GREEN STREETS CLEAN WATER PLAN

COUNTY OF SAN DIEGO

MARCH 2022

GREEN STREETS CLEAN WATER

PLAN

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ACKNOWLEDGMENTS

PROJECT TEAM

Project Manager Sheri McPherson
Project Manager Stephanie Gaines
Program Coordinator René Vidales
Civil Engineer Charles Mohrlock

Prepared with assistance from:
Geosyntec Consultants
IVC Media

INTERNAL ADVISORY COMMITTEE MEMBERS

Department of Public Works
- Watershed Protection Program
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SURVEY RESPONDENTS

ACRONYMS

%	Percent
AB	Assembly Bill
ac	acres
BMP	Best Management Practice
bgs	Below ground surface
CASQA	California Stormwater Quality Association
CES	CalEnviroScreen
CIA	Cooperative Implementation Agreement
CIP	Capital Improvement Program
cu-ft	cubic feet
DAC	Disadvantaged Community
DPW	Department of Public Works
EJC	Environmental Justice Community
EMC	Event Mean Concentration
FC	Fecal coliform
FCO	Financial Contribution Only
ft	feet
GAMA	Groundwater Ambient Monitoring and Assessment
GI	Green Infrastructure
GIS	Geographical Information System
GS	Green Street
GSCW	Green Streets Clean Water
HPI	Healthy Places Index
HSG	Hydrologic Soil Group
HSA	Hydrologic Subarea
IRWM	Integrated Regional Water Management
LUEG	Land Use and Environmental Group
MS4	Municipal Separate Storm Sewer System
MPN	Most Probable Number
NGO	Non-Governmental Organization
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OEHHA	Office of Environmental Health Hazard Assessment
O&M	Operations and Maintenance
PGA	Pedestrian Gap Analysis
ROW	Right-of-Way
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SanGIS	San Diego Geographic Information Source
TBL	Triple Bottom Line
TCu	Total Copper
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorous
TPb	Total Lead
TSS	Total Suspended Solids
TZn	Total Zinc
US EPA	United States Environmental Protection Agency
WPP	Watershed Protection Program
WQE	Water Quality Equivalency

DEFINITIONS

Best Management Practice (BMP)	A procedure or device designed to minimize the quantity of runoff pollutants and/or volumes that flow to downstream receiving water bodies.
Biofiltration BMPs	Practices that use vegetation and Biofiltration Soil Media to detain and treat runoff from impervious areas. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes, and/or vegetative uptake.
Dispersion Area	The practice of effectively disconnecting impervious areas from directly draining to the storm drain system by routing runoff from impervious areas such as rooftops (through downspout disconnection), walkways, and driveways onto the surface of adjacent pervious areas. The intent is to slow runoff discharges and reduce volumes.
Centrifugal Force	An apparent force that acts outwardly on a body moving around a center, arising from the body's inertia.
Environmental Justice Community	Communities are defined based on data indicators from both CalEnviroScreen 3.0 and Live Well San Diego HC3 communities. Seventeen qualifying census tracts are grouped into four distinct EJ Communities: North El Cajon, North Lemon Grove, Spring Valley, and Sweetwater.
Event Mean Concentration	A flow-weighted average pollutant concentration for a given land-use type.
Green Infrastructure	An approach to stormwater and flood management that protects, restores, and mimics the natural water cycle using vegetation, mulch, soils, and natural processes while creating healthier environments.
Geographical Information System	A system that integrates data creation, management, and analysis with the location of that data on maps.
Green Street	A natural system approach to reduce stormwater flow, improve water quality, reduce urban heating, enhance pedestrian safety, reduce carbon footprints, and beautify neighborhoods. Green Streets integrate Green Infrastructure strategies into roads and right-of-ways.
Gross Pollutants	In stormwater, generally litter (trash), organic debris (leaves, branches, seeds, twigs, grass clippings), and coarse sediments (inorganic breakdown products from soils, pavement, or building materials).
Hydrologic Subarea	Subdivisions of regional watersheds.
Infiltration	The percolation of water into the ground.
Municipal Separate Storm Sewer System (MS4) Permit	A regulatory tool used by the Regional Water Quality Control Board (RWQCB) to regulate stormwater and non-stormwater discharges into MS4s and from MS4s into local water bodies. The MS4 Permit defines the regulatory obligations that agencies must meet to remain in compliance with the Permit and avoid enforcement actions. MS4 Permits are issued to municipalities as owners of the MS4 and are renewed approximately every five years.

DEFINITIONS

National Pollutant Discharge Elimination System (NPDES)	The national program for issuing, modifying, revoking, and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the Clean Water Act.
Right-of-Way	Portions of privately owned land dedicated to the San Diego County for public use (easement). The boundary lines of the County right-of-way are marked out in official survey maps that use survey pins and monuments as reference points. Generally, the County right-of-way extends beyond the actual traffic lanes including 10-feet past the face of curb or edge of the paved road.
Trash Amendments	California State Water Resources Control Board Amendments to the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California and the Water Quality Control Plan for Ocean Waters.
Treatment System	An ecosystem-based network of constructed water quality treatment facilities. Also known as Best Management Practices (BMPs) or green infrastructure.
Tree Well	A stormwater management feature that consists of a tree with a minimum amount of soil media to allow for storage, infiltration, and evapotranspiration of runoff.
Triple Bottom Line	An accounting framework that typically measures success in three areas: community, environmental, and economic.
Total Maximum Daily Load	The maximum amount of a pollutant allowed to enter a water body so that the waterbody will meet and continue to meet water quality standards for that particular pollutant.
Underserved Community	Underserved communities were identified using data from CalEnviroScreen, the California Healthy Places Index, San Diego LiveWell, and the Environmental Justice Element of the County's General Plan.
Vegetated Swale	Shallow, open channels that are designed to remove stormwater pollutants by physically straining/filtering runoff through vegetation in the channel. Swales can be used in place of traditional curbs and gutters and are well-suited for use in linear transportation corridors to provide both conveyance and treatment via filtration.
Water Quality Improvement Plan (WQIP)	Copermittees are required to develop a WQIP for each Watershed Management Area in the San Diego Region. The purpose of the Water Quality Improvement Plans is to guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. WQIPs requirements are defined mainly in the MS4 Permit provision B.

1 INTRODUCTION

PLAN

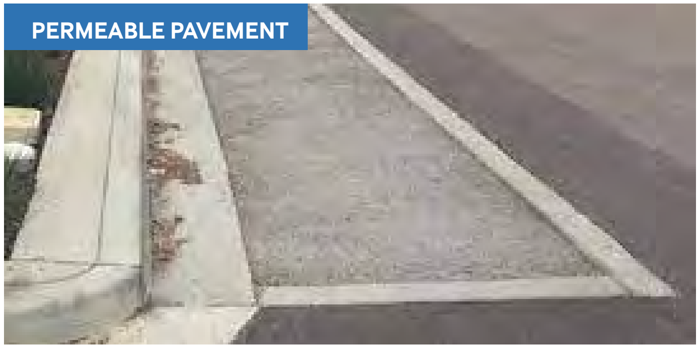
1 INTRODUCTION

1.1 WATER QUALITY NEED AND OBJECTIVES

Water quality at beaches and creeks throughout San Diego County is impacted by pollution carried in stormwater runoff from developed areas, including roadways. The Municipal Separate Storm Sewer System (MS4) Permit, issued by the San Diego Regional Water Quality Control Board in 2013 and amended in 2015, requires the County of San Diego and other Copermittees to address this pollution by developing and implementing plans that identify strategies for improving water quality through the management of stormwater runoff. Water Quality Improvement Plans (WQIPs) have been developed for each westward-draining watershed within the county. Progress towards the water quality goals and schedules described in the WQIPs is achieved by implementing actions to limit pollution in urban runoff, including through the use of green stormwater infrastructure.

On August 25, 2020, the County Board of Supervisors unanimously voted to appropriate funds to the Department of Public Works for the development of a plan to support green stormwater infrastructure (Minute Order No. 2, Action 2.8). This Green Streets Clean Water (GSCW) Plan ("Plan") is the fulfillment of the Board's direction. It builds upon the County's recently developed green infrastructure guidelines to identify and prioritize green streets project opportunities within unincorporated communities. These projects are intended to help reduce stormwater runoff, improve water quality, and provide a variety of related community benefits.

This Plan is designed as an intentional benefit-driven effort to address multiple objectives and identify potential projects that provide environmental, community, and economic benefits distributed across multiple watersheds and unincorporated communities. The Plan supports two key outcomes: 1) development of a menu of initial Green Streets projects to facilitate efficient implementation, and 2) documentation of a reproduceable project identification, benefit quantification, and prioritization process that can be extended to additional planning or project-specific efforts. Additional information regarding this Plan and the County's efforts to improve water quality can be found on the Watershed Protection Program's Green Infrastructure website at: https://www.sandiegocounty.gov/content/sdc/dpw/watersheds.html



1.2 GREEN STREETS BASICS

What are green streets?

The use of green infrastructure is a planning and design approach to managing stormwater and urban runoff that helps mimic and restore natural processes to create healthier environments. Green infrastructure refers to a network of natural features integrated into traditional "grey" infrastructure that can provide cleaner water, cleaner air, improved habitats and ecosystems, and flood protection. When these approaches are applied to infrastructure within streets or roads, they are called green streets. More information on common water quality-focused green streets elements can be found in Section 4 of this Plan. Green streets include elements such as specially designed landscaped areas that filter and soak runoff into the ground. General green streets information is available from numerous sources including the U.S. EPA. The County of San Diego provides guidance on the implementation of Green Streets in its Best Management Practices (BMP) Design Manual, Green Streets Guidelines, and Green Streets Standard Drawings (County of San Diego, 2020b, 2019a, 2019b). Green streets elements can also be integrated into comprehensive transportation network planning, design, and implementation as presented in the Federal Highway Administration's Small Towns and Rural Multimodal Networks report (FHWA, 2016).

Why green streets?

Green streets are just one of many tools the County uses to improve water quality and to meet the requirements of various stormwater permits and regulations. Since roadways and adjacent areas collect much of the runoff generated by commercial and residential land uses within developed areas, there are opportunities to remove pollution from runoff within the County right-of-way (ROW) before the runoff can impact downstream receiving waters (beaches, rivers, lakes). Green streets can also be combined with other project elements within the ROW to provide valuable community benefits such as enhanced pedestrian safety, improved mobility and access to schools and parks, reduced urban heating, and neighborhood beautification through greening. The use of green streets is one of the strategies that help the County meet requirements outlined in the MS4 Permit issued by the San Diego Regional Water Quality Control Board as part of the federal Clean Water Act's National Pollutant Discharge Elimination System (NPDES) program (California Regional Water Quality Control Board San Diego Region, 2015). The MS4 Permit requires the County and other public agencies (Copermittees) to assess pollutant loading to the area's receiving waters. It establishes Total Maximum Daily Loads (TMDLs), Receiving Water Limitations, and several other requirements mandating the achievement of water quality standards on defined timelines. These requirements and the County's strategies to address them are documented in WQIPs that have been developed collaboratively with the Copermittees sharing responsibility within each of the eight major watersheds that include unincorporated land. The WQIPs can be accessed on the Project Clean Water website (www.projectcleanwater.org/watersheds), additional information is provided in Section 1.3.

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What is the Green Streets Clean Water Plan?
This GSCW Plan documents the County of San Diego's strategic approach to identifying and evaluating the potential benefits of green streets projects within the unincorporated County. This approach was designed to help achieve the following outcomes:

1. To the extent practicable, utilize green streets projects to achieve water quality benefits;
2. To the extent practicable, utilize green streets projects to achieve additional community benefits;
3. Engage communities in green infrastructure planning within the road ROW;
4. Identify and prioritize top candidate project opportunities to maximize the County's return on investment in green infrastructure;
5. Summarize the green streets planning process for both public and private projects; and
6. Develop a vision and path forward for the future implementation of green streets.

How are green streets projects initiated and implemented?
Green streets projects can be initiated and implemented in a variety of ways. Sometimes green streets may be initiated as part of private development projects. Green streets may also be initiated by the County to support MS4 Permit compliance associated with roadway-related development or redevelopment. This is typically the case for capital improvement projects initiated for purposes other than water quality improvement such as road widening or realignments and bridge reconstruction, but which still require treatment of stormwater runoff to attain compliance with the MS4 Permit. In other cases, the County has initiated retrofits of its existing roadways to incorporate green street features with the specific goal of water quality improvement in mind. While this Plan focuses largely on the last category, it can also be used as a resource to help guide other types of green streets projects.

1.3 GEOGRAPHIC SCOPE

Green streets projects can be implemented within the unincorporated County, on public roads within the right-of-way (ROW), and on private roads within a private road easement. Within the unincorporated County there are nearly 2,000 miles of County-maintained roads. To focus this planning effort on locations with the optimal potential to combine water quality and community benefits, the study area for this plan was established as the County designated "village areas" with a surrounding two-mile buffer of adjacent rural-residential areas. These areas are more densely developed than outlying areas, can generate higher levels of pollution in runoff, and would most benefit from retrofits using green street elements. The study area was further narrowed to only include areas within the westward-draining watersheds. These watersheds are more densely developed and are highly regulated for stormwater quality under the jurisdiction of the San Diego Regional Water Quality Control Board (Region 9). The resulting study area covers approximately 580 square miles, more than 20 community planning areas, and over 1,200 miles of County-maintained roadway.

1.4 COMPATIBILITY WITH OTHER COUNTY/REGIONAL PLANS

This Plan is one part of a suite of solutions to improve water quality and the County's transportation infrastructure. Where possible, this Plan builds upon or works in coordination with other water quality, environmental, and transportation projects and plans at the unincorporated County and regional levels. Some of the County plans most directly relevant to the GSCW Plan include the County's Green Streets Guidelines, Green Street Standard Drawings, Pedestrian Gap Analysis, Local Traffic Safety Plan, Public Works 5-Year Capital Improvement Program Plan, Best Management Practices (BMP) Design Manual, and the San Diego County Regional Storm Water Resource Plan (SWRP) among others (County of San Diego, 2019a, 2019b, 2016a, 2021b, 2020a, 2020b, ESA, 2017).

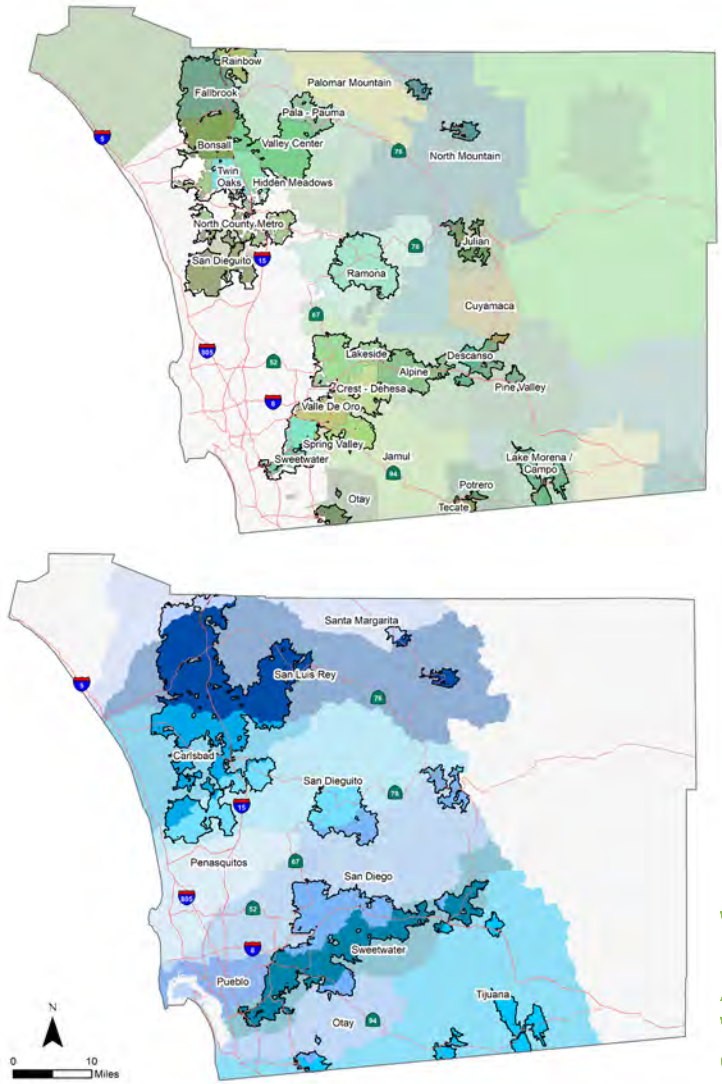
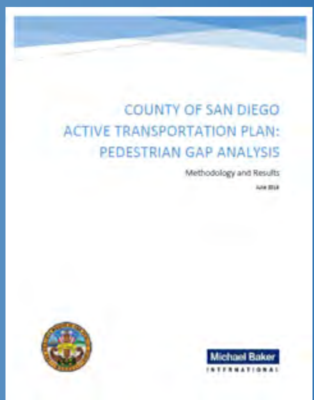
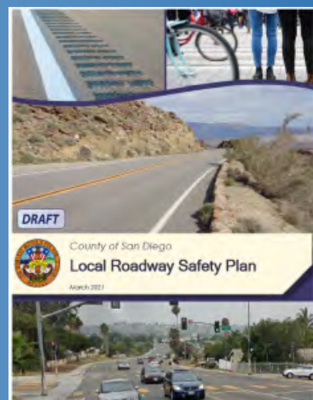
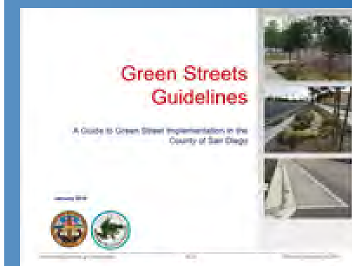


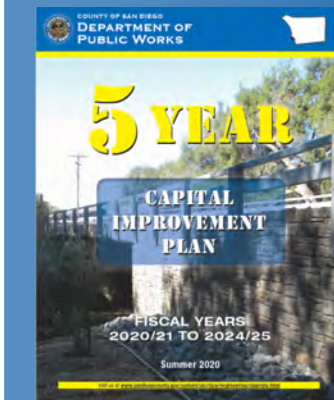
FIGURE 1: GSCW PLAN STUDY AREA WITH COMMUNITY PLANNING AREAS (TOP) AND WATERSHEDS (BOTTOM)

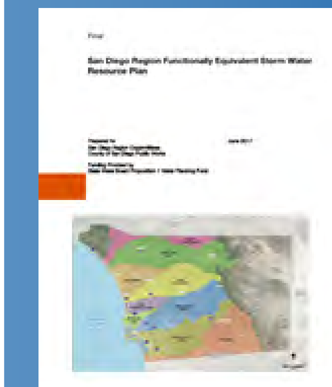
TABLE 1: GSCW PLAN COMPATIBILITY WITH OTHER REGIONAL DOCUMENTS











Active Transportation Plan: Pedestrian Gap Analysis (PGA)	Draft Local Road Safety Plan	Green Streets Guidelines, Green Streets Standard Drawings & BMP Design Manual	5-Year Capital Improvement Program Plan	San Diego County Regional Storm Water Resource Plan (SWRP)
The Pedestrian Gap Analysis (County of San Diego, 2016a) reviewed sidewalk conditions throughout the unincorporated County and developed a scoring system to identify and prioritize areas where new sidewalks or improvements and maintenance to existing sidewalks are needed. The results of this scoring analysis were used in the GSCW Plan to quantify the benefit of coupling green streets and sidewalk improvement projects.	The Local Road Safety Plan (County of San Diego, 2021b) summarizes where collisions are occurring most frequently, what safety improvements could be made, and prioritizes a list of potential improvements. These results (locations of 60 priority intersections and 60 priority roadway segments) were used to identify where green streets projects could potentially be coupled with road safety improvements.	The Green Streets Guidelines, Green Streets Standard Drawings and BMP Design Manual (County of San Diego, 2019a, 2019b, and 2020b) include required and minimum feasibility and design standards for green streets treatment systems. This information was used to inform feasibility screening and potential project site evaluation during the development of project concepts and potential projects included in this plan.	The locations of recently completed CIPs, as well as planned CIPs, (County of San Diego, 2020a) were evaluated and considered in project ranking and prioritization to combine projects where possible and to avoid areas with recently completed projects.	The purpose of the San Diego County Regional SWRP (ESA, 2017) is to identify and prioritize stormwater-related projects which most effectively address watershed-based stormwater quality and beneficial use goals and to qualify these projects for State grant funding. The prioritization and ranking framework developed for this plan incorporated the SWRP framework so that projects would remain eligible for grant funding.

1.5 COMMUNITY ENGAGEMENT

Input from community members has been integrated into the GSCW Plan by tailoring the project locations and types of green infrastructure considered based on preferences for local benefits. Outreach mechanisms used to engage the communities included the development of a website and informational video, two advertised and recorded online stakeholder workshops, integration of specific projects with local community plan objectives, coordination with community planning groups, and a community survey regarding green streets.

Additional input on the GSCW Plan, including specific projects, can be provided to the County directly by visiting the Green Infrastructure page on the Watershed Protection Program's website at: https://www.sandiegocounty.gov/content/sdc/dpw/watersheds.html. Additionally, as projects are advanced to the design stage, local community stakeholders and applicable Community Planning Groups will be engaged in the project concepts, where project-specific input will be welcomed.

> "THIS IS SUCH AN EXCITING AND NECESSARY PLAN. I HOPE IT GETS ALL THE SUPPORT IT DESERVES."
>
> **– SURVEY RESPONDENT**

2 COUNTY-HOSTED ONLINE WEBINARS
JULY 7TH AND NOVEMBER 18TH (RECORDINGS AVAILABLE)

- 100+ views of recorded webinars
- 3 invited community presentations

2-MINUTE INFORMATIONAL VIDEO

- 160+ views in English
- 40+ views in Spanish

7 MONTHS OF PUBLIC SURVEY

- 6 survey languages
- 40+ survey respondents

500 INDIVIDUAL STAKEHOLDER EMAILS

- 40+ community planning sub-groups
- 20+ libraries, community centers, and school districts
- 16+ local environmental groups and non-governmental organizations (NGOs)
- 11+ local chambers of commerce

4 WEEKS OF SOCIAL MEDIA AND PROGRAMMATIC ADVERTISING

- 3 social media platforms (Nextdoor, Twitter, and Facebook)
- 270,000+ programmatic advertising reach
- 870,000+ programmatic advertising impressions

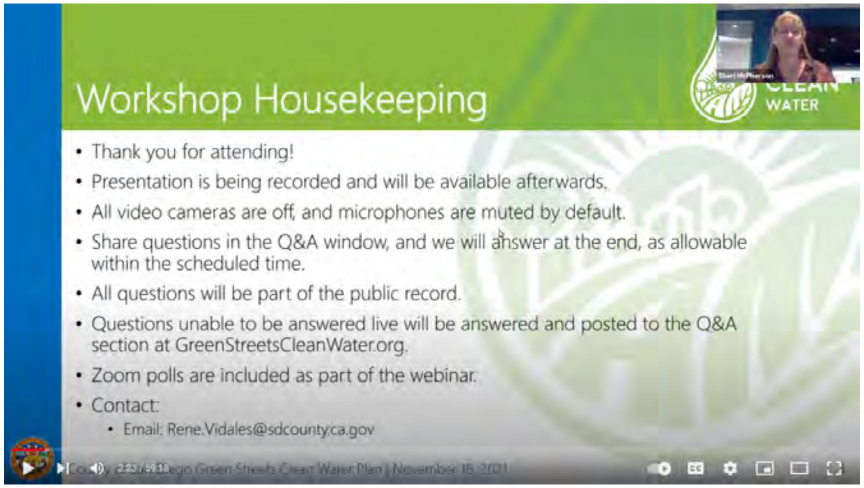
1.5.1 STAKEHOLDER WORKSHOPS AND COMMUNITY MEETINGS

The GSCW planning process, drivers, and objectives were introduced to interested stakeholders via two public workshops held on July 7th and November 18th, 2021. Both workshops were hosted remotely using the Zoom platform, scheduled in the evening to increase access and participation, and recorded and posted on the project website for those unable to attend in real-time. Comments provided during the meetings were posted to the website as part of the public record. Opinion polls were also hosted during the meeting to gather real-time input on the preferences of those in attendance. Where specific project locations were recommended, the project team investigated such opportunities as part of the planning process and incorporated them into the Plan where warranted. Updates on later progress toward the GSCW Plan were also provided upon request at several other community group meetings.

1.5.2 COMMUNITY SURVEY

An introductory community survey was published in six languages (English, Spanish, Arabic, Chinese, Tagalog, and Vietnamese) with the intent of gathering community-specific input. The survey gathered information on:

- The participants' community and familiarity with green streets,
- The preferred or desired environmental, community, and economic benefits that can result from green streets,
- Preferred green streets treatment systems, and integration with existing facilities,
- Any potential concerns with adding green streets, and
- A request for contact information on any local community groups and organizations that would be interested in hearing more about the GSCW Plan.



The information gathered from this survey was used to inform the type and placement of green streets treatment systems. For example, survey respondents noted a strong preference for landscaped systems that would improve the aesthetic appearance of the roadside while also improving walkability through increased shade from trees. Respondents also valued water quality improvements and enhancements that would provide habitat for local wildlife and pollinators. There was a strong preference for tree well and biofiltration systems compared to permeable parking and dispersion areas. Respondent's concerns were primarily focused on the type of vegetation that would be planted as well as the resulting water demand and sustainability of vegetated systems.

The survey responses were used to inform the initial planning stages on a broad geographical scale. The small sample size may not reflect the localized, site-specific preferences expected at the project scale. Importantly, community engagement does not stop with the development of this Plan – early and thorough community engagement will continue to be an important part of all project-specific implementation and as part of any efforts to modify or enhance this Plan in the future.

The survey also gathered open-ended questions and comments. These have been combined with questions submitted during both the public workshops and the community group meetings and are responded to in Attachment A.

1.5.3 INTEGRATION WITH COMMUNITY PLANS

Multiple communities within the study area have developed community revitalization plans (e.g., Campo Road Revitalization Plan [MBI]) or similar long-term planning documents. Where project opportunities identified under the GSCW Plan fall within the geographic scope of these plans, the design components were selected to integrate with the objectives and other planned roadway elements of the established community plans, where feasible.

GREEN STREETS CLEAN WATER

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2
GREEN STREETS PLANNING PROCESS

2 GREEN STREETS PLANNING PROCESS

The GSCW Plan is just one step in a larger planning process; it identifies potential project opportunities for further evaluation, preliminary engineering, and design. The Plan is not intended to produce a scheduled list of specific projects; rather, it provides a menu of options with assessed benefits for further development and implementation depending on needs and priorities. To understand the scope and limitations of this Plan it is helpful to understand the overall project planning process.

As described in Section 1, there are several scenarios under which green streets projects may be initiated and implemented (as part of a private development/redevelopment project, as part of a capital improvement project initiated for purposes other than water quality, or as a standalone water quality improvement project). The project planning process is unique under each of these scenarios and depends on the specific permitting and approval process for each project.

This Plan focuses on the requirements for capital improvement and water quality improvement projects as they are similar and most applicable to the project types identified in this plan (for planning requirements for private projects, refer to the BMP Design Manual [County of San Diego, 2020b]).

In general, the project planning process includes the key steps described below:

- **Green Streets Opportunity Identification and Initial Screening** – Identify potential project sites based on factors including water quality need, available space, obvious site constraints, and associated project opportunities; Select locations with the optimal combination of benefits and the greatest potential for further detailed evaluation.
- **Preliminary Engineering and Alternatives Evaluation** – Evaluate potential projects for technical feasibility, refine estimates of benefits and costs, and evaluate project alternatives or scenarios (i.e., minimize impacts to existing infrastructure or maximize benefits by reconfiguring existing infrastructure and/or road geometry).
- **Project Design and Permitting** – Develop project design plans, estimate construction costs, perform community outreach and engagement, and prepare permits for the preferred alternative.

This plan documents a multi-part project identification and quantification approach to optimize the potential benefit of project opportunities, evaluate opportunities across a large study area, and objectively rank and prioritize them. This approach complements the objectives in multiple Water Quality Improvement Plans (WQIPs), which identify distributed green infrastructure (such as green streets) as a critical strategy in achieving numeric water quality goals through pollutant load reduction while also providing multiple community benefits. The approach can be implemented using common geospatial analysis tools, a newly developed water quality quantification tool built as part of this plan, and benefit quantification methods that build upon previous County efforts, the 2017 Stormwater Resource Plan (SWRP) (ESA, 2017), and similar efforts throughout Southern California. This approach can be replicated and extended to additional planning efforts or project-specific analysis using the three-step approach summarized below; additional detail is provided in Sections 3, 4, and 5. For the projects evaluated in this plan, previously developed drainage areas were used as the geographic unit of analysis.

Step 1
Highest Need Locations

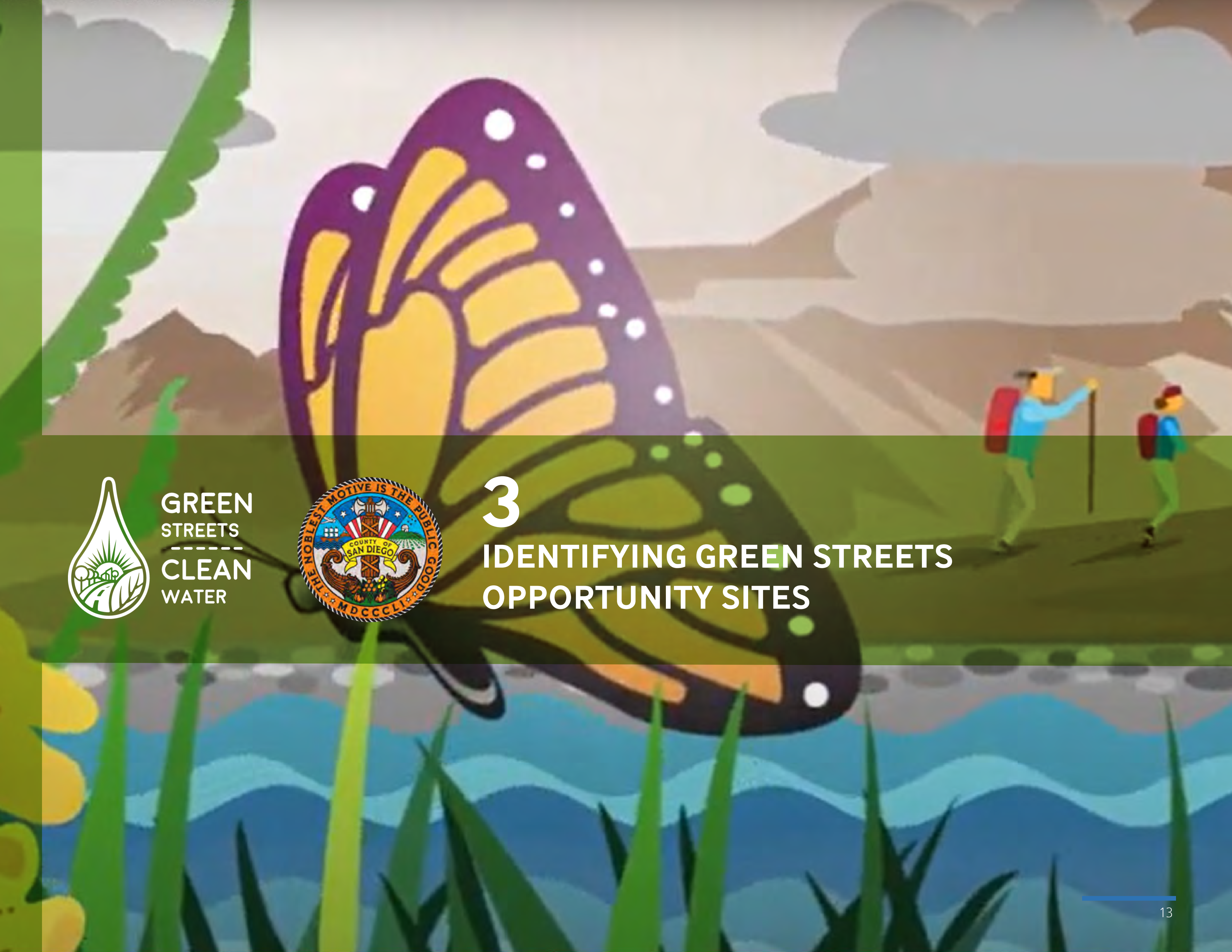
Rank drainage areas based on combined pollutant loading and potential for community benefits, aiming to optimize both.

Step 2
Best-Suited Treatment Systems

Within the highest ranked drainage areas, further optimize benefits through the site-specific selection of tailored treatment systems.

Step 3
Highest Benefit Projects

Prioritize groups of treatment systems, or projects, using a detailed analysis of combined environmental, community, and cost-effectiveness.



GREEN STREETS CLEAN WATER

3
IDENTIFYING GREEN STREETS OPPORTUNITY SITES

GREEN STREETS CLEAN WATER

PLAN

3 IDENTIFYING GREEN STREETS OPPORTUNITY SITES

Step 1
Highest Need Locations

The goal of the opportunity screening analysis is to identify priority drainage areas to allow for more focused project siting in areas with a high combined estimated pollutant loading and potential for community benefits. The opportunity screening is the first step in moving from a large study area to the project scale. Section 3.1 provides a high-level overview of the water quality analysis used to identify the potential water quality benefit of projects at the drainage area scale. Section 3.2 summarizes the community benefit quantification process at the drainage area scale. Together, these two scores are used to perform a relative comparison of drainage areas and identify areas for a more detailed project siting review.

Water quality benefits are a function of:

- Extent of pollution carried by urban runoff; and
- Sensitivity of creeks and streams to pollutants.

Community benefits are a function of:

- Pollution burden carried by neighborhoods;
- Disproportionately impacted communities (underserved communities);
- Need for recreational opportunities, including open space and parks;
- Need for shade along pedestrian corridors;
- Potential integration with Caltrans projects to leverage available funding; and
- Potential integration with planned CIP projects.

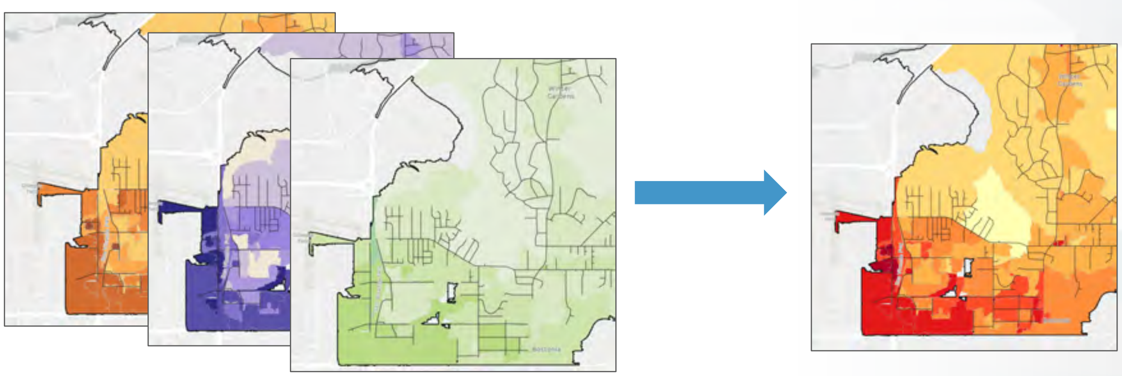
Potential water quality benefit score (WQ) + Potential community benefit score (CB) = Total drainage area prioritization score

3.1 WATER QUALITY IMPROVEMENT OPPORTUNITY

In this plan, the Potential Water Quality Benefit Score quantifies the potential pollutant load reduction for each of the eight priority pollutants. This was calculated using relative pollutant concentration estimates that are generated based on an area's land uses and potential to generate runoff. This relative comparison process was previously developed and documented in the San Diego Regional MS4 Copermittees' Water Quality Equivalency (WQE) Guidance Document that was approved by the San Diego Regional Water Quality Control Board (San Diego Region MS4 Copermittees, 2018).

To estimate annual pollutant loads and runoff volumes, local runoff hydrology was quantified using the commonly applied Hydrologic Response Unit (HRU) methodology. HRUs are geographic areas that represent unique combinations of land use (e.g., residential, commercial, industrial) and land cover (e.g., impervious or pervious). Hydrologic modeling was then used to simulate common rainfall-runoff processes within each HRU, which generates estimates of annual pollutant loads and volumes. Pollutant loads and volumes were then aggregated across all of the HRUs within a defined drainage area, resulting in the total annual pollutant load and volume for that area. This local runoff hydrology estimate is appropriate for making comparisons of annual pollutant loads and runoff volumes between potential treatment system locations.

FC score + TSS score + TN score + TP score + TCu score + TPb score + TZn score + Trash score = Potential water quality benefit score (WQ)



The eight pollutants considered in this analysis include bacteria (as fecal coliform), sediment (as total suspended solids), nutrients (total nitrogen and total phosphorous), metals (total copper, total lead, and total zinc), and trash generated from priority land uses as defined by the California State Water Resource Control Board Trash Implementation Program (Trash Amendments) (California State Water Resources Control Board, 2015). A score was developed for each pollutant; these scores were then combined, resulting in a single quantitative assessment of the potential for water quality benefits within each drainage area.

The subsequent sections provide additional information on some of the key inputs in this process. Attachment C includes detailed documentation of the quantification methodology.

3.1.1 RELATIVE POLLUTANT CONCENTRATIONS

Pollutant scores are dependent on both the hydrologic characteristics of the contributing watershed and the expected pollutant loading within that watershed. This plan used the relative pollutant concentrations developed in the WQE process to represent pollutant concentration in the drainage area screening process. These relative pollutant concentrations were developed as Event Mean Concentrations (EMCs) from data collected during wet weather monitoring and are commonly used for water quality modeling in the San Diego Region. Additional information is included in Attachment C.

3.1.2 RECEIVING WATER BODY TMDL AND 303(D) LISTINGS

Individual pollutant scores were assigned additional weighting factors in the scoring process if the drainage areas contribute runoff to receiving waters identified by the State of California as impaired.

Receiving water TMDLs and impairments on the 2014/2016 303(d) List, as found in the 2014/2016 California Integrated Report (US EPA, 2018), were identified for the pollutants of concern and mapped to the corresponding drainage area based on Hydrologic Subarea (HSA) (see Figure 2). HSAs were used to trace TMDLs and impairments to upstream drainage areas so that all contributing drainage areas could be identified and included in the scoring. 303(d) listings for this analysis were filtered for Category 5 (listing requiring the development of a TMDL) and Category 4b (listing is being addressed by an action other than a TMDL). Category 4a 303(d) listings are addressed by US EPA-approved TMDLs and are included under the receiving water TMDLs. If the drainage area drains to a receiving water with an existing TMDL for the pollutant of concern, a weighting factor of 3 was applied. If the drainage area drains to a 303(d) listed receiving water for the pollutant of concern, a weighting factor of 2 was applied. Additional information is included in Attachment C.

Pollutant Score = Relative Pollutant Concentration × Area Weighted Runoff Coefficient × TMDL Weighting Factor (3) *or* 303(d) Weighting Factor (2)

If the drainage area drains to both a 303(d) or TMDL, the TMDL weight factor was utilized.

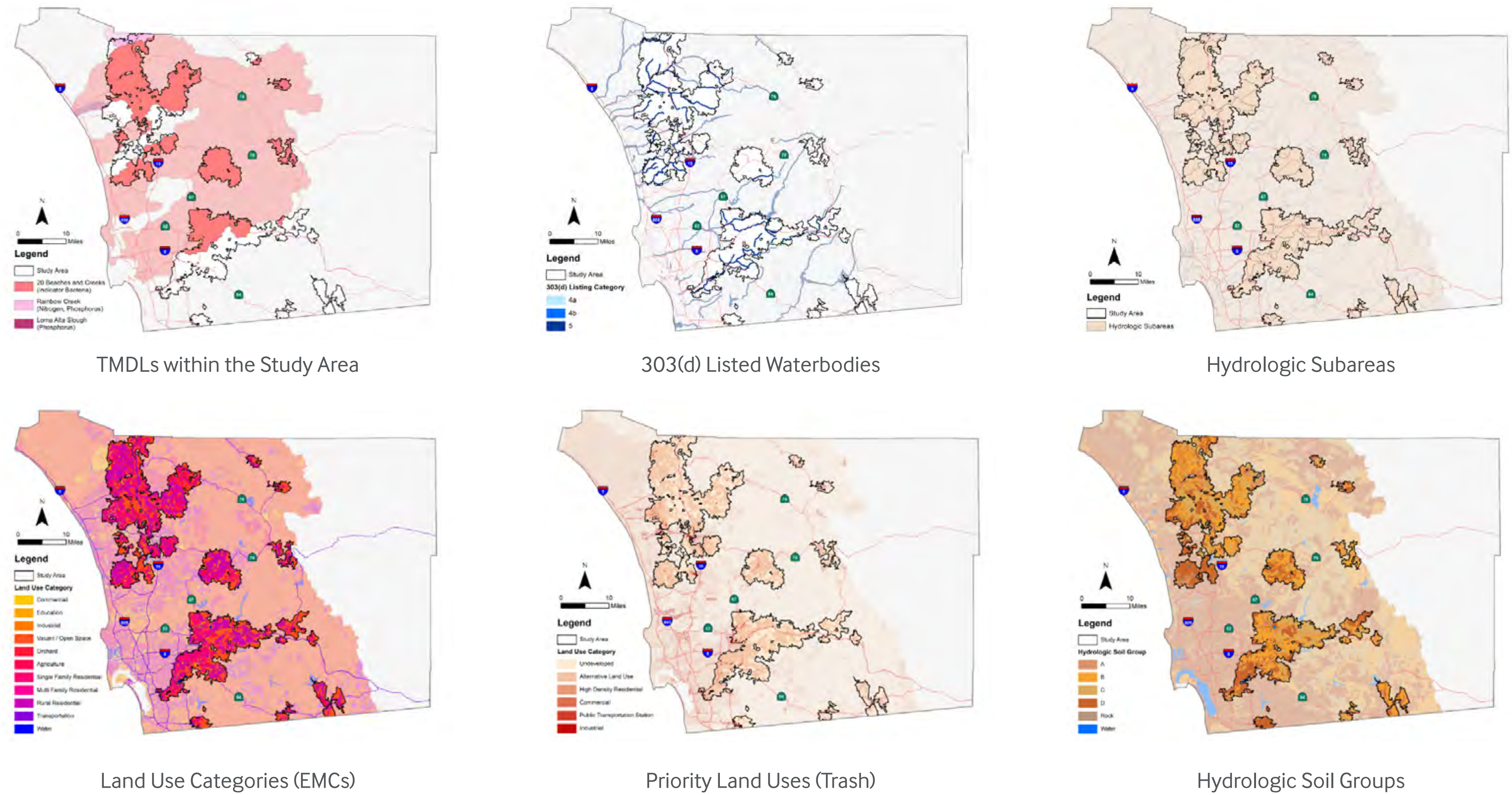


FIGURE 2: KEY INPUTS FOR WATER QUALITY BENEFIT SCREENING

3.2 COMMUNITY BENEFIT OPPORTUNITY SCREENING

The community benefit opportunity screening assigned points to drainage areas based on the potential for green streets within the drainage areas to provide benefits beyond water quality. Drainage areas meeting the metrics defined in Table 2 received points toward the total community benefit score, resulting in a higher likelihood of that drainage area being prioritized for a potential green streets project. A high priority was placed on identifying opportunities in underserved communities to support environmental justice elements such as adding green space and community enrichment opportunities, mitigating impacts of climate change, encouraging investments through partnerships with other agencies, and/or other benefits. Each metric is described in the sections below, and Appendix B provides a detailed source list for the datasets and layers used for the metrics.

Underserved Communities score + EJC score + Low Income Communities score + Park access score + Tree canopy cover score + Receipt of Runoff from Caltrans ROW score + 5-Year CIP score = Potential community benefit score (CB)

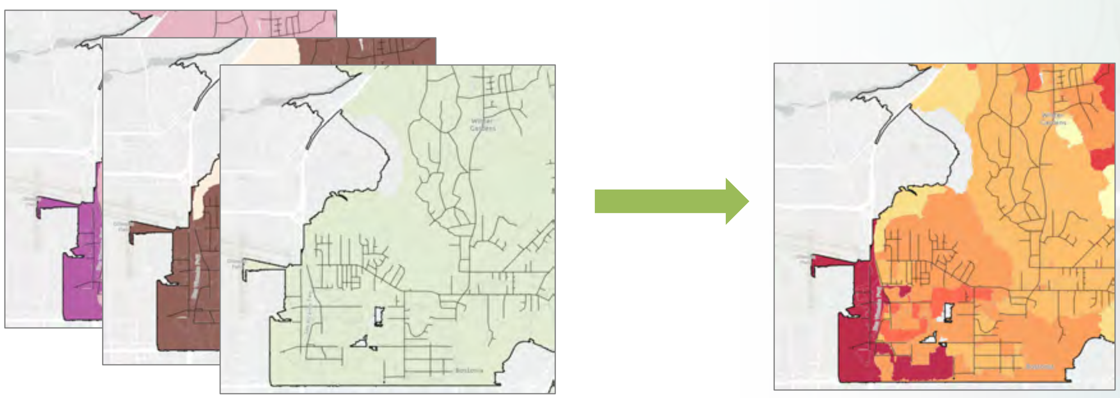


TABLE 2: COMMUNITY BENEFIT DRAINAGE AREA SCORING METRICS

Metric	Criteria	Points Earned	Maximum Points	Relative Contribution to Community Benefit Score
SB 535 Disadvantaged Communities (DACs)	Drainage area intersects mapped DAC Drainage area does not intersect mapped DAC	5.0 0.0	5.0	10%
County Environmental Justice Communities (EJCs)	Drainage area intersects the defined EJC Drainage area does not intersect the defined EJC	7.5 0.0	7.5	15%
AB1550 Low-Income Communities	Drainage area intersects mapped AB1550 low-income community Drainage area does not intersect mapped AB1550 low-income community	20 0.0	20	40%
Public Parks and Open Space – Park Access	Park/open space > ½-mile from residential parcels Park/open space <= ½-mile from residential parcels	5.0 0.0	5.0	10%
Tree Canopy Cover	Bottom 10% of coverage >10-50% >50-90% Top 10% of the highest coverage	5.0 3.0 1.0 0.0	5.0	10%
Drainage area receiving runoff from Caltrans ROW	Drainage area receives runoff from Caltrans ROW Drainage area does not receive runoff from Caltrans ROW	2.5 0.0	2.5	5%
CIP 5-Year Plan	Drainage area intersects a location identified in CIP 5-year Plan Drainage area does not intersect a location identified in CIP 5-year Plan	5.0 0.0	5.0	10%
		Total	**50**	**100%**

3.2.1 DISADVANTAGED COMMUNITIES

California State Senate Bill 535 (SB 535) defines disadvantaged communities or DACs as the top 25% of the census tracks with the highest amount of pollution and low-income populations based on a combination of pollution exposure, environmental effects, sensitive populations, and socioeconomic factors (OEHHA, 2018). For this plan, CalEnviroScreen 3.0 (OEHHA, 2018) was used to identify disadvantaged communities. CalEnviroScreen 4.0 was released in October 2021 and after the GSCW Plan assessment period. The census tracts identified as disadvantaged communities are presented in Figure 3. Disadvantaged communities within the study area account for 265 acres, or 0.07%, of the study area).

By siting green streets projects in disadvantaged communities, local residents would benefit through the reduction of stormwater pollution, enhanced local aesthetics from vegetated surface treatment systems, reduction of heat island effects and improved air quality, and other potential improvements depending on the selected treatment systems and designs details. Projects located in disadvantaged communities may also qualify for state or federal funding (e.g., Integrated Regional Water Management (IRWM)– California Department of Water Resources (CA DWR), US EPA Justice40 Initiative (US EPA, 2021)). As part of the GSCW Plan drainage area prioritization, drainage areas overlying a disadvantaged community received more points and thereby are more likely to be prioritized for green streets projects.

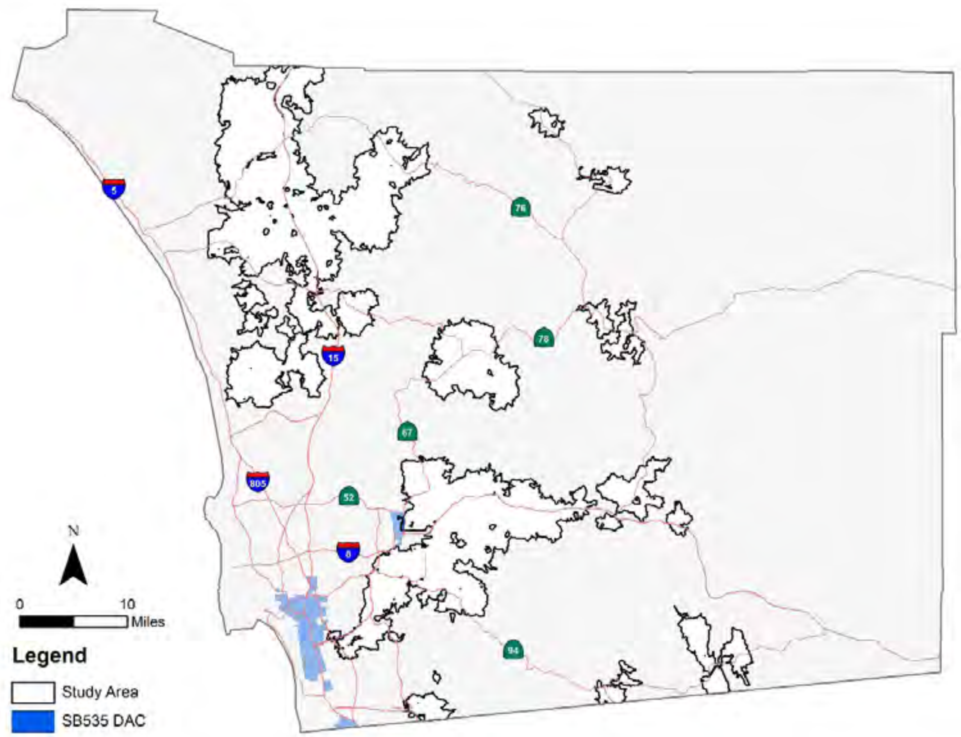


FIGURE 3: DISADVANTAGED COMMUNITIES

3.2.2 ENVIRONMENTAL JUSTICE COMMUNITIES

The County of San Diego General Plan Environmental Justice Element (County of San Diego, 2021e) has defined four Environmental Justice Communities (EJCs) based on a combination of the CalEnviroScreen 3.0 (OEHHA, 2018) pollution burden score (greater than 75%) and Live Well San Diego Healthiest Cities and Counties Challenge (HC3) communities, which addresses wellness and equity for underserved communities. While some of the SB535 disadvantaged communities overlap with the EJCs, there are additional communities within the GSCW Plan study area that qualify as EJCs. The census tracts within the GSCW Plan study area that qualify as EJCs are shown in Figure 4 and account for 8,400 acres, or 2.3%, of the study area. Drainage areas overlying an EJC were prioritized in a similar fashion to disadvantaged communities as described in Section 3.2.1.

LIVE WELL SAN DIEGO

OEHHA
SCIENCE FOR A HEALTHY CALIFORNIA

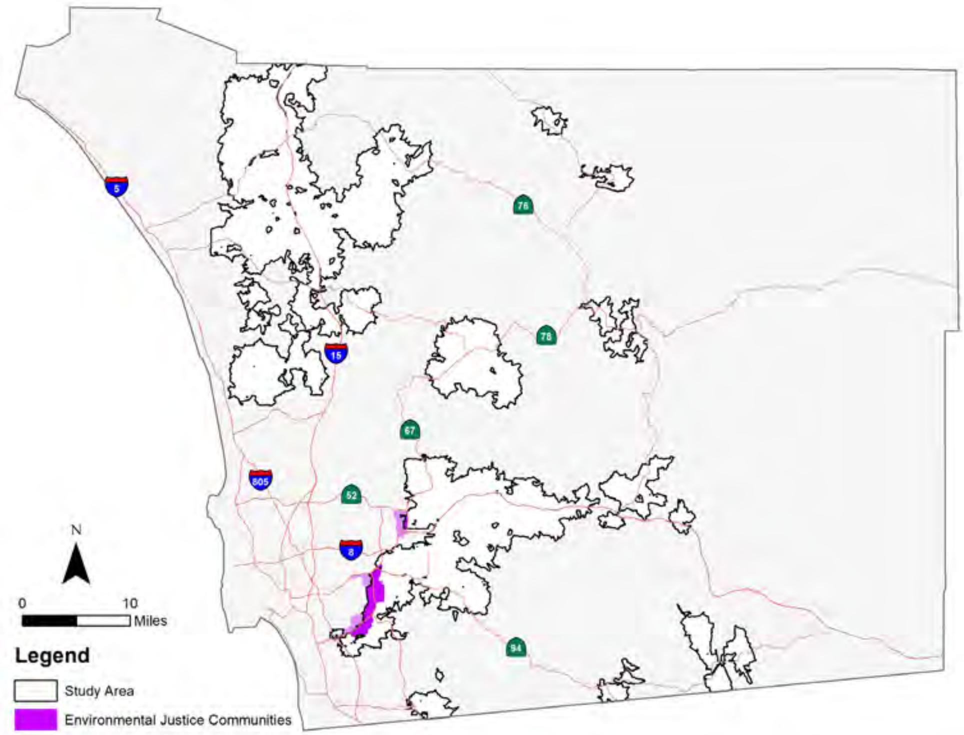


FIGURE 4: ENVIRONMENTAL JUSTICE COMMUNITIES

3.2.3 AB1550 LOW-INCOME COMMUNITIES

"Low-income communities" are defined by California State Assembly Bill 1550 (AB1550) as "census tracts with median household incomes at or below 80% of the statewide median income or with median household incomes at or below the threshold designated as low-income by the Department of Housing and Community Development's State Income Limits adopted under Section 50093" (California Air Resources Board, 2017). The census tracts within the GSCW Plan study area that qualify as low-income communities are shown in Figure 5 and cover 75,500 acres, or 20.5%, of the study area. Drainage areas overlying low-income communities were prioritized in a similar fashion to disadvantaged communities and EJCs, as described in Section 3.2.1.

California Department of Housing and Community Development

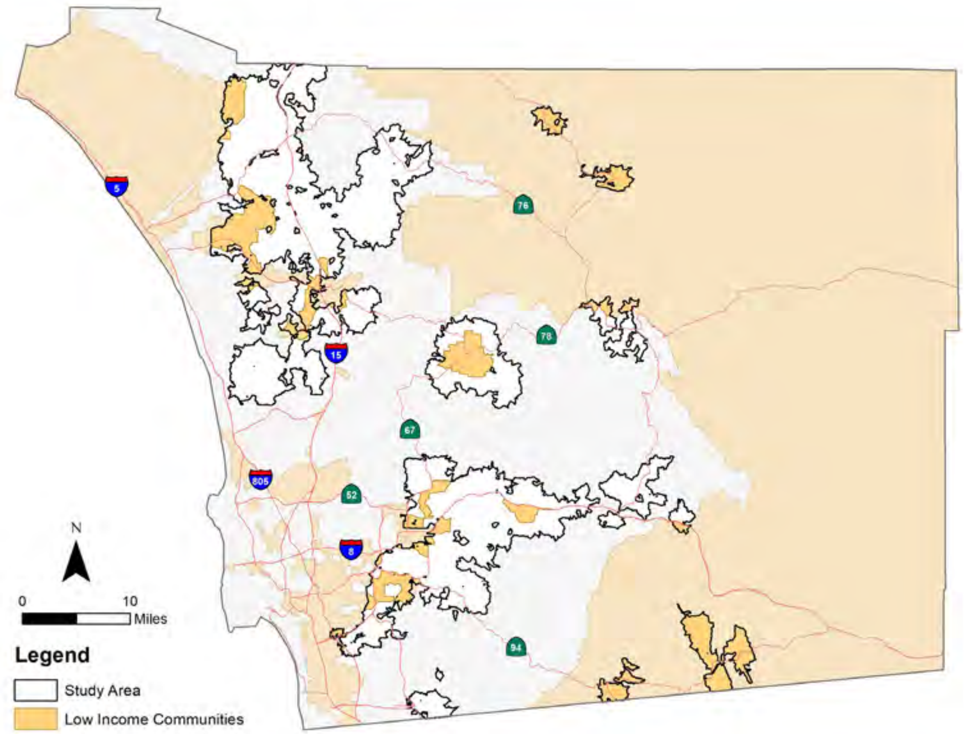


FIGURE 5: LOW-INCOME COMMUNITIES

3.2.4 PARK ACCESS

The siting of vegetated green streets projects in areas without parks that are within walking distance of residential communities can make green spaces more accessible to residents, improving quality of life. As part of the GSCW Plan drainage area prioritization, drainage areas without parks within ½ mile of the residential land uses received more points and thereby were more likely to be prioritized for green streets projects.

The County's Park Land Dedication Ordinance (Chapter 1, Article 1, Section 810.105.a.7) expresses a preference for dedicated park land to be located within ½ mile walking distance of a residential area (County of San Diego, 2020c). To assess where such opportunities exist within the GSCW Plan study area, the County's residential land uses were buffered by ½ mile and then intersected with the County's parks GIS layer. Qualifying areas within the GSCW Plan study area are shown in Figure 6 and account for 146,200 acres, or 39.6%, of the study area.

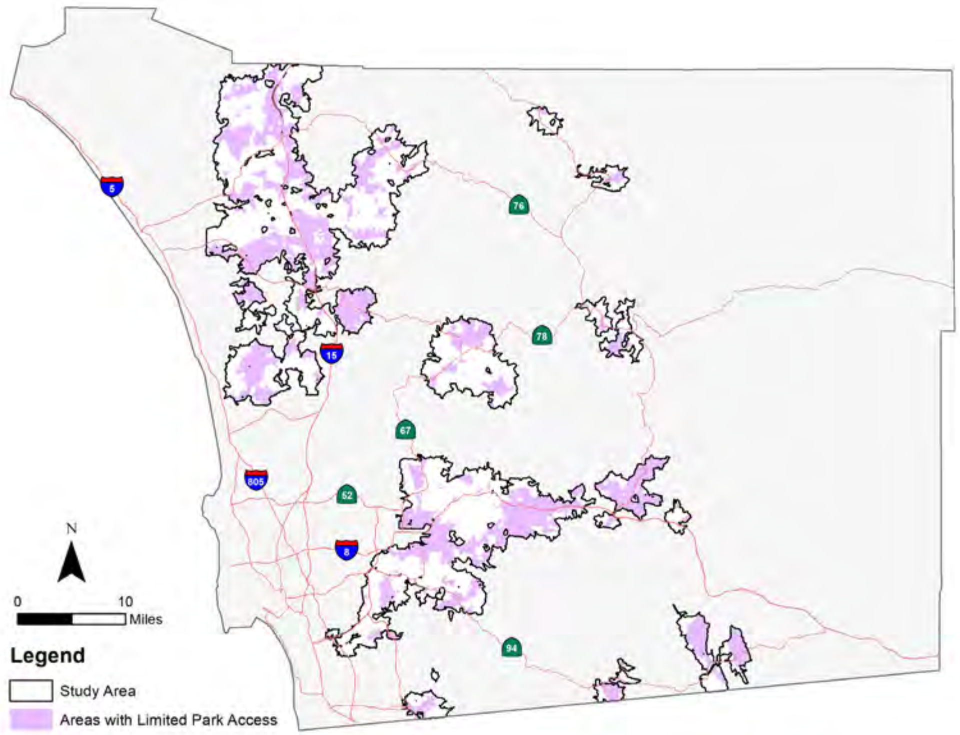


FIGURE 6: RESIDENTIAL GSCW PLAN AREAS WITHOUT PARKS WITHIN ½-MILE

3.2.5 TREE CANOPY COVER

The siting of tree-oriented green streets projects in areas with less tree canopy coverage increases access to shade in public spaces, reducing the localized heat island effect, and enhancing equitable access to outdoor space and recreation opportunities. As part of the GSCW Plan drainage area prioritization, drainage areas with lower tree canopy coverage will receive more points than those with higher coverage and are thereby more likely to be prioritized for green streets projects.

To assess tree canopy coverage, a data layer developed by the County was used which mapped tree canopy coverage as elevated vegetation (≥ 15-ft). The distribution of tree canopy coverage within the GSCW Plan study area is shown in Figure 7.

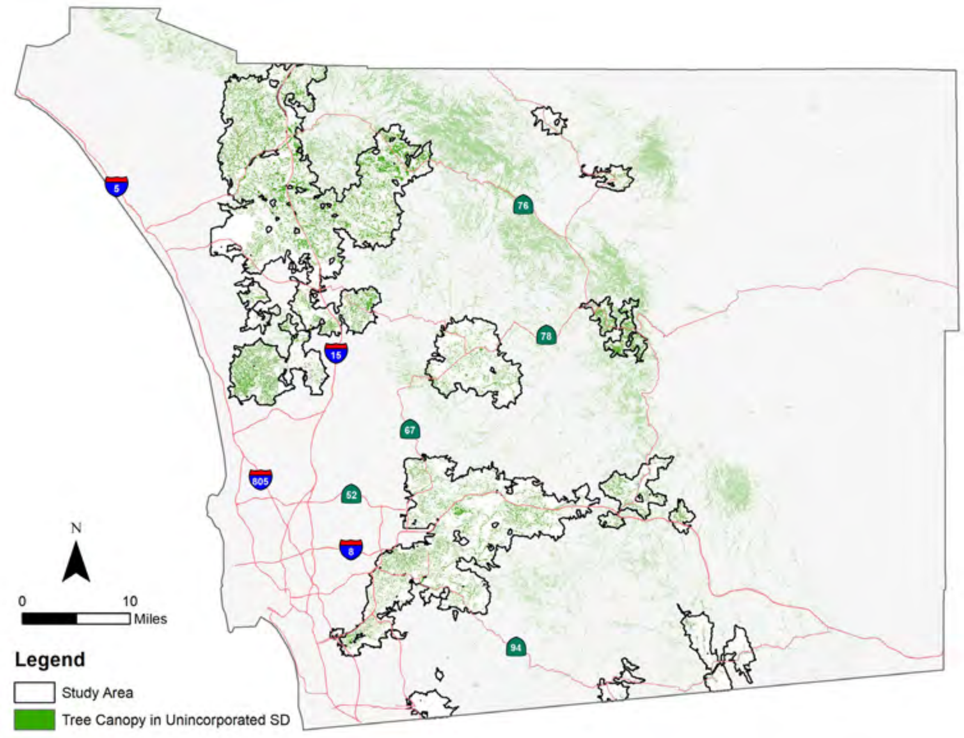


FIGURE 7: TREE CANOPY IN SAN DIEGO COUNTY

3.2.6 DRAINAGE AREA RECEIVING RUNOFF FROM CALTRANS ROW

The siting of green streets projects to treat runoff in areas that would also address Caltrans water quality objectives, would be more likely to receive funding under either the Cooperative Implementation Agreement (CIA) or Financial Contribution Only (FCO) municipal partnership programs (Caltrans, 2021). As part of the GSCW Plan drainage area prioritization, drainage areas overlying a Caltrans-defined significant trash generating area received more points and thereby are more likely to be prioritized for green streets projects.

Both funding programs are designed to provide funding for water quality treatment facilities in which Caltrans is identified as a responsible party or in significant trash-generating areas. While Caltrans is listed as a responsible party in several of the TMDL watersheds within San Diego County, its primary focus within District 11 (San Diego area) is addressing the significant trash-generating areas defined in the Statewide Trash Implementation Plan (Caltrans, 2019).

Caltrans defined significant trash-generating areas within the GSCW Plan study area are shown in Figure 8.

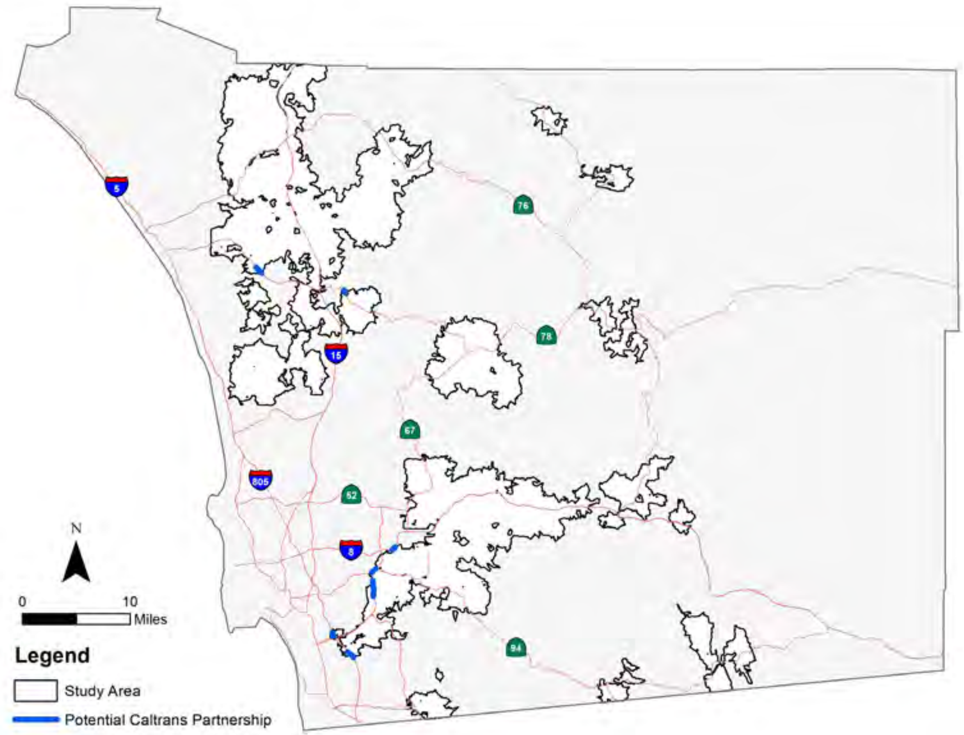


FIGURE 8: POTENTIAL CALTRANS PARTNERSHIPS

3.2.7 CAPITAL IMPROVEMENT PROGRAM 5-YEAR PLAN

By siting green streets projects in areas where improvements are already planned under the County's Public Works Capital Improvement Program (CIP), cost savings can be achieved by integrating green streets components into the planned improvements, minimizing traffic disruptions by constructing projects simultaneously, accelerating implementation, and sharing costs across projects such as design and mobilization/demobilization costs. As part of the GSCW Plan drainage area prioritization, drainage areas overlying a qualifying CIP project received more points and thereby are more likely to be prioritized for green streets projects.

The Capital Improvement Program Plan identifies improvements to roads and bridges, County-owned airports, drainage structures, wastewater facilities, and watershed water quality projects. The County's 5-year Capital Improvement Program Plan (County of San Diego, 2020a) was screened to identify projects listed as "in current plan" (vs. completed or removed) and scheduled for completion in 2023 or later (to align with the approximate date of completion for any green streets developed under the GSCW Plan and to avoid disruptions to recently improved road surfaces per the Pavement Cut Policy [County of San Diego, 2016b]). Qualifying CIP projects within the GSCW Plan study area are shown in Figure 9.

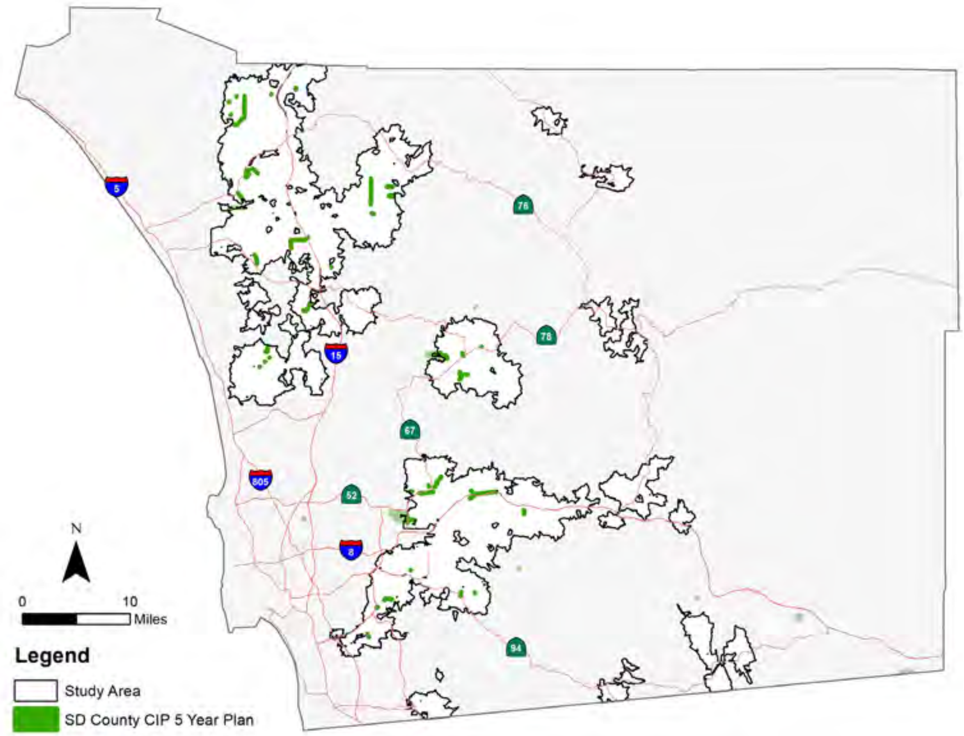


FIGURE 9: SAN DIEGO COUNTY CAPITAL IMPROVEMENT PROJECTS 2020/21 TO 2024/25

3.3 OPPORTUNITY SCREENING RESULTS

Based on the screening factors described in Sections 3.1 and 3.2, the drainage areas within the Study Area received water quality benefit and community benefit scores indicating the relative impact a green street project may have on each drainage area. The highest priority areas for multiple combined benefits or biggest impact were ranked, and the top 85 drainage areas were chosen for further investigation. Attachment D.1 provides the top 85 ranked drainage areas.

The combined benefit score was selected from several options to ultimately reflect an approximate split of 75% for the water quality benefit score and 25% for the community benefit score, with the water quality contributions weighted higher to better align with the primary project drivers. The resulting scores varied by individual drainage area based on site-specific factors. The spatial distribution of water quality benefit, community benefit, and combined benefit scores are shown in Figure 10, Figure 11, and Figure 12.

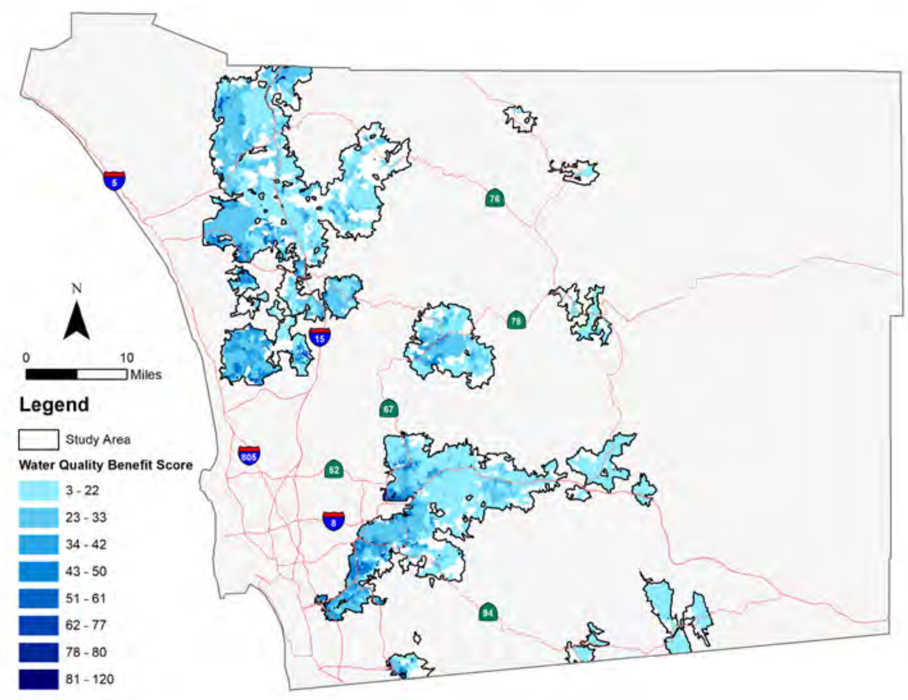


FIGURE 10: WATER QUALITY BENEFIT SCORE

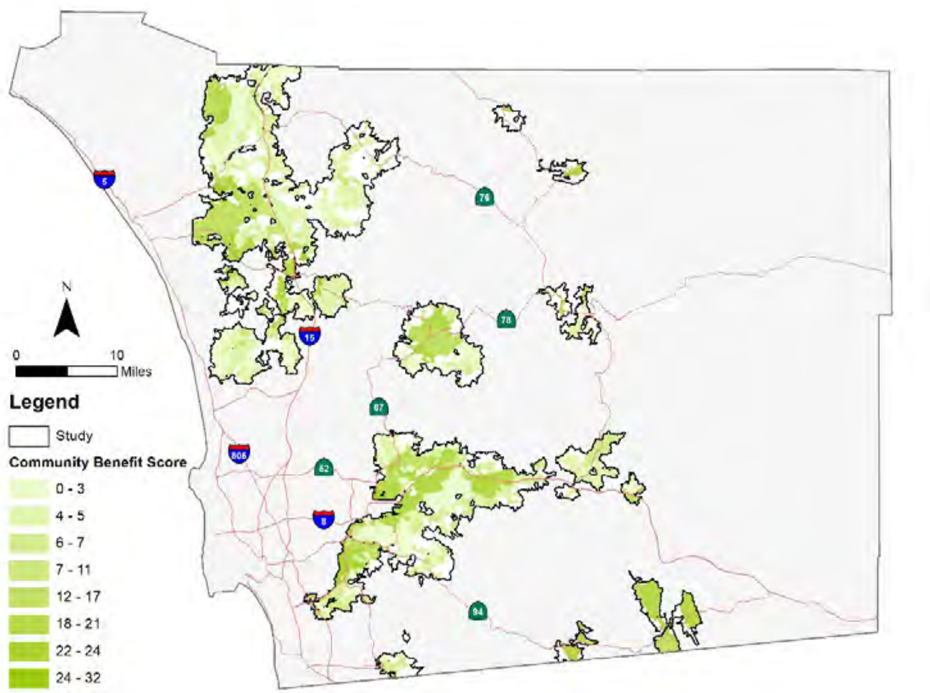


FIGURE 11: COMMUNITY BENEFIT SCORE

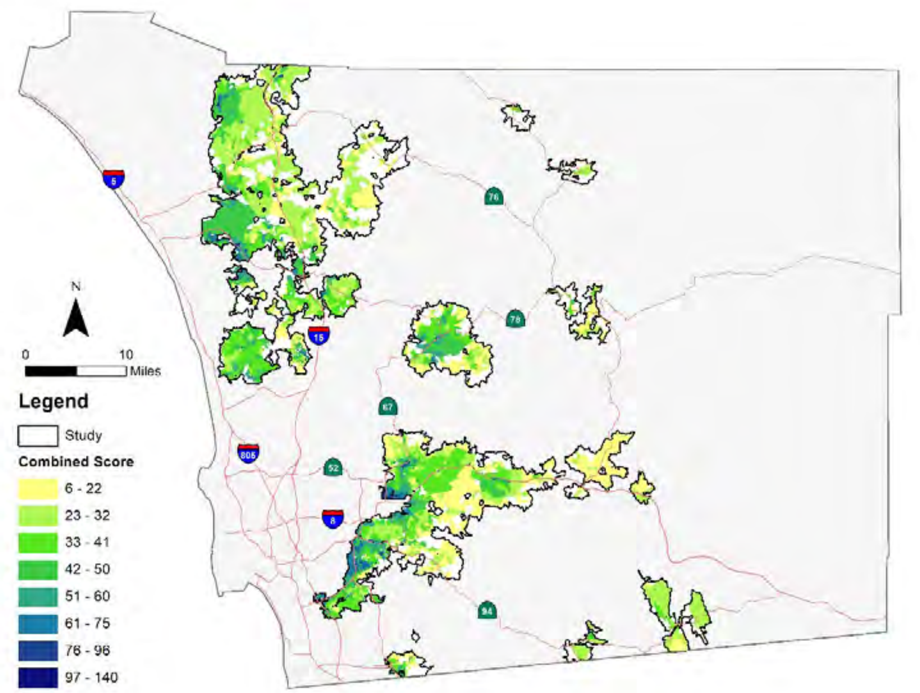


FIGURE 12: TOTAL COMBINED SCORE

To distribute the potential benefits across the study area (and County) the top-scoring catchments within each regional watershed were selected such that the total drainage area of selected catchments was similar to the percentage of each regional watershed within the study area (i.e., regional watersheds that coincided with larger portions of the study area received larger portions of the overall drainage area potentially treated). This catchment prioritization step allowed the plan to focus on strategic opportunities to site green streets treatment systems where they can maximize pollutant load reductions as outlined in the WQIPs. The resulting distribution of drainage areas is summarized in Table 3. Based on the number of community planning areas compared to priority drainage areas (24 to 85, respectively), County staff did not recommend distributing drainage area prioritizations across communities because this would result in a much lower overall water quality and community benefit for the program (i.e., lead to prioritization of drainage areas based purely on location rather than potential benefit).

TABLE 3: DISTRIBUTION OF PRIORITY DRAINAGE AREAS BY WATERSHED

Overlapping Regional Watershed	Selected Priority Drainage Areas (ac)	% of Total Priority Drainage Area
Santa Margarita River	18	5%
San Luis Rey	65	17%
Carlsbad	53	14%
San Dieguito River	27	7%
San Diego River	111	30%
San Diego Bay	80	21%
Tijuana River	24	6%
Total	**378**	**100%**

4

SELECTING GREEN STREETS PROJECT COMPONENTS

4 SELECTING GREEN STREETS PROJECT COMPONENTS

Step 2
Best-Suited Treatment Systems

The GSCW Plan process utilized an array of tools and methodologies to select the most effective treatment system, or Best Management Practice (BMP), for the prioritized drainage areas. This included desktop visual inspections for opportunities and limitations with the County's right-of-way and a geospatial characterization and screening based on known factors using Geographic Information Systems (GIS) software. The initial desktop inspections helped narrow down specific locations where treatment systems could potentially be placed. The geospatial screening evaluated the feasibility of these locations for various treatment system types that would be appropriate for installation.

4.1 INITIAL TREATMENT SYSTEM SITING

Visual screening helped to identify opportunities and constraints not mapped in the GIS analysis, such as utility boxes, fire hydrants, existing trees, bus stops, parking areas, and other obstructions. Visual screening of the priority drainage areas was performed using several tools, including 2019 aerial imagery from SanGIS in ArcGIS, Google Earth, Google Street View, and the SANDAG Online Parcel Viewer. The visual screening was focused on areas within or directly adjacent to the ROW. An example of typical constraints identified through the visual screening process is provided in Figure 13. The visual screening identified a preliminary set of potential treatment system locations in each of the priority drainage areas for further characterization and evaluation.

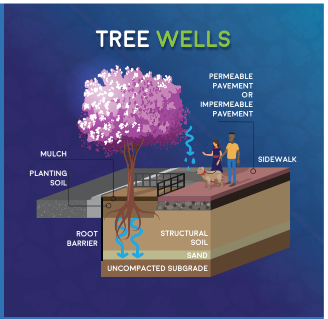
FIGURE 13: VISUAL SCREENING CONSTRAINT IDENTIFICATION

4.2 TREATMENT SYSTEM BMPS

There were seven BMP types considered for the GSCW Plan. Four types are detailed in the County of San Diego's Green Streets Standard Drawings, including tree wells (GS-1), dispersion areas (GS-2), biofilters (GS-3), and permeable pavement (GS-4). Dry wells, hydrodynamic separators, and vegetated swales were also considered to broaden the palette of stormwater treatment options available for priority drainage areas.

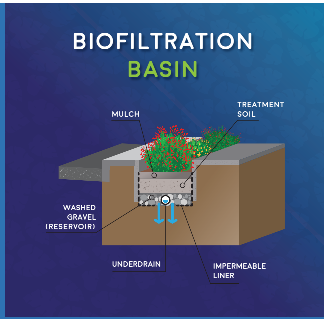
ABOVE GROUND TREATMENT SYSTEMS

TREE WELLS



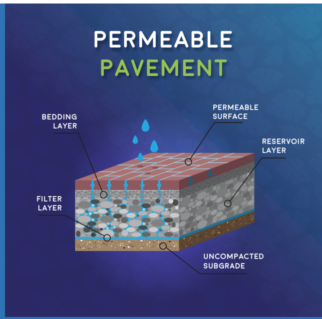
From a water quality improvement perspective, tree wells are treatment systems designed to utilize the roots and soil volume surrounding the roots of a tree to retain and treat stormwater runoff. These are typically located adjacent to roadways in sidewalks or parking lots.

BIOFILTRATION BASIN



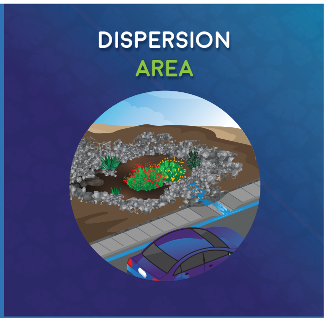
Biofiltration Basin treatment systems, when designed for green streets, are linear, landscaped areas containing soil media intended to filter stormwater runoff and support plant growth while minimizing the leaching of potential pollutants. These basins may or may not be designed to include a perforated underdrain and/or a liner to support infiltration and can be tailored to the specific site.

PERMEABLE PAVEMENT



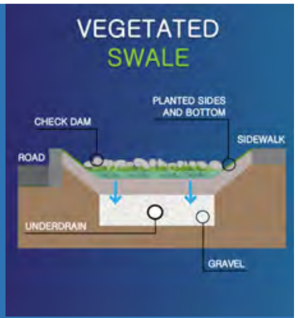
Unlike conventional paved surfaces, permeable pavements contain small voids that allow stormwater runoff to pass through to a layer for storage and treatment. Permeable pavements come in a variety of forms, such as modular concrete pavers, gravel grids, porous concrete, or permeable asphalt.

DISPERSION AREA



Dispersion is the practice of directing stormwater runoff from impervious areas to pervious areas, which slows down the stormwater runoff and promotes infiltration. To improve effectiveness, stormwater runoff should be evenly distributed into a vegetated area with amended soils that improve infiltration and plant health.

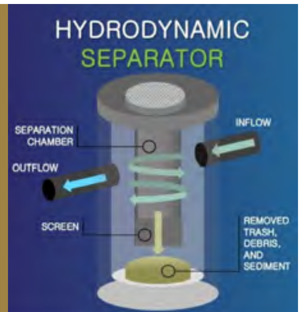
VEGETATED SWALE



A vegetated swale is an open, shallow channel with dense, low-lying vegetation that collects and sends runoff to a downstream discharge location. Swales reduce the velocities of incoming stormwater runoff and provide treatment through filtration and incidental infiltration.

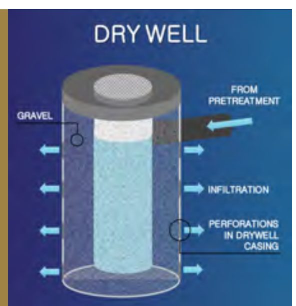
BELOW GROUND TREATMENT SYSTEMS

HYDRODYNAMIC SEPARATOR



Hydrodynamic separators, or HDS units, are units that use gravity to remove gross pollutants (trash, debris, and sediment) using screens, settlement, and/or centrifugal forces. They can be located completely underground, are space-efficient, and easily maintained using a vacuum truck. Engineered media can also be incorporated to remove oils and grease.

DRY WELL



Dry wells collect stormwater runoff and gradually dissipate it into the surrounding soils. These devices have vertically bored holes that promote infiltration and have a small surface footprint. Dry wells are particularly effective at promoting infiltration in areas with low permeability in the surface soils but higher permeability in the subsurface. They can clog easily and therefore require upstream pretreatment.

4.3 RIGHT-OF-WAY CONSTRAINTS & STANDARD DETAILS

The feasibility of proposed treatment system locations was analyzed using available desktop resources within GIS. The first step included a baseline characterization screening for underground utilities and site-specific geotechnical data (e.g., soil types and groundwater basins for infiltration feasibility and potential groundwater recharge). Table 4 presents the background datasets used to screen for constraints, these datasets and sources are detailed in Attachment B.

TABLE 4: BACKGROUND DATASETS

Name	Source
County of San Diego ROW	SanGIS
Storm Drain Infrastructure	County DPW
Sanitary Sewer Infrastructure	County DPW
Hydrologic Soil Group	NRCS
County Maintained Streets	County DPW
Liquefaction Zones	SanGIS
Contaminated Sites	GeoTracker
Groundwater and Monitoring Well Data	GAMA (Groundwater Ambient Monitoring and
Floodplains/Floodways	County DPW
Surface Slopes	Derived from Countywide Elevation Dataset
Collision Prone Areas	County DPW
Priority Land Uses	County DPW

The second step was to screen for constraints based on each treatment system's unique processes and applicable construction requirements. Table 5 summarizes which treatment systems were considered possible based on site and vicinity constraints. Attachment D.2 lists the specific constraints for each type of treatment system considered.

TABLE 5: POSSIBLE TREATMENT SYSTEMS BASED ON ON-SITE AND VICINITY CONSTRAINTS

Site has...	Tree Wells	Biofiltration Basins	Permeable Pavement	Dispersion Areas	Vegetated Swale	Hydro Dynamic Separators	Dry Wells
No constraints	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No storm drain	Yes	Maybe	Yes	Yes	Yes	No	Yes
No water source	Maybe	Maybe	Yes	Maybe	Maybe	Yes	Yes
No free space	Yes	No	Yes	No	No	Yes	Yes
Has poor soils	Yes	Yes	Yes	Yes	Maybe	Yes	No
Safety concerns	Maybe	Maybe	Yes	Yes	Maybe	Yes	Yes

In some cases, priority drainage areas did not have the characteristics that supported feasible treatment system opportunities because either:

1. Visual screening failed to identify available physical footprint within the ROW to support a treatment system, or
2. GIS analysis determined that identified opportunity sites were constrained such that none of the potential treatment system types were likely feasible.

When non-suitable drainage areas were identified, the drainage area with the next highest ranking within the same watershed was evaluated for opportunities and included as a priority drainage area (i.e., non-suitable drainage areas were removed from the priority list). This ensured the plan could maintain a minimum of 85 priority drainage areas with identified treatment system locations even as screening removed certain drainage areas from consideration.

Additional datasets and information were evaluated for each of the priority drainage areas and associated treatment system opportunities. These included the presence of adjacent parking within priority drainage areas, proximity to priority intersections and road segments identified within the Local Road Safety Plan (County of San Diego, 2021b), and Pedestrian Gap Analysis (PGA) (County of San Diego, 2016a) scores and sidewalk condition. Although specific treatment system opportunities were not identified based on this information, it was anticipated these data could indicate opportunities for significant benefits and additional treatment system footprints. Where feasible, geometric changes to existing ROW configurations such as reduced lane or shoulder width, physical separation of sidewalks or bike paths from the traffic lanes, and addition of pedestrian medians, bulb-outs, or roundabouts can create additional physical space for treatment systems. Specific opportunities related to physical changes in the street should be evaluated on a site-specific basis.

4.4 TREATMENT SYSTEM HIERARCHY

In selecting specific treatment systems for each suitable location, a hierarchy was developed to choose between multiple potential systems. This hierarchy is based on the ability of the seven treatment system types to treat stormwater pollutants and reduce volume through infiltration, which is the preferred method to simply and effectively manage runoff. Table 6 shows how each treatment system was categorized in terms of infiltration ability. Some treatment systems can be designed to be more or less infiltrating based on site-specific soil conditions and project requirements, these systems are listed in multiple categories. The design elements that help control infiltration are the inclusion or exclusion of perforated pipe underdrains (see Green Streets Standard Drawings GS-1.05, GS-3.10, and GS-4.03) and impermeable liners.

TABLE 6: POSSIBLE TREATMENT SYSTEMS BASED ON ON-SITE AND VICINITY CONSTRAINTS

Water Quality Treatment Systems
Type 1 (Infiltration) Tree Well without an underdrain Biofilter without underdrain Permeable Pavement without an underdrain
Type 2 (Partial Infiltration) Tree Well with underdrain Biofilter with underdrain Permeable Pavement with underdrain
Type 3 (Low/No Infiltration) Tree Well with underdrain and liner Biofilter with underdrain and liner
Other Hydrodynamic Separator Vegetated Swale

In cases where multiple treatment system types were identified as potentially suitable for a location, the treatment system type expected to produce the greatest number of benefits was prioritized. This hierarchy is based on the following principles and feedback:

1. Full infiltration (Type 1) is prioritized (by the MS4 Permit) when feasible. Pollutant removal is maximized by retention systems. If space is limited, but soil type allows for infiltration, prioritize dry wells.
2. When full infiltration is not feasible, maximizing partial infiltration is preferred (Type 2),
3. When no infiltration is feasible, maximize filtration systems (Type 3),
4. When no space is available and soil type does not allow for infiltration, prioritize HDS units.
5. Additionally, when tree wells and biofilters are compared within each Type, tree wells are preferable based on initial survey results of community members. Tree wells also provide greater environmental and community benefits such as shading, local cooling, and improved air quality.

Dry wells and vegetated swales were considered as treatment systems, but were ultimately not suitable for the project opportunities identified due to infiltration constraints or the presence of shallow groundwater. Tree wells and biofiltration were also preferred over vegetated swales due to the treatment effectiveness.

4.5 PROJECT DEFINITION

Following the initial identification of best-suited treatment systems within the highest-ranked catchments, the treatment systems were grouped into "projects". For this plan, a project was defined as one or more treatment systems within 1,000 feet (along the right of way) of another treatment system, roads and blocks were also used to help group treatment systems into projects. This rationale was used to both increase the cost-effectiveness of a single project, while also minimizing traffic impacts by focusing each project in a limited geographic area. The following section provides the project prioritization approach and results of the top 30 projects.

GREEN STREETS CLEAN WATER

5
PROJECT PRIORITIZATION APPROACH

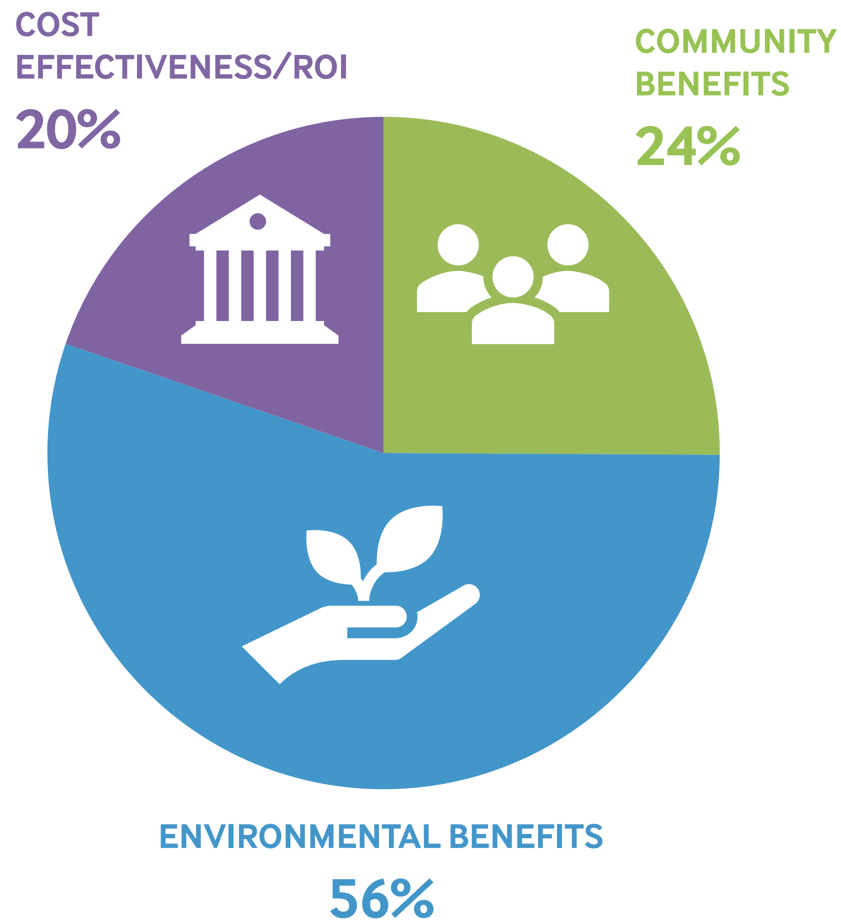
5 PROJECT PRIORITIZATION APPROACH

Step 3
Highest Benefit Projects

The GSCW Plan prioritized the green streets opportunity sites and treatment systems based on their anticipated potential benefits, with the ultimate goal of identifying well-suited designs for the selected sites from the County's Green Streets Standard Drawings.

The project prioritization process assessed the environmental (specifically water quality), community, and cost-effectiveness benefits of each project and applied a scoring framework to identify the most beneficial projects. The GSCW Plan applied the triple bottom line (TBL) concept, which is an assessment method used to prioritize projects, evaluate benefits, and to aid in program and investment decisions (CASQA, 2017). The project ranking framework developed for the GSCW Plan is a numeric quantification method that generally follows the San Diego Stormwater Resource Plan (SWRP) (ESA, 2017) prioritization framework, but is supplemented with Envision™ (ISI, 2018) and Safe Clean Water (SCW) (LACFD, 2019) metrics.

Within the GSCW Plan prioritization, points were assigned to each of the identified projects (refer to Section 4.5) based on whether the individual criteria associated with each metric were satisfied for each of the TBL benefits. Each project was assigned a maximum of 100 points for environmental benefits (56%), a maximum of 43 points for community benefits (24%), and a maximum of 35 points for cost-effectiveness benefits (20%). The total maximum TBL points available for each project was 178. The contribution of each benefit for the GSCW Plan prioritization framework is comparable to the SCW approach. Additionally, the breakdown of points considered here is generally consistent with the drainage area scoring breakdown presented in Section 3.2. The following sections describe each benefit and criteria utilized for prioritization. This framework was applied to all of the identified projects to determine the top 30 projects.



5.1 ENVIRONMENTAL BENEFITS

The GSCW Plan's environmental benefit metric evaluated the project's water quality benefit to reduce pollutant loads. Additionally, other environmental component benefits are evaluated including water supply, flood management (peak flow and runoff reductions), and natural environment benefits to the project.

The water quality and flood management benefits were quantified using a water quality modeling tool adapted from the Orange County Stormwater Tools platform. The land surface characteristics, project locations, and treatment system types were inputs into the water quality modeling tool. The tool then calculated the runoff volume, peak flows, and pollutant concentrations for both wet weather and dry weather conditions draining to each project and determined the long-term volume capture performance and annual load reduction performance provided by each project. The water quality modeling tool quantifies the amount of volume captured and pollutant load reduced based on the dimensions and details from the San Diego County BMP design standards. The inputs required in the model are either calculated based on minimum depths and filtration rates or are site-specific to the project.

Additionally, benefits related to water supply and the natural environment were measured through various metrics and criteria, examples of these criteria include: whether a project infiltrates, has the potential to capture stormwater for direct or indirect uses, increases urban green space, improves water temperatures, or reduces operational energy consumption.

The following environmental benefit criteria were utilized to rank projects:

- **Water Quality Benefit**
    - Projects with the highest pollutant load reductions or treated impervious areas for wet and dry weather.
    - Addresses TMDL and/or Priority Water Quality Conditions in the WQIP informed by the 303(d) listed pollutants. Based on the receiving water TMDLs and pollutant of concerns on the 2014/2016 303(d) List, as found in the 2014/2016 California Integrated Report (US EPA, 2018).
    - Within a priority land use area identified by the California State Water Resource Control Board Trash Implementation Program (Trash Amendments) (California State Water Resources Control Board, 2015).

- **Natural Environment**
  - Projects can be landscaped with native, drought-resistant, pollinator species, or fire-resistant vegetation to reduce pesticide and fertilizer impacts and control invasive species. It is assumed that vegetation species will be selected to match native conditions and have minimal need for fertilizer/pesticide use.
  - Increases urban green space. It is assumed that vegetated treatment systems would provide this benefit.
  - Creates or enhances wetland and/or riparian habitat by treating runoff adjacent to a waterbody.
  - Improves water temperatures by increasing the amount of shaded water through vegetation. It is assumed that vegetated treatment systems would provide this benefit.
  - Reduces Greenhouse Gas (GHG) emissions or increases carbon sinks. It is assumed that vegetated treatment systems would provide this benefit.
  - Reduces operational energy consumption during maintenance. It is assumed that HDS units and dry wells would utilize the most operational energy during maintenance.

- **Flood Management**
  - Projects with the highest peak flow reduction.
  - Projects with the highest total annual runoff reduction.

- **Water Supply**
  - Potential to capture wet and/or dry weather runoff for direct uses:
    - For irrigation on site, at a park, habitat restoration, or natural treatment system; or
    - To wastewater or water treatment facility for potable or recycled use.
  - Potential to capture wet and/or dry weather runoff for direct uses if the project infiltrates to a Sustainable Groundwater Management Act (SGMA) (CA DWR, 2020) priority groundwater aquifer that is a source of local potable water. The SWRP notates that groundwater basin recharge occurs from sources like stormwater runoff infiltration (ESA, 2017).
  - Potential to capture wet and/or dry weather runoff for indirect use (infiltration to groundwater not used as water source).
  - Reduces water usage for irrigation during operation.
  - Project infiltrates and is located within a water supply project area opportunity as identified in the SWRP (ESA, 2017).

Figure 14 visually presents the relative weighting of the metrics and associated points used within the prioritization process for the environmental benefit score. Each of the four benefit categories is colored (darkest to lightest) by the highest to the lowest contribution of points. Within each benefit category, the sub-benefit criteria rectangles are proportional to the size of the point value (noted in parenthesis) they each contribute to the overall benefit. Water quality makes up the majority of the environmental benefit at 55%.

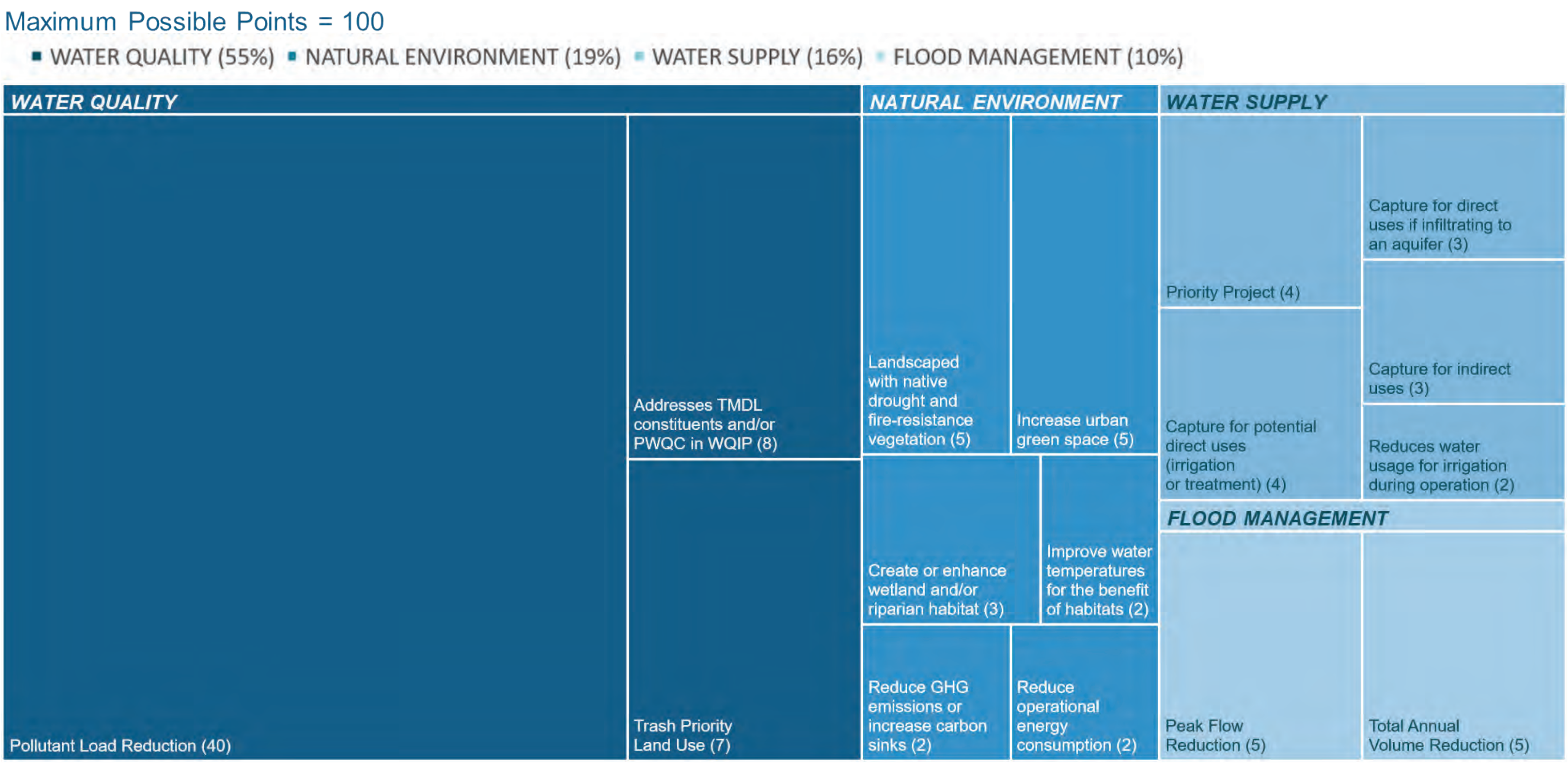


FIGURE 14: ENVIRONMENTAL BENEFIT SCORE DISTRIBUTION

5.2 COMMUNITY BENEFITS

The GSCW Plan community benefit metric measured the social dimensions of the projects and included criteria related to the identification of underserved communities, community involvement, enhancing or creating recreational/public use areas, improving limited pedestrian access, traffic safety improvements, and other potential community benefits, etc. The following potential community benefit criteria were utilized for project ranking:

- **Located in an Underserved Community: Census Tracts which are identified as "Underserved Communities" per criteria provided by LUEG:**
  - Healthy Places Index (HPI) in the 3rd and 4th quartiles
  - CalEnviroScreen (CES) 2.0 percentile scores above 25%
  - San Diego LiveWell Healthiest Cities and Counties Challenge (HC3) communities
  - 17 Census Tracts identified as Environmental Justice Communities (within the communities of north El Cajon, north Lemon Grove, Spring Valley, and Sweetwater)
- **Potential for Community Involvement:** Potential to include community involvement through project design and/or landscaping reflects desired preferences from local non-governmental organizations (NGOs) or community-based organizations. Assumes surface treatment systems will involve the community due to the visible components (landscaping, vegetation, feature design) associated with surface systems.
- **Pedestrian Improvements:** Road segments with the highest points are the highest priority for maintenance and pedestrian access improvement, based upon the ranking factors within the Pedestrian Gap Analysis Report (County of San Diego, 2016a).
- **Aesthetic Improvements:** Enhance and/or create recreational and public use areas through aesthetic improvements or additions. Assumes vegetated or trash treatment systems will enhance areas.
- **Opportunity for Public Education:** Assumes surface treatment systems will provide public education opportunities.
- **Community Mobility and Access Improvements:** Treatment Systems could be applied in or adjacent to transit and would be designed for improved mobility and access.
- **Addition of Green Space:** Vegetated treatment systems not within ¼ mile of parks.
- **Integration with Traffic Safety Improvements:** Projects or treatment systems located on roads and intersections in need of safety improvements as identified in the Local Road Safety Plan (County of San Diego, 2021b).

Figure 15 visually presents the relative weighting of the metrics and associated points used within the prioritization process for the community benefit. Each of the criteria is colored (darkest to lightest) by the highest to the lowest contribution of points and is proportional to the size of the point value (given in parenthesis) they each contribute to the overall benefit. Project location within an Underserved Community makes up 40% of the community benefit.

Maximum Possible Points = 43

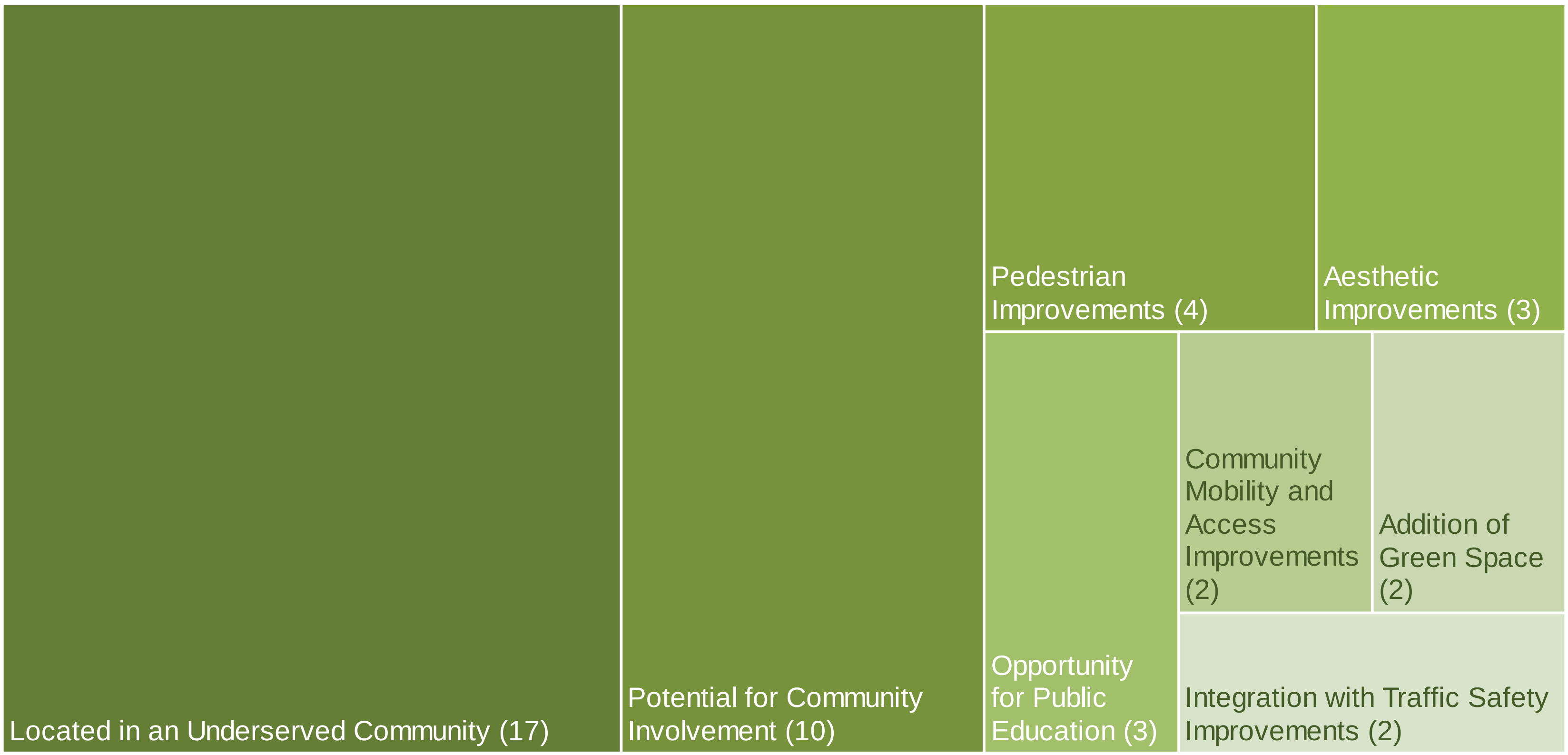


FIGURE 15: COMMUNITY BENEFIT SCORE DISTRIBUTION

5.3 COST-EFFECTIVENESS AND ROI

Project costs were evaluated to estimate the costs and compare the return on investment of different projects. This information was used in the prioritization process using a single cost-effectiveness metric based on the 30-year lifecycle cost per acre of impervious area treated. 30-year lifecycle costs were developed based on a fixed-term present value cost analysis (Net Present Value) that included the following cost components:

- **Capital Cost** – The initial upfront cost for materials and construction, typically developed from unit prices,
- **Construction Contingency** – Cost for other items and construction changes not included in other assumptions, typically a percentage of the capital cost,
- **Project Delivery Costs** – Costs for design, survey, permitting, and utility coordination,
- **Maintenance Cost** – The yearly (or annualized) cost to perform routine maintenance activities, typically a percent of the capital construction cost, or a fixed value based on a unit cost buildup,

The lifecycle cost analysis is also dependent upon the following key parameters:

- **Useful Life** – The design life of an asset after which replacement is needed,
- **End of Life Replacement Cost** – The cost to replace an asset at the end of its useful life (e.g., 90% initial construction cost), and
- **Interest Rate** – The value of money over time (i.e., 2.5%), same for all projects.

Using the opportunity-specific information identified in Section 4, capital costs were quantified using the Unit and Maintenance Cost Tool (County of San Diego, 2021c) and the Unit Price List (County of San Diego, 2021d). Capital costs were focused solely on the water quality elements and directly associated improvements (such as adjacent sidewalk replacement, roadway striping, storm drain extension, and storm drain connection). The costs do not include additional features beyond what is required for the installation of treatment system components, consequently, the costs estimated here represent a low baseline cost. It should also be expected that certain project alternatives evaluated during the project design phase may have significantly higher costs due to the addition of other improvements including drainage system upgrades, traffic calming and other safety measures, etc.

Maintenance costs for the suite of treatment systems considered in these projects can be expected to vary significantly based on several project factors. The County has developed several maintenance cost items and estimates which are documented in the Unit and Maintenance Cost Tool; however, due to the preliminary nature of projects identified in this Plan and the expectation that significant changes may be made during design, for this planning-level analysis, typical maintenance costs as a percent of the treatment system capital cost were assumed based on published values. Similarly, the useful life and cost of replacement at the end of the design life were referenced from the available literature. Utilizing the 30-year lifecycle costs, the cost per acre of impervious area treated for each project is ranked to provide a cost/benefit project ranking. Parameters and sources used in this analysis are summarized in Table 7:

TABLE 7: PARAMETERS AND SOURCES USED IN THE COST-EFFECTIVENESS ANALYSIS

Treatment System Type	Annualized Maintenance Cost (% of Cost)[1]	Useful Life	Runoff Volume Reduction (cu-ft) (% of Cost)[1]
Tree Wells and Biofiltration	3% [2]	25 Years [2]	90% [3]
Hydrodynamic Separators	8% [4]	30 Years [5]	90% [6]

1. *Maintenance and Replacement costs are calculated as a % of the capital cost of just the treatment system elements (e.g., no soft costs, contingency, etc.).*
2. *USEPA, 2005. County Cost Tool Varies by treatment system footprint with a typical value of about 4%.*
3. *Geosyntec, 2011 for USEPA.*
4. *Brown and Caldwell Business Case Evaluation, 2015.*
5. *Proprietary vendor information*
6. *Assumed herein as cost of new minus 10% to account for excavation/other savings.*

5.4 PRIORITIZATION RESULTS

This section presents a scored menu of candidate projects and summarizes key attributes of the projects derived from the previous sections. The prioritization framework was applied to the projects and the TBL benefit scores for environmental, community, and cost-effectiveness were summed and calculated for each project. The projects were ranked based on the combined TBL scores to identify the top 30 projects. This menu of projects is presented in prioritized order (highest scoring projects first); however, it is important to note that in some cases, specific project attributes (e.g., County and community planning area preferences, constraints, opportunities, available funds, etc.) may advance one project faster than another, despite a lower overall ranking. For this reason, the projects presented in this section are considered a "menu of projects" rather than a sequential list with an implied order of implementation.

The Top 30 projects are summarized in Table 8. Additional project information, scoring inputs, and prioritization results are provided in Attachment D.3 with detailed project summary maps provided in Attachment E.

TABLE 8: SUMMARY OF TOP 30 PROJECTS

Rank	Project Name	Score	Total Acres Treated (ac)	Impervious Acres Treated (ac)	Treatment System Type	Total Annual FC Reduction (MPNx10^12)	30-Year Lifecycle Cost
1	Sweetwater Rd	161	48.34	34.66	Tree Well (Type 3)	3.51	$4,059,000
2	Magnolia Ave	152	20.12	16.51	Tree Well (Type 3), HDS	1.78	$2,548,000
3	Campo Rd	149	11.95	9.95	Tree Well (Type 3), HDS	2.21	$1,470,000
4	S Mission Rd (North)	148	21.71	11.92	Tree Well (Type 3), HDS	1.34	$2,414,000
4	Ammunition Rd	148	3.50	2.35	Tree Well (Type 1), HDS	0.03	$513,000
6	Day St	146	6.25	4.04	Tree Well (Type 3), HDS	1.14	$853,000
6	Wintercrest Dr	146	3.74	2.95	Tree Well (Type 3)	0.97	$814,000
8	Osborne St	143	30.42	13.21	Tree Well (Type 3)	3.69	$1,360,000
9	S Mission Rd (W Aviation Rd)	140	5.41	3.32	Tree Well (Type 3)	1.37	$1,031,000
10	Denny Way	137	3.48	3.11	Tree Well (Type 3)	0.86	$1,255,000
11	S Main Ave	136	2.23	1.52	Tree Well (Type 1), HDS	0.14	$295,000
12	Vine St (El Cajon North)	135	4.72	3.75	Tree Well (Type 2)	0.31	$310,000
12	Channel Rd	135	2.52	1.79	Tree Well (Type 2)	0.49	$637,000
14	Vine St (El Cajon South)	126	3.23	2.63	Tree Well (Type 3), HDS	0.34	$266,000
15	S Santa Fe Ave	119	48.47	36.74	HDS	0.00	$87,000
16	Montecito Rd	118	7.08	4.21	HDS	0.00	$87,000
17	W Bradley Ave	117	5.85	5.33	HDS	0.00	$87,000
17	Vernon Way	117	8.71	7.18	HDS	0.00	$87,000
19	S Mission Rd (South)	115	2.22	1.22	Tree Well (Type 3)	0.26	$149,000
20	Troy St	113	0.89	0.55	Tree Well (Type 3)	0.14	$847,000
21	Airway Rd	111	23.56	11.38	Tree Well (Type 3)	1.20	$348,000
22	W Fallbrook St	110	0.72	0.56	Tree Well (Type 3)	0.11	$172,000
23	N Vine St (Fallbrook)	109	1.76	1.18	Tree Well (Type 3), HDS	0.24	$321,000
24	16th St	107	3.08	1.95	HDS	0.00	$119,000
25	Prospect St	104	4.41	3.34	HDS	0.00	$87,000
26	W College St	100	2.59	1.75	Tree Well (Type 3)	0.55	$1,101,000
26	Julian Ave	100	0.44	0.36	Tree Well (Type 3)	0.04	$78,000
28	Birch St	99	1.90	1.50	HDS	0.00	$87,000
29	Bancroft Dr	98	2.27	1.61	HDS	0.00	$199,000
30	8th St	94	1.71	2.47	HDS	0.00	$143,000
	TOTAL		283	193		20.7	$21,824,000

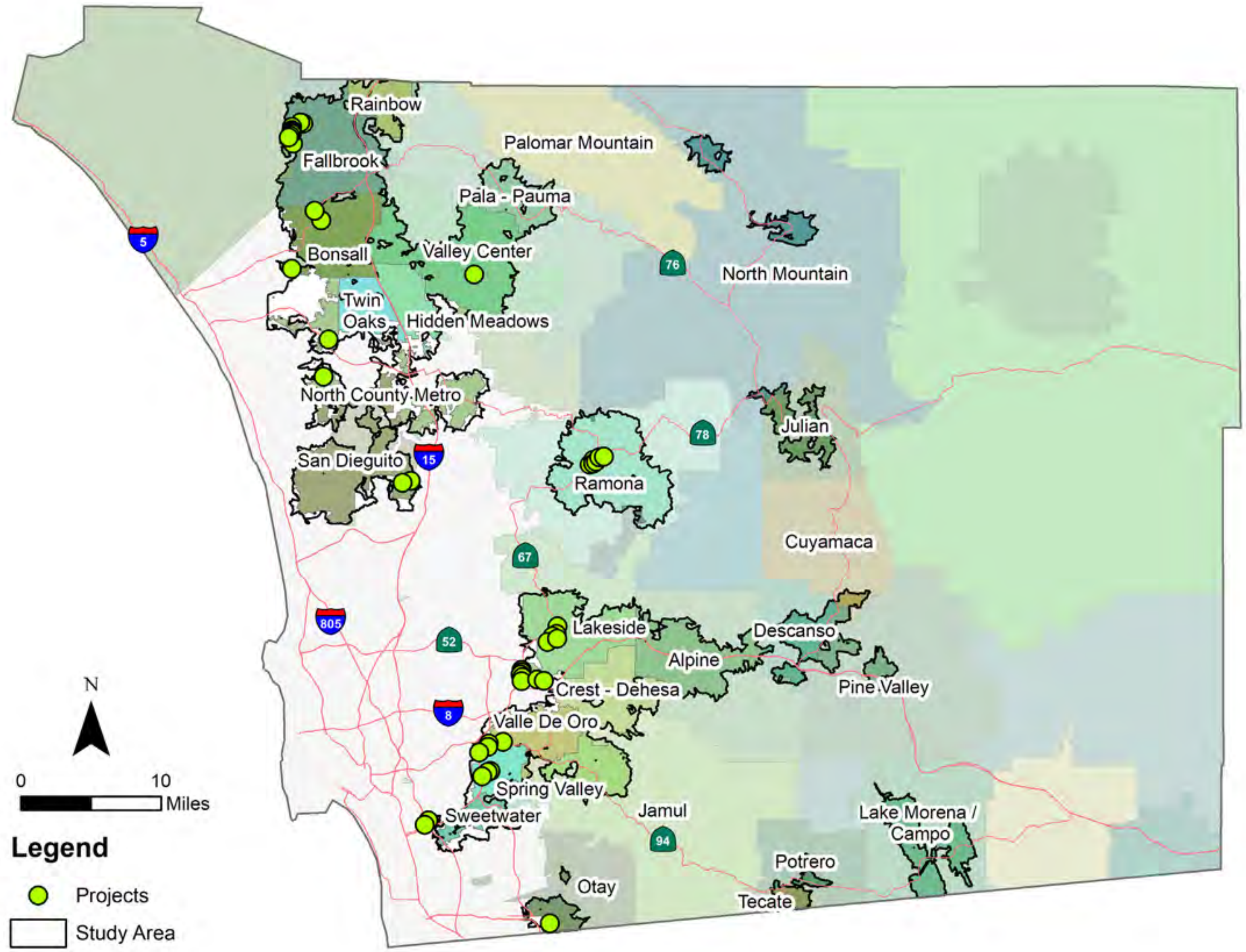


FIGURE 16: TOP 30 PROJECT LOCATIONS

The pollutant load reduction, runoff reduction, and average peak flow results for the top 30 projects are presented in Table 9. Detailed quantitative modeling results are shown in Attachment D.4. Volume-based results include the total, wet, and dry (summer and winter) weather volume treated, retained, captured, and bypassed. Pollutant loading results include total, wet, and dry (summer and winter) weather annual load reductions, including trash. Additionally, the 30-year lifecycle cost for the combined top 30 projects are shown in Table 10.

TABLE 9: ANNUAL BENEFITS FROM THE TOP 30 PROJECTS

	Fecal Coliform Reduction ($MPN x 10^{12}$)	Sediment Reduction (lbs)	Runoff Volume Reduction (cu-ft)	Average Long-Term Peak Flow Reduction
Wet Weather	20.7	42,700	87,900	0.77
Dry Weather	–	–	13,800	--
Total	20.7	42,700	101,700	0.77

TABLE 10: GSCW PLAN 30-YEAR LIFECYCLE COST, TOP 30 PROJECTS

Component	Total
Construction Cost	$7.0M
Soft Cost	$7.0M
Contingency	$1.4M
Net Present Value of Maintenance and Replacement	$6.4M
Total Net Present Value (over 30 years)	$21.8M

To illustrate the components and potential benefit of green streets projects included here, an example project titled the South Mission Road Green Streets Biofiltration Project is presented on the next page. This project has been identified through the GSCW planning process described in this plan.

GREEN STREETS CLEAN WATER

PLAN

5

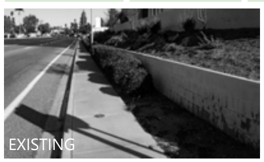
SOUTH MISSION ROAD

Green Streets Biofiltration Project

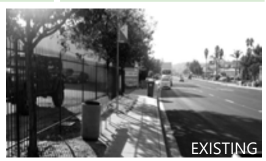
The South Mission Road Project will use green streets elements to capture and treat dry and wet weather runoff from 12 impervious acres of commercial, transportation, and other land uses along South Mission Road in Fallbrook. Green streets features are proposed to include vegetated tree well biofilters (above ground) and hydrodynamic separators (below ground). The project will support the County's progress toward meeting the Twenty Beaches and Creeks Bacteria Total Maximum Daily Load (TMDL) targets, while also treating runoff for sediment, nutrients, metals, and trash, thus protecting downstream waterbodies.

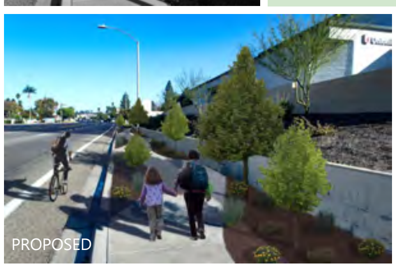
Other complete streets elements being considered include protected walkways, improved sidewalks, and at least one enhanced transit stop. Shaded pedestrian areas will support increased access to recreation and improved public health, enhancing the overall walkability of the corridor. The project will also provide local jobs, both directly via construction and maintenance of the green streets features, as well as indirectly at local businesses with increased foot traffic.

COMMUNITY	WATERSHED	PROJECT EXTENT	AREA TREATED	PRIORITY POLLUTANTS
Fallbrook	San Luis Rey	0.8 miles; 10,000 sq-ft	Total: 21.7 acres Impervious: 12 acres	Bacteria, nutrients, and sediment

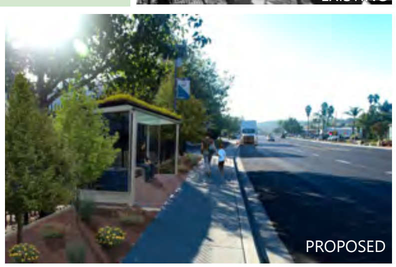


PROJECT COMPONENTS
Tree wells biofilters with underdrains, hydrodynamic separators, and segments of protected walkways.





South Mission Road at Rocky Crest Rd.



South Mission Road at Almond St.

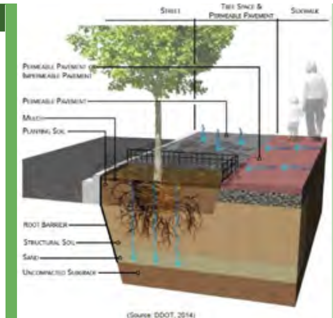
County of San Diego
Green Streets Clean Water Program (greenstreetscleanwater.org)

ENVIRONMENTAL BENEFITS

- Estimated to remove 1,698 lbs. of sediment annually
- Estimated to remove 1.34 x 10^{12} MPN of Fecal Coliform annually, supporting progress toward the Bacteria TMDL target
- Reduces flooding potential by capturing initial runoff
- Supports climate resilience through:
  - Carbon sequestration
  - Addressing vegetative cover in the community

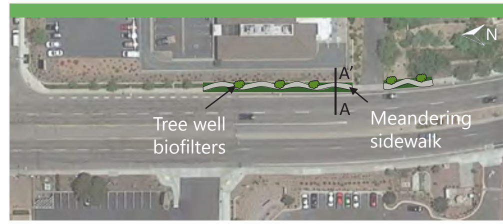
COMMUNITY BENEFITS

- Project benefits an Underserved Community
- Healthy Places Index = 37.7%
- CalEnviroscreen 4.0 = 48th percentile
- AB1550 Community
- Improves local walkability and pedestrian safety
- Improves community mobility and access to transit

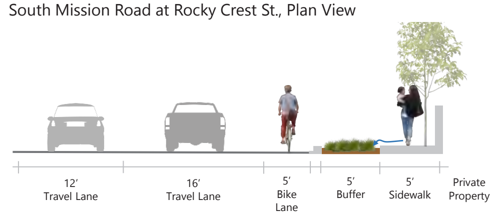


ECONOMIC BENEFITS

- Anticipated cost of water quality green streets elements:
  - Capital cost: $1.6M
  - Operations and maintenance cost:
    - Annual: $52,600; Total 30-year (Net Present Value): $864,000
  - 30-year lifecycle cost: $2.4M
- Provides local jobs during construction and maintenance
- Enhances aesthetics, encouraging increased local foot traffic



South Mission Road at Rocky Crest St., Plan View



South Mission Road at Rocky Crest St., Profile View (A-A')

South Mission Road Project Extent

County of San Diego
Green Streets Clean Water Program (greenstreetscleanwater.org)

GREEN STREETS CLEAN WATER

GREEN STREETS CLEAN WATER

6 SUMMARY OF PROJECTS AND FUTURE VISION

6 SUMMARY OF PROJECTS AND FUTURE VISION

This Plan lays out a process that can be used to identify candidate locations for multi-benefit green streets projects that optimize water quality benefits while also prioritizing community benefits and cost-effectiveness.

The process presented in this Plan is one way to identify projects, and there may be more green streets projects worth implementing than the ones identified through the Plan. The GSCW Plan is not intended to develop a prescriptive list of candidate projects but to develop a menu of options that can be considered for further evaluation. Additionally, the quantification and ranking methods presented in this plan can be used to evaluate the relative benefits of other green streets projects and compare the relative benefits of green streets with other retrofit projects and programs.

As discussed previously, green streets projects can be implemented through a number of programs and processes, including as elements of larger CIP projects. While some of the potential projects identified here can be considered as standalone projects, others can and should be considered as starting points or supplemental aspects of larger projects. It is expected that through the next phases of the planning and design process, project aspects can and will change based on more detailed information that will be reviewed, collected, and evaluated as part of that process.

6.1 PROJECT BENEFIT SUMMARY

The full menu of projects identified here has the potential to provide significant benefits at both the community and regional watershed scale. The potential aggregated benefits of these projects are summarized below. As noted previously, actual benefits will vary based on individual project designs. It can be expected that benefits would decrease as project footprints are reduced due to presently unforeseen conflicts (e.g., due to underground utilities) and increase as project footprints are augmented due to additional site-specific opportunities (e.g., expansion of treatment system footprints into available parking, changes to roadway width). In fact, it is expected that significant additional benefits can be provided by incorporating these elements into larger transportation network retrofits focused on traffic safety improvements and increased mobility (refer to Section 6.2 for additional discussion).

ENVIRONMENTAL BENEFITS

TREATED AREA 193 IMPERVIOUS ACRES 283 TOTAL ACRES
TOTAL POLLUTANT LOAD REDUCTION 20.7×10^{12} MPN FECAL COLIFORM 42,700 LBS. SEDIMENT 796 GALLONS TRASH
TOTAL ANNUAL RUNOFF REDUCTION 101,700 CUBIC FEET OR 760,700 GALLONS
AVERAGE PEAK FLOW REDUCTION 0.8%
GREEN STREETS TREATMENT SYSTEMS 80 BIOFILTRATION TREE WELLS 26 HYDRODYNAMIC SEPARATORS

COMMUNITY BENEFITS

GREEN SPACE **82,300 SQUARE FEET**
TREES 1,000+
PROJECTS IN UNDERSERVED COMMUNITIES 30
SIDEWALK IMPROVEMENTS 3 MILES
OPPORTUNITIES FOR LOCAL ROAD SAFETY IMPROVEMENTS 15

6.2 PLAN LIMITATIONS, FUNDING STRATEGIES, AND POLICY OPTIONS

Green streets treatment systems are one tool in the toolbox to enhance water quality and address regulatory compliance goals while simultaneously providing desirable community benefits such as public health, green jobs, climate resilience, and improved quality of life. As such, green streets are intentionally designed to capitalize on available space within the public right-of-way, complementing other projects and programs with similar goals but different implementation approaches, such as regional treatment systems, retrofits on private property (e.g., County Waterscape Rebate Program), public education, compliance inspections, and other programs.

PLAN

6

The GSCW Plan presents a menu of projects identified to provide significant environmental and community benefits in a cost-effective way compared to other opportunities. These projects and treatment systems were identified based on known opportunities and constraints and were influenced by key decisions made by County staff and members of the multi-departmental Internal Advisory Committee who directed this project. In some cases, the inclusion of specific project attributes (e.g., environmental justice-related benefits) may qualify one project for funding over another, despite a lower overall ranking in this plan. For this reason, the set of projects presented in Section 6.1 is considered a "menu of projects" rather than a sequential list, with an implied order of implementation. In most cases, it was not feasible to maximize all potential benefits simultaneously on the projects identified. For example, shaded and protected sidewalks may be a high priority for communities; however, to maintain proper lines of sight and clear recovery zones for traffic safety, shade trees may not be feasible directly adjacent to travel lanes. To address these competing priorities, a project may include meandering walkways abutted by alternating biofiltration units, including trees that are limited to the sides opposite the roadway. While meeting multiple project objectives often requires a compromise, such a solution still provides some segments of separated walkways (versus a sidewalk still fully abutting the road), allows for trees in the biofilter segments opposite the roadway (versus no trees), and retains the biofiltration function.

The integration of green streets components into new and retrofit projects is also encouraged for private landowners as part of the development process, as described in the County of San Diego Green Streets Guidelines (County of San Diego, 2019a). In some cases, it may be prudent to further partner with specific private landowners to integrate shared goals and adjacent spaces into a mutually beneficial design (e.g., treatment systems on private frontages). Other design considerations may also make the implementation of green streets more accessible and commonplace, such as the development of standard details for traffic calming measures and mobility enhancements that incorporate water quality components.

Projects included in the GSCW Plan may be moved forward as funding becomes available. Beyond typical funding streams for the stormwater program such as the General Fund, alternate funding options will also be considered, including local, state, and federal grants and programs. For example, the American Rescue Plan Act and the Infrastructure Investment and Jobs Act, both approved in 2021, have the potential to provide significant funding for green infrastructure. Partnerships with local agencies, non-profit organizations, and private landowners can also be considered with appropriate agreements in place to govern long-term ownership and operations and maintenance responsibilities.

The potential policies and considerations presented below are based on examples from other regions, and may be further explored to encourage and enhance the use of green streets in unincorporated communities:

1. **Maximizing green street opportunities for additional implementation:**
    a. Consider incorporating green streets elements into all County right-of-way projects where feasible, whether they are priority development projects or not, evaluate green street opportunities and constraints as early as possible in the project planning process.
    b. Review the existing "Pavement Cut Policy" (County of San Diego, 2016b) and evaluate the addition of exceptions for green streets projects located within the right-of-way, but out of the travel lanes to reduce potential delays in project implementation.
    c. Oversize green streets, where possible, when used for compliance on County-sponsored CIP projects to support a future water quality credit trading program and to provide potential revenue generation for additional projects.
    d. Expand green streets guidance and resources to facilitate the implementation of complementing green streets elements including traffic calming measures, protected bike lanes, transit stops, and striping elements. This will allow a more network-focused approach as outlined in the Small Town and Rural Multimodal Networks report (FHWA, 2016).

2. **Improve benefit quantification and refinement of cost assumptions to support County of San Diego priorities:**
    a. Quantify the potential benefits (both water quality, to assess progress toward TMDL targets, and community benefits) of green street elements in all ROW projects.
    b. Track design, permitting, construction, and operations and maintenance costs of green streets projects to support development and refinement of County-specific project costs. This will help inform cost-effectiveness and return-on-investment analyses and allow the County to better project the cost of future pollutant load reductions (i.e., WQIP and TMDL compliance).

3. **Explore opportunities for treatment outside of the ROW:**
    a. Investigate opportunities to treat ROW runoff on adjacent private properties while implementing the appropriate agreements with the adjacent property owners.

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