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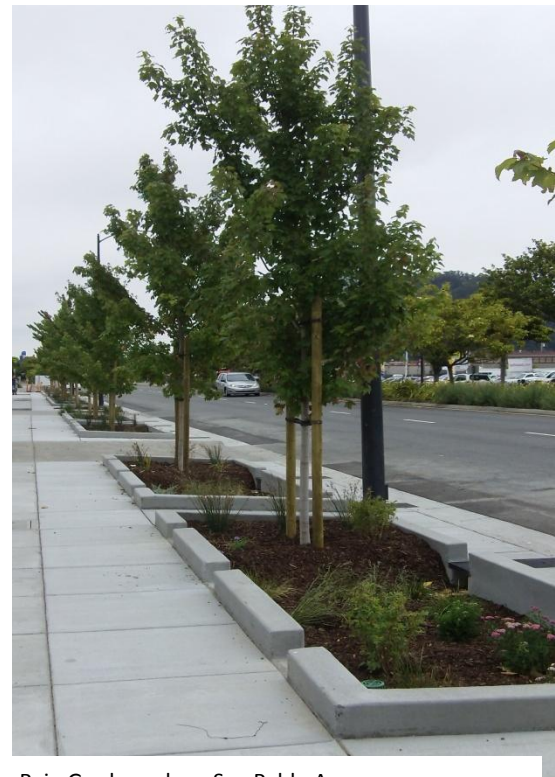
## *Case Study: El Cerrito Green Street Project Integrating Green Infrastructure with Community Needs*

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The San Francisco Bay-Delta Estuary is the largest estuary on the West Coast. It provides water for irrigation of 7,000 square miles of farmland, drinking water to 25 million people, and habitat for over numerous species, including salmon, waterfowl, and shorebirds. (For more information about the estuary see: <http://www.epa.gov/sfbay-delta/basicinfo.html>) However, this valuable resource is threatened by pollutants in stormwater runoff. The El Cerrito Redevelopment Agency, in combination with the San Francisco Estuary Partnership, obtained a \$392,000 loan in the form of 100 percent principal forgiveness through the American Recovery and Reinvestment Act (ARRA) for the construction of a series of rain gardens and bioswales along San Pablo Avenue in El Cerrito, California. The loan was administered through the California Clean Water State Revolving Fund as a part of the Green Project Reserve. This “green street” project has lessened the amount of polluted runoff entering the estuary system by implementing green infrastructure stormwater solutions that allow for natural infiltration and evapotranspiration of rainwater.

### **Benefits of Green Infrastructure**

Green infrastructure allows for runoff to more closely mimic natural hydrology. While traditional gray stormwater infrastructure collects runoff in storm sewers or combined sewer systems and can allow pollutants to enter waterways, green infrastructure captures the rainwater where it falls and allows it to naturally infiltrate into the ground. There are a number of benefits associated with these more natural processes. For example, as water percolates through soil, pollutants like heavy metals, pesticides, bacteria, nutrients and sediments are naturally reduced. This lessens the nonpoint source pollutant load to surrounding surface waters and benefits the environment by improving water quality, reducing water temperatures, and creating habitat in which both flora and fauna may flourish. Additionally, the risk of overflow events, which lead to untreated water being discharged to the watershed, is reduced. The increase in plants and vegetation also creates more wildlife habitat and enhances the appearance and livability of the community.



Rain Gardens along San Pablo Avenue

There is a broad range of options for sustainable management of stormwater runoff, including rain gardens, bioswales, green roofs, green walls, and permeable pavement. Each of these options serves as a way to stop or slow the flow of contaminated stormwater runoff, easing the impact on the stormwater system and the watershed by containing

rainwater on-site. According to San Francisco's Stormwater Management Ordinance (Available at: <http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances10/o0083-10.pdf>), developers disturbing more than 5,000 square feet are responsible for managing stormwater on-site. While this ordinance is undoubtedly beneficial for the Estuary, the question of stormwater management in public rights-of-way is more complicated. The El Cerrito project faced this green infrastructure challenge head-on.

### **Green Streets in El Cerrito**

The decision to undertake the "greening" of two stretches of San Pablo Avenue (see picture on right) in El Cerrito can be largely attributed to the environmental benefits that green infrastructure solutions can offer. Neighborhood stakeholders shared a common vision to turn the San Pablo Avenue corridor into a more walkable environment and a welcoming feature of the community. They believed that using rain gardens would not only address the community's stormwater pollution issues effectively, but that the beautification of San Pablo Avenue would enhance the quality of life and economic vitality of the community. In this sense, the goals of the local businesses and those of the local government overlapped.

Ultimately, the decision was made to create a demonstration project that would not only benefit the environment and the community, but would also serve as a model for future green infrastructure projects. Two block-long stretches of San Pablo Avenue were updated with curb cuts leading to vegetated treatment basins. These treat runoff from 1.23 acres of impervious surface and serve as a highly visible example of green infrastructure in the community. Constant water quality monitoring will track the success and efficacy of the rain gardens in treating contaminated stormwater runoff. (Further information available at: <http://www.sfestuary.org/projects/detail.php?projectID=41>)

The greatest challenge in the planning phase of the El Cerrito project was not the engineering aspect – the technological requirements of bioswale construction are well established. Instead, it was the logistical aspects: finding enough land in public rights-of-way that were available for green infrastructure, avoiding underground utilities in the area, and coordinating the presence of rain gardens with the need for ample sidewalk space, light posts, bus stops, and other public amenities. However, careful planning, cooperative effort from all parties involved, and flexibility in the face of the unexpected – such as the discovery of an underground waterline during construction – ensured the success of this project. Post-construction maintenance of the rain gardens and bioswales had to be considered as well. Overall, the ongoing maintenance required will be primarily that of a landscape feature, including occasional watering and trimming as well as trash removal. To minimize these needs, native plants were chosen which require very little watering and attention. The plants are also relatively stable in terms of size and require minimal trimming to keep roads and sidewalks clear. (Video available at: <http://www.youtube.com/watch?v=aErRvs35Ttw>)

### **Impact Beyond El Cerrito**

Although the planning phase of the El Cerrito project was challenging, to some extent these difficulties were embraced as a way to add to its demonstration value. One of the primary goals of this project was to demonstrate the value and feasibility of green infrastructure, which can now include examples of how to overcome challenges for future green street planners. The demonstration aspect of the El Cerrito project is already beginning to reap rewards. San Pablo Avenue has received a lot of attention for its benefits to the watershed, including acknowledgment from the California Department of Transportation, who may consider using this project as a guide in the greening of future roadways. Much of this impact has been attributed to the use of partnerships that brought attention to the project from outside El Cerrito.

Interpretative signage and post-project water quality monitoring will also enhance the demonstration impact of the project. To many people, rain gardens are a beautiful addition to the street, but their environmental benefits may be overlooked or not well understood. Interpretative signage will help to spread the word regarding the benefits of green infrastructure. Similarly, the results of water quality monitoring will be included in a report to the State Water Resources Control Board and will be used in materials for the community. Monitoring will include measurements of pollutants such as PCBs, pyrethroids, suspended sediment, mercury, copper, and organic carbon both at the inlet and the outlet. This will provide a comprehensive view of the way that the green street project impacts stormwater runoff in El Cerrito and, ultimately, the San Francisco Bay.

*For more information please contact the California Clean Water State Revolving Fund Program*

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