

**USGBC North Florida
Annual Chapter Update
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**Low Impact Development
(LID)**

Presentation by:

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- What is LID?
- How does LID fit into the Comprehensive Strategy for Improving the health of the St. Johns River?
- How is LID being incorporated?

LID

A stormwater management approach that uses a suite of hydrologic controls (structural and non-structural) distributed throughout the site and integrated as a treatment train (i.e., in series) to replicate the natural hydrologic functioning of the predevelopment landscape.

How will the City comply with the Lower St. Johns River Nutrient Basin Management Action Plan (BMAP)?

How does LID fit in?

- Water Supply
- Water Quality



The Problem.....
Excessive Nutrient input to the River

Microcystis Bloom - I-295 (north view) over mid-channel St. Johns River - 08.19.05 - 2:43pm
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- Excess Nutrient Impacts**
- Drainage impairment
 - Algal blooms
 - Fish kills
 - Aesthetics
 - Violations of Water Quality Standards

Morris Hill Pond
Photo: Guyon Hill
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BMAP Strategy

1. Master Stormwater Management Plan
 - River Accord
 - Stormwater Utility
 - Capital Improvement Projects
 - Structural Controls
 - Best Management Practices (LID)
2. Stormwater NPDES Program
 - Street Sweeping
 - Pollution Prevention (LID)
 - Education & Outreach – Florida-Friendly Landscaping (LID)
3. Water Quality Monitoring Program
 - State of the River Report
4. Water Quality Credit Trading

BMAP Strategy *cont'd*

5. Reuse Ordinance (Ch 752 O.C.)
6. Septic Tank Phase-out
7. Florida Friendly Landscape and Irrigation System Design - 2009-864 (LID)
8. Landscape Irrigation Schedule Ordinance (Ch 366 O.C.) (LID)
9. Fertilizer Ordinance (Ch 366 O.C.) (LID)

How is LID being incorporated?

- Subdivision Standards Policy Advisory Committee (SSPAC)
 - City Design specifications
 - Land Development Procedures Manual
- SSPAC LID Subcommittee
 - LID Manual for Duval County

LID Manual for Duval County

- LID Subcommittee will oversee development of the Manual and forward to SSPAC
- Planning Department is preparing a Request For Proposal to contract with a Facilitator/Consultant
- Environmental Protection Board has approved \$100k (pending City Council) from Environmental Protection Fund (penalty \$) for first version of Manual

LID Manual for Duval County

- Voluntary – Alternative to traditional development
- Consensus – Involve key stakeholders
- Guide for including LID in stormwater permitting (State and City).

LID Manual Duval County

The LID Manual is intended for use primarily by professionals engaged in the planning, design, construction, operations, and maintenance of building and development projects in Duval County. These potential users include but are not limited to stormwater design engineers, stormwater utility staff, natural resource managers, planning officials and administrators, building officials, architects, developers, landscape architects, site design specialists, and landscape operations and maintenance professionals.

The fundamental goal of applying LID concepts, design, and practice is to improve the overall effectiveness and efficiency of stormwater management (reducing total and peak runoff volumes and improving the quality of waters discharged from the site).

LID Manual Duval County

- Site Planning and Design
- Preserving site assets
- Minimizing and Controlling Runoff Generation at the Source
- Promoting Infiltration
- Promoting Stormwater Reuse
- Minimizing Site Disturbance
- Detention with Biofiltration
- Shallow Bioretention
- Rainwater Harvesting

LID Manual Duval County

- Pervious Pavements
- Greenroof Stormwater Treatment Systems
- Swale Section Design
- Roadway Design (width)
- Sidewalk Design
- Safety Vehicle Access
- Right of Way – utilities, width, interceptor ponds, rain gardens
- Operation and Maintenance – Inspections and Enforcement (HOA issues)
- Incentives – Rebates / Density

Contrast Development Practices:

**LID
&
Conventional**



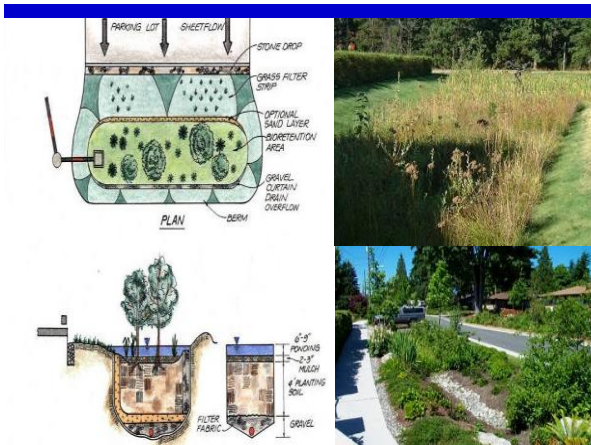
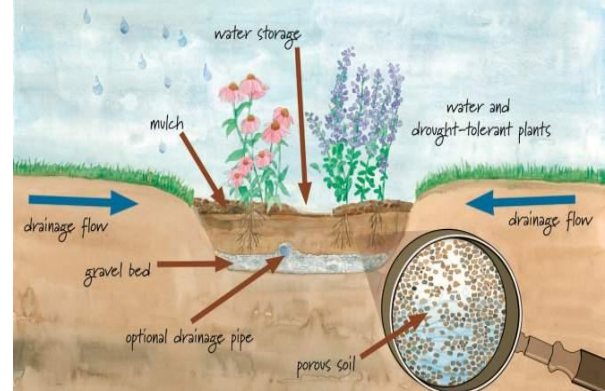


Why Raingardens?

- Reduce runoff volume
- Remove pollutants
- Provide functionality
- Enhance aesthetics
- Attract wildlife
- Recharge groundwater
- Consume CO₂



What is a Raingarden?



Examples of Raingardens



Detention with Biofiltration (Swale)

Prefilter strip:

Reduces maintenance & extends economic life, less than 1 ft/sec with shallow depth, Vegetated or grassed

Ponding area:

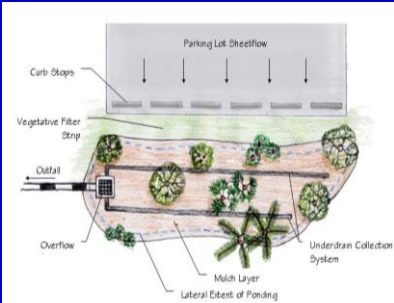
Less than 12 inches, Recovery time of no more than 72 hours but no less than 24 hours

Key Considerations

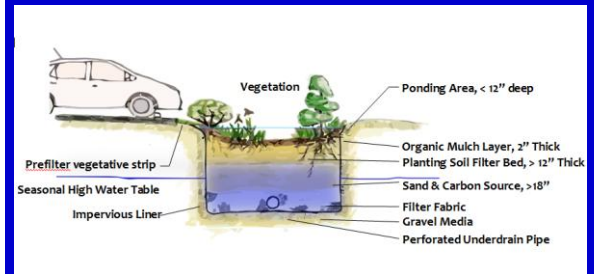
- Applicable to small drainage areas
- Good retrofit capability
- Relatively low maintenance requirements
- Can be planned as an aesthetic feature
- High nutrient removal efficiency
- Volume attenuation benefits
- Requires landscaping, liner, and underdrain

Detention with Biofiltration (Swale Design)

- Shallow landscaped depressions
- Engineered media
- Typically lined
- Underdrains

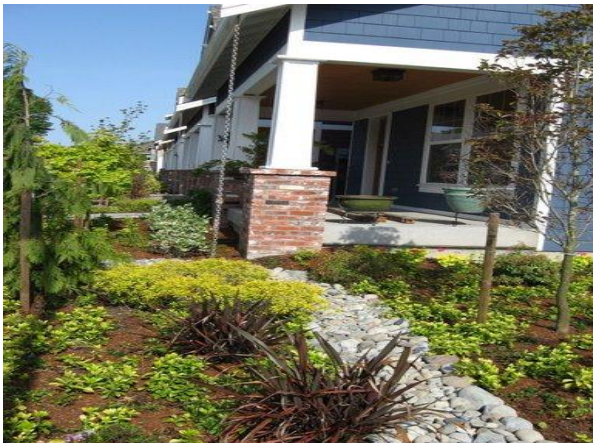


Cross Section View



Before NIE Fremont Stormwater Curb Extension After.





Greenroof

- Vegetated Roof Cover
- Active (Intensive): Deep Media, Intended for Public Access and Aesthetics
- Passive (Extensive): Shallow Media, Intended for Maintenance Access Only.
- Credit is gained by retention of rainfall and if used with a cistern, additional credit for retention is earned.

Credit: Dr. Mark Wadzinski



Greenroof Stormwater Treatment System

- **Greenroof Stormwater Treatment System:** A vegetated roof with a cistern that can be used for stormwater pollution control, volume reduction, and peak flow reduction.



Greenroof Benefits

- Effective stormwater treatment
- Longer roof life & warranty
- Decreases temperature fluctuations from more than 70° F to 5° F
- Office space with view of greenroof had rent increased by \$8 per square foot in March 2005.
- Energy benefits - heat reduction of about 45% in a year



Incentives

- Fast track permitting
- Building density – green space credit
- Rebates / Tax Credit
- Awards & Recognition

LID Demonstration

- Location
- Funding
- Planning & Implementation
- Competition?

QUESTIONS?

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