



Regional Stormwater Projects Funding Recommendation

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Water Pollution Prevention Program



C/CAG Stormwater Committee
September 19, 2019

Available Funding – C/CAG

- \$2.94 million State grant (General Fund)
 - C/CAG request for “planning, environmental review, community engagement, alternatives analysis, engineering design, and engineering” for regional retention projects
 - Administered through Natural Resources Agency
 - Funds must be expended by March 2022
 - Need C/CAG Board Resolution
 - Goal is to advance projects to implementation

Available Funding – County OOS

- \$500,000 from US EPA WQIF (Federal funds)
 - \$100K – planning effort to identify additional regional project opportunities, including engaging with schools
 - \$200K – Preliminary design for Redwood City regional project at Red Morton Park
 - \$200K – Preliminary design for San Bruno regional project at 280/380 interchange
 - Funds must be expended by November 2021

Site Plan Description

The project consists of a subsurface concrete gallery that will be located beneath vacant space in the Caltrans right-of-way between the I-280 and I-380 interchange. The project would divert from a storm drain that serves portions of the Rollingwood, Crestmoor, Portola Highlands, and Pacific Heights neighborhoods of San Bruno. The storm drain eventually discharges to San Bruno Creek, which flows to the Bay. The drain runs underneath I-280 and crosses the frontage road along the northbound side of the freeway. The diversion structure will be constructed in the section of the drain that runs beneath the frontage road to minimize disruption to highway traffic while providing accessibility. A 650-foot length of diversion pipe will be required to route runoff to the facility. Captured runoff will be routed through a pretreatment system, such as a hydrodynamic separator, to remove solids and sediment, then routed to the facility. Due to the length of the required diversion line, a pump structure will likely be necessary to move captured runoff to the facility. However, a geotechnical analysis may show that a gravity-flow diversion alternative is feasible. A gravity diversion may increase excavation costs but will eliminate capital and O&M costs associated with operating a pump station. A pump system may also be beneficial for flood control downstream since diversions can be timed to manage the peak of storms. A passive system may potentially fill the facility before the peak occurs, effectively eliminating potential flood control benefits. Cost-benefit analysis should be performed to select a diversion alternative. The subsurface concrete gallery is designed to capture 21 ac-ft and will be 8.4-ft deep with a 2.5-acre footprint. Captured runoff will be removed from the storm drain system and treated through infiltration. Soil testing will need to confirm infiltration rates greater than 1.4 inches per hour in order to drain the facility within 72-hours, in compliance with local design standards. A shallower structure with greater footprint may be needed if a lower infiltration rate is found. All conceptual design details should be explored in greater detail during a feasibility analysis.

Disclaimer: Utilities were evaluated through GIS analysis using best available data. A utilities survey should be performed prior to construction to confirm the location of all utilities on site.

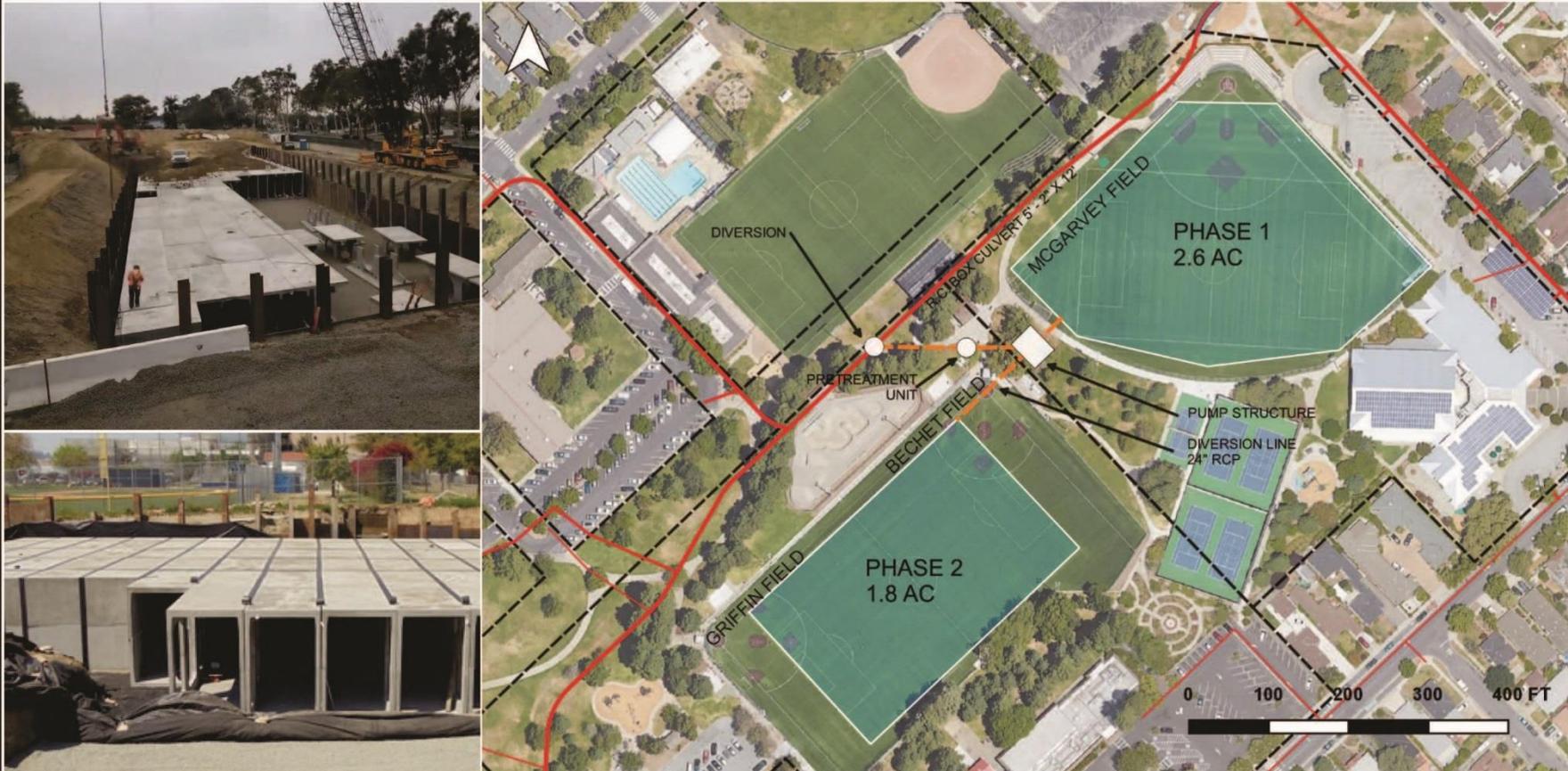


Site Plan Description

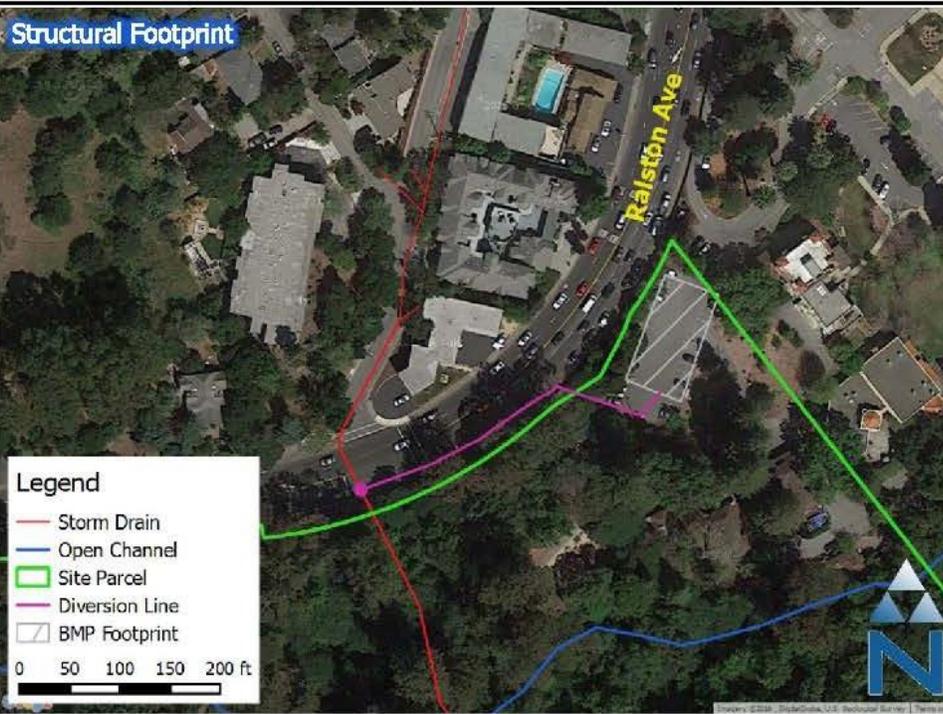
The project consists of a subsurface concrete gallery that will be located beneath McGarvey Field at Red Morton Community Park. The structure has potential to capture 31.2 acre-feet of runoff from Arroyo Ojo, a tributary of Redwood Creek that flows to the Bay. Storage capacity is capped at 31.2 acre-feet due to available area at McGarvey Field and a reasonable structure depth of 12 feet. The section of Arroyo Ojo just west of the park is an open channel that is routed underneath the park through a large reinforced concrete drain before daylighting to an open channel east of the park. The project will divert from the 5-ft 2-in by 12-ft drain using a rubber dam system and intake basin. Runoff will be routed through a pretreatment system, such as a hydrodynamic separator, to remove solids and sediment, then pumped to the gallery. The total storage (31.2 ac-ft) will account for approximately 72% of the 85th percentile, 24-hour runoff volume (43.2 ac-ft). Captured runoff will be treated through infiltration. Stormwater reuse elements (irrigation, greywater, etc.) may be incorporated if infiltration rates are deemed too low at the site.

A second phase may be considered to capture the remaining 12 ac-ft of the design volume uncaptured by the McGarvey Field structure (Phase I). Phase II would likely be located on Griffin and Bechet Fields just west of the Phase I structure to minimize disruption of utilities on the northern half of the park. The Phase II facility can be constructed at a later date but may still be able to utilize some of the diversion infrastructure from Phase I. For example, it may be possible for the diversion components to be built in parallel to make use of the same pump housing and intake structure. These design aspects should be explored in greater detail during a feasibility analysis.

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Structural Footprint



Cost Estimate for Infiltration Chamber at the Meadow Picnic Area

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
Excavation/Removal	1,614	CY	\$50.00	\$81,000
Diversion Structure	1	LS	\$20,000.00	\$20,000
Hydrodynamic Separator	1	LS	\$15,000.00	\$15,000
Pump Structure (450 GPM)	1	LS	\$50,000.00	\$50,000
Diversion Pipe (12" RCP)	350	LF	\$150.00	\$53,000
Infiltration Structure	726	CY	\$300.00	\$218,000
Restoration/Pavement	8,712	SF	\$10.00	\$87,000
CONSTRUCTION SUBTOTAL				\$524,000
Mobilization (10% construction)				\$52,000
Contingency (25% construction)				\$131,000
Design (10% total)				\$71,000
TOTAL COST				\$778,000

***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. Cost estimates are based on available data. Actual costs will vary.

Project Description:

A subsurface infiltration chamber will be considered in the parking lot to the west of the Twin Pines Manor. The project would require a 350-foot diversion from the storm drain that crosses Ralston Avenue at the South Road intersection. A subsurface facility would preserve functional use of the parking lot after construction and would prevent disturbance of other recreational areas of the park. The proposed design would allow for the treatment of over 100% of the 85th percentile, 24-hr runoff volume (0.47 ac-ft) from the 30-acre area.

Design Criteria

Precipitation, 85 th percentile, 24-hr storm (in)	0.75
Runoff Volume, 85 th percentile, 24-hr storm (ac-ft)	0.47
Peak Discharge, 85 th percentile, 24-hr storm (cfs)	1.0
Infiltration Rate (in/hr)	0.5

Project Characteristics

Stormwater Capture Process	Subsurface Infiltration Chamber
Footprint (acres)	0.15
Design Height (ft)	3
Depth of Excavation (ft)	6
Pumping Requirements	Dependent on Geotechnical Investigation
Design Volume (ac-ft)	0.45
24-hr Infiltration Volume (ac-ft)	0.15
Total Treatment Volume (ac-ft)¹	0.6
Percent Treated²	100%

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

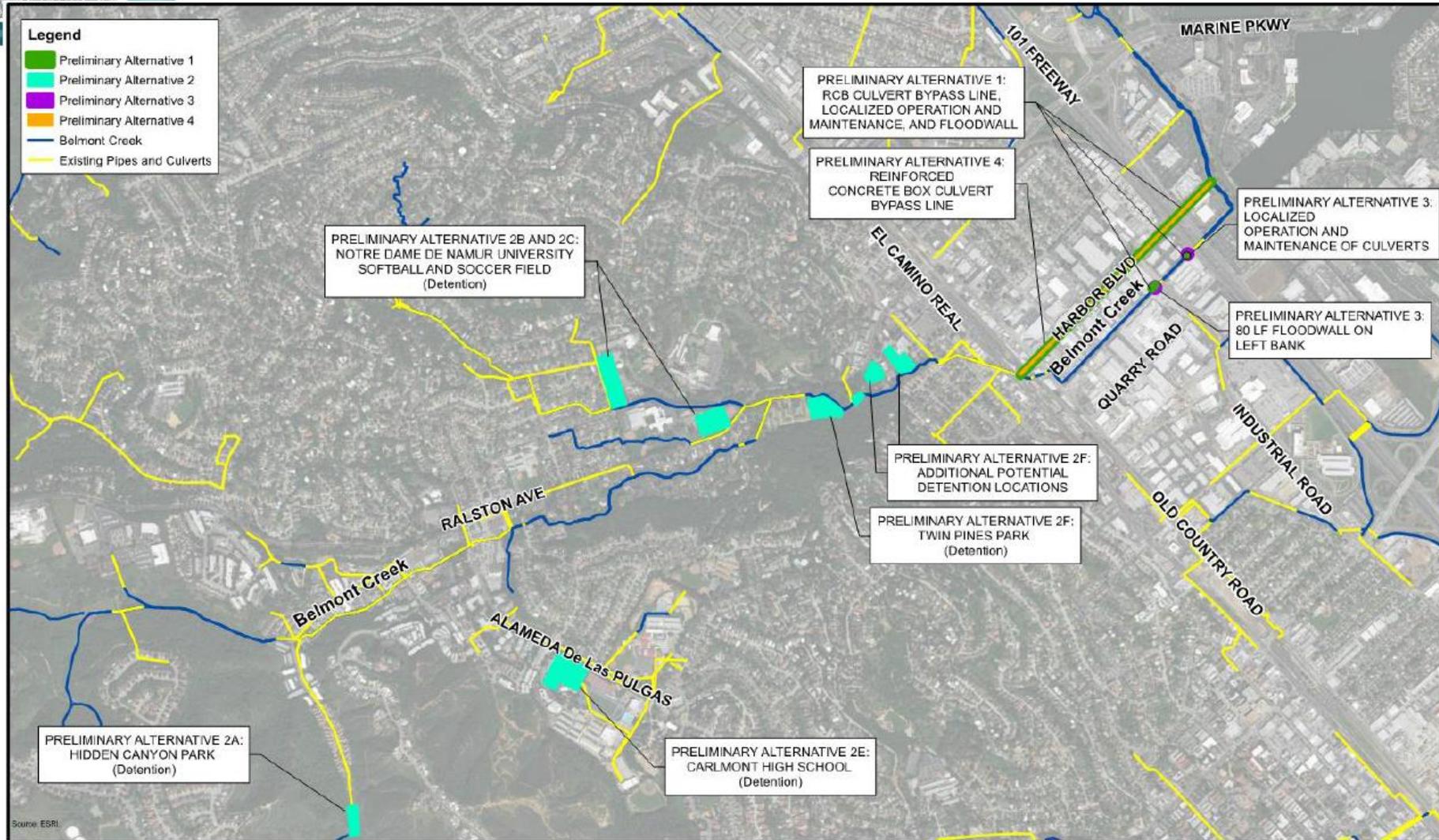


Example plastic infiltration chamber beneath a future parking lot

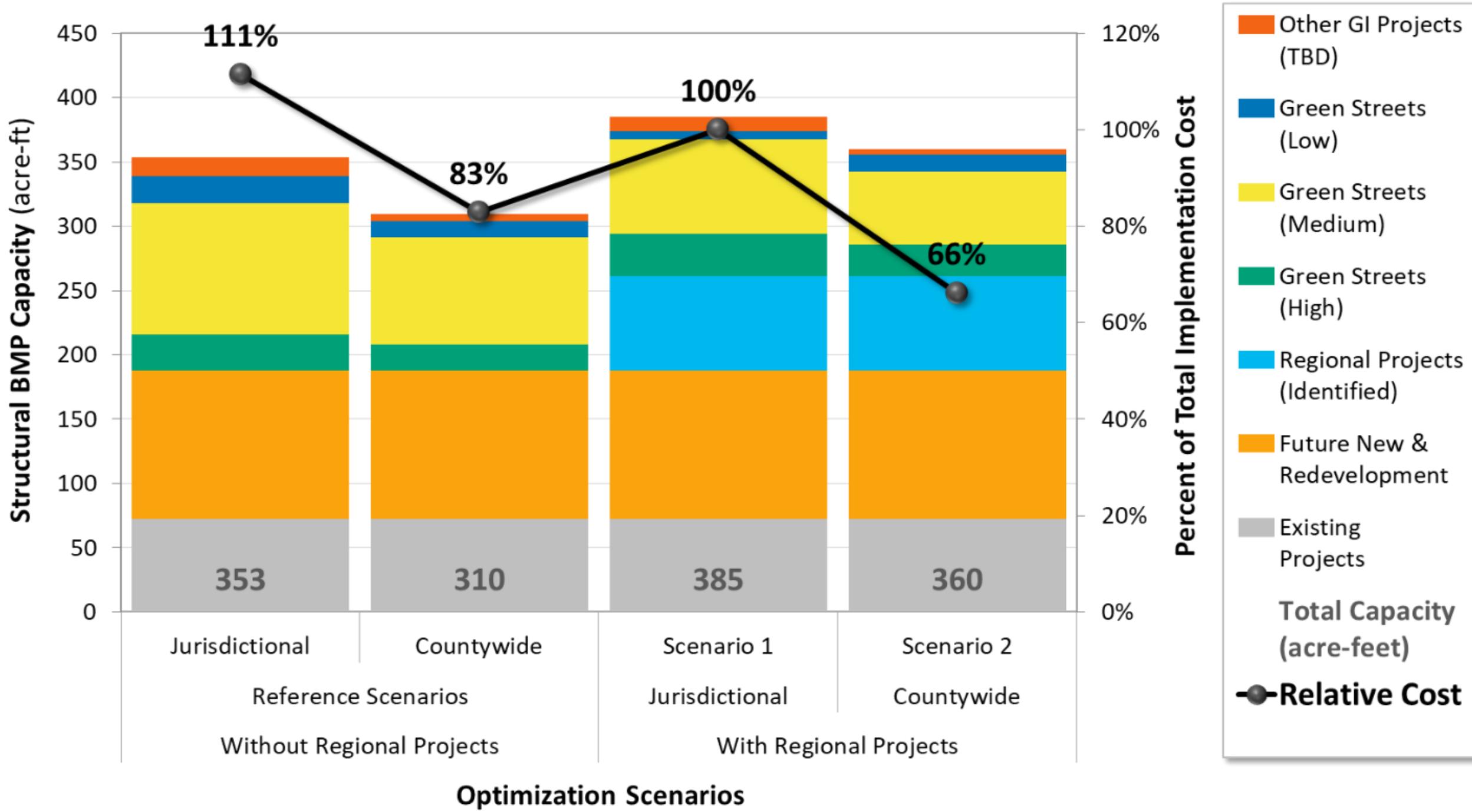
Concept for a Multi-jurisdictional Regional Stormwater Capture Project Site: Twin Pines Park (City of Belmont)



Project Alternatives



Source: ESRI



Recommendation

- Provide funding for FSLRRD to develop “business case” for countywide MOU/collaboration on stormwater
- Provide funding, as needed, to support County OOS effort to find more regional project opportunities, including engaging schools
- Work with ad-hoc workgroup to develop and issue “Call for Interest” from member agencies/others to identify candidate projects that are ready to move forward toward implementation – bring results back to SW Committee at future meeting
- Depending on results of Call for Interest, consider a competitive call for formal project proposals, requiring local match (recommend minimum be required, extra points for greater match)
- Goal is to be successful in moving one or more multi-benefit projects through complete design/environmental
- Look for opportunities to get more \$\$ from upcoming grants