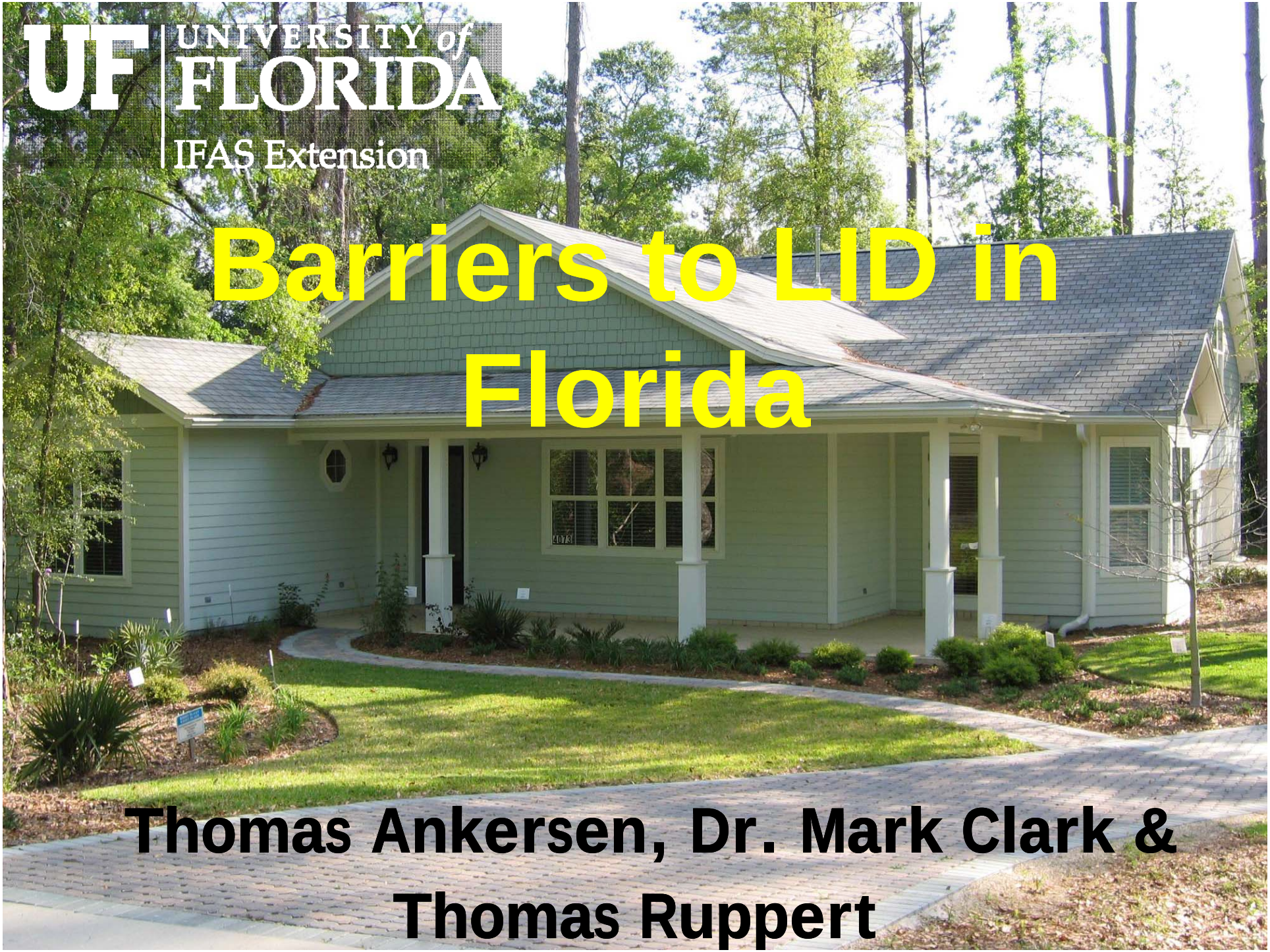
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IFAS Extension
Barriers to LID in Florida
Thomas Ankersen, Dr. Mark Clark & Thomas Ruppert

Who's Responsible for Stormwater Regulation?

- **Clean Water Act's MS4 permitting authority delegated to State of Florida**
- **The Florida Department of Environmental Protection (FDEP) administers stormwater management**
- **FDEP delegated authority to Florida's Water Management Districts (WMDs)**

What is the Target for Quality?

- 80% removal for discharges to Class III (recreational) waters
- 95% removal discharges to potable supply waters (Class I), shellfish harvesting waters (Class II), and Outstanding Florida Waters (OFWs)
- No net increase of discharge to impaired waters

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Quality of State Waters

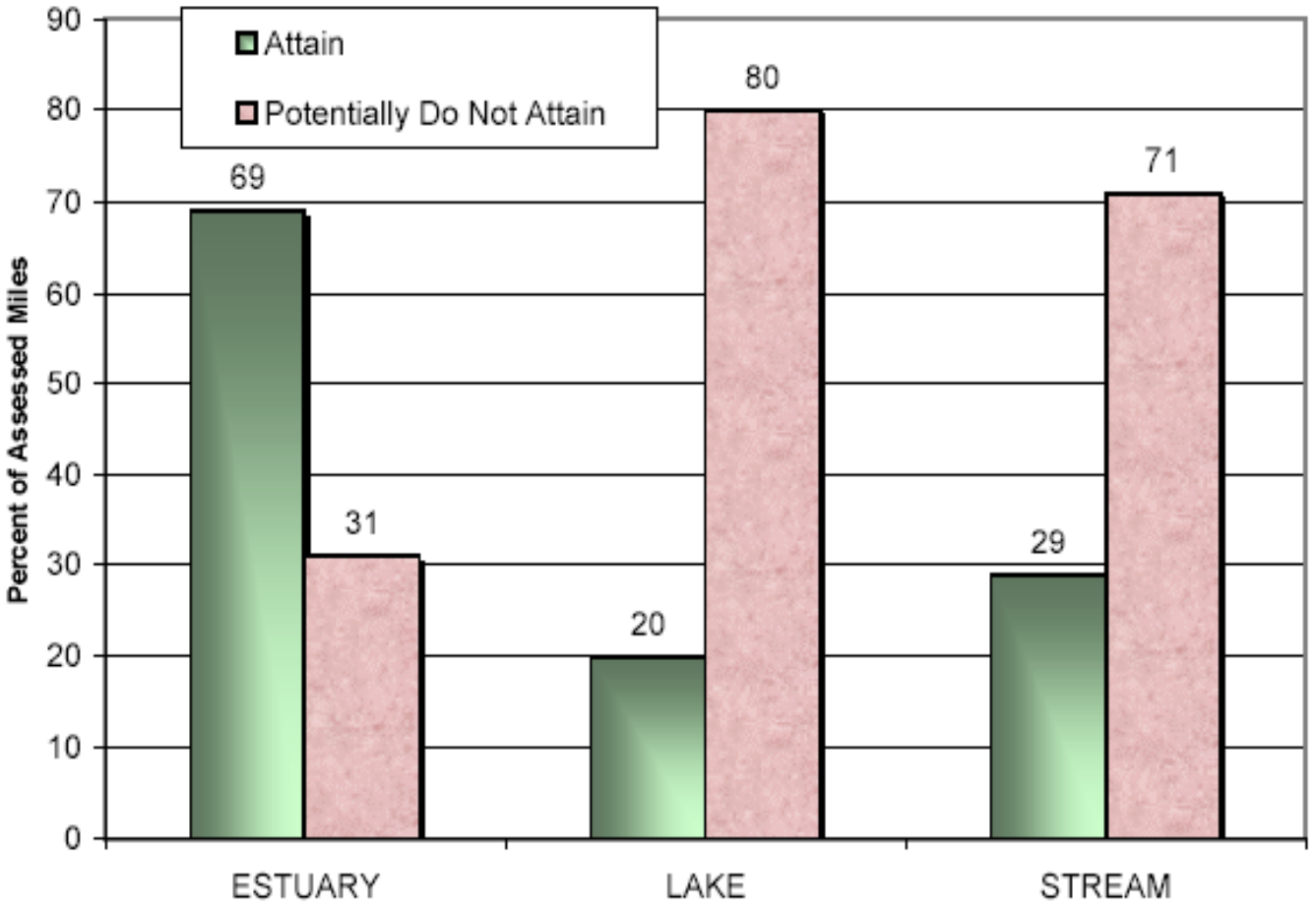

Figure 1: Percent of Florida Waters which Attain or Potentially Do Not Attain their Designated Uses

Florida Water Quality Assessment 2002 305(b) report

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Regulatory Requirements

"The applicant must provide reasonable assurance that the stormwater management system:

- **Will not result in discharges from the system to surface and ground water of the state that *cause or contribute to violations of state water quality standards*…;**
- **Will not adversely affect drainage and flood protection on adjacent or nearby properties not owned or controlled by the applicant;**
- **Will be capable of being effectively operated and maintained…"**

Impact of TMDLs

"If the receiving water body has been determined to be impaired, the applicant must demonstrate that the project will result in a net improvement for the parameter for which the water body is impaired. . . ."

[12.2 Applicant's Handbook]

Evaluation of Current Stormwater Design Criteria within the State of Florida

Final Report

Prepared for:

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

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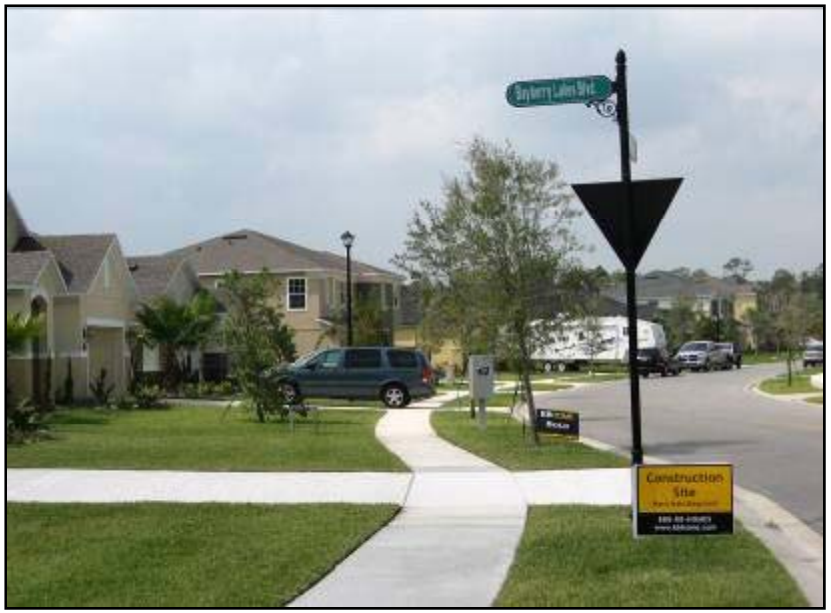
Development Under Current Practices



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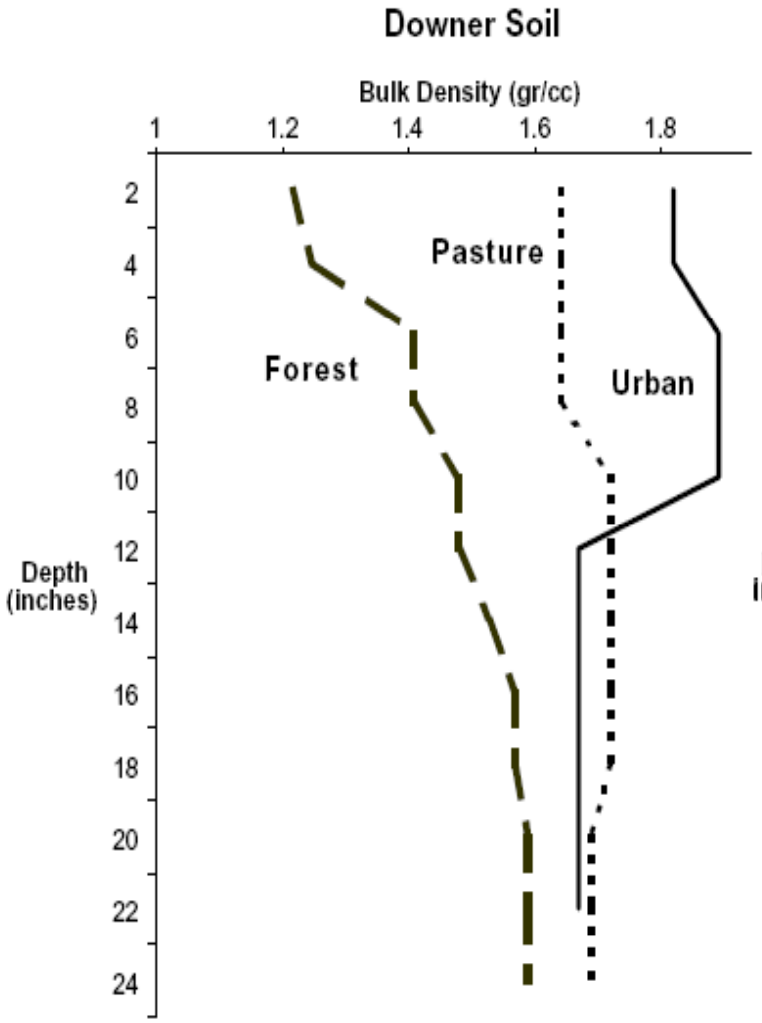
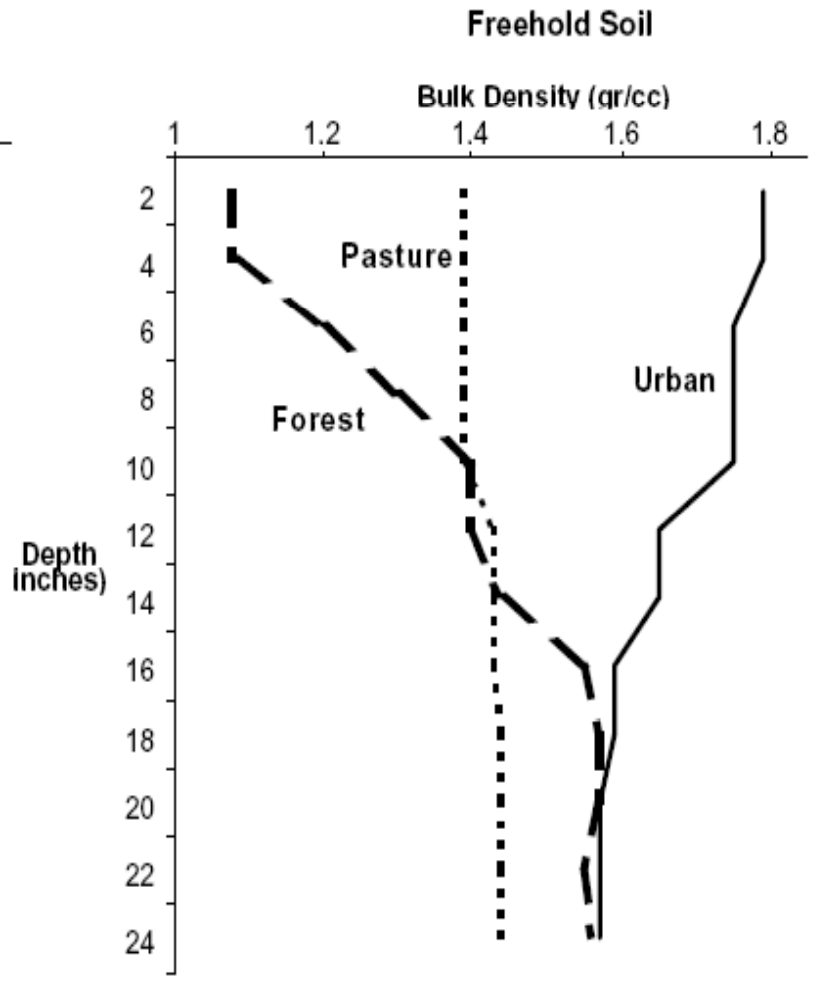
Increased Runoff

(Impervious area, Compaction, Lost Interception)





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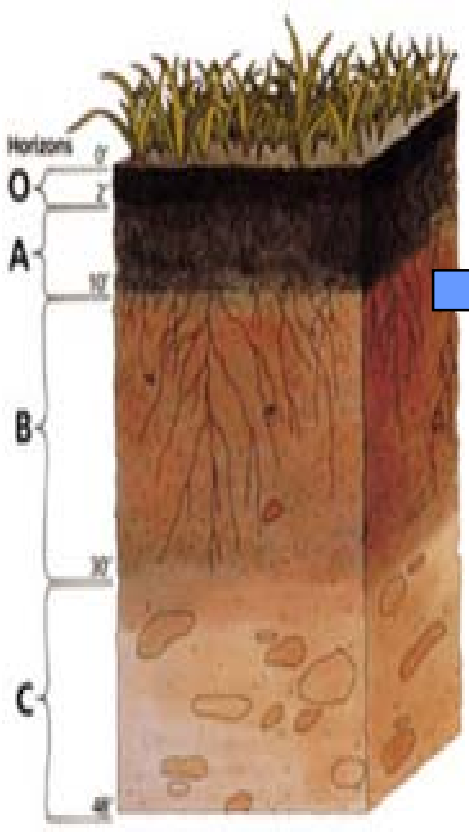
Soil Profile



Fill and Soil Quality

Native Soil
pH = 5.0,
leachable P = 1.4 ± 0.5 ppm

Fill Material
pH = 7.3
leachable P = 77.7 ± 52 ppm

Common space landscape
pH = 7.3
Mehlich 1 P = 80.9 ± 48 ppm

Residential landscape
pH = 7.3
Mehlich 1 P = 93.5 ± 34 ppm

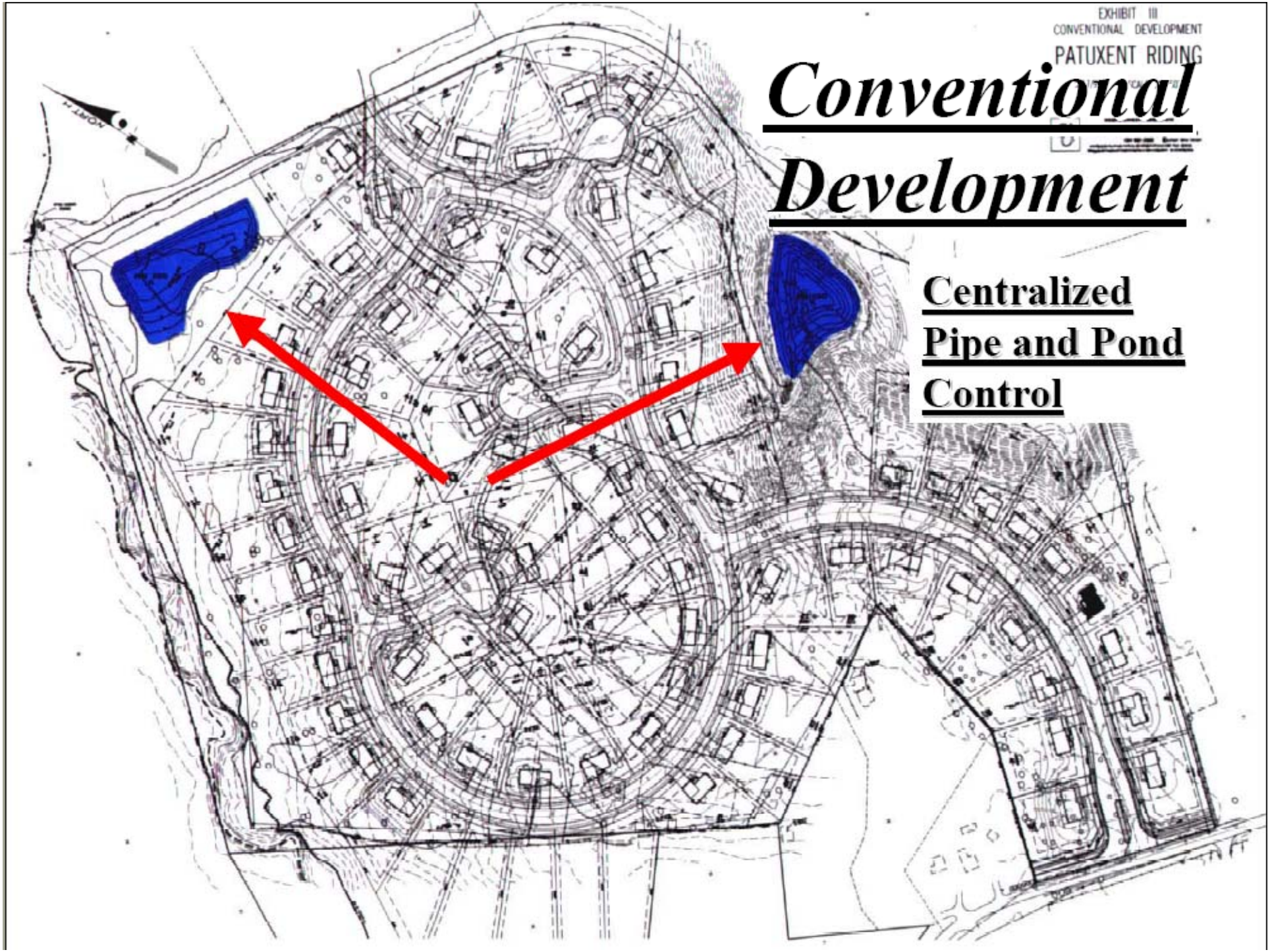


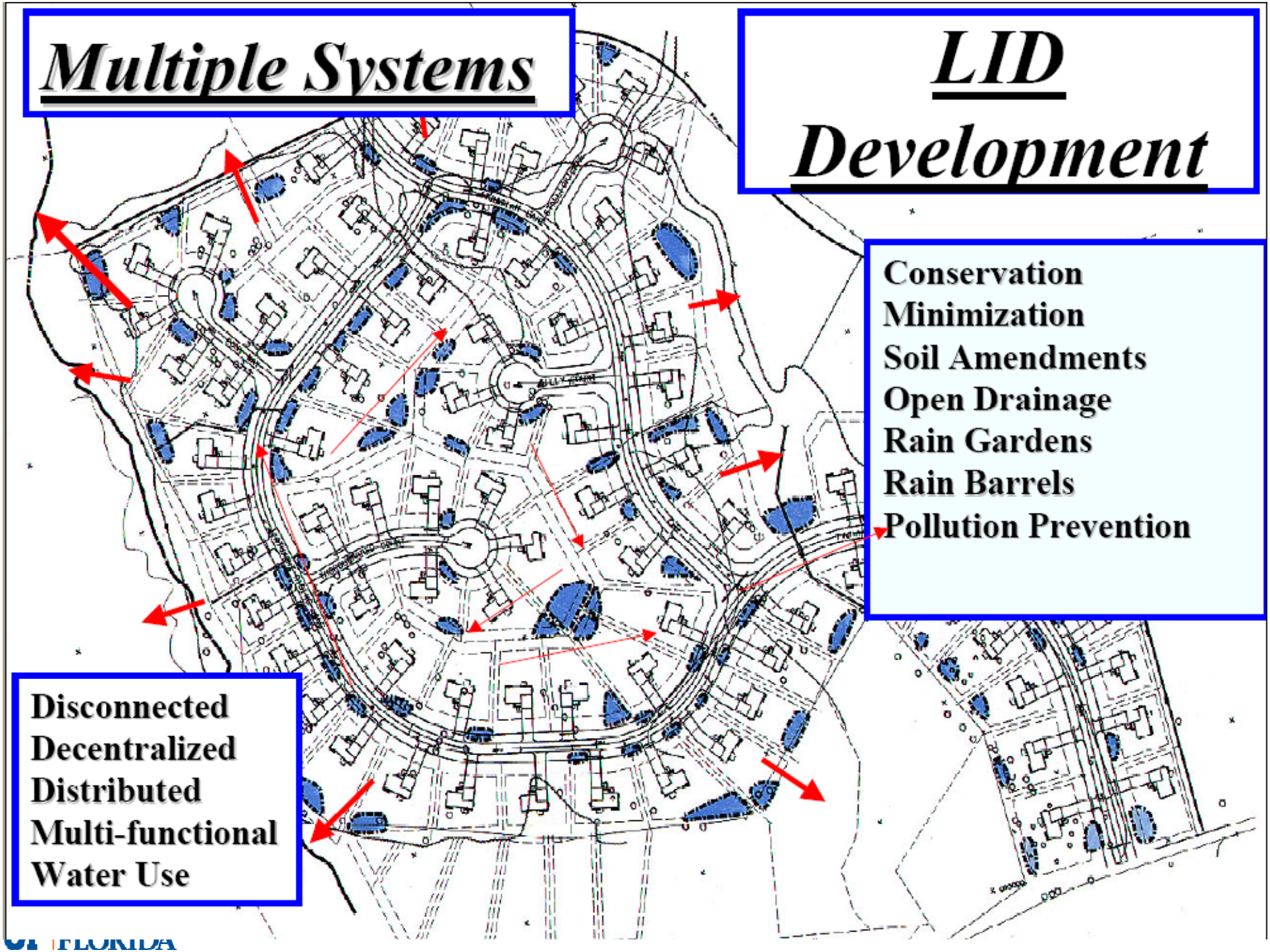
EXHIBIT III
CONVENTIONAL DEVELOPMENT
PATUXENT RIDING
Conventional Development
Centralized Pipe and Pond Control

Why Conventional Designs are Not Sufficient

- Focuses only on treatment, not source control.
- Matches pre vs. post peak discharge, does not match volume pre vs. post.
- Wet basin designs mostly focus on settling of particulates, does not effectively treat dissolved contaminants.
- Concentrates volume and contaminants on smaller footprint of landscape,
  - typically down slope of predevelopment infiltration point
  - modifies internal site hydrologic characteristics
  - Reduces opportunity to promote biological or soil treatment
- Promotes disconnect between stormwater infrastructure /management and neighborhood perceptions/behavior

Multiple Systems

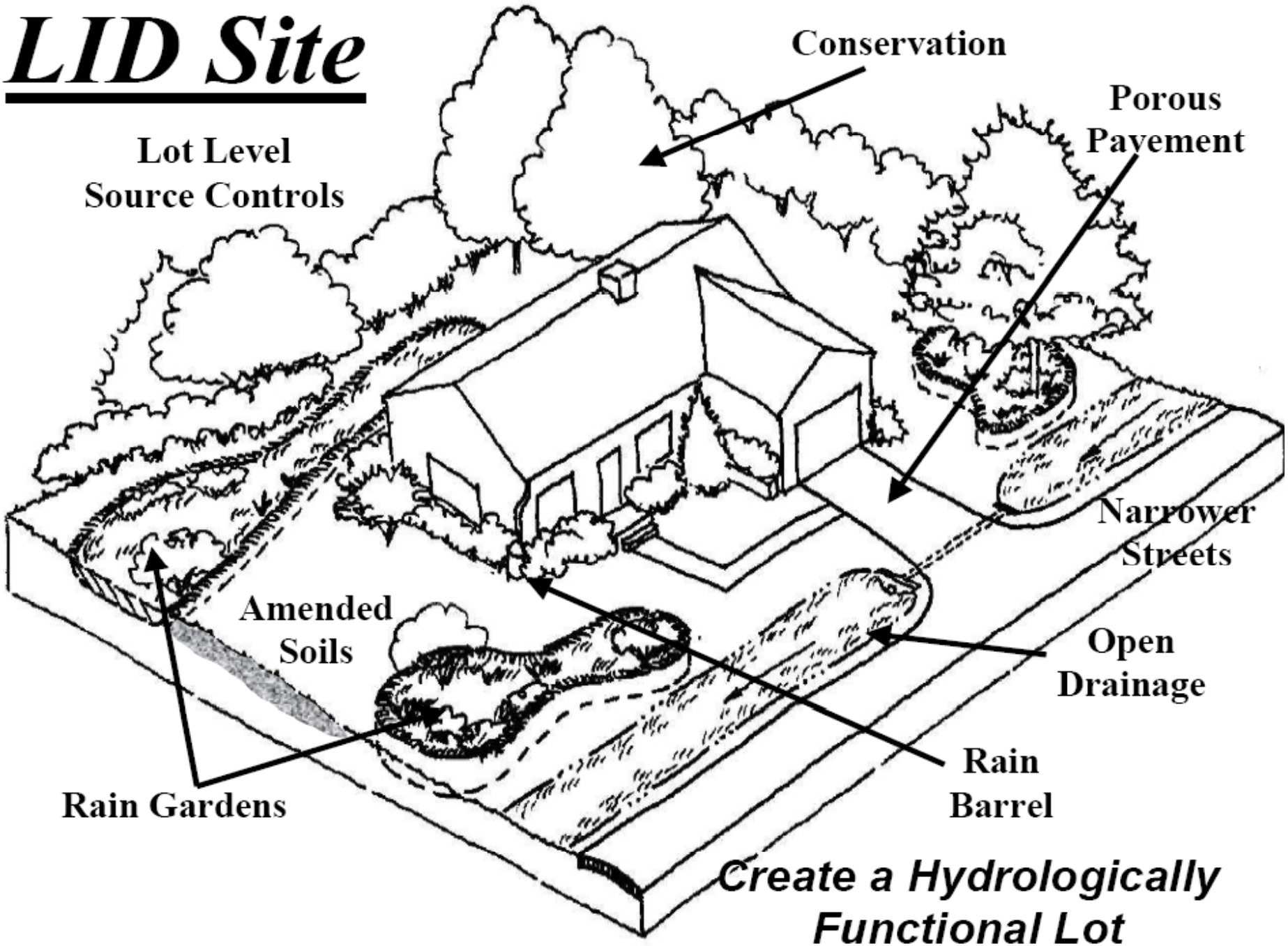
LID Development



Conservation
Minimization
Soil Amendments
Open Drainage
Rain Gardens
Rain Barrels
Pollution Prevention

Disconnected
Decentralized
Distributed
Multi-functional
Water Use

LID Site



Create a Hydrologically Functional Lot

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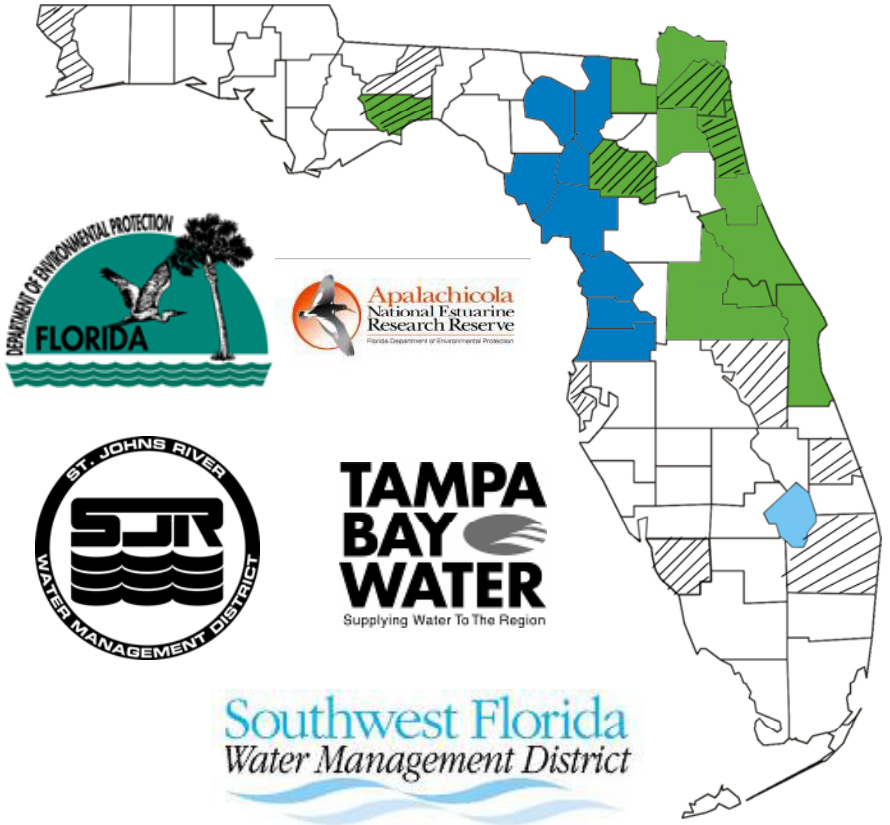
Program for Resource Efficient Communities

- **Purpose**
  - **Raise awareness of environmental issues and regulatory implications of "conventional" development practices.**
  - **Provide information and resources for alternative development practices.**
  - **Stimulate discussion within local county governments to review land development regulations and evaluate limitations/incentives for Low Impact Development alternatives.**



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Barriers to LID Implementation

- **Developers, professionals and local government officials**
  - **Survey of workshop and CEU training program participants.**
- **Regulatory**
  - **Interview state and water management district staff to determine limitations from a regulatory perspective.**

What Regulators Say

"The applicant must provide reasonable assurance that the stormwater management system:

- **Will not result in discharges from the system to surface and ground water of the state that cause or contribute to violations of state water quality standards…;**
- **Will not adversely affect drainage and flood protection on adjacent or nearby properties not owned or controlled by the applicant;**
- **Will be capable of being effectively operated and maintained…"**

"What is your Profession?" **(who took the survey)**

Engineer	**24%**
Planner	**19%**
Other	**16%**
Educator/Consultant	**13%**
Regulatory/Local Government Official	**10%**
Builder/Developer	**10%**
Elected Official	**4%**
Landscape Architect	**3%**
Architect	**2%**

"Based on your experiences and perspective, what do you feel are the main challenges to successful implementation of LID practices in your County?"

Acceptance/Changing Status Quo/Overcoming Apathy to Promote Behavior Change	**25%**
Regulatory/Permitting Barriers	**23%**
Education & Awareness	**21%**
Cost and/or Lack of and Misguided Incentives	**18%**
Technical Training & Implementation	**5%**
Other	**3%**
Compliance and Enforcement	**2%**
Maintenance	**2%**

373 responses

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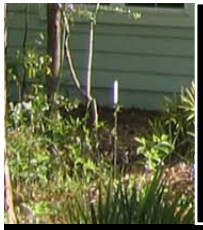
"What do you feel are the most important strategies and/or next steps for overcoming these challenges?"

Education, Outreach, and Marketing to Promote Awareness	35%
Regulatory/Permitting/Code Changes that Allow for LID	18%
Offer Incentives, Monetary and Otherwise	14%
Participation, Communication, and Cooperation among Stakeholders	11%
Fundamental Shift in Thinking/Change the Status Quo/Leadership	9%
Research/Data Collection/Demonstration Projects	8%
Technical Training/Design Requirements	3%
Other	3%



"What do you need in your role to complete or approve an LID project?"

Real Examples that Work / Case Studies	**26%**
Example Code Language	**21%**
Training in LID Design	**16%**
Additional Training in LID Principles	**13%**
Available Material (hardware)	**12%**
Training in Material Installation	**8%**
Other	**3%**

633 responses

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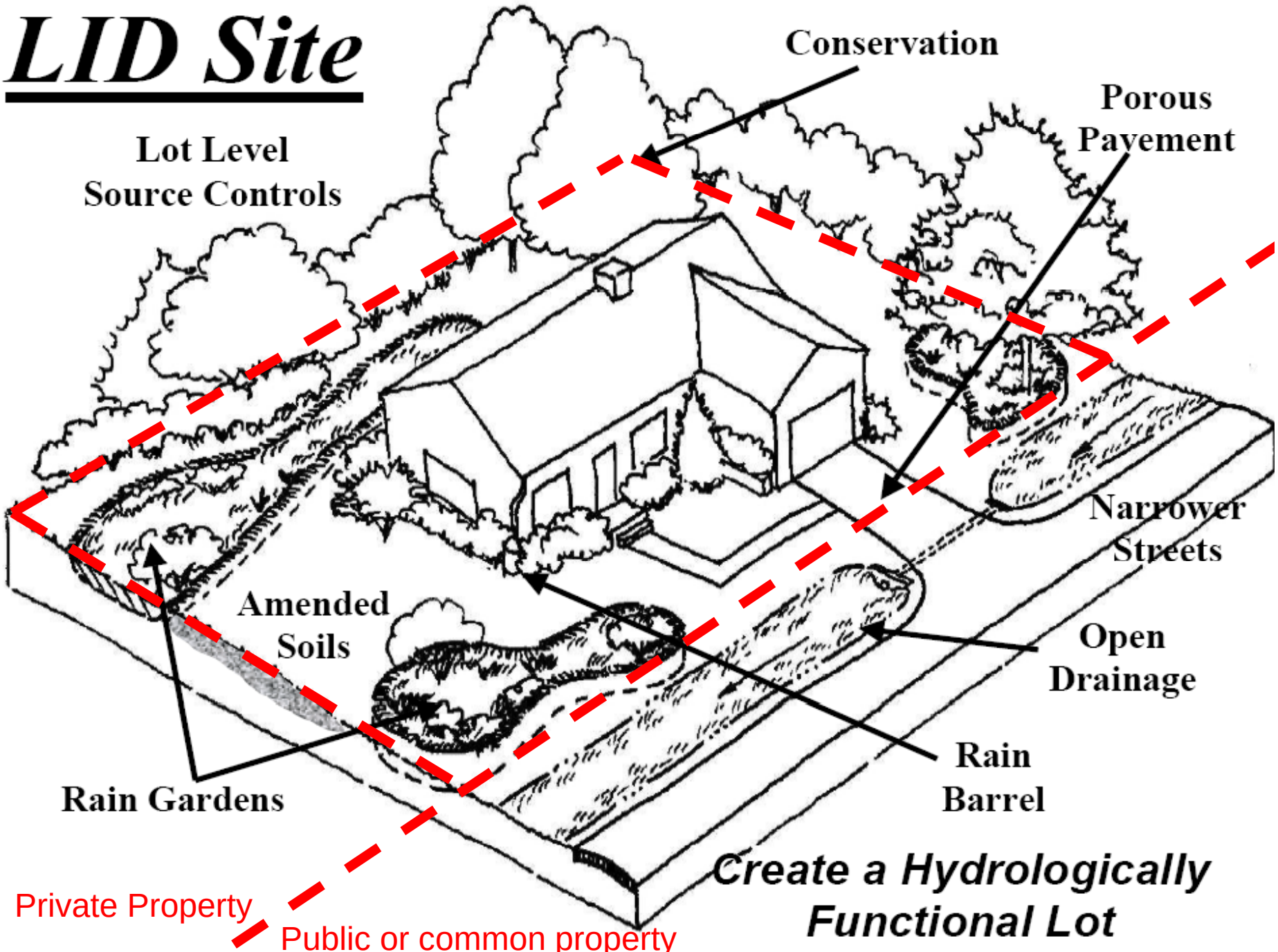
Statewide Stormwater Rule

- **Post ≤ Pre loading std. for draft rule**
  - **Loading = nutrient concentration X runoff amount**
- **Scale of efficiencies for different treatments and "Treatment Train"**
- **Essentially need to hold/retain amount requiring treatment**

Statewide Stormwater Rule

- **Credits for good development practices and debits for bad ones**
  - **Credits for Fla. Friendly Landscaping and preserving native vegetation**
  - **Debits for cleared areas/compaction**
- **Cisterns; green roofs; stormwater reuse systems; wet detention; pervious pavement**

LID Site


Conservation
Porous Pavement
Lot Level Source Controls
Narrower Streets
Amended Soils
Open Drainage
Rain Barrel
Rain Gardens
Create a Hydrologically Functional Lot
Private Property
Public or common property

Developing O&M Solutions

- Limit LID to common property /commercial /ROWs
- Consider stormwater utilities
- Consider scale of development
  - Community Development District
  - HOA
- Change the standard for “REASONABLE ASSURANCE” from maintenance to treatment efficacy

Summary

- **Early presumptions of treatment led to problems**
- **Eliminate barriers:**
  - **Differing perceptions of barriers**
  - **Develop legal strategies to assure O&M of LID systems**
  - **LID compatible code language**

Policy Impacts

- **Working with Sarasota County on development of their LID O & M Manual**
- **Statewide Stormwater Rule**
  - **Current draft incorporates by reference model HOA Conditions, Convenants & Restrictions (CCRs) drafted by Conservation Clinic**
- **Marion County**
  - **Clinic provided language in Comprehensive Plan Policy for Springs Protection Zone requiring "innovative approaches" to development to address stormwater quality through land development regulations**
  - **LDRs still in progress (w/ O&M language)**

Research and Education Needs

- Research needed on efficacy of social marketing for behavior change to address source control
- Further development of regulatory and contractual bases for O & M
- Landscape-level examples of LID to monitor and adaptively manage
- Strategies to apply LID to existing development and redevelopment (retrofit)

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