School and Green Streets projects, which integrated stormwater quality and traffic calming improvements. http://ccag.ca.gov/opportunities

8. PUBLIC OUTREACH AND EDUCATION

Public Works staff have conducted various outreach methods to educate other department staff, City Councilmembers, and the public about the purposes and goals of green infrastructure, the required elements of the GI Plan, and steps needed to develop and implement the GI Plan. It is important to receive comments and buy-in from all staff that have a role in the GI Plan since implementation will require commitment to embracing this approach to urban infrastructure.

8.1. Citywide Public Outreach Efforts

Outreach to the Public

The City has educated and will continue to educate residents about the benefits of green infrastructure while using completed projects as examples. The following lists include methods by which the City has educated the public on the benefits of GI and the requirements of the GI Plan:

- **Green Infrastructure Webpage**[20] – The City created a green infrastructure webpage that describes the many forms of GI, such as rain gardens, permeable pavement, and rainwater harvesting. This page also includes information about the creation of this GI Plan.
- **Green Infrastructure Map**[21] – The City created a publicly-accessible ArcGIS Story Map that not only shows where all the existing and upcoming green infrastructure projects in Burlingame are located, but also a short description about each project including the completion date.

[20] The City's Green Infrastructure webpage is accessible at https://www.burlingame.org/gi.
[21] The City's Green Infrastructure Map is accessible at https://bit.ly/burlingamegi.

- **Social Media** – The City engages with residents through its Facebook[22] and Instagram[23] pages. Both of these platforms are used to increase awareness of green infrastructure and examples of completed green infrastructure projects around town.

- **Burlingame eNews** – The City sends a weekly electronic newsletter to communicate City news, projects, programs, and upcoming events to its subscribers. This has been an effective tool for disseminating information to our community.

- **City Council Presentations** – City staff conducted two public presentations to City Council regarding the requirements of the Green Infrastructure Plan (prior to its adoption). Although the targeted audience was City Council, members of the public attended these meetings and anyone can access the presentation slides or watch the presentation online through the Burlingame website.

- **Donnelly Rain Garden Project** – The City completed its first green infrastructure demonstration project in April 2010. This parking lot retrofit includes a new rain garden and vegetated curb extension to capture and filter stormwater runoff from the adjacent parking lot and street. An interpretive sign was also installed to educate people walking by this garden on how it helps improve stormwater quality.

- **Landscape Workshop** – The City hosted a free workshop called "Harvesting Rainwater and Building a Rain Garden" on April 20, 2019. This workshop educated members of the public on how to harvest rainwater by building a rain garden. Part of the workshop took place outdoors and included stops at the Donnelly Rain Garden and the recently completed California Drive Roundabout Project. Since GI will be more pervasive in public and private projects, the City staff will look into offering (or expanding) this class next year to encourage more homeowners to install rain gardens on their property.

[22] The City's Facebook page is accessible at https://facebook.com/burlingamecityhall.
[23] The City's Instagram page is accessible at https://www.instagram.com/burlingame_sustainability.

Outreach to the Professional Community

City staff conducts plan reviews for public and private projects. Although most private developers are aware of the MRP's Provision C.3 requirements, staff will still communicate the requirements during the planning application phase. The City's website contains specific information regarding the stormwater requirements for new development and redevelopment projects, including a link to the C.3 Stormwater Technical Guidance handbook[24] for additional information.

Training for Municipal Staff

While developing the GI Plan, the City hosted an internal staff meeting with representatives from the Building, Planning, Engineering, Community Development, Parks, and Sustainability departments. Municipal staff were trained on the requirements of the GI Plan and how it would affect their respective departments.

Educating the Burlingame City Council

Public Works staff conducted two presentations to City Council, one on May 15, 2017 and another on November 19, 2018. The first presentation on May 15, 2017 focused on providing an overview of the MRP requirements and included an adoption of a resolution approving a workplan for developing this GI Plan. The second presentation on November 19, 2018, provided an update to City Council members on the status of the GI Plan prior to its final adoption in 2019. These presentations provided opportunities for staff to communicate to City Council members the GI Plan requirements as well as general stormwater requirements as indicated in the Municipal Regional Stormwater Permit.

8.2. Countywide Public Outreach Efforts

The SMCWPPP is working with an outreach consultant to educate San Mateo County residents about the benefits of green infrastructure on behalf of all municipalities in the County. Specific outreach methods include the following:

- Creating a sustainable streets and green infrastructure webpage[25];
- Organizing a high school contest where students propose GI solutions on their campus;
- Providing a Countywide Rain Barrel Rebate Program in partnership with the Bay Area Water Supply and Conservation Agency, including regular social media, newsletter, and community outreach event promotion;
- Conducting and promoting rain barrel workshops for San Mateo County residents to learn more about rain barrel usage, benefits, and installation;
- Writing GI-related newsletter articles that were emailed to thousands of people;
- Tabling at public outreach events; and
- Posting messages on social media relating to green infrastructure.

As mentioned in Chapter 1.10, C/CAG was awarded a grant to develop a Countywide Sustainable Streets Master Plan. Part of the scope of this plan is to conduct in-person outreach at three pop-up events around the county to educate and obtain feedback from the community about this master plan.

Green Infrastructure Technical Advisory Committee

Burlingame staff have actively participated in the San Mateo Countywide Pollution Prevention Program (SMCWPPP) GI Technical Advisory Committee (TAC) meetings where SMCWPPP and consultants have facilitated countywide collaboration for many of the GI Plan requirements. The GI TAC meetings also provide a forum for discussion where agencies can share progress regarding the GI Plan and ask questions

[24] The C.3 Stormwater Technical Guidance handbook is accessible at https://www.flowstobay.org/newdevelopment.
[25] The Countywide Sustainable Streets and Green Infrastructure webpage is accessible at https://www.flowstobay.org/content/about-sustainable-streets-and-green-infrastructure.

for the group. Previous deliverables from the GI TAC include the GI Design Guide, the Reasonable Assurance Analysis, and model language to incorporate in City planning documents. Refer to **Appendix E** for a summary and timeline of key GI TAC work products.

8.3. Next Steps

As the City creates additional green infrastructure projects, staff will continue to conduct community outreach to collect residents' input. There are several educational resources and methods available for engaging the public, such as the Environmental Law Institute's *Step-by-Step Guide to Integrating Community Input into Green Infrastructure Projects and Community-Centered Design Thinking*.

The GI Plan is intended to be a "living" document and will be periodically updated to reflect the outcomes of the City's adaptive management process, adjusting to reflect lessons learned, and used to track GI implementation progress. The City may revise its internal processes or implementation strategies to meet GI Plan milestones. **Table 12** proposes a preliminary schedule for when various elements of the GI Plan may be revisited. The City may change or modify this schedule without updating this section.

Table 12. Green Infrastructure Plan Update Schedule

Implementation Element	GI Plan Chapter	What Will Be Updated	Update Schedule
Capital Improvement Program Screening	Chapter 4. Public Project Prioritization, Identification, and Tracking	City's internal screening database	**Every two years** in the CIP cycle, and mid-cycle as applicable.
Progress Towards Meeting GI Targets	Chapter 3. Green Infrastructure Targets Chapter 4. Public Project Prioritization, Identification, and Tracking	Tracking of progress towards meeting GI milestones	**2021**, or when the San Mateo Countywide Sustainable Streets Master Plan is developed.
Planning Document Updates	Chapter 5. Implementing the GI Plan	Future City documents which are identified to have potential for GI integration.	**Every 5 years**, the City will review planning documents which are scheduled for update which have the potential for integration with the GI Plan.
Policies and Procedures	Chapter 5. Implementing the GI Plan	Standard Operating Procedures, Municipal Code, and Policies	Revisit **every 5 years** to assess whether implementation approach is adequate to meet the GI Targets established in Chapter 3.0.
Guidelines and Specifications	Chapter 6. Green Infrastructure Guidelines, Specifications, and Typical Design Details	GI Guidelines and Standards	**Every 5 years**, the City will reassess the applicability of the Countywide GI Guidelines and Standards and review the potential for updating City-specific standards and details.
Funding Options	Chapter 7. Funding Options	Funding strategies	Revisit **every 5 years** to assess whether funding strategies are adequate.
Outreach and Education	Chapter 8. Public Outreach and Education	Internal outreach and education strategy	Participate at the Countywide level (estimated **2 times per year**) to support outreach and education about GI.

GLOSSARY

Best Management Practices (BMPs)
Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the Pollution of Waters of the U.S.

Bioinfiltration
The process of reducing peak runoff rates and volumes and providing stormwater treatment by directing stormwater runoff into a depressed area containing plants and specified biotreatment soil mix and allowing the runoff to infiltrate into the underlying natural soils.

Bioretention
The process of reducing peak runoff rates and volumes and providing stormwater treatment by directing stormwater runoff into a depressed area containing plants and specified biotreatment soil mix and by retaining and slowing down the runoff that would otherwise flow quickly into the stormwater system.

C.3
Provision of the Municipal Regional Stormwater NPDES Permit (MRP) that requires each municipality to control the discharge of stormwater pollutants and erosive flows from land development projects (C.3 Regulated Projects). It is often used as a shorthand term for green infrastructure measures that are required for new development and redevelopment sites over which a municipality has jurisdiction.

C.3.d Amount of Runoff
The water quality design flow or design volume of runoff, as determined by the methodologies described in Provision C.3.d of the MRP, required to be treated for compliance with C.3.

Cistern
A green infrastructure treatment measure that is used to harvest (collect) and store rainwater for subsequent use. Storage facilities can be above or below ground. Water stored in this way can be used to supplement onsite irrigation needs, or for toilet flushing.

Clean Water Act (CWA)
The Federal Water Pollution Prevention and Control Act, or 33 U.S.C. 1251 et seq., is designed to control or eliminate surface water pollution and establishes the National Pollutant Discharge Elimination System of permits to regulate surface water discharges from municipal storm drains, publicly-owned treatment works, and industrial discharges.

Creek Daylighting
The process of uncovering and restoring creeks, streams, and rivers previously buried in underground pipes and culverts.

Detention
The temporary storage of stormwater runoff in ponds, vaults, within berms, or in depressed areas to allow treatment by sedimentation and metered discharge of runoff at reduced peak flow rates.

Evapotranspiration
Evaporating water into the air directly or through plant transpiration (process where moisture is carried through plants from roots to small pores on the underside of leaves, where it changes to vapor and is released to the atmosphere).

Flow-Through Planter
Contained landscape areas designed to capture and retain stormwater runoff and designed as fully lined and connected via an underdrain to a stormwater system.

Green Infrastructure
Stormwater infrastructure that uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city or county, green infrastructure refers to the patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the scale of a neighborhood or site, green infrastructure refers to stormwater management systems that mimic nature by soaking up, storing, and/or improving the quality of water.

Green Infrastructure Alternative Measure
A type of green infrastructure that does not meet the requirements of MRP Provision C.3, but may be used as part of a green infrastructure system in some circumstances. Some alternative

measures may receive some credit toward achieving TMDL reductions depending on the resolution of regional discussions regarding a single approach to reduced sizing requirements.

Green Roof
A green infrastructure treatment measure with landscaped systems placed on rooftops designed to capture rainfall and allow it to evaporate back into the air before runoff is created.

Groundwater
Subsurface water that occurs in pervious geologic formations that are fully saturated.

Hydromodification
The modification of a stream's hydrograph, caused in general by increases in flows and durations that result when land is developed (e.g., made more impervious). The effects of hydromodification include, but are not limited to, increased bed and bank erosion, loss of habitat, increased sediment transport and deposition, and increased flooding.

Impervious surface
A surface covering or pavement of a developed parcel of land that prevents the land's natural ability to absorb and infiltrate rainwater or stormwater. Impervious surfaces include, but are not limited to, roof tops; walkways; patios; driveways; parking lots; storage areas; impervious concrete and asphalt; and any other continuous watertight pavement or covering.

Infiltration
The process of slowing, filtering, and soaking stormwater runoff into native soil. Greater infiltration can often be achieved, when necessary, by employing a specified biotreatment soil mix and aggregate storage prior to infiltration into native soil.

Low Impact Development (LID)
A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional stormwater management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Mercury
Mercury is a naturally-occurring chemical element found in rock in the earth's crust, including in deposits of coal. Mercury becomes a problem for the environment when it is released from rock and ends up in the atmosphere and in water. Human activities are responsible for much of the mercury that is released into the environment. The burning of coal, oil and wood as fuel can cause mercury to become airborne, as can burning wastes that contain mercury. The MRP requires Permittees to implement urban runoff requirements of the mercury TMDL. Permittees in San Mateo County must achieve a mercury load reduction of 6 g per year by June 30, 2020 through green infrastructure.

Municipal Regional Stormwater NPDES Permit (MRP)
The Phase I municipal stormwater NPDES permit under which discharges are permitted from municipal separate storm sewer systems throughout San Mateo County and other NPDES Phase I jurisdictions within the San Francisco Bay Region.

Municipal Separate Storm Sewer System (MS4)
A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains), that is:

- Owned or operated by a state, city, town, county, or other public body that discharges into waters of the U.S.,
- Designed or used for collecting or conveying stormwater,
- Not a combined sewer, and
- Not part of a sewage treatment plant, or publicly-owned treatment works.

National Pollutant Discharge Elimination System (NPDES)
A national program, created in 1972 by the Clean Water Act, which helps address water pollution

by regulating point sources that discharge pollutants to waters of the U.S.

Nonpoint Source Pollution
Pollution that does not come from a point source. Nonpoint source pollution originates from aerial diffuse sources that are mostly related to land use.

Pervious Pavement
A green infrastructure treatment measure or site design measure consisting of pavement (e.g., interlocking concrete pavers, porous asphalt, or pervious concrete) that is designed to allow rainwater to either pass through the pavement system itself or through joint openings between the pavers into an underlying gravel bed designed to store and infiltrate rainfall.

Point Source
Any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant
Generally, any substance introduced into the environment that adversely affects the usefulness of a resource.

Polychlorinated biphenyls (PCBs)
PCBs are a group of man-made organic chemicals consisting of carbon, hydrogen, and chlorine atoms. PCBs were domestically manufactured from 1929 until manufacturing was banned in 1979. Products that may contain PCBs include capacitors, fluorescent light ballasts, cable insulation, oil-based paint, caulking, and floor finish. PCBs do not readily break down once in the environment. They can remain for long periods cycling between air, water and soil. The MRP requires Permittees to implement urban runoff requirements of the PCBs TMDL. Permittees in San Mateo County must achieve a PCBs load reduction of 15 grams per year by June 30, 2020 through green infrastructure.

Rain Barrel
A small above-ground cistern, often in the shape of a barrel, used to collect rain water from roofs via roof gutters and downspouts. Rain barrels are typically used in residential applications that are not required to meet Provision C.3.d sizing requirements of the MRP.

Rain Garden
A green infrastructure treatment that is often used as a synonym for bioretention or bioinfiltration areas. In this plan, it is used as a term for bioretention/bioinfiltration areas with sloped sides which use soil and plants (ranging from grasses to trees) to collect, filter, and treat stormwater runoff.

Rainwater Harvesting
The act of harvesting, or collecting, rainwater. Rainwater harvesting systems include rain barrels and cisterns.

Runoff
Water originating from rainfall and other sources (e.g., sprinklers) that is found in drainage facilities, creeks, streams, ponds, lakes, wetlands, and shallow groundwater.

Self-Treating Area
A green infrastructure site design measure comprised of a pervious area in a development site designed to retain the first one inch of rainfall (by ponding, infiltration, and/or evapotranspiration) without producing stormwater runoff. Self-treating areas may include conserved natural open areas, slightly depressed areas of landscaping, green roofs, and pervious pavement. Self-treating areas treat only the rain falling on them and do not receive stormwater runoff from other areas.

Storm Drain
Above- and below-ground structures for transporting stormwater to streams or outfalls for flood control purposes without treatment.

Stormwater
Urban runoff and snowmelt runoff consisting only of those discharges which originate from precipitation events. Stormwater is that portion of precipitation that flows across a surface to the storm drain system or receiving waters.

Stormwater Curb Extension

A green infrastructure treatment measure consisting of a bioinfiltation or bioretention planter typically within the parking zone of a street that captures stormwater and allows it to interact with plants and soil while also achieving complete streets goals for improving pedestrian access and safety.

Total Maximum Daily Loads (TMDLs)

The maximum amount of a pollutant that can be discharged into a waterbody from all sources (point and nonpoint) and still maintain WQS. Under CWA section 303(d), TMDLs must be developed for all waterbodies that do not meet WQS even after application of technology-based controls, more stringent effluent limitations required by a state or local authority, and other pollution control requirements such as BMPs.

Watershed

A region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or body of water.

Wetland

Land or areas (such as marshes or swamps) that are covered, often intermittently, with shallow water or that have soil saturated with moisture.

Vegetated Swale

A green infrastructure alternative treatment measure consisting of shallow linear recessed landscaped areas with vegetation covering gentle side slopes and bottom areas that collect and slowly convey runoff flow to downstream discharge points. Use only for conveyance or pretreatment – these are no longer considered a C.3 treatment system in the MRP unless it is part of a treatment train. Vegetated swales also have some potential to infiltrate stormwater runoff as it moves downstream depending on the specific conditions of the site and through the use of check dams to retain shallow amounts of runoff.

APPENDICES

Appendix A. Green Infrastructure Prioritization Maps

Appendix B. Capital Improvements Program GI Screening Process

Appendix C. Development Review Process Flowcharts

Appendix D. Workplan for Prioritized GI Projects

Appendix E. Key Green Infrastructure TAC Work Products

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Appendix A.

Green Infrastructure Prioritization Maps

City of Burlingame: Green Infrastructure

No.	Project
1	Donnelly Rain Garden
2	Walgreens
3	Peninsula Humane Society
4	Safeway
5	St. Catherine of Siena
6	Downtown Burlingame Streetscape
7	1800 Trousdale Dr
8	Public Storage
9	SFPUC Water Quality Division Office
10	US 101 and Broadway Interchange Project
11	Carolan Ave Complete Streets Project
12	1600 Trousdale Drive
13	City Parking Lot H
14	California Drive Roundabout
15	SummerHill Apartment Communities
16	988 Howard Ave
17	Burlingame Point

Legend

City Boundary

Streams

Projects

Existing

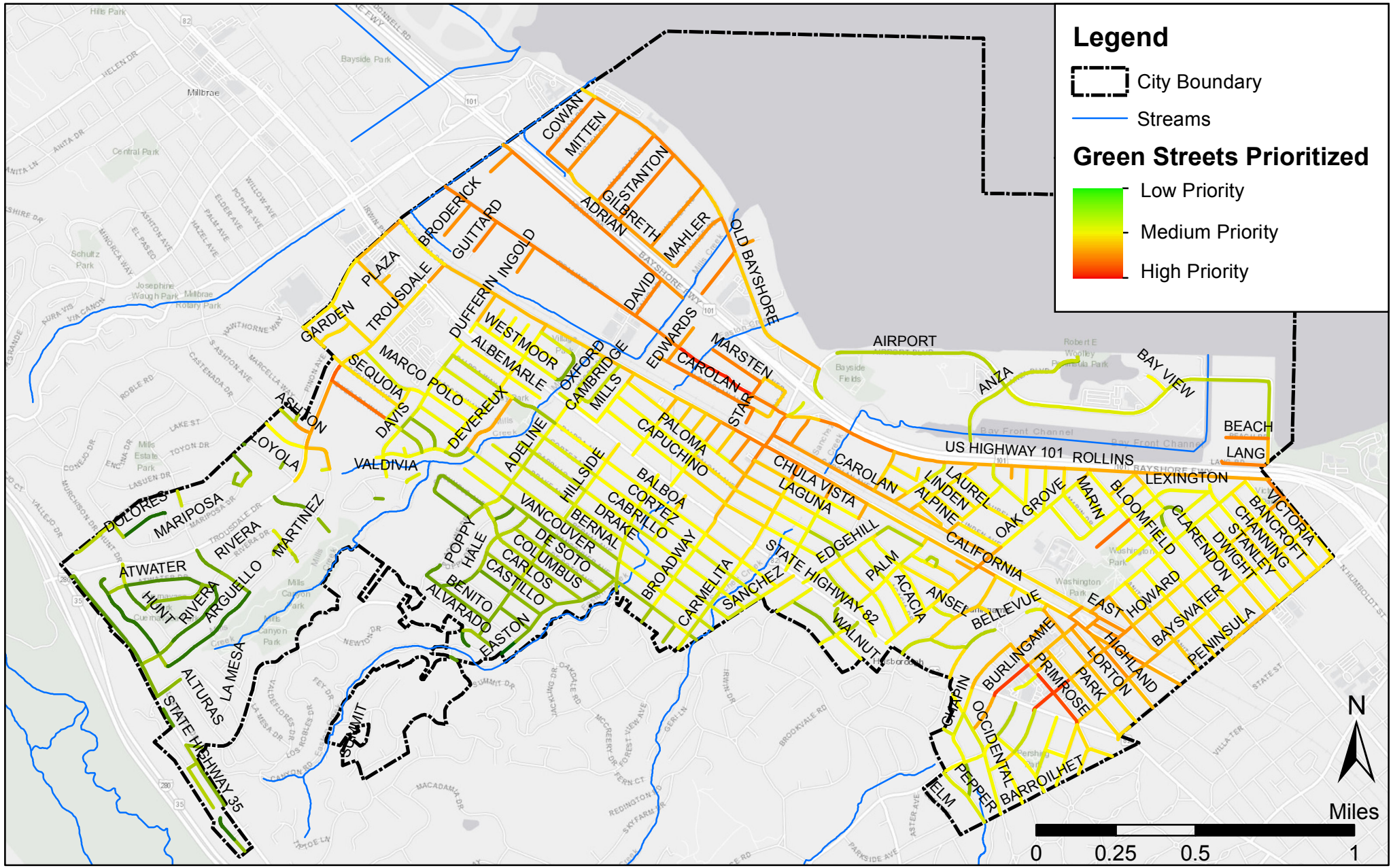
Upcoming

N

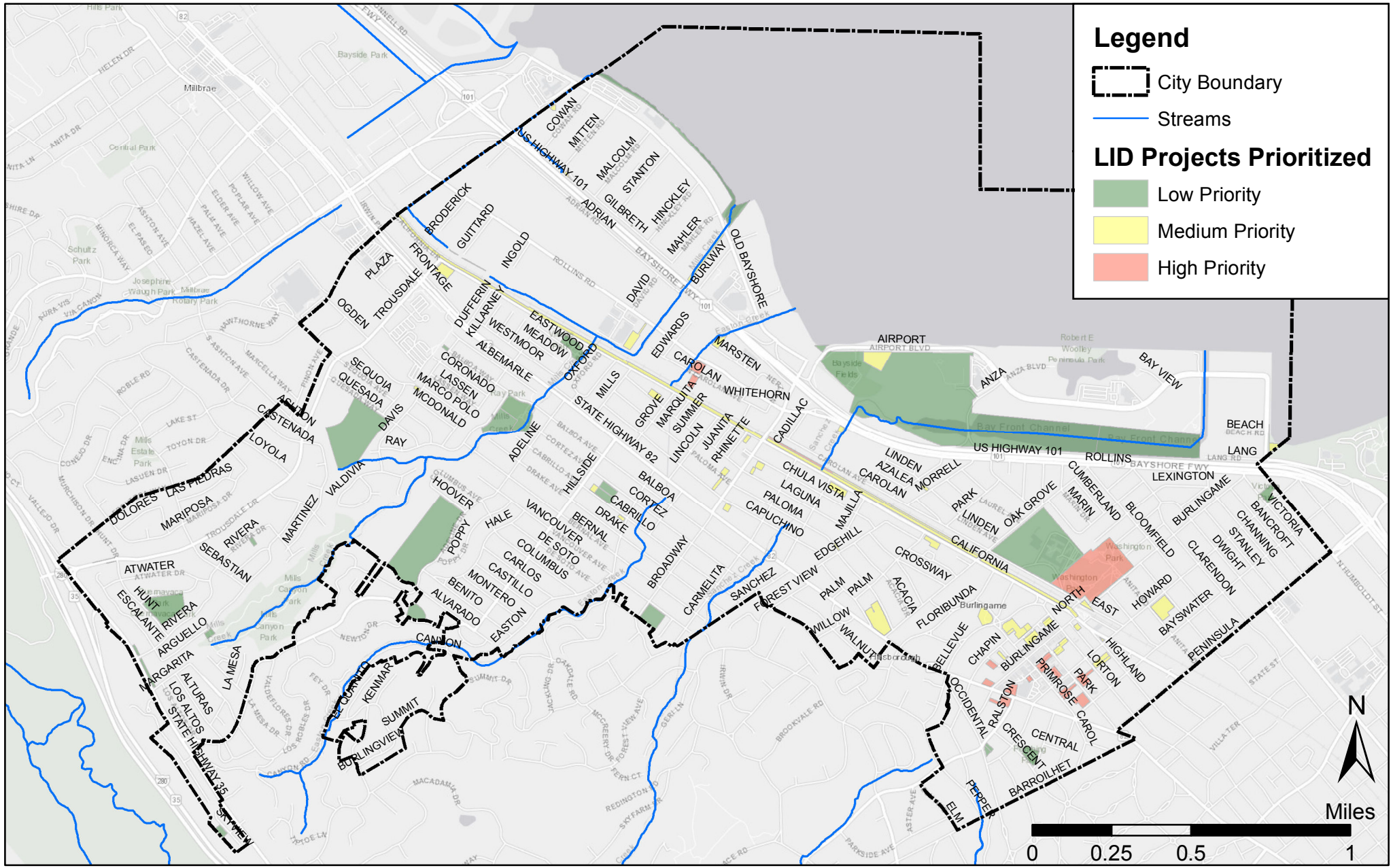
Miles

0 0.25 0.5 1

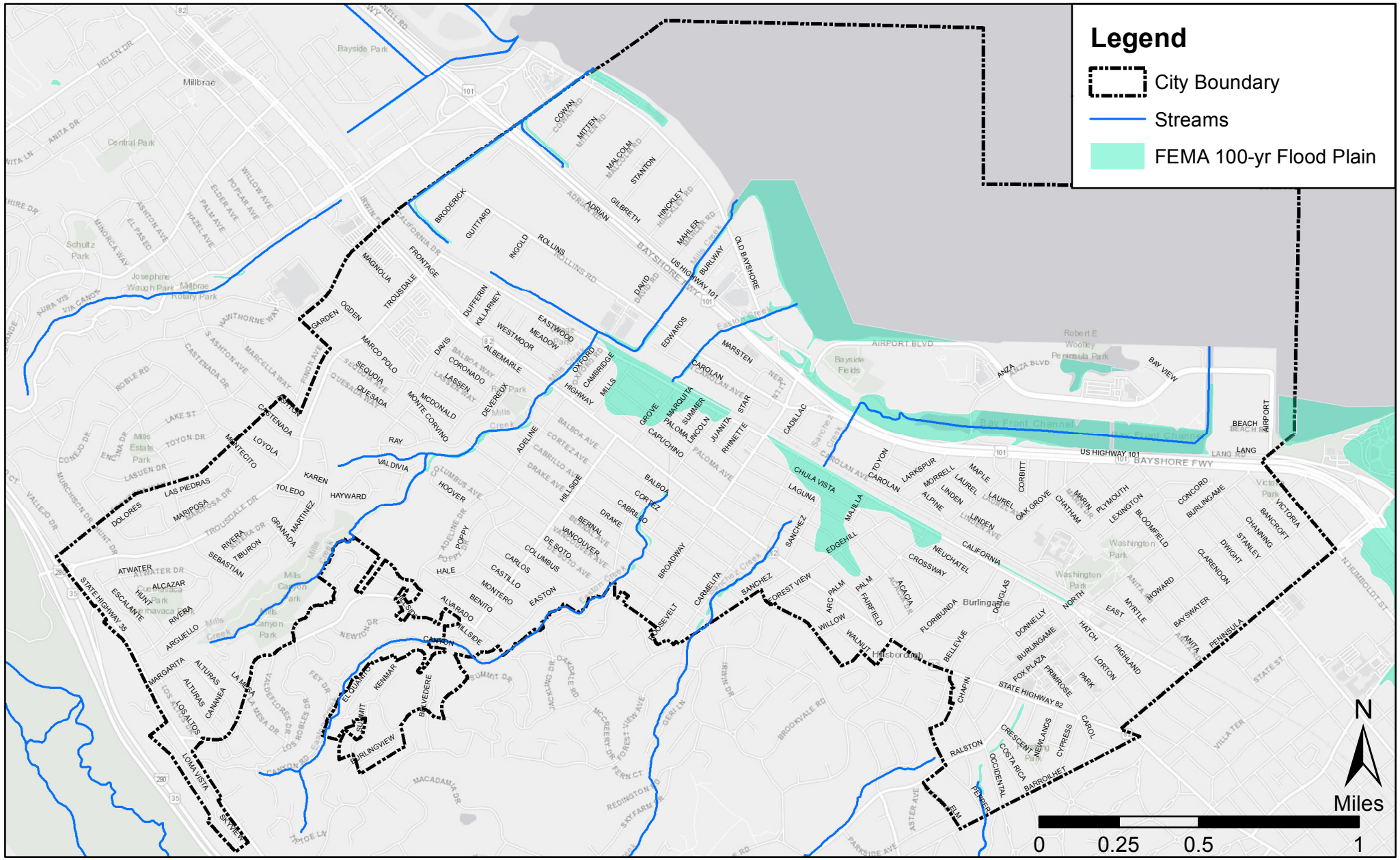
City of Burlingame: Prioritized Green Streets



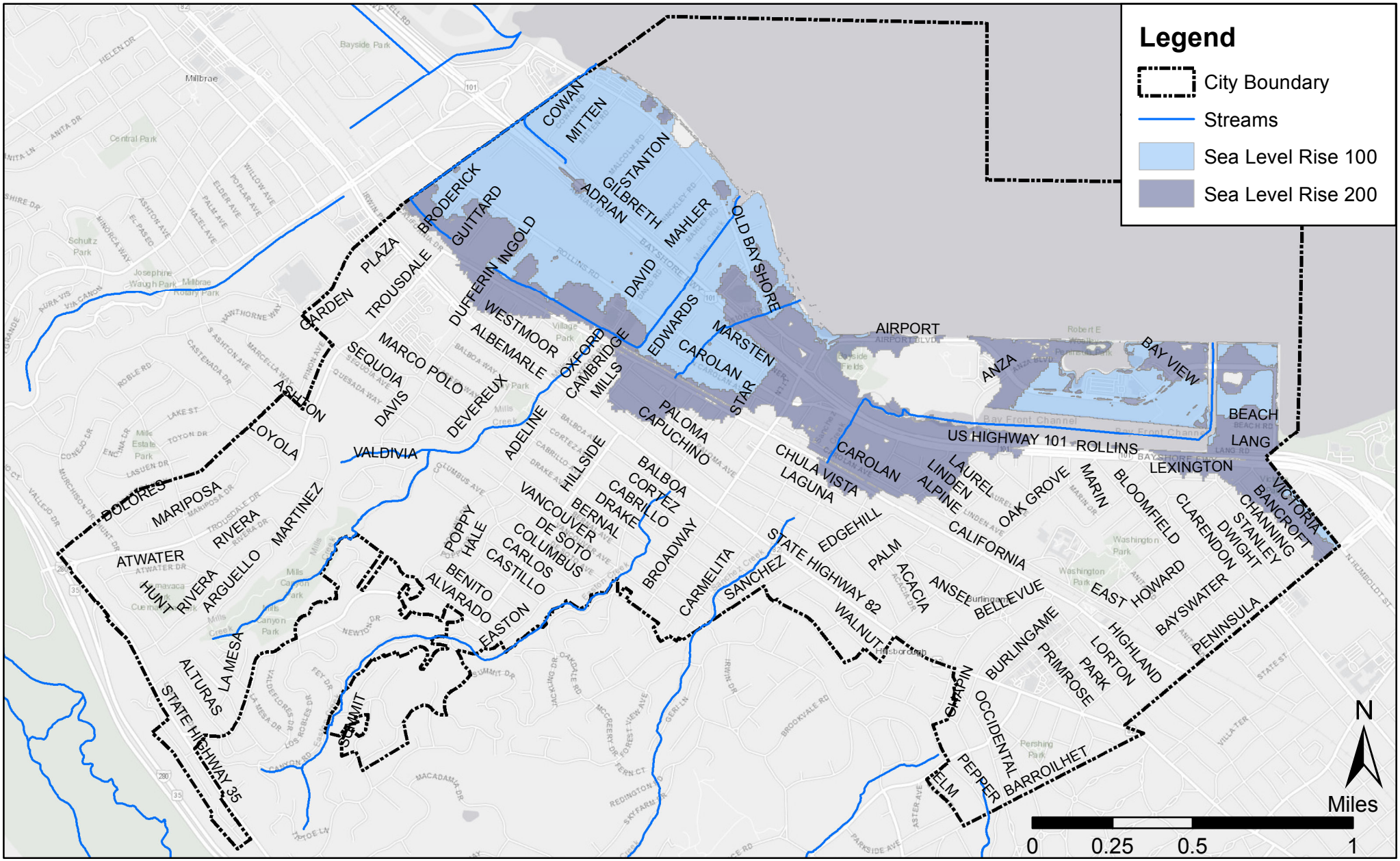
City of Burlingame: Prioritized LID and Regional Projects



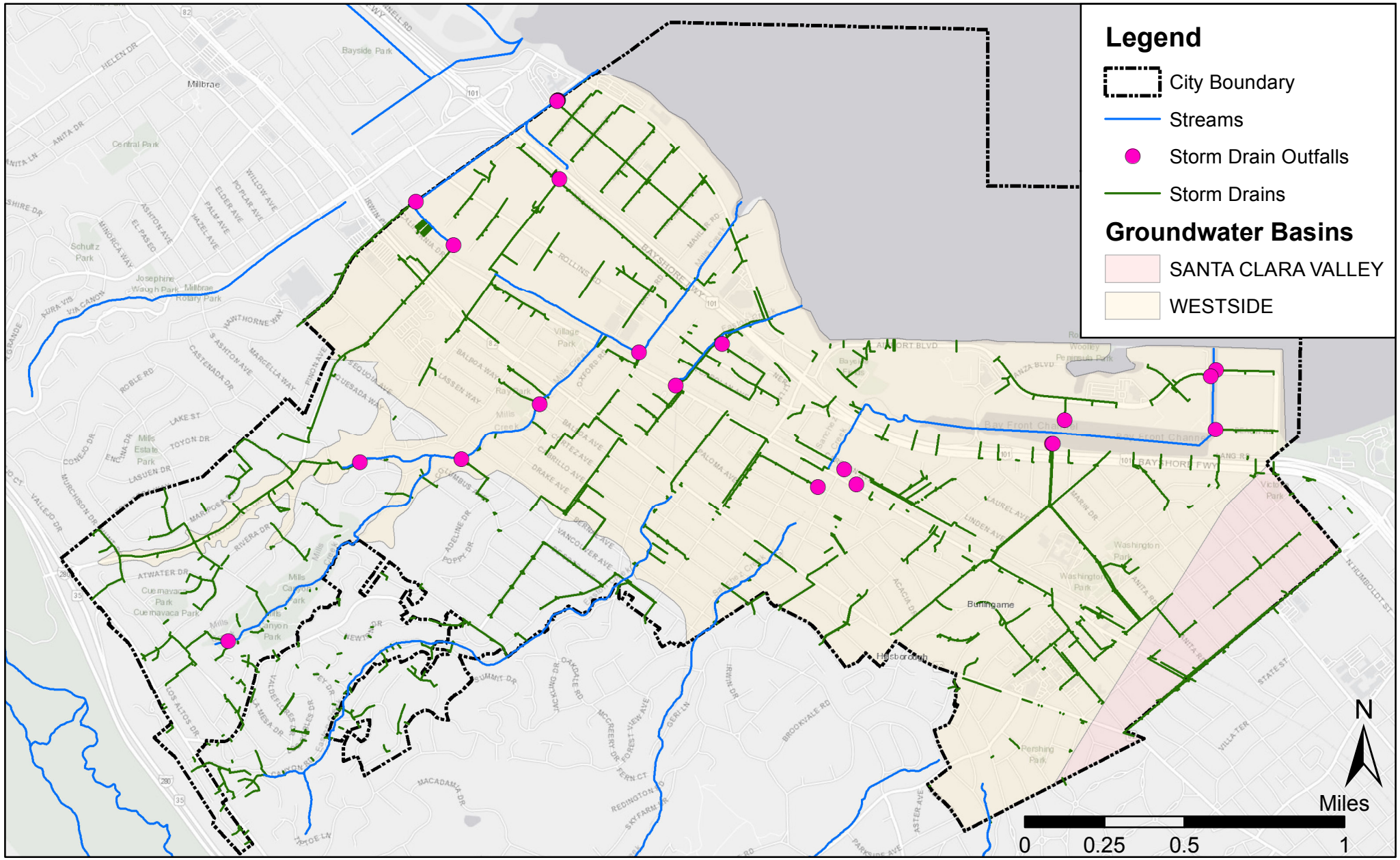
City of Burlingame: FEMA 100-yr Flood Plain



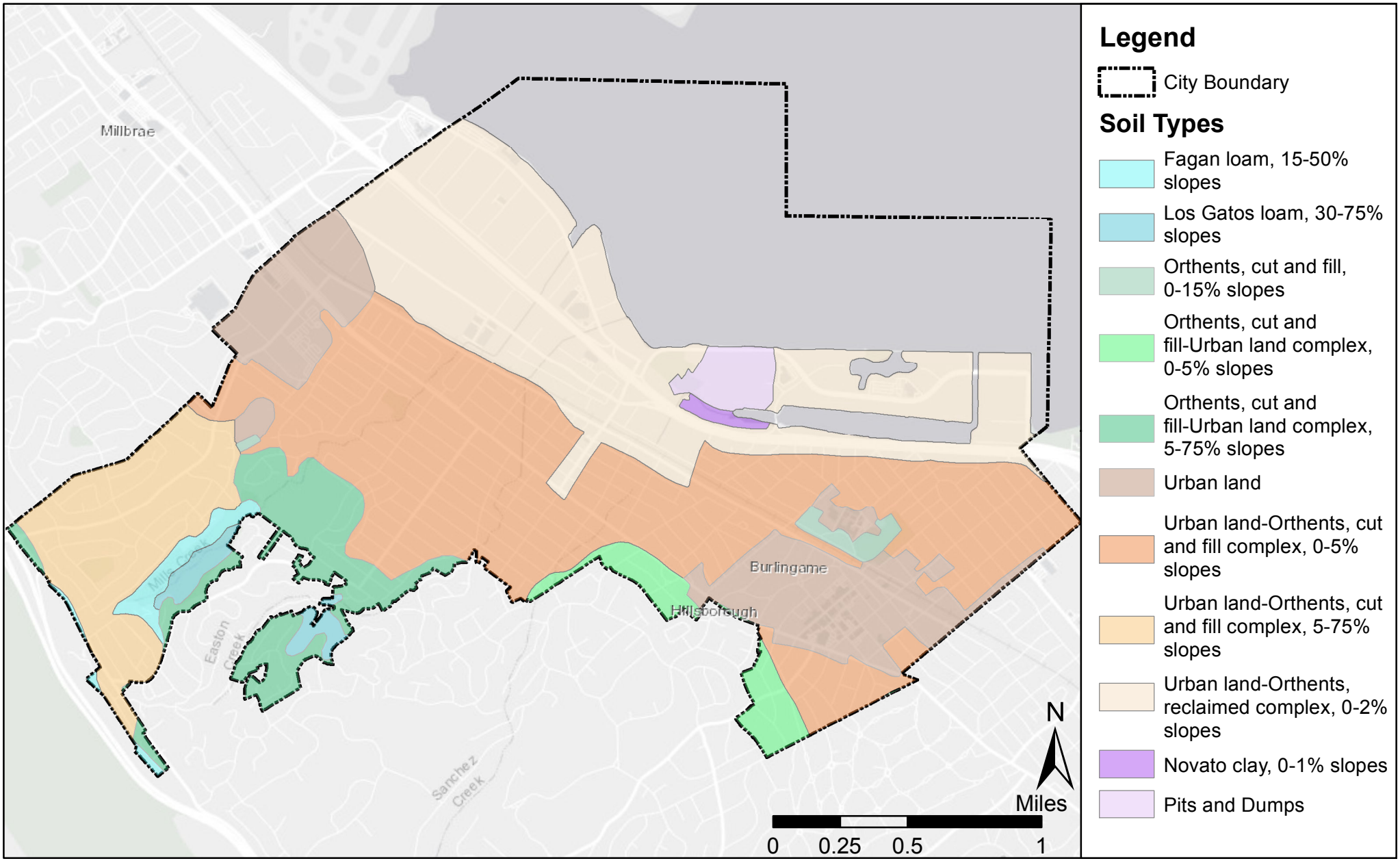
City of Burlingame: Sea Level Rise



City of Burlingame: Water Resources



City of Burlingame: Soil Types



Appendix B.

Capital Improvement Program GI Screening Process

Part 1: Initial Screening

No Potential	**Eliminate from List**
No exterior work (e.g., interior remodel)	
Exterior building upgrades or equipment	
Development or funding of municipal programs	
Technical studies, data collection, or training	
Construction of streetlights and traffic signals	
Minor bridge and culvert repairs/replacement	
Non-stormwater utility projects	
Equipment purchase or maintenance	
Irrigation system installation, upgrades, or repairs	
Too Late to Change	
Project has gone to bid or is under construction	
Project is too far along in design stage to make changes (up to Agency judgment based on schedule and budget considerations)	
Too Early to Assess	**Eliminate from list, but reconsider next FY**
Not enough information to assess project for GI potential	
Maintenance/Minor Construction	**Eliminate from List**
Project is for maintenance purposes only or is minor in nature, and maintains the existing lines, grades, and capacity of the original facility. In addition, the project is not concentrated in one location and includes multiple work orders throughout various locations in the City. For example: 1. Pavement maintenance/replacement 2. Sidewalk, curb and gutter repairs 3. ADA ramps and other improvements	
Project meets the above criteria but includes at least 5,000 SF of impervious surface created or replaced in a single contiguous area.	**Move to Part 2**
All other projects	

Part 2: Assessment of GI Potential

Project involves: Alternations to existing building's roof drainage New/replaced pavement or drainage structures Concrete work Landscaping, including tree planting Streetscape and intersection improvements	**Move to Part 3**
Project is of these retrofit types: Road Diet Bike/Ped Facilities Pavement Reconstruction Street Beautification Tree Planting Park/Landscaping Retrofit Drainage Reconstruction Parking Lot Building	
Project is a master planning document, such as a Bike/Ped Master Plan, Parks Master Plan, or Storm Drain Master Plan	Assess possibility of integrating green infrastructure into these Master Planning Documents. **Associated individual projects move to Part 3**
Project is subject to C.3 requirements	Project must include GI per Provision C.3 Requirements.
None of the above categories apply	Individually assess for GI Potential. If no potential exists, document why GI is impracticable.

Part 3: Preliminary Design

Step 1: Information Collection / Reconnaissance

- Locate roof leaders and discharge points.
- Look for opportunities to substitute pervious pavements for impervious pavements.
- Identify available landscaped or paved areas adjacent or downgradient from paved or roof areas.
- Locate nearby storm drains.
- Assess potential for infiltration and groundwater depth.
- Assess potential for connection of underdrain (typ. 2-2.5 below bioretention area surface).

Step 2: Preliminary Sizing and Drainage Analysis

- Delineate drainage areas.
- Identify pathways to direct drainage from roof and pavement areas to potential GI facilities.
- Preliminary sizing of GI facilities.

Step 3: Barriers and Conflicts

- Identify barriers and conflicts:
  - Utility conflicts.
  - Property ownership.
  - Availability of water supply for irrigation.
  - Integration of GI features vs. "add-on".
- Presence of barriers or conflicts does not necessarily mean GI is infeasible but may affect cost or public acceptance.

Step 4: Budget and Schedule

- Budget considerations:
  - Sources of funding that might be available for GI.
  - Potential savings achieved by integrating with other planned projects (e.g. bike/pedestrian, beautification, etc.) or reducing cost of "gray" drainage facilities.
- Schedule considerations:
  - Constraints on schedule due to regulatory mandates, grant requirements, etc.
  - Whether schedule allows time for any design changes needed to incorporate GI.
  - Whether schedule allows time to align separate funding for GI features.

Step 5: Results of Assessment

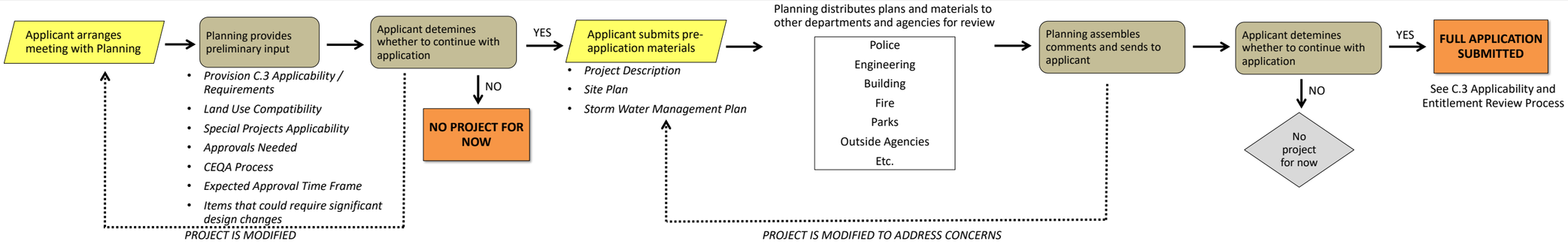
- Does the project have GI potential?
  - Consider results of previous steps.
  - Consider ancillary benefits of GI.
- Does it make sense to include GI in this project, if funding was available for the incremental costs of GI elements?

Appendix C.

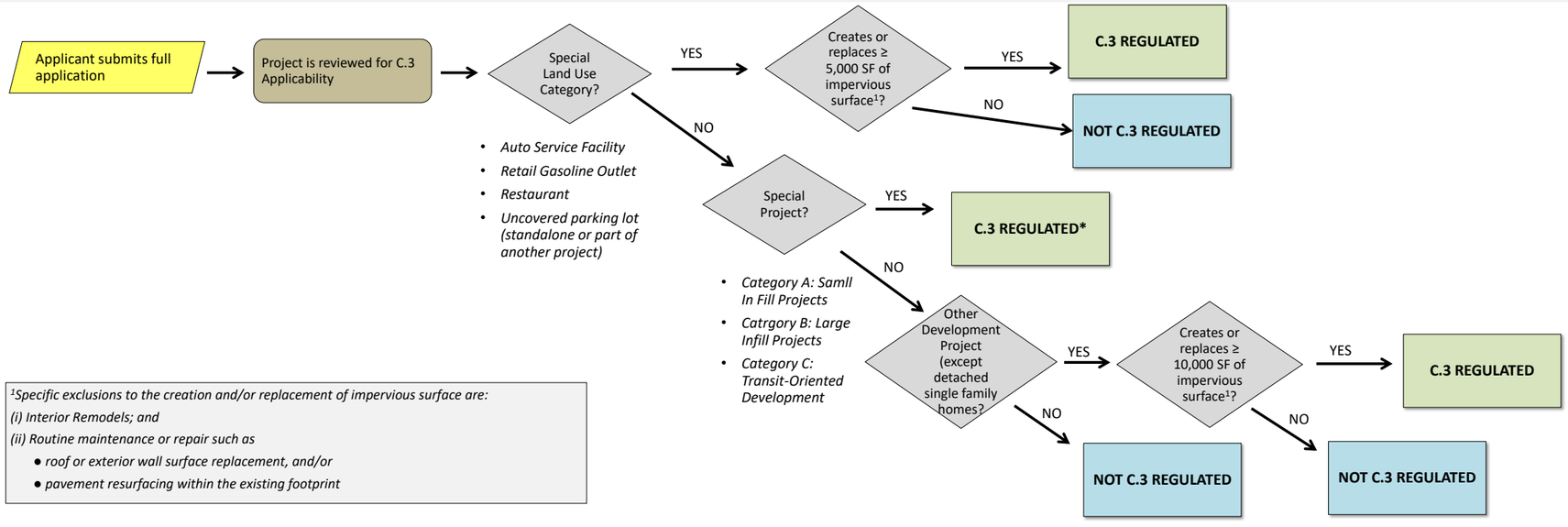
Development Review Process Flowcharts

DEVELOPMENT REVIEW PROCESS

Entitlement Pre-Application Review



Development and Redevelopment C.3 Applicability Review



[1]*Specific exclusions to the creation and/or replacement of impervious surface are:*
(i) Interior Remodels; and
(ii) Routine maintenance or repair such as
- *roof or exterior wall surface replacement, and/or*
- *pavement resurfacing within the existing footprint*

C.3 REGULATED PROJECT MEASURES

Applicant to complete the "C.3 and C.6 Development Review Checklist", and select appropriate:

- *Site Design Measures*
- *Source Control Measures*
- *Construction Best Management Practices*
- *Stormwater Treatment Measures*
- *Hydromodification Management Controls (if applicable)*

*Special Projects need to complete the Special Projects Worksheet

- Special Projects may be allowed to use non-lid treatment for 100% of the C.3.d amount of runoff

NON-C.3 REGULATED PROJECT MEASURES

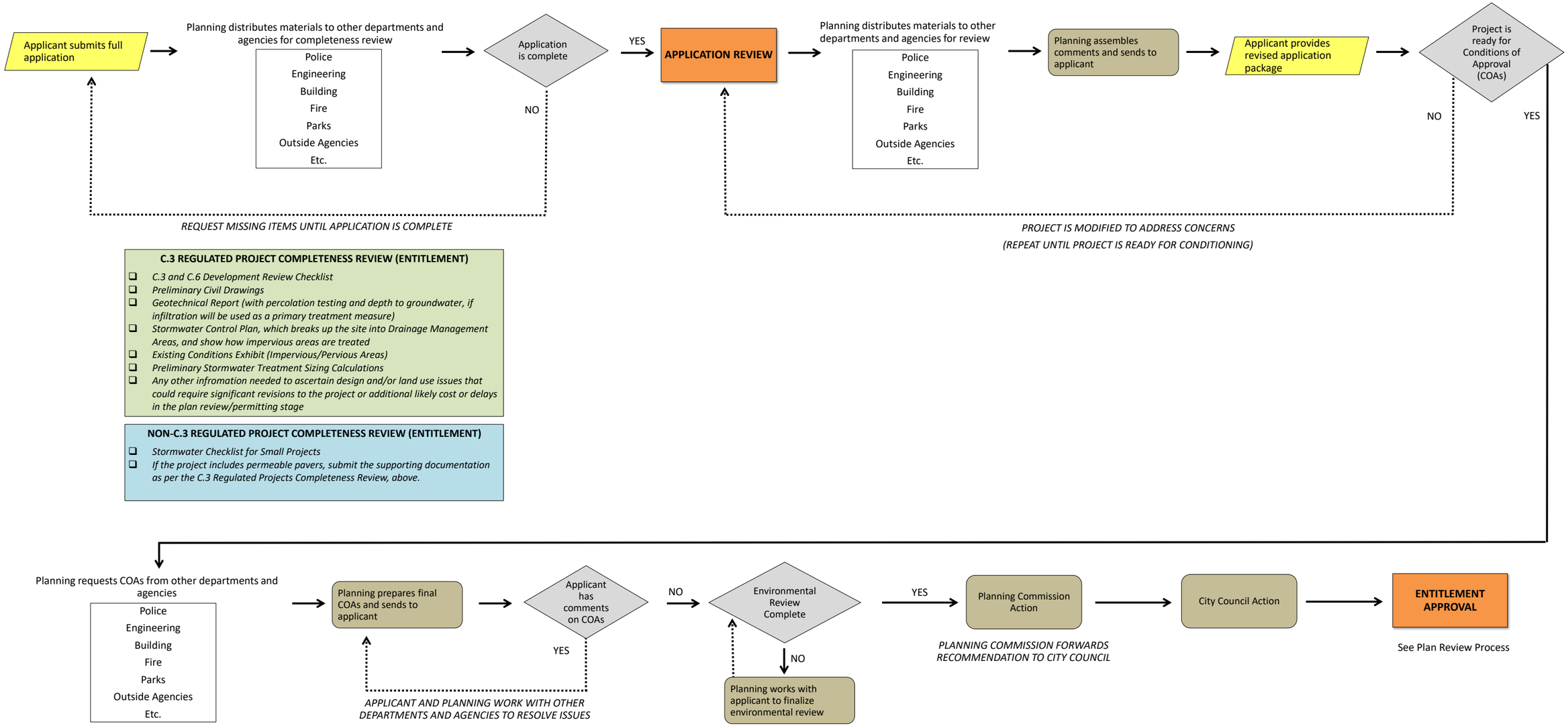
Applicant to complete the "Stormwater Checklist for Small Projects", and select appropriate:

- *Site Design Measures**
- *Source Control Measures*
- *Construction Best Management Practices*

**One or more site design measures <u>are required</u> for projects that create and/or replace 2,500 square feet or more of impervious surface. Otherwise, these measures are optional.*

DEVELOPMENT REVIEW PROCESS

Entitlement Review



C.3 REGULATED PROJECT COMPLETENESS REVIEW (ENTITLEMENT)

- ❑ *C.3 and C.6 Development Review Checklist*
- ❑ *Preliminary Civil Drawings*
- ❑ *Geotechnical Report (with percolation testing and depth to groundwater, if infiltration will be used as a primary treatment measure)*
- ❑ *Stormwater Control Plan, which breaks up the site into Drainage Management Areas, and show how impervious areas are treated*
- ❑ *Existing Conditions Exhibit (Impervious/Pervious Areas)*
- ❑ *Preliminary Stormwater Treatment Sizing Calculations*
- ❑ *Any other infromation needed to ascertain design and/or land use issues that could require significant revisions to the project or additional likely cost or delays in the plan review/permitting stage*

NON-C.3 REGULATED PROJECT COMPLETENESS REVIEW (ENTITLEMENT)

- ❑ *Stormwater Checklist for Small Projects*
- ❑ *If the project includes permeable pavers, submit the supporting documentation as per the C.3 Regulated Projects Completeness Review, above.*

ENVIRONMENTAL REVIEW

Planning completes the initial study:

- ➢ *Categorical Exemption - No further environmental review needed*
- ➢ *No Impact - Negative Declaration*
- ➢ *Minor Impact - Mitigated Negative Declaration*
- ➢ *Major Impact - Environmental Impact Report (EIR) Needed*

DEVELOPMENT REVIEW PROCESS

Plan Review

ENTITLEMENT APPROVAL → Applicant submits complete plan set package → Package is complete → YES → **PLAN REVIEW**

Package is complete → NO → *REQUEST MISSING ITEMS UNTIL PACKAGE IS COMPLETE* → Applicant submits complete plan set package

Lead department distributes materials to other departments and agencies for review

- Police
- Planning
- Engineering
- Building
- Fire
- Parks
- Outside Agencies
- Etc.

→ Lead department assembles comments and sends to applicant → Applicant provides revised package → All comments addressed, all COAs complied with

All comments addressed, all COAs complied with → NO → Applicant provides revised package → Lead department distributes materials to other departments and agencies for review

All comments addressed, all COAs complied with → YES → WORK ON PRIVATE PROPERTY / WORK ON PUBLIC PROPERTY

- **GRADING PERMIT**
- **ENCROACHMENT PERMIT**
- **BUILDING PERMIT**

See Construction Oversight Process

C.3 REGULATED PROJECT COMPLETENESS REVIEW (IMPROVEMENT PLANS)

- ❑ *C.3 and C.6 Development Review Checklist*
- ❑ *Civil Improvement Drawings*
- ❑ *Geotechnical Report (with percolation testing and depth to groundwater, if infiltration will be used as a primary treatment measure)*
- ❑ *Stormwater Control Plan, which breaks up the site into Drainage Management Areas, and shows how impervious areas are treated*
- ❑ *Existing Conditions Exhibit (Impervious/Pervious Areas)*
- ❑ *Preliminary Stormwater Treatment Sizing Calculations*
- ❑ *Draft Operations and Maintenance Agreement and Plan for the stormwater treatment measures. Refer to Regulated Projects Guide, Appendix G.*
- ❑ *Landscape Plans (if landscape-based stormwater treatment measures are used)*

NON-C.3 REGULATED PROJECT COMPLETENESS REVIEW (IMPROVEMENT PLANS)

- ❑ *Stormwater Checklist for Small Projects*
- ❑ *If the project includes permeable pavers, submit the supporting documentation as per the C.3 Regulated Projects Completeness Review, above.*

LEAD DEPARTMENT

Engineering will take the lead if the project includes grading, site work, and/or public right of way improvements (i.e., requires a grading permit).

Building will take the lead if the project includes new building construction (i.e., requires a building permit).

If both a grading permit and building permit are require, Engineering will typically take the lead first, and once the Grading Permit is received, Building will take the lead for the Building Permit phase.

Construction Oversight

PERMIT ISSUED → City Inspector(s) hold pre-construction meeting with Permittee → Discuss expectations and requirements

- Police
- Planning
- Engineering
- Building
- Fire
- Parks
- Outside Agencies
- Inspectors
- Etc.

→ Construction proceeds per approved plan set → See Closeout / Acceptance / Occupancy Process

Construction proceeds per approved plan set → *SUPPLEMENTAL MEETINGS AS NECESSARY WITH RELEVANT STAFF* → Discuss expectations and requirements

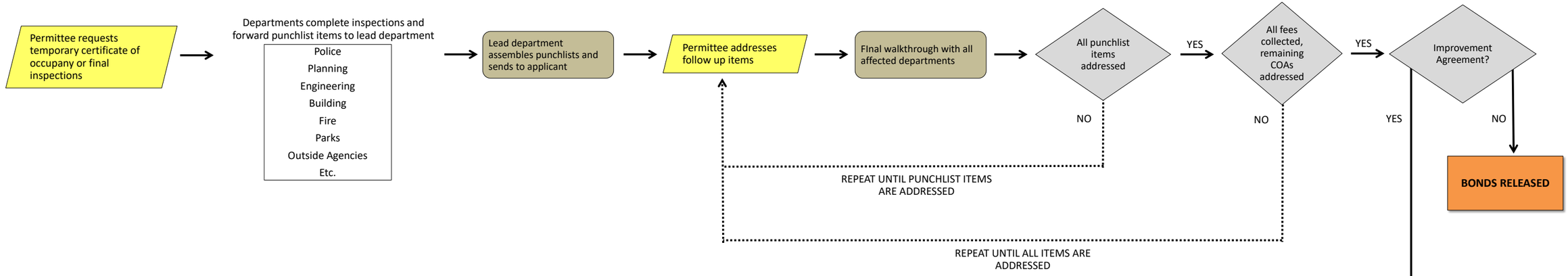
IN-PROGRESS C.3 REGULATED PROJECT INSPECTIONS

In-progress inspections of stormwater treatment measures are optional under the Municipal Regional Stormwater NPDES Permit (MRP), though are recommended to ensure the measures are constructed in accordance with the approved plan set. Any issues identified can be corrected in a timely fashion, well before project closeout. Inspections should occur at several stages of construction, for example:

- ❑ *Subgrade preparation*
- ❑ *Placement of material layers (filter fabric, subbase, base, soil, etc.)*
- ❑ *Installation of storm drain piping and structures*
- ❑ *Reinforcing steel and concrete formwork placement (if applicable)*
- ❑ *Installation of irrigation and planting*
- ❑ *After final landscaping*

DEVELOPMENT REVIEW PROCESS

Closeout / Acceptance / Occupancy



C.3 REGULATED PROJECT PUNCHLIST ITEMS

- ❑ *Final inspection performed for stormwater treatment measures and hydromodification management measures and found all measures to be constructed per plans and fully operational, with no observed issues*
- ❑ *As-built plans which fully reflect the field conditions*
- ❑ *Operations and Maintenance (O&M) Agreement, per local standards, has been reviewed and recorded*
- ❑ *O&M Plan, per Appendix G of the Regulated Projects Guide and local standards, has been reviewed and attached to the O&M Agreement*

NON-C.3 REGULATED PROJECT PUNCHLIST ITEMS

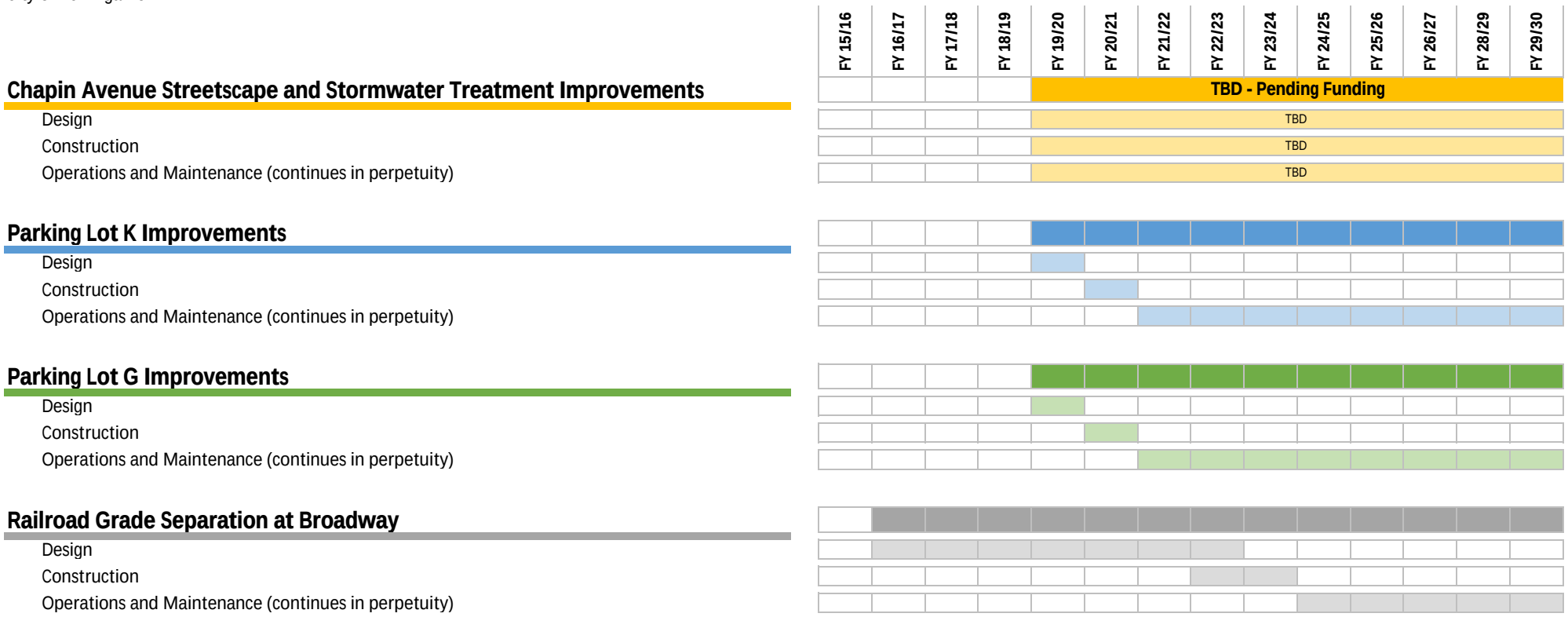
- ❑ *As-built plans which fully reflect the field conditions*
- ❑ *If the project includes permeable pavers, submit the C.3 Regulated Projects Punchlist Items, above.*

Appendix D.

Workplan for Prioritized GI Projects

DRAFT SCHEDULE FOR PRIORITIZED GI PROJECTS

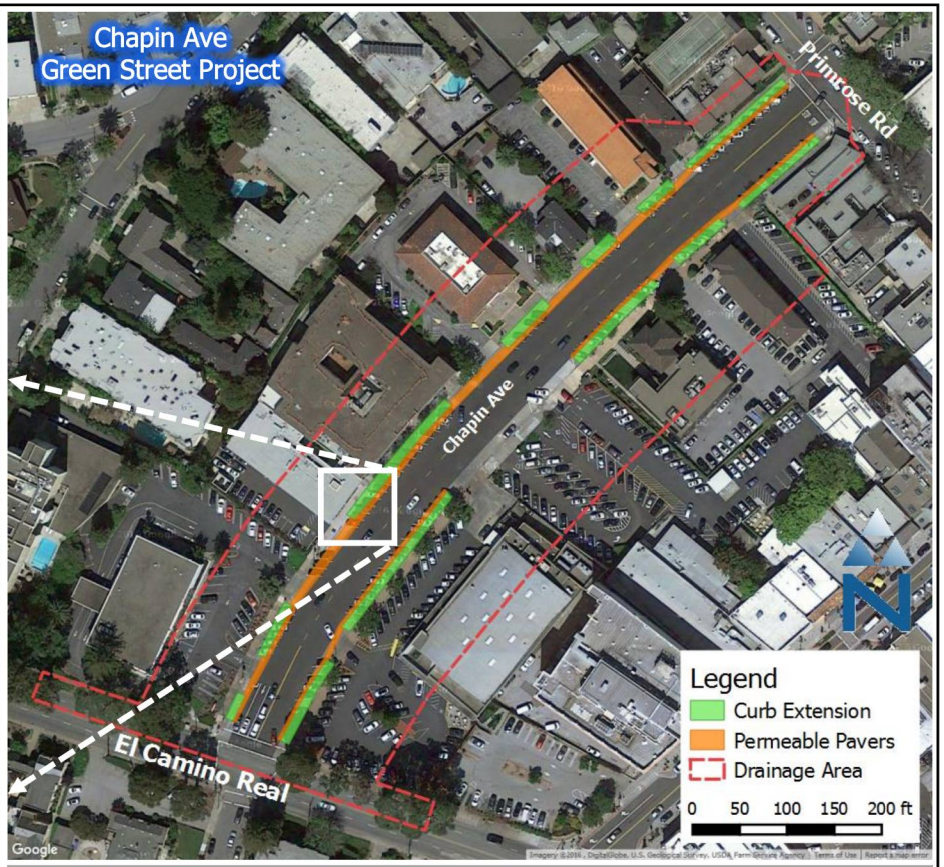
City of Burlingame



Site Information

Jurisdiction	City of Burlingame
Street Name	Chapin Ave
Bounding Streets	El Camino Real/ Primrose Rd
Street Typology	Commercial Main Street
Co-Located Project	Parking Lot LID Projects near El Camino Real
Capture Area (acres)	5.53
Impervious Area (%)	79
85th Percentile Rainfall (in)	0.85
Generated Runoff (ac-ft)	0.27

Bioretention on a Commercial Main Street



Design Summary

Green Infrastructure Type	Design Width (ft)	Design Length (ft)	Capture Volume (ac-ft)
Bioretention (Curb Extension)	4	1,000	0.173
Permeable Pavement	3	1,400	0.097

Cost Estimate

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Excavation/Hauling	1,520	CY	$50.00	$76,000
Bioretention	4,000	SF	$25.00	$100,000
Permeable Pavement	4,200	SF	$35.00	$147,000
Curbs and Gutters	1,000	LF	$17.25	$17,000
			CONSTRUCTION SUBTOTAL	$340,000
Planning (20%), Mobilization (10%), Design (30%), Contingency (25%)				$289,000
			TOTAL COST	**$629,000**

Site Description:

The proposed project consists of green street improvements along Chapin Avenue between El Camino Real and Primrose Road. The total street length is 925 feet. The site is a commercial main street with high parking demand. Curb extensions are recommended as the primary treatment type. The street is relatively wide and if angled parking is converted to parallel parking, wider curb extensions can be placed. Permeable pavers are suggested at parking spaces to meet stormwater capture goals. Planned parking lot LID retrofits near this site may reduce the required capture volume and permeable pavers may not be necessary.

The proposed improvements would capture 100% of the 85th percentile runoff volume (0.27 ac-ft) while providing flood risk mitigation, community enhancement, increased property values, and other multiple benefits.

DISCLAIMER: All elements of this conceptual design are planning-level. Locations of opportunities for placement of green infrastructure shown in the map are preliminary and subject to further site assessment and design. Percent imperviousness is based on best professional judgement. All design assumptions/parameters and cost estimates must be re-evaluated during the detailed design process.

Concept for a Green Street Retrofit for Stormwater Capture

Site: Chapin Avenue (City of Burlingame)

San Mateo Countywide Water Pollution Prevention Program

PARADIGM ENVIRONMENTAL

Prioritized Project Concept: Parking Lot K Improvements

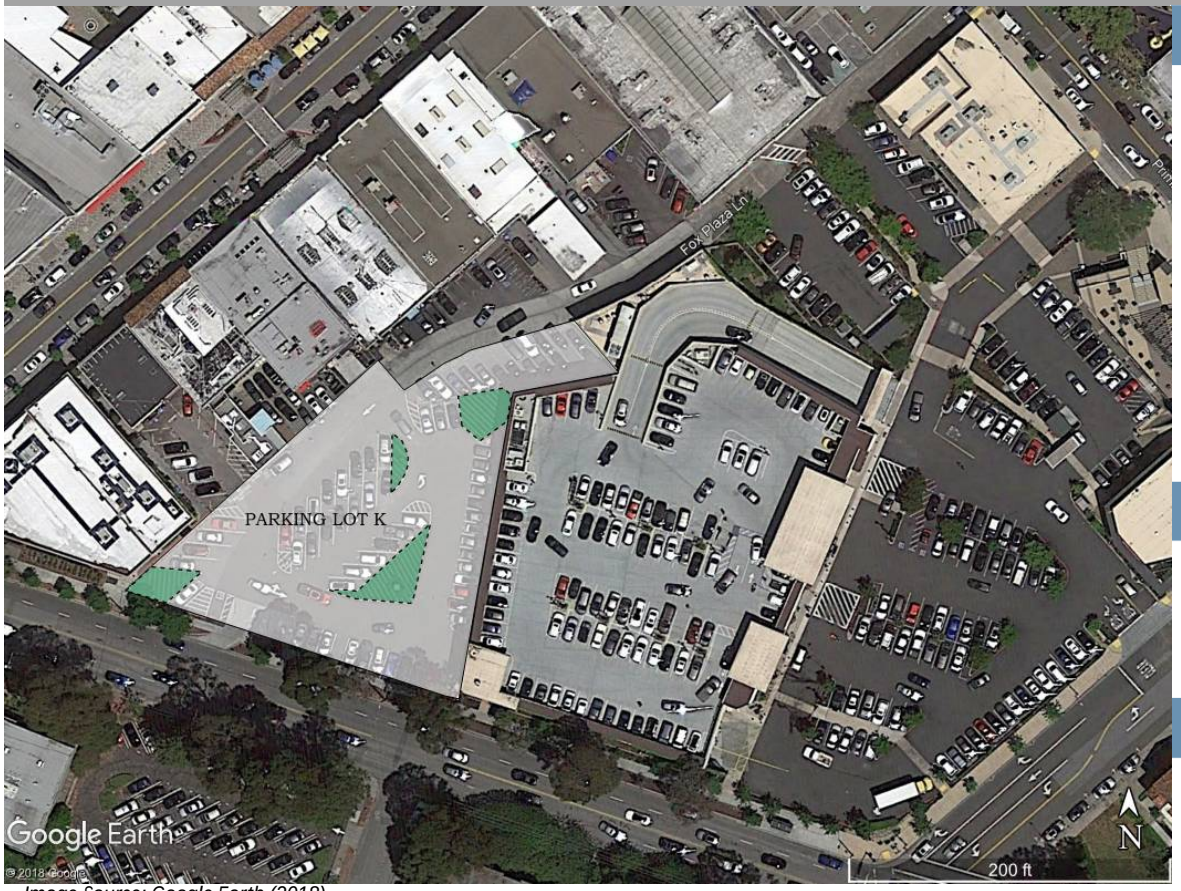


Image Source: Google Earth (2018)

Site Information:

Location	Parking Lot K End of Fox Plaza Lane Burlingame CA 94010
Capture Area	< 30,000 SF
Impervious Area	100%
GI Measures	Stormwater planter (location and size to be determined)

Project Schedule:

Project design and construction is anticipated to begin in within the next five years.

Project Estimate:

The project cost estimate is yet to be developed, but the City has allocated $100,000 for resurfacing parking lots each year from FY 2020 onward. The FY 2019 budget need is $391,000.

Project Description:

This project involves improvements to Public Parking Lot K, to improve the layout and quality of the asphalt. Similar to the City's rehabilitation approach on other recent parking lot projects, the City will allocate space in the areas not taken up by parking stalls for a stormwater planter. For example, the green areas in the existing parking lot configuration above are diagonally striped buffer areas to provide protection for vehicles or delineate "dead zones". These areas represent ideal locations for stormwater planters. The stormwater planter will reduce and filter storm drainage leaving the parking lot. The exact configuration of the parking lot and size and location of the stormwater planter(s) will be determined during project design development.

The scope will include sawcutting, demolition, pavement removal, earthwork, pavement installation, curb and gutter, storm drain installation, landscaping, striping, and signage.

This project is part of the City's Parking Lot Resurfacing Program, which targets parking lot reconstruction at various City lots.

Prioritized Project Concept: Parking Lot G Improvements

Image Source: Google Earth (2018)

Site Information:

Location	Parking Lot G Parallel to Howard Ave, between Primrose Rd and Park Rd Burlingame CA 94010
Capture Area	< 27,000 SF
Impervious Area	100%
GI Measures	Stormwater planter (location and size to be determined)

Project Schedule:

Project design and construction is anticipated to begin in within the next five years.

Project Estimate:

The project cost estimate is yet to be developed, but the City has allocated $100,000 for resurfacing parking lots each year from FY 2020 onward. The FY 2019 budget need is $391,000.

Project Description:

This project involves improvements to Public Parking Lot G, to improve the layout and quality of the asphalt. Similar to the City's rehabilitation approach on other recent parking lot projects, the City will allocate space in the areas not taken up by parking stalls for a stormwater planter. For example, the green areas in the existing parking lot configuration above are diagonally striped buffer areas to provide protection for vehicles or delineate "dead zones" or existing landscaping areas. These areas represent ideal locations for stormwater planters. The stormwater planter will reduce and filter storm drainage leaving the parking lot. The exact configuration of the parking lot and size and location of the stormwater planter(s) will be determined during project design development.

The scope will include sawcutting, demolition, pavement removal, earthwork, pavement installation, curb and gutter, storm drain installation, landscaping, striping, and signage.

This project is part of the City's Parking Lot Resurfacing Program, which targets parking lot reconstruction at various City lots.

Prioritized Project Concept: Railroad Grade Separation at Broadway

Image Source: Rendering of project from the Caltrain Burlingame Broadway Grade Separation Community Meeting on August 8, 2018.

Site Information:

Location	Broadway Ave and California Drive Burlingame, CA 94010
Capture Area (SF)	To be determined
Impervious Area (%)	To be determined
GI Measures	To be determined

Project Schedule:

Preliminary design (35%) was underway from Winter 2017 to Spring 2019. Environmental clearance is anticipated in Summer 2019. The construction schedule has not yet been determined.

Project Estimate:

The project is primarily funded through Measure A, with an allocation of $3.85 million. The City has currently allocated $743,000 to the project, with another $250,000 to be allocated in 2023.

Project Description:

Caltrain, in cooperation with the City of Burlingame, will separate the tracks from the road at Broadway in Burlingame. The City's preferred alternative is to partially depress Broadway while partially raising the railroad tracks. This will improve safety for motorists, pedestrians, bicyclists and Caltrain railroad operations, as well as reduce local traffic congestion in Burlingame. The project will also construct a new elevated Broadway Station with new amenities that eliminates the current hold-out rule in which only one train is allowed at the station at a time.

During project design development, the project C.3 regulation status and potential for the incorporation of green infrastructure will be assessed.

Appendix E.

Key Green Infrastructure TAC Work Products

The SMCWPPP GI TAC provided work products which supplied and informed the key elements of the GI Plan. Developing these elements at a countywide level was a significant effort, and required collaboration among the various agencies in San Mateo, all of which have a different local context and perspective. Each GI TAC meeting required a commitment on the part of member agency staff to (1) review discussion items several weeks prior to the meeting, (2) attend meetings a minimum of 2.5 hours in length either remotely or in person, and (3) provide feedback on in-progress or updated versions of deliverables within a few weeks of each meeting. Key work products developed through the GI TAC include the following (select deliverables are summarized in a timeline on the next page):

- **GI TAC.** Formation of a committee to aid coordination among the San Mateo County Permittees to develop the GI Plans.
- **SRP.** Development of the San Mateo Countywide Stormwater Resource Plan (SRP), which established a prioritization protocol for GI projects and a list of prioritized GI projects.
- **CIP Screening.** Training on the BASMAA GI screening process to aid cities in undertaking an annual evaluation of their Capital Improvement Program for GI potential.
- **GI Workplan.** GI Workplan materials development, including the template, sample staff report, and sample resolution.
- **GreenSuite.** Development of Countywide GI Guidelines and Specifications, consisting of the *Design Guide* and *C.3 Regulated Projects Guide*, referred together as the "GreenSuite."
- **GI Funding Analysis.** Evaluation of GI funding options, which was summarized in a Nexus Funding Evaluation report developed by SCI Consulting Group on behalf of SMCWPPP, and with input from the GI TAC.
- **RAA.** Completion of a Reasonable Assurance Analysis (RAA), which sets countywide milestones for the amount of stormwater treatment capacity, impervious surface, and sediment reduction which will be provided by each Permittee in 2020, 2030, and 2040.
- **Planning Updates.** Model language for insertion in municipalities' documents. This included a review of various planning documents (e.g., Bicycle Plan, Climate Action Plan, General Plan, Municipal Code, etc.) completed by SMCWPPP consultant and with input from the GI TAC.
- **Alternative Sizing Criteria.** BASMAA Guidance for Sizing GI Facilities in Street Projects & GI Facility Sizing for Non-Regulated Street Projects. This serves to address Provision C.3.j.i.(2)(g) of the MRP, which states, "Permittees may collectively propose a single approach with their GI Plans for how to proceed should project constraints preclude full meeting the C.3.d. sizing requirements."

SMCWPPP Green Infrastructure Technical Advisory Committee Deliverables Timeline.