

Upper Trinity River Population Growth & Development Effects on Flooding


Population Growth


Developed Land Area


Stormwater Runoff


Increased Flooding



**Transportation & Stormwater
Integrated Planning Approach**

VS

**Development as Usual
Approach**



Safe, Reliable, and Attractive Transportation System; Resilient Against Increasing Climate Variability and Rainfall Intensity.



Homes and Other Structures Safeguarded from Flooding.



Integrated Infrastructure Design Optimizes Land Use and Can Reduce Current and Future Retrofit Costs to Residents and Developers by 30-60%.



Resilient Communities with Improved Water Quality, Property Values, and Greenspace.



Proactive and Integrated Approach that Increases Resiliency and Quality of Life.



At-Risk Transportation System: Many Bridges and Miles of Roads at Risk of Flooding.



\$ Annual Building Flood Damages: High # of Homes and Buildings at Risk of Flooding.



Higher Transportation and Stormwater Lifecycle Costs Borne by Residents and Developers.



More Water Pollution, Higher Urban Heat, Less Greenspace.



Reactive and Inefficient Approach with infrastructure More Prone to Failure.



**North Central Texas
Council of Governments**



**integrating Transportation
& Stormwater Infrastructure**

www.nctcog.org/tsi

Funding Partners: Texas General Land Office, U.S. Department of Housing and Urban Development; Texas Water Development Board; Texas Department of Transportation, Federal Highway Administration; Federal Emergency Management Agency

Does GSI Work in North Texas?

Urban stormwater BMP performance under Blackland Prairie clay soil conditions

Texas A&M AgriLife Research & Extension Center, Dallas | Monitoring period: 2012–2015

Study Snapshot

Regional challenge

Clayey, low-permeability soils make stormwater control difficult.

GSI / BMPs evaluated

-  Green roofs
-  Permeable pavement
-  Bioretention
-  Detention pond

Runoff Volume Reduction

All tested practices reduced runoff volume.



*Wettest period. The detention pond retained nearly all runoff during most testing.

Water Quality Results

Bioretention and detention pond monitoring showed strong pollutant reduction.

Bioretention

High removal across nutrients, sediment, and bacteria indicators.



Detention Pond

Wettest-period monitoring showed strong flow, nitrate, and E. coli reduction.



TSS = Total Suspended Solids. Values represent reported pollutant or flow reductions.

Additional Observations

Permeable pavement

Especially effective at reducing TSS and nitrate.

Green roofs

Reduced TSS loads; some bacterial export concerns.