



Green Infrastructure Plan

Town of Atherton



September 18, 2019

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CONSULTANT TEAM

COMMUNITY DESIGN + ARCHITECTURE
LARRY WALKER ASSOCIATES

List of Acronyms

Acronym	Definition
Ac	Acre
Ac-ft	Acre-feet
BASMAA	Bay Area Stormwater Management Agencies Association
C/CAG	City/County Association of Governments
CEQA	California Environmental Quality Act
CIP	Capital Improvements Projects
Countywide Program	San Mateo Countywide Water Pollution Prevention Program
DMA	Drainage Management Area
FY	Fiscal Year
GI	Green infrastructure
LID	Low impact development
HM	Hydromodification management
HRU	Hydrologic Response Units
LSPC	Loading Simulation Program C++
MRP	Municipal Regional Stormwater Permit
MTC	Metropolitan Transportation Commission
N/A	Not appropriate
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and maintenance
PCBs	Polychlorinated biphenyls
RWQCB	Regional Water Quality Control Board
RAA	Reasonable Assurance Analysis
sf	Square feet
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
SRP	Stormwater Resource Plan
SUSTAIN	System for Urban Stormwater Treatment & Analysis Integration
TBD	To be determined
TMDL	Total maximum daily load

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1.0 Introduction

a. Purpose of the Green Infrastructure Plan

The purpose of the Green Infrastructure Plan is to guide the identification, implementation, tracking, and reporting of green infrastructure projects within the Town of Atherton in accordance with the requirements of Municipal Regional Stormwater Permit (MRP), Order No. R2-2015-0049, adopted by the San Francisco Bay Regional Water Quality Control Board on November 15, 2015. The Plan is required by the MRP, in part, as an alternative to expanding the definition of Regulated Projects prescribed in Provision C.3.b to include all new and redevelopment projects that create or replace 5,000 square feet or more of impervious surface areas and road projects that just replace existing impervious surface area. “Green infrastructure” refers to 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 and landscaped areas that provide habitat, flood protection, cleaner air, and cleaner water. At the scale of a neighborhood, street, or site, green infrastructure refers to stormwater management systems that mimic nature by soaking up, storing, and/or improving the quality of water.

MRP Requirements

This Green Infrastructure Plan has been developed to comply with Green Infrastructure Plan requirements in Provision C.3.j of the MRP, which states in part:

The Plan is intended to serve as an implementation guide and reporting tool during this and subsequent Permit terms to provide reasonable assurance that urban runoff TMDL wasteload allocations (e.g., for the San Francisco Bay mercury and PCBs TMDLs) will be met, and to set goals for reducing, over the long term, the adverse water quality impacts of urbanization and urban runoff on receiving waters. For this Permit term, the Plan is being required, in part, as an alternative to expanding the definition of Regulated Projects prescribed in Provision C.3.b to include all new and redevelopment projects that create or replace 5,000 square feet or more of impervious surface areas and road projects that just replace existing impervious surface area. It also provides a mechanism to establish and implement alternative or in-lieu compliance options for Regulated Projects and to account for and justify Special Projects in accordance with Provision C.3.e.

Over the long term, the Plan is intended to describe how the Permittees will shift their impervious surfaces and storm drain infrastructure from gray, or traditional storm drain infrastructure where runoff flows directly into the storm drain and then the receiving water, to green—that is, to a more-resilient, sustainable system that slows runoff by dispersing it to vegetated areas, harvests and uses runoff, promotes infiltration and evapotranspiration, and uses bioretention and other green infrastructure practices to clean stormwater runoff.

The Plan shall also identify means and methods to prioritize particular areas and projects within each Permittee’s jurisdiction, at appropriate geographic and time scales, for implementation of green infrastructure projects. Further, it 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. As appropriate, it shall incorporate plans required elsewhere within this Permit, and specifically plans required for the monitoring of and to ensure appropriate reductions in trash, PCBs, mercury, and other pollutants.

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MRP Provision C.3.j requires Permittees to complete and implement GI Plans that facilitate Permittee efforts to transition from traditional gray to green infrastructure-centric approaches. The MRP sets forth three broad goals for these plans:

1. Ensure each Permittee has established the necessary procedures and practices to require and implement green infrastructure practices in public and private projects as part of its regular course of business.
2. Serve as a reporting guide and implementation tool to provide reasonable assurance that urban runoff TMDL wasteload allocations will be met, including the projected goal of controlling 3 kg/year of PCBs regionwide via green infrastructure by 2040.
3. Set targets for green infrastructure implementation and identify future actions needed to address the adverse water quality impacts of urbanization and urban runoff on receiving waters.¹

b. Town of Atherton Description and Background

Atherton is part of the near continuously developed area stretching along the western shore of San Francisco Bay between the cities of San Francisco and San Jose. The area known as “The Peninsula” is constrained by the Bay and the Santa Cruz Mountains. Atherton is in the heart of the mid-peninsula and is bounded by Redwood City on the north, Menlo Park on the east and south, and Woodside on the west. Atherton has an area of approximately 3,600 acres or 5.6 square miles; 89% of which is single-family residential, 5% parks and open space, and 6% public and private schools and municipal facilities.

Through the years, Atherton has evolved from a collection of country estates into a residential community consisting of predominantly larger single-family residential lots. The Town’s rural character, including its extensive tree canopy, sets itself apart from its more urbanized neighbors. The Town has committed to maintaining its rural character and contains primarily lower density residential uses. There are also a few schools. Commercial, industrial and mixed-use developments are prohibited by the Town’s strict zoning code. Lot sizes are typically limited to a minimum of 1 acre. Home sizes, while often large, typically have large setbacks. The Town is essentially fully developed, but does experience on-going redevelopment and remodeling of existing homes and residential lots. Preservation of trees, particularly heritage oak trees, is a high priority for the community.

With the exception of El Camino Real, a State Highway, streets are limited to a maximum of two through lanes, and generally do not have sidewalks. El Camino Real is a major artery not just through Atherton, but the entire peninsula. To address on-going issues with the El Camino Real corridor, the Grand Boulevard Initiative has been established. The Grand Boulevard Initiative is a collaboration of 19 cities, counties, and local and regional agencies united to improve the performance, safety and aesthetics of El Camino Real. The redesign of El Camino Real can provide an opportunity for the Town and other jurisdictions to integrate green infrastructure into the street. The Town’s Bicycle and Pedestrian Master Plan envisions a redesign of El Camino Real into a Grand Boulevard Greenway, repurposing a travel lane in each direction to provide dedicated bicycle, pedestrian and stormwater planter buffers.

Atherton City Council has adopted Complete Streets policies. The policies adopted include a commitment to creating and maintaining Complete Streets serving all users, to maintaining a context of sensitivity to a strong sense of place and preservation of the Town’s rural character, to assure that Complete Streets are routinely addressed by all the Town departments, and to consider incorporating Complete Streets infrastructure in all projects and phases. Along with Complete Streets policies the Town also has Green Streets Policies. Green Streets will have a stormwater managements approach that requires pervious shoulders, incorporates

¹ Letter from San Francisco Bay Regional Water Quality Control Board to Municipal Regional Stormwater NPDES Permit Permittees. February 5, 2019.

vegetation (perennials, shrubs, trees), soil, and engineered systems (permeable pavements) to slow, filter, and cleanse stormwater runoff from impervious surfaces in support of the Green Infrastructure Plan.

Flooding has not presented a significant, extensive hazard in Atherton in the past, however, there have been numerous recurring localized areas of flooding. Many of the identified problem areas were addressed with improvement projects implemented since 2001 or with maintenance activities. There are no Federal Emergency Management Agency (FEMA) identified flood prone or hazard areas in Atherton. There are areas within the Town, due to their proximity to the Atherton Channel or in portions of lower-lying Lindenwood, which require raised finished floor elevations (typically by approximately 1 foot) during new construction.

The primary waterway in Atherton is the Atherton Channel. The headwaters of the Atherton Channel originate west of Interstate 280 in the hillside area of the Town of Woodside. The Town formed the Atherton Channel Drainage District in 1958 to construct and maintain storm water collection facilities in areas determined to be in the local stream flood plain. The District boundaries include most of the Town south of Atherton Avenue, a portion of unincorporated University Heights, and small areas of the City of Menlo Park and Town of Woodside.

Atherton has entered into a partnership with the jurisdictions of Redwood City, Menlo Park, and San Mateo County to complete the planning, design and environmental permitting for the proposed Bayfront Canal/Atherton Channel Flood Protection Project. The two channels intersect in the City of Redwood City west of U.S. 101 near the Marsh Road interchange. Both watersheds have experienced decades of repetitive flooding in the lower reaches of the channels, flooding streets, residences and businesses in Redwood City.

The Town is currently evaluating a regional stormwater capture project: a runoff diversion, storage and filtration system, within the Atherton Channel watershed. This project has a number of objectives, including:

1. Capturing dry weather runoff in order to reduce the transport of pollutants to San Francisco Bay,
2. Capturing at least the first flush of wet-weather runoff to reduce the load of pollutants transported to the Bay,
3. Diverting and detaining potential flood flows from the Atherton Channel,
4. Meeting requirements of the MRP including implementing green infrastructure opportunities,
5. Minimizing the on-going operations and maintenance costs, and
6. Potentially reusing storm water by infiltration and for irrigation.

The proposed project, which is currently in the environmental analysis phase, is in partnership with Caltrans and two private land owners.

c. Green Infrastructure Plan Development Process

Atherton has engaged in a comprehensive and coordinated process in the development of the Town’s Green Infrastructure Plan. As a member agency of the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) and its Green Infrastructure Committee, the Town jointly collaborated with the Countywide Program, its consultants, and other member agencies in the development and integration of some of the materials required to fulfill or to support the preparation of GI Plans, and related documents including the San Mateo Stormwater Resource Plan, Green Infrastructure Reasonable Assurance Analysis, Bay Area Stormwater Management Agencies Association regional sizing for constrained non-regulated street projects, and the San Mateo Sustainable Streets Master Plan. Atherton staff has participated on a quarterly basis with the SMCWPPP GI Committee for the past two years to review and discuss GI Plan related elements and approaches. This ongoing support that helped with coordination and providing template material. In addition, Atherton’s GI Plan was developed in collaboration with multi-disciplinary town staff, town decision makers, and the community in coordination with town consultants.

The Town has worked extensively over the last three years to work with staff, decision makers, and the public to identify opportunities to develop its GI Plan to meet achieve the mandates of the MRP. Staff has held internal ongoing multi-disciplinary meetings to discuss the need, goals, and vision for both Atherton’s GI WorkPlan and GI Plan.

d. San Mateo Countywide Program, Inter-Agency, and Town Coordination

The Town is a member of the San Mateo Countywide Water Pollution Prevention Program (Countywide Program), a program that is a partnership of the City/County Association of Governments (C/CAG), the County of San Mateo, and each incorporated city and town in the county, that share a common National Pollutant Discharge Elimination System (NPDES) permit. The Town’s GI Plan was developed in collaboration with internal Town staff, coordinating with consultants, and countywide guidance.

The Town held internal multi-disciplinary meetings with Town staff and discussed the need for the GI Plan. The Town used a builder’s round table to discuss PCBs and low-impact site design measures. There were also important discussions regarding no missed opportunities for green infrastructure planning and implementation. The Town also met for the past two years on a quarterly basis with SMCWPPP Green Infrastructure Committee member agencies to review and discuss GI Plan related work plans. This was ongoing countywide program support that helped with coordination and providing template material.

The Town has been working with other agencies and private landowners to create regional projects. One large project that the Town has been working on is the Cartan Fields Water Capture Project where there are several opportunities to incorporate green infrastructure. The Town has also created guidance to encourage incorporating green infrastructure into private development projects. This includes grading and drainage guidelines to encourage LID and pervious materials along the frontage of properties and requiring developments increasing impervious areas to incorporate detention basins. In addition, the Town is investigating further opportunities to implement green infrastructure.

e. Summary of Green Infrastructure Plan Elements

This GI Plan contains the elements required by the MRP. Table 1-1 below links each section of this Plan to the applicable MRP provision.

Table 1-1: Green Infrastructure Plan Chapters and Applicable MRP Provisions for Green Infrastructure Planning and Implementation

Chapter of Green Infrastructure Plan	Applicable MRP Provision
1. Introduction	C.3.j
2. Green Infrastructure Project Identification and Prioritization	C.3.j.i.(2)(a), C.3.j.i.(2)(b), and C.3.j.i.(2)(j)
3. Atherton Green Infrastructure Implementation	C.3.j.i.(2)(a), C.3.j.i.(2)(b), C.3.j.i.(2)(c), and C.3.j.i.(2)(d)
4. Green Infrastructure Project Tracking and Mapping	C.3.j.i.(2)(d)
5. Green Infrastructure Integration with Other Planning Documents and Legal Mechanisms	C.3.j.i.(2)(h), C.3.j.i.(2)(i), and C.3.j.i.(3)
6. Green Infrastructure Guidance	C.3.j.i.(2)(e), C.3.j.i.(2)(f), and portion of C.3.j.i.(2)(g)
7. Green Infrastructure Hydraulic Sizing	C.3.j.i.(2)(g)
8. Evaluation of Funding Opportunities	C.3.j.i.(2)(k)
9. Outreach and Education	C.3.j.i.(4)
Appendices A. Atherton-specific Prioritization Factor and Criteria Tables B. Example GI Plan Text Summarizing Results of the RAA C. Atherton-specific Implementation Measures and Strategies Identified by the Countywide Program’s GI RAA	

2.0 Green Infrastructure Project Identification and Prioritization

a. *Prioritization Approach*

This chapter describes the prioritization and mapping approach and process for green infrastructure projects as required in Provision C.3.j.i.(2)(a) and provides a summary description of prioritized green infrastructure projects and opportunities by type per Provision C.3.j.i.(2)(b). In addition, prioritized projects for early implementation are summarized; the discussion of early implementation outlines a workplan to complete prioritized projects per Provision C.3.j.i.(2)(j).

The San Mateo Countywide Stormwater Resource Plan (SRP) was used to identify, prioritize, and map areas for planned and potential green infrastructure projects throughout the County. A secondary process was developed for and used by Atherton to refine the countywide process to develop Town-specific criteria for prioritizing potential public green infrastructure opportunities and other opportunities for private development and private/public partnerships. Both processes developed maps and project lists which can be incorporated into the Town's long-term planning and capital improvement processes. A map and listing of these prioritized opportunities is included in this section.

The Countywide Program is developing a GI Reasonable Assurance Analysis (GI RAA) to first identify and map a "recipe" of projects and wasteload allocation reduction goals for implementation by 2020, by 2030, and by 2040, and secondly, to develop a tracking system for completed projects. Refer to Chapter 3 for further information.

b. *Project Identification and Prioritization*

Countywide Process²

The SRP includes an evaluation of project benefits addressing several key metrics: Water Quality, Water Supply, Flood Management, Environmental, and Community benefits. First, suitable public parcels and public rights of way were identified. Hydrologic Response Units (HRUs), small spatial units containing unique attributes, were used to evaluate watershed processes to prioritize stormwater and dry weather runoff capture projects. The following attributes were assessed: land use, impervious cover, hydrologic soil groups, and slope. Based on these key metrics, watershed characteristics, and watershed processes, several green infrastructure stormwater projects were identified and prioritized to address water quality impairments, reduce flooding, and provide more natural groundwater recharge throughout the County.

A screening and prioritization method was developed, for the SRP, to reasonably assess stormwater capture projects, with an emphasis on projects that offered the greatest opportunity for multiple benefits. Higher prioritization was given to projects that addressed flood-prone streams, those located in PCBs-interest areas, and ones that drain to TMDL waters.

Three types of stormwater management project opportunities were identified throughout the County:

Regional Stormwater Capture Projects – These consist of facilities that capture and treat stormwater from large drainage areas or watersheds. The primary objective of regional projects is often flood attenuation, but many also contain a water quality treatment and/or infiltration component. In some cases, the diverted flows are returned after treatment or are used for irrigation.

Green Streets – These consist of stormwater capture infrastructure in public rights of way. Green streets are intended to capture only runoff from the street and adjacent land that drains to the street.

Low Impact Development (LID) Retrofit – This includes green infrastructure, is a form of on-site urban infrastructure design that uses a suite of technologies intended to imitate pre-urbanization (natural)

² San Mateo Countywide Stormwater Resource Plan, 2017.

hydrologic conditions. LID and green infrastructure are meant to capture, slow, and decrease (through infiltration) runoff to reduce the impacts of the urban landscape.

Separate prioritization scoring processes were developed for each of the three project types. 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, and other various multiple benefits. All public parcels and streets throughout the county were prioritized and the results were analyzed at the countywide scale and city-scale. The scoring was used to rank the projects by cost benefit, watershed, jurisdiction, and project type.

Atherton-specific Process

Due to Atherton's unique existing characteristics, Town goals and policies, and other factors, it was important to customize the countywide project identification and prioritization process. This allows the Town to modify countywide prioritization factors and scoring, and include new prioritization factors to address conditions not included in the countywide process and to focus upon circumstances or preferences that are specific to Atherton.

Prioritization factors, scoring, and weighting used in the Countywide process were assessed and then modified, retained, or eliminated as appropriate to reflect Atherton-specific concerns. In addition, new criteria were included and some factors were used as screening criteria before the projects were prioritized. Atherton-specific screening and prioritization criteria factors were also assessed for three different types of projects – regional (water capture) projects, green streets, and parcel-based.

Table 2-1, on the following page, illustrates the various screening and prioritization criteria factors that were used to identify, prioritize, and map green infrastructure opportunities within Atherton.

The project prioritization process was a two-step process. Screening factors were used to screen out conditions that are detrimental to green infrastructure. In this case, that included certain land uses, ownership, and slope. After the prioritization criteria factors were identified, they were scored. Some criteria were then weighted to emphasize specific issues identified as having a higher level of importance for the Town.

A project's overall priority score is the sum of the individual weighted prioritization scores. Because each project type's prioritization method contains a different mix of screening and prioritization factors, and scoring and weighting varies between project types, the scores cannot be directly compared between different project types. Refer to Appendix A for tables illustrating the screening and prioritization criteria factors.

Following the SRP method of categorizing the level of project priority, the recalculation of green infrastructure project opportunities using Atherton-specific criteria and scoring of selected green infrastructure opportunities were prioritized as High, above the 90th percentile; Medium, above the 60th percentile; and Low, below the 60th percentile.

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Table 2-1: Screening and Prioritization Criteria Factors of the San Mateo SRP and Atherton-specific Prioritization Process

Prioritization Criteria and Screening Factors	Regional Stormwater Capture	Green Streets	Public and Private Parcel-based GI Projects
San Mateo SRP Prioritization Factors Retained or Modified			
Parcel land use (modified for Atherton-specific criteria to include ownership)	X		X
Impervious area (%)	X	X	X
Parcel size (acres)	X		
Street Type (modified for Atherton-specific criteria to emphasize street types and projects more likely to receive grant funding)		X	
Hydrologic soil groups	X	X	X
Slope (%)	X	X	X
Proximity to flood-prone channels (miles)	X	X	X
Contains PCBs risk areas	X	X	X
Currently planned by Town or co-planned with other Town project	X	X	X
Drains to TMDL water	X	X	X
Safe Routes to School program		X	
Above groundwater basin	X	X	X
Augments water supply	X	X	X
Water quality source control	X	X	X
Creates or enhances habitat	X		
Atherton-specific Prioritization criteria			
Greenways/Complete streets projects (adjacency)	X	X	X
Streets with existing storm drains	X	X	X
Streets identified for future storm drains and other drainage improvements	X	X	X
Project located within ¼ mile of identified RHNA site or other affordable housing site	X	X	X
Project identified in approved master plan, community plan, policy, etc.	X	X	X
Within drainage area of Cartan Fields Water Capture Project	X	X	X
Parcel Ownership	X		X
Parcel ownership and land use	X		X
Slope (%)	X	X	X

c. Identification of Prioritized Green Infrastructure Project Opportunities

Existing and Planned Projects and Potential Opportunities

Existing, planned, and potential green infrastructure projects were identified by a range of methods. Existing projects were identified using the Town's list of completed projects. Planned projects are C.3 regulated and other green infrastructure projects in the planning and design phase that the Town is tracking or are currently under construction. These include projects related to development, redevelopment or remodeling of school facilities, the Town Center redevelopment project currently under construction, and the Cartan Fields water capture project. These projects are expected to be completed during the 2015 to 2020 or 2020 to 2030 time periods.

The Town's Capital Improvement Projects (CIP) list was reviewed to determine if existing planned and/or funded projects are opportunities for green infrastructure. The review found that, with the exception of the Town Center and Library project, current CIPs are typically limited to minor street and other facility maintenance projects. Longer term future projects not on the CIP list, such as bicycle and other complete street improvements, redevelopment of Holbrook-Palmer Park, and safe routes to schools projects, were considered and included in the analysis for identifying potential green infrastructure opportunities. Other considerations included identifying streets and intersections that could easily accommodate green infrastructure – these were typically those with porkchop islands, leftover spaces created by intersecting street alignments, and wider streets; proximity to existing and planned storm drain improvements; and while not mapped, private residential parcels that offer the potential for shared public/private or private provision of green infrastructure. In addition, potential green infrastructure projects are expected to happen opportunistically as prospects and funding avail themselves.

During the course of a study session on the GI Plan, the City Council stated they supported the integration of green infrastructure for use in traffic calming and streetscape applications such as with Bicycle and Pedestrian Master Plan improvements; at street intersections including existing “pork chop” islands; corner and midblock crossing extensions; and in the street shoulder where existing trees would not be negatively impacted.

A customized list of “higher priority” potential green infrastructure opportunities was developed. First, the SRP's prioritized regional projects, green streets, and parcels green infrastructure project opportunities were reviewed and assessed. Secondly, Google Earth and Google StreetView were used to perform a more detailed evaluation of streets, intersections, and public and private institutional parcels that could include potential green infrastructure opportunities. This information was brought into the GIS data sets for analysis, which was then reviewed, and in some cases, adjusted to better reflect certain conditions, such as impervious area on a street or parcel and adjacencies of drainage infrastructure. The goal of this assessment was to identify public and private locations that could accommodate green infrastructure projects that could be implemented with relative ease in the near term, that could be more quickly or easily implemented if funding was obtained, and that have the potential for public/private partnerships. While Atherton owned parcels and other publicly and privately-owned parcels were evaluated, Atherton only has control over Town owned parcels to direct the timing of implementation.

Regional Water Capture Projects

Atherton has identified a regional water capture project at Cartan Fields that is being coordinated with two private schools as a public-private partnership, Menlo School and Menlo College, with potential grant funding from Caltrans. The project has the potential to provide multiple benefits to the Town, schools, the other jurisdictions within the watershed that drains to the project, and could contribute to limiting downstream flooding. The GI RAA includes this project as part of the countywide regional project system. The GI RAA discusses how regional projects are more cost-effective than other public green infrastructure investment, such as green streets. Atherton intends to prioritize the use of regional projects to help meet their pollutant

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load reduction requirements. Though regional projects are the most cost-effective project type, due to their nature, a longer lead time for planning and a higher level of funding for planning, construction, and operations and maintenance is needed over other project types.

Green Streets

The Town's rural roadways, with narrow pavement, soft shoulders, and extensive tree canopy, are by their nature, green streets. The Town will be pursuing opportunities to enhance and further green its streets and intersections to help manage and treat stormwater runoff and provide complete and sustainable streets, traffic calming, urban greening, neighborhood enhancement, and other community-wide benefits. However, the rural nature of the Town, the high percentage of narrow rights of way, heavily planted streets with existing large mature trees, and lack of storm drain infrastructure limit the ability for full green street development. This, along with poor infiltrating soils and an existing lack of funding for street construction and maintenance, limits opportunities for green streets and intersection. However, there are pockets throughout the Town in which streets and intersections can be retrofitted to include some green infrastructure. The largest such project, identified in the Town's Bicycle and Pedestrian Master Plan is the Grand Boulevard Greenway, which proposes to repurpose a travel lane in each direction along El Camino Real to provide dedicated bicycle, pedestrian and stormwater planter buffers.

Public and Private Parcel Green Infrastructure/LID Projects

Public parcels, owned by the Town of Atherton and by other public agencies such as the fire district and school districts, and private institutional uses such as schools were identified and assessed for potential individual or shared green infrastructure opportunities. Many of these parcels offer the ability to integrate green infrastructure facilities in a variety of locations and of differing types of measures, such as in parking lots, around buildings, within landscape areas, and along street frontages. Atherton owned sites are limited to the Atherton Town Center and Library site, which is currently under construction, and Holbrook-Palmer Park. Both are ranked a higher priority as they are under the control of the Town for the implementation of green infrastructure. The Atherton Town Center and Library project, which includes the implementation of low-impact development features and green infrastructure, is anticipated to be completed in 2021, and is listed in the "planned projects" and "projects to be completed by 2030" category. Non-town owned public and private parcels within Park and Open Space (POS) and Public Facility and School (PFS) Zoning Districts were evaluated as they typically offer larger areas to integrate green infrastructure facilities within the site due to the existence of open space, parking lots, and ball fields.

The following tables and maps show the outcome of the Atherton-specific prioritization process and evaluation of green infrastructure opportunities of higher priority projects (those parcels and streets/intersections identified above as opportunities for green infrastructure on Town and other public agency and private potential projects) and ranks the prioritized potential opportunity projects. This list provides Town staff the preferred "short list" of prioritized projects to plan for and implement as funding, opportunities, and the need arises. As the opportunities identified in this process are implemented, new green infrastructure opportunities will be added to the list. The green infrastructure and LID that will be implemented on private residential parcels are not included in these tables and maps as the timing and location of the projects cannot be anticipated.

Figure 2-1 and Table 2-2 show the constructed and planned green infrastructure projects in Atherton. A map and list illustrating the resulting Atherton-specific prioritized potential green infrastructure projects is found in Figure 2-2 and Tables 2-3 and 2-4. In addition, other public parcel and street project opportunities identified in the SRP are represented.

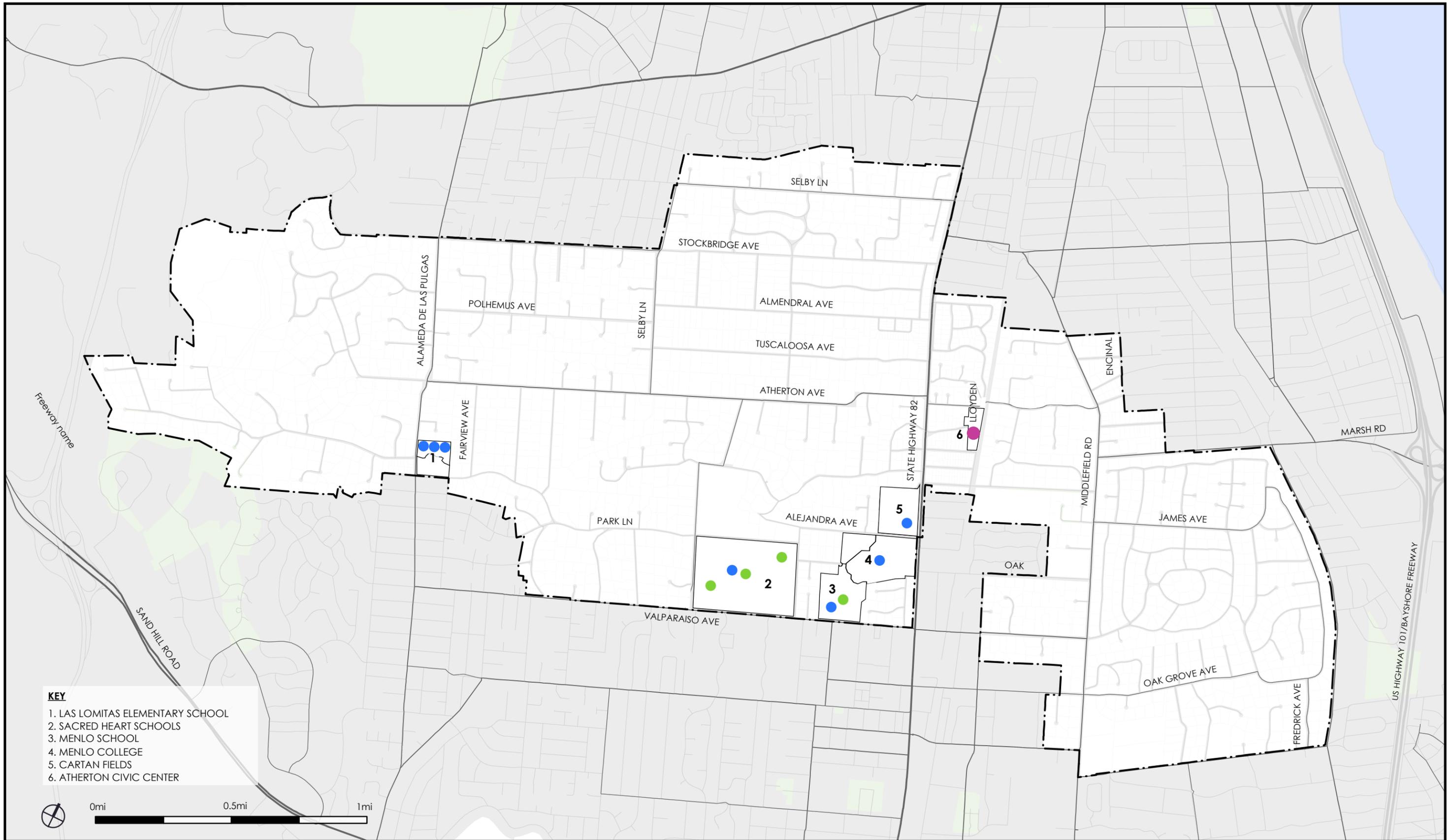
Lists and maps of planned and potential projects will be updated, as needed, to provide information in regard to changed circumstances, the identification of funding options, new opportunities, or a regional approach scenario is implemented countywide.

Table 2-2. Completed and Planned Green Infrastructure Projects

Project Type	Project Type	Ownership
Completed Projects (Public, Public Other Agency, and Private)		
Sacred Heart High School – Sites A, B, and C	Parcel	Private
Menlo School	Parcel	Private
Planned Projects (Public, Public Other Agency, and Private)		
Las Lomas Elementary School (subject to change from planned to potential due to need to obtain funding)	Parcel/Street	Public – Other
Atherton Town Center and Library	Parcel/Street	Public--Town
Sacred Heart High School	Parcel	Private
Menlo School Performing Arts	Parcel	Private
Menlo College Pathways	Parcel	Private
Cartan Fields Water Capture Project	Regional	Private

Table 2-3. Atherton-specific Identified Potential Green Infrastructure Opportunities for Regional and Parcel-based Projects

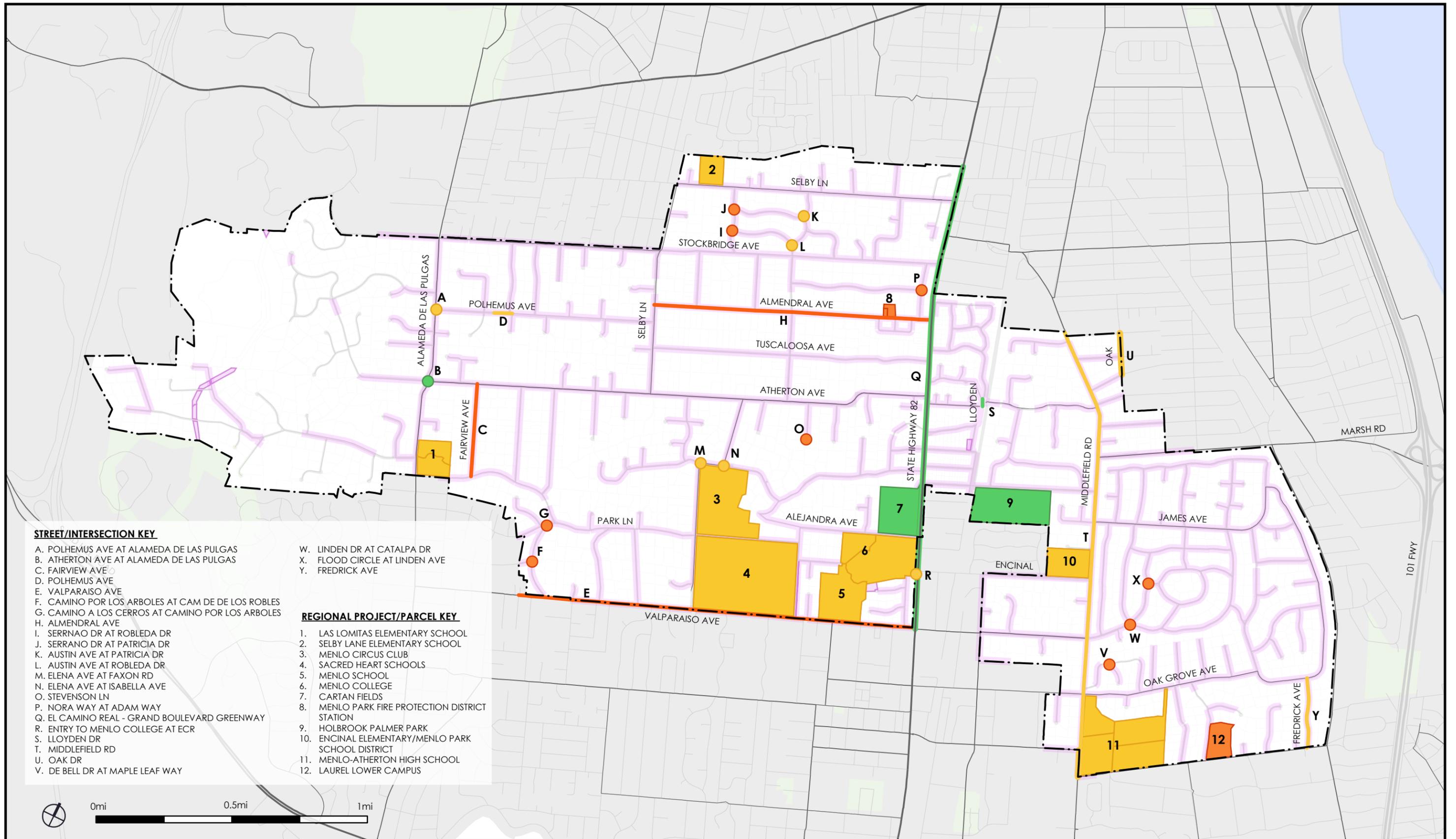
Atherton-specific Prioritized Potential Projects (Public, Public Other Agency, and Private)	Priority Level	Ownership
Regional Projects and Parcel-based Green Infrastructure Projects		
Cartan Fields (if a regional project)	High	Private
Holbrook-Palmer Park	High	Public – Town
Selby Lane Elementary School	Medium	Public – Other
Encinal Elementary School	Medium	Public – Other
Menlo-Atherton High School	Medium	Private
Las Lomas Elementary School	Medium	Public – Other
Sacred Heart Schools	Medium	Private
Menlo Circus Club	Medium	Private
Cartan Fields (if not a regional project)	Medium	Private
Menlo School	Medium	Private
Menlo College	Medium	Private
Laurel School Lower Campus	Low	Private
Menlo Park Fire Protection District Station	Low	Public – Other



Green Infrastructure Status

- CONSTRUCTED
- UNDER CONSTRUCTION
- PLANNED

Figure 2-1: Existing and Planned Green Infrastructure Opportunities
Regional Projects, Streets, and Parcels



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Atherton-Specific Prioritization Opportunities

San Mateo Stormwater Resource Plan Prioritization Opportunities

■ HIGH PRIORITY
 ■ MEDIUM PRIORITY
 ■ LOW PRIORITY

■ OTHER POTENTIAL OPPORTUNITIES

Figure 2-2: Prioritized Potential Green Infrastructure Opportunities
Regional Projects, Streets, and Parcels

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Table 2.4. Atherton-specific Identified Potential Green Infrastructure Opportunities for Green Streets Projects

Potential Projects	Priority Level	Ownership
Green Streets Projects		
El Camino Real/State Highway 82 – Grand Boulevard Greenway	High	Public – State/Town
Lloyden Dr	High	Public – Town
Atherton Ave and Alameda de las Pulgas	High	Public – Town
Entries- Polhemus Ave and Alameda de las Pulgas	Medium	Public – Town
Middlefield Rd	Medium	Public – Town
Austin Ave and Patricia Dr	Medium	Public – Town
Elena Ave and Faxon Rd	Medium	Public – Town
Elena Ave and Isabella Ave	Medium	Public – Town
Polhemus Ave	Medium	Public – Town
Austin Ave and Robleda Dr	Medium	Public – Town
Oak Dr	Medium	Public – Town
Frederick Ave	Medium	Public-Town
Corner of Adam Way and Nora Way	Low	Public-Town
Serrano Dr and Patricia Dr	Low	Public-Town
De Bell Dr and Maple Leaf Way	Low	Public-Town
Linden Ave and Catalpa Dr	Low	Public-Town
Almendral Ave	Low	Public-Town
Camino Por Los Arboles and Cam De Los Robles	Low	Public-Town
Camino A Los Cerros and Camino Por Los Arboles	Low	Public-Town
Flood Cir and Linden Ave	Low	Public-Town
Stevenson Ln	Low	Public-Town
Serrano Dr and Robleda Dr	Low	Public-Town
Fairview Ave	Low	Public-Town
Valparaiso Ave	Low	Public-Town

d. Workplan to Complete Alternative Compliance and Early Implementation

Prioritized projects identified as part of a Provision C.3.e Alternative Compliance program or part of Provision C.3.j Early Implementation are required to prepare a Workplan to ensure completion of those prioritized projects. Those projects that fall under these Provisions are summarized below. A Workplan has been developed to identify the approach, scheduled timeframes, and other key information for implementing these projects.

As of June 2019, there are no identified Provision C.3.e Alternative Compliance program projects in Atherton.

Atherton has identified the following prioritized projects as part of Provision C.3.j.ii Early Implementation. These are public and private green infrastructure projects that are already planned for implementation during the permit term and infrastructure projects planned for implementation during the permit term that have potential for green infrastructure measures.

1. Project: Town-wide Permeable Material Use with Encroachment Permit Request

Location: Town-wide

Description: As an on-going policy, the Town requires the use of permeable materials within right of way frontage strips when improvements are proposed by fronting property owners. The with the exception of utility work, conversion to permeable materials is approximately 95% of encroachment permits for construction within the right of way. Only the ingress and egress routes of the fronting property are allowable to be impervious. Length and width of permeable area varies by street right of way width and lot size.

Status: On-going policy requirement. Individual projects are in various phases of planning, review, and construction.

Workplan: Continue with Town policy of requiring the provision of permeable materials within the right of way when encroachment permits are requested by adjacent property owners. Staff will continue to review and track projects during the course of planning and construction until each individual project is complete.

2. Project: Cartan Fields Water Capture Project

Location: Cartan Athletic Field (Menlo School and Menlo College), 1000 El Camino Real

Description: The Town has initiated preliminary design and environmental review of a stormwater capture facility project at Cartan Fields, on part of an approximate 15-acre private recreation facility at the northwest corner of Alejandra Avenue and El Camino Real. The project is identified as a high opportunity project for regional stormwater capture. The project is near the channelized segment of Atherton Creek, which drains to the Bayfront Canal, another flood-prone channel. The project would capture a large portion of the upper Atherton Creek watershed reduce pollutant loads to the creek and its receiving water, San Francisco Bay, and would help alleviate downstream flooding issues.³

The Town received a grant from Caltrans for green stormwater diversion and treatment. This is one of the first grants of its kind in Northern California which is intended to detain and clean first flush stormwater.

Status: The Town has had several alternative conceptual designs for a water capture facility at Cartan Fields developed and an Initial Study and Mitigated Negative Declaration (IS/MND) are being prepared. Prior to selecting one of the alternatives and proceeding to the full design phase of the project, an environmental document complying with the provisions of the California Environmental Quality Act (CEQA) must be prepared and certified and a Development Agreement executed with the property owners. A complete CEQA document is expected to be released for public comment in Fall 2019. Final

³ San Mateo Stormwater Resource Plan, page 76.

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design is expected to begin once CEQA is completed, with the project anticipated to be completed in 2022.

Workplan: Town staff to continue to guide and monitor the project for completion and release of CEQA documents. Once final CEQA documentation is completed and a preferred alternative design is selected, Town will proceed with final design of the project. Once final design and engineering documents are completed, reviewed, and approved, the Town will monitor the installation of the project to ensure that the facility is built as designed.

3.0 Atherton Green Infrastructure Implementation Goals⁴

This chapter provides an overview of the purpose of the San Mateo Countywide Program GI Reasonable Assurance Analysis (GI RAA) and a summary of GI RAA results for Atherton to serve as stormwater improvement goals that set the stage for an adaptive management approach.

a. Overview

The MRP requires the development of GI Plans (Provision C.3) and Polychlorinated Biphenyls (PCBs) and Mercury Control Measure Implementation Plans (Provisions C.11 and C.12) that provide the necessary pollutant load reductions to meet Total Maximum Daily Load (TMDL) wasteload allocations, or the maximum load, or amount, of pollutants each discharger of waste is allowed to release into a particular waterway⁵, over specified compliance periods. A key component of these plans is a GI RAA⁶ that quantitatively demonstrates that proposed control measures will result in sufficient load reductions to meet wasteload allocations for municipal stormwater discharges to the San Francisco Bay.

The City/County Association of Governments (C/CAG) of San Mateo County, via its Countywide Program, led a county-wide effort to develop a GI RAA to determine load reductions to meet wasteload allocations among San Mateo County permittees, and set goals for the amount of green infrastructure each permittee needs to achieve for their portion of the countywide load reductions the MRP assigns to green infrastructure. The Town's GI Plan must therefore reasonably be expected to achieve the stormwater improvement goals outlined in the countywide GI RAA.

b. Preliminary Identification of Opportunities for Green Infrastructure Projects

To support the GI RAA and GI Plans, C/CAG has undertaken a number of planning efforts to identify opportunities for green infrastructure implementation. The following is a summary of those efforts.

Green Infrastructure for New Development and Redevelopment

The MRP includes Provision C.3 for the integration of green infrastructure within new development and redevelopment. LID and green infrastructure are implemented throughout the Town as new development and redevelopment occurs. The reduced volumes of urban runoff and associated pollutant loads can be considered as part of the load reductions attributed to implementation of green infrastructure. C/CAG worked with San Mateo County permittees to compile information on green infrastructure and LID practices that have been implemented within new development and redevelopment since 2003, the baseline year for calculation of wasteload allocations.

In support of the GI RAA to model pollutant load reductions, an estimate of the land area and location of new and redevelopment within San Mateo County required to achieve new development and redevelopment (C.3

⁴ Portions of this chapter use template materials from the *Reasonable Assurance Analysis and Green Infrastructure Implementation Goals* by Paradigm, 2019. Refer to Appendix B to review this document in its entirety.

⁵ Glossary, Federal Remediation Technology Roundtable. <https://definedterm.com/a/document/10661>.

⁶ The San Mateo GI RAA is comprised of two documents:

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

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regulated) green infrastructure stormwater management improvements by 2040 was developed. The overall estimate was then translated into estimates for 2015 to 2020, 2020 to 2030, and 2030 to 2040.

These estimates were made by first estimating the land area that can be expected to develop between 2015 and 2040. A range of information was used to make these estimates including the available land area and the demographic files for new households and jobs that were developed and used for the San Mateo Countywide Transportation Plan. The Countywide Program's consultants used a four-step process to estimate future new and redevelopment. The first step identified available land and the land's capacity for new mixed use, residential, and non-residential development, based on assessor's data, member agency policies, and other factors. The second step converted countywide population and employment growth projections into demand for single-family and multi-family homes, and square feet of various non-residential uses. Step three allocated the projected demand to the available land supply. Step four adjusted available land area and expected intensity of development to get a "fit" between supply and demand where the initial allocation process did not indicate enough land for projected development. This information was documented for each jurisdiction, including Atherton, and jurisdictions were given the opportunity to comment on the initial estimates and a revised set of estimates.

These assessments found that Atherton is not projected to experience growth in the land uses that typically generate green infrastructure per the requirements of the MRP, such as single-family subdivisions, multi-family, mixed use, or commercial development in any of the timeframes, which is much different from that projected countywide and in most other jurisdictions. This is due to Atherton's situation of having predominantly single-family residential uses and being built out.

Some land uses, such as schools, are not accounted for in the countywide land development projections as they do not align with either residential or a quantifiable employment use. Many school sites are present in Atherton, and these uses present other opportunities to provide green infrastructure that can count towards Atherton's load reduction requirements.

Countywide Stormwater Resource Plan (SRP)

The SRP is a comprehensive plan that identifies and prioritizes thousands of green infrastructure project opportunities throughout San Mateo County and within each municipal jurisdiction. Prioritized project opportunities include:

- Large regional projects within publicly owned parcels (e.g., parks) that infiltrate or treat stormwater runoff generated from surrounding areas (e.g., diversion from neighborhood storm drain system; diversions from creeks draining large urban areas);
- Retrofit of publicly owned parcels with green infrastructure that provide demonstration of onsite green infrastructure and LID designs; and,
- Retrofit of public street rights of way with green infrastructure, referred to as green streets.

The SRP includes a multi-benefit scoring and prioritization process that ranks green infrastructure project opportunities based on multiple factors beyond pollutant load reduction (e.g., proximity to flood prone channels, potential groundwater basin recharge).

The above efforts and resulting technical products provide preliminary identification of opportunities for green infrastructure projects. These green infrastructure project opportunities, along with the estimate of new and redevelopment green infrastructure discussed above, serve as the foundation for the GI RAA and Atherton's GI Plan as strategies are developed for implementation plans to meet the PCBs and mercury load reduction goals per the TMDL.

Description of the San Mateo Countywide GI RAA Model

Through the GI RAA, C/CAG performed a comprehensive, countywide modeling effort to provide:

- Simulation of baseline loads of PCBs and mercury for each of the County’s watersheds and municipal jurisdictions discharging to San Francisco Bay;
- Estimation of necessary load reduction goals to meet requirements of the MRP and TMDL wasteload allocations; and,
- Determination of the amount of green infrastructure needed to address load reduction goals based on project opportunities.

The GI RAA also provides analysis of alternative implementation scenarios through cost-benefit optimization that can inform cost-effective green infrastructure implementation within each municipal jurisdiction, including Atherton. These results set goals for GI Plans developed by each Permittee.

The primary goal of the GI RAA is to quantitatively demonstrate that GI Plans and Control Measure Implementation Plans will result in load reductions of PCBs and mercury sufficient to attain TMDL wasteload allocations and the component stormwater improvement goals to be achieved with green infrastructure. Based on the baseline hydrology and water quality model, the GI RAA determined that a 17.6% reduction in PCBs loads is needed, countywide, to meet the green infrastructure 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 wasteload allocations for San Mateo County.

The analytical framework selected to support the San Mateo Countywide GI RAA is based on a linked system of models. These models provide a characterization of existing conditions and determination of necessary pollutant load reductions to meet requirements of TMDLs and the MRP as well as provide analysis of the amount of green infrastructure needed to provide the portion of the load reduction assigned to green infrastructure by the MRP. Implemented together, the models have the capacity to support efforts to identify cost-effective green infrastructure implementation scenarios that align with municipal goals.

c. Model Considerations to Inform GI Plans

An important consideration for the GI RAA was the ability to track costs and benefits of different categories of green infrastructure projects within the model. This tracking supports the selection of the most cost-effective implementation strategy to attain pollutant reduction goals, see Figure 3-1. The GI RAA builds upon the previous planning efforts and represents the following generalized green infrastructure project categories in the model:

1. **Existing Projects:** Stormwater treatment and green infrastructure 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.
2. **Future New and Redevelopment:** All the regulated projects that will

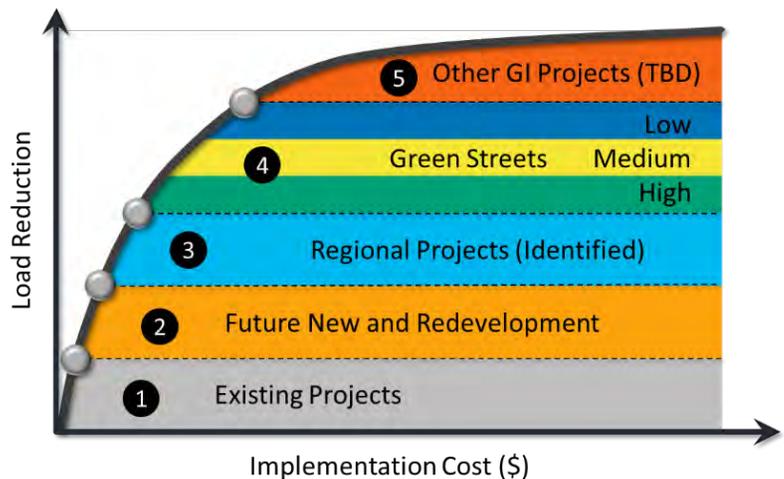


Figure 3-1. Example Implementation Recipe Showing General Sequencing of Green Infrastructure Projects.

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be subject to Provision C.3 requirements to treat runoff via green infrastructure and LID and is based on projections of future new and redevelopment, see earlier discussion for more detail.

3. **Regional Projects (identified):** C/CAG worked with agencies to identify five projects within public parks, Caltrans property, and other entities willing to partner with permittees, including the Cartan Fields project that is being pursued by the Town of Atherton, to provide regional capture and infiltration/treatment of stormwater, and included conceptual designs to support further planning and designs. Note – the model can be updated to include future identified projects to support adaptive management.
4. **Green Streets:** The Stormwater Resource Plan (SRP) identified and prioritized opportunities throughout San Mateo County for retrofitting existing streets with green infrastructure in public rights-of-way. Green streets were ranked as high, medium, and low priority (within each subwatershed) based on a multiple-benefit prioritization process developed for the SRP. These opportunities were carried forward into the GI RAA analysis. As shown in Figure 3-1, green street implementation is less cost effective at treating stormwater than development and regional projects.
5. **Other GI Projects (to be determined):** Other types of green infrastructure projects on publicly owned parcels, representing a combination of either additional parcel-based GI or other Regional Projects which have not been identified to date. This may also include additional green infrastructure projects developed in relation to private development that is not required by C.3 requirements to implement green infrastructure, but that may be required to implement green infrastructure through local regulation.

The GI RAA considers the potential combinations of green infrastructure project opportunities that exist within each municipal jurisdiction, and selects a suite or “recipe” of projects that can most cost-effectively address pollutant load reductions. The amount and combination of those green infrastructure projects can be determined through analysis of estimated load reductions and implementation costs. Cost-benefit optimization of green infrastructure project opportunities was included to build upon the preliminary C/CAG SRP planning efforts above, and to inform and set meaningful goals for GI Plans. The model provides an estimate of the resulting pollutant load reduction and implementation costs.

d. Atherton Green Infrastructure Implementation Goals

The GI RAA considered multiple alternative scenarios that can inform implementation and the adaptive management process. Four modeling scenarios were configured for this analysis and are summarized in Table 3-1:

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

Table 3-1. Model scenarios objectives and cost-benefit evaluation.

The following factors are considered for each model scenario:

Load Reduction Objective - With a cohesive sediment load reduction objective, Scenarios 1 and 2 represent the most conservative approaches. These assume that given the uncertainties about PCBs source areas, targeting an overall 17.6% load reduction of cohesive sediment in general (silts and clays) achieves the PCBs load reduction objective for GI. Scenarios 3 and 4 assume that PCBs sources are spatially distributed based on analysis of land use types. The cost-benefit optimization process targets those areas as having the highest likelihood of PCBs sources. Scenarios 3 and 4 highlight the potential cost savings (relative to Scenarios 1 and 2) that could be realized if PCBs sources are identified and targeted for green infrastructure implementation.

Jurisdictional versus Countywide - There are many possible ways to achieve a 17.6% load reduction for all of San Mateo County. The “Jurisdictional” approach, Scenario 1, outlines an approach where each jurisdiction is responsible to individually achieve at least a 17.6% load reduction based on the population-based wasteload reduction for each jurisdiction. Conversely, the “Countywide” approach, Scenario 2, achieves the 17.6% load reduction countywide by allowing the model to allocate the countywide wasteload reduction via green infrastructure across jurisdictional boundaries.

Based on the San Mateo Countywide GI RAA, for Atherton to achieve the 17.6% load reduction under the Jurisdictional approach (Scenario 1), approximately 4.5 – 6.5 acre-feet of treatment capacity would be required by 2040 depending upon which treatment measures are used. Under the Countywide approach (Scenario 2), approximately 2.5 acre-feet of treatment capacity would be required by 2040.

The Scenario 2 approach requires each municipality to agree to reduce overall PCBs within the county with the goal of creating a more cost-effective and efficient scenario by focusing on implementing green infrastructure in municipalities with higher yields of PCBs and soil conditions that are more amenable for infiltration. In general, the countywide approach can provide significant cost savings over the jurisdictional approach, based on the GI RAA modeling. Some agencies will have more green infrastructure opportunities, higher presence of PCBs, or better infiltrating soils and be able to do more, and some agencies will have fewer or more costly green infrastructure opportunities. A countywide approach also provides the opportunity to fund regional project opportunities, the costs of which could be shared by multiple jurisdictions. It may also provide a vehicle for credit trading between agencies. *Refer to the Green Infrastructure Funding Nexus Evaluation*⁷ for more information about the concept of credit trading.

Following are different conceptual scenarios developed for Atherton to illustrate a range of possibilities in terms of jurisdictional (Scenario 1) or countywide (Scenario 2) approaches and projects for Atherton to achieve their pollutant reduction goal. The results of the GI RAA scenarios can inform the Town’s adaptive management process for green infrastructure implementation and help garner support for collaborative efforts for green infrastructure implementation or further research of PCBs source areas that could be more cost-effective implementation strategies over time.

Scenario 1: Atherton, Jurisdictional⁸

Two sub-scenarios were developed as alternative implementation “recipes” of green infrastructure projects that could achieve the 17.6% reduction of modeled PCBs for the Town. The first sub-scenario, 1.a, assumes the Cartan Fields regional project is implemented and the second sub-scenario, 1.b, illustrates a mix of green infrastructure implementation if the Cartan Fields regional project is not built.

⁷ SCI Consulting Group and Larry Walker Associates, January 2019.

⁸ Refer to Appendix C for more detailed implementation measures and strategies tables and charts that the Countywide GI RAA model identified for Atherton.

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Scenario 1a: Atherton, Jurisdictional with Regional Project, full credit for regional project

Table 3-2 includes the combination of green infrastructure projects that the Countywide GI RAA model identifies as the most cost-effective implementation scenario for the Town if the Cartan Fields regional project is implemented and the Town receives full credit for it. The Cartan Fields stormwater capture project is proposed with a capacity of approximately 6 acre-feet. The model indicates that the capacity provided by existing projects and future C.3 regulated new development and redevelopment projects, combined with the Cartan Fields regional stormwater capture project will exceed the minimum 17.6% pollutant reduction goal for the Town of Atherton.

In addition, the modeling does not account for green infrastructure projects at public schools located within Atherton or the Town’s anticipated policy of requiring residential projects of a certain size to implement green infrastructure to C.3 standards. The inclusion of these additional green infrastructure projects into Atherton’s green infrastructure constructed projects accounting will further increase the amount of green infrastructure within Atherton and further exceed their pollutant load reduction goals. The Town will continue to identify, calculate, and track these different projects as part of their adaptive management process to determine what projects are needed to achieve their reduction goals.

Implementation Metrics		Implementation Milestones				
		Incremental		Cumulative		Final 2040
		2020-2030	2030-2040	2020	2030	Jurisdictional
Index	% Load Reduction	18.5%	1.3%	0.2%	21.3%	21.7%
	Volume Managed (acre-ft/yr)	90.0	0.2	0.7	90.7	90.9
	Treated Impervious (acres)	145.6	0.3	0.4	145.9	146.3
Capacities (acre-ft)	Existing Projects	0.0	0.0	0.4	0.4	0.4
	Future New & Redevelopment	0.0	0.1	0.1	0.1	0.2
	Regional Projects (Identified)	6.0	0.0	--	6.0	6.0
	Green Streets (High)	--	--	--	--	--
	Green Streets (Medium)	--	--	--	--	--
	Green Streets (Low)	--	--	--	--	--
	Other GI Projects (TBD)	--	--	--	--	--
	Total	6.0	0.1	0.4	6.4	6.5

Table 3-2. Scenario 1a: Green Infrastructure implementation milestones for Atherton with the Town receiving full credit for Cartan Fields. (Note: numbers have been rounded and may not add to the total).

Scenario 1b: Atherton, Jurisdictional without Regional Project

If the Cartan Fields regional project is not implemented, the Countywide GI RAA model indicates that, in addition to existing projects and future C.3 Regulated Projects associated with new development and redevelopment projects, the most cost-effective implementation strategy plan for the Town is suggested to implement predominately green street projects with some other green infrastructure projects that have yet to be identified to meet the Town’s treatment goals. Table 3-3 provides implementation milestones for this scenario. In addition, the table compares the 2040 green infrastructure management and project capacities between this scenario and if the countywide approach Scenario 2, discussed in the following section, was implemented.

However, as mentioned previously, the modeling does not account for green infrastructure projects at public schools located within Atherton or the Town’s anticipated policy of requiring residential projects of a certain size to implement green infrastructure to C.3 standards. Accounting for these additional green infrastructure projects will reduce the amount of green infrastructure required to be implemented in green street and other to be determined projects to meet Atherton’s pollutant load reduction goals.

The Town will continue to identify, calculate, and track these different projects as part of their adaptive management process to determine what projects are needed to achieve their reduction goals.

Implementation Metrics		Implementation Milestone
		Final 2040
		Jurisdictional
Index	% Load Reduction	19.2%
	Volume Managed (acre-ft/yr)	59.4
	Treated Impervious (acres)	14.9
Capacities (acre-ft)	Existing Projects	0.4
	Future New & Redevelopment	0.2
	Regional Projects (Identified)	0.0
	Green Streets (High)	0.2
	Green Streets (Medium)	2.2
	Green Streets (Low)	1.7
	Other GI Projects (TBD)	0.0
	Total	4.5

Table 3-3. Scenario 1b: Green Infrastructure implementation milestones for Atherton without Cartan Fields. (Note: numbers have been rounded and may not add to the total).

Scenario 2: Countywide Approach

Table 3-4 illustrates a combination of green infrastructure projects if San Mateo County permittees worked together to achieve the targeted reduction under a Countywide approach (Scenario 2). This scenario accounts for the implementation of the five regional projects currently included with the GI RAA across San Mateo County.

The model indicates that under a Countywide approach strategy, the combination of Atherton’s existing green infrastructure projects, future Atherton C.3 regulated new and redevelopment projects, the Cartan Fields project, the other four regional projects located throughout the county in other jurisdictions, and other more cost-effective green infrastructure projects in locations outside of Atherton, that no additional green streets or other green infrastructure projects within Atherton would be needed within Atherton in order to achieve the Countywide pollutant reduction target.

Implementing the countywide scenario would require significant discussion among San Mateo County Permittees in order to gain consensus and provide cost-sharing agreements that could result in Atherton providing the reduced green infrastructure capacity indicated in this scenario. The expense to Atherton is unknown at this time, as they would receive some amount of reimbursement in the cost of construction for the Cartan Fields project and may either take on maintenance of the facility or assign it to a countywide entity.

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Implementation Metrics		Implementation Milestones				
		Incremental		Cumulative		Final 2040
		2020-2030	2030-2040	2020	2030	Countywide
Index	% Load Reduction	18.5%	1.3%	0.2%	18.7%	15.0%
	Volume Managed (acre-ft/yr)	58.9	4.1	0.7	59.5	41.9
	Treated Impervious (acres)	102.6	7.2	0.4	103.0	103.1
Capacities (acre-ft)	Existing Projects	0.0	0.0	0.4	0.4	0.4
	Future New & Redevelopment	0.0	0.1	0.1	0.1	0.2
	Regional Projects (Identified)	1.9	0.0	--	1.9	1.9
	Green Streets (High)	0.2	--	--	0.2	--
	Green Streets (Medium)	1.1	1.4	--	1.1	--
	Green Streets (Low)	--	0.1	--	--	--
	Other GI Projects (TBD)	--	0.7	--	--	--
	Total	3.3	2.3	0.4	3.7	2.5

Table 3-4. Scenario 2, Countywide, green infrastructure implementation milestones for Atherton, compared to Atherton with the Town receiving credit proportional to jurisdictional area for Cartan Fields. (Note: Incremental and Cumulative numbers are associated with the Jurisdictional Scenario and are shown for reference. Numbers have been rounded and may not add to the total).

Implementation Milestones for Impervious Area Treated

These tables represent Atherton’s range of available implementation strategies and goals for projected impervious areas treated, percent pollutant load reduction, and the volume of stormwater runoff managed as modeled for the countywide GI RAA for both the jurisdictional and countywide scenarios. The Town will continue to identify, calculate, and track these, and other, projects as part of their adaptive management process to determine what projects to implement in order to achieve their reduction goals. As noted earlier, the model indicates that the implementation of the identified projects will meet the pollutant reduction goal for Atherton.

e. Adaptive Management and Managed Metrics

It is likely that the actual implementation of green infrastructure projects will not follow the Town prioritization and GI RAA output exactly; however, the Implementation Milestones tables, or “recipes” provide “management metrics” to guide the adaptive management process. Dimensions, capacity, and location of green infrastructure projects will vary based on on-the-ground feasibility and site-specific constraints.

The management metrics used for managing and tracking the implementation of green infrastructure includes the performance metrics for “% Load Reduction PCBs (Annual),” “Annual Volume Managed (acre-ft),” and “Impervious Area Treated (acres).” “Impervious Area Treated (acres)” is a metric suggested by the MRP for implementation tracking. The “% Load Reduction PCBs (Annual)” and “Annual Volume Managed (acre-ft)” are additional metrics based on annualized results represented in the GI RAA modeling system that are directly comparable to TMDL wasteload allocations. The “% Load Reduction PCBs (Annual)” provides a relative comparison of the load reduction to be achieved within each subwatershed. The “Annual Volume Managed (acre-ft)” shows the acre-feet of water captured and infiltrated and/or treated within each subwatershed. As a result of adaptive management, the implementation plan strategy may change over time and alternative green infrastructure projects can be substituted without having to re-run the GI RAA model, as long as the “Management Metrics for GI,” representing the goals for the GI Plan, remain on track. While the various implementation strategies illustrate different ways that Atherton can implement green infrastructure, all scenarios meet the pollutant reduction goals of the MRP.

As part of the adaptive management process, Atherton will continue to look for opportunities to fund and implement green infrastructure projects to meet the final load reduction goals for 2040. The process will include the tracking of management metrics and continued re-evaluation of green infrastructure project opportunities considered for the GI RAA, including those identified and discussed in Chapter 2. For instance, the GI RAA assumed projected amounts of green infrastructure and LID associated with new and redevelopment projects, which are limited in Atherton and which are subject to change based on factors that are outside the control of the Town, such as levels of development and changing requirements of the MRP as it is updated. If less development occurs over time, more green streets or regional projects on public land may be needed to provide equivalent volume management. Alternatively, the Town may receive full credit for the provision of the Cartan Fields regional water capture project or the permittees in the county may be successful in negotiating a countywide approach for meeting the pollutant load reduction targets. For the GI RAA and GI Plan, a preliminary schedule was developed to chart a potential course for green infrastructure implementation and considered the various project opportunities.

Given the relatively small scale of most green infrastructure projects, outside of the regional projects (e.g., LID on an individual parcel or green infrastructure in a single street block converted to green street), numerous individual green infrastructure projects will be needed to address the pollutant reduction goals, specifically if full credit is not received for the Cartan Fields water capture project. All the green infrastructure projects will require site investigations to assess feasibility and costs. As a result, the GI RAA provides a preliminary investigation of the amount of green infrastructure needed to achieve the countywide pollutant load reduction target. The GI RAA sets the GI Plan goals in terms of the amount of green infrastructure implementation over time to address pollutant load reductions. As GI Plans are implemented and more comprehensive municipal engineering analyses (e.g., masterplans, capital improvement plans) are performed, the adaptive management process will be key to ensuring that goals are met. In summary, the GI RAA informs green infrastructure implementation goals, but the pathway to meeting those goals is subject to adaptive management and can potentially change based on new information or engineering analyses performed over time.

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The following provides a priority list of actions for the Town to undertake for implementing the GI Plan:

1. Continue to assess the feasibility of implementing the Cartan Fields project. If feasible, move forward with Cartan Fields partnership agreement documents and its design and implementation, while at the same time pursuing either full credit or a cost sharing agreement with the County of San Mateo and Menlo Park.
2. Continue to evaluate and participate in on-going jurisdictional discussions about a countywide approach.
3. Implement “short list” priority green infrastructure projects identified in Chapter 2, and continue to look for other opportunities to implement green infrastructure in public and private projects.
4. Continue to monitor and pursue funding opportunities for green streets, other public, and joint public and private green infrastructure implementation.
5. Track green infrastructure projects management metrics and implement adaptive management strategies to ensure the Town’s pollutant reduction goals are met.
6. Continue discussions and potential implementation of new Town policies and standards to increase the amount of green infrastructure developed through private new and redevelopment and building upon Town stormwater greening mechanisms such as maintaining its urban forest and tree canopy.
7. Assess and make modifications to the GI Plan and other Town documents and procedures to reflect lessons learned.

4.0 Green Infrastructure Project Tracking and Mapping

a. Countywide Program Tracking and Mapping Tool

Municipal Regional Stormwater Permit (Order No. R2-2015-0049) Provision C.3.j requires stormwater Permittees to “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” into their GI Plans and develop a “process for tracking and mapping completed projects, public and private, and making the information publicly available.” C/CAG has taken the lead to develop a Countywide tracking and mapping resource to address the requirements of Provision C.3.j by leveraging and building upon analyses carried out during the development of the Countywide Stormwater Resource Plan (SRP) and GI Reasonable Analysis Assurance (GI RAA). C/CAG was recently awarded a Caltrans grant for the development of a San Mateo Countywide Sustainable Streets Master Plan that included \$250,000 in funding for development of a Web-based Sustainable Street and Green Infrastructure Project Implementation Mapping and Tracking Tool (Tracking Tool).

The Tracking Tool will allow C/CAG member agencies to easily enter, track, and update potential, planned, and implemented projects and compare green infrastructure planning efforts to relevant goals through an intuitive and user-friendly “dashboard.” C/CAG member agencies including the Town of Atherton will be asked to input planned and implemented green infrastructure project locations and associated treatment areas to the Tracking Tool database. Project locations will be shown on a dynamic map with key base layers including watershed boundaries, waterbodies, city boundaries, and storm drain networks. Users will be able to click on any project or search the green infrastructure project database by keyword to view additional available information such as facility type, sizing, and status. The Tracking Tool will use extensive Countywide stormwater, green infrastructure, and climate change modeling resources to establish water quality and climate change benefits. Water quality performance metrics are expected to address requirements outlined in MRP Provision C.3.j and include an estimate of total area and impervious area treated with green infrastructure as well as stormwater volumes managed during the annual average year. Climate change performance metrics to be included in the Tracking Tool are anticipated to include carbon sequestration, public health benefits, heat island reduction, and water supply augmentation to support climate change adaptation and mitigation efforts.

C/CAG member agency staff responsible for green infrastructure planning and implementation will be able to create various iterations of the Tracking Tool targeted toward the end user to support discussions with public officials, potential funding partners, and public outreach efforts. The Tracking Tool will be delivered in two phases to align with grant funding, with Phase 1 completed June 30, 2019 and Phase 2 being completed by June 30, 2020.

b. Town Project Tracking Process

Tracking Tools and Procedures

Atherton uses a variety of tools to track the planning and implementation of pervious area, stormwater detention, green infrastructure, and C.3 regulated projects. These tools include:

- **Project plan review** – New and remodel/redevelopment projects are required to address a range of Town required regulations as well as submit for a variety of permits, etc. for review and approval by a range of Town multidisciplinary staff. This includes if provision of roadside impervious area is triggered, if on-site detention needed is required, if C.3 is triggered, etc.
- **Project approvals** – Once project submittals contain all of the necessary information and requirements and are found to be in compliance with regulations, conditions of approval and other requirements may be placed on the project along with the project approvals.

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- **Construction observations, inspections and enforcement actions** – Atherton performs construction activity, post construction, and operation and maintenance observations and inspections to ensure green infrastructure, low impact development, and other project elements are installed and maintenance as required and requires corrective actions when a project is found defective.
- **Coordination with private and public schools** – Atherton enjoys a good relationship with the private schools in the Town and discuss anticipated upcoming planned projects and related C.3 requirements, etc. Numerous potential private and public school projects are in the planning stages. The Town will continue to monitor and coordinate with the schools to track the projects.
- **Coordination with the Cartan Fields Water Capture Project** – The Town will continue to work with various partner entities in the planning, assessment, and funding of this project.
- **Prioritized Green Infrastructure Project Opportunities Maps and Lists** – Atherton will continue to monitor and search for green infrastructure opportunities within the Town, including the ability to partner with other public and private projects to provide or expand green infrastructure.
- **Internal accounting** – Town staff tracks individual permits and agreements (limited number) and maintains an internal accounting of site design measures, stormwater detention, green infrastructure provision including Regulated Projects, and provides such information within their stormwater Annual Report. The Town will use the Countywide tracking system once it is operational.
- **Operations and maintenance** – The Town has developed checklists and schedules for the operations and maintenance of green infrastructure projects, as well as determined which town departments and staff are responsible for inspection of regulated and private green infrastructure projects and the operations and maintenance of Town owned projects.

The Town recently awarded a construction contract for its Town Center and Library redevelopment project. Construction is expected to be completed in 2021. The project includes the preparation of an Operations and Maintenance manual for the green infrastructure improvements, including maintenance checklists and schedules. Town staff will be responsible for operations and maintenance.

Atherton will continue their internal green infrastructure project tracking process and add the operation and maintenance tracking of the Town Center project once completed.

The Town will upload completed green infrastructure project information into the Countywide Program's Tracking Tool to keep the San Mateo County's completed green infrastructure project accounting up to date, as well as to monitor the provision of regional projects and green infrastructure projects and their resulting acre-feet volume water managed and impervious area reduced to assess and understand if the Town and the county is on track to meet its 2020, 2030, and 2040 load reduction goals.

As discussed in Chapter 3, Adaptive Management, Atherton will integrate adaptive management strategies into their routine practices to track planned and potential green infrastructure opportunity projects through all phases of implementation and their timeline; assess the progress towards the achieving their goals; determine the potential need for additional new Town or other public and private green infrastructure provision projects including the amount, potential locations, and funding needs, etc.; make modifications to the plan to take advantage of lessons learned, and following if a countywide approach scenario to providing green infrastructure is implemented over individual jurisdiction provision of green infrastructure.

c. Public Access to Information

The public will have access to this GI Plan via the Town’s Stormwater web page⁹. Resources developed by the Countywide Program on behalf of the Town and other C/CAG member agencies that have informed the development of this GI Plan are often posted to the Countywide Program’s website. The San Mateo Countywide Stormwater Resource Plan that was approved by the C/CAG Board of Directors on February 9, 2017 and identified potential green infrastructure locations can be found on the Countywide Program’s “Flows to Bay” website.¹⁰ The forthcoming Countywide GI RAA will be available on the same website for public access and review once final documents have been produced.

The GI Tracking Tool presented above is expected to serve as a user-friendly, intuitive, and dynamic mechanism for the public to interact with the green infrastructure planning process. The public will have the opportunity to use a web-mapping interface to locate potential, planned, and implemented green infrastructure projects.

⁹ The Town of Atherton’s Environmental Programs Webpage can be found accessed at:
<https://www.ci.atherton.ca.us/141/Environmental-Programs-Committee>

¹⁰ The San Mateo Countywide Stormwater Resource Plan can be accessed at:
<https://www.flowstobay.org/2016srp>

5.0 Green Infrastructure Integration with Other Planning Documents and Legal Mechanisms

a. Approach

As required under C.3.j.i.2.h of the MRP's requisites for Green Infrastructure Plans, the Town of Atherton evaluated their existing planning, engineering, and other plans, policies, ordinances, resolutions, and similar documents to determine which should be further reviewed and updated or modified to incorporate green infrastructure requirements, reference the Town's Green Infrastructure Plan, and other changes to support the implementation of green infrastructure in Atherton. A range of documents were assessed including those related to land use, urban forestry, transportation, infrastructure, health and safety, flooding and drainage, development regulations, and standard details and specifications.

b. Modifications to Existing Documents

The following table, Table 5-1, lists Town documents that were collected and evaluated, identifies the documents that were determined to need modification in regard to the implementation of green infrastructure, and the expected timing for revision and adoption of the planning document modifications. Documents determined to be technical in nature or not relevant to green infrastructure policy and implementation have been designated as Not Appropriate (N/A) for modification.

Selected Town documents have been reviewed and updated or modified to incorporate or expand upon references to and add definitions, policies, opportunities, requirements, descriptions, and other discussions related to the Atherton's Green Infrastructure Plan, as well as water quality, green infrastructure, low impact development, community character, and other related benefits and issues connected to the mandates of the GI Plan.

Documents noted in Table 5-1 to be modified and adopted prior to or concurrently with the Green Infrastructure Plan have been reviewed by staff from various Town departments, commissions, and elected officials, and their comments considered and integrated. Updated documents can be found on the Town's website.

Table 5-1. Identification, Evaluation, and Modification of Town Planning Documents

Document	Incorporates GI Requirements	Expected Update Schedule
Bicycle and Pedestrian Master Plan – Priority List	N/A	N/A
Bicycle and Pedestrian Master Plan – Class Design Approach, 2015	N/A	N/A
Bicycle and Pedestrian Master Plan, 2014	Yes	Green and complete streets aspects can be further expanded upon. Town will evaluate and consider during its next regularly scheduled update (date TBD).
Climate Action Plan, 2016 Final	No	Later, at next regularly scheduled update (date TBD). Can consider green infrastructure to aid flood reduction, improve water quality, increase multimodal and active transportation and its relationship to green and complete streets, etc.
Drainage Channel Basins Map, Exhibit 1	N/A	N/A
Drainage Criteria, 2013	No	Amendment and adoption in Fall 2019. Would apply to new projects that submit on or after January 1, 2020.
Driveways Specifications and Comments	N/A	N/A
Encroachment Permit Application	N/A	N/A
General Plan, Draft Update, 2019	Yes	While green infrastructure concepts and requirements are discussed, they can be enhanced. Now, as part of regularly scheduled update process of General Plan. Adoption anticipated in Fall 2019.
Grading and Drainage Checklist, 2018	No	Amendment and adoption in Fall 2019.
Holbrook-Palmer Master Plan, 2015	Yes	N/A. However, Town will evaluate and consider additional green infrastructure measures and related modifications at the next regularly scheduled update (date TBD).
Housing Element, 2015	No	Consider later, at next regularly scheduled update in 2020.
Model Water Efficient Landscape Ordinance, 2015	No	Amendment and adoption in Fall 2019.
Municipal Code	No	Amendment and adoption in Fall 2019.
Neighborhood Traffic Management Program, 2016	N/A	N/A
Specifications, Valley Gutter Curb	N/A	N/A
Standard Specifications, 4th Edition, 2018	No	Amendment and adoption in Fall 2019.
Streetfronting Landscaping and Fence Standards, 2018	N/A	N/A
Trench Details	N/A	N/A
Townwide Drainage Study Update, 2015	No	Later, at next regularly scheduled update (date TBD).

c. Policies, Regulations, and Other Implementation Mechanisms

As an outcome of the review of existing policy documents, development standards, etc.; and the identification of green infrastructure opportunities throughout the Town, it was determined that several new regulations should be prepared for adoption, these are addressed below. In addition, it was determined that the Town should pursue an additional method for achieving its stormwater treatment goals which is not currently credited through the MRP; this is discussed below as well.

Another implementation mechanism is a set of green infrastructure-related typical design details which take into account Atherton's rural context and site-specific character. This guidance has been developed and is included in Chapter 6 of this GI Plan.

New single-family development regulations

Given constraints in terms of space within public rights of way and the minimal amount of public land in Atherton, as well as limited local funding for design, construction, and maintenance for green infrastructure, the concept of expanding upon the existing single family detention facility regulations found in the *Town of Atherton Drainage Criteria* to include creation of green infrastructure through development of single family homes was identified as a viable approach for implementing green infrastructure in Atherton.

Development regulations have been prepared to require certain residential development projects that are not regulated by the current MRP to provide green infrastructure designed to meet the treatment levels defined for C.3 new and redevelopment projects.

These requirements will be placed into the Town of Atherton's Drainage Criteria policy document:

- Full-site single family residential development projects that create or replace 10,000 sf of impervious area shall:
 - develop on-site green infrastructure meeting C.3 regulated project standards as a supplement to or to assist in meeting Town detention facility requirements.
 - develop green infrastructure that is sized to treat runoff from immediately adjacent public streets compliant with C.3 treatment and design requirements either within the adjacent public street frontage or on the single family development's property.
- The term "full site residential development project" is defined as a "single family project involving additions or remodels that impact 50% or more of the existing square footage or replacing 50% or more of impervious area on the site, within any continuous 12-month period."

Preservation and Enhancement of Atherton's Urban Forest

Trees perform a variety of functions and benefits including reducing runoff volumes and improving water quality. Atherton's extensive urban forest and its tree canopy aid in reducing stormwater runoff and flooding by capturing rainfall in leaves and bark and allowing for evapotranspiration. This and the effect of delaying runoff prevents or limits rain from falling to the ground and becoming runoff. In addition, the soil around trees often allow for more infiltration of stormwater and can treat pollutants while tree roots take up infiltrated water and pollutants.

Certain existing trees that are preserved or new trees that are planted as part of a C.3 regulated project, "interceptor trees", can earn stormwater treatment credits. Interceptor Trees are a true landscaped-based green infrastructure measure and do not "mimic" the natural hydrologic cycle that green stormwater measures strive to replicate. For each qualifying tree that is planted or preserved, and meets the minimum requirements of Section 4.1.1 of the C.3 Regulated Projects Guide, previously named the C.3 Technical Guidance, the project earns stormwater treatment credits which reduces the surface area of the project that

must receive stormwater treatment. In other words, the stormwater treatment credit can be subtracted from the amount of impervious surface area requiring treatment.¹¹

Atherton is a community that is well known for its heavily forested streets and residential lots and rural character. The Town is a Tree City USA community and cherishes and celebrates its community trees. The Town and its residents feel strongly about enhancing, protecting and maintaining the health of its trees. But the Atherton urban forest needs to be maintained, and in some locations, it can be expanded through the planting of trees on public and private property and within public rights of way. To better protect, preserve and expand its urban forest of heritage and other trees and the community character of Atherton, the Town has developed and enforces a town-wide heritage tree protection and preservation ordinance that restricts activities near or to tree roots, trunks, and limbs.

Amended heritage tree protection ordinance

The Town's heritage tree protection ordinance and related application forms are currently (2019) being updated to further enhance and maintain the health of Atherton's urban forest; maintain and increase the Town's benefits associated with trees such as climate adaptation, air and water treatment, and enhanced community character; and the Town's wishes to expand its tree protection ordinance.

Interceptor tree definition and stormwater credit refinement

Atherton believes that the Countywide Program's existing guidance for Interceptor Trees in the C.3 Regulated Projects Guide needs to be re-evaluated and refined to better define interceptor trees to allow greater flexibility in determining which trees are considered Interceptor Trees. As one of the primary goals of green infrastructure is to mimic natural processes and mitigate the loss of tree canopies and natural vegetation, maintenance and expansion of the urban forest should be credited towards a Permittee's reduction of TMDLs as they reduce the impact of development projects on the natural environment, retaining the capacity of evapotranspiration and infiltration. Issues and metrics for consideration can include:

- The C.3 Technical Guidance Manual (version 5) requires an interceptor tree to be planted within 25 feet of a ground-level impervious surface.
 - Expand qualifying impervious surface areas to include above ground level (e.g., roofs) elements in addition to ground level elements if it can be shown that mature tree height will cover the raised impervious surface. Regardless of the impervious surface's elevation, tree canopies can prevent or limit the volume of runoff requiring treatment.
 - Allow for a greater horizontal distance between a designated preserved tree or new tree and project designated impervious surface to be used. This would account for mature tree roots, larger tree sizes and canopies, and conditions where impervious and pervious areas may drain to other impervious areas such driveways or a parking draining to a street.
- Recognize that Interceptor Trees are a true landscaped-based green infrastructure measure and do not "mimic" the natural hydrologic cycle that green stormwater measures strive to replicate.
- Be accepted as a stormwater management and treatment measure as they encourage soil infiltration and take up water and pollutants, treating and improving water quality and reducing erosion and flooding.
- Expand credit for existing mature trees being retained.
- Expand the allowable canopy area to acquire stormwater tree credits for existing trees to be the mature canopy size of each tree.
- Expand credit for preservation or planting of trees anywhere as forested cover aids in capturing and reducing runoff and providing treatment at an overall community and regional scale and reduces the burden on public infrastructure and public area impacts.

¹¹ C.3 Regulated Projects Guide.

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- Expand credit to include evapotranspiration, pollutant removal and volume reduction, and not only canopy interception related to impervious area reduction.

There are examples of other municipalities across the country that have implemented a variety of stormwater credits, fee incentives, and other techniques for existing or newly planted trees to be considered as a stormwater management tool. Some of these expand upon the benefits of trees as stormwater measures. In some cases, the trees are recognized as a treatment measure.

Atherton will continue to research, evaluate, and explore these considerations and advocate the use of interceptor trees with the Countywide Program for discussions with the Water Board to provide and receive interceptor tree credit for existing trees as related to stormwater treatment, stormwater management and flooding attenuation. At the same time, Atherton will move forward with revising their tree ordinance in relation to preservation and enhancement of the urban forest.

Other potential policies, regulations, and other implementation mechanisms

In addition, Atherton is exploring other techniques and strategies to increase green infrastructure implementation and aid in the reduction of TMDL loads. This includes:

1. Continuing to explore the benefits, pros and cons, and potentially advocate for a countywide approach to achieving the countywide TMDL reductions rather than the current approach of each individual member agency/Permittee providing and maintaining green infrastructure within their own jurisdictions to achieve their proportion of the countywide TDML reduction.
2. If projects move forward in partnership with other agencies or entities, various new documents would need to be developed, such as:
 - If Cartan Fields Water Capture project becomes a shared multi-jurisdictional facility, MOUs and other agreements on planning, implementation, funding, O&M, etc. will need to be developed.
 - Similarly, the Grand Boulevard Greenway Concept will require coordination and cooperation with Caltrans, C/CAG and adjacent jurisdictions.
3. Atherton will continue to look for opportunities to partner with other public and private institutional facilities to add or expand green infrastructure facilities as well as treat shared public and private runoff.

If these and/or other new issues and strategies are determined to be implemented, existing planning documents and legal mechanisms may be updated or completely new documents and mechanisms may need to be prepared.

d. Work Plan for Inclusion of Green Infrastructure in Future Updates or New Documents

A few of the Town's planning, engineering, and other documents have been identified to be updated and/or approved after adoption of the Green Infrastructure Plan, including the General Plan and Heritage Tree Protection Ordinance. This timing is due to the documents being updated as part of the Town's normal cycle of plan updates or are currently in the midst of being updated and finalized, as is the case of the General Plan.

Per section C.3.j.i.2.i of the MRP's requirements for Green Infrastructure Plans, a Workplan for updating and modifying these existing documents and preparing new documents must be developed. Atherton's Workplan to include references to the Town's Green Infrastructure Plan and other policy, requirements, and guidance to identify and implement green infrastructure is included below. As mandated by the MRP, the Workplan is to identify how the Town will ensure that green infrastructure and low impact development measures are appropriately considered, coordinated, and included in future plans.

identify how the Town will ensure that green infrastructure and low impact development measures are appropriately considered, coordinated, and included in future plans.

Town staff, officials, stakeholders, and the selected consultants responsible for developing new or updating existing documents will coordinate and actively monitor, consider and incorporate goals, policies, guidance, requirements, and other discussions related to green infrastructure, low impact development, stormwater management, and improving water quality as mandated by the MRP and required by the Green Infrastructure Plan as appropriate to the document. New policies, regulations, and other planning documents and legal mechanisms will be developed to implement green infrastructure, including the potential strategies noted above. Atherton will work with partner agencies in the drafting and adoption of documents related to joint projects or a countywide approach. In addition, secondary community benefits such as enhancing Town character and improving roadway safety, building upon earlier green infrastructure policy and plans, evaluating prior projects and programs, consistency between plans and documents, and so forth will be considered for inclusion. Interdepartmental Town staff have and will continue to work together to identify, discuss, and implement green infrastructure requirements on projects and planning documents.

Green infrastructure opportunities, prioritization, and strategies will be considered and integrated into these plans when they're updated or developed, where feasible and in accordance with the Town's adopted Green Infrastructure Plan and future amendments, including locations identified as opportunities for green street and other green infrastructure measures and facilities.

6.0 Green Infrastructure Guidance

a. Green Infrastructure Design Guide

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

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

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

The 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.

Atherton will use the Design Guide and future amended versions to provide support and guidance in implementing green infrastructure within the Town. As more green infrastructure projects are implemented in Atherton, portions of the Design Guide may be superseded by Atherton-specific updates or modifications based upon lessons learned and other factors experienced in or determined by the Town. The Design Guide can be found at SMCWPPP's website, at <https://www.flowstobay.org/gidesignguide>.

As noted in the following subsections, the Town has included some additional Atherton-specific guidance to address local context and existing policies to customize the guidance for Atherton. Sections of the Design Guide that have been modified or supplemented are maintained in a companion document for convenient understanding, use, and tracking by staff and project proponents. Atherton-specific typical green infrastructure details can be found at <https://www.ci.atherton.ca.us/237/Construction-and-Engineering>.

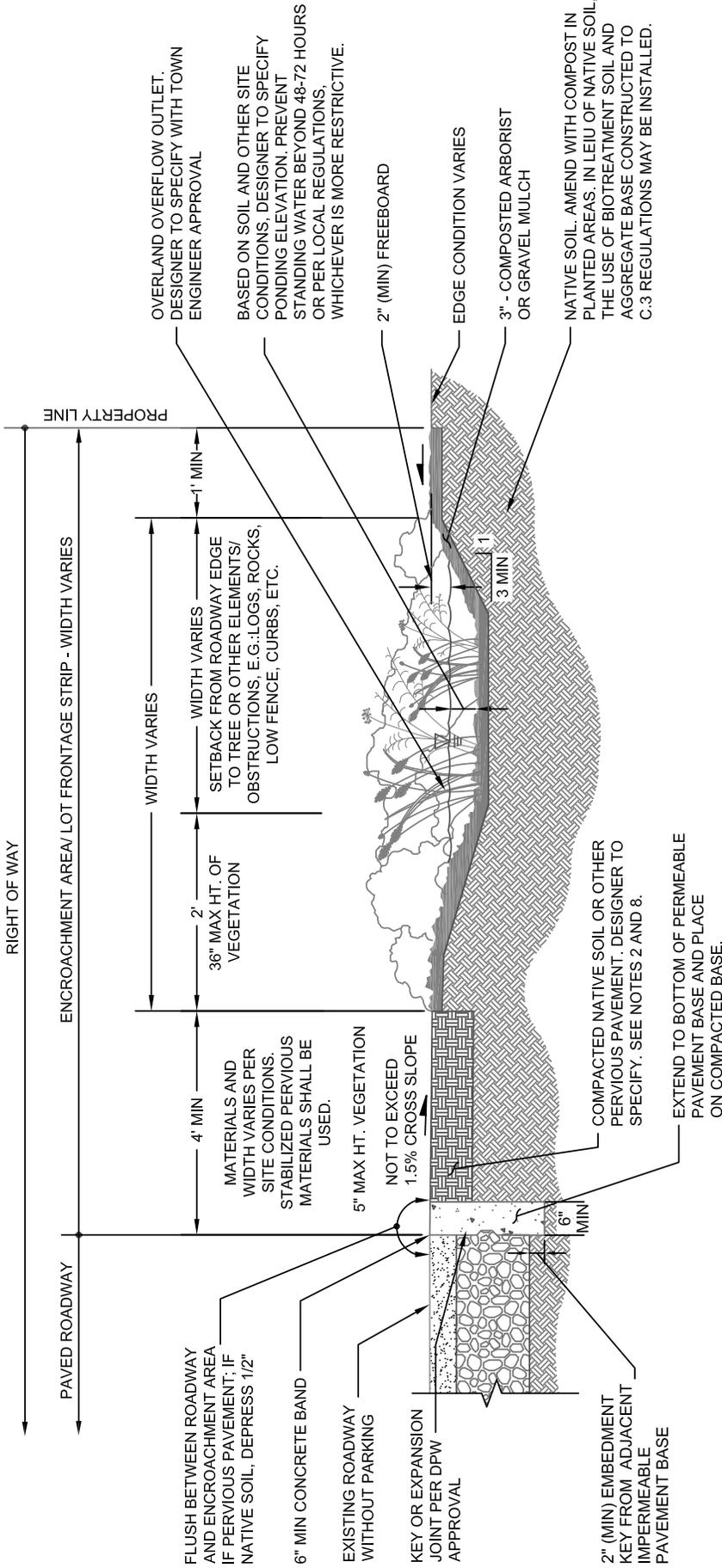
b. Atherton-specific Typical Green Infrastructure Details

To aid in the development and implementation of green infrastructure measure types and character that is appropriate to and complementary with the existing appearance of the Town, Atherton has prepared or customized additional typical details to those already present in the set of typical details modified by the SMWCPPP and SFPUC details. Typical details developed as of September 2019 are as follows:

1. GI 1 Landscaped stormwater planter shoulder. See Figure 6-1.
2. GI 2 Bioretention basin/rain garden in right of way. See Figure 6-2.
3. GI 3 Pervious pavement shoulder. See Figure 6-3.

c. SMCWPPP C.3 Regulated Projects Guide

The C.3 Regulated Projects Guide, previously named the C.3 Technical Guide, is being updated and expected to be finalized in late 2019. It is available to provide guidance related to more technical aspects of green infrastructure for regulated and other projects.



CONSTRUCTION NOTES:

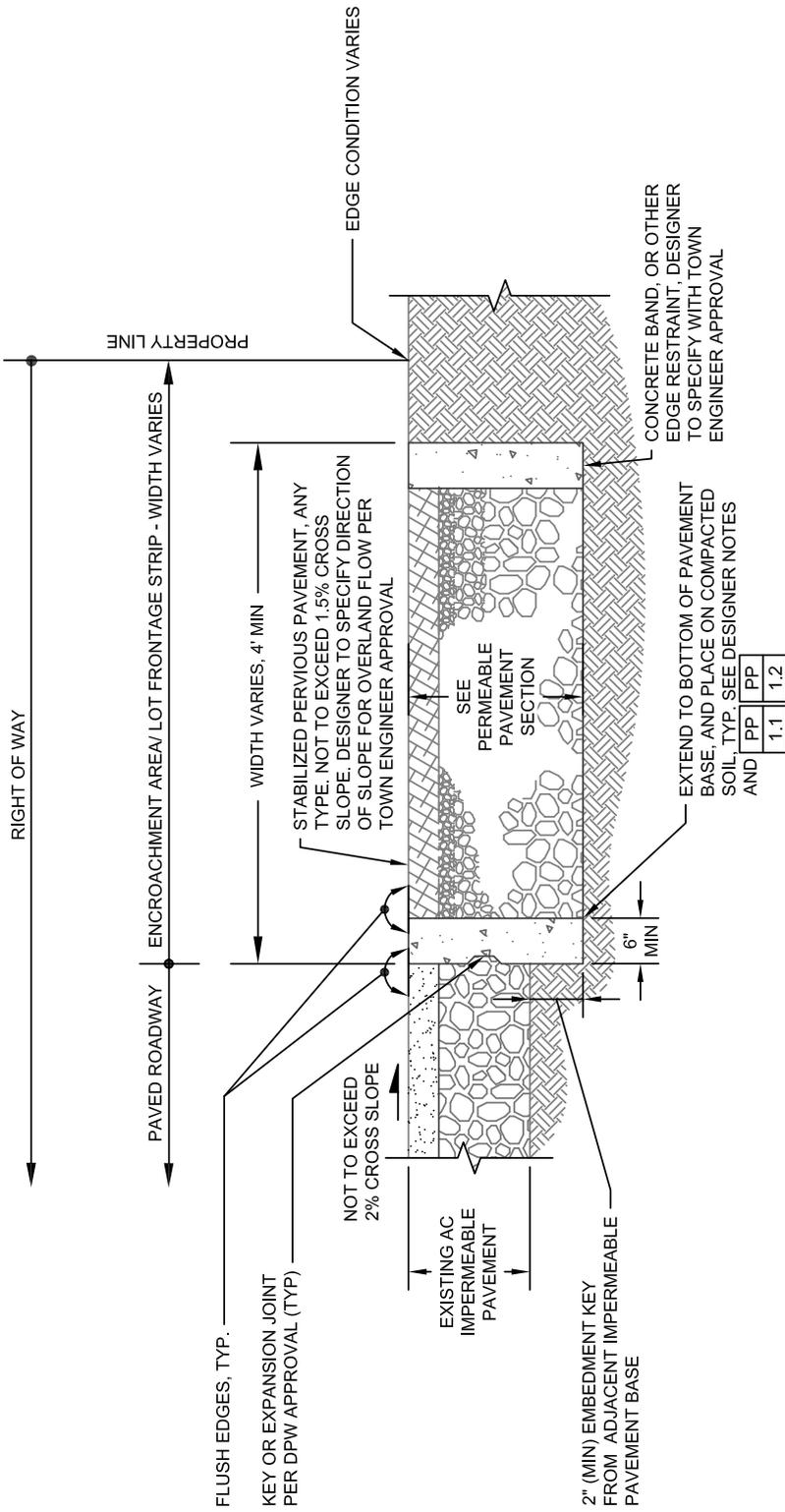
1. SCARIFY SUBGRADE TO A DEPTH OF 3 INCHES (MIN) IMMEDIATELY PRIOR TO PLACEMENT OF AMENDED SOIL MATERIALS.
2. COMPACT SOIL IMMEDIATELY BEHIND ROADWAY PAVEMENT AND TO 90% OF MAXIMUM DENSITY PER STANDARD PROCTOR TEST (ASTM D698).
3. UNDERDRAIN MAY BE INCLUDED IF CONNECTION TO STORM DRAIN IS AVAILABLE.
4. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO ATHERTON'S PROTECTION STANDARDS. COORDINATE WITH CITY ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
5. GEOTECHNICAL OR HYDROLOGIST ENGINEER TO DETERMINE DEPTH OF STORMWATER PLANTER PER TESTED SOIL INFILTRATION RATE AND OTHER SITE CONDITIONS.
6. PLACE TALLEST PLANTS AT DEEPEST AREAS OF STORMWATER PLANTER.
7. DESIGNER TO PROVIDE OVERLAND OVERFLOW LOCATION AND DIRECTION, CONSISTENT WITH PRE-DEVELOPMENT FLOW DIRECTION.
8. PERVIOUS MATERIALS SHALL MEET MANUFACTURER'S SPECIFICATIONS.



TOWN OF ATHERTON TYPICAL DRAWING

DATE	SEPTEMBER 2019
VERSION	1.0
REVISED	

LANDSCAPED STORMWATER PLANTER SHOULDER



CONSTRUCTION NOTES:

1. SCARIFY SUBGRADE TO A DEPTH OF 3 INCHES (MIN) IMMEDIATELY PRIOR TO PLACEMENT OF AMENDED SOIL MATERIALS.
2. PERVIOUS MATERIALS SHALL MEET MANUFACTURER'S SPECIFICATIONS.
3. MAINTAIN OVERLAND FLOW.

EDGE TREATMENTS		SUBSURFACE CHECK DAMS		SUBSURFACE OUTLETS	
NOTES	KEY MAP	NOTES	COMPONENTS	NOTES	COMPONENTS
PC 1.1	PC 1.2	PC 2.1	PC 2.2	PC 3.1	PC 3.2
PC 1.3	PC 1.4	PC 2.1	PC 2.2	PC 3.1	PC 3.2
PC 1.5	PC 1.6	PC 2.1	PC 2.2	PC 3.1	PC 3.2
PC 1.7	PC 1.8	PC 2.1	PC 2.2	PC 3.1	PC 3.2

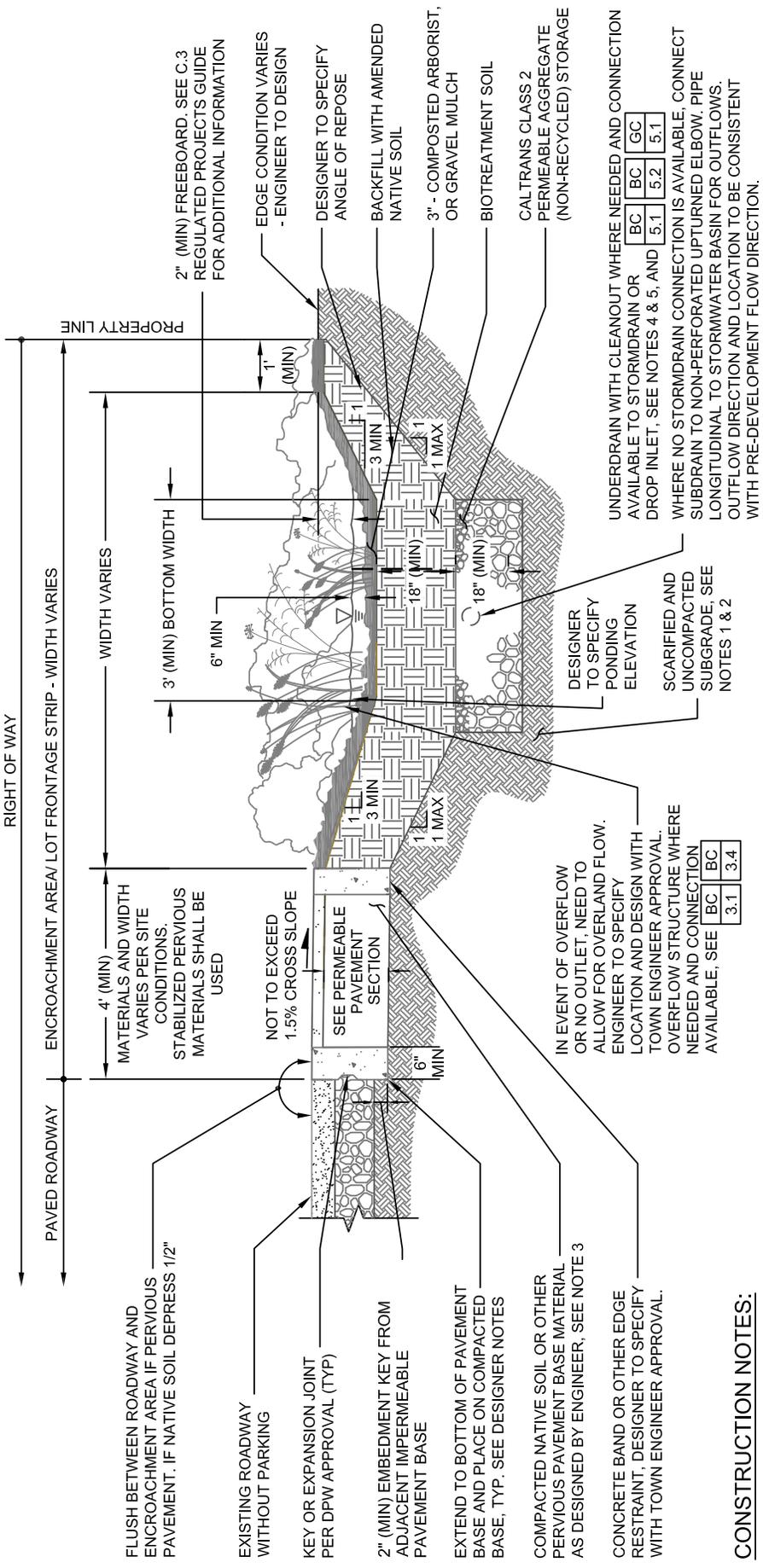
DETAIL ADAPTED FROM: SAN FRANCISCO PUBLIC UTILITIES COMMISSION (PC 1.3)
 REFER TO SAN MATEO GREEN INFRASTRUCTURE DESIGN GUIDE FOR MORE
 INFORMATION ON NOTED COMPANION DETAILS.



TOWN OF ATHERTON TYPICAL DRAWING

DATE	SEPTEMBER 2019
VERSION	1.0
REVISION	

PAVEMENT COMPONENTS PERVIOUS PAVEMENT SHOULDER



CONSTRUCTION NOTES:

1. AVOID COMPACTION OF EXISTING SUBGRADE BELOW BASIN/ RAIN GARDEN.
2. SCARIFY SUBGRADE TO A DEPTH OF 3 INCHES (MIN) IMMEDIATELY PRIOR TO PLACEMENT OF AGGREGATE STORAGE AND BIOTREATMENT SOIL MATERIALS.
3. COMPACT SOIL IMMEDIATELY BEHIND ROADWAY PAVEMENT AND TO 90% OF MAXIMUM DENSITY PER STANDARD PROCTOR TEST (ASTM D698) IF REMAINS IN NATIVE SOIL CONDITION.
4. UNDERDRAIN REQUIRED FOR ALL FACILITIES WITH IMPERMEABLE LINER.
5. PROVIDE ONE CLEANOUT PER RAIN GARDEN (MIN) FOR FACILITIES WITH UNDERDRAINS.
6. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO ATHERTON'S PROTECTION STANDARDS. COORDINATE WITH CITY ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
7. GEOTECHNICAL OR HYDRAULOGIST ENGINEER TO DETERMINE IF LINER SHALL BE USED.
8. ANGLE OF REPOSE MAY VARY BASED ON GEOTECHNICAL ENGINEER RECOMMENDATIONS.
9. PERVIOUS MATERIALS SHALL MEET MANUFACTURER'S SPECIFICATIONS.

DETAIL ADAPTED FROM: SAN FRANCISCO PUBLIC UTILITIES COMMISSION (BB 2.1)
 REFER TO SAN MATEO GREEN INFRASTRUCTURE DESIGN GUIDE FOR MORE INFORMATION ON NOTED COMPANION DETAILS.



**TOWN OF ATHERTON
 TYPICAL DRAWING**

DATE	SEPTEMBER 2019
VERSION	1.0
REVISED	

**STORMWATER BASIN (RAIN GARDEN)
 ROADSIDE SECTION
 LOCATED UPSTREAM OF DROP INLET**

NOTES	BB	1.1
SECTIONS	BB	2.1
	BB	2.2
	BB	2.1.2

7.0 Green Infrastructure Hydraulic Sizing

MRP Provision C.3 requires Phase I stormwater Permittees like the Town of Atherton to use the municipal planning process to address pollutant discharges in stormwater runoff by requiring the implementation of control measures that infiltrate, biotreat, or capture and use stormwater during new development and redevelopment. The MRP outlines numeric and hydromodification management criteria for Regulated Projects¹² and allows for the use of an alternative sizing methodology for constrained non-regulated green streets projects with green infrastructure typically implemented in rights of way.

a. Regulated Projects

Numeric Sizing Criteria

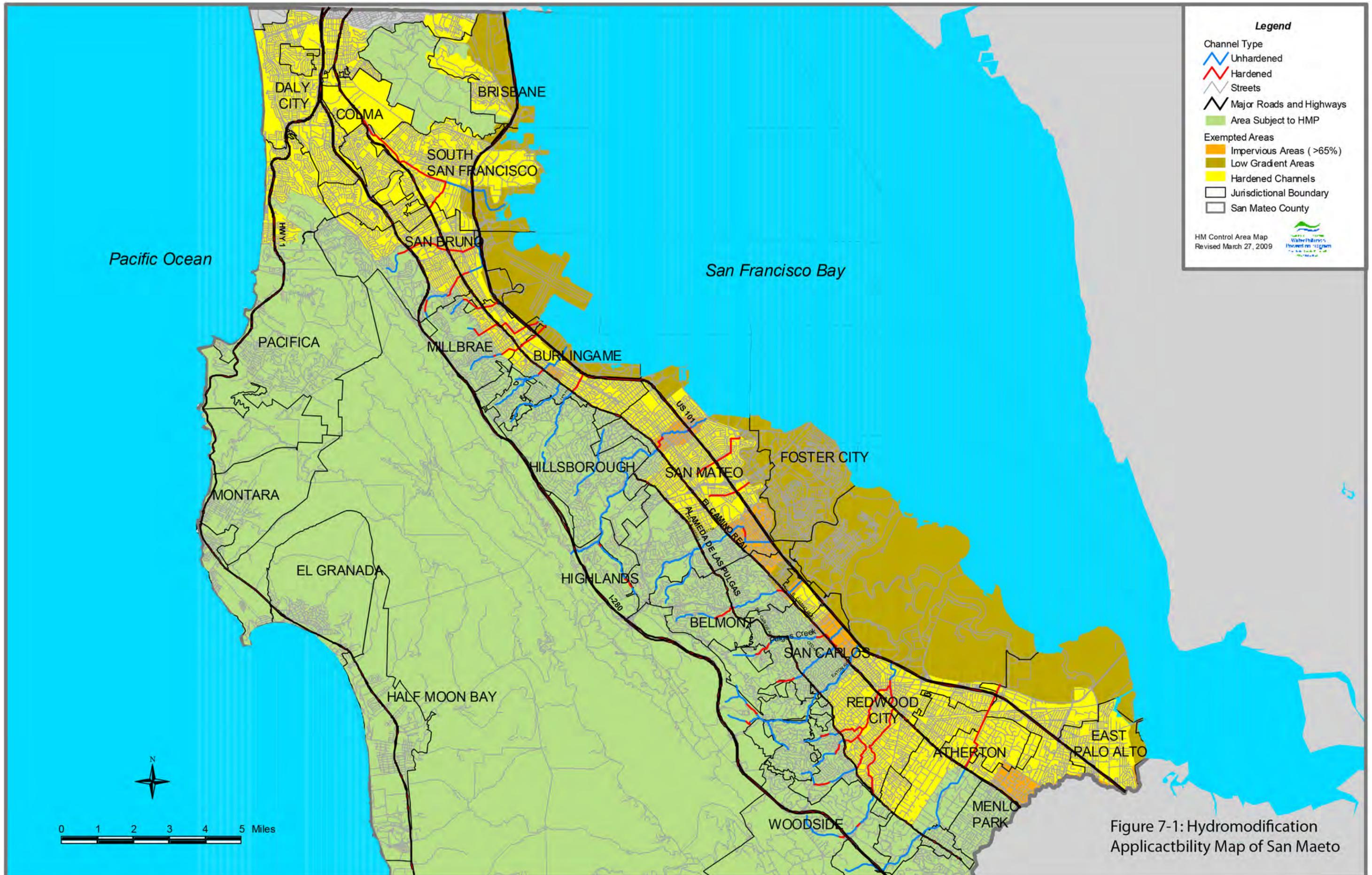
MRP Provision C.3.d outlines volume and flow-based numeric sizing criteria for stormwater treatment measures implemented on Regulated Projects. Two options are presented for the volume hydraulic design criteria in Provision C.3.d.i.(1), specifically 1) capturing the volume for the 85th percentile, 24-hour storm or 2) capturing 80% or more of annual runoff generated at the site. Flow hydraulic design criteria presented in Provision C.3.d.i.(2) include treating 1) 10% of the 50-year peak flow rate, 2) the runoff produced by a storm two times the depth of the 85th percentile, 24-hour storm, or 3) runoff resulting from a rain event equal to an intensity of 0.2 inches per hour. An extensive catalog of technical guidance documentation and resources supporting the sizing of C.3 projects is available on the Countywide Program's Flows to Bay website¹³ including worksheets for both volume and flow-based sizing of green infrastructure in a manner consistent with the requirements outlined in MRP section C.3.d.

Hydromodification Management Sizing Criteria

Regulated Projects that create and/or replace one acre or more of impervious surface are also considered Hydromodification Management Projects and are required to meet the Hydromodification Management (HM) Standard of Provision C.3.g.ii unless projects meet one or more of the criteria for exclusion presented in C.3.g.i. These criteria include conditions where post project impervious is less than or equal to pre-project impervious, the project is located in a catchment that drains to a hardened or engineered channel, or the project is located in a subwatershed that is highly developed with 70% or more imperviousness. The Hydromodification Applicability Map of San Mateo County developed on behalf of Permittees during the previous permit term, presented in Attachment C of the MRP and as Figure 7-1 here, indicates that a significant part of the western and northern portion of the Town of Atherton drains to a hardened channel, the engineered Atherton Channel, and is therefore exempt from the HM requirements outlined in C.3.g. The portion of the Town shown in green is subject to HM requirements outlined in the MRP Provision C.3.g. The Countywide Program has developed a HM Measure resource, presented as Section 7 of the C.3. Regulated Projects Guide, to support efforts to demonstrate that post-project runoff volumes and duration do not exceed pre-project conditions.

¹² Regulated Projects are typically associated with new development or redevelopment on parcels or portions of parcels to meet the definition outlined in the MRP (e.g.; creating or replacing greater than or equal to 5,000 square feet of impervious area). A comprehensive definition of Regulated Projects can be found in Provision C.3.b of the MRP.

¹³ C.3 Regulated Projects Guide documentation can be found on the Countywide Program's Flows to Bay website at <https://www.flowstobay.org/newdevelopment#c3TechGuidance>



Legend

- Channel Type
 - Unhardened
 - Hardened
- Streets
- Major Roads and Highways
- Area Subject to HMP
- Exempted Areas
 - Impervious Areas (>65%)
 - Low Gradient Areas
 - Hardened Channels
- Jurisdictional Boundary
- San Mateo County

HM Control Area Map
Revised March 27, 2009

Figure 7-1: Hydromodification Applicability Map of San Mateo

b. Non-Regulated Constrained Green Streets Projects

The MRP recognizes that green street green infrastructure implemented in the public right of way may be constrained by available space, the presence of utilities, preservation of heritage trees, or other factors and allows non-regulated green streets project with clearly defined and documented constraints to use an alternative sizing methodology. The Bay Area Stormwater Management Agencies Association (BASMAA) has developed a regional green streets alternative sizing guidance¹⁴ (green streets sizing guidance) based on an extensive hydrologic and hydraulic modeling analyses. This green streets sizing guidance presents sizing curves outlining the minimum bioretention surface area required to treat 80% of average annual runoff to meet the second volumetric hydraulic design criteria presented in MRP Provision C.3.d.i.(1). The guidance also outlines approaches to green infrastructure design for projects where C.3.d sizing requirements cannot be reasonably achieved and presents an equation to calculate the minimum bioretention sizing factor, the ratio of the surface area or footprint of the bioretention facility and the impervious area treated by green infrastructure, to meet requirements outlined in C.3.d based on the mean annual precipitation (MAP) of the project site. The sizing factor equation presented is:

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

A review of annual rainfall records for the closest available long-term rainfall gauge, NOAA gauge number 046646 in Palo Alto, indicates that Atherton receives a MAP of 15.41¹⁵ inches per year translating into an alternate green infrastructure sizing factor of 0.019. Non-regulated constrained green streets projects implemented within the Town of Atherton could therefore be sized at 1.9% of a green streets drainage area and achieve the alternative sizing requirements consistent with MRP Provision C.3.d.i.(1). Additional information regarding the alternative sizing methodology can be found in the *Guidance for Sizing Green Infrastructure Facilities in Street Projects* (which includes the companion analysis document *Green Infrastructure Facility Sizing for Non-Regulated Streets Projects*) presented in Appendix 7 of the Green Infrastructure Design Guide.

¹⁴ BASMAA, 2018. "Guidance for Sizing Green Infrastructure Facilities in Street Projects."

¹⁵ Climate summaries for northern California available online at https://w2.weather.gov/climate/local_data.php?wfo=STO

c. Hydraulic Sizing Resources

An overview of relevant guidance documents and resources for Regulated Projects and green streets projects for 1) areas exempt from hydromodification management requirements and 2) areas subject to those requirements and is presented in Table 7-1.

Project Type	Guidance Source Location	
	Provision C.3.i or HM Guidance, if Applicable	Hydraulic Sizing Guidance
Regulated Project that is not a Hydromodification Management Project	Not applicable	SMCWPPP C.3 <i>Regulated Projects Guide, Section 5.1, Hydraulic Sizing Criteria</i>
Regulated Project that is a Hydromodification Management Project	SMCWPPP C.3 <i>Regulated Projects Guide, Section 7, Hydromodification Management Measures</i>	SMCWPPP C.3 <i>Regulated Projects Guide, Section 7, Hydromodification Management Measures</i>
Non-Regulated Green Infrastructure Project (public or private project) not subject to Provision C.3.i	Not applicable	<i>BASMAA Guidance for Sizing Green Infrastructure Facilities in Streets Projects with companion analysis: Green Infrastructure Facility Sizing for Non-Regulated Streets Projects</i> (can also be found in: <i>Green Infrastructure Design Guide, Section 4.12 Sizing of Green Infrastructure Facilities</i> and <i>Appendix 7 Guidance for Sizing Green Infrastructure in Streets</i>) as site conditions permit.
Non-Regulated Green Infrastructure Project (public or private project) subject to Provision C.3.i	SMCWPPP C.3 <i>Regulated Projects Guide, Appendix L – Site Design Requirements for Small Projects</i>	<i>BASMAA Guidance for Sizing Green Infrastructure Facilities in Streets Projects with companion analysis: Green Infrastructure Facility Sizing for Non-Regulated Streets Projects</i> (can also be found in: <i>Green Infrastructure Design Guide, Section 4.12 Sizing of Green Infrastructure Facilities</i> and <i>Appendix 7 Guidance for Sizing Green Infrastructure in Streets</i>) as site conditions permit.

Table 7-1. Location of hydraulic sizing and other applicable guidance for different project types.

8.0 Evaluation of Funding Opportunities

a. Overview of Current and Potential Funding Opportunities

SMCWPPP commissioned the Green Infrastructure Funding Nexus Evaluation¹⁶ to aid member agencies in an efficient, comprehensive, and cohesive countywide identification, evaluation, and selection of potential funding sources for the implementation of public green infrastructure that would be most useful to each member agency. MRP provision C.3.j.i(2)(k) requires a GI Plan to include “an evaluation of prioritized project funding opportunities, 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.”

The *Green Infrastructure Funding Nexus Evaluation* report looked into common existing funding mechanisms (fees, taxes, developer fees, etc.) as well as recently pioneered funding strategies such as alternative compliance funds and enhanced infrastructure finance districts. Many municipalities are finding that obtaining funding for green infrastructure can be challenging and that no single source of revenue is adequate to fund its stormwater and green infrastructure needs. Hence, most agencies will need to develop a strategy to obtain funding from several sources – a portfolio approach – to successfully achieve the needed funding. The current and ongoing process the Town is undertaking of reviewing the funding sources that are, or could be, available will culminate in a tool box of the green infrastructure funding opportunities that are most beneficial and feasible for Atherton.

Atherton has reviewed the *Green Infrastructure Funding Nexus Evaluation* report and evaluated its findings for potential green infrastructure funding sources and strategies to supplement the funding sources currently being used or intended to be used by Atherton. This evaluation has identified a variety of sources and strategies that can be used or explored more thoroughly following the approval of the GI Plan as Atherton moves forward with planning, design, construction, and operations and maintenance of green infrastructure. The identification of potential funding sources is a requirement of Provision C.3.j.i.(2) of the MRP. Atherton intends to periodically review their evaluation and identification, exploration, and use of funding sources to inform their approach to streamlining, selecting, and obtaining funds for the implementation and operations and maintenance of green infrastructure.

Current funding is insufficient for the capital and maintenance needs of existing stormwater infrastructure. Obtaining additional funds to implement and maintain new green infrastructure facilities within the existing system will be difficult. Atherton will need additional funding to implement all phases of green infrastructure, including staff, planning, design, construction, and operations and maintenance. It is expected that multiple sources of funding will need to be obtained to achieve the Town’s goals in providing and maintaining green infrastructure. As possible, Atherton intends to partner with other agencies and private property owners to lessen the Town’s direct financial burden. This can include the planning, design, and construction of projects as well as operations and maintenance for shared projects with partners, projects that provide co-benefit to other entities, and private or public projects by others.

In addition, Atherton will review other projects to determine if green infrastructure implementation and funding can be integrated into other transportation, utility, and other improvement projects that already have funding or have access to other funding streams. These and other potential green infrastructure funding sources will be monitored by the Town and the Potential Funding Opportunities table will be assessed and updated periodically.

¹⁶ SCI Consulting Group and LWA, *Green Infrastructure Funding Nexus Evaluation*, January 2019. Excerpts from this report are used in this GI Plan section. This report can be found as Appendix 6 in the Green Infrastructure Design Guide, another document included by reference as part of this Green Infrastructure Plan.

Atherton Green Infrastructure Plan

Potential San Mateo Flood and Sea Level Rise Resiliency Agency

While not included in the following matrix, another source for potential funding may be from San Mateo County and the City/County Association of Governments (C/CAG). The County and C/CAG are currently developing a proposal for a new agency, the San Mateo Flood and Sea Level Rise Resiliency Agency, to plan, build and maintain projects of regional significance which could complement, or possibly supplement, local green infrastructure needs as well as address sea level rise and flooding challenges. Funding could be provided through a countywide property tax or similar mechanism. If this agency is created it is anticipated that it would fund the maintenance associated with the Cartan Field Water Capture project, discussed below.

Past and Current Infrastructure Funding Efforts

In the past, Atherton has requested special parcel taxes to fund infrastructure and capital improvements including roadway and drainage improvements. In order to fund the storm system improvement needs for the Atherton Channel District, the Town Council has discussed different funding opportunities including consideration of a benefit assessment. Atherton is currently partnering with Caltrans for a water capture project to be located Cartan Field, a private athletic field. It is expected that other regional projects and Caltrans designated rights of way within Atherton will be good candidates for Caltrans funding opportunities. A range of green infrastructure measures and facilities are included as part of Atherton's Civic Center and Library development project in order to meet the Provision C.3 requirements for the project. The planning, design, and construction of these facilities have been integrated with the overall project's funding, which is from the Town's general fund. Other green infrastructure improvements such as pervious frontage strips and landscaping within the right of way have been funded by adjacent property owners.

b. Potential Funding Opportunities Evaluation

The range of green infrastructure techniques and applications allows for the consideration of a variety of funding approaches. Based on the funding types, sources, description, and pros and cons identified in the *Green Infrastructure Funding Nexus Evaluation*, the Town of Atherton has evaluated funding opportunities for implementing identified and future stormwater and green infrastructure projects. The matrix below provides a summary of the evaluation of green infrastructure potential funding opportunities, options, and strategies as well as concise information about the nexus to green infrastructure, what is funded, funding requirements, and potential for use by Atherton.

Funding opportunities were evaluated on a variety of factors including:

- existing funding and organizational structures within Atherton
- whether ballot approval, approval by voters, is needed to implement the funding option
- past voting outcomes for balloted measures in Atherton
- likelihood for grant and loan approval
- ability to support shared projects/partnerships/alternative compliance projects
- what activities the funds can be used towards – staff, planning, capital, operations and maintenance (O&M)

Based on the evaluation of funding opportunities, Atherton has identified the funding source opportunities and approaches that will be considered for use or to be explored in greater detail for potential use. These, and other funding source opportunities determined to not be appropriate for Atherton, are listed in the table below. In addition, their nexus to green infrastructure, green infrastructure funding capabilities, funding requirements, and potential and rational as a green infrastructure funding opportunity for Atherton are summarized.

The "GI Nexus" column explains how the type of funding is connected to green infrastructure and can be leveraged to fund green infrastructure projects. Proving nexus to interrelated infrastructure funding sources is

necessary to link development impacts and compliance needs. This column conceptualizes the importance of green infrastructure regarding the funding categories.

“GI Funding Capabilities” identifies where the funds can be applied to, being: planning, staff (time), capital costs, and operations and maintenance. It is important to reiterate that some funding sources may be able to cover some, but not all, of these categories and it is likely that more than one avenue for funding will be necessary.

The “Requirements” column indicates the significant compliance requirements or actionable steps that are necessary to obtain the funding source. These requirements touch on information on regulatory compliance, voting approval rate, applications, necessary reporting, existing or planned conditions, and approach.

Finally, the Potential GI Funding Opportunity column indicates the viability of the opportunities as a possible funding source as evaluated and determined by Atherton: Yes, No, or Explore, and a concise rationale to support the finding. Where a funding opportunity is marked “Yes”, that indicates where the Town has either experienced success in obtaining green infrastructure funding or is interested in pursuing as a funding opportunity for green infrastructure projects. The “Explore” label is given to funding opportunities that may provide possible avenues for funding green infrastructure projects, but viability is reliant on additional factors or further investigation is needed. Funding opportunities marked “No” are considered highly unlikely for Atherton to pursue as a funding source for green infrastructure projects.

Table 8-1: Tool Box of Potential Funding Opportunities

Funding Category/ Opportunities	GI Nexus	GI Funding Capabilities	Requirements	Potential GI Funding Opportunity
Traditional Methods –Balloted Approaches				
Parcel Tax	Can fund all or any parts of a GI program as stipulated in the ballot questions and authorizing ordinance	Staff, Planning, Capital, O&M	Typically require a 2/3 voter approval	No. 2/3 vote to approve will be difficult and unlikely to pass – even for pre-identified stormwater needs – and harder for GI implementation.
Special Tax	Business license tax; vehicle license fees; sales tax; utility users tax; transient occupancy tax	Staff, Planning, Capital, O&M	Typically require a 2/3 voter approval	No. 2/3 vote to approve will be difficult and unlikely to pass – even for pre-identified stormwater needs – and harder for GI implementation.
Property Related Fee	Establishes storm drainage as a separate utility service and can fund all or any parts of a GI program	Staff, Planning, Capital, O&M	Prop 218 compliance; rigorous rate study; must define services and service area; property owner approval for non-water, sewer and garbage	No. 50% property owner approval will be difficult to achieve.
General Obligations Bond	Can fund capital GI projects through debt taken on by municipality	Planning, Capital	Voter approval at 2/3 level; will need financial advising consultant	No. Town will not borrow funds for these types of improvements. Also, 2/3 vote to approve will be difficult and unlikely to pass.

Atherton Green Infrastructure Plan

Funding Category/ Opportunities	GI Nexus	GI Funding Capabilities	Requirements	Potential GI Funding Opportunity
Traditional Methods – Non-balloted Approaches				
Senate Bill 231	Allows for adoption of property related fees without having to go to ballot	Staff, Planning, Capital, O&M	Cost of service analysis; rate study; Prop 218 protest hearing	No. As the Town does not manage and/or maintain water or sewer systems, there would be no nexus in assessing a non-balloted fee that would stand up to any challenge.
Regulatory Fee (plan, check, and inspection)	Fees and charges for performing administrative activities related to GI	Staff	Cannot exceed the actual cost of performing activities such as permit issuance, inspection, onsite mitigation, etc.	Explore. Fees are limited to recouping costs for services rendered, therefore cannot be used to implement capital improvements.
Realignment of Services	Leverage funding from other Town departments for stormwater activities or reassign the stormwater activity to another department	Staff, Planning, Capital, O&M	Prop 218 compliance for realignment to water, sewer, or garbage must demonstrate applicability	No. Town does not manage or maintain water supply or sewer services. Though a nexus may be made associated with refuse collection for trash capture and street sweeping, extending that to GI would be difficult. Refuse rates are already high and with the limited number of customers this option would likely not yield a significant amount of funds.
Business License Fee	Applies to commercial operations with clear impacts on stormwater such as restaurants, vehicle repairs.	Staff, Planning, Capital, O&M	Must be a commercial or other operation with clear impacts on stormwater.	No. The Town is predominantly single family residential, with no commercial zoning. Nexus is unlikely.
Developer Impact Fee	Could incorporate fees for mitigating stormwater impacts to help fund GI. Would not relieve developer of NPDES requirements	Planning, Capital	Must comply with AB 1600 and include a rigorous nexus study	No. Would need to investigate and develop a Town-specific nexus. Most development in Town are single family residential projects and other structures on single family residential lots.

Atherton Green Infrastructure Plan

Funding Category/ Opportunities	GI Nexus	GI Funding Capabilities	Requirements	Potential GI Funding Opportunity
Integration with Transportation or Utility Project	Make the connections between streets and drainage systems that are green and complete, where allowed by conditions of the funding source.	Planning, Capital	Examples may include: permeable pavements; roadside rain gardens; cisterns	Yes/Explore. With the exception of storm drains, the Town does not maintain utilities and conditioning utility projects to incorporate would be challenged. The Town may be able to implement some GI improvements with larger transportation projects, but most street projects the Town implements are smaller scale street maintenance projects (overlay and slurry seals) and Town budget allocation for these improvements is minimal.
Special Financing Districts				
Benefit Assessment	Can fund the construction and maintenance of GI projects	Planning, Capital, O&M	Prop 218 compliance; rigorous engineer’s report; must deduct general benefit from special benefit; property owner approval is required through a ballot proceeding (weighted voting); works best with new development due to voting requirement	Explore. May be possible to incorporate some GI into overall benefit calculation for the Atherton Channel District.
Community Facilities District	Can fund the construction and maintenance of GI projects	Planning, Capital, O&M	Requires vote by majority of landowners or 2/3 majority of registered voters	No. Do not have any development of the scale that a CFD would be appropriate

Atherton Green Infrastructure Plan

Funding Category/ Opportunities	GI Nexus	GI Funding Capabilities	Requirements	Potential GI Funding Opportunity
Business Improvement District	Business and property owners tax themselves to build and maintain GI improvements	Planning, Capital, O&M	Formed by a municipality through a notice and protest hearing process	No. Do not have any businesses areas.
Enhanced Infrastructure Financing District	Captures property tax increment for building and maintaining infrastructure like GI	Planning, Capital	With no debt: Establish a public finance authority; adopt financing plan; resolutions from participating agencies. With debt: All of the above; get approval from at least 55% of voters in district.	No. Town general fund revenues are predominantly property tax based. Town cannot dedicate portions of its tax increment and others would not likely share their increment for this purpose.
Alternative Compliance				
Alternative Compliance	Allows developers who cannot meet GI requirements on-site to build (or pay for) off-site construction of GI elements	Staff, Planning, Capital, O&M	Municipality would need to have alternative projects ready-- could be done case by case	Yes/Explore. If projects are defined, may be able to participate.
In-lieu Fee	Allows developers who cannot meet GI requirements on-site to build or pay for off-site construction of GI elements	Staff, Planning, Capital, O&M	Municipality would need to estimate the costs of mitigation – could be done case-by-case	Explore. If a regional or large-scale opportunity is developed by the Town or private entity, the Town can explore the opportunity for creation of an in-lieu program.
Credit Trading Program	Creates GI Credit program for developers and others to trade GI responsibilities to others who have better capability to meet GI goals	Planning, Capital, O&M	A municipality (or regional entity) must create credit trading program including: Definition of GI credits, relative value of credits, timing of responsibilities, eligibility	Explore. Potential if others have projects or if Town can credit public right of way for treatment on private property

Atherton Green Infrastructure Plan

Funding Category/ Opportunities	GI Nexus	GI Funding Capabilities	Requirements	Potential GI Funding Opportunity
Partnerships				
Multi-Agency Partnership	Encourages partnerships with non-stormwater agencies to explore GI co-benefits in their work.	Staff, Planning, Capital	Examples may include: spreading basins for groundwater agencies; GI project sites on school grounds; GI on housing authority sites. Can generate credits for Credit Trading Program.	Yes. May participate in regional projects, credit transfers, and projects with other agencies.
Transportation	Encourages partnerships with transportation agencies to explore GI co-benefits in their work and take advantage of Complete or Green Streets programs	Staff, Planning, Capital, O&M?	Examples may include: Permeable pavements; rain gardens	Yes. May participate in regional projects and projects with other agencies. Currently working with Caltrans on the Water Capture Project.
Caltrans Mitigation Collaboration	Caltrans looks for opportunities for off-site mitigation of stormwater impacts of their highways	Planning, Capital	Local municipalities may enter in a cooperative agreement with Caltrans to build GI as a way for them to mitigate stormwater impacts of their highways	Yes. Currently working with Caltrans on the Water Capture Project.
Public-Private Partnership (P3)	Private enterprises can provide overall solutions to GI programs through better access to resources and capital	Planning, Capital, O&M	P3 is primarily a delivery system for projects where debt provides near-term funding and project acceleration	Yes/Explore. Interested in potential options.

9.0 Outreach and Education

Atherton has provided outreach and education to staff, decision makers, and the community regarding green infrastructure in general and specifically for the development of the Town's Green Infrastructure Workplan and Green Infrastructure Plan.

a. Coordination with SMCWPPP and Inter-Agency Efforts

Atherton is a participating member of the Countywide Program, a program that is a partnership of the C/CAG, the County of San Mateo, and each incorporated jurisdiction in the county, that share a common National Pollutant Discharge Elimination System (NPDES) permit. The Countywide Program convened a Green Infrastructure Committee (GI Committee) to collaborate and comment upon the development of materials to support the preparation of GI Plans. Atherton's GI Plan was developed in collaboration with internal town staff, City Council, coordination with consultants, and the Countywide Programs' guidance.

The Countywide Program has developed numerous educational and reference materials for use by member agencies. This includes the flowstobay.org website, a five-year public education and outreach program, educational flyers about street streets and green infrastructure, and development of PowerPoint Presentations for use in educating elected officials and other stakeholders.

b. Atherton Efforts

The Town has also been collaborating with private institutional facilities and other stakeholders such as Caltrans to address flooding and other related stormwater management and treatment issues and the desire to develop a water capture facility project in the Town. This process has offered numerous public meetings and the opportunity to educate area residents, decision makers, and others to understand underlying issues and the options to address them, including the use of green infrastructure, to discuss the project and allow stakeholders to provide input and feedback. The Town has a project website about the Cartan Field water capture facility project to inform residents about the project. This information can be found at <https://www.ci.atherton.ca.us/484/Atherton-Water-Capture-Facility-Project>

Atherton has worked extensively to educate staff, decision makers, and the community about green infrastructure and the preparation of its GI Plan. Staff has held internal ongoing multi-disciplinary meetings to discuss the need, goals, and vision for both Atherton's GI WorkPlan and GI Plan. In addition, the Town hosts a builder's roundtable every other month to discuss a variety of topics, including PCBs and low impact site design measures.

As discussed previously, Atherton staff has participated on a roughly quarterly basis with the Countywide Program's GI Committee for the past two years to review and discuss GI Plan related elements and development. This ongoing support helped the Countywide Program with coordination and providing template material. In addition, staff has participated in workshops related to green infrastructure well as GI RAA seminars held by the Countywide Program.

The Town has also created guidance such as grading and draining criteria and street frontage design to require the use and placement of pervious materials along street fronting property frontages and requiring new and re-development projects of over 5,000 square feet of impervious area to incorporate detention facilities into their projects to aid in reducing downstream flooding.

The Town's website contains a webpage with a link to the Countywide Program, www.flowstobay.org, to educate town residents and others in understanding issues related to stormwater runoff and water quality, to define and explain the benefits of green infrastructure, and provide other information.

The Green Infrastructure Workplan was presented to City Council and adopted in January 2018. The GI Plan was presented to the City Council, at both a study session in June 2019 and a public approval hearing in July 2019. These meetings provided the public a chance to review and provide input as part of the outreach and education process.

Appendices

A. Atherton-specific screening and prioritization criteria factors with assigned scores and weighting factors table

Regional Capture Screening and Prioritization

Criteria	Source	Points					Weight Factor	Maximum Pts	
		0	1	2	3	4			5
Screening Criteria Factors									
Slope (%)	San Mateo SWRP							--	--
Parcel Ownership and Land Use	San Mateo SWRP (modified)	Properties with a predominant slope greater than 10% have not been included as opportunities							--
Prioritization Factors									
Parcel Ownership and Land Use	San Mateo SWRP (modified)		Private Institutional		Public (other agency)		Public (Town)	1	5
Impervious Area (%)	San Mateo SWRP	X < 40	40 ≤ X < 50	50 ≤ X < 60	60 ≤ X < 70	70 ≤ X < 80	80 ≤ X < 100	1	5
Parcel Size (acres)	San Mateo SWRP	0.25 ≤ X < 0.5	0.5 ≤ X < 1	1 ≤ X < 2	2 ≤ X < 3	3 ≤ X < 4	4 ≤ X	1	5
Hydrologic Soil Group	San Mateo SWRP	--	D	Unknown	C	B	A	1	5
Slope (%)	San Mateo SWRP	5 < X ≤ 10	4 < X ≤ 5	3 < X ≤ 4	2 < X ≤ 3	1 < X ≤ 2	0 < X ≤ 1	1	5
Proximity to Flood-prone Channels (miles)	San Mateo SWRP	Not in sub-basin	3 < X	--	1 < X ≤ 3	--	X ≤ 1	2	10
Areas with localized flooding - channel or ditch overflow - storm system overflow or clog	Atherton-specific	No					Yes	2	10
Contains PCBs Risk Areas	San Mateo SWRP	None	--	--	Moderate	--	High	2	10
Greenways / Complete Streets Projects	Atherton-specific	No					Yes	1	5
Streets identified for future or with existing storm drains, swales, other drainage improvements	Atherton-specific	No					Yes	2	10
Currently planned by City or co-located with other City project	San Mateo SWRP (modified)	No			Strong Potential		Yes	2	10
Project identified in approved master plan, community plan, policy, etc.	Atherton-specific	No					Yes	1	5
Within the drainage area of Cartan Field Water Capture Project	Atherton-specific	Yes = -10						1	0/-10
Drains to TMDL water	San Mateo SWRP	No					Yes	1	5
Above groundwater basin	San Mateo SWRP	No		Yes				1	1
Augments water supply	San Mateo SWRP	No	Yes					1	1
Water quality source control	San Mateo SWRP	No	Yes					1	1
Reestablishes natural hydrology	San Mateo SWRP	No	Yes					1	1
Creates or enhances habitat	San Mateo SWRP	No	Yes					1	1
Project is within 1/4 mile of identified RHINA site or other affordable housing site	Atherton-specific	No	Yes					1	1
Community enhancement	San-Mateo-SWRP	No	Yes					--	0

Parcel Based Green Infrastructure Screening and Prioritization

Criteria	Source	Points					Weight Factor	Maximum Pts	
		0	1	2	3	4			5
Screening Criteria Factors									
Slope (%)	San Mateo SWRP	Properties with a predominant slope greater than 10% have not been included as opportunities						--	--
Parcel Ownership and Land Use	San Mateo SWRP (modified)	Public, Private Institutional, Schools, Park/Open Space - Yes						--	--
Prioritization Factors									
Parcel Ownership and Land Use	San Mateo SWRP (modified)	Private Institutional		Public (other agency)		Public (Town)		1	5
Impervious Area (%)	San Mateo SWRP	X < 40	40 ≤ X < 50	50 ≤ X < 60	60 ≤ X < 70	70 ≤ X < 80	80 ≤ X < 100	1	5
Hydrologic Soil Group	San Mateo SWRP	--	D	Unknown	C	B	A	1	5
Slope (%)	San Mateo SWRP	5 < X ≤ 10	4 < X ≤ 5	3 < X ≤ 4	2 < X ≤ 3	1 < X ≤ 2	0 < X ≤ 1	1	5
Proximity to Flood-prone Channels (miles)	San Mateo SWRP	Not in sub-basin	3 < X	--	1 < X ≤ 3	--	X ≤ 1	2	10
Areas with localized flooding - drywell saturation or clog - channel or ditch overflow - private property floods - driveways and intersection floods - storm system overflow or clog	Atherton-specific	No					Yes	2	10
Contains PCBs Risk Areas	San Mateo SWRP	None	--	--	Moderate	--	High	2	10
Greenways / Complete Streets Projects	Atherton-specific	No					Yes	1	5
Streets identified for future or with existing storm drains, swales, other drainage improvements	Atherton-specific	No					Yes	2	10
Currently planned by City or co-located with other City project	San Mateo SWRP (modified)	No			Strong Potential		Yes	2	10
Project identified in approved master plan, community plan, policy, etc.	Atherton-specific	No					Yes	1	5
Within the drainage area of Cartan Field Water Capture Project	Atherton-specific	Yes = -10						1	0/-10
Drains to TMDL water	San Mateo SWRP	No					Yes	1	5
Above groundwater basin	San Mateo SWRP	No		Yes				1	1
Augments water supply	San Mateo SWRP	No	Yes					1	1
Water quality source control	San Mateo SWRP	No	Yes					1	1
Reestablishes natural hydrology	San Mateo SWRP	No	Yes					1	1
Creates or enhances habitat	San Mateo SWRP	No	Yes					1	1
Project is within 1/4 mile of identified RHNA site or other affordable housing site	Atherton-specific	No	Yes					1	1
Community-enhancement	San-Mateo-SWRP	No	Yes					--	0

Green Streets Screening and Prioritization

Criteria	Source	Points					Weight Factor	Maximum Pts		
		0	1	2	3	4			5	
Screening Criteria Factors										
Slope (%)	San Mateo SWRP (modified)	No						--	--	
Ability to add within existing right of way	Atherton-specific	Identified GI opportunities have already screened for this								
Prioritization Factors										
Imperviousness (%)	San Mateo SWRP	X < 40	40 ≤ X < 50	50 ≤ X < 60	60 ≤ X < 70	70 ≤ X < 80	80 ≤ X < 100	1	5	
Hydrologic Soil Group	San Mateo SWRP	--	D	Unknown	C	B	A	1	5	
Slope (%)	San Mateo SWRP (modified)	--	4 < X ≤ 5	3 < X ≤ 4	2 < X ≤ 3	1 < X ≤ 2	0 < X ≤ 1	1	5	
Proximity to Flood-prone Channels (miles)	San Mateo SWRP	Not in sub-basin	3 < X	--	1 < X ≤ 3	--	X ≤ 1	2	10	
Areas with localized flooding - drywell saturation or clog - channel or ditch overflow - private property floods - driveways and intersection floods - storm system overflow or clog	Atherton-specific	No					Yes	2	10	
Contains PCBs Risk Areas	San Mateo SWRP	None	--	--	Moderate	--	High	2	10	
Street Type	San Mateo SWRP (modified)	--	--	--	Collector Local	Minor Arterial	Boulevard School Collector Transit Collector School Access	1	5	
Greenways / Complete Streets Projects	Atherton-specific	No					Yes	2	10	
Streets identified for future or with existing storm drains, swales, other drainage improvements	Atherton-specific	No					Yes	2	10	
Currently planned by City or co-located with other City project	San Mateo SWRP (modified)	No					Yes	2	10	
"Safe Routes to School" program	San Mateo SWRP	No					Yes	2	10	
Project identified in approved master plan, community plan, policy, etc.	Atherton-specific	No					Yes	1	5	
Within the drainage area of Cartan Field Water Capture Project	Atherton-specific	Yes = -10						1	0/-10	
Drains to TMDL water	San Mateo SWRP	No					Yes	1	1	
Above groundwater basin	San Mateo SWRP	No		Yes				1	1	
Augments water supply	San Mateo SWRP	No	Yes					1	1	
Water quality source control	San Mateo SWRP	No	Yes					1	1	
Reestablishes natural hydrology	San Mateo SWRP	No	Yes					1	1	
Creates or enhances habitat	San Mateo SWRP	No	Yes					1	1	
Project is within 1/4 mile of identified RHNA site or other affordable housing site	Atherton-specific	No	Yes					1	1	
Community enhancement	San-Mateo-SWRP	No	Yes					--	0	

B. Example GI Plan Text Summarizing Results of the RAA

To: Matt Fabry, San Mateo Countywide Water Pollution Prevention Program
From: Stephen Carter, Paradigm Environmental
Date: 5/3/2019
Re: Example Green Infrastructure Plan text summarizing results of the Reasonable Assurance Analysis

Paradigm is currently leading C/CAG's efforts to perform a Reasonable Assurance Analysis that demonstrates the amount of green infrastructure needed to meet the portions of the PCB and mercury load reductions required by the Municipal Regional Stormwater Permit to address Total Maximum Daily Load wasteload allocations over specified compliance periods. Results of the Reasonable Assurance Analysis can be used to set goals for green infrastructure implementation, which can be incorporated within Green Infrastructure Plans currently being prepared by the C/CAG member agencies. The following is example text that each C/CAG member agency can use as a template to tailor discussions incorporated within each agency's Green Infrastructure Plan. The purpose of this example text is to provide a consistent narrative for discussion of the Reasonable Assurance Analysis and outcomes for the Permittees of San Mateo County. This portion of the Reasonable Assurance Analysis only addresses the Green Infrastructure requirements of the Municipal Regional Permit, not the other source control measures that will be evaluated in the Total Maximum Daily Load implementation plans submitted in September 2020. Each agency may tailor this text, incorporating their respective Reasonable Assurance Analysis results specific to each jurisdiction. The text also refers to the following two separate documents that can either be included within appendices of each Green Infrastructure Plan, or referenced as separate documents:

- San Mateo County-Wide Reasonable Assurance Analysis Addressing PCBs and Mercury: Phase I Baseline Modeling Report (June 2018)
- San Mateo County-Wide Reasonable Assurance Analysis Addressing PCBs and Mercury: Phase II Green Infrastructure Modeling Report (under development)

1 REASONABLE ASSURANCE ANALYSIS AND GREEN INFRASTRUCTURE IMPLEMENTATION GOALS

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

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

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

1.1 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) (USEPA 2017), which provides guidance on the technical needs of the RAA and considerations for model selection. Building upon the EPA RAA Guide, the Bay Area Stormwater Management Agencies Association (BASMAA) prepared the *Bay Area Reasonable Assurance Analysis Guidance Document* (Bay Area RAA Guidance) (BASMAA 2017), which provides specific guidance on modeling to support RAAs performed in the Bay Area to meet MRP requirements, address TMDLs for PCBs and mercury, and support GI planning. The EPA RAA Guide and Bay Area RAA Guidance both outline essential steps for performing an RAA, as depicted in Figure 1-1.

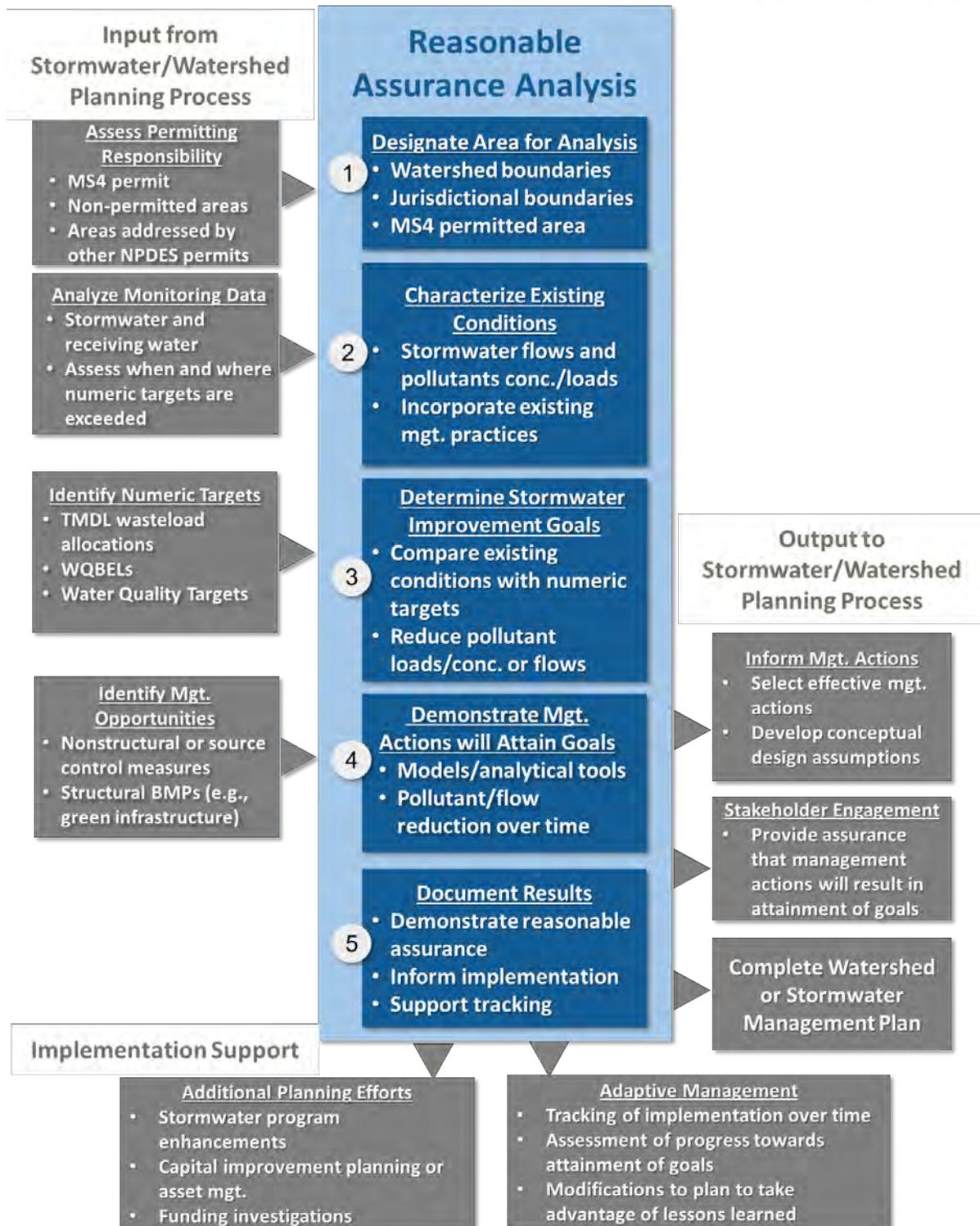


Figure 1-1. RAA Process Flow Chart (USEPA 2017).



Depending on the audience, the purpose of the RAA can vary in terms of what constitutes reasonable assurance, 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 (USEPA 2017):

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

Appendix X and Y provide full documentation of the technical approaches and results of the SMCWPPP RAA, which are consistent with the recommendations of the EPA RAA Guide and Bay Area RAA Guidance.

1.2 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:

- **LID for New Development and Redevelopment** – The MRP includes a Provision (C.3) for the integration of LID within new development and redevelopment. As LID techniques are implemented as new development and redevelopment occurs throughout the City, the benefits of such practices in terms of reducing urban runoff flows and associated pollutant loads can be considered as part of the pollutant load reductions attributed to implementation of GI. C/CAG worked with San Mateo County Permittees to compile information on LID practices that have been implemented within new development and redevelopment since water year 2003 (baseline year for the TMDL). C/CAG also performed an analysis to project the number of acres of future new development and redevelopment to be addressed 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: (1) large regional projects within publicly owned parcels (e.g., public parks) that infiltrate or treat stormwater runoff generated from surrounding areas (e.g., diversion from neighborhood storm drain system; diversions from creeks draining large urban areas); (2) retrofit of publicly owned parcels with GI that provide demonstration of onsite LID designs; and (3) retrofit of public street rights-of-way with GI, or “green streets.” The SRP included a multi-benefit scoring and prioritization process that ranks GI project opportunities based on multiple factors beyond pollutant load reduction (e.g., proximity to flood prone channels, potential groundwater basin recharge). Figure 1-2 provides an example of green street opportunities identified, scored, and prioritized by the SRP throughout San Mateo County (SMCWPPP 2017).

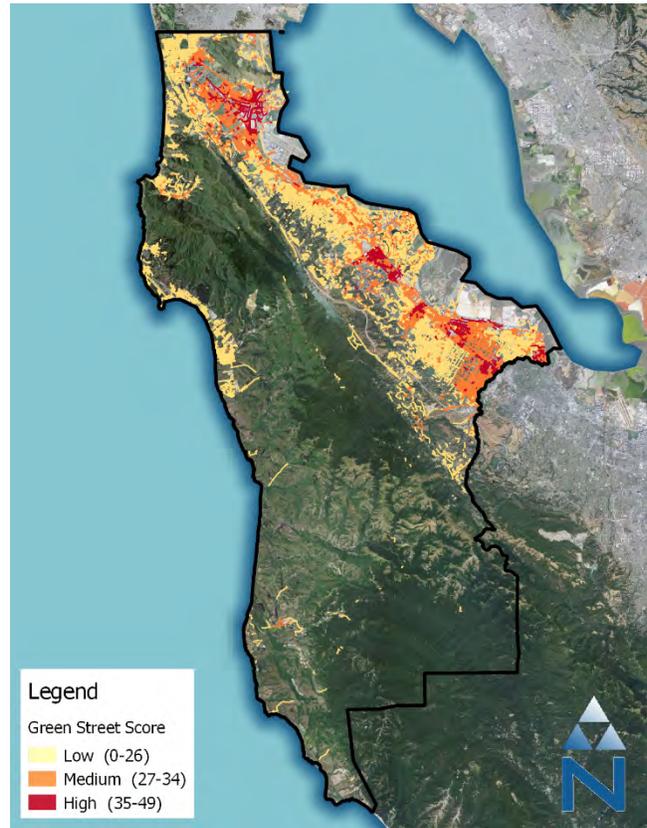


Figure 1-2. SRP Prioritized Green Street Opportunities.

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.

1.3 Description of the RAA Model

C/CAG performed a comprehensive, countywide modeling effort to provide: (1) simulation of baseline loads of PCBs and mercury for each of the County’s watersheds and municipal jurisdictions discharging to San Francisco Bay; (2) estimation of necessary load reduction goals to meet requirements of the MRP and TMDL WLAs; and (3) determination of the amount of GI needed to address load reduction goals based on project opportunities identified Section 1.2. 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 1-3). Component models of the linked system include:

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

Hydrologic Simulation Program – FORTRAN (HSPF) (Bicknell et al. 1997) algorithms for simulating watershed hydrology, erosion, water quality, and 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-effective management recommendations by evaluating the trade-offs between different scenarios. The “benefit” component can be represented in several ways: (1) reduction in flow volume (2) reduction in load of a specific pollutant or (3) other conditions including numeric water quality targets, frequency of exceedances of numeric water quality targets, or minimizing the difference between developed and pre-developed flow-duration curves (USEPA 2009, Riverson et al. 2014).

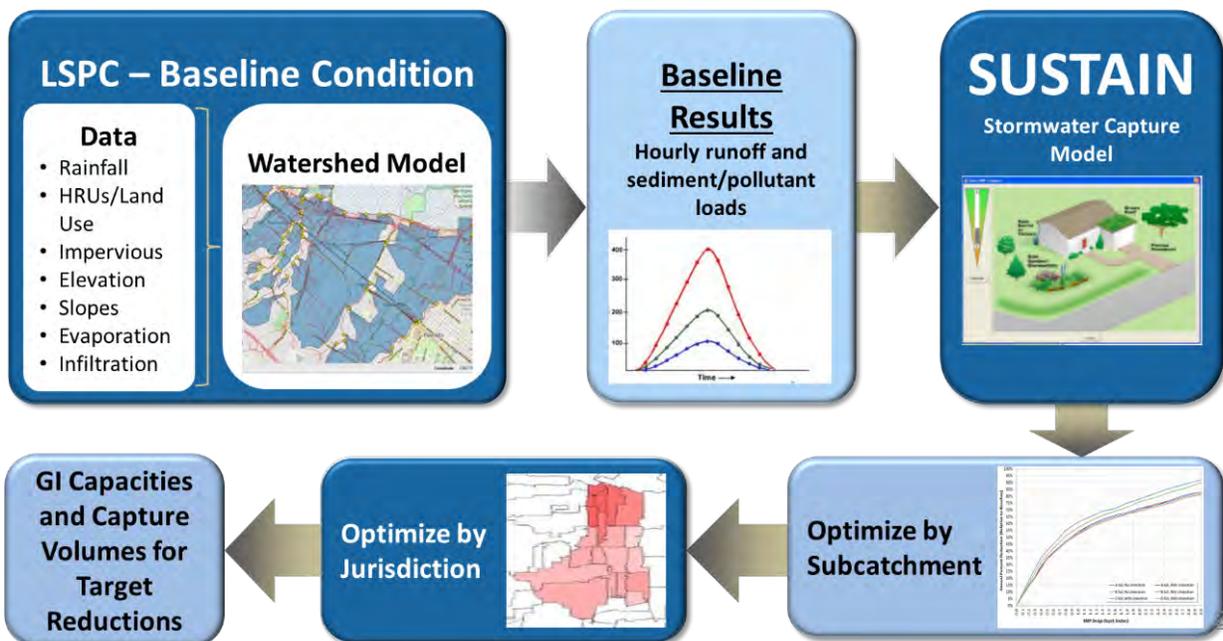


Figure 1-3. Modeling System Supporting the RAA.

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 county-wide 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. Appendix X and Y provide more detailed discussion of the models and their application to the San Mateo County watersheds.

1.4 Model Considerations to Inform GI Plans

An important consideration for the RAA was the ability to track costs and benefits of different categories of GI projects within the model. This tracking was performed for GI project categories within each model subwatershed and municipal jurisdiction, and supports the selection of the most cost-effective implementation strategy to attain pollutant reduction goals. The RAA builds upon the previous planning efforts and 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 C.3 implementation, stormwater treatment may have been achieved through non-GI means, such as underground vault systems or media filters.
2. **Future New and Redevelopment:** All the regulated projects that will be subject to Provision C.3 requirements to treat runoff via LID and is based on spatial projections of future new and redevelopment tied to regional models for population and employment growth.
3. **Regional Projects (identified):** C/CAG worked with agencies to identify five projects within public parks or Caltrans property to provide regional capture and infiltration/treatment of stormwater, and included conceptual designs to support further planning and designs. Note – the model can be updated to include future identified projects to support adaptive management.
4. **Green Streets:** The SRP identified and prioritized opportunities throughout San Mateo County for retrofitting existing streets with GI in public rights-of-way. Green streets were ranked as high, medium, and low priority (within each subwatershed) based on a multiple-benefit prioritization process developed for the SRP.
5. **Other GI Projects (to be determined):** Other types of GI projects on publicly owned parcels, representing a combination of either additional parcel-based GI or other Regional Projects. The SRP screened and prioritized public parcels for opportunities for onsite LID and Regional Projects. These opportunities need further investigation to determine the best potential projects.

The RAA considers the numerous GI project opportunities that exist within each municipal jurisdiction, and selects a suite or “recipe” of projects that can most cost-effectively address pollutant load reductions. The amount and combination of those GI projects can be determined through analysis of estimated load reductions and implementation costs. Figure 1-4 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.

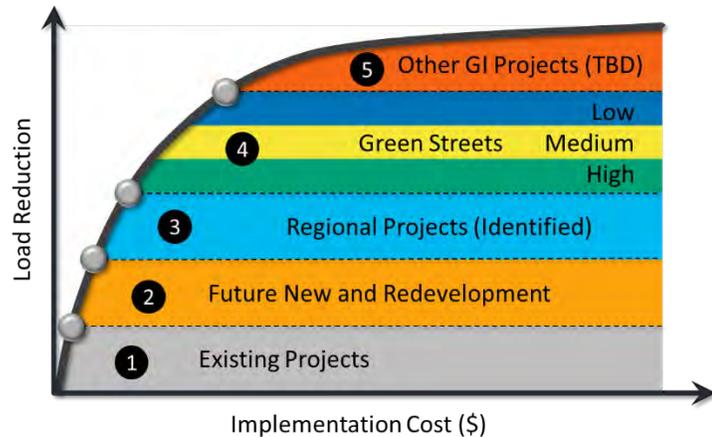


Figure 1-4. Example Implementation Recipe Showing General Sequencing of GI Projects.

1.5 Goals for Green Infrastructure Implementation

As discussed in Section 1.1, 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. The following are key considerations for the RAA output:

- Demonstrate PCBs and Mercury Load Reductions** – The primary goal of the RAA is to quantitatively demonstrate that GI Plans and Control Measure Implementation Plans will result in load reductions of PCBs and mercury sufficient to attain their respective TMDL WLAs and the component stormwater improvement goals to be achieved with GI. Based on the baseline hydrology and water quality model ([Appendix X](#)), 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.

- **Develop Metrics to Support Implementation Tracking** – The MRP (Provision C.3.j) also requires tracking methods to provide reasonable assurance that TMDL WLAs are being met. Provision C.3.j states that the GI Plan “shall include means and methods to track the area within each Permittee’s jurisdiction that is treated by green infrastructure controls and the amount of directly connected impervious area.” 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. The tracking tool is planned for completion in 2020.
- **Support Adaptive Management** – 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 subwatershed and municipal jurisdiction) to achieve the countywide pollutant load reduction target. The RAA sets the GI Plan “goals” in terms of the amount of GI implementation over time to address pollutant load reductions. As GI Plans are implemented and more comprehensive municipal engineering analyses (e.g., masterplans, capital improvement plans) are performed, the adaptive management process will be key to ensuring that goals are met. In summary, the RAA informs GI implementation goals, but the pathway to meeting those goals is subject to adaptive management and can potentially change based on new information or engineering analyses performed over time.

The RAA output, or goals for GI implementation, attempt to identify the appropriate balance in terms of detail and specificity needed to address the above considerations. The RAA also considered multiple alternative scenarios that can inform implementation and the adaptive management process. These scenarios tested the underlining assumptions for GI implementation, and demonstrate the need for further research, collaboration among multiple Permittees, and incorporation of lessons learned in order to gain efficiencies and maximize the cost-effectiveness of GI to reduce pollutant loads over time. Four modeling scenarios were configured for this analysis (as summarized in Table 1-1):

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

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

The following factors are considered for each model scenario:

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

Third: SUSTAIN is used to provide cost-optimization and selection of the most cost-effective combination of GI projects to attain the target reduction. In Figure 1-6, this solution can be viewed as the vertical slice that intersects the point on the x-axis at 17.6% reduction. The combination of GI structural capacities in that slice at the 17.6% load reduction represents the proposed GI implementation plan for **Menlo Park produced by the model**. Table 2 provides details on that implementation plan for the **five** subwatersheds within the City’s jurisdiction (represented by each row in table). Optimization results recommend that varying amounts of GI capacity in different subwatersheds (different rows) are needed to achieve the most cost-effective solution, but the overall PCBs load reduction addresses 17.6% (bottom row of table). The relative amount of GI capacities (normalized by area) for each subwatershed are shown in the map in Figure 1-7.

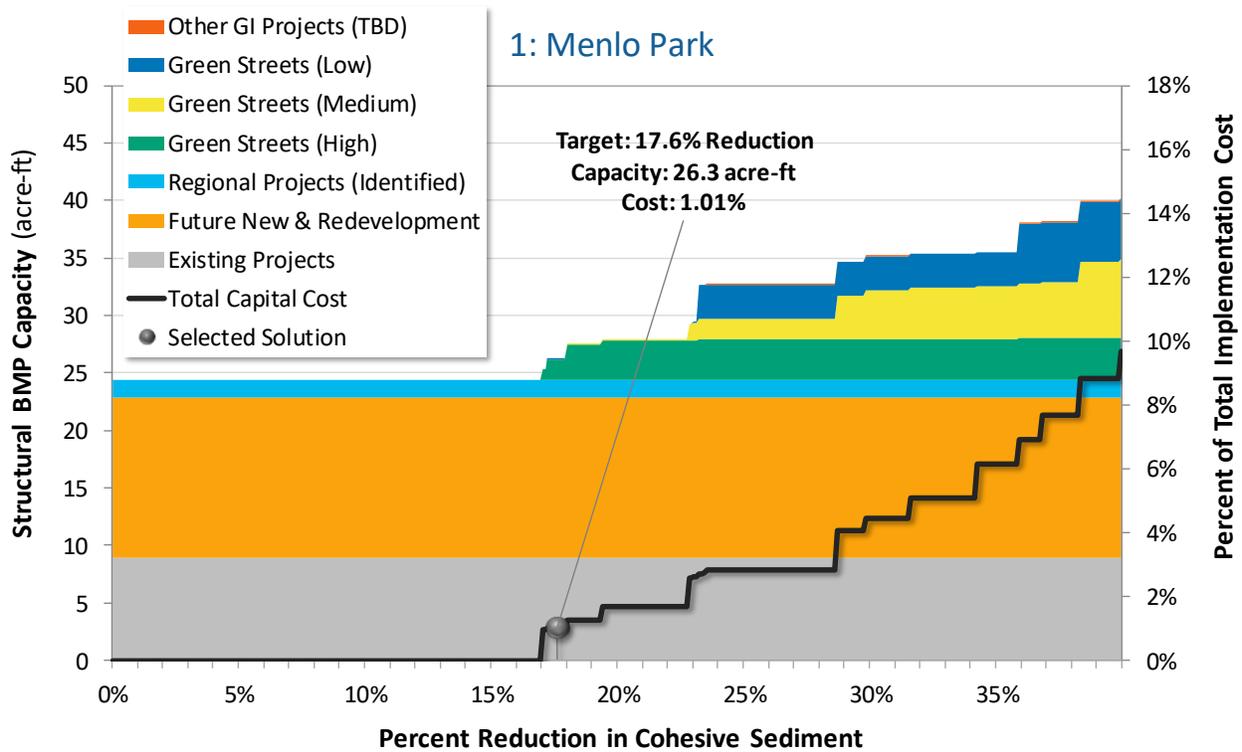


Figure 1-6. Scenario 1: Optimization summary for **Menlo Park** (sediment target, with regional identified project).

Table 2. Scenario 1: GI implementation strategy for **Menlo Park** (sediment target, with regional identified project)

Subwatershed ID	Management Metrics for GI			Green Infrastructure Capacity to Achieve 17.6% Reduction Target (Capacity expressed in units of acre-feet)							
	% Load Reduction PCBs (Annual)	Annual Volume Managed (acre-ft)	Impervious Area Treated (acres)	Existing/Planned			Green Streets			Other GI Projects (TBD)	Total BMP Capacity (acre-ft)
				Existing Projects	Future New & Redevelopment	Regional Projects (Identified)	High	Medium	Low		
220111	23%	1.26	26.11	1.12	1.12	0.03	2.19	0.08	--	--	4.5
220311	13%	1.10	0.27	--	--	--	--	0.03	0.05	--	0.1
221211	15%	0.50	4.22	0.86	0.10	0.02	--	--	--	--	1.0
230111	19%	69.81	94.39	4.81	7.32	--	--	--	--	--	12.1
230211	17%	37.95	80.00	2.10	5.41	1.50	0.91	--	--	--	9.9
Total	17.9%	110.6	205.0	8.9	13.9	1.6	3.1	0.1	0.0	--	27.6

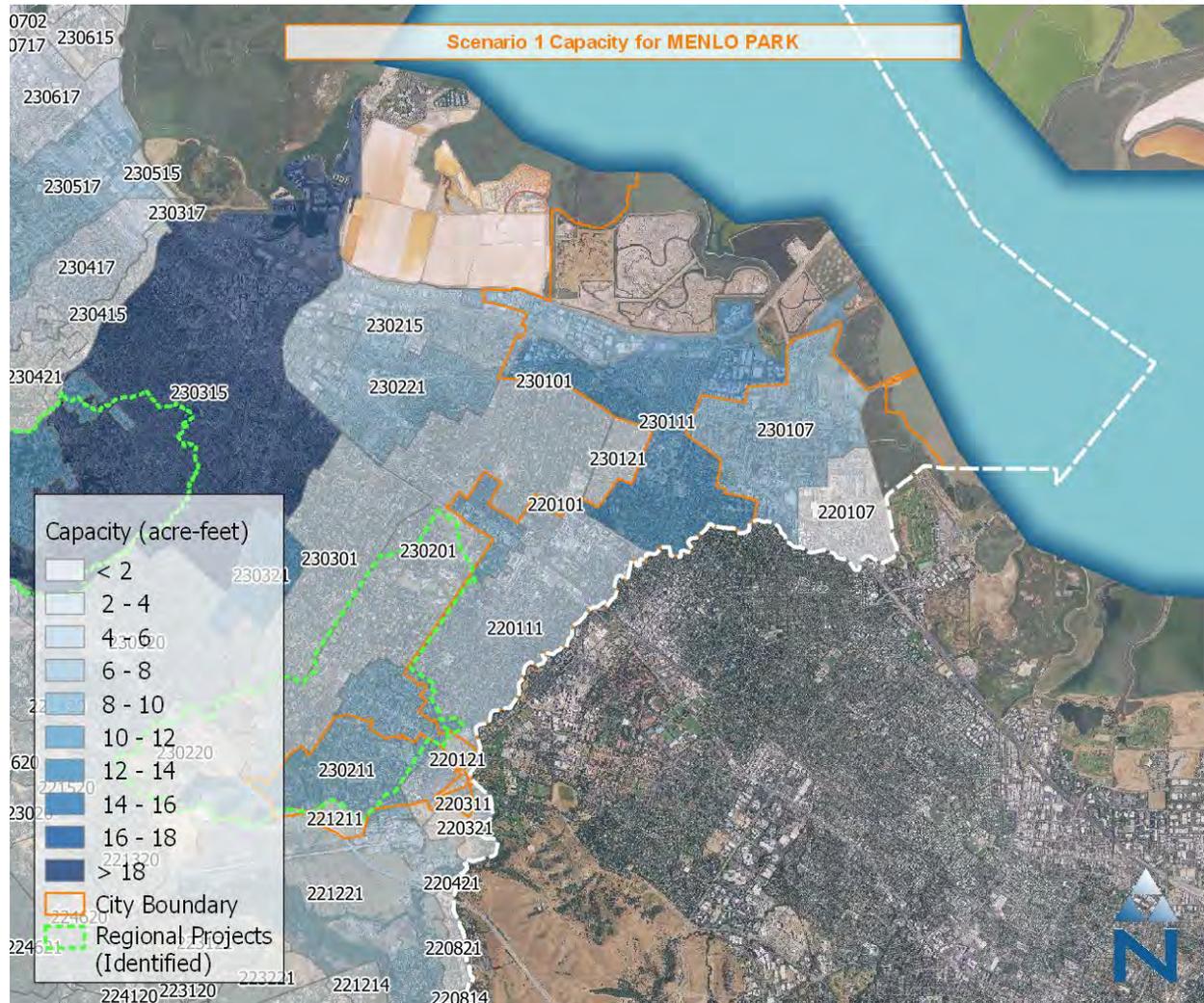


Figure 1-7. Scenario 1: Map of GI capacities within each subwatershed of Menlo Park (sediment target, with regional identified project).

As can be seen in the above results, the cost-optimization favored implementation of different combinations of GI projects within each subwatershed. These combinations were based on: (1) number and type of GI project opportunities identified within each subwatershed, and (2) cost-effectiveness given various characteristics associated with GI control measure efficiency (typically governed by infiltration rates), higher sediment (or PCBs) generation in upstream areas, etc. During implementation, it is almost certain that the actual implementation of GI will not follow the RAA output exactly; however, the recipe provides “management metrics” by subwatershed (described below) to guide the adaptive management process. Dimensions and location of GI projects will vary based on on-the-ground feasibility and site-specific constraints. GI performance varies based on factors like the physical properties of the facility and upstream drainage area managed. For these reasons, it is not recommended that *GI capacity* serve as the focus for stormwater improvement goals for the GI Plan.

The RAA recommends management metrics for the GI Plan that are based on metrics that can be easily measured and tracked throughout implementation. At the left side of the table in Table 2 are

columns under the header “Management Metrics for GI,” which include performance metrics for “% Load Reduction PCBs (Annual),” “Annual Volume Managed (acre-ft),” and “Impervious Area Treated (acres).” The “% Load Reduction PCBs (Annual)” and “Annual Volume Managed (acre-ft)” metrics are based on annualized results represented in the RAA modeling system that are directly comparable to TMDL WLAs. The “% Load Reduction PCBs (Annual)” provides a relative comparison of the load reduction to be achieved within each subwatershed. The “Annual Volume Managed (acre-ft)” shows the acre-feet of water captured and infiltrated and/or treated within each subwatershed, resulting in a total annual volume of 110.6 acre-feet of stormwater managed in Menlo Park for an average year. This 110.6 acre-feet of stormwater managed could serve as the primary metric to be tracked for GI implementation. In other words, stormwater volume managed is being used as a unifying metric to evaluate GI effectiveness. “Impervious Area Treated (acres)” is an additional metric suggested by the MRP for implementation tracking. As a result of adaptive management, the implementation plan may change over time and alternative GI projects can be substituted without having to re-run the RAA model, as long as the “Management Metrics for GI,” representing the goals for the GI Plan, remain on track.

1.6 Implementation Schedule

Throughout the adaptive management process, the City 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. If less development occurs over time, 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.

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. In addition, the Cartan Field regional project, in the Town of Atherton, is assumed to be built and operational by 2030. Finally, 33 percent of green streets required by 2040 are assumed to be implemented by 2030. The resulting schedule presented in Figure 1-4 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 2). These interim and final GI capacities are subject to adaptive management, however the 2040 Management Metrics for GI (left side of Table 2) sets the ultimate goal for GI planning efforts and tracking.

Table 2 also provides a comparison of the amount of GI capacity estimate to be needed in Menlo Park to address 2040 goals for Scenario 1 (jurisdictional) and Scenario 2 (countywide) (see Table 1-1). Results demonstrate that if the 17.8% sediment load reduction target is met countywide, the RAA favors the implementation of additional GI projects within the Menlo Park, above the amount needed if Menlo Park only addressed the 17.8 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 within Menlo Park, likely resulting in less GI implemented in other city or unincorporated County jurisdictions. 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.

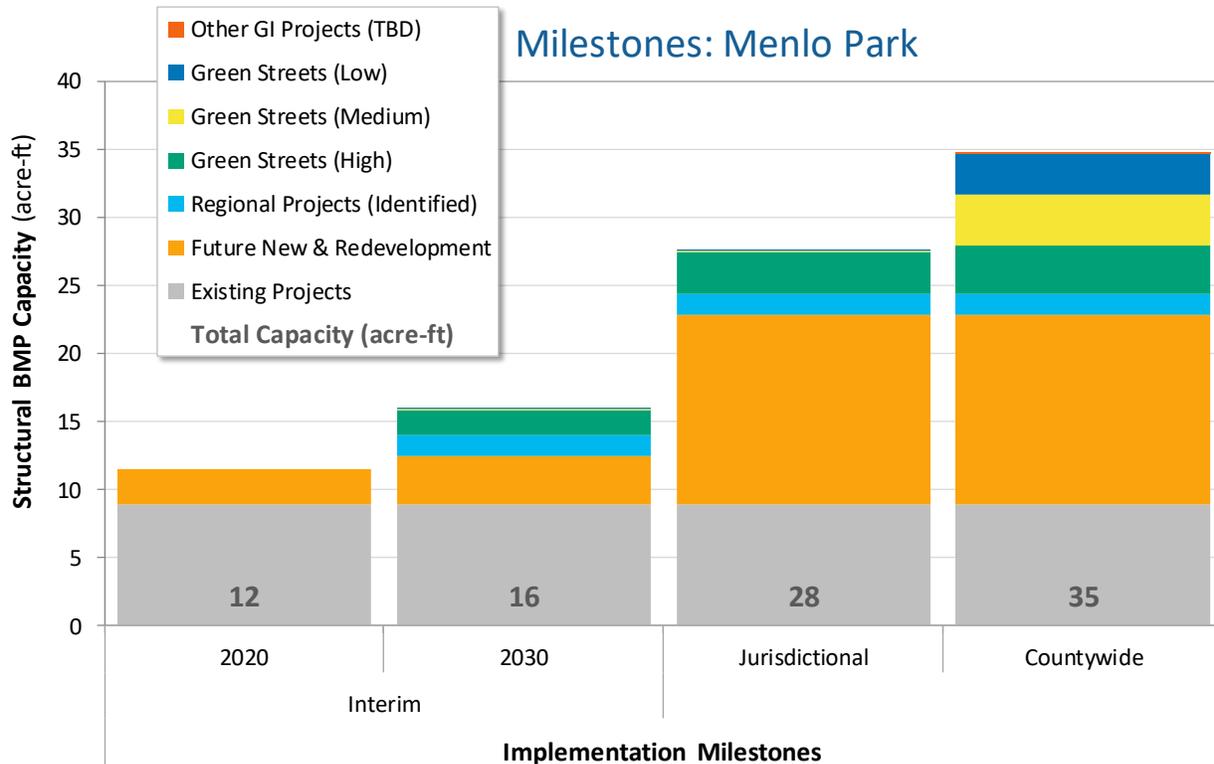


Figure 1-8. Summary GI capacity for interim and final implementation milestones.

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C. Atherton-specific Implementation Measures and Strategies Identified by the Countywide Program Green Infrastructure Reasonable Assurance Analysis

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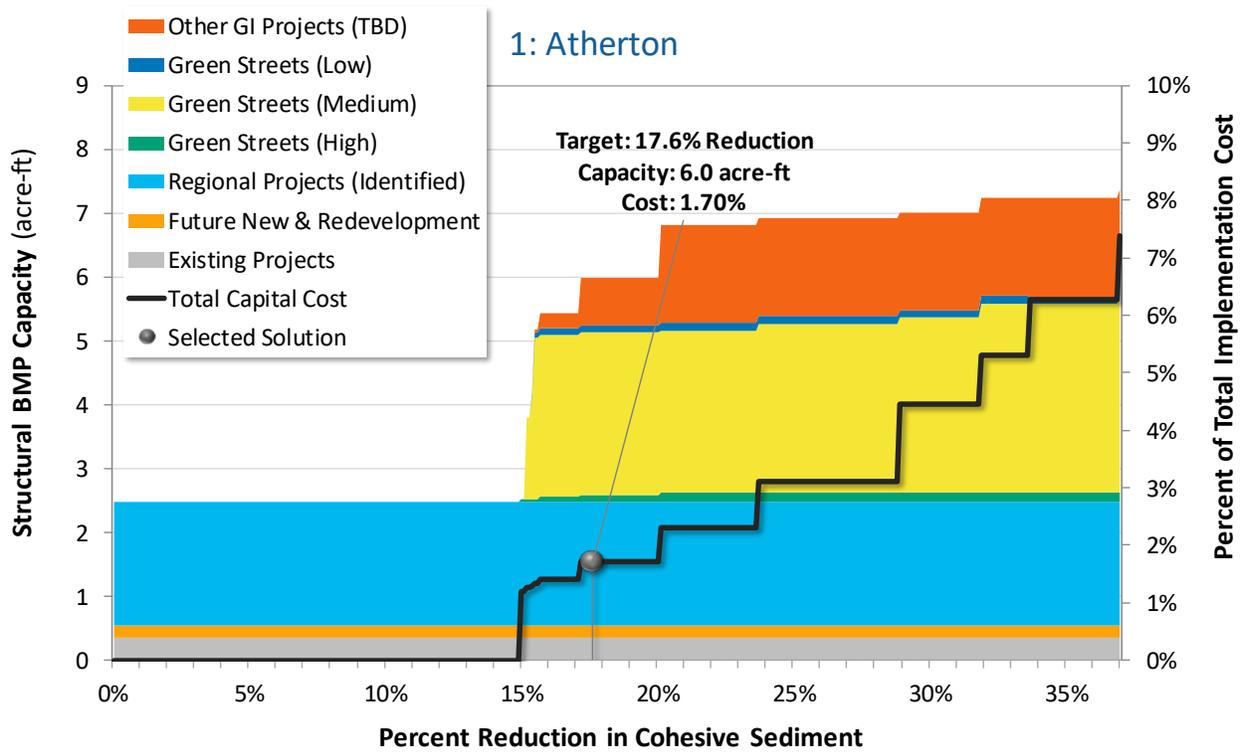


Figure 1. Optimization summary for Atherton, sediment target (by jurisdiction).

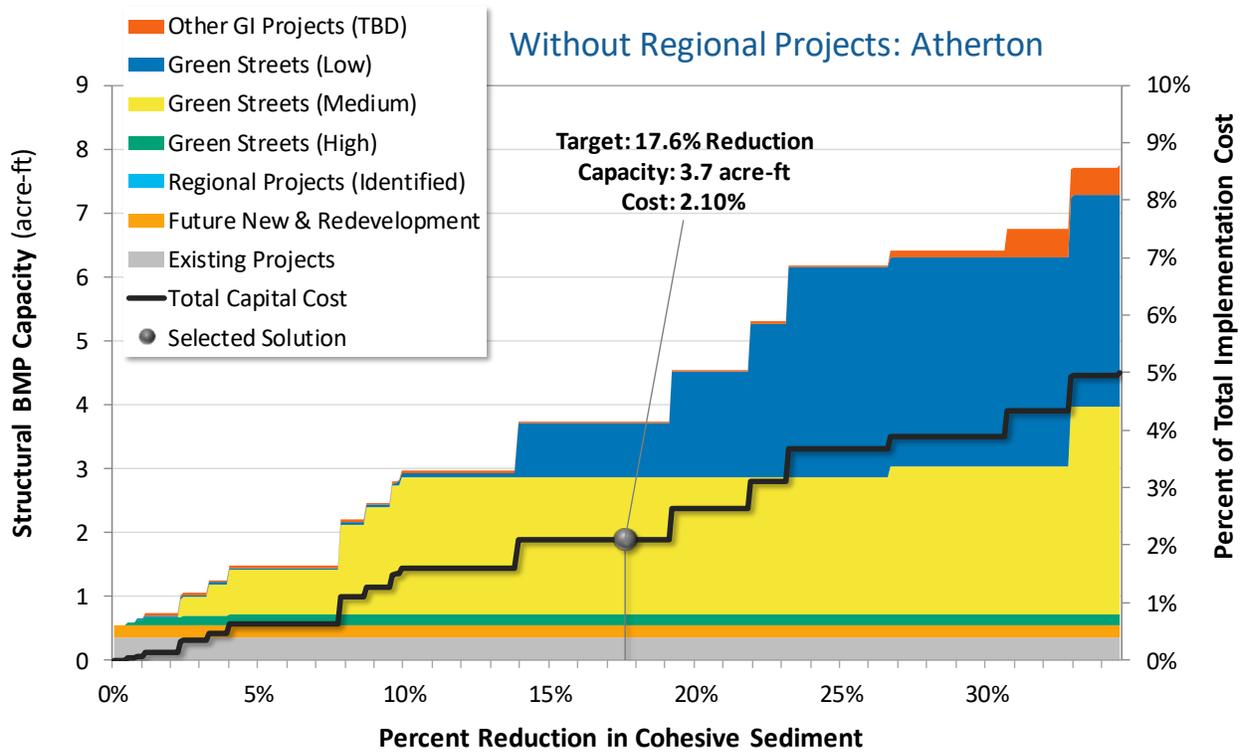


Figure 2.. Optimization summary for Atherton, sediment target (by jurisdiction) without regional projects.

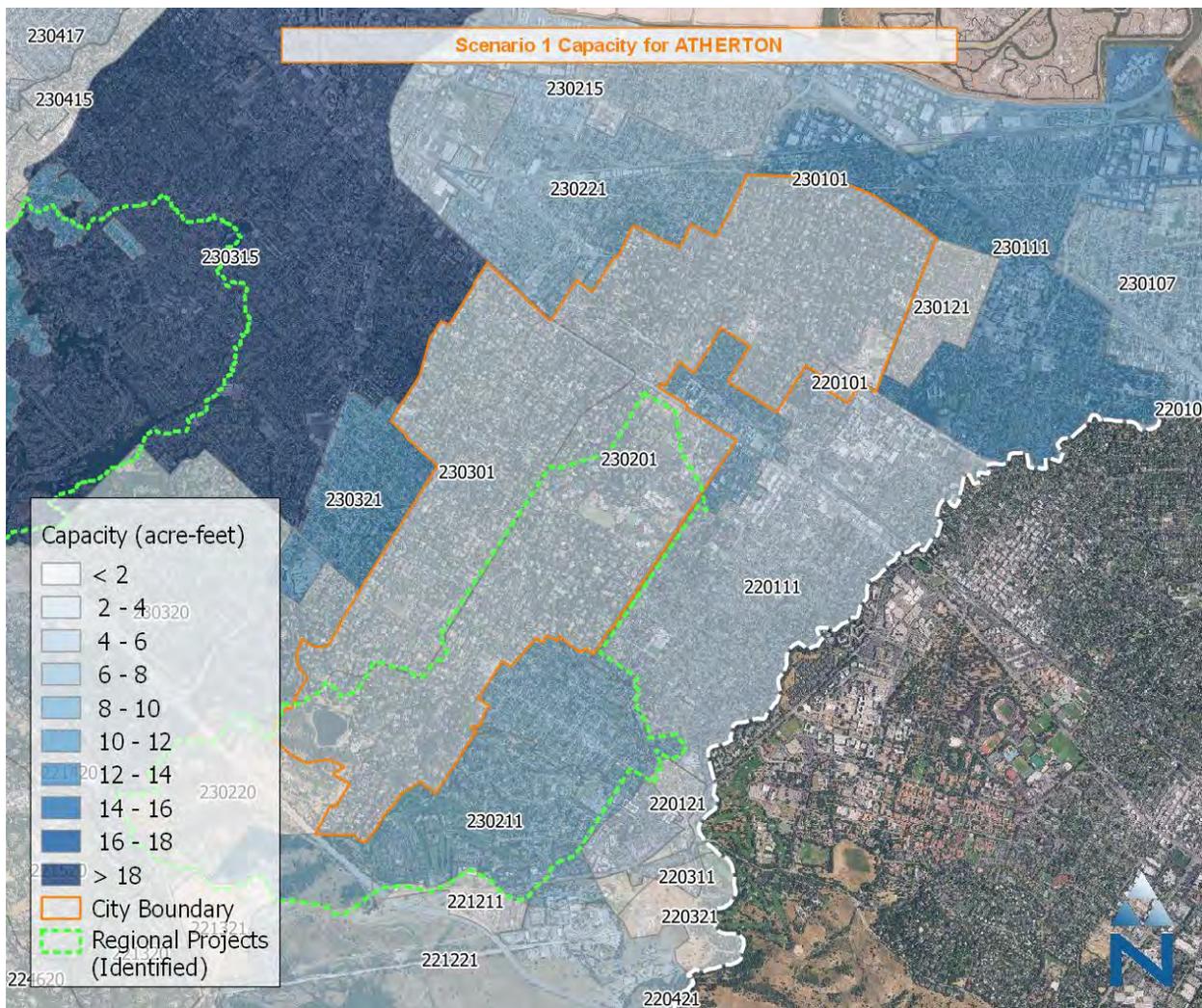


Figure 3. Scenario 1: Atherton, sediment target (by jurisdiction).

Table 1. Scenario 1, Atherton: Sediment Target (By Jurisdiction, With Regional Projects)

Subwatershed ID	Management Metrics for GI			Green Infrastructure Capacity to Achieve 17.6% Reduction Target (Capacity expressed in units of acre-feet)							
	% Load Reduction PCBs (Annual)	Annual Volume Managed (acre-ft)	Impervious Area Treated (acres)	Existing/Planned			Green Streets			Other GI Projects (TBD)	Total BMP Capacity (acre-ft)
				Existing Projects	Future New & Redevelopment	Regional Projects (Identified)	High	Medium	Low		
220101	62%	0.82	0.15	--	0.01	--	0.00	--	0.04	0.02	0.1
230101	23%	0.00	0.00	--	--	--	--	--	--	0.00	0.0
230201	19%	60.20	101.77	0.36	0.14	1.90	0.16	--	--	--	2.6
230301	58%	2.62	8.33	--	0.03	0.02	--	2.53	0.07	0.72	3.4
Total	20.0%	63.6	110.3	0.4	0.2	1.9	0.2	2.5	0.1	0.7	6.0

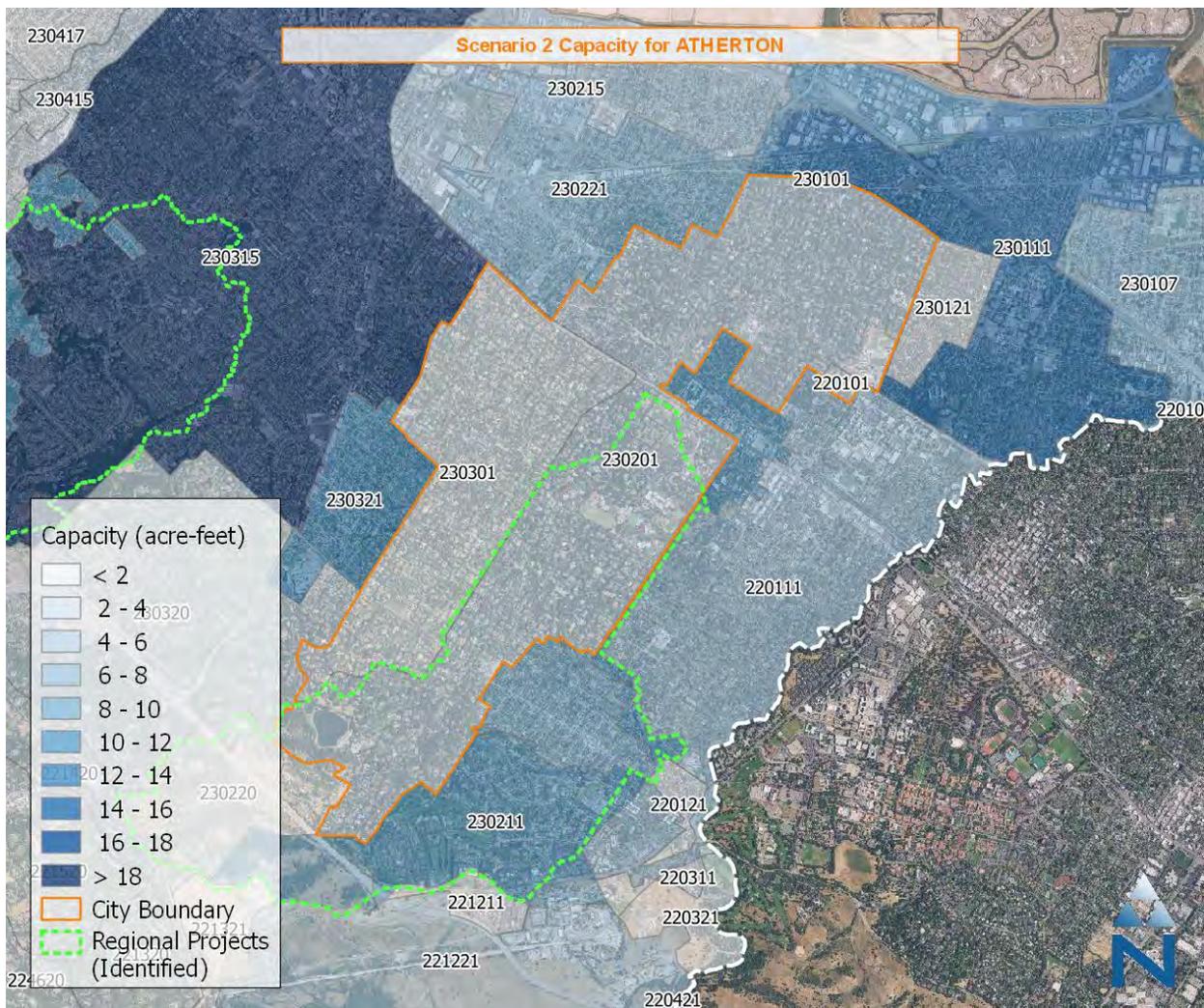


Figure 4. Scenario 2: Atherton, sediment target (countywide).

Table 2. Scenario 2, Atherton: Sediment Target (Countywide, With Regional Projects)

Subwatershed ID	Management Metrics for GI			Green Infrastructure Capacity to Achieve 17.6% Reduction Target (Capacity expressed in units of acre-feet)							
	% Load Reduction PCBs (Annual)	Annual Volume Managed (acre-ft)	Impervious Area Treated (acres)	Existing/Planned			Green Streets			Other GI Projects (TBD)	Total BMP Capacity (acre-ft)
				Existing Projects	Future New & Redevelopment	Regional Projects (Identified)	High	Medium	Low		
220101	1%	0.03	0.03	--	0.01	--	--	--	--	--	0.0
230101	0%	0.00	--	--	--	--	--	--	--	--	0.0
230201	15%	41.38	101.77	0.36	0.14	1.90	0.04	--	--	--	2.4
230301	15%	0.51	1.26	--	0.03	0.02	--	--	--	--	0.1
Total	15.0%	41.9	103.1	0.4	0.2	1.9	0.0	--	--	--	2.5

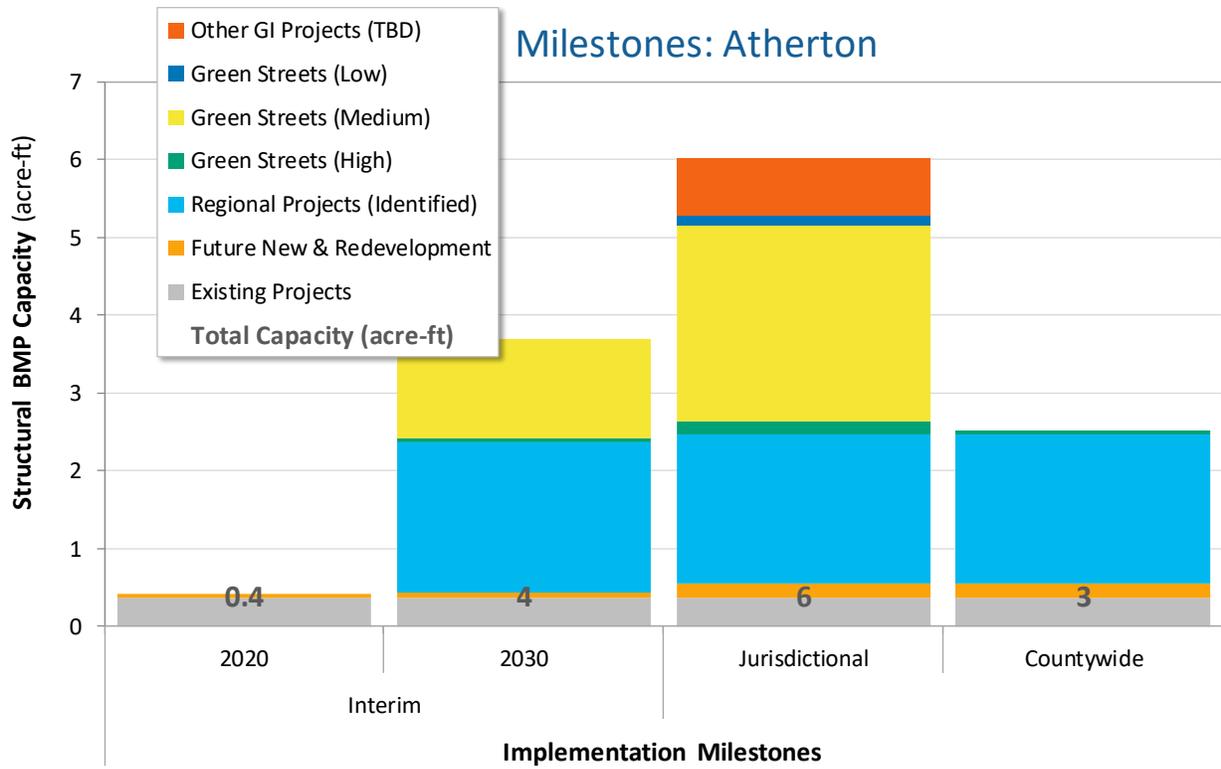


Figure 5. Summary GI capacity for interim and final implementation milestones.

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Table 1. Scenario 1, Atherton: Sediment Target (By Jurisdiction, With Regional Projects)

Subwatershed ID	Management Metrics for GI			Green Infrastructure Capacity to Achieve 17.6% Reduction Target (Capacity expressed in units of acre-feet)							
	% Load Reduction PCBs (Annual)	Annual Volume Managed (acre-ft)	Impervious Area Treated (acres)	Existing/Planned			Green Streets			Other GI Projects (TBD)	Total BMP Capacity (acre-ft)
				Existing Projects	Future New & Redevelopment	Regional Projects (Identified)	High	Medium	Low		
220101	62%	0.82	0.15	--	0.01	--	0.00	--	0.04	0.02	0.1
230101	23%	0.00	0.00	--	--	--	--	--	--	0.00	0.0
230201	19%	60.20	101.77	0.36	0.14	1.90	0.16	--	--	--	2.6
230301	58%	2.62	8.33	--	0.03	0.02	--	2.53	0.07	0.72	3.4
Total	20.0%	63.6	110.3	0.4	0.2	1.9	0.2	2.5	0.1	0.7	6.0

Table 2. Atherton: Sediment Target (By Jurisdiction, Without Regional Projects)

Subwatershed ID	Management Metrics for GI			Green Infrastructure Capacity to Achieve 17.6% Reduction Target (Capacity expressed in units of acre-feet)							
	% Load Reduction PCBs (Annual)	Annual Volume Managed (acre-ft)	Impervious Area Treated (acres)	Existing/Planned			Green Streets			Other GI Projects (TBD)	Total BMP Capacity (acre-ft)
				Existing Projects	Future New & Redevelopment	Regional Projects (Identified)	High	Medium	Low		
220101	60%	0.80	0.15	--	0.01	--	0.00	--	0.04	0.02	0.1
230101	56%	0.02	0.00	--	--	--	--	--	--	0.00	0.0
230201	26%	35.07	9.84	0.36	0.14	--	0.17	0.54	1.58	--	2.8
230301	13%	23.52	4.89	--	0.03	--	--	1.61	0.04	--	1.7
Total	19.2%	59.4	14.9	0.4	0.2	--	0.2	2.2	1.7	0.0	4.5

Table 1. Implementation Milestones: Atherton with credit proportional to jurisdictional area in regional project drainage area

Implementation Metrics		Implementation Milestones: Atherton					
		Incremental			Cumulative		
		2020-2030	2030-2040	2040	2020	2030	Final 2040
Index	% Load Reduction	18.5%	1.3%	0.2%	18.7%	20.0%	15.0%
	Volume Managed (acre-ft/yr)	58.9	4.1	0.7	59.5	63.6	41.9
	Treated Impervious (acres)	102.6	7.2	0.4	103.0	110.3	103.1
	Existing Projects	0.0	0.0	0.4	0.4	0.4	0.4
	Future New & Redevelopment	0.0	0.1	0.1	0.1	0.2	0.2
	Regional Projects (Identified)	1.9	0.0	--	1.9	1.9	1.9
	Green Streets (High)	0.2	--	--	0.2	0.2	0.0
	Green Streets (Medium)	1.1	1.4	--	1.1	2.5	--
	Green Streets (Low)	--	0.1	--	--	0.1	--
	Other GI Projects (TBD)	--	0.7	--	--	0.7	--
	Total	3.3	2.3	0.4	3.7	6.0	2.5

Table 2. Implementation Milestones: Atherton with full credit for regional project

Implementation Metrics		Implementation Milestones: Atherton					
		Incremental			Cumulative		
		2020-2030	2030-2040	2040	2020	2030	Final 2040
Index	% Load Reduction	18.5%	1.3%	0.2%	21.3%	21.7%	21.7%
	Volume Managed (acre-ft/yr)	90.0	0.2	0.7	90.7	90.9	90.9
Capacities (acre-ft)	Treated Impervious (acres)	145.6	0.3	0.4	145.9	146.3	146.3
	Existing Projects	0.0	0.0	0.4	0.4	0.4	0.4
	Future New & Redevelopment	0.0	0.1	0.1	0.1	0.2	0.2
	Regional Projects (Identified)	6.0	0.0	--	6.0	6.0	6.0
	Green Streets (High)	--	--	--	--	--	--
	Green Streets (Medium)	--	--	--	--	--	--
	Green Streets (Low)	--	--	--	--	--	--
	Other GI Projects (TBD)	--	--	--	--	--	--
	Total	6.0	0.1	0.4	6.4	6.5	6.5
							Countywide