

Department of Public Works

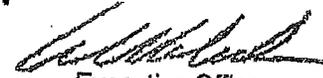
Bureau of Engineering
Bureau of Sanitation
Bureau of Street Services
Joint Report No. 1

July 11, 2011
CD Nos. All

"Policy"
ADOPTED BY THE BOARD
PUBLIC WORKS OF THE CITY
of Los Angeles California

175327

JUL 11 2011


Executive Officer

DEPARTMENT OF PUBLIC WORKS (DPW) OFFICIAL GREEN STREET POLICY

RECOMMENDATION

Adopt the DPW official Green Street Policy as discussed below.

FISCAL IMPACT STATEMENT

There is no direct impact to the General Fund for initial capital improvement costs. Funding for the design and construction of Green Street elements will come from project funds and will typically be funded directly through available grants or special funds. Costs and funding sources for the continued operation and maintenance of Green Street elements are unknown at this time.

DISCUSSION

Background

The City of Los Angeles has approximately 6,500 miles of streets with 10,000 miles of sidewalks, 900 linear miles of alleys, and 38,000 catch basins. The vast majority of the streets are currently constructed of concrete and asphalt. In addition to carrying vehicle and pedestrian traffic, they are also part of the City's storm water conveyance system. Storm water runoff and dry weather flows captured within the City streets are either deposited into catch basins that are connected to storm drain lines or flow directly into channels, rivers, lakes and the ocean. When the storm water is not treated prior to being discharged into the receiving water bodies, pollutants, including trash, grease, oil, and sediments, are carried into receiving water bodies and eventually the ocean, causing pollution in the waterways and along the shores. Contaminated storm water runoff is the number one source of ocean pollution in Southern California, and the City's street infrastructure plays a major role in flushing these pollutants out to sea.

The City of Los Angeles is subject to a number of water quality mandates and pollutant limits in its water bodies through Total Maximum Daily Load (TMDL) requirements. TMDLs are intended to reduce pollutants of concern that are designated for each water body to restore the designated beneficial use of the water body. Compliance with these TMDLs is conducted through integrated planning that maximizes green projects such as Green Streets. The location and sizing of such projects vary depending on the source of pollutants, the soil type and availability of runoff. Integrating these projects with street improvement projects is beneficial and cost effective.

Rainwater and storm water runoff are valuable water resources. Capturing and infiltrating rainwater and storm water runoff reduces the pollution in water ways and augments water sources by infiltrating water into aquifers and groundwater. By managing runoff close to the source and maximizing infiltration, the volume of runoff will be reduced, which will help in minimizing localized flooding.

The public right-of-way provides a large area where infiltration swales or other types of pervious surfaces can be constructed to collect, retain, or detain storm water runoff. The transformation of the City's existing paved streets into Green Streets can help to alleviate many of the storm water pollution issues, and in many cases provide greener City streets and a sustainable urban environment.

A Green Street contains various elements intentionally designed and placed to treat, capture, and/or infiltrate storm water prior to its release into the standard storm drain system. Two of the more typical green street elements are a landscaped swale or a below grade infiltration or filtration trench designed to capture and infiltrate or filter storm water runoff through a natural soil profile and vegetative root system. The parkway area between the roadway and the sidewalk is one part of the street system that may be used as a location for landscaped infiltration swales or below grade infiltration galleries to increase the treatment capacity. In some cases, below grade infiltration or storage galleries can be located within the roadway area as well as within the parkway. In other cases, curb extensions, parking lanes, areas beneath sidewalks, and other suitable areas within the public right-of-way may be used to facilitate infiltration and/or storage galleries. Each of these areas within a street may be used to incorporate Green Street elements where storm water runoff can be easily and practically directed from the street into the Green Street elements.

Many of the Green Street elements employ the use of either depressed planters or below grade galleries that are capable of capturing, treating, and retaining storm water and urban runoff. They minimize the impacts of storm water runoff on the receiving water bodies by reducing the volume of polluted storm water that currently flows untreated into the City's storm drain system. They also minimize the impact of urban runoff during dry weather by diverting the low volumes of dry weather flow into Green Street elements rather than allowing the water to flow untreated into the City's storm drain system. The reduction of the storm water flow and urban runoff is achieved by allowing the storm water in the infiltration swales or galleries to percolate into the ground below and to be filtered through the soil and root matrix. Bio-swales located in parkways also provide space for street trees to mature and develop significant canopy coverage which will improve air quality as well as reduce the heat island effect from urban pavements.

Landscaped bio-swales typically consist of a depressed planter area located behind the street curb, with curb cuts located at both ends of the swales that allow water to flow from the gutter into the bio-swale and exit back into the downstream gutter during times of high volume flows. Storm water and urban runoff percolates into the ground, filtering pollutants and helping to irrigate the landscaping. Gravel and rock trenches can be incorporated below the bio-swales to increase storage capacity and infiltration. Bio-swales may also function as pre-screening devices in order to reduce the sediment loads contained in the runoff and to reduce clogging of the infiltration system. Sub-drain systems and overflow drainage may be provided to prevent flooding in the parkways.

July 11, 2011

Page 3

Typical infiltration galleries consist of long trenches, usually located beneath the sidewalk or street pavement, composed of gravel and rock for the detention of storm water prior to infiltration into the ground. Perforated pipes are usually incorporated to transfer the water into the gravel and rock trench, speeding up the distribution of water into the rock and helping to increase the storage capacity of the rock matrix. Runoff is stored in the void spaces between the gravel and rocks and infiltrates into the soil matrix through a permeable liner at the bottom and sides of the trench.

In areas where soil permeability is very low, infiltration swales and galleries can be used to filter urban runoff before it reaches the storm drain system by placing perforated pipes at the bottom of a sand and gravel matrix to pick up the water after filtration has been achieved and re-depositing it back into the storm drain system.

There are other technologies available to capture pollutants in urban runoff, usually referred to as Best Management Practices (BMPs). Although some of these BMPs can have a higher long term maintenance cost than those elements mentioned above, the overall operable service life may be longer. These other technologies include:

- Pre-fabricated or custom designed storm water clarifiers installed up or downstream of standard catch basins.
- Storm water diversion structures that divert low flow urban runoff from storm drains into the sanitary sewer system or into City facilities such as parks or City parking lots, to be treated outside of the public right-of-way.
- Permeable pavement, which is more appropriate for use in parkways, parking lots or parking lanes in low volume traffic areas such as residential streets.

The Board of Public Works (BPW) adopted a Green Streets Initiative in May 2007 with the idea that the streets of Los Angeles offer an enormous opportunity to infiltrate, capture, and filter urban runoff to prevent pollution and to convert storm water into a valuable source of groundwater and recycled water. Its purpose is to promote, advance and evaluate the implementation and design of streets and parking lots to maximize the capture and infiltration of urban runoff and to create community beautification benefits.

The Green Street Initiative is an aggressive, proactive measure that aims not only to meet water quality objectives but also to address multiple beneficial uses such as infiltration to recharge groundwater aquifers, using "green" BMPs, such as landscaping to provide aesthetics as well as reducing the heat island effect, and to implement the storm water objectives as the BMPs enhance habitat and the natural environment. The Initiative aims to

utilize natural landscape systems both at the surface and below-grade to capture, cleanse, and infiltrate storm water and urban runoff where storm water can be easily directed from the streets and sidewalks into the parkways.

The DPW is the lead in carrying out various action items required for this initiative, which include: preparation of design guidelines, standard plan development and adoption, development of policies, identifying priority projects, and applying for funds from various funding sources.

Developing and constructing Green Street elements, such as infiltration galleries, bio-swales, and BMPs in the public right-of-way on a regional scale will address many environmental issues within the City and will:

- Reduce the amount of storm water runoff currently flowing untreated into storm drains and natural bodies of water.
- Improve flooding conditions in some streets and intersections.
- Improve the water quality of storm water runoff that flows to the ocean.
- Increase the City's water supply by recharging local ground water basins.
- Improve air quality and reduce the heat island effect of street pavement.
- Enhance pedestrian use of sidewalks and encourage alternate means of transportation.
- Increase jobs and urban recreational opportunities.

Although the Bureaus within the DPW actively pursue funding for Green Street elements and BMPs, and implement these elements in the design of Capital Improvement Projects (CIPs) whenever feasible, there is currently no official policy adopted by the BPW regarding Green Streets within the Department.

Adopting a Green Street policy for the Department will help the City in meeting its water quality mandates, reduce storm water runoff and flooding, improve water quality, supplement the City's water supply via groundwater recharge (where applicable), improve air quality through reduction of heat island effects from street pavement, and provide a more aesthetically pleasing environment which reinforces the Board's Green Street Initiative.

The Recommendations

It is recommended that the Board adopt the following DPW official Green Street Policy:

- The Bureaus of Engineering (BOE), Sanitation (BOS) and Street Services (BSS) will pursue funding for Green Street BMPs and Green Street Elements for Public Works CIPs whenever appropriate, and will incorporate Green Street BMPs and Green

Department of Public Works
Bureau of Engineering
Bureau of Sanitation
Bureau of Street Services
Joint Report No. 1

July 11, 2011

Page 5

Street Elements into CIP designs whenever funding is available. All designs incorporating Green Street BMPs and Green Street Elements will be reviewed by the BOS and BSS during the pre-design phase for comments and maintenance commitments before they are included in the design and construction of a project.

- The BOE, in coordination with BSS and BOS and other City Departments, will continue to develop and adopt Green Street Standard Plans and guidelines for use in City street designs and private development.
- The BOE, in cooperation with BSS and BOS and the Los Angeles Departments of Water and Power and Transportation, will develop an annual list of prioritized CIPs that include Green Street Elements and BMPs. This list will be included in an annual report presented to the BPW in July of each year.
- The BOS will identify opportunities for green street projects that maximize the ability to improve water quality and comply with water quality mandates. The opportunities will be identified as part of the TMDL implementation plans for specific watersheds and pollutants.
- The BOS will conduct monitoring as necessary to evaluate the effectiveness of green street projects, specifically for reducing pollutants and maximizing infiltration. The monitoring results will be included in the annual report presented to the BPW each year.
- The BOE will issue this adopted policy to staff by Special Order, and will incorporate it into the Bureau's Project Delivery Manual (PDM) and the appropriate design manuals. Green Street Guidelines and Standard Plans will be referenced in the PDM and the appropriate design manuals
- The BOS will issue this adopted policy to staff by Bureau Directive and will incorporate it into BOS's Project Management Guidelines (PMG) and the appropriate design manuals and guidelines. Green Street Guidelines and Standard Plans will be referenced in the PMG and the appropriate design manuals and guidelines.
- The BSS will issue this adopted policy to staff by Bureau Directive and will incorporate the information into its regularized staff meetings and in-house training sessions with its Engineering Division supervisors and staff. Such policies will also be incorporated into BSS Engineering Division manuals and design guidelines. BSS operations staff will become familiar with departmental policies for Green Streets elements through the implementation of its projects that include Green Street elements.

Joint Report No. 1

Page 6

(MPB TSA RMK VJ AH RO)

Report reviewed by:

BOE (ASD and PAC)

Report prepared by:

Street and Stormwater Program

Michael P. Brown, P.E., G.E.
Program Manager
Phone No. (213) 485-4523

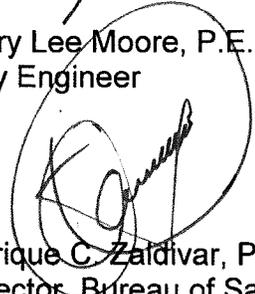
MPB/04-2011-0086.SSD.gva

Questions regarding this
report may be referred to:
Michael P. Brown, Principal Civil Engineer
Phone No. (213) 485-4523
E-mail: Michael.Brown@lacity.org

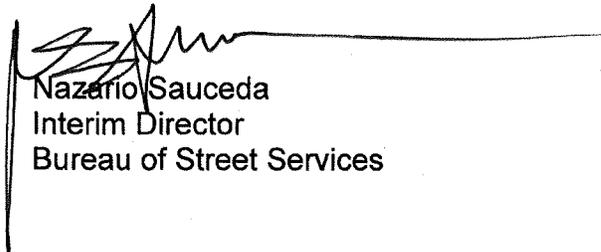
Respectfully submitted,



Gary Lee Moore, P.E.
City Engineer



Enrique C. Zaldivar, P.E.
Director, Bureau of Sanitation



Nazario Saucedo
Interim Director
Bureau of Street Services