



Memo

To: Public Works Department

From: David A. Davies
Director of Public Works

Date: June 30, 2013

Subject: Green Streets Policy

The recently adopted National Pollutant Discharge Elimination System (NPDES) permit for Municipal Separate Storm Sewer Systems (MS4) requires each local agency to adopt a Green Streets Policy. Below are the tentative policy points for Glendora's green street policy. They are still in development as we are consulting the geotechnical consultants to determine specifications for use on permeable pavements and dimensions for vegetated swales and bioretention curbs within the public right of way.

The function of Green Streets are to:

- Mimic local hydrology prior to development
- Provide multiple benefits along the street right of way including:
 - Integrated system of stormwater management within the right of way
 - Volume reductions in stormwater which reduce the volume of water discharged via pipe into receiving streams, rivers and larger bodies of water
 - Key linking component in community efforts to develop local green infrastructure networks
 - Aesthetic enhancement of the transit right of way
 - Improves local air quality by providing interception of airborne particulates and shade for cooling
 - Enhanced economic development along the transit corridor

Available approaches to require on new development are:

- **Alternative Street Designs (Narrower Street Widths):** A green street design begins before any BMPs are considered. If building a new street or streets, the layout and street network must be planned to respect the existing hydrologic functions of the land (preserve wetlands, buffers, high-permeability soils, etc.) and minimizing the impervious area. If retrofitting

or redeveloping a street, opportunities to eliminate unnecessary impervious area should be explored.

- **Swales:** Swales are vegetated open channels designed to accept sheet flow runoff and convey it in broad shallow flow. The intent of swales is to reduce stormwater volume through infiltration, improve water quality through vegetative and soil filtration, and reduce flow velocity by increasing channel roughness. In the simple roadside grassed form, they have been a common historical component of road design. Additional benefit can be attained through more complex forms of swales, such as those with amended soils, bioretention soils, gravel storage areas, underdrains, weirs, and thick diverse vegetation.
- **Bioretention Curb Extensions and Sidewalk Planters:** Bioretention is a versatile green street strategy. Bioretention features can be tree boxes taking runoff from the street, indistinguishable from conventional tree boxes. Bioretention features can also be attractive attention grabbing planter boxes or curb extensions. Many natural processes occur within bioretention cells: infiltration and storage reduces runoff volumes and attenuates peak flows; biological and chemical reactions occur in the mulch, soil matrix, and root zone; and stormwater is filtered through vegetation and soil.
- **Permeable Pavement:** Permeable pavement comes in four forms: permeable concrete, permeable asphalt, permeable interlocking concrete pavers, and grid pavers. Permeable concrete and asphalt are similar to their impervious counterparts but are open graded or have reduced fines and typically have a special binder added. Methods for pouring, setting, and curing these permeable pavements also differ from the impervious versions. The concrete and grid pavers are modular systems. Concrete pavers are installed with gaps between them that allow water to pass through to the base. Grid pavers are typically a durable plastic matrix that can be filled with gravel or vegetation. All of the permeable pavement systems have an aggregate base in common which provides structural support, runoff storage, and pollutant removal through filtering and adsorption.
- **Sidewalk Trees and Tree Boxes:** From reducing the urban heat island effect and reducing stormwater runoff to improving the urban aesthetic and improving air quality, much is expected of street trees. However, most often street trees are given very little space to grow in often inhospitable environments. The soil around street trees often becomes compacted during the construction of paved surfaces and minimized as underground utilities encroach on root space. By providing adequate soil volume and a good soil mixture, the benefits obtained from a street tree multiply. To obtain a healthy soil volume, trees can simply be provided larger tree boxes, or structural soils or root paths can be used under sidewalks or other paved areas to expand root zones. These allow tree roots the space they need to grow to full size.

Each of the approaches above must be approved for use in the City right of way by the City Engineer. This policy is in the process of being expanded to provide more guidance. In the interim, please contact the City Engineer if you have any questions.

cc: Chris Jeffers, City Manager
File

\\NEO\Public Works\NPDES\GREEN STREETS POLICY\2013-0225 Green Streets Policy.doc

DRAFT