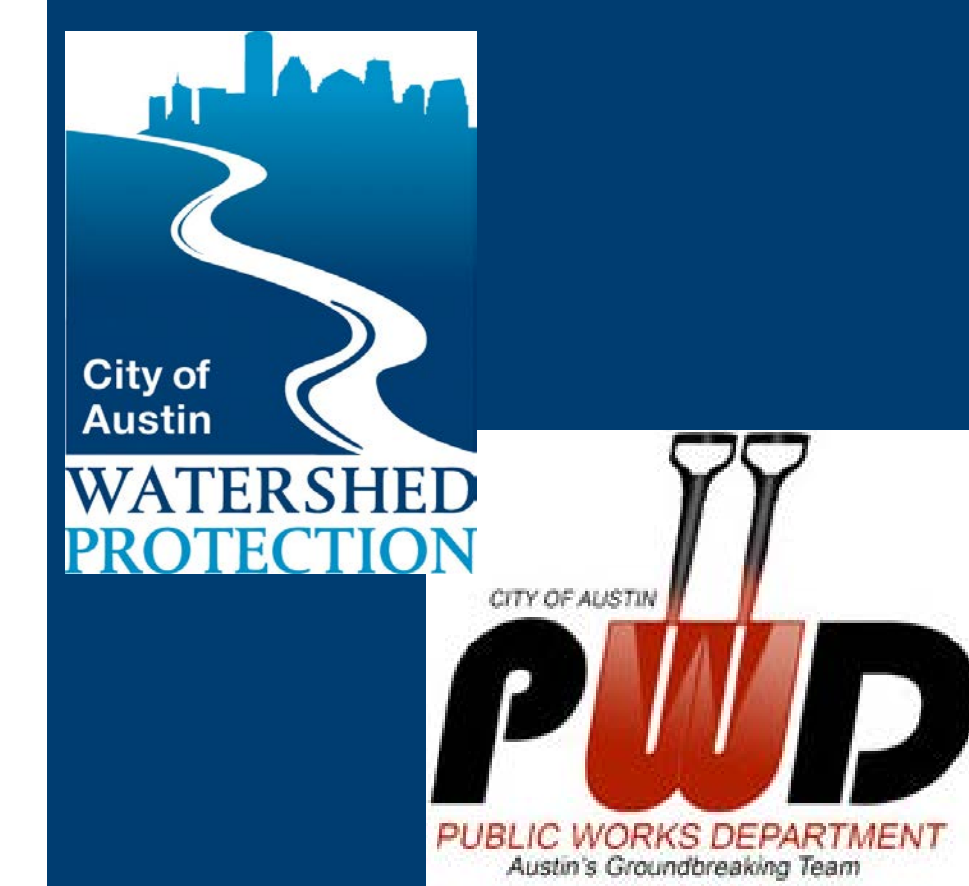
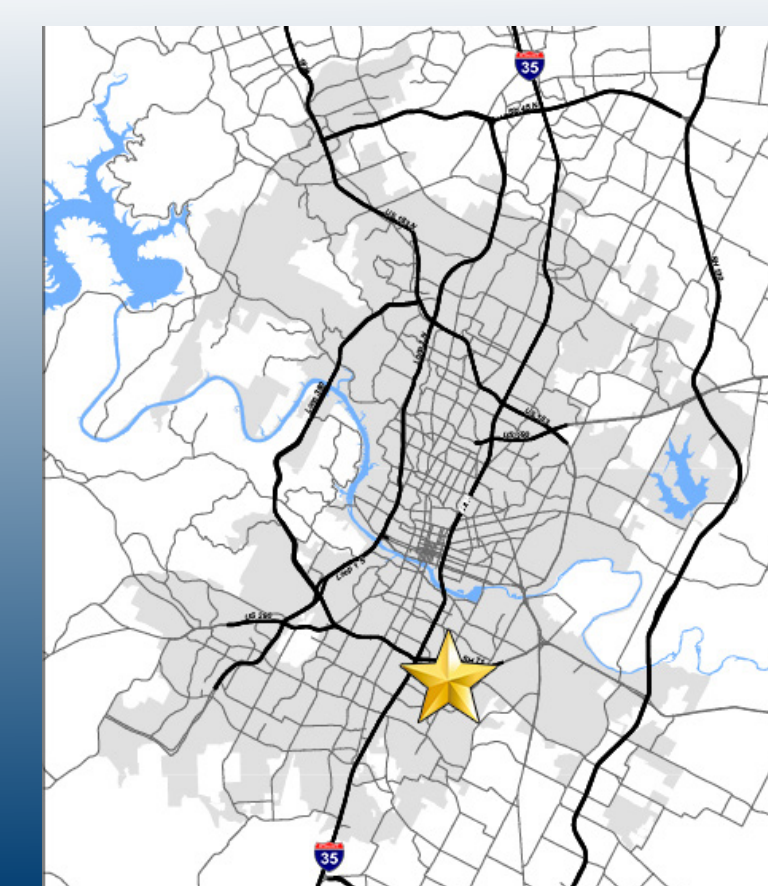




TODD LANE IMPROVEMENT PROJECT

Austin, Texas



OVERVIEW

- Project Length: 3,200 feet
- Total Project Timeline: October 2011 - Sept. 2016
- Construction Duration: 723 days
- Budget: \$7.5 million
- New Sidewalks/Bike Lanes: 14,000 l.f.
- Trees Planted: 164
- SCM Plants Installed: 1184
- Completely ADA/TAS Compliant

The recently completed Todd Lane Improvement project includes 6.8 acres of both new and redeveloped impervious cover to the existing transportation infrastructure. As Austin becomes increasingly urbanized, native landscapes are replaced with impervious surfaces that prevent rainwater from soaking into the ground. Stormwater quickly runs off these hard surfaces carrying pollutants into the creeks. For this reason, the City of Austin Land Development Code requires on-site water quality control(s) for the treatment of stormwater.

The City of Austin Public Works design team worked with the Watershed Protection Department, Stormwater Treatment Section to develop the water quality control strategy for the Todd Lane project. The required criteria of any proposed strategy was that: 1) it complied with the City of Austin stormwater treatment requirements and 2) it could be incorporated into the existing right-of-way, therefore eliminating additional property acquisition.

In the City of Austin, the primary control strategy for water quality controls is to capture at least a minimum volume of stormwater runoff for treatment, and to release the treated volume over a minimum of forty-eight hours to enhance base flow and minimize erosion. The minimum volume is the first one-half inch of runoff plus an additional one-tenth inch for each ten percent increase of impervious cover over twenty percent within the drainage area to the control. Typically, this requirement has been met with a single, end-of-pipe, water quality control. Because the acquisition of additional right-of-way made a typical, end-of-pipe solution cost prohibitive for this project, distributed green stormwater infrastructure controls or stormwater control measures (SCM) had to be considered.

The resulting design comprises seven rain gardens and two partial sedimentation/biofiltration ponds. The biofiltration ponds and rain gardens capture stormwater and provide filtration and natural infiltration into the soil. They filter out pollutants including suspended solids, oil, heavy metals, and other chemicals, and enhances the base flow to the nearby streams in the Country Club West and Williamson Creek watersheds of South Austin.

Stakeholder interaction included nine public meetings and a monthly newsletter.

INNOVATIVE SOLUTIONS



Curb Cuts

Curb Cuts

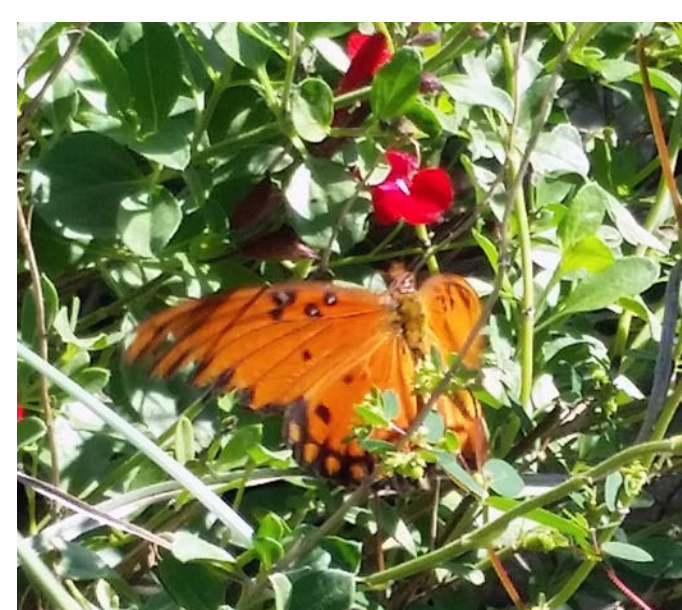
- Where feasible, curb cuts were installed to act as sump inlets to convey stormwater into the SCMs. The number of curb cuts needed depended on the 100-year, 24 hour flow and the ability to maintain non-erosive velocities into the SCMs.

Modified Curb Inlet

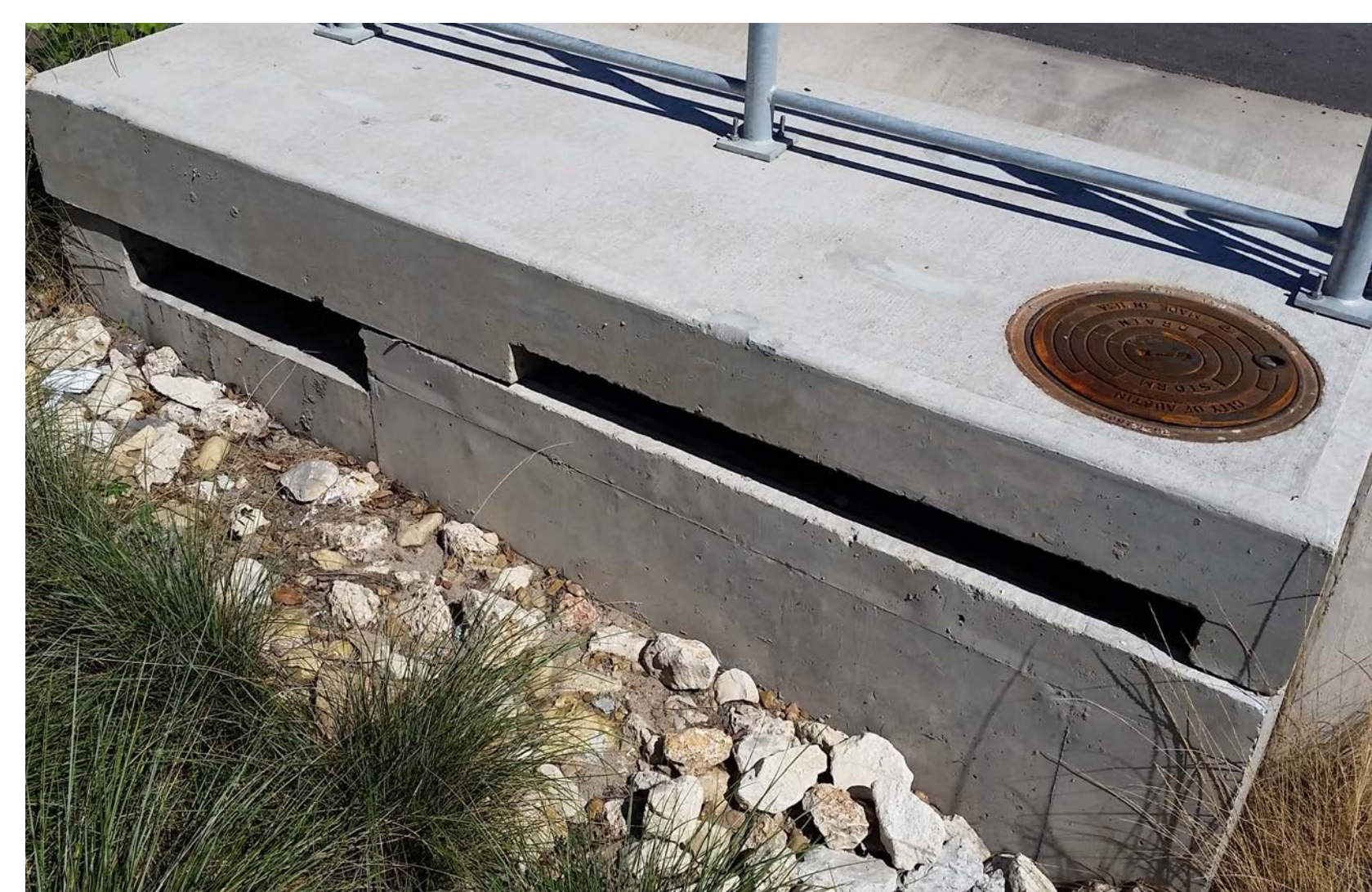
- Due to the lack of space for full size diversion structure (splitter box) at some locations, the design staff created a modified curb inlet that performs as a diversion structure while occupying the same space as a standard ten foot curb inlet.

Underdrain Connection

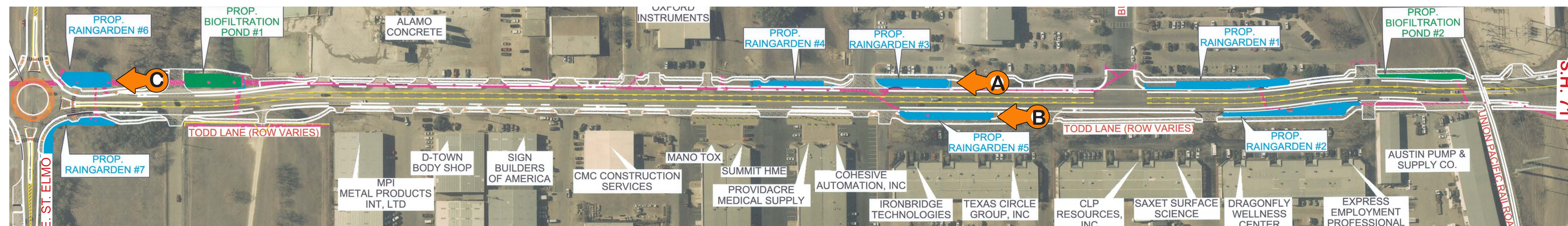
- An innovative underdrain collection device was designed to connect the metered outflow from the SCM underdrain system orifice cap to the box culvert storm sewer system located a few feet directly below the SCM. Access for inspection and maintenance was simplified by incorporating a removable water-tight lid at ground level. This allows inspection and maintenance staff to view the underdrain system outlet and orifice cap quickly from the surface and eliminates the need for confined space entry.



Pollinator at Rain Garden 6



Modified Curb Inlet



Project corridor from frontage road of S.H. 71 to East St. Elmo showing locations of seven rain gardens and two biofiltration ponds.



Ⓐ BEFORE: Rain Garden 3



Ⓐ AFTER: Rain Garden 3



Ⓑ BEFORE: Rain Garden 5



Ⓑ AFTER: Rain Garden 5



Ⓒ BEFORE: Rain Garden 6



Ⓒ AFTER: Rain Garden 6

ENVIRONMENTAL BENEFITS

Water Quality Improvement

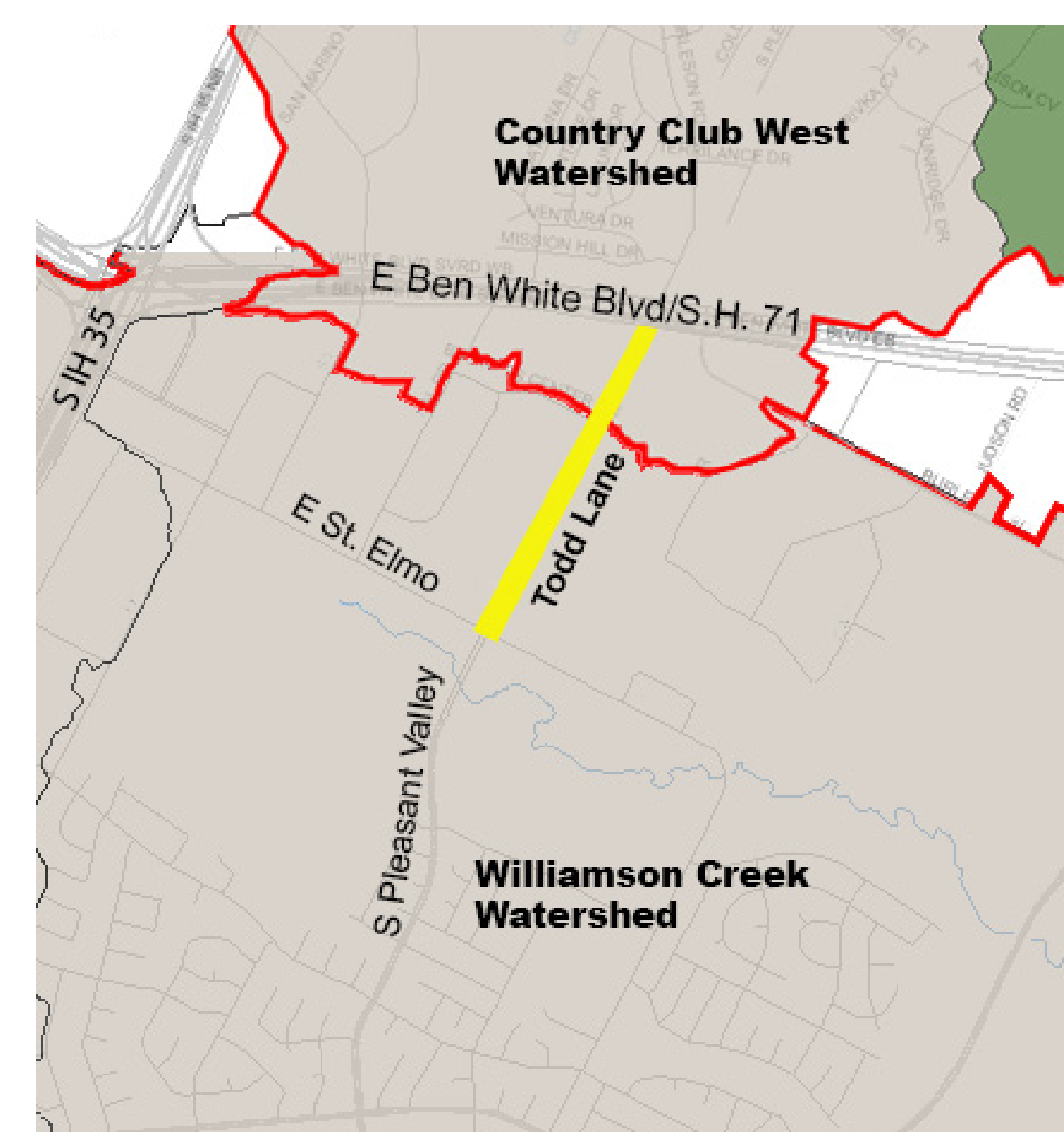
- Designed to treat over 25,000 cubic feet of stormwater runoff in each storm.
- Estimated to remove over 3000 lbs of Total Suspended Solids (TSS) annually.

Baseflow Enhancement

- Extended 48 hour draw-down time period improves environmental integrity and mitigates the hydrologic impacts of excess shear due to urbanization in the nearby creeks of the Country Club West and Williamson Creek watersheds.

Corridor Ecosystem Restoration

- New corridor plantings increase floral diversity in an area that was formerly turfgrass, weedy plant species, and very mature trees. Enhanced diversity provides benefits for birds, pollinators, and wildlife, as well as increased aesthetics in this industrial area. New street trees along the entire corridor will shade the pavement, making a more comfortable environment for pedestrians and cyclists.



SCM PLANTS

The design team selected non-invasive, drought-tolerant, native and adapted plants for the SCM, including bunch grasses, shrubs, turfgrass, and small trees. Besides filtering stormwater and stabilizing the soil, many of the SCM plants also benefit pollinators. The challenge in selecting SCM plants in this semi-arid climate is to choose species that survive very hot, dry conditions for most of the year, punctuated by extremely variable rain storms that are increasingly more intense. Rain garden plants will receive irrigation until established and thereafter rely only on precipitation. The other challenge in plant selection is the ease of maintenance for City crews.



Fibrous, deep rooted plants such as Muhly grass and xeric red yucca tolerate drought and inundation while filtering and cleaning stormwater.



Rain garden with herbaceous plants in the filtration area.

MAINTENANCE

As with any stormwater control measure, it only works as long as it is maintained on a regular basis. Maintenance and access to the SCMs requires planning and input from the City of Austin Field Operations staff. By listening to the maintenance staff and integrating their concerns regarding safe and easy access staff were able to incorporate the following:

- Expanded width of sidewalks around key portions of the rain gardens and biofiltration ponds to allow equipment to perform maintenance outside of the Right of Way. This gives crews a buffer between the traffic in this busy industrial area and eliminates the need for a traffic control plan that would require closure of a traffic lane during maintenance activities.
- Removable railings or double gates to allow crews and equipment to access a facility at multiple locations.



Rain Garden 4: Removable railings along sidewalk for ease of access.



Rain Garden 2: Sidewalk expands from 6 - 10 feet to allow vehicular access for maintenance.

CERTIFICATION



Todd Lane is Austin's first completed Greenroads® project and achieved a silver certification. This international ratings system measures and manages the sustainability of transportation projects by providing a rigorous third-party assessment to ensure that projects save money, water, energy, and reduce their carbon footprints. This project meets these goals by incorporating numerous sustainable features while also improving pedestrian, bicyclist and driver safety. Notably, this project was the first in the U.S.—out of 38 projects—to receive maximum points for Runoff Quality and Runoff Flow Control.

Contact: Tom Franke City of Austin, Watershed Protection Department tom.franke@austintexas.gov