

Santa Clara Basin Stormwater Resource Plan Stakeholder Meeting #2

April 23, 2018

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SCVURPPP



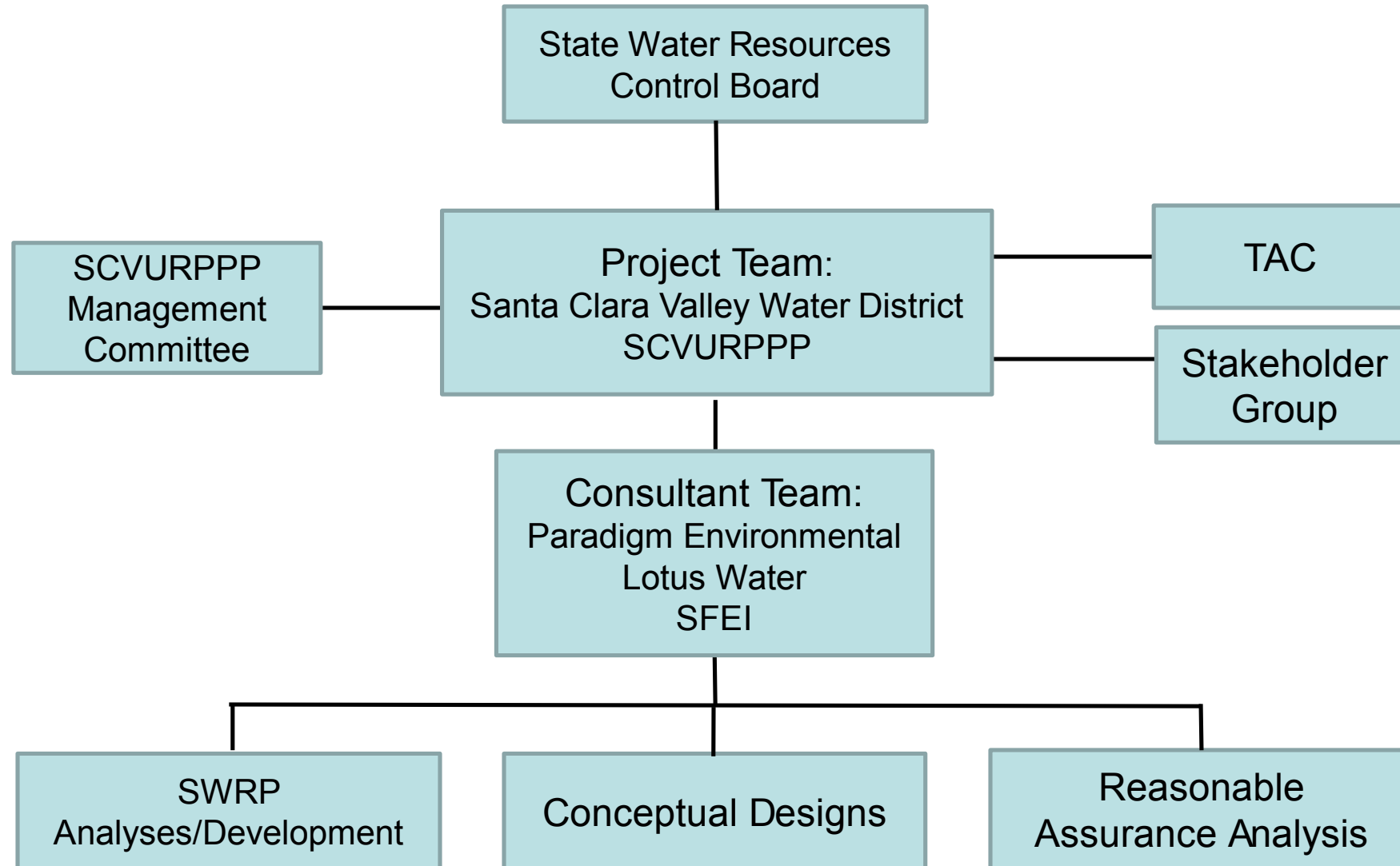
Presentation Overview

- Stormwater Resource Plan (SWRP) Purpose and Project Partners
- SWRP Task Activity and Deliverables to Date
- Development of List of Prioritized Potential Projects
- Projects Selected for Quantification of Benefits and Possible Conceptual Design
- Next Steps

SWRP Purpose

- Identify potential stormwater capture/treatment projects throughout the Santa Clara Basin
- Produce list of prioritized multi-benefit projects eligible for future State implementation grant funds
- Support development and implementation of Green Stormwater Infrastructure (GSI or GI) Plans within the Basin
- Coordinate with District's One Water Plan and local municipal plans

Santa Clara Basin SWRP Partners and Roles



SWRP Approach

- Data Collection and Watershed Identification
- Project Identification and Prioritization
 - Define methodology for project identification and metrics for assessment of benefits
 - Water quality improvement, water supply, flood management, environmental and community benefits
 - Use GIS tools and hydrologic models to identify project opportunities and quantify benefits
 - Develop list of prioritized projects
 - Prepare conceptual designs for 5-10 projects
- Plan Development
 - Prepare draft and final Plan and implementation strategy

SWRP Task Activity (10/17- 4/18)

- Task 4.4 – Metrics, Methodologies, Models and Tools
 - Addressed TAC and SCVURPPP agency comments and finalized memo
- Task 4.5.1 - Analysis, Prioritization Process, and Project Selection
 - Assembled GIS datasets for identifying project opportunities
 - Obtained potential projects from SCVURPPP agencies and stakeholders
 - Conducted GIS screening and prioritization analysis (metrics scoring)
 - Provided results to SCVURPPP agencies and incorporated comments
 - Obtained top priority projects from SCVURPPP agencies for quantification of benefits and possible conceptual design
- Task 4.7 – SWRP Development
 - Began preparing chapters of the SWRP

Update on SWRP Deliverables

Task	SWRP Deliverable	Submittal Date
3.1	Data Collection and Previous and Current Planning Efforts	October 2017
3.2	Watershed Identification (Planning Area Boundaries)	October 2017
4.3	Description of Approach Addressing Water Quality	October 2017
4.4	Metric and Methodologies for Identifying and Prioritizing GI Projects, and Evaluation and Selection of Appropriate Models and Tools for the SWRP	December 2017
5.2.2	Green Infrastructure Plan Template	December 2017
5.3	Green Stormwater Infrastructure Handbook – Part 1 (Final Draft) and Part 2 (Draft)	February 2018
A-5(c)	Annual Progress Summary	November 2017

Upcoming SWRP Deliverables

Task	SWRP Deliverable	Due Date
6.1.2	Stakeholder Meeting #2	April 23, 2018
4.6.3	SWRP Implementation Strategy Memo	May 2018
4.7	Administrative Draft SWRP	June 1, 2018
5.4	Project Conceptual Designs	May/June 2018
4.8	Public Draft SWRP	July 2018
6.3	SWRP Webpage	July 2018

Projects Submitted by Stakeholders

- Stakeholders submitted 12 projects
- Prioritization metrics applied to all projects
- All projects are included in the SWRP prioritized projects list
- Open Space Authority
 - Fisher Creek Floodplain Expansion
 - Fisher Creek Realignment & Restoration
 - Laguna Seca Wetland Restoration
 - Coyote Valley foothills Stormwater Capture Basins

Projects Submitted by Stakeholders

- Master Gardeners of Santa Clara County
 - Demonstration Project at Martial Cottle Park
- Valley Transportation Authority
 - Stevens Creek Trail Improvements
 - Guadalupe River Trail Improvements
 - Coyote Creek Trail Improvements
 - Los Gatos Creek Trail Improvements
 - Bay Trail Improvements
 - Sunnyvale East Channel Improvements
 - King Road Corridor Pedestrian Safety and BRT Enhancements

Development of List of Prioritized Potential Projects for Inclusion in the SWRP

Project Types

Regional Projects



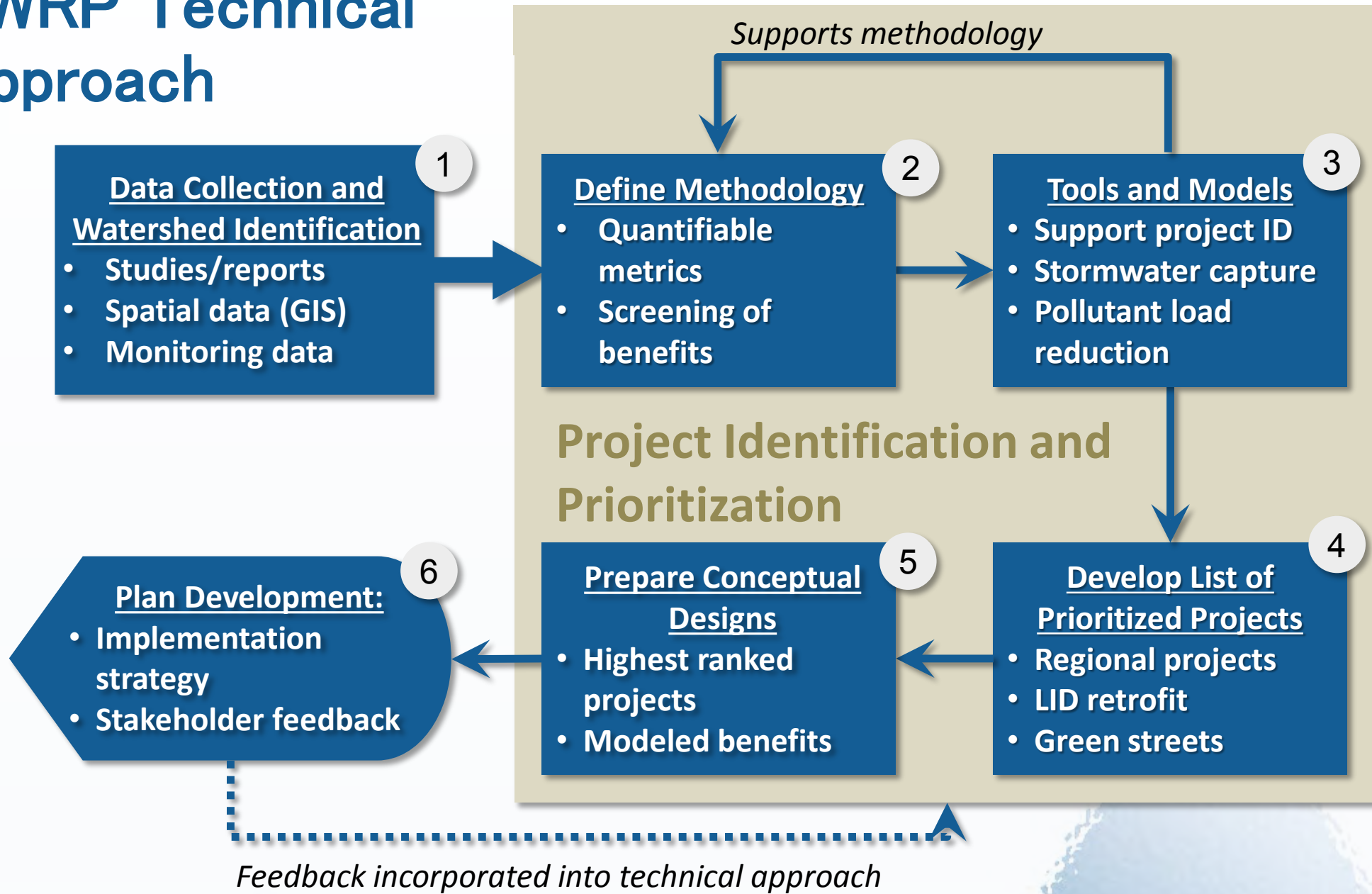
Green Streets



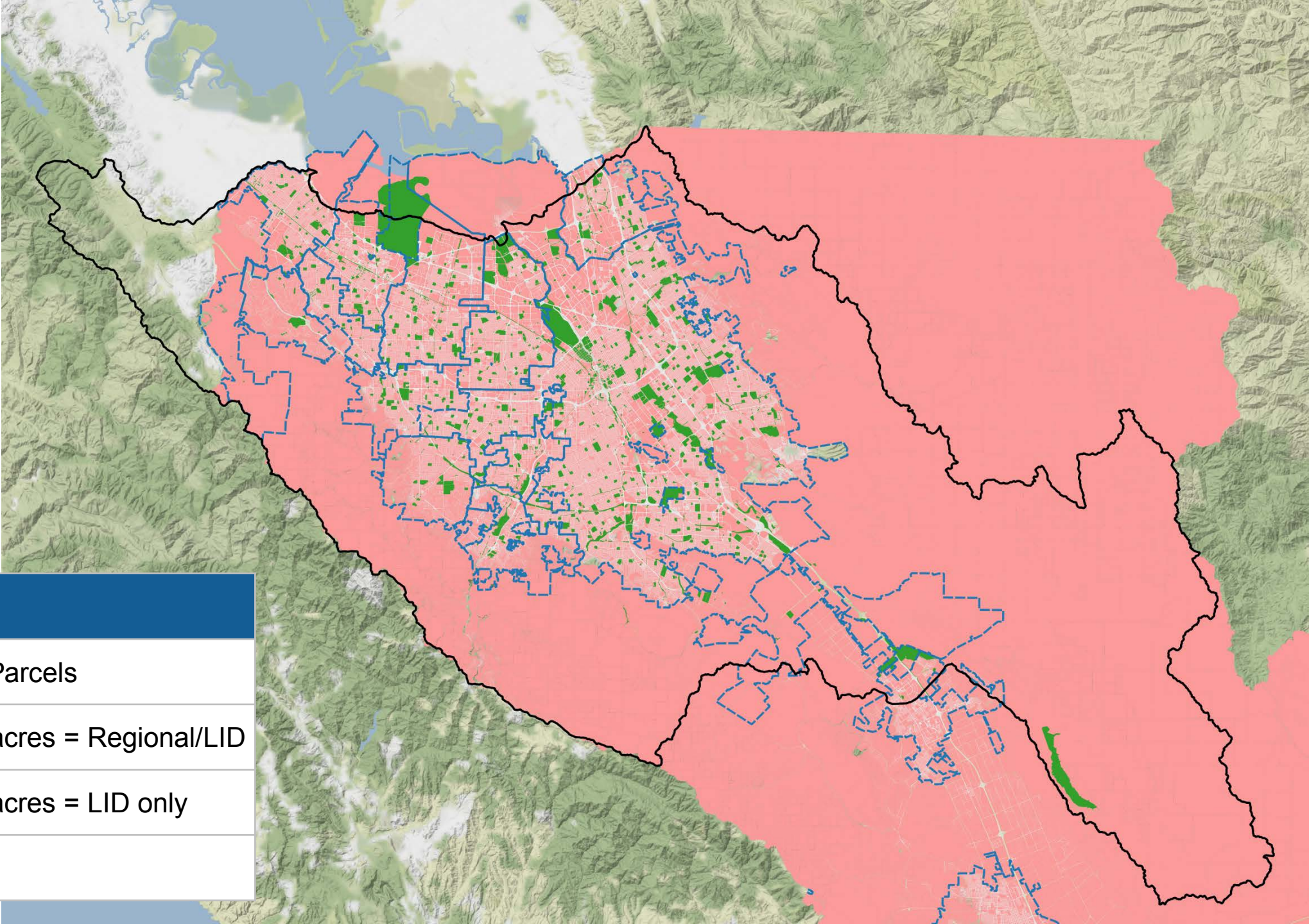
Low Impact Development



SWRP Technical Approach

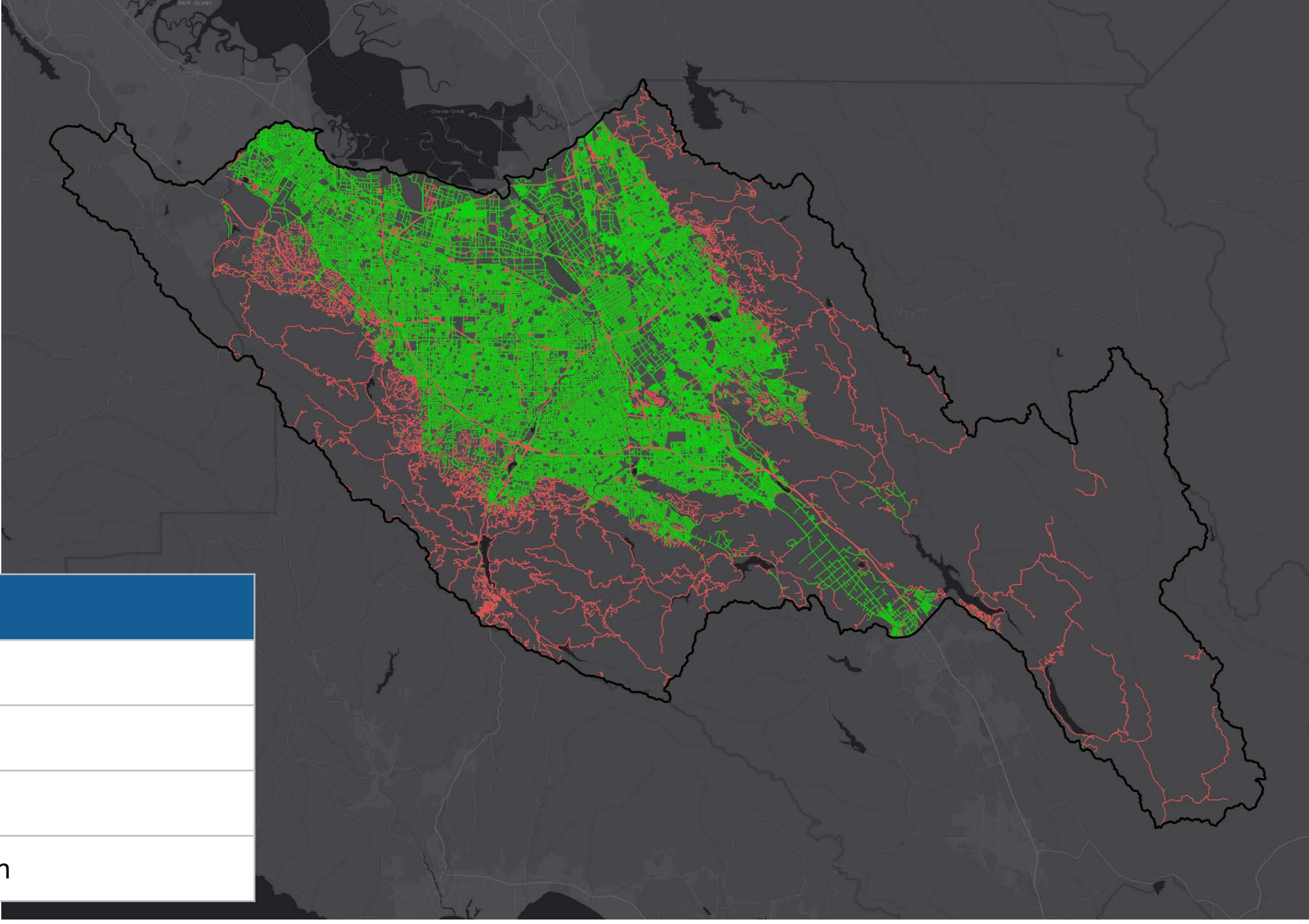


Parcel Screening



Screening Factor	Criteria
Ownership	Public Parcels
Parcel Size	> 0.25 acres = Regional/LID
	< 0.25 acres = LID only
Site Slope	< 10 %

Street Screening



Screening Factor	Criteria
Ownership	Public
Surface	Paved
Slope	< 5%
Speed	≤ 45mph

Prioritization Metrics for Regional Projects

Metric	Points						Weight Factor
	0	1	2	3	4	5	
Parcel Land Use			Schools/Golf Courses	Public Buildings	Parking Lot	Park / Open Space	--
Impervious Area (%)	X < 40	40 ≤ X < 50	50 ≤ X < 60	60 ≤ X < 70	70 ≤ X < 80	80 ≤ X < 100	2
Parcel Size (acres)	0.25 ≤ X < 0.5	0.5 ≤ X < 1	1 ≤ X < 2	2 ≤ X < 3	3 ≤ X < 4	4 ≤ X	--
Hydrologic Soil Group		C/D		B		A	--
Slope (%)		10 > X > 5	5 ≥ X > 3	3 ≥ X > 2	2 ≥ X > 1	1 ≥ X	--
Proximity to Storm Drain (feet)	X > 1,000	1,000 ≥ X > 500		500 ≥ X > 200		200 ≥ X	--
Within flood-prone storm drain catchments	No			Moderate		Yes	--
Contains PCB Interest Areas	None					High	2
Within Priority Development Area	No					Yes	--
Co-located with another agency project	No					Yes	--
Augments water supply	No					Opportunity for capture and reuse	Above groundwater recharge area and not above groundwater contamination area
Water quality source control	No	Yes					--
Reestablishes natural hydrology	No	Yes					--
Creates or enhances habitat	No	Yes					--
Community enhancement	No	Opportunities for other enhancements					Within DAC or MTC Community of Concern

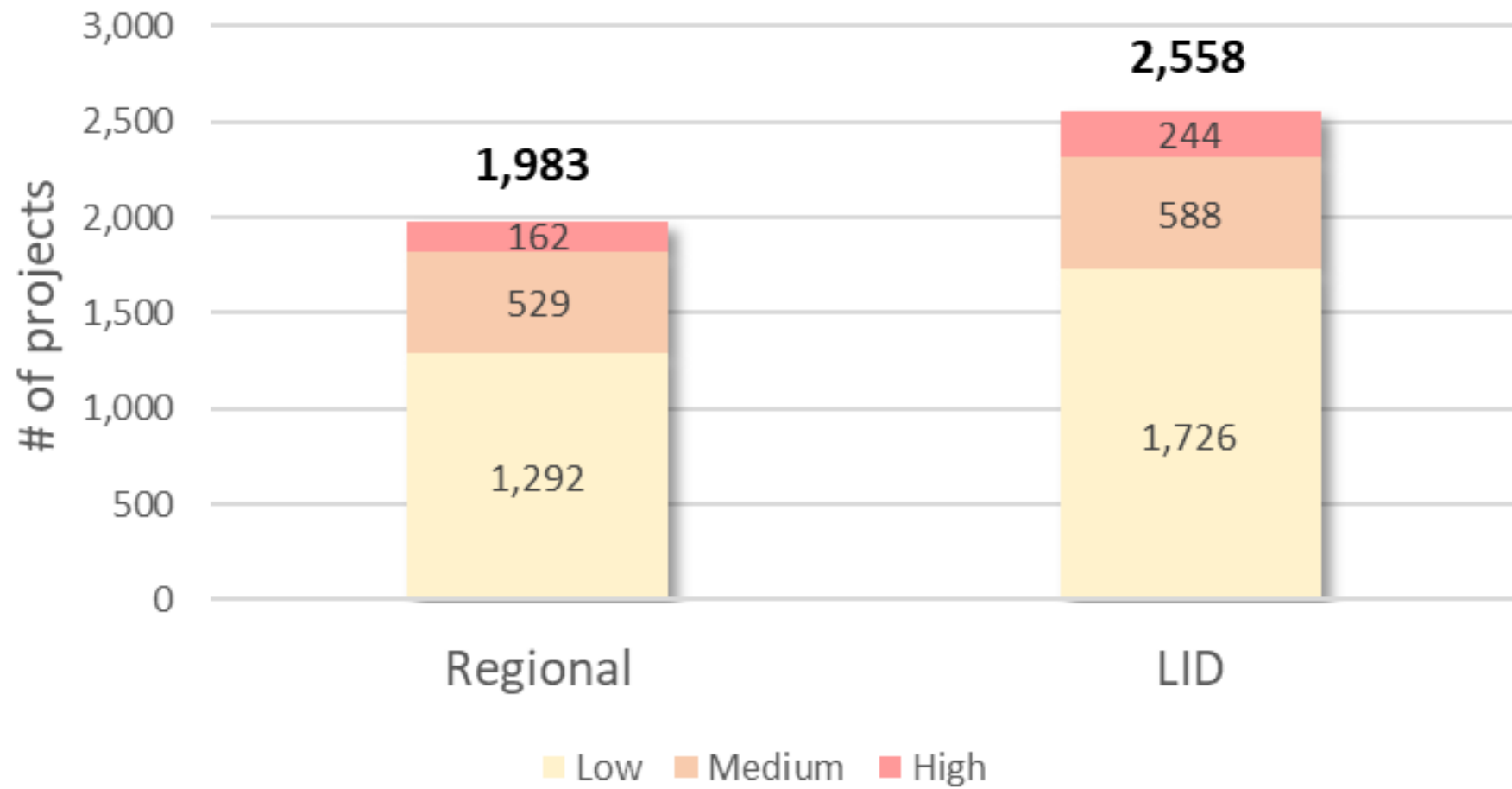
Prioritization Metrics for LID Projects

Metric	Points						Weight Factor
	0	1	2	3	4	5	
Parcel Land Use			Schools/Golf Courses	Park / Open Space	Public Buildings	Parking Lots	--
Impervious Area (%)	X < 40	40 ≤ X < 50	50 ≤ X < 60	60 ≤ X < 70	70 ≤ X < 80	80 ≤ X < 100	2
Hydrologic Soil Group		C/D		B		A	--
Slope (%)		10 > X > 5	5 ≥ X > 3	3 ≥ X > 2	2 ≥ X > 1	1 ≥ X	--
Within flood-prone storm drain catchments	No	Moderate				Yes	--
Contains PCB Interest Areas	None					High	2
Within Priority Development Area	No					Yes	--
Co-located with another agency project	No					Yes	--
Augments water supply	No	Opportunity for capture and reuse				Above groundwater recharge area and not above groundwater contamination area	2
Water quality source control	No	Yes				--	
Reestablishes natural hydrology	No	Yes				--	
Creates or enhances habitat	No	Yes				--	
Community enhancement	No	Opportunities for other enhancements				Within DAC or MTC Community of Concern	--

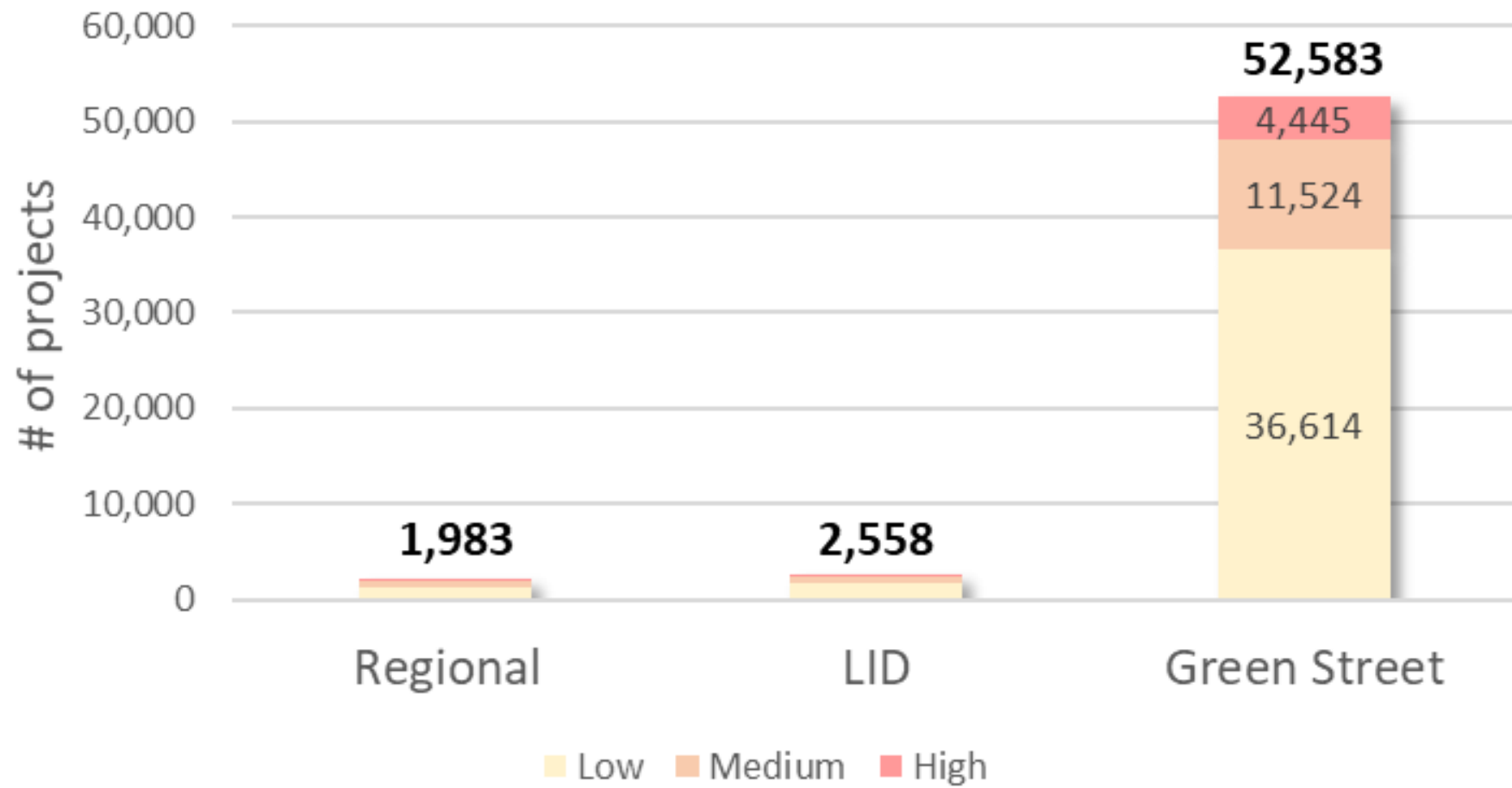
Prioritization Metrics for Green Street Projects

Metric	Points						Weight Factor	
	0	1	2	3	4	5		
Imperviousness (%)	X < 40	40 ≤ X < 50	50 ≤ X < 60	60 ≤ X < 70	70 ≤ X < 80	80 ≤ X < 100	2	
Hydrologic Soil Group		C/D		B		A	--	
Slope (%)		5 > X > 4	4 ≥ X > 3	3 ≥ X > 2	2 ≥ X > 1	1 ≥ X > 0	--	
Within flood-prone storm drain catchments	No	Moderate				Yes	--	
Contains PCB Interest Areas	None					High	2	
Within Priority Development Area	No					Yes	--	
Co-located with another agency project	No					Yes	--	
Augments water supply	No	Opportunity for capture and reuse					Above groundwater recharge area and not above groundwater contamination area	2
Water quality source control	No	Yes					--	
Reestablishes natural hydrology	No	Yes					--	
Creates or enhances habitat	No	Yes					--	
Community enhancement	No	Opportunities for other enhancements					Within DAC or MTC Community of Concern	--

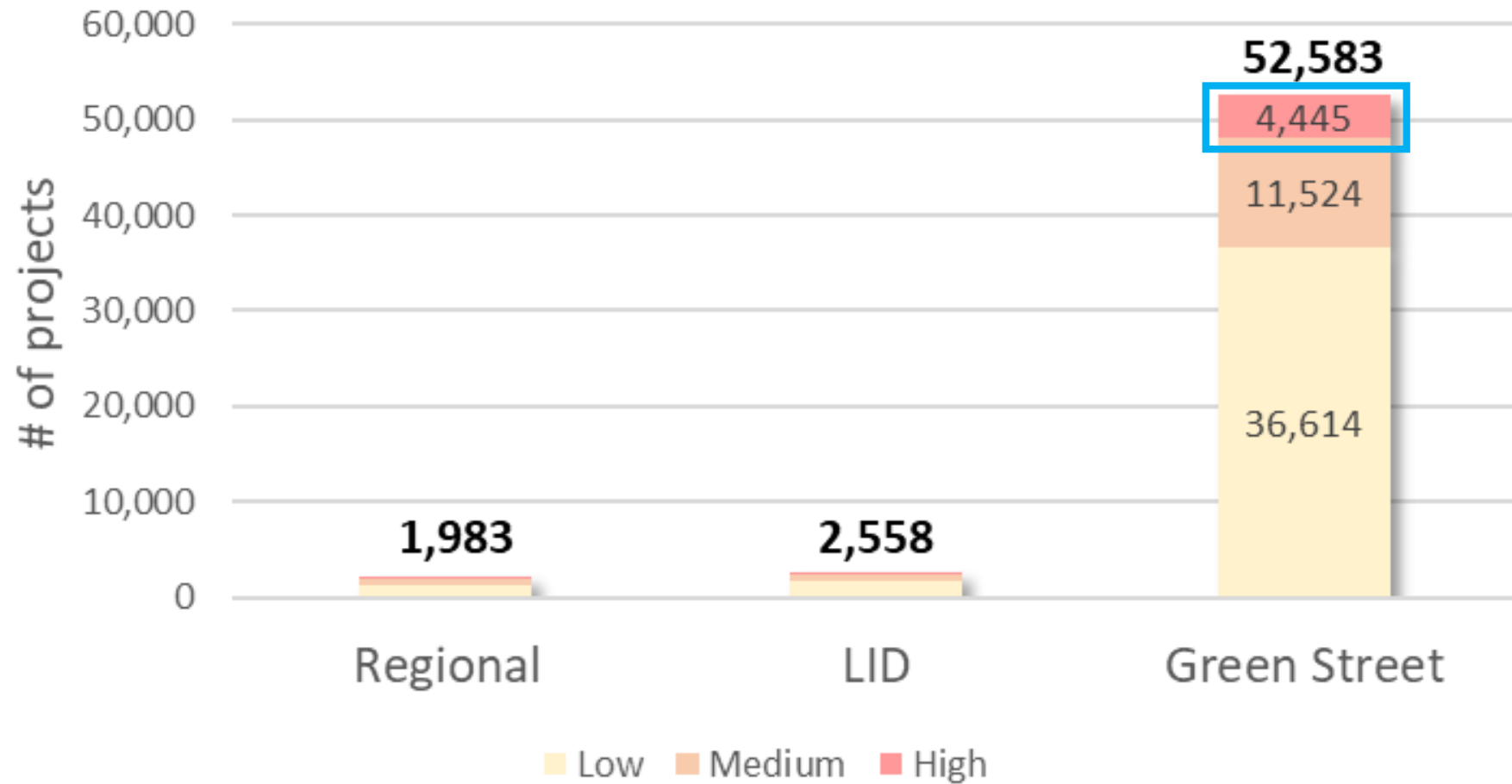
County-Wide Project Totals



County-Wide Project Totals



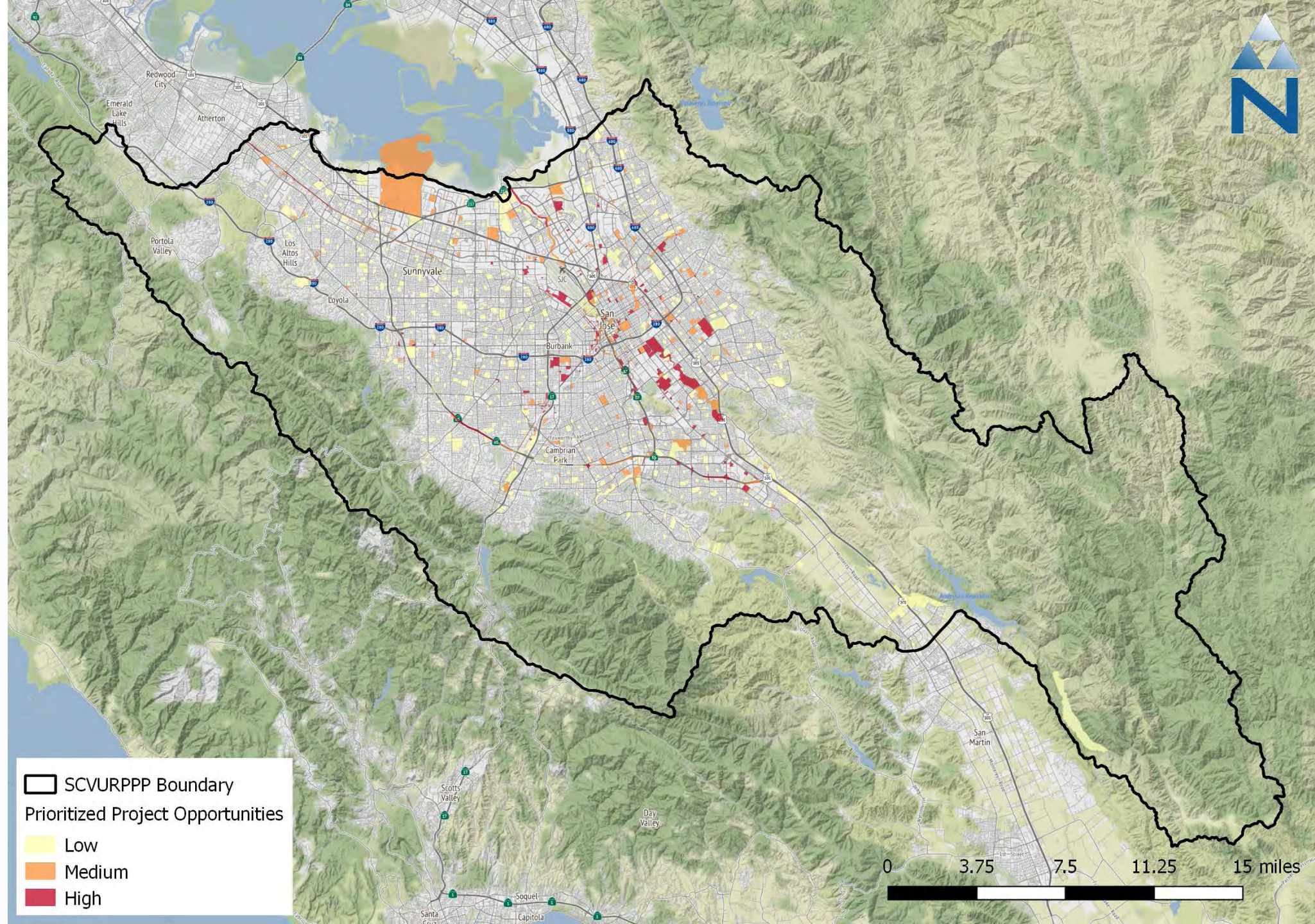
County-Wide Project Totals



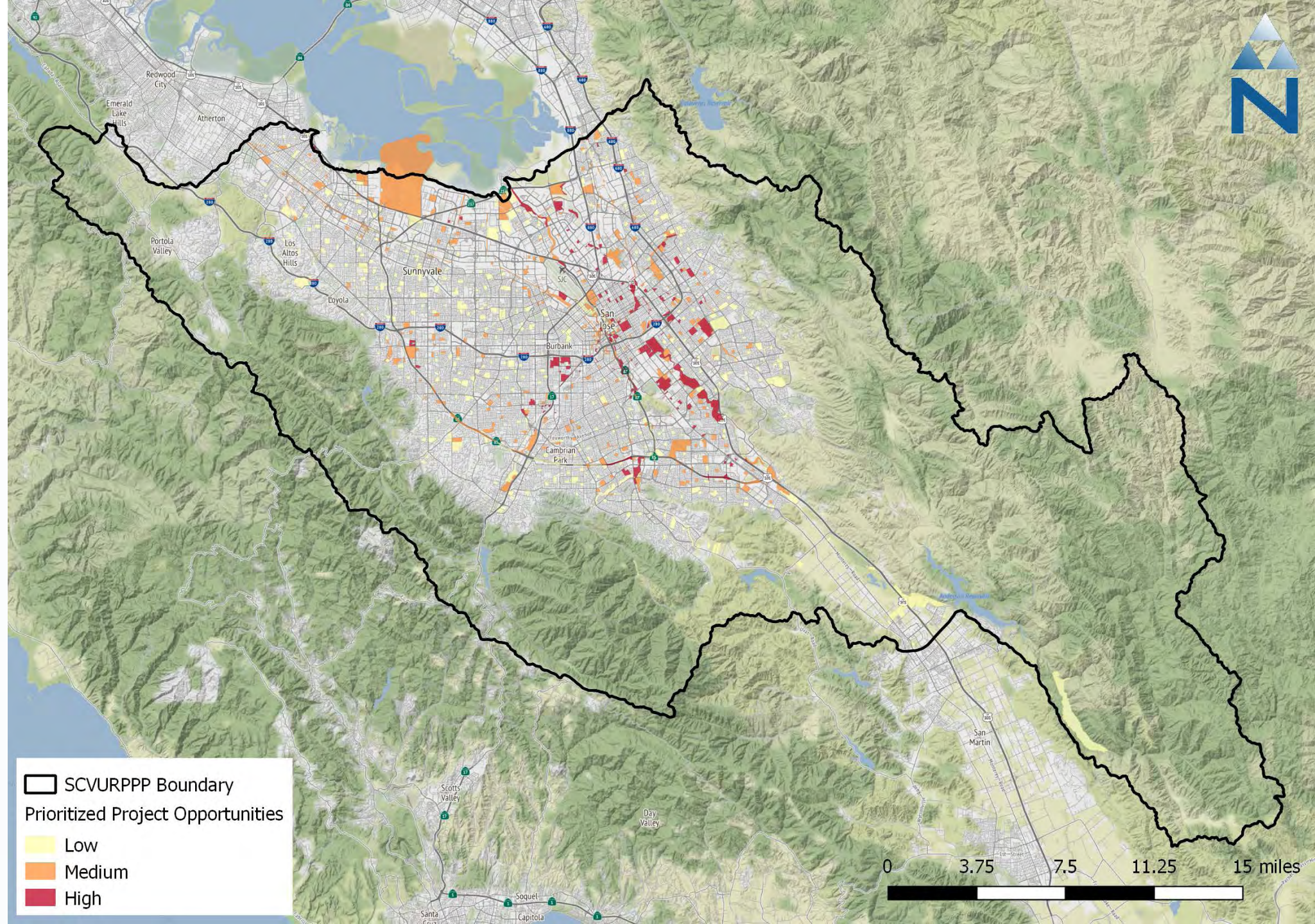
Top 10th Percentile of Green Streets

Jurisdiction	By Jurisdiction	
	# of Projects	%
Campbell	138	3.0%
Cupertino	152	3.3%
Los Altos	118	2.6%
Los Altos Hills	12	0.3%
Los Gatos	87	1.9%
Milpitas	154	3.4%
Monte Sereno	12	0.3%
Morgan Hill	42	0.9%
Mountain View	193	4.2%
Palo Alto	252	5.5%
San Jose	2,404	52.4%
Santa Clara	308	6.7%
Santa Clara County	171	3.7%
Saratoga	130	2.8%
Sunnyvale	413	9.0%
TOTAL	4,586	

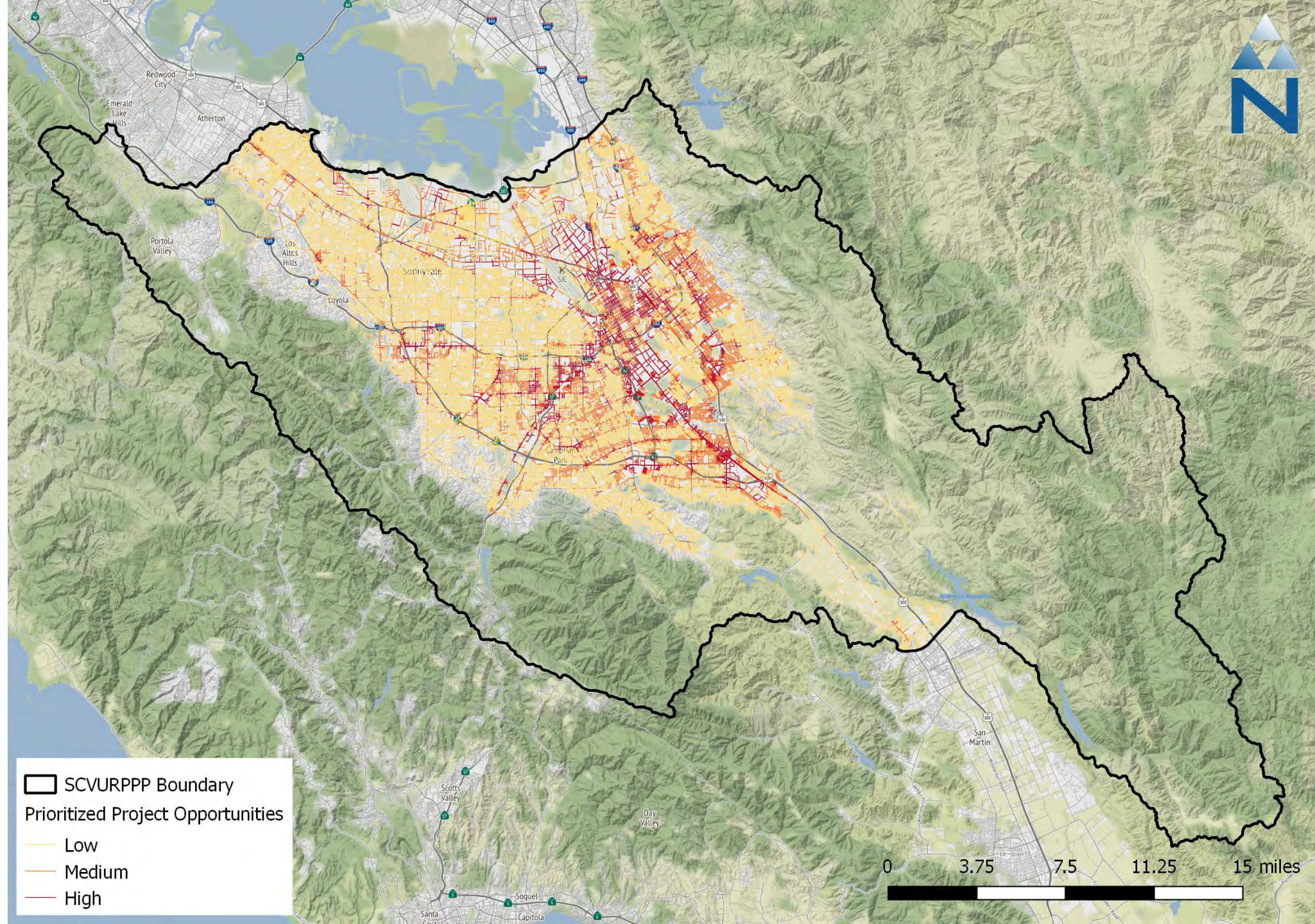
Prioritization Results – LID on Public Parcels



Prioritization Results – Regional Projects

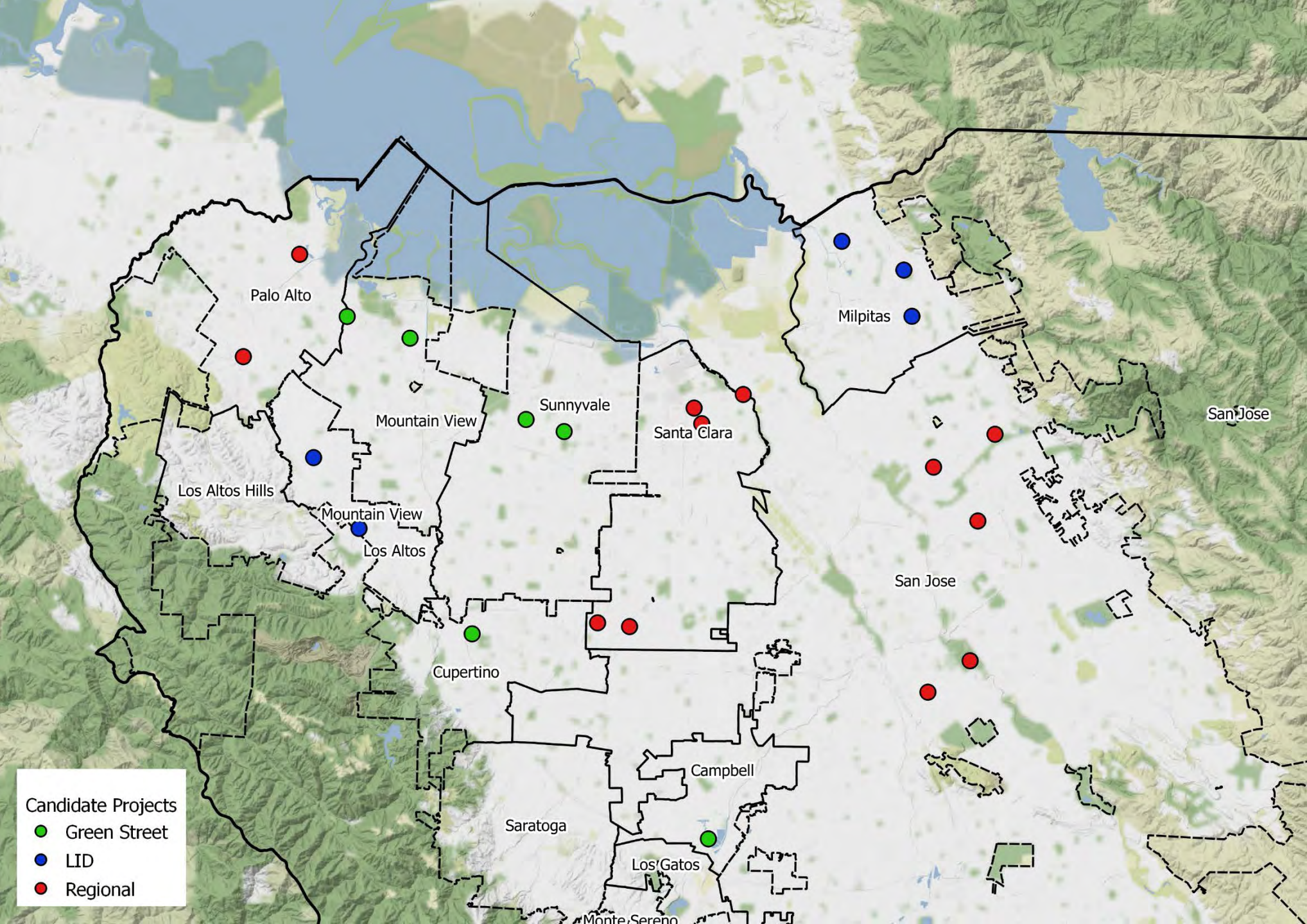


Prioritization Results – Green Streets



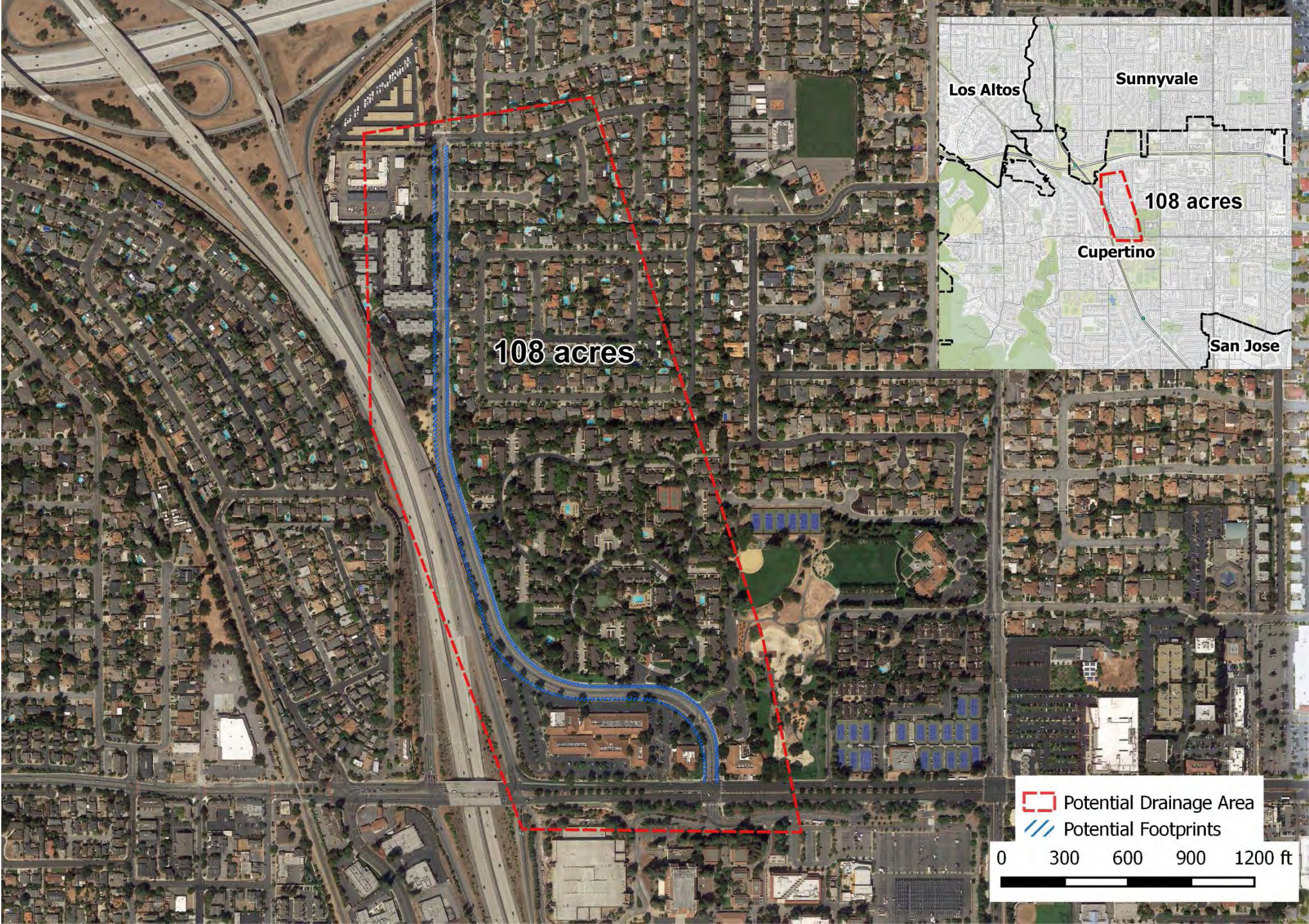
Projects Selected for Quantification of Benefits and Possible Conceptual Design

Candidate Projects



Mary Avenue
Green Street

Sponsor Agency:
Cupertino

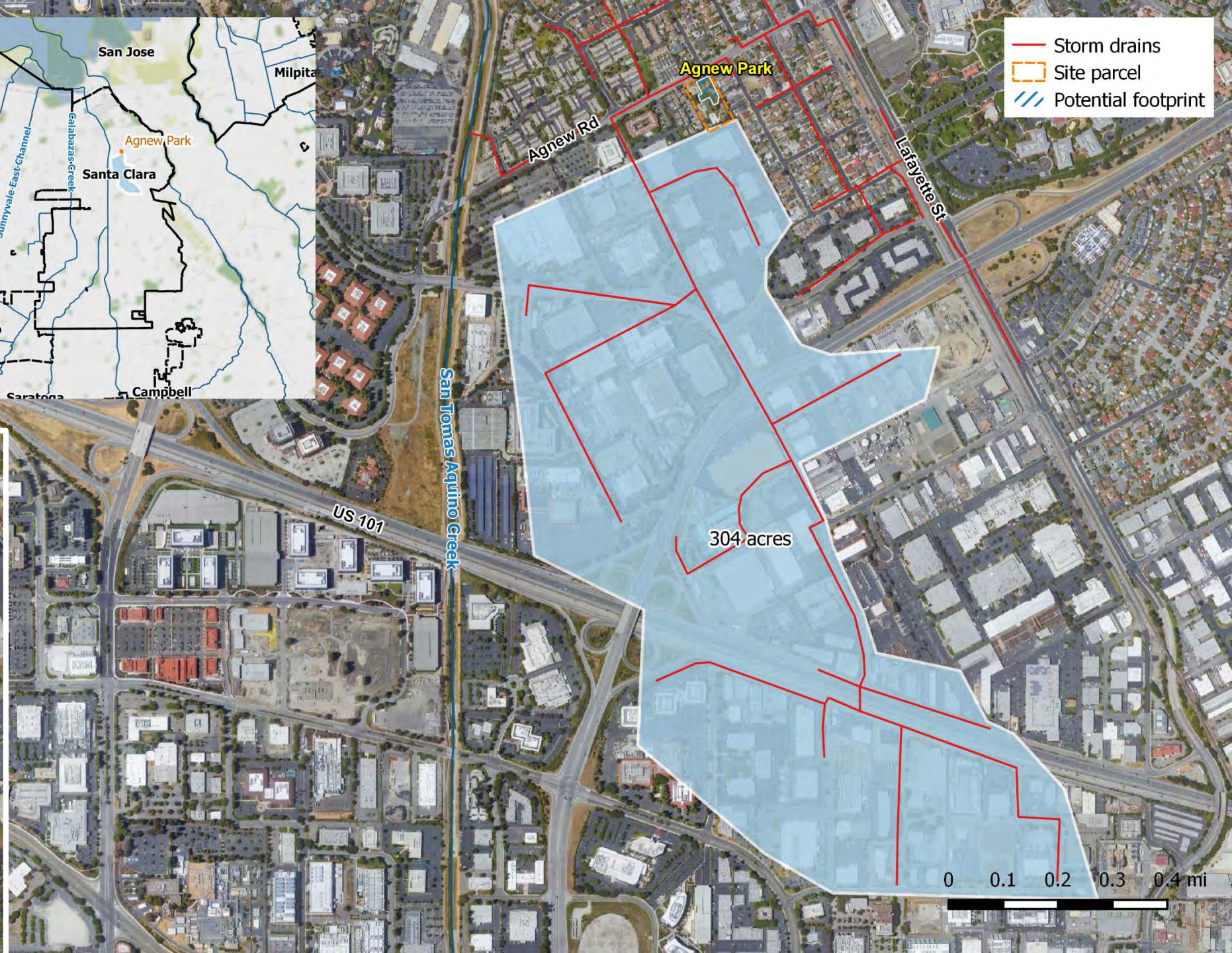


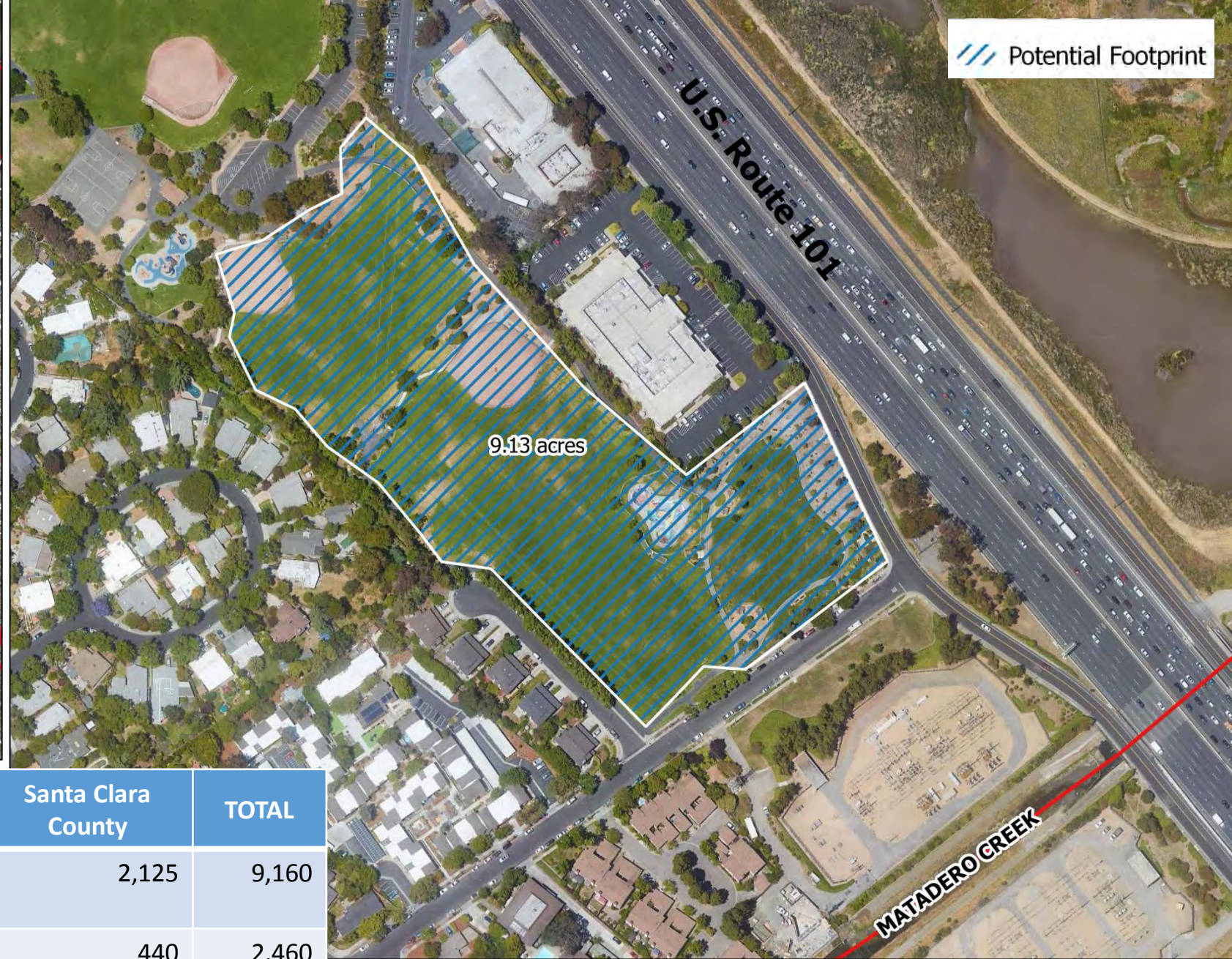
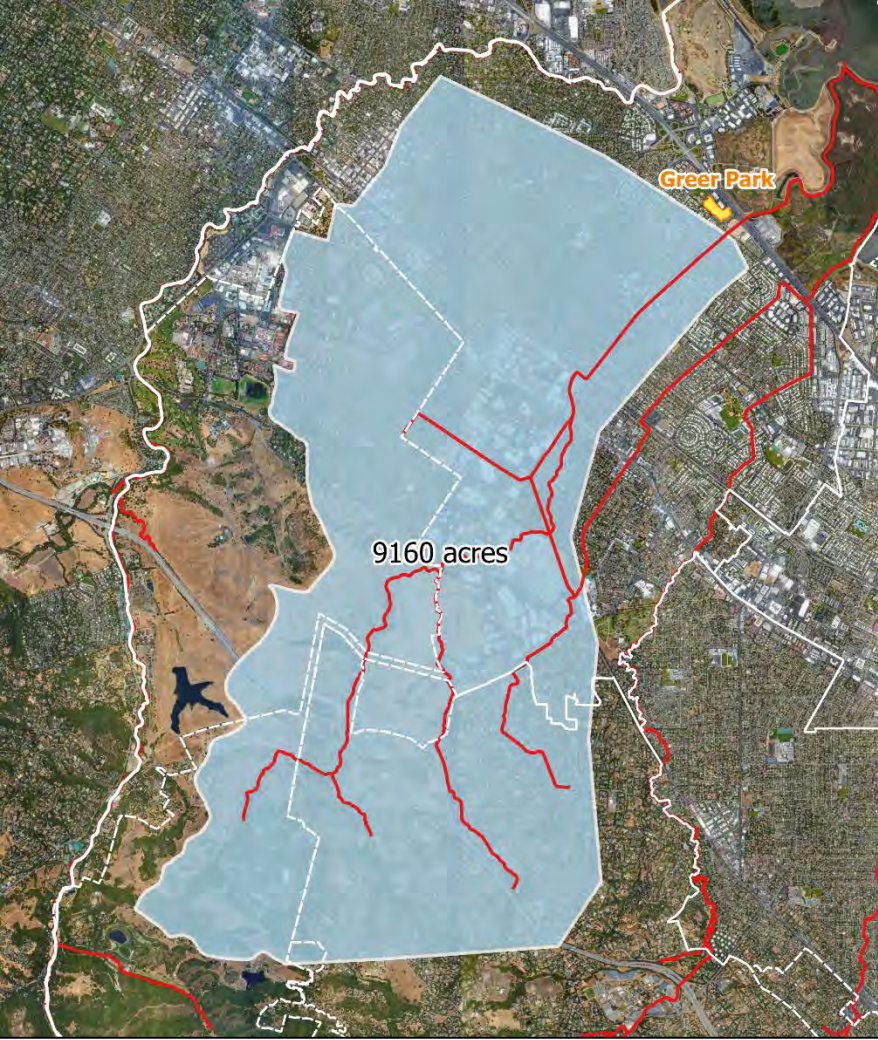
Hillview
Community
Center
Redevelopment
Sponsor Agency: Los
Altos



Agnew Park Stormwater Capture Project

Sponsor Agency:
City of Santa Clara





Jurisdiction	Palo Alto	Los Altos Hills	Santa Clara County	TOTAL
Drainage Area (acres)	4,745	2,290	2,125	9,160
Impervious Area (acres)	1,680	340	440	2,460
% Impervious	35 %	15 %	21 %	27 %

Greer Park Regional Stormwater Capture Project

Sponsor Agency: Palo Alto

Site Information	
Jurisdiction	City of San Mateo
Address	2720 Alameda de las Pulgas, San Mateo, CA 94403
Co-Located Project	Beresford Park Parking Lot Resurfacing
Capture Area (acres)	1.42
Impervious Area (%)	90
85 th Percentile Rainfall (in)	0.85
Generated Runoff (ac-ft)	0.09



Design Summary			
Green Infrastructure Type	Design Width (ft)	Design Length (ft)	Capture Volume (ac-ft)
Bioretention (Rain Garden)	8	260	0.090

Cost Estimate				
DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Excavation/Hauling	385	CY	\$50.00	\$19,000
Bioretention	2,080	SF	\$25.00	\$52,000
Curbs and Gutters	520	LF	\$17.25	\$9,000
CONSTRUCTION SUBTOTAL				\$80,000
Planning (20%), Mobilization (10%), Design (30%), Contingency (25%)				\$68,000
TOTAL COST				\$148,000



Site Description:

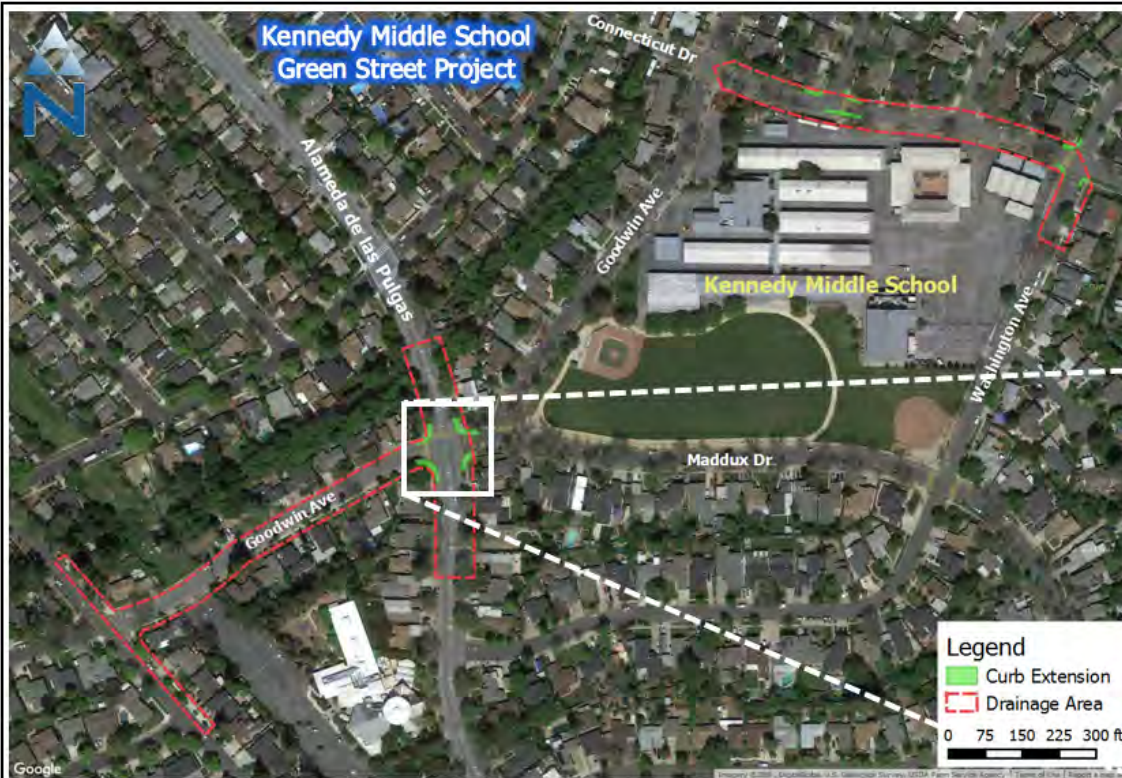
The proposed project consists of low impact development (LID) retrofits at the parking lot of Beresford Park along Alameda de las Pulgas. LID will be implemented to capture stormwater from on-site. Bioretention is recommended as the primary treatment type. Implementation of LID improvements will coincide with a resurfacing project for the parking lot. The parking lot layout depicted in the figure above is conceptual in order to show how a rain garden can be implemented in a typical parking lot. Actual traffic flow and available area for parking stalls must be evaluated separately during the actual design phase.

The proposed improvements would capture 100% of the 85th percentile runoff volume (0.09 ac-ft) while providing flood risk mitigation, community enhancement, increased property values, and other multiple benefits. Additionally, signage can be implemented to provide opportunities for public education on green infrastructure.

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

Concept for a Low Impact Development Retrofit for Stormwater Capture

Site: Beresford Park Parking Lot (City of San Mateo)

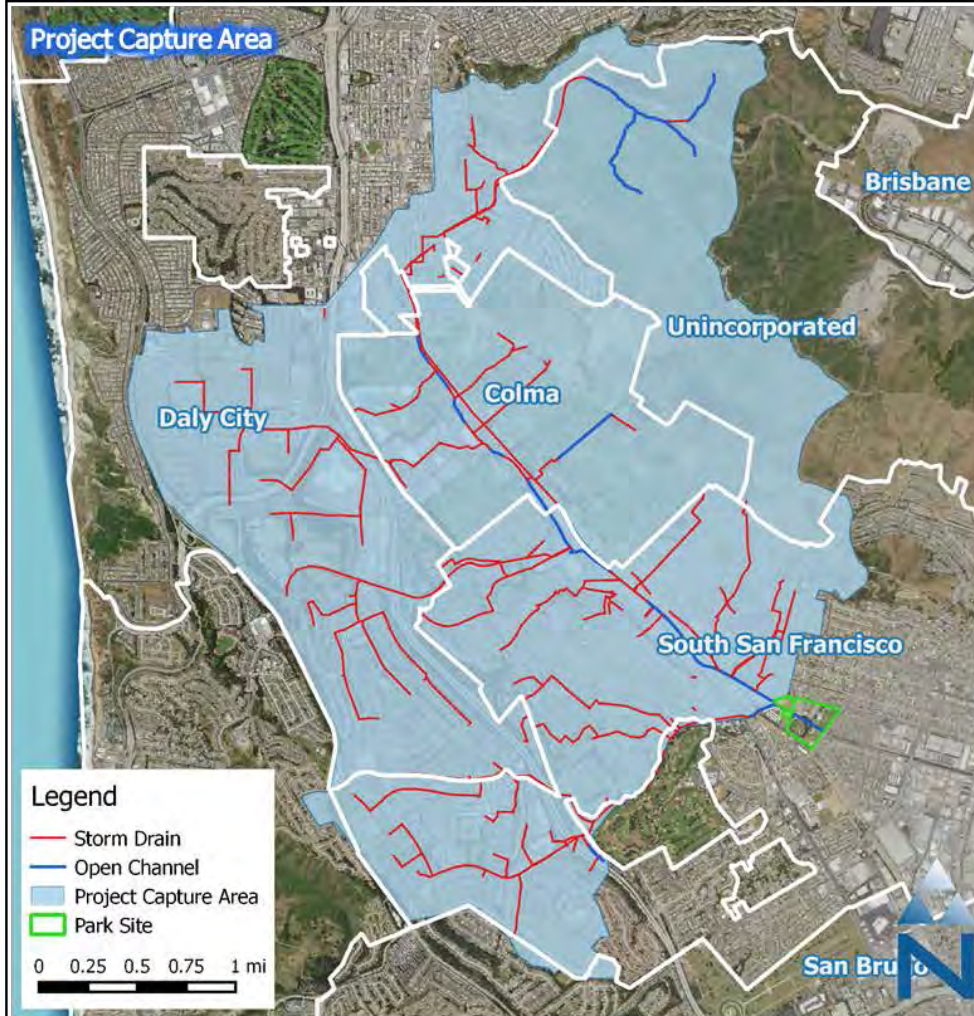


Site Information	
Jurisdiction	City of Redwood City
Street Name	Goodwin Ave & Connecticut Dr
Street Typology	High-Density Residential
Co-Located Project	Safe Routes to School
Capture Area (acres)	3.32
Impervious Area (%)	90
85 th Percentile Rainfall (in)	0.85
Generated Runoff (ac-ft)	0.21



Site Description:
<p>The proposed project consists of green street improvements along Connecticut Drive between Goodwin Avenue and Washington Avenue, and the intersection of Goodwin Avenue and Alameda de las Pulgas. The site is characterized by high-density residential streets that border the John F. Kennedy Middle School. Curb extensions are recommended as the primary treatment type. This project will integrate with the Safe Routes to School Program to implement green infrastructure that will also improve pedestrian safety. Curb extensions are proposed at crosswalks to improve pedestrian visibility and decrease crossing distance. The project also presents an opportunity for public education and signage can be implemented to inform the public on the benefits of green infrastructure.</p> <p>The proposed improvements would capture 100% of the 85th percentile runoff volume (0.21 ac-ft) while providing flood risk mitigation, community enhancement, increased property values, safer pedestrian routes, and other multiple benefits.</p> <p>DISCLAIMER: All elements of this conceptual design are planning-level. Locations of opportunities for placement of green infrastructure shown in the map are preliminary and subject to further site assessment and design. Percent imperviousness is based on best professional judgement. All design assumptions/parameters and cost estimates must be re-evaluated during the detailed design process.</p>

Design Summary				
Green Infrastructure Type	Design Width (ft)	Design Length (ft)	Capture Volume (ac-ft)	
Bioretention (Curb Extension)	12	405	0.210	
Cost Estimate				
DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Excavation/Hauling	900	CY	\$50.00	\$45,000
Bioretention	4,860	SF	\$25.00	\$122,000
Curbs and Gutters	405	LF	\$17.25	\$7,000
CONSTRUCTION SUBTOTAL				\$174,000
Planning (20%), Mobilization (10%), Design (30%), Contingency (25%)				\$148,000
TOTAL COST				\$322,000



Site Information	
Land Owner	City of South San Francisco
Street Address	Orange Ave, South San Francisco, CA 94080
Latitude/Longitude	37° 39' 13.1" N / 122° 25' 35.4" W
Watershed	Colma Creek

Site Description:

This project concept consists of two offline subsurface infiltration chambers at Orange Memorial Park. The park is a prime location to site a regional stormwater capture project and captures stormwater from large portion of the upper Colma Creek watershed and multiple city and county jurisdictions. The potential capture area of the project is roughly 6,300 acres that drains portions of the cities of South San Francisco, Colma, and Daly City and Unincorporated San Mateo County. A stormwater capture project at this location would aid these jurisdictions in meeting stormwater permit compliance and alleviate flooding in the lower reaches of Colma Creek. The project would also contribute to reductions of high-priority pollutants discharged to San Francisco Bay (including TMDLs that require reductions of mercury and PCB loads), augment water supply by recharging the Westside groundwater basin, and provide community enhancement through integration with the recreational facilities of the park. With the incorporation of a hydrodynamic separator for pretreatment of diverted water from the creek, the project also provides the reduction of trash transported through the creek to the San Francisco Bay. The Orange Memorial Park Master Plan (2007) was referenced in this design to ensure that the concept is consistent with the goals of future development for the park.

Although not specifically included within this project concept, the project also provides the opportunity for future integration of Low Impact Development (LID) within parking lots of the park to provide further community enhancement and opportunities for public education of LID and other project components.

Drainage Characteristics	
Capture Area (acres)	6,300
Impervious Area (%)	38
Dominant Land Use	Residential
Jurisdictions	South San Francisco, Colma, Daly City, Unincorporated San Mateo County





Example concrete infiltration chamber

Site Description:

Two subsurface infiltration chambers will be considered on parcels owned by the City of South San Francisco to the west of Orange Memorial Park. Both parcels were acquired by the City of South San Francisco in 1996 and, while vacant, are included in plans for future park expansion. The first chamber (Project 1) will be located in the vacant parcel to the south of the Colma Creek channel. The second chamber (Project 2) will be located in portions of the vacant parcel to the north of the channel and the current park parcel. The Project 2 site represents the location of the future little league baseball fields according to the Master Plan. Runoff would be diverted directly from Colma Creek and details of the diversion structures will be determined during the design phase through coordination with the San Mateo County Flood Control District. A pretreatment unit (e.g. hydrodynamic separator) will be implemented to provide trash and sediment capture. Two projects are proposed to maximize the amount of available space used for the design and to provide an option for the City of South San Francisco to implement the design in two separate phases. This would allow the City to move forward with each phase separately as funding is acquired. The Master Plan also accounts for the possible purchase of the CalWater parcels along Chestnut Avenue for future park expansion, which could be used to expand Project 2 if that land becomes available. The proposed design (both chambers) would allow for the treatment of 26% of the 85th percentile, 24-hour runoff volume (36.4 of 142.4 ac-ft) for the Colma Creek watershed. As these volumes are completely removed via storage and infiltration, this provides an equivalent 26% reduction of pollutant loads for the storm event.

DISCLAIMER: All elements of this conceptual design are planning-level, based on desktop analysis. All assumptions and parameters must be re-evaluated during the detailed design process. Costs estimates are based on available data. Actual costs will vary.

Design Criteria

Precipitation, 85 th percentile, 24-hr storm (in)	0.83
Colma Creek Runoff Volume, 85 th percentile, 24-hr storm (ac-ft)	142.4
Colma Creek Peak Discharge, 85 th percentile, 24-hr storm (cfs)	309
Infiltration Rate (in/hr)	0.5

Project Characteristics	Project 1	Project 2
Stormwater Capture Process	Subsurface Infiltration Chamber	
Footprint (acres)	0.5	2.3
Design Height (ft)	12	12
Depth of Excavation (ft)	15	15
Pumping Requirements	Dependent on Geotechnical Investigation	
Design Volume (ac-ft)	6	27.6
24-hr Infiltration Volume (ac-ft)	0.5	2.3
Total Treatment Volume (ac-ft) ¹	6.5	29.9
Percent Treated ²	5%	21%

1 – sum of the Design Volume and 24-hr Infiltration Volume

2 – percentage the 85th percentile 24-hr storm Runoff Volume that is treated

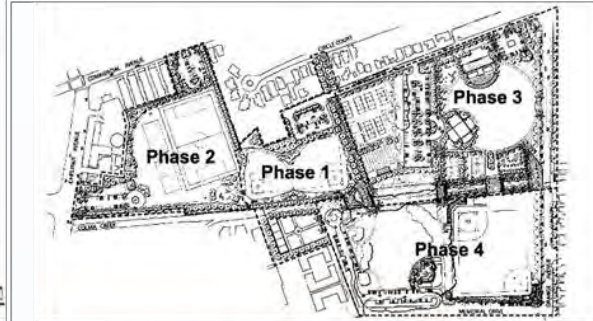
Concept for a Multi-jurisdictional Regional Stormwater Capture Project

Site: Orange Memorial Park (City of South San Francisco)



Project Implementation:

The figure to the left depicts the layout for the two subsurface infiltration chambers in relation to the planned improvements in the Orange Memorial Park Master Plan 2007. The figure below depicts the phased implementation of various areas of the park according to the Master Plan. The proposed infiltration chambers would coincide with Phase 1. Adding a stormwater component to the first phase of park improvements would likely garner enthusiasm for park enhancements and open avenues for funding. Phase 1 of the Master Plan can be further split into two sub-phases. The first sub-phase of park improvements would include Project 1 in the location of the future community gardens. The second sub-phase would include Project 2 at the little league baseball fields.



Cost Estimate for Infiltration Chamber south of Colma Creek (Project 1)				
DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Excavation/Removal	14,520	CY	\$50.00	\$726,000
Rubber Dam System	1	LS	\$80,000.00	\$80,000
Diversion Structure	1	LS	\$100,000.00	\$80,000
Hydrodynamic Separator Device	1	LS	\$90,000.00	\$100,000
Pump Structure	1	LS	\$1,000,000.00	\$1,000,000
Diversion Pipe (24" RCP)	100	LF	\$200.00	\$20,000
Infiltration Structure	9,680	CY	\$300.00	\$2,904,000
Restoration	21,780	SF	\$2.00	\$44,000
CONSTRUCTION SUBTOTAL				\$4,954,000
Mobilization (10% construction)				\$495,000
Contingency (25% construction)				\$1,239,000
Design (10% total)				\$669,000
TOTAL COST				\$7,357,000

Cost Estimate for Infiltration Chamber north of Colma Creek (Project 2)				
DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Excavation/Removal	55,660	CY	\$50.00	\$2,783,000
Rubber Dam System (dam from Project 1 can be utilized by both projects)				N/A
Diversion Structure	1	LS	\$150,000.00	\$150,000
Hydrodynamic Separator	1	LS	\$150,000.00	\$150,000
Pump Structure	1	LS	\$1,750,000.00	\$1,750,000
Diversion Pipe (24" RCP)	150	LF	\$200.00	\$30,000
Infiltration Structure	44,528	CY	\$300.00	\$13,358,000
Restoration	100,188	SF	\$2.00	\$200,000
CONSTRUCTION SUBTOTAL				\$18,421,000
Mobilization (10% construction)				\$1,842,000
Contingency (25% construction)				\$4,605,000
Design (10% total)				\$2,487,000
TOTAL COST				\$27,355,000

Concept for a Multi-jurisdictional Regional Stormwater Capture Project
Site: Orange Memorial Park (City of South San Francisco)



Next Steps

- Conduct the hydrologic modeling of selected potential projects to quantify benefits
- Conduct field visits to potential project sites, select projects for conceptual design, and prepare designs
- Complete/submit Administrative Draft SWRP (June 1)
- Complete and post Public Draft SWRP on new SWRP web page (July)
- Plan public meeting for August



Thank you for your participation!

Next meeting ~ August 2018