Integrated Safe Routes to School and Green Streets Infrastructure Pilot Program Report

August 2025

C/CAG
City/County Association of Governments
of San Mateo County

Table of Contents

Acknowledgements

The Integrated Safe Routes to School and Green Streets Infrastructure Pilot Program was a collaborative effort of the City/County Association of Governments of San Mateo County (C/CAG) and the 10 participating municipalities in the county listed below. It was made possible by leveraging $2.1 million in local vehicle registration fee revenue dedicated to regional congestion management and stormwater management activities. The Pilot Program would not have been possible without the key input and efforts of the staff from the following agencies and programs.

C/CAG Staff

San Mateo Countywide Water Pollution Prevention Program

Congestion Management Program

Sponsor Agency Staff

City of Brisbane

Town of Colma

City of Daly City

City of East Palo Alto

City of Half Moon Bay

City of Menlo Park

City of Millbrae

City of Pacifica

City of Redwood City

Unincorporated County of San Mateo

Executive Summary

This report catalogs the successes and lessons learned from the Integrated Safe Routes to School and Green Streets Infrastructure Pilot Program (Pilot Program), administered by the City/County Association of Governments of San Mateo County—a Joint Powers Agency of the 20 incorporated municipalities in San Mateo County and County of San Mateo. The Pilot Program was developed by C/CAG with the primary intent of advancing a number of pilot integrated infrastructure projects throughout San Mateo County that explicitly bridge the goals of active transportation improvements near schools with the water quality and community benefit goals of green stormwater infrastructure (GSI). A secondary objective of the Pilot Program was to demonstrate the potential cost savings of integrating infrastructure planning and implementation between the transportation and stormwater management departments of local agencies. By planning drainage and water quality improvements with active transportation infrastructure improvements together, there's a potential cost avoided by "only digging once" and expanding co-benefits, like enhanced safety, community greening, reduced urban heat island effects, among others.

The Pilot Program was initiated in 2017 and the last of the ten pilot projects was completed in 2024. C/CAG leveraged $2.1 million in local vehicle registration fee revenue dedicated to regional congestion management and stormwater management activities. The Pilot Program was available to any C/CAG member agency in the county and participating agencies were required to provide at minimum 15 percent matching contributions to leverage the grant funds. The projects also needed to demonstrate an approximate split in program components to achieve Safe Routes to School (SRTS) and GSI benefits.

During the development and implementation of the Pilot Program, C/CAG also advanced a parallel and related initiative to support integrated active transportation and GSI infrastructure through the San Mateo County Sustainable Streets Master Plan (SSMP)[1]. The SSMP identified and prioritized hundreds of opportunities throughout the county for integrated infrastructure projects, with the overarching goal of bridging Complete Streets designs with GSI for active transportation, water quality and climate resilience benefits. As detailed in Section 2, this report draws on the three main "sustainable streets typologies" from the SSMP to illustrate how the Pilot Program projects fit into this conceptual framework for advancing multi-scale integrated roadway improvements.

Section 3 of the report includes a compilation of one-page case studies for each of the ten pilot projects. The project case studies summarize the background of each project, as well as the project typology, the project cost, and the Safe Routes to School and Green Stormwater Infrastructure components of the project.

Lastly, in partnership with the local project sponsors, C/CAG staff documented lessons learned in Section 4 to gather key takeaways from designing, constructing, and, to the extent available, maintaining the pilot projects. Common issues included dealing with underground utilities, existing street trees, and limited space in the right-of-way, while other challenges were more site specific. The hope is that these lessons will support municipalities in navigating potential difficulties and identifying innovative solutions for future projects.

[1] San Mateo County Sustainable Streets Master Plan (2021) - https://flowstobay.org/data-resources/plans/sustainable-streets-master-plan/

1. Integrated Safe Routes to School and Green Streets Infrastructure Pilot Program Overview

1.1 Background

The Integrated Safe Routes to School and Green Streets Infrastructure Pilot Program (Pilot Program), administered by the City/County Association of Governments of San Mateo County (C/CAG), funded ten integrated Safe Routes to School and green stormwater infrastructure (GSI) projects throughout the county in 2017, with the last project completed in June 2024. C/CAG, which is a Joint Powers Authority of the 20 incorporated municipalities in San Mateo County and County of San Mateo, is the Congestion Management Agency in San Mateo County, which supports many transportation planning and funding initiatives in the County, including administering the Safe Routes to School Program in partnership with the San Mateo County Office of Education. Among its other roles, C/CAG also operates the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), which provides regulatory compliance support to C/CAG's member agencies regarding State and Federal water quality mandates administered by the San Francisco Bay Water Quality Control Board via the Municipal Regional Stormwater Permit (MRP). Given C/CAG's focus on transportation planning and water quality management, the concept of integrating transportation infrastructure enhancements—especially active transportation improvements—with nature-based GSI for water quality and other community co-benefits is something that C/CAG has supported internally as an organization and regionally among its counterparts and partners in the San Francisco Bay Area for many years.

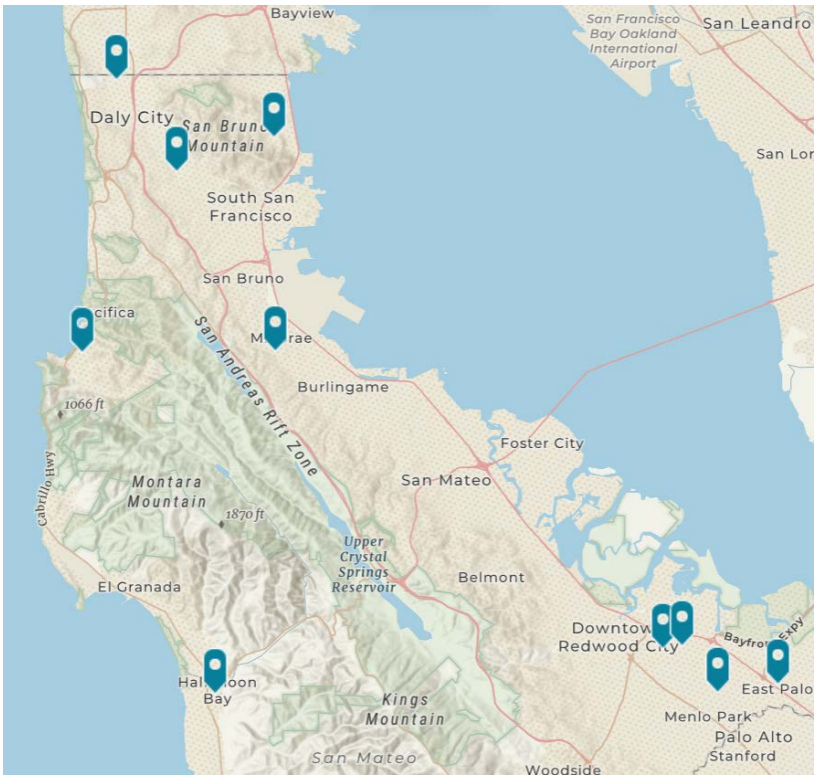


Figure 1. Integrated Safe Routes to School and Green Streets Pilot Program Project Map

The 10 projects built as part of the Pilot Program are intended to make walking and biking to and from schools safer and more enjoyable for students and families, while also supporting the municipalities in San Mateo County to advance water quality requirements related to GSI planning and implementation associated with the MRP. The projects are focused on enhancing intersection and mid-block crossings near neighborhood schools and feature a balance of active transportation safety improvements (e.g., new Americans with Disabilities Act curb-ramps incorporated into pedestrian bulbouts, rectangular rapid flashing beacons, high visibility striping at intersections), integrated with GSI components, including bioretention areas in various configurations (e.g., stormwater curb-extensions/bulbouts or stormwater planters behind the curb). These integrated GSI features capture, store and treat polluted runoff using vegetation and special soils designed to filter water. It is well established that many of the aspects of GSI can also have cross-over benefits for roadway safety, which was one of the main drivers for these projects. For example, incorporating stormwater curb-extensions in mid-block crossings or at intersections can reduce vehicle speeds by narrowing the roadway at crossings and increasing visibility of pedestrians, if vegetation is planned and maintained properly. These features can also improve drainage associated with new crossings, sidewalks, etc., which can be an added value to new infrastructure projects when significant roadwork is being done. As described previously, GSI can also improve community aesthetics, support urban cooling (especially where trees are included) and can mitigate the growing impact of extreme precipitation and localized flooding during wet weather.

The cost of building GSI, however, can be prohibitive, and cities often lack dedicated funding to effectively plan, build and maintain GSI, especially when motivated and funded by local stormwater program initiatives alone, which typically compete with other General Fund priorities, like fire, police, libraries, etc. Though not likely the entire solution, local transportation programs may play an important role in co-funding GSI projects when integrated with other related infrastructure. For instance, transportation grant programs, such as the One Bay Area Grant Program (administered by ABAG/MTC), allow for GSI as an eligible cost. Other state and federal transportation grant programs may also support GSI implementation, though funding for maintenance of vegetated facilities is almost never an eligible grant cost and this remains a significant challenge. A significant need from a policy and local governance standpoint is supporting local municipalities with local planning and policy changes that will foster greater innovation and opportunity to expand project benefits via integration of multi-benefit components.

To that end, the Pilot Program is also intended to demonstrate the potential cost-efficiencies of integrating infrastructure improvements to prevent redundant planning and reduce construction costs and to also provide case study examples of real projects to provide lessons learned for other municipalities working on future projects. In essence, the intended benefits and overall goals of integrating infrastructure improvements under this Pilot Program were to demonstrate how active transportation programs can be “stacked” to include additional water quality and environmental benefits, while reducing potentially duplicative planning and construction work by only digging once to achieve multiple community goals, and showing how transportation and water quality/natural resource funds can be leveraged to jointly fund multi-benefit projects.

An additional goal of the Pilot Program was to bring municipalities and schools together to identify potential project ideas and give municipalities a clearer understanding of the barriers schools face in enabling students to walk and bike safely.

1.2 Pilot Program Design

The Safe Routes to School and Green Streets Infrastructure Pilot Program was jointly funded through C/CAG's countywide stormwater program and congestion management program via a fund balance from the prior $4 vehicle registration fee funds (Assembly Bill 1546 funds) dedicated to addressing countywide roadway related stormwater runoff impacts and the countywide congestion management program funds available through the replacement $10 vehicle registration fee established under Measure M in 2010. The total funding available through the Pilot Program was $2.1M, split evenly between the two funding sources. To leverage the grant funds through the Pilot Program, participating agencies were required to provide a minimum 15% local match on the total grant funds received. Projects were funded between $144,500K-$250K.

In July 2017, C/CAG staff developed a Call for Projects and application process to be considered for funds under the Pilot Program, which was made available to all C/CAG member agencies. Project eligibility criteria for the Pilot Program included the following:

- Infrastructure projects only/not programmatic (only construction costs reimbursable)
- Projects must be at mid-block crossings or intersections
- Projects must be identified in a Walk Audit or Pedestrian/Bike Plan – or located within a ½ mile radius of a school with adequate justification
- Projects must demonstrate a balance of GSI and SRTS components
- Agencies could submit for funding up to two separate project locations

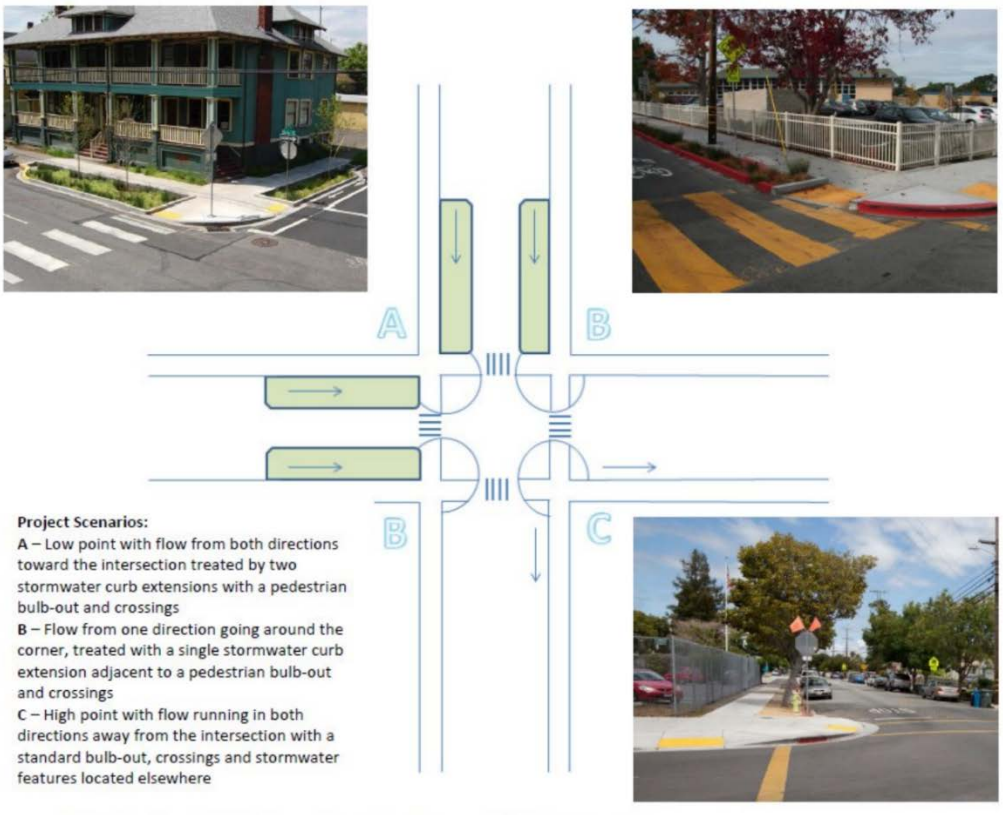


Figure 2. Potential project scenarios from the Pilot Program Call For Projects

The process for developing the call for projects was completed in coordination with the San Mateo County Office of Education (SMCOE) Safe Routes to School (SRTS) program to establish grant guidelines. C/CAG and SMCOE hosted an information sharing workshop with the SMCOE and SRTS coordinators working with a range of participating school sites. The main goal of the workshop was to encourage municipalities to work with schools in their jurisdiction and to apply for funding and identify potential project locations using SRTS audits.

As part of the application process, project sponsors needed to include details about the existing project conditions, a basic conceptual design of the project, a description of the approximate split between GSI and SRTS components, the sizing calculations for the proposed stormwater treatment measures, a commitment to long-term operation and maintenance (O&M) of the GSI, a letter of support from the local school district or site, a detailed project scope, budget, and timeline, and additional information about the planned matching funds. Proposals were also encouraged to include additional community support letters and the inclusion of educational signage as part of the construction projects.

Pilot Project Funding List			
Jurisdiction	Project Title	Funding Request	Funding Amount
Redwood City	Safe Routes to School (SRTS) and Green Streets Infrastructure Pilot Program at Taft Community School	$250,000	$250,000
Colma	Mission Road Improvements Safe Routes to School and Green Streets Infrastructure Project	$200,000	$200,000
Pacifica	Cabrillo School Pedestrian Crossing Improvement Project	$157,600	$157,600
East Palo Alto	Addison Avenue SRTS and Green Streets Infrastructure Project	$250,000	$250,000
Millbrae	Taylor Middle School SRTS and GSIPP	$212,500	$212,500
Brisbane	Brisbane SRTS and Green Infrastructure Project	$245,263	$245,263
Daly City	Westlake Elementary School Pilot Green Streets Improvements Project	$144,500	$144,500
San Mateo County	Fair Oaks Community School Green Infrastructure and SRTS Improvements	$250,000	$250,000
Half Moon Bay	Half Moon Bay Safe Routes to Cunha School Project	$153,000	$153,000
Menlo Park	Oak Grove SRTS and Green Infrastructure Improvements Project	$250,000	$250,000
	TOTAL:	$2,112,863	$2,112,863

Table 1. Safe Routes to School and Green Streets Pilot Program Funding Overview

Fifteen project proposals were submitted by 12 municipalities and based on staff evaluation of the eligibility and project scoring criteria, 10 projects were selected and recommended for funding (see Table 1). Staff sought to allocate the entirety of the available funds, which totaled $2,112,863, and funding ranged between $144,500 and the maximum of $250,000.

Most projects required substantial funding beyond what C/CAG was able to provide and the sponsor agencies in many cases leveraged additional grant funding from other sources and/or used other local agency funds to complete the projects. This program has demonstrated how expensive these projects can be, especially when dealing with utility conflicts, and when design and construction costs are higher than expected due to unanticipated project redesigns and other logistical challenges in the field. These costs can make it challenging for simple Right-of-Way (ROW) improvements to incorporate GSI, especially where funding is limited and where fully developed urban areas are being retrofitted.

The project funding agreements were executed in late 2017 and early 2018 with an initial three-year funding period, though many projects experienced delays, not the least of which was attributed to the COVID-19 pandemic which caused substantial time delays and increased costs. As a result, a majority of

projects required one or more one-year time extensions to complete construction. No additional grant funds were provided for increased costs, as this was a one-time, limited pot of funding.

2. Sustainable Streets Master Plan Project Typologies

Subsequently to the launch of the Pilot Program, C/CAG secured a $1M grant from the Caltrans Climate Adaptation Grant Program to develop the San Mateo County Sustainable Streets Master Plan (Master Plan). The Master Plan provides an important institutional framework and technical resources for advancing integrated roadway infrastructure projects in San Mateo County and is included in this report as a reference for how the Pilot Program projects fit within this framework of different sustainable streets typologies. A primary goal of the Master Plan was to explicitly link Complete Streets design elements with GSI for overall expanded community and environmental outcomes, including climate resilience, water quality, greening and other community co-benefits. The Master Plan also included an evaluation of future precipitation under climate change (including simulated 6-hour runoff depths for future 2-yr, 5-yr, 10-yr, 25-yr, 50-yr, 100-yr and 200-yr storm events) and incorporated climate resilience benefits into the scoring criteria to prioritize existing planned and newly identified opportunities. The primary outputs of the Master Plan include a report documenting the methodologies, geospatial data of the project screening, stormwater management and co-benefit data layers, and the prioritization of hundreds of sustainable streets project opportunities countywide across three separate typologies that maximize the integration of pedestrian, bicycle, and transit improvements with GSI components. The Master Plan is a roadmap and set of tools to assist public agencies across the county in planning and implementing sustainable streets projects, and includes additional resources to support this work, including an Excel-based intersection feasibility assessment tool, a comprehensive cloud-based Green Stormwater Infrastructure Mapping and Tracking Tool, and policy and funding recommendations.

The three primary project typologies outlined in the Master Plan and summarized below are (1) Sustainable Street Curb Extensions, (2) Sustainable Street Connectivity Improvements, (3) Sustainable Streetscape Redesign Projects. There is a fourth typology (Sustainable Street Frontage Improvements for New Developments), which is not part of the prioritization assessment, but rather was included in the Master Plan as a sustainable street typology that municipalities may include in local policies and ordinances requiring developers to plan and fund sustainable streets projects as a condition of new and redevelopment projects. The following summarizes each typology:

1. **Sustainable Street Curb Extensions** are curb modifications that improve pedestrian safety and traffic calming while integrating GSI to manage stormwater, enhance neighborhood greening, and meet regulatory and mobility goals.

2. **Sustainable Street Connectivity Improvements** are linear corridor projects that combine transportation features like bike paths and medians with integrated GSI such as planters and permeable pavement to enhance mobility, meet water quality regulations, and support broader stormwater and sustainability goals.

3. **Sustainable Streetscape Redesign Projects** are multi-block, high-investment efforts typically located in downtown or main street areas that integrate public realm enhancements, GSI, and transportation improvements, driven by goals of revitalization, water quality compliance, and Complete Streets design.

4. **Sustainable Street Frontage Improvements for New Developments** are regulatory-driven transportation, public realm, and stormwater upgrades built along development frontages to enhance neighborhood livability and environmental quality.

As detailed in the Project Case Studies section of this report (Section 3), the Pilot Program projects model a variety of the sustainable streets typologies described in the Master Plan. The figure below summarizes the different aspects of the four typologies, including relative costs, project drivers and Complete Streets and GSI elements. Additional information and resources from the Master Plan can be found on C/CAG's stormwater program website – www.flowstobay.org/ssmp.

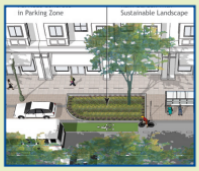
	Sustainable Street Typology	Relative Cost	Example Project Drivers	Example Transportation Design Elements	Example Stormwater Design Elements
1	Sustainable Street Curb Extensions	$	Safe Routes to School, Vision Zero Plans, Safe Routes to Transit, Traffic Calming Corridor,	Crosswalks, Curb Extensions, Pedestrian Refuges	Stormwater Curb Extension
2	Sustainable Street Connectivity Improvements	$$-$$$	First/Last Mile Project, Class I or IV Bikeways, Gap Closure Project	Cycle Tracks, Extended Medians, Bike Lanes	Stormwater Planter, Stormwater Curb Extension, Green Gutter, Pervious Pavement, Tree Well, Infiltration System
3	Sustainable Streetscape Redesign Projects	$$$$	Main Street Redesign, Complete Street Project, Corridor Beautification, Downtown Reinvestment	Street Trees, Seating, Lighting, Sidewalk Widening, Transit and Bike/Ped Improvements	Stormwater Planter, Stormwater Curb Extension, Tree Well Pervious Pavement, Infiltration System
4	Sustainable Street Frontage Improvements for New Developments	$-$$(1)	Development Conditions of Approval	Street Trees, Sidewalk and Pedestrian Improvements	Stormwater Planter, Stormwater Curb Extension, Pervious Pavement, Tree Well, Infiltration System

(1) Costs may be paid by private sector if tied to redevelopment requirements.

1: Bulb Outs and Curb Extensions

2: Connectivity Improvements

3: Streetscape Projects



4: Frontage Improvements

Figure 3. Sustainable Street Typologies

3. Project Case Studies

This section of the report showcases the 10 pilot projects funded under the Pilot Program via one-page case studies, or factsheets, of each project. The case studies provide a brief background description of the projects, including the location and identified need for the improvements, as well as a summary of the primary infrastructure components, relevant sustainable streets typologies, the project-specific Pilot Program grant funding allocation from C/CAG, and cost breakdown between SRTS and GSI infrastructure elements.

3.1 City of Brisbane – Brisbane Elementary SRTS/GI Pilot Project

Background:

The City of Brisbane sponsored a multi-block pedestrian improvements project, including several components of an integrated Safe Routes to School and Green Streets Infrastructure Pilot Project. The project includes bioretention areas at the pedestrian island at Visitacion Ave., Alvarado St., and on the curb return at Visitacion Ave. and Alvarado St. The Safe Routes to Schools improvements include four pedestrian bulbouts with ADA ramps, as well as maintaining the existing rapid flashing beacons at each crossing. The improvements at San Bruno Ave. and Santa Clara St. include a mid-block pedestrian bulbout with a bioretention area on San Bruno Ave. and a pedestrian bulbout and a bioretention area on the southeast corner of San Bruno Ave. and Santa Clara St.

Sustainable Streets Context:

• Typology 2 – Sustainable Street Connectivity Improvement.

• Reduces flooding and treats stormwater runoff, while increasing accessibility, safety, and connectivity.

Project Cost:

• C/CAG grant for construction costs (plus minimum 15% local match): $245,263.

• Relative funding breakdown: 60% Safe Routes to School and 40% Green Stormwater Infrastructure.

• Required additional funding: Yes.

Sustainable Streets Components:

Safe Routes to School:

• Installation of a crosswalk.

• Striping and signage improvements.

• 2,430 feet of sidewalk pedestrian bulbouts.

Green Stormwater Infrastructure:

• 275 square feet of permeable pavers.

• 1,560 sq. ft. of bioretention area.

Educational Signage: Yes.

Figure 4. Brisbane Elementary SRTS/GI Pilot Project

3.2 Town of Colma – El Camino High School SRTS/GI Pilot Project

Background:

The Town of Colma sponsored an integrated Safe Routes to School and Green Infrastructure Pilot Project that features bioretention areas on both sides of Mission Road at the Holy Cross Cemetery entrance with an improved crossing with ADA (Americans with Disabilities Act) ramps and rapid flashing rectangular beacons. The project is part of a larger capital project for improvements of bicycle and pedestrian facilities on Mission Road. The project also includes an enhanced mid-block crossing north of the main gate with ADA ramps and rapid flashing beacons.

Sustainable Streets Context:

• Typology 1 – Sustainable Street Curb Extensions.

• Reduces flooding and treats stormwater runoff, while increasing accessibility and safety.

Project Cost:

• C/CAG grant for construction costs (plus minimum 15% local match): $200,000.

• Relative funding breakdown: 40% Safe Routes to School and 60% Green Infrastructure.

• Required additional funding: Yes.

Sustainable Streets Components:

Safe Routes to School:

• 345 feet of high visibility crosswalk striping.

• Four ADA ramps.

• Two rapid flashing beacon systems.

Green Infrastructure:

•Three bioretention areas.

Educational Signage: Yes.

Figure 5. El Camino High School SRTS/GI Pilot Project

3.3 City of Daly City – Westlake Elementary School SRTS/GI Pilot Project

Background:

The City of Daly City sponsored an integrated Safe Routes to School and Green Infrastructure Pilot Project that incorporates two pedestrian bulbouts integrated with bioretention areas at two corners located at the intersection of Fieldcrest Dr. and Westlawn Ave. The integrated improvements will help make biking and walking to and from Westlawn Elementary School safer and more enjoyable for students and families, while improving the water quality of stormwater runoff.

Sustainable Streets Context:

• Typology 1 – Sustainable Street Curb Extensions.

• Reduces flooding and treats stormwater runoff, while increasing accessibility, and safety.

Project Cost:

• C/CAG grant for construction costs (plus minimum 15% local match): $144,500.

• Relative funding breakdown: 34% Safe Routes to School and 66% Green Infrastructure.

• Required additional funding: No.

Sustainable Streets Components

Safe Routes to School:

• Three pedestrian bulbouts.

• Two curb ramps with detectable warning surface.

Green Infrastructure:

• 375 square feet of bioretention area.

• Two curb opening catch basins.

Educational Signage: No.

Figure 6. Westlake Elementary School SRTS/GI Pilot Project

3.4 City of East Palo Alto – Cesar Chavez Elementary School SRTS/GI Pilot Project

Background:

The City of East Palo Alto sponsored an integrated Safe Routes to School and Green Infrastructure Pilot Project. The multi-block project combines pedestrian and bike safety with green infrastructure improvements, including several components of an integrated Safe Routes to School and Green Infrastructure Pilot Project. The project incorporates ADA ramps, pavement markings/ signage to designate the road as a Class III bike route, permeable concrete, and pedestrian bulbouts at intersection corners and intermediate mid-block locations. The bulbouts enhance pedestrian safety by improving pedestrians' visibility to approaching vehicles and by slowing vehicles on Addison Ave. The project also includes educational signage at the north and south ends of the project corridor. The signs demonstrate the stormwater and pedestrian safety benefits of the improvements along the corridor.

Sustainable Streets Context:

• Typology 2 – Sustainable Street Connectivity Improvement.

• Reduces flooding and treats stormwater runoff, while increasing accessibility, safety, and connectivity.

Project Cost:

• C/CAG grant for construction costs (plus minimum 15% local match): $250,000.

• Relative funding breakdown: 32% Safe Routes to School and 68% Green Infrastructure.

• Required additional funding: Yes.

Sustainable Streets Components:

Safe Routes to School:

• 14 ADA ramps.

• Striping and signage improvements.

Green Infrastructure:

• 19,000 square feet of permeable concrete.

• Eight bioretention areas.

Educational signage: Yes.

Figures 7 & 8. Cesar Chavez Elementary School SRTS/GI Pilot Project

3.5 City of Half Moon Bay – Manuel F. Cunha Intermediate School SRTS/GI Pilot Project

Background:

The City of Half Moon Bay sponsored an integrated Safe Routes to School and Green Infrastructure Pilot Project located at the intersection of Correas St. and Purissima St., adjacent to the new Half Moon Bay Library and one block from the Manuel F. Cunha Intermediate School. This project creates a safe walking atmosphere for students trying to reach Cunha Intermediate School. This pilot project demonstrates the multiple benefits of Sustainable Streets Typologies 1 and 4 by integrating green stormwater infrastructure with crossing improvements on three corners of a high-traffic intersection as part of a larger development project to update the library. This site has been included in C/CAG's Green Streets Stewardship Pilot Program in partnership with the San Francisco/San Mateo Master Gardeners. From 2019-2021, Master Gardeners were onsite collecting performance data and helping maintain the bioretention areas, while educating the public about the facilities.

Sustainable Streets Context:

• Typology 1 & 4 – Sustainable Street Curb Extensions and Frontage Improvement for New Development

• Urban look and feel in a rural coastside context

Project Cost:

• C/CAG grant for construction costs (plus minimum 15% local match): $153,000.

• Relative funding breakdown: 40% Safe Routes to School and 60% Green Infrastructure.

• Required additional funding: No.

Sustainable Streets Components:

Safe Routes to School:

• Three bi-directional ADA pedestrian bulbouts.

• High visibility crossings on all four crossings.

• A wider sidewalk, bike repair station, and pedestrian-scale lighting and seating.

Green Infrastructure:

• Five bioretention areas integrated within the pedestrian bulbouts.

• Two subsurface hydraulic connections to improve drainage into bioretention areas.

Educational signage: Yes.

Figure 9. Manuel F. Cunha Intermediate School SRTS/GI Pilot Project

3.6 City of Menlo Park – Menlo-Atherton High School and Nativity School SRTS/GI Pilot Project

Background:

The City of Menlo Park sponsored an integrated Safe Routes to School and Green Infrastructure Pilot Project located on Oak Grove Ave. in Menlo Park, one block from Menlo Atherton High School and alongside the Nativity Catholic School, Vallombrosa Center and Nativity Church. The project aims to improve connectivity and drainage issues on the street. Safety focus points include lack of accessibility to nearby buildings, lack of sidewalks in area, and limited crossings along Oak Grove Avenue.

Sustainable Streets Context:

• Typology 2 – Sustainable Street Connectivity Improvement.

• Reduces flooding and treats stormwater runoff, while increasing accessibility, safety, and connectivity.

Project Cost:

• C/CAG grant for construction costs (plus minimum 15% local match): $250,000.

• Relative funding breakdown: 45% Safe Routes to School and 55% Green Infrastructure.

• Required additional funding: Yes

Sustainable Streets Components:

Safe Routes to School:

• 200 feet of curb-separated pedestrian path on the south side of the street.

• 800 ft. of path connecting Nativity Catholic School and Nativity Church.

• Rapid flashing beacon and new midblock crossing.

Green Infrastructure:

•2,400 square feet of bioretention area

Educational signage: Yes.

Figure 10. Menlo-Atherton High School and Nativity School SRTS/GI Pilot Project

3.7 City of Millbrae – Taylor Middle School SRTS/GI Pilot Project

Background:

The City of Millbrae designed and built an integrated Safe Routes to School and Green Infrastructure Pilot Project near Taylor Middle School on Taylor Blvd. and Almenar St. The enhancements include an upgraded crossing integrated with bioretention areas on both sides of Taylor Blvd. at Almenar St. and a bioretention area on the south curb return on Almenar St. The project addresses pedestrian safety concerns related to high traffic volume.

Sustainable Streets Context:

• Typology 1 – Sustainable Street Curb Extensions.

• Reduces flooding and treats stormwater runoff, while increasing accessibility, and safety.

Project Cost:

• C/CAG grant for construction costs (plus minimum 15% local match): $212,500.

• Relative funding breakdown: 31% Safe Routes to School and 69% Green Infrastructure.

• Required additional funding: Yes.

Sustainable Streets Components

Safe Routes to School:

• Signage and striping improvements.

• Two pedestrian bulbouts.

Green Infrastructure:

• Four bioretention areas.

Educational Signage: Yes.

Figure 11. Taylor Middle School SRTS/GI Pilot Project

3.8 City of Pacifica – Cabrillo Elementary School SRTS/GI Pilot Project

Background:

The City of Pacifica sponsored an integrated Safe Routes to School and Green Streets Infrastructure Pilot Project at the Cabrillo Elementary School on Crespi Dr. The project advances pedestrian safety with an improved crossing on Crespi Dr. at the entrance to the school with bioretention areas on both sides of the street and both sides of the crossing. This site has been included in C/CAG's Green Streets Stewardship Pilot Program in partnership with the San Francisco/San Mateo Master Gardeners. From 2019-2021, Master Gardeners were onsite collecting performance data and helping maintain the bioretention areas, while educating the public about the facilities.

Sustainable Streets Context:

• Typology 1 – Sustainable Street Curb Extensions.

• Reduces flooding and treats stormwater runoff, while increasing accessibility, and safety.

Project Cost:

• C/CAG grant for construction costs (plus minimum 15% local match): $157,600.

• Relative funding breakdown: 50% Safe Routes to School and 50% Green Infrastructure

• Required additional funding: No.

Sustainable Streets Components:

Safe Routes to School:

• ADA access ramps on both sides of the mid-block crossing.

• Thermoplastic crosswalk.

• Updated existing crosswalk traffic light.

Green Infrastructure:

• 1,600 square feet of bioretention area.

Educational Signage: Yes.

Figure 12. Cabrillo Elementary School SRTS/GI Pilot Project

3.9 City of Redwood City – Taft Elementary School SRTS/GI Pilot Project

Background:

The City of Redwood City sponsored an integrated Safe Routes to School and Green Streets Infrastructure Pilot Project at 5th Ave. and Page St. near Taft Elementary School. The primary features of this project include five bioretention areas at three corners of the intersection of 5th Ave. and Page St., including two in the southwest, two in the southeast, and one in the northwest. The Safe Routes to School improvements include four pedestrian bulbouts at 5th Ave. and Page St., along with high visibility crosswalks at that intersection and high visibility crosswalks and rapid rectangular flashing beacons at 8th Ave. and Bay Rd., and 10th Ave. and Bay Rd.

Sustainable Streets Context:

- Typology 1 – Sustainable Street Curb Extensions.
- Reduces flooding and treats stormwater runoff, while increasing accessibility, and safety.

Project Cost:

- C/CAG grant for construction costs (plus minimum 15% local match): $250.000.
- Relative funding breakdown: 38% Safe Routes to School and 62% Green Infrastructure.
- Required additional funding: Yes.

Figure 13. Taft Elementary School SRTS/GI Pilot Project

Sustainable Streets Components

Safe Routes to School:

- Four pedestrian bulbouts.
- Four high-visibility crosswalks.
- Two rectangular rapid flashing beacons.

Green Infrastructure:

- Five bioretention areas.

Educational Signage: Yes.

3.10 Unincorporated County of San Mateo – Fair Oaks Community School SRTS/GI Pilot Project

Background:

The County of San Mateo sponsored an integrated Safe Routes to School and Green Streets Infrastructure Pilot Project at the Fair Oaks Community School. This project integrates a linear bioretention area behind the sidewalk on Fair Oaks Ave. The project collects runoff from the campus and the adjacent right of way through a trench drain. The project also includes an improved crossing at the intersection with new ADA improvements and an improved mid-block crossing on the same street segment. The project increases visibility of pedestrians and slows vehicle traffic through the intersection.

Sustainable Streets Context:

• Typology 1 – Sustainable Street Curb Extensions.

• Reduces flooding and treats stormwater runoff, while increasing accessibility, and safety.

Project Cost:

• C/CAG grant for construction costs (plus minimum 15% local match): $250,000.

• Relative funding breakdown: 51% Safe Routes to School and 49% Green Infrastructure.

• Required additional funding: Yes.

Sustainable Streets Components

Safe Routes to School:

• 200 feet of curb-separated pedestrian path on the south side of the street.

• 800 ft. path connecting Nativity Catholic School and Nativity Church.

• Rectangular rapid flashing beacon and new midblock crossing.

Green Infrastructure:

• Two bioretention areas.

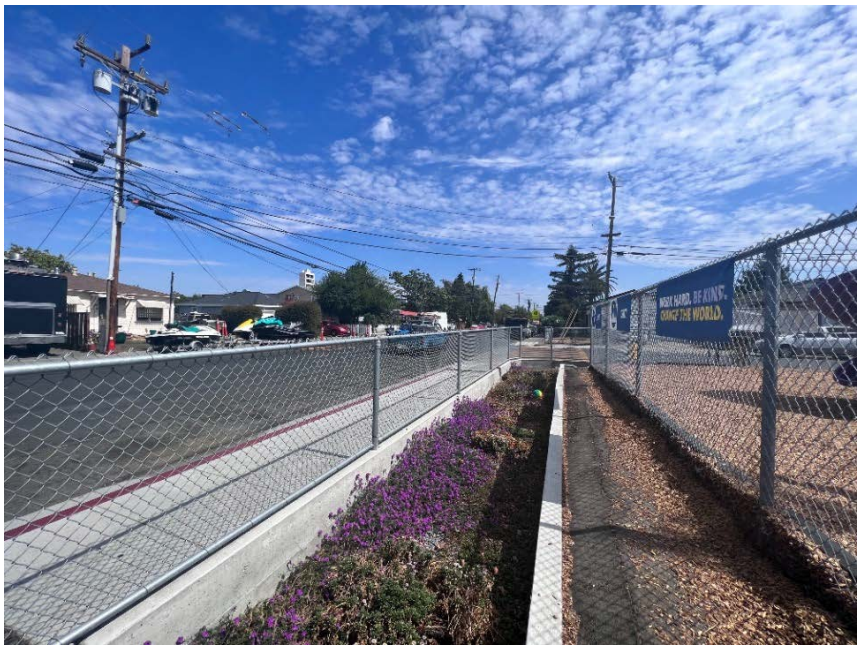


Figure 14. Fair Oaks Community School SRTS/GI Pilot Project

Educational Signage: Yes.

4. Lessons Learned

One of the goals of the Pilot Program was to catalogue the lessons learned from the project sponsors regarding key aspects of designing, constructing, and maintaining the integrated SRTS and GSI projects. C/CAG staff surveyed the lead staff on each pilot project and received feedback to the extent that information and data were available after project completion. A separate, but related overarching goal of the Pilot Program was to better understand and articulate the relative costs of integrated SRTS and GSI projects. The data on costs, though limited in terms of documenting the use of C/CAG's Pilot Program grant funds for construction (vs. the entire pooled funding needed to build these projects, which in most cases far exceeded the C/CAG grant funds), provides a small, local dataset for estimating the additional cost of including GSI in transportation projects on a dollar per "greened acre" managed basis. This can be helpful for local agency staff to evaluate opportunities for integrating GSI with active transportation projects as well as for providing messaging to C/CAG's member agency staff, elected officials, regulatory agencies, and other stakeholders regarding the costs and potential long-term cost-savings of being strategic about integrating infrastructure planning. Lastly, the case studies in the Pilot Program demonstrate how the expanded benefits of integrated projects can be achieved and importantly how transportation funding, whether through local program funds or state and federal grant programs (including regionally allocated programs, such as the Metropolitan Transportation Commission-Association of Bay Area Governments One Bay Area Grant Program or the Caltrans Active Transportation Program) can be leveraged to help defray some of the costs including GSI in transportation improvements, where these components may otherwise be left out due to funding limitations.

4.1 Planning and Design

During the planning and design phase, some project sponsors found it more beneficial to use their own municipal design standards, while other project sponsors relied on the guidance outlined in the stormwater treatment requirements of the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP). Specific feedback on planning and design considerations was not provided by all project sponsors, but the bullets below highlight key takeaways from some of the projects.

Utility/underground considerations:

- Confirm the minimum clearances with utilities where potential conflicts exist with PG&E, water and sewer utilities. etc., especially if the GSI requires an underdrain to be connected to the storm drainage system.
- Consider narrowing the GSI or encasing utilities in sleeves or concrete in the event of conflict.
- Ensure that perforated pipes do not intersect with shallow services (dry utilities).
- Review utility maps during the grant application phase.
- During design, consider the additional separation required with water lines as well as other utilities.
- Contact PG&E early in the design process if there are guy wires or poles that need to be relocated. Guy wires can be relocated within 6 months of notification, pole relocation may take longer.

- Confirm the sub-grade conditions underneath the GSI and whether impermeable liners are needed through a geotechnical report.
- Survey for existing or potential tree roots that could damage bioretention areas.

Planting considerations:

- Involve a landscape architect early in the planning process to design for irrigation considerations and to develop a planting plan that notes which plants for the GSI must be irrigated.
- Irrigation installation may be difficult due to cost considerations and lack of public water service lines available. If irrigation installation is impossible, plan on trucking water to the basins during the plant establishment period.
- To mitigate irrigation needs, select drought tolerant plants.

Other considerations:

- Collaboration between municipalities and schools helps ensure that project concepts are informed by the schools' firsthand knowledge of their students' transportation challenges.
- To forgo the need for costly cut-off walls, design for a buffer between the edge of the sidewalk and the GSI, as well as between the curb and the gutter leading to the GSI.
- Provide a watershed map and confirm if the GSI can be sized per C.3.d requirements of the MRP, or whether the use of alternative sizing metrics is needed.
- Coordinate street and traffic calming benefits with the Transportation Department prior to final design.
- Consider the importance of public education and awareness (e.g. signs for the GSI).
- Ensure proper offsets from joint poles to preserve structural integrity.
- Ensure the drainage from sloped terrain flows into GSI basins and ensure there is an appropriate underdrain connection to the storm drainage system.
- When designing pedestrian bulbouts, consider roadway width and turning template.

4.2 Construction

Construction experiences varied among project sponsors. During construction is where the greatest cost-sharing benefit was observed between the Safe Routes to Schools and Green Streets Infrastructure elements of the project. However, unexpected costs occurred more frequently during the construction phase than other project phases. One of the most common issues identified during construction was encountering and managing for underground utilities during excavation.

Construction considerations:

- Inspect the construction site after design to determine whether aspects of the design may not be feasible in the field.
- If the project requires the removal of soils, plan for testing soil for contaminants to ensure proper disposal and avoid significant delays.

- Exercise extreme caution when installing plastic pipe bracing detail.
- Contractors with limited GSI experience may require more oversight during construction.
- Bioretention area retaining walls can require significant excavation with many potential underground utility conflicts.
- Ensure that Biotreatment Soil Media (BSM) is not compacted and avoid foot traffic during installation where possible.
- Perform a percolation test to confirm 5 inch/hour infiltration after the installation of a bioretention area.
- Keep consistent and clear specifications that detail pay items.
- Concrete swale wall depth can have a significant impact on construction costs.
- When procuring bids, seek a diverse range of construction trades that are needed for GSI, underground work, and road work.

4.3 Post-Construction Operations & Maintenance

The information on post-construction operations & maintenance (O&M) was collected soon after the projects were completed and before extensive O&M was conducted, thus, the feedback is limited in nature. The most common feedback emphasized ensuring that early plant establishment is successful.

Post-construction O&M considerations:

- Irrigation installation may be difficult due to cost considerations and lack of public water service lines available. If irrigation installation is impossible, plan on trucking water to the bioretention areas during and after the three-month plant establishment period.
- To mitigate irrigation needs, select drought tolerant plants.
- Be prepared to replace the BSM when needed.
- Request the contractor agree to at least a 90-day plant and irrigation maintenance period.
- From a program perspective, ensure future grant applications contain incentives to ensure that future O&M responsibilities are accounted for.
- Cobblestone aprons can require more maintenance than concrete splash aprons.

4.4 Integrating Projects, Funding Considerations and Future Projects

Funding remains the largest obstacle to making these projects successful and for advancing integrated SRTS/GSI projects in San Mateo County more broadly. Many projects required substantial additional funding beyond what C/CAG was able to provide, and project sponsors needed to cobble together complex funding arrangements, often including other state/federal grants and local funds (including matching funds for grants). Several aspects of the integrated projects, however, can be used to leverage funding from local and outside sources.

Integration and funding considerations:

- GSI bulbouts can reduce the crossing distance at intersections and the two elements can naturally make school crossings safer.
- GSI sidewalk work can be a reasonable cost if there is ample distance of separation, but if not, the concrete structures may be compromised, resulting in costly repair.
- The most common project costs were attributed to concrete work. Combining GSI improvements with SRTS improvements provides an opportunity to eliminate the cost of redundant concrete work.
- Traffic control accounted for significant project costs for some projects and GSI improvements with SRTS improvements provides an opportunity to eliminate redundant traffic control spending.

The table below shows the breakdown of how the funding was split between GSI costs and Safe Routes to Schools costs for the Pilot Projects, as well as the relative cost of the GSI components.[2] It is worth noting, however, the cost data are not entirely consistent for "apples to apples" comparisons. For example, in some cases, the costs reflect the entire project, while in others they only reflect the portion of a larger project that was paid for by other funding sources, where the costs shown reflect just the parts of the project that C/CAG's grant funds were applicable to. Despite this, these data are useful for showing the general breakdown of costs when integrating infrastructure components and the overall rough estimate of the cost for integrating GSI on a dollar per acre basis. Though not included in this report for comparison, the goal of this project was to demonstrate how integrated projects may provide cost-efficiencies for GSI and active transportation improvements. According to data collected nationally, the cost of building standard GSI could approach $930,000 per acre[3], suggesting that the average cost of $317,839 per acre managed from the Pilot Program may be a value savings as a result of the integrated program components.

Project Sponsor	Year Completed	Drainage Area (acres)	GI Project Cost (2025$)	SRTS Cost (2025$)	Other Cost (2025$)	Total Cost (2025$)	GI Cost/Acre (2025$)	Total Cost/Acre (2025$)
Brisbane	2021	0.78	$ 385,104	$ 572,130	$ -	$ 957,234	$ 491,832	$1,222,521
Colma	2021	1.47	$ 208,062	$ 136,553	$ -	$ 344,615	$ 141,539	$ 234,432
County Unincorporated	2020	0.23	$ 170,895	$ 179,966	$ 10,082	$ 360,943	$ 736,616	$1,555,787
Daly City	2019	1.40	$ 141,042	$ 72,658	$ -	$ 213,700	$ 100,745	$ 152,643
East Palo Alto	2024	6.22	$ 1,295,938	$ 597,090	$ -	$ 1,893,027	$ 208,350	$ 304,345
Half Moon Bay	2018	0.48	$ 370,336	$ 246,890	$ -	$ 617,226	$ 771,533	$1,285,887
Menlo Park	2020	1.46	$ 341,103	$ 281,736	$ 51,729	$ 674,568	$ 233,632	$ 462,033
Millbrae	2020	1.95	$ 409,106	$ 183,912	$ 463	$ 593,481	$ 209,798	$ 304,349
Pacifica	2022	1.25	$ 159,183	$ 162,266	$ -	$ 321,449	$ 127,347	$ 257,159
Redwood City	2021	2.83	$ 444,301	$ 274,893	$ -	$ 719,193	$ 156,997	$ 254,132
						Average (2025$)	**$ 317,839**	**$ 603,329**

Table 2. Safe Routes to School and Green Streets Pilot Program Funding Breakdown

[2] Costs are shown in 2025 dollars, adjusted for inflation.

[3] TheStateOfPublicSectorGSI.pdf – Green Infrastructure Leadership Exchange (2022)

C/CAG is grateful for having the chance to develop and implement these projects with the local project sponsors in San Mateo County. C/CAG is also grateful for the connections forged between municipalities and schools through this Pilot Program. These partnerships created valuable opportunities for municipalities to better understand the needs and challenges schools face in supporting students who walk and bike, ensuring that future projects are more responsive to community priorities. C/CAG and its member agencies have already greatly benefited from the Pilot Program by advancing several projects throughout the county and by supporting MRP GSI implementation goals, including several high priority projects identified and conceptualized in the Sustainable Streets Master Plan, as shown below. C/CAG looks forward to continuing to foster greater collaboration and future successes with the integration of GSI and other countywide and local planning efforts in the county, whether sustainable streets, climate resilience, hazard mitigation, parks development and more.

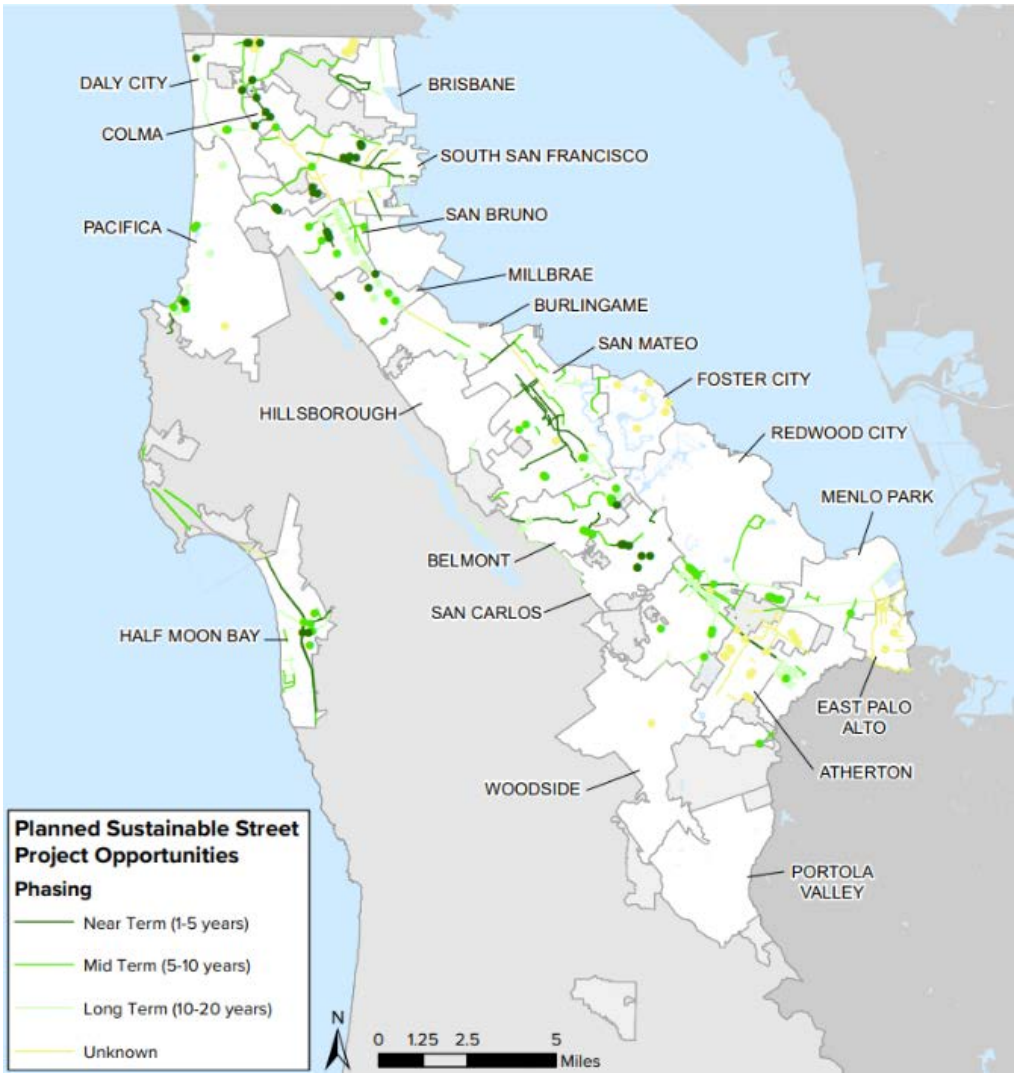


Figure 15. Planned Sustainable Streets Project Opportunities Map

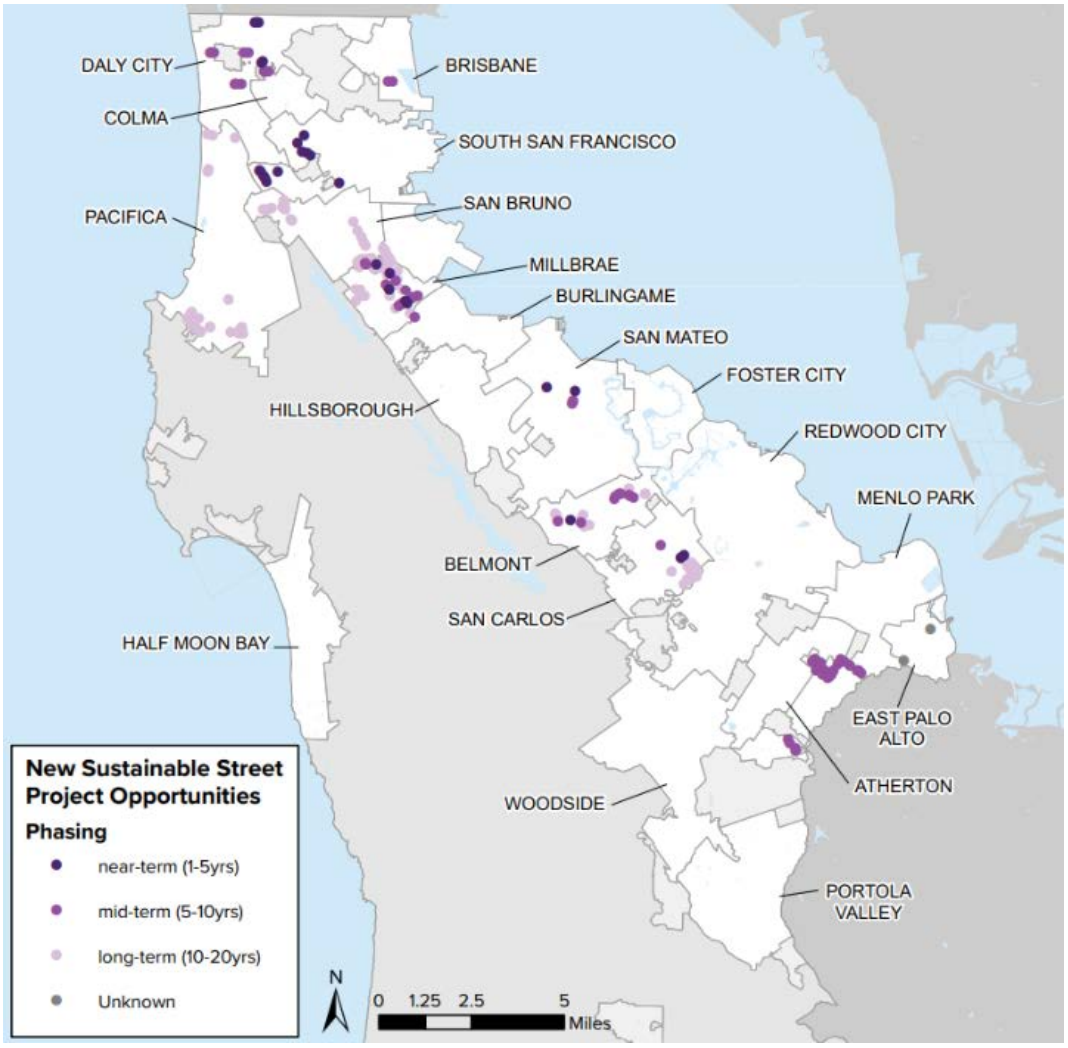


Figure 16. New Sustainable Streets Project Opportunities Map