



Green Infrastructure & Stormwater Management CASE STUDY

Bioretention for Stormwater Quality Improvement in Texas

Location: Bryan/College Station, TX

Client: Texas Department of Transportation

Design Firm(s): Texas A&M University/Texas Transportation Institute

Landscape architect/Project contact: Ming-Han Li, ASLA

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ASLA Chapter: Texas



Project Specifications

Project Description: This project investigates the applicability and identifies benefits and drawbacks of bioretention BMPs in Texas, specifically for highway related applications. The project includes large-scale laboratory testing and real-world roadside demonstration projects.

Project Type:

A retrofit of an existing property

Design features: bioretention facility.

This project was designed to meet the following specific requirements or mandates:

State statute, developer/client preference

Impervious area managed: 1 acre to 5 acres

Amount of existing green space/open space conserved or preserved for managing stormwater on site: 1 acre to 5 acres

The regulatory environment and regulator was supportive of the project.

Did the client request that other factors be considered, such as energy savings, usable green space, or property value enhancements? No. The request was primarily on the water quality.

Cost & Jobs Analysis

Estimated Cost of Stormwater Project: \$100,000-\$500,000 (Public funding: State). This is a four-year project with a total budget of almost \$463,000. Majority of the budget is for research. Approximately \$9,000 was used to construct a demonstration bioretention cell. For the demonstration project, the footprint was about 640 sq/ft. The expense breakdown is \$1,900 for labor, \$3,300 for equipment and \$3,900 for materials.

Was a green vs. grey cost analysis performed? Yes. The research part was published in a report. <http://tti.tamu.edu/documents/0-5949-2.pdf>

Cost impact of conserving green/open space to the overall costs of the site design/development project: This was not conducted as part of the research project.

Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)? Reducing pollutant loads/concentrations is the major benefit of the bioretention application. In our project, we did not translate this benefit into cost-savings.

Number of jobs created: 6

Job hours devoted to project:

Construction: 5%

Other: Research: 95%

Performance Measures

Stormwater reduction performance analysis:

Detailed analysis of the bioretention testing is [published](#). Meanwhile, Transportation Research Board has accepted the research article presented at the 2011 TRB Annual Meeting. The title of the article is "ASSESSING PERFORMANCE OF BIORETENTION BOXES IN HOT AND SEMI-ARID REGIONS: A HIGHWAY APPLICATION PILOT STUDY."

Community & economic benefits that have resulted from the project: The impact is that highway engineers will become more aware of LID techniques such as bioretention. This will increase the actual implementation of LID on highway corridors.

Additional Information

<http://tti.tamu.edu/publications/researcher/newsletter.htm?vol=45&issue=4&article=10&year=2009>

<http://tti.tamu.edu/publications/researcher/newsletter.htm?vol=46&issue=4&article=2&year=2010>

<http://tti.tamu.edu/documents/0-5949-2.pdf>