



Stormwater Resource Plan for San Mateo County

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SAN MATEO COUNTYWIDE
**Water Pollution
Prevention Program**

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CMEQ Committee
January 31, 2017

Stormwater Resource Plan (SRP)

- Senate Bill 985 (2014, Pavley) requires Stormwater Resource Plans in order to receive grants for stormwater capture projects
- Goal is to better manage stormwater as a resource to address water supply, flood, and quality concerns
- C/CAG took lead to develop countywide SRP, work began in March 2016
- C/CAG Board approved release of a public review draft in December 2016

- SRPs must identify and prioritize, on a watershed basis, stormwater projects “in a quantitative manner, using a metrics-based and integrated evaluation and analysis of multiple benefits to maximize water supply, water quality, flood management, environmental, and other community benefits within the watershed.”

Watershed-Based Approach

- San Francisco Bay & San Francisco Coastal South Watersheds
 - Watershed processes
 - Surface and groundwater quality
 - Water usage
 - Land use characteristics
 - Natural habitats
- Built on previous planning efforts



Project Screening & Prioritization Process

1. Identify suitable public parcels and rights-of-way
2. Use Hydrologic Response Units (HRUs) to prioritize projects
 - Land use, impervious cover, hydrologic soil groups, slope
3. Screen and prioritize through a ranking method, with emphasis on projects with multiple benefits



Legend

- 303(d) Listed Waterbodies
- Watershed boundaries
- County line
- Slope (%)
 - < 0.5
 - < 10
 - < 20
 - < 30
 - > 30



Project Types

Regional Projects



Green Streets



Low Impact Development



Prioritized Regional Project Opportunities

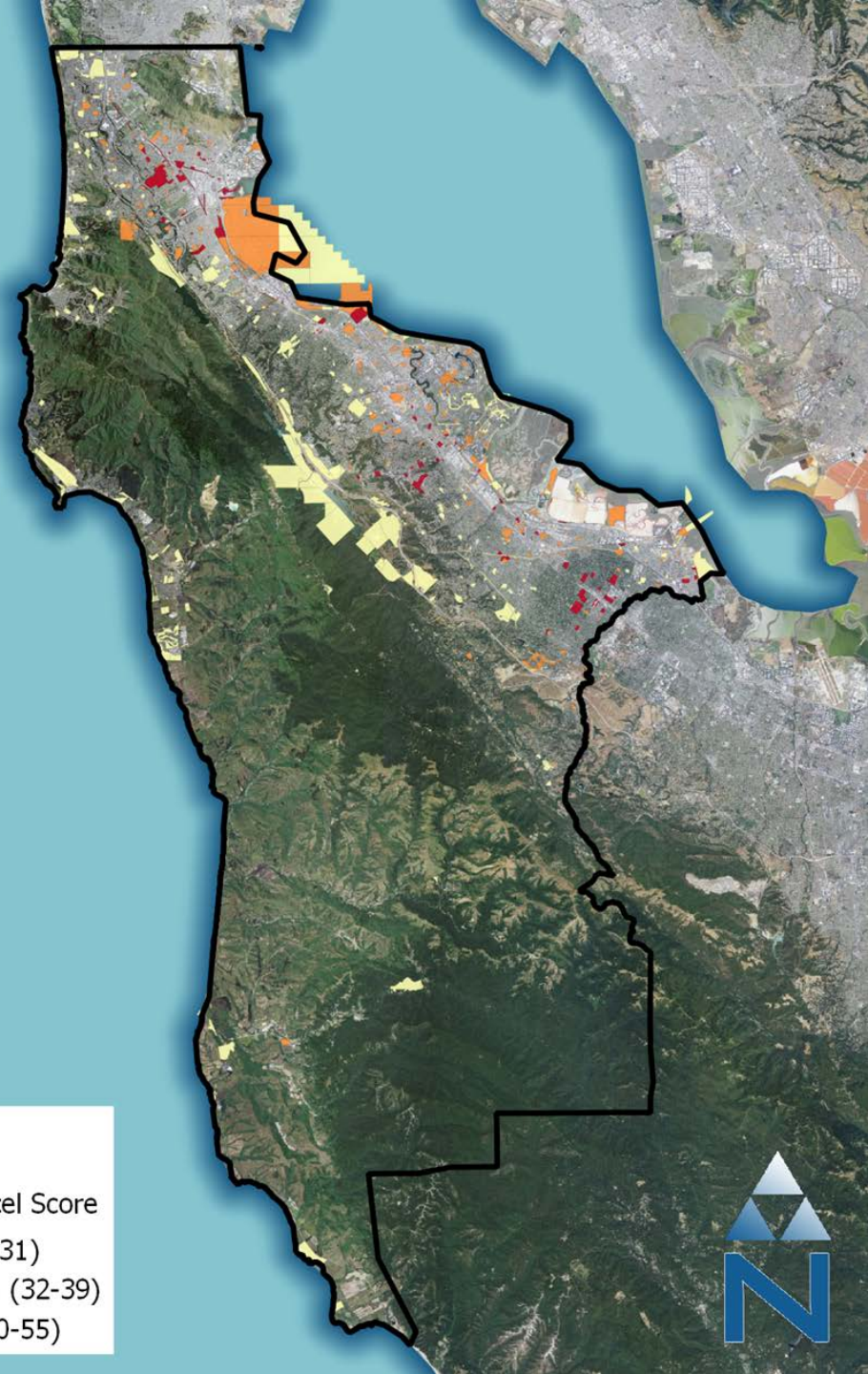
Legend

Regional Parcel Score

Low (0-31)

Medium (32-39)

High (40-55)



Prioritized Green Street Opportunities

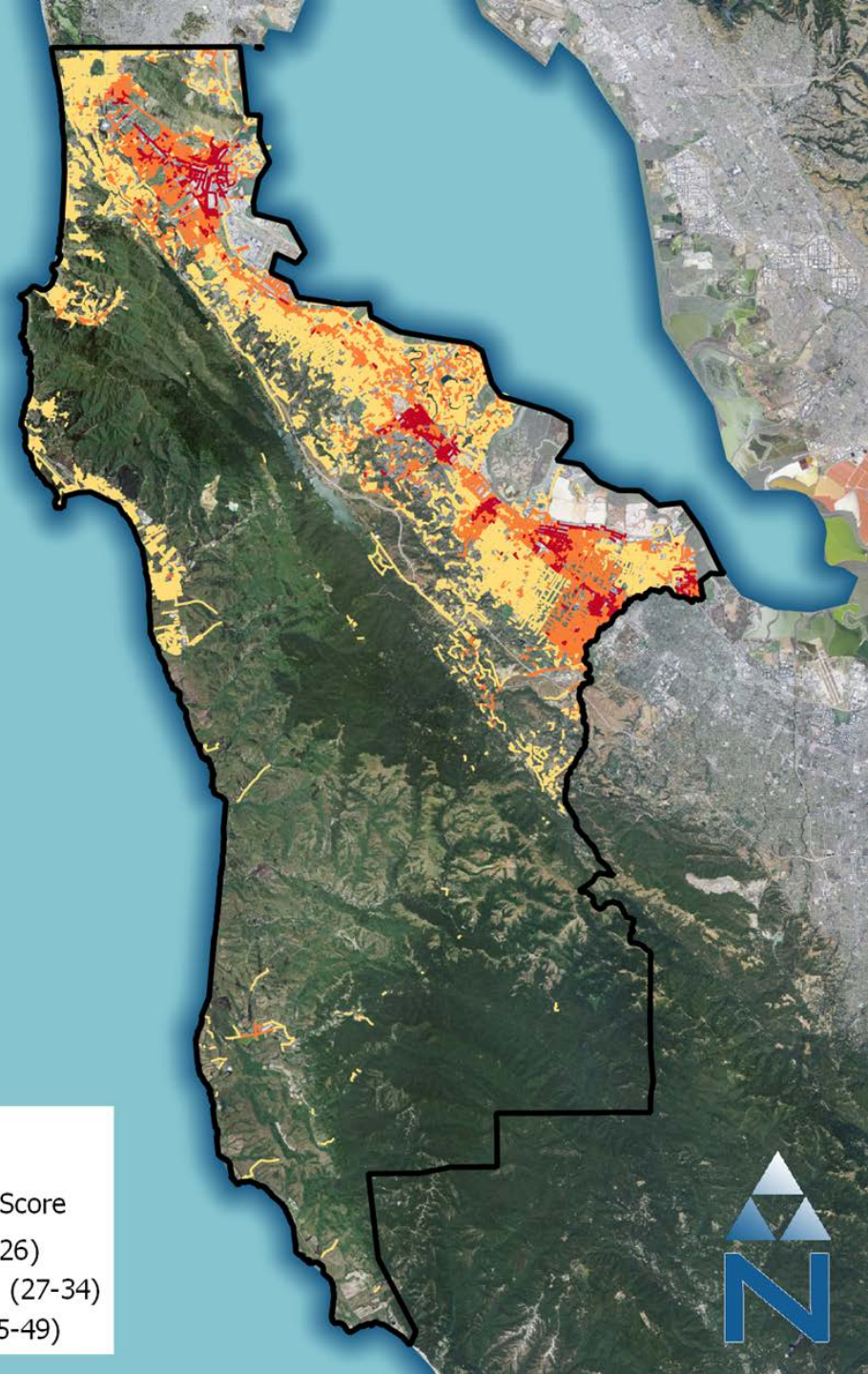
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Green Street Score

Low (0-26)

Medium (27-34)

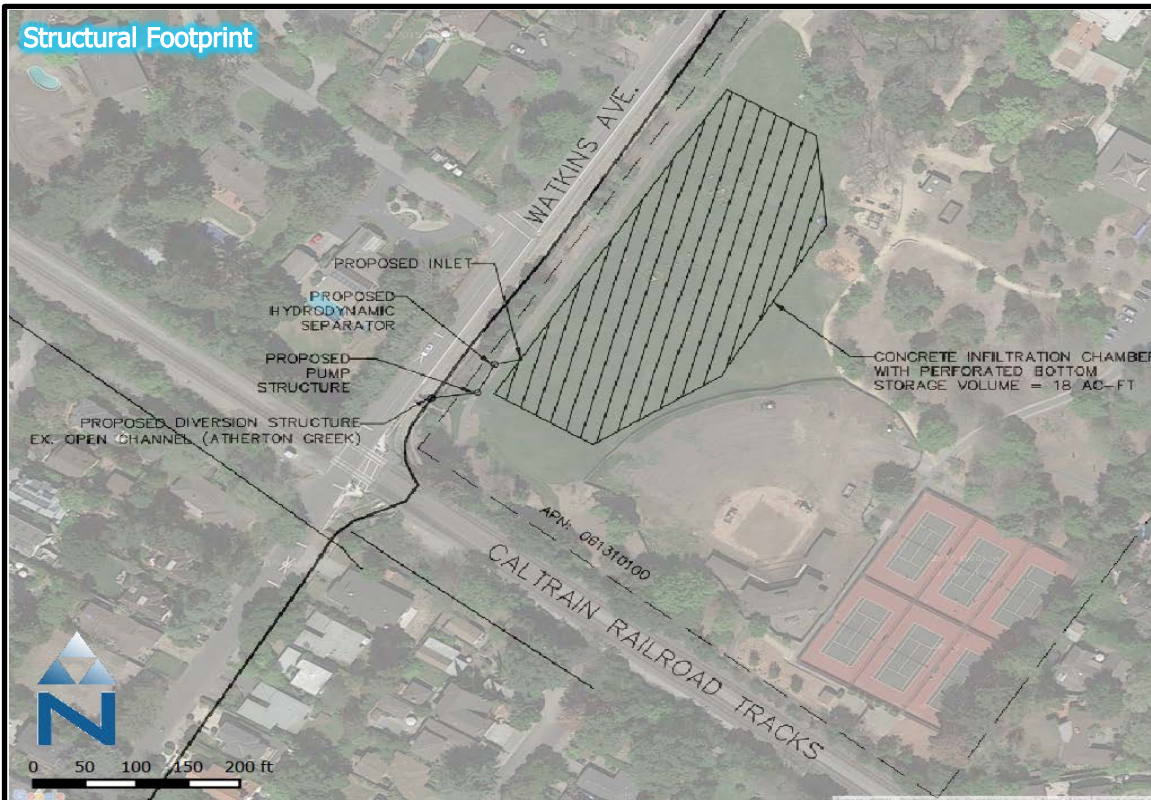
High (35-49)



Project Concepts

- C/CAG developed 22 project concepts to support member agency grant proposals
- Combination of regional, green street, and onsite projects

Structural Footprint



Example concrete infiltration chamber



Example Hydrodynamic Separator

Design Criteria

Precipitation, 85 th percentile, 24-hr storm (in)	0.86
Runoff Volume, 85 th percentile, 24-hr storm (ac-ft)	65.90
Peak Discharge, 85 th percentile, 24-hr storm (cfs)	72
Infiltration Rate (in/hr)	0.5

Project Characteristics

Stormwater Capture Process	Subsurface Infiltration Chamber
Footprint (acres)	1.5
Design Height (ft)	12
Depth of Excavation (ft)	15
Pumping Requirements	Dependent on Geotechnical Investigation
Design Volume (ac-ft)	18
24-hr Infiltration Volume (ac-ft)	1.5
Total Treatment Volume (ac-ft) ¹	19.5
Percent Treated ²	30%

Cost Estimate

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Excavation/Removal	36,300	CY	\$50.00	\$1,815,000
Rubber Dam System	1	LS	\$80,000.00	\$80,000
Diversion Structure	1	LS	\$150,000.00	\$150,000
Hydrodynamic Separator	1	LS	\$120,000.00	\$120,000
Pump Structure	1	LS	\$1,500,000.00	\$1,500,000
Diversion Pipe (24" RCP)	120	LF	\$200.00	\$24,000
Infiltration Structure	29,040	CY	\$300.00	\$8,712,000
Restoration	65,340	SF	\$2.00	\$131,000
CONSTRUCTION SUBTOTAL				\$12,532,000
Mobilization (10% construction)				\$1,253,000
Contingency (25% construction)				\$3,133,000
Design (10% total)				\$1,692,000
TOTAL COST				\$18,610,000

Project Description:

A subsurface infiltration chamber will be considered in the sports field of Holbrook-Palmer Park. The project site is in the south-west corner of the park and will be located just outside of the newly-renovated baseball field. Stormwater will be diverted directly from the channelized segment of Atherton Creek that borders the park along Watkins Avenue. Runoff would first be directed to a pretreatment unit (e.g. hydrodynamic separator) before being routed to the chamber. This will assist in removing trash and sediments from the creek while also reducing maintenance requirements of the chamber. The proposed design would allow for the treatment of 30% of the 85th percentile, 24-hr runoff volume (19.5 of 65.90 ac-ft) for the Atherton Creek watershed. As these volumes are completely removed via storage and infiltration, this provides an equivalent 30% reduction of pollutant loads for the storm event. While no major enhancements are planned for the sports field in the Holbrook-Palmer Park Master Plan (2015), the Master Plan noted that the field could be regraded to improve the playing surface. This project would provide the opportunity to coordinate with the field regrading effort once the chamber is installed.

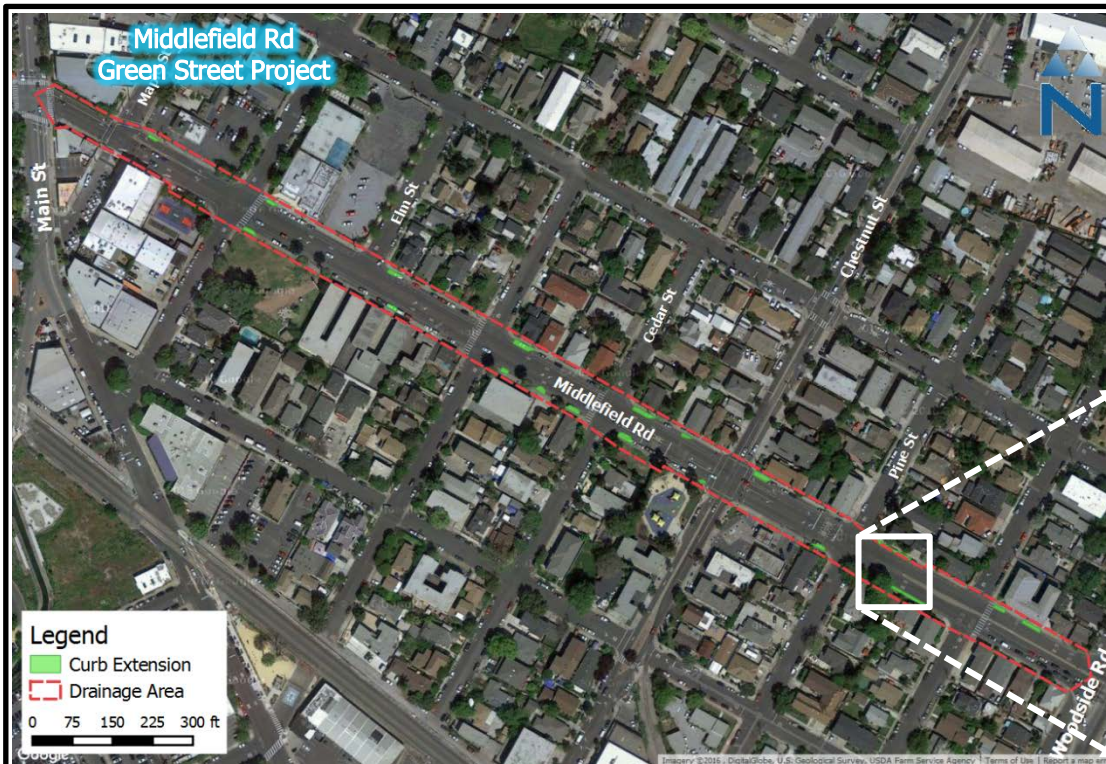
¹ – sum of the Design Volume and 24-hr Infiltration Volume

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

Concept for a Multi-jurisdictional Regional Stormwater Capture Project

Site: Holbrook-Palmer Park (Town of Atherton)





Site Information	
Jurisdiction	City of Redwood City
Street Name	Middlefield Rd
Bounding Streets	Main St / Woodside Rd
Street Typology	Arterial
Co-Located Project	Middlefield Streetscape Project
Capture Area (acres)	4.16
Impervious Area (%)	90
85 th Percentile Rainfall (in)	0.85
Generated Runoff (ac-ft)	0.27



Site Description:

The proposed project consists of green street improvements along Middlefield Road between Main Street and Woodside Road. The street segment is approximately 2,250 feet long. Middlefield Road is an arterial street that is relatively narrow. Limited space is divided between bike lanes, multiple lanes each direction, turn lanes, and parking lanes. This presents a challenge with siting green infrastructure without sacrificing some usage of the roadway. Curb extensions are recommended as the primary treatment type. Segments of the street that feature two lanes may be reduced to single lanes to allow adequate area for improvements. Center medians can be removed to provide additional area. Curb extensions can also be placed at crosswalks to improve pedestrian safety while increasing stormwater capture capacity. Where lanes cannot be reduced, some parking may need to be removed.

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

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.

Design Summary

Green Infrastructure Type	Design Width (ft)	Design Length (ft)	Capture Volume (ac-ft)
Bioretention (Curb Extension)	8	780	0.270

Cost Estimate

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Excavation/Hauling	1,160	CY	\$50.00	\$58,000
Bioretention	6,240	SF	\$25.00	\$156,000
Curbs and Gutters	780	LF	\$17.25	\$14,000
CONSTRUCTION SUBTOTAL				\$228,000
Planning (20%), Mobilization (10%), Design (30%), Contingency (25%)				\$194,000
TOTAL COST				\$422,000

Concept for a Green Street Retrofit for Stormwater Capture

Site: Middlefield Road (City of Redwood City)



Stormwater Grants

- Proposition 1 stormwater grants announced in Dec
- Redwood City and San Mateo recommended for funding (~\$1.2 million total)
- Daly City also recommended to receive \$10 million
- Award announcement starts 90-day clock
- Final SRP needs to be submitted to State Board and Bay Area IRWMP group by March 1

Public Comment Period

- Open from Dec 14 through Jan 13
- Three workshops
 - 1/5 Menlo Park
 - 1/9 Millbrae
 - 1/10 Pacifica
- 62 attendees total
- GIS web viewer
- Online comment form



Summary of Comments Received

- 53 Total Comments from 23 different agencies and individuals

Comment Category	Number of Comments
General typographical edits/ suggested wording	22
Specific Concept/Project Input	17
Prioritization Scoring Process & Screening Criteria	10
Outreach / Public Engagement Process	4
Future Planning & Updates, Costs	3
Additions/edits to maps & tables	2
Project submission / IRWMP Process	1
Database / Data Storage	1

Agency Type	Number of Comments
Public*	31
Water Board	8
San Mateo Resource Conservation District	7
County Environmental Health	1
Private Industry	4
City Government**	2

* Residents of Palo Alto, Menlo Park, Milbrae, El Granada, Pacifica

** Daly City, Redwood City (Community Development Dept.)

Review and Approval Process

- Oct/Nov – Member agency review of Admin Draft
- Dec 8 – C/CAG Board approved releasing for public review
- Early Jan – Three public workshops
- Jan 19 - Stormwater Committee
- Jan 30 – CMEQ Committee
- Feb 9 – C/CAG Board to consider adoption
- March 1 – Submit to State Water Board and IRWMP



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QUESTIONS?

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