

FUNDING STORMWATER PROJECTS



Picture taken from Harris County, Texas

Oklahoma Clean Water State Revolving Fund (CWSRF)

Oklahoma Water Resources Board

- Five grant and loan programs for water, wastewater, stormwater, and green infrastructure
- Provide water and wastewater infrastructure financing in all 77 counties
- Clean Water State Revolving Fund (CWSRF) provides *below market rate loans*
- Repayment can be a pledge of water/sewer rates, sales tax, stormwater fees, etc

CWSRF Eligibility

- Political Subdivisions of the State
 - Counties, towns, municipalities
 - Rural water, sewer, irrigation districts
 - Water conservation districts
- Projects that manage, reduce, treat or recapture stormwater or subsurface drainage
 - Practices recommended by a MS4 permit including green roofs, rain gardens, roadside plantings, porous pavement and rainwater harvesting

What Can We Fund ?

- Traditional Stormwater Conveyance Infrastructure
 - pipes
 - Inlets
 - road side ditches
- Capital to maintain infrastructure
 - street sweepers
 - storm drain pumper trucks
- Traditional Stormwater Treatment
 - wet ponds
 - dry ponds
 - manufactured devices

Green Infrastructure

- Green stormwater infrastructure that uses natural hydrologic features to manage water and provided social and environmental benefits.
 - By incorporating green stormwater infrastructure and low impact development practices into stormwater management, communities will capture the first flush of runoff allowing it to soak naturally into the ground and naturally remove pollutants

Low Impact Development (LID)

- LID is an innovative stormwater management approach to land development that works with the nature.
 - Preserving and recreating natural landscape features
 - Minimize effective imperviousness to create functional site drainage.



What Can We Fund ?

- Eligible Green Infrastructure/LID Practices
 - Permeable/porous pavements
 - Green roofs
 - Tree boxes
 - Vegetated swales
 - Vegetated median strips
 - Cistern and rain barrels
 - Land conservation and reforestation
 - Eliminate curbs/gutters
 - Riparian buffers
 - Parks and greenways for stormwater collection
 - Rain gardens and bio-filtration practices
 - Retrofit Projects to detain and infiltrate stormwater flows.





CWSRF Stormwater Projects

- Bixby, OK Rain Garden/Roundabout at 148th & Riverview: Funded in 2011 in conjunction with a sewer improvement project
 - Oblique geometry of the intersection created hazards for safe traffic flow
 - Runoff resulted in localized flooding and weakening of the road base which undermined the pavement surface
 - Blended Funding – Bixby (part from CWSRF loan), INCOG, and Oklahoma Conservation Commission
- Solution
 - Bio-retention facility to treat storm water runoff
 - Permeable pavers to reduce runoff volumes

Bixby, Oklahoma – Bio-retention Roundabout



As of May, 2015...



CWSRF Stormwater Projects

- Lenexa, Kansas-\$1M CWSRF - GPR –ARRA
 - Rain to Recreation Project (Goals: Flood Prevention, Water Protection, Habitat Restoration and Education and Recreation) - Central Green Streamway Project drains 65 ac.
 - 7 Step pools: waterfalls that oxygenate the water
 - Native plants with deep roots both filter the water and help slow down SW so it can percolate.
 - Tied into previous developed area, made into green belt of jogging trails and other recreation

Lenexa, Kansas – Rain to Recreation Projects



Lenexa, Kansas – Rain to Recreation Projects



Stormwater Projects Examples

- City of Spokane, Washington Public Works and Utilities
 - Retrofitting existing curb and gutter systems
 - Rain gardens with native vegetation
 - Porous pavement sidewalks
 - Green parks
- Lessons learned
 - Budget life cycle costs
 - Appropriate personnel to handle O&M

Lincoln St. SURGE Project





Hazel Creek Regional Infiltration Facility and low impact development demonstration site. This has a porous concrete walking trail, rain barrel, a rain garden (the grates are drywells), and native plantings.



Curb Cuts & Tree Boxes



Stormwater Projects Examples

- Harris County Public Infrastructure Department, Houston, Texas
 - Birnamwood Drive Extension
 - Low Impact Development Practices with native vegetation plantings, bioswales, underground rain tanks with engineered soils
- Lessons Learned
 - O&M (primarily mowing) was cut in half with this construction change
 - Construction costs were reduced

LID Practices Used in Harris County

- False Back Inlets/Open Channel Drainage
- Predominate Native Plantings
- Biofiltration/Engineered Soils
- On-site/In-line detention



Harris County Public Infrastructure Department Birnamwood Drive

Birnamwood Drive Extension



Birnamwood Drive Extension

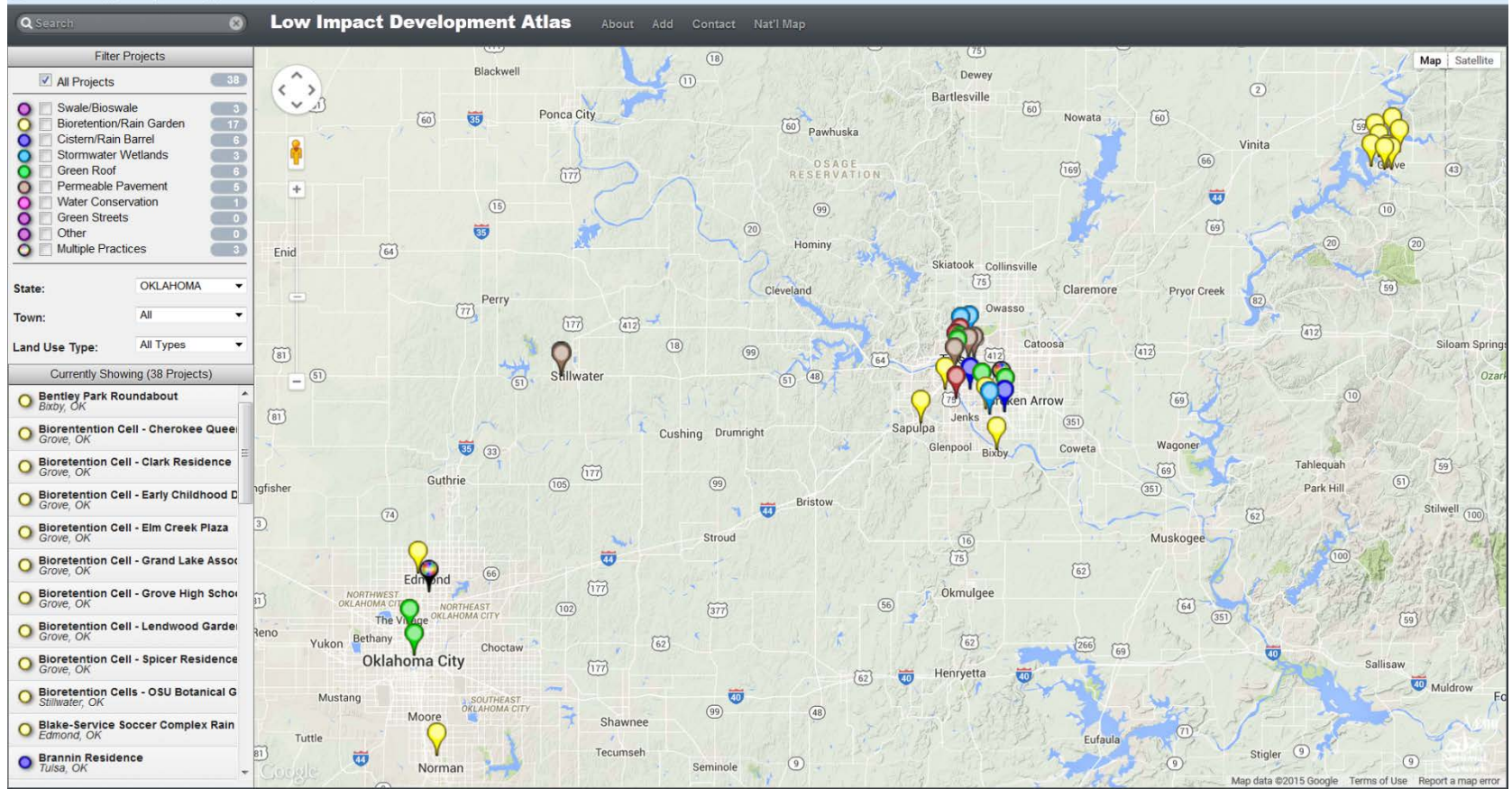
Mowing

Swale mowed once (in Feb. 2014) since establishment in June 2012.



February 2014

Map of Oklahoma GI/LID Projects



For more information:

Oklahoma Water Resources Board

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