LOW IMPACT DEVELOPMENT

LID IN REGION 6

Introduction
Robert Adair, HLWSF
The Harris County Story
Alisa Max, PE, Harris County PID
Nick Russo, Harris County PID
Justin Taack, TCEQ
Houston Area Focus
Charlie Penland, PE, LEED AP, Walter P Moore & Associates
Margaret Robinson, PLA, ASLA, LEED AP, Asakura Robinson
Steve Albert, PE, CFM, Sherwood Design Engineers

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Introduction
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San Antonio
Karen Bishop, San Antonio River Authority
Tiffany Price, Bender Wells & Clark
Austin
Andy Johnston, PE, CFM, CPESC, Halff & Associates
Dallas-Fort Worth
Mikel Wilkins, PE, ISI ENV-SP Verdunity
Oklahoma
Zach Roach, Ideal Homes
LID O&M Considerations: Policy and Practicality
David Batts, Construction EcoServices

Introduction
Robert Adair, HLWSF
Arkansas
Becky Roark, Illinois River Watershed Partnership
Louisiana
Dana Brown, PLA, ASLA, LEED AP, CSI, AICP, Dana Brown Associates
New Mexico
George Radnovich, ASLA, Sites Southwest
Water Management at All Scales the New Orleans Region

- GNO Urban Water Plan
- Early Projects
- Stormwater Lots
- Pontilly Neighborhoods
- Green Infrastructure Education Program
- City of New Orleans CZO
- Grassroots Efforts & Advocacy
- You can Feel it in the Air
GNO Urban Water Plan

- Unprecedented Effort
- Multi-disciplinary
  - Architects
  - Landscape Architects
  - Engineers
  - Urban Designers
  - Planners
  - Economists
  - Policy Makers
  - Attorneys
- Multi-jurisdictional (three Parishes)
- Comprehensive
- Integrated
- Supported by the Royal Netherlands Embassy
GNO Urban Water Plan

- Process
  - System Level Analysis
  - System Level Design
  - Urban Design
  - Canal Vocabulary
  - Roadway Retrofits
  - New Street Standards
  - Parking Lot Retrofits
  - Demonstration Projects
Soil Types
The region’s soft soils—each with different physical properties—are important considerations for water management. The city rests on layers of clay, sand, and muck.
Circa 1800 A Challenging Site
- Canals are dug in an attempt to drain the city and to improve access.
- The city grows on the high ground along the river.
- The young city is continuously challenged by tropical storms, hurricanes, and river floods.

Circa 1895 The Draining of the Backswamp
- Oxidation due to dewatering causes the ground to start subsiding, increasing the need for pumping.
- In the 1930s, new drainage pumps at the edge of the city successfully drain the backswamp.
- The city prospers, but suffers from outbreaks of malaria and yellow fever.

Circa 2000 City Between River and Lake
- Problems are concentrated in isolated low areas.
- Runoff from the high grounds becomes floodwaters lower down.
- Sinking land degrades subsurface shallows.
- Area of paved surfaces grows exponentially after World War II.
- Settling of the soils below sea level and the loss of wetland buffers increase vulnerability to hurricanes, and damages to infrastructure.

- High-vacancy after Katrina
- Suburban settlement in lowlands has eroded
- Land erosion in the lakeweed at hurricane protection (1935)
Subsidence Potential

As organic soils are drained of water, their contents “oxidize,” or decompose and shrink. The areas with the highest percentage of organic material in their soils typically have the highest potential for subsidence. Water levels in these areas demand special attention to avoid subsidence-related damage to buildings and infrastructure.
Introduce retention features on vacant lots to increase permeability.

Introduce circulating canal system to recharge groundwater and raise water table.

Increase storage capacity in public spaces, such as parks and underutilized rights-of-way.

Remove outfall canal floodwalls to access outfall canals and water networks as high-quality public spaces.

Lakefront closure structures for outfall canals in place.

Slow:
- Rooftops, driveways, streets, and sidewalks can be redesigned to catch and store more of the rainwater, allowing some of that water to soak into the ground. A healthy urban tree canopy also slows the flow of water and improves environmental quality.

Store & Use:
- Large-scale detention and retention features integrated into canal networks and public spaces provide additional storage capacity for managing stormwater. Slow and store featured rain gardens, green roofs, and other features.

Drain When Necessary:
- Pumping should not be the only solution for managing stormwater. Slow and store features lessen loads on pumping stations, provide additional sources of safety, and enhance the capacity of drainage systems overall.

Circulate:
- Flowing water makes for improved water quality and more healthful and beautiful canal environments. Restoring connections to wetlands strengthens regional ecology.

Recharge:
- Maintaining higher groundwater levels improves soil stability and reduces the rate of subsidence for the region’s low-lying areas. This requires distribution and monitoring networks.
The Integrated Living Water System
The Components of the Proposed System

- **Small-scale Retrofits** in streets, on individual properties, in patios, and in squares and plazas slow and store stormwater, capturing and infiltrating water where it falls. Interceptor streets on high ground are a critical feature of small-scale retrofits.

- **Circulating Canals** in the region’s bowls and lowlands recharge groundwater and sustain local habitats. During wet weather, they continue to serve as drainage conduits.

- **Strategic Parklands** at key junctures of the integrated living water system contain vast quantities of stormwater during heavy rains, while providing valuable open space and recreational amenities.

- **Integrated Wetlands** located within strategic parklands and distributed throughout the region store and filter stormwater and dry weather flows. Detention wetlands are filled with treated wastewater and filtered stormwater.

- **Integrated Waterworks** are the water treatment plants, drainage pumps, siphons, sluices, wells, and gates that control, draw, redirect, and filter stormwater, surface water, groundwater, drinking water, sewage, and industrial wastewater. They are the components that establish the flows and rhythms of the living water system.

- **Regional Monitoring Networks** for surface water and groundwater provide system managers with real-time data that are necessary to sustain and repair drainage networks and long-term trends in water levels and water quality, and to maintain higher water levels without compromising safety.

- **Waterfront Development Zones** around key waterways and parklands anchor the development of higher-density, multi-use districts defined by urban water assets.
TRICENTENNIAL PLACE
CITY PARK, NEW ORLEANS

1. 100% PARKING LOT RUNOFF COLLECTED
2. WATER TREATMENT BY RAIN GARDEN
Stormwater Lots
Pontilly Neighborhoods
RETAIN (private)
DETAIN (public)
DRAIN (system)
Other Efforts

- Green Infrastructure Education Program
- City of New Orleans CZO
- Sewerage & Water Board GI Grants
- Grassroots Efforts & Advocacy
  - LUSC
  - Water Wise Group
  - GNO Water Collaborative
- You can Feel it in the Air!
Thank you.

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• Resources
  o LUSC www.louisianastormwater.org
  o Urban Water Plan www.livingwithwater.com
  o iPad App GNO Urban Water Plan
  o New Orleans Water Challenge www.ideavillage.org

• Active Participants
  o GNO Inc.
  o GNOF
  o Sewerage & Water Board of New Orleans
  o New Orleans Redevelopment Authority
  o New Orleans City Planning Commission
  o Jefferson Parish
  o St. Bernard Parish
  o New Orleans Regional Planning Commission
  o Many non-profit organizations