

**NACTO Designing Cities Conference:  
Streetscape Ecologies**

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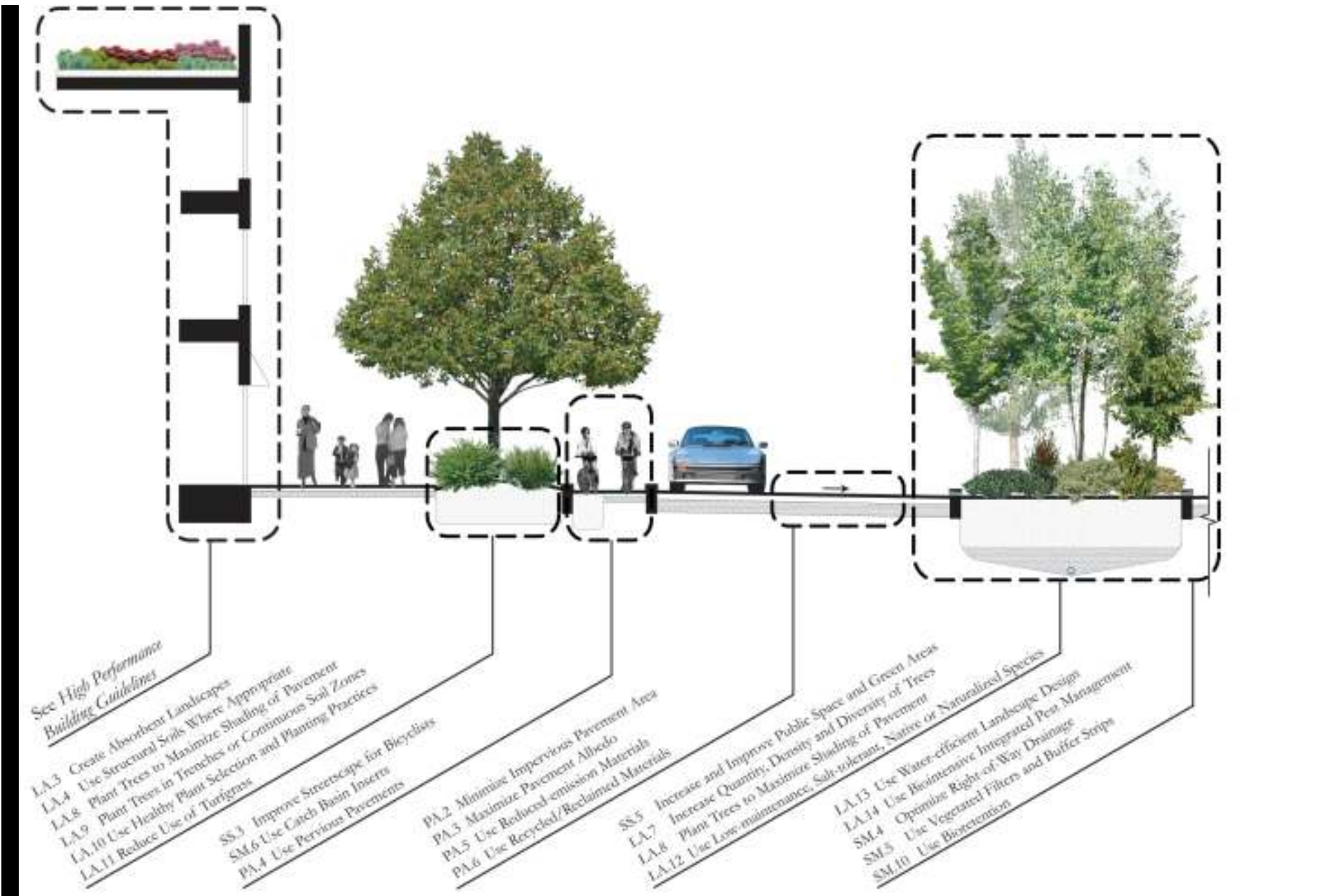
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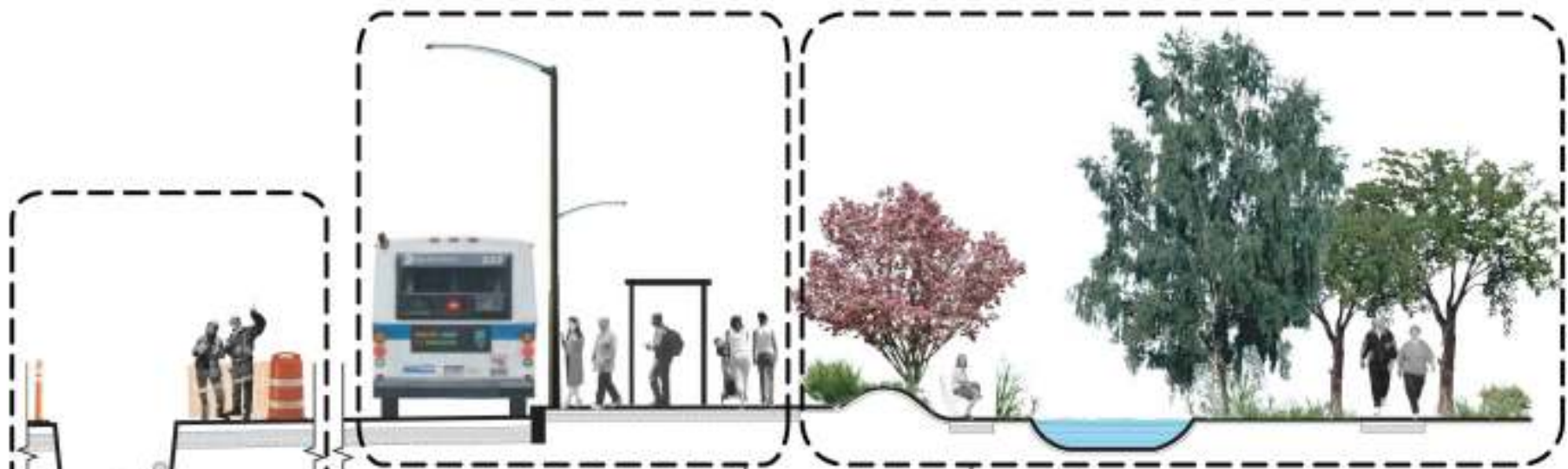


# HIGH PERFORMANCE INFRASTRUCTURE GUIDELINES

OCTOBER 2005







- UL3 Coordinate Utility Infrastructure
- UL1 Minimize Impact of Utility Work
- CP1 Develop and Enforce a Site Protection Plan
- CP2 Protect Existing and Future Planted Areas
- CP3 Protect Water Sources During Construction
- UL4 Use Trenchless Technologies
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- SS5 Increase and Improve Right-of-Way Public Space and Green Areas
- SS4 Improve Streetscape for Surface Mass Transit
- SS2 Improve Streetscape for Pedestrians
- SS8 Optimize Streetlighting and Signaling
- LA2 Encourage Ecological Connectivity and Habitat
- LA7 Increase Quantity, Density and Diversity of Trees

- SM10 Use Constructed Wetlands
- SM11 Use Constructed Wetlands
- LA3 Create Absorbent Landscapes
- LA6 Perform Soil Bering
- LA11 Reduce Use of Torgness























**1 RAIN WATER RUNOFF**

During a rain storm the water quickly runs off impermeable surfaces such as sidewalks and roadways. Typically, the storm water runoff is then carried to adjacent streams and rivers through the municipal storm sewer system. In urban areas with high concentrations of impermeable surfaces this runoff increases stream velocities and volumes causing erosion and flooding down stream. Urban runoff also transports particulates and pollutants, such as oil and grease, and deposits them in nearby streams, lakes, and rivers.

**2 BIO RETENTION**

A bio retention system is a system designed to capture and infiltrate storm water before it flows into streams and rivers. Depressed planters in the sidewalk section capture the storm water runoff where it slowly infiltrates into the ground or is released back into the atmosphere through a process called evapotranspiration. The planters utilize roughly 5% of the street area and are planted with Path Rushes and other plants tolerant of wet and dry soils.

**3 WATER FILTRATION**

Water entering the bio retention system is filtered through the soil planting bed before being carried downstream or infiltrating into local aquifers. The soils and plants in the bio retention system remove the suspended solids and improve quality of the water leaving the system.

**4 UNDERDRAIN**

Once soils are saturated and cannot absorb additional water the surplus water is then carried through an underdrain system. These underdrains connect to the city storm water system which outfalls to the Niagara River. When the water reaches the river it is cleansed of suspended particulates and other pollutants typically carried by storm water runoff.

**5 OVERFLOW**

The bio retention system is designed as a series of connected basins which allow the water to flow from one planter to the next. During a heavy rainstorm this allows the system to utilize the full storage and infiltration capacity of all the planters before water is allowed outflow into the city storm drain system.



















