

The Implementation of Low Impact Development (LID) Practices along the South Carolina Coast



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The Oak Terrace Preserve Research Project



- LID implementation obstacles and options
- Cost comparison
- LID design and installation guidelines
- Performance and Efficiency
- Homeowner perceptions and educational needs
- Knowledge dissemination

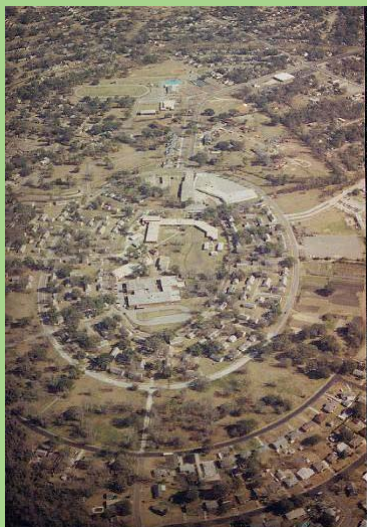
Restoring a Garden City



In early 2001, The City of North Charleston identified 5 areas of concern in the Noisette footprint: Century Oaks, Calhoun Homes, Northpark Village, GARCO and the abandoned Charleston Navy Yard.

Today all 5 areas are actively being redeveloped.

Old Century Oaks



- World War II era community
- Temporary shelters for shipyard workers and their families throughout the 1940's
- Occupied as rental units until 4 years ago

Site Fabric



Oak Terrace Preserve

Clustered Development

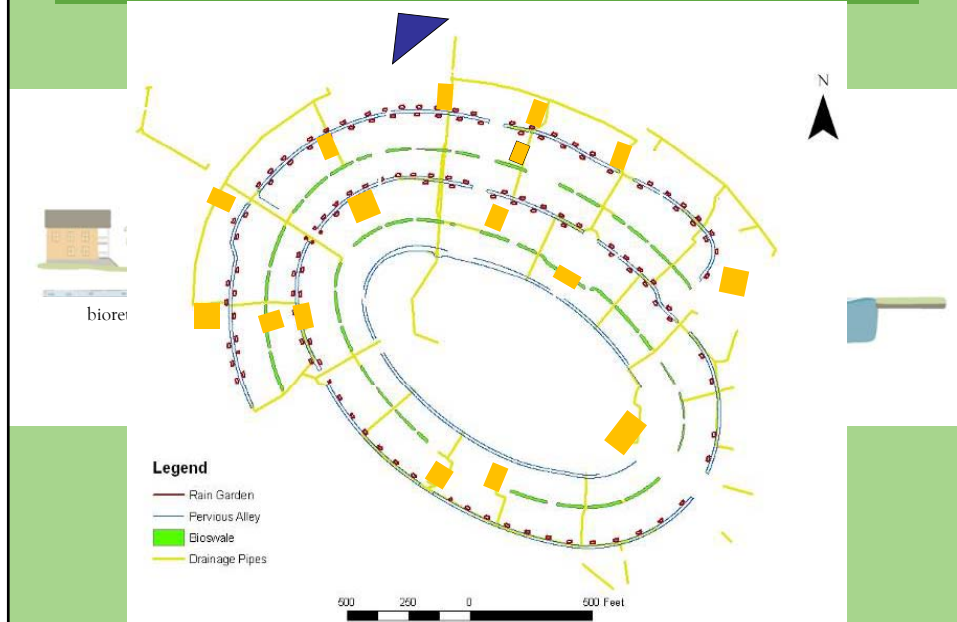
- 374 units / 55 acres

Tree Preservation

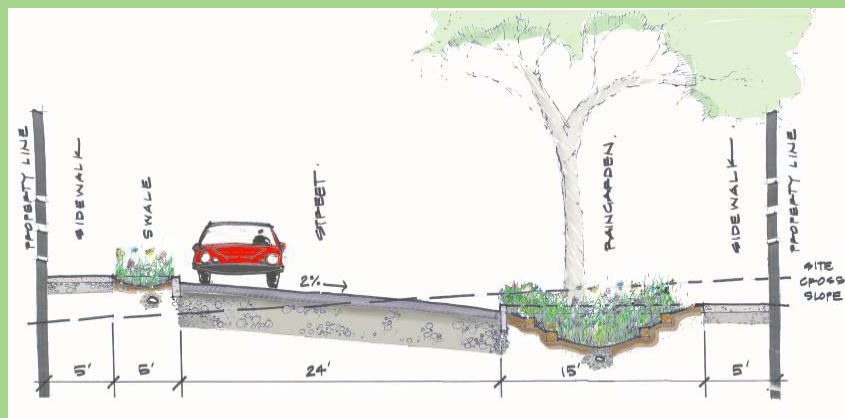
- 90% of A,B,C trees
- Flexibility in setbacks



Low Impact Development Practices



Bioretention Swales



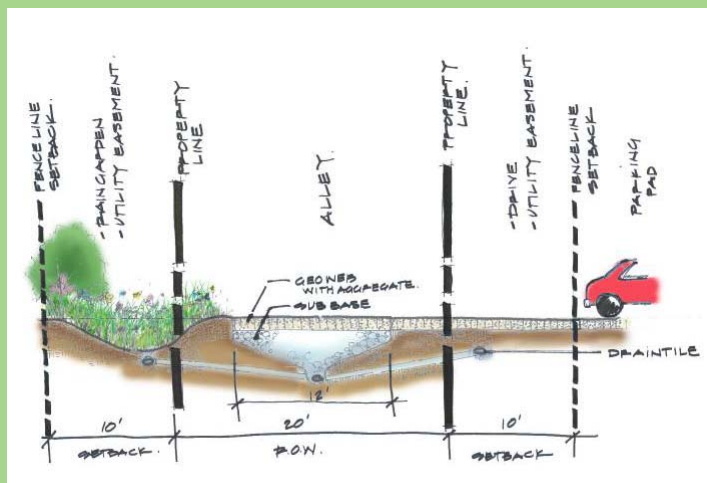
Pre-Installation



Post-Installation



Pervious Alleys



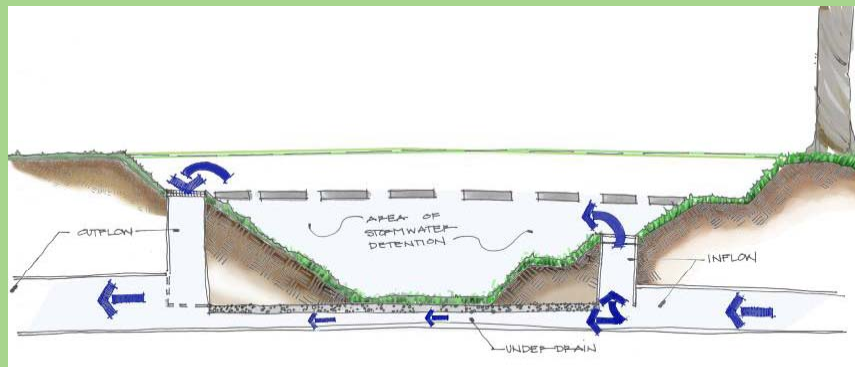
Pre-Installation



Post-Installation



Pocket Parks



Pre-Installation



Post-Installation



Lessons Learned - Strengths

- Partnership with the City of North Charleston and the developer (Noisette)
- Restoring forested wetland characteristics
- Green is trendy
- Phasing of Construction
 - Pervious Alleys
 - Bioretention swales as sediment traps



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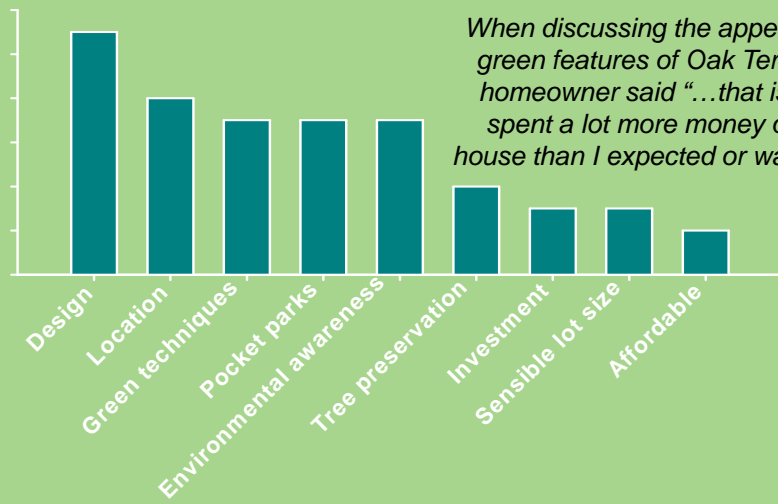


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Attributes used to describe Oak Terrace Preserve



When discussing the appeal of the green features of Oak Terrace, a homeowner said "...that is why I spent a lot more money on this house than I expected or wanted to."

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Lessons Learned - Weaknesses

- Phasing of Construction:
 - Inexperience and lack of knowledge
 - LID implementation is still a learning process
 - Creative marketing
- Expensive
 - Underdrains
 - Need economic incentives
- General public lack of knowledge



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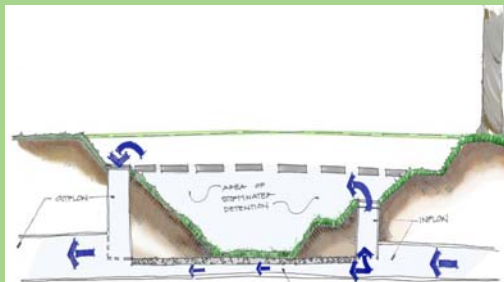
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Implementation Obstacles and Options

- Limited prevalence along SC Coast
- SC Coastal Study
 - Identify obstacles to implementing LID
 - Identify options to overcome the obstacles
 - Disseminate to assist coastal communities and their stakeholders



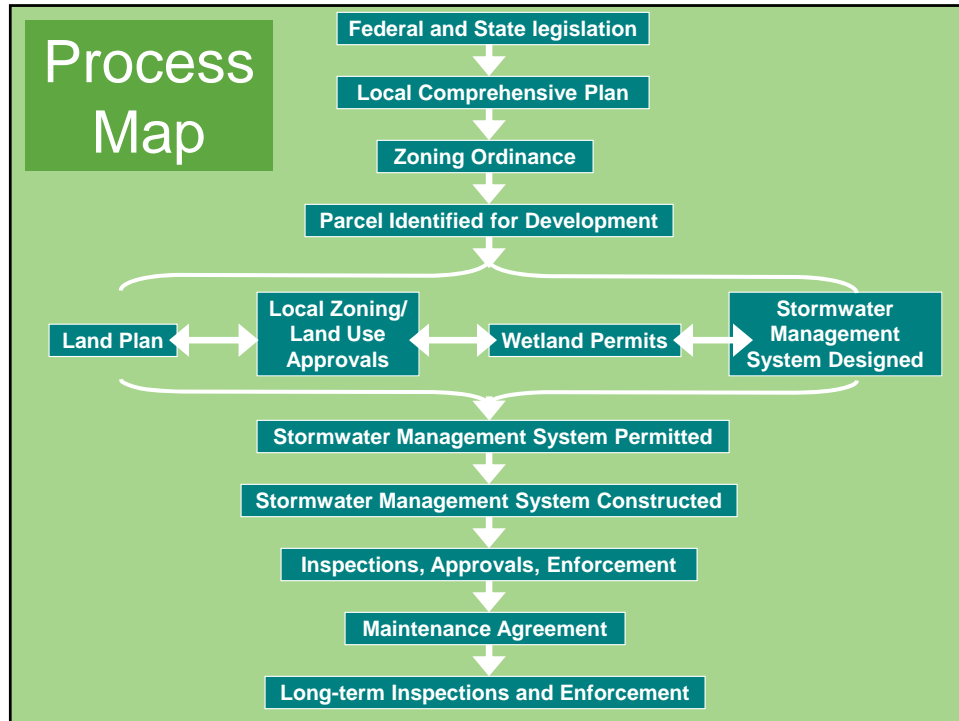
Carolina Yard,
Ladson Exchange Park



Green roof,
Circular Congregational Church



Rain garden,
James Island Charter HS



Interview Questions

- Have all the critical steps in the process been identified?
- Who are the key decision-makers in each step?
- What does the term Low Impact Development (LID) practices mean to you?
- Are there stormwater practices that you would consider lower impact (than stormwater ponds) and if so what are some examples?
- How would you describe the advantages of LID in terms of managing stormwater?
- How would you describe the disadvantages of LID in terms of managing stormwater?
- How prevalent are LIDs in the SC coastal region?
- From your perspective, where in the process do road blocks or constraints to utilizing LID exist?
- What do you think needs to be done to increase the number of LIDs that are constructed in the coastal region?
- What stakeholder in the process would have the greatest influence on the number of LIDs installed in the area?

Workshop

**Stormwater Management in Coastal SC:
A Focused Seminar on Ponds and
Low Impact Development Practices**

*A Short Seminar and Discussion for Developers, Engineers, Contractors,
Planners, Researchers, Regulatory Staff, Municipal Officials, and Public
Works Staff Interested in Low Impact Development.*

January 22nd, 2009
10:00-3:00
Charleston, SC



This event is designed to provide developers, engineers, contractors, planners, researchers, regulatory staff, municipal officials, and public works staff an opportunity to discuss the stormwater management options for coastal South Carolina. The session will focus on the strengths and weaknesses of traditional and alternative stormwater management strategies (e.g., ponds and Low Impact Development practices). Strengths and weaknesses of traditional stormwater practices as well as obstacles and opportunities to implementing Low Impact Development practices will be explored via small group discussions to address future needs of coastal communities. Discussions from the event will be summarized and provided as an assessment report to be distributed to interested stakeholders and will include recommendations addressing options for incentives, regulatory obstacles and opportunities, and educational and research needs. Your input is critical to assuring that the needs of affected communities and stakeholders are addressed. This event is free of charge and lunch will be provided. CEU and PDH credits are available.



Registration information will be available in January at www.dcp.sc.gov/main/NEWS/overland.html. Certificates of completion will be available at the end of the day for CEU and PDH credits. Please contact Rebekah Schalk (Rebalk@dhhs.sc.gov) or 813-953-9024 for questions.



LID Practices

PROS:

- Water quality/quantity benefits
- Aesthetics
- Marketing tool
- Alternative to ponds



Green roof,
Bowen's Island



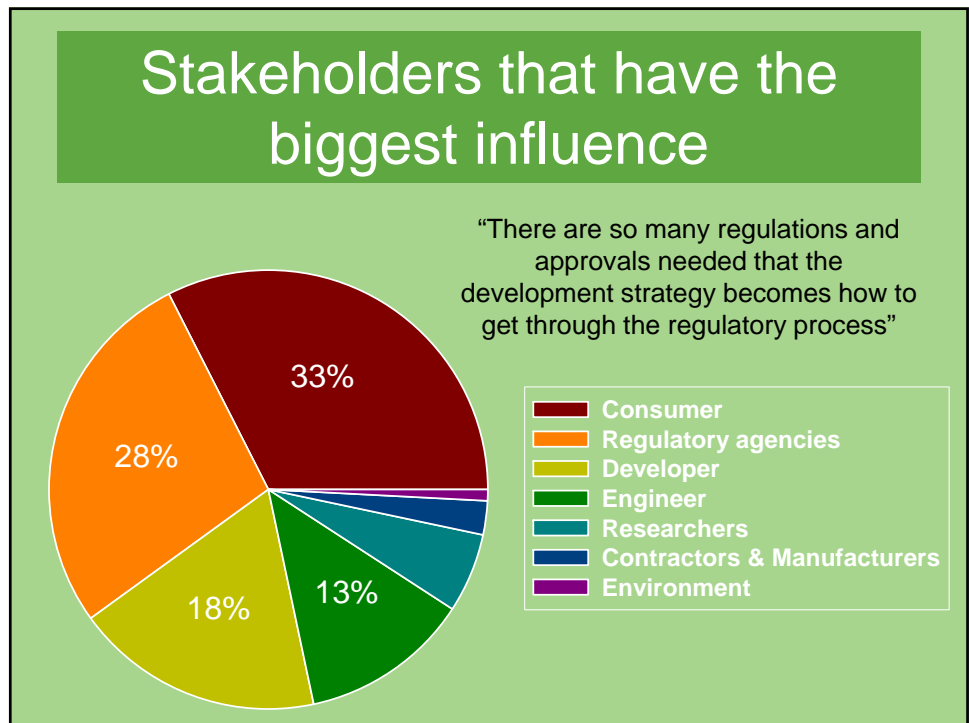
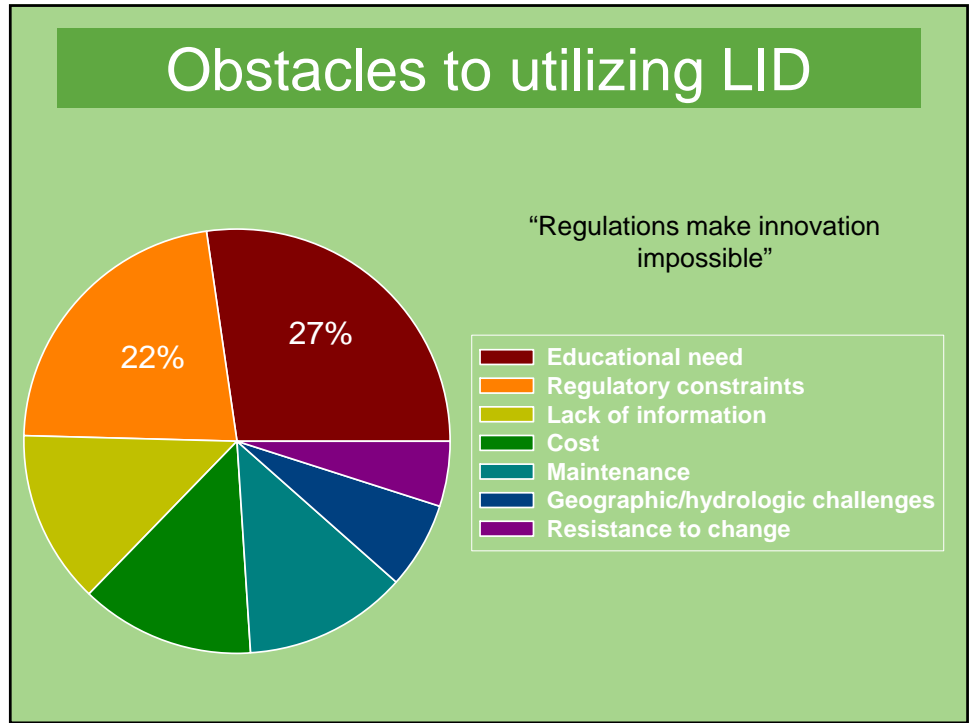
Pervious pavers,
Oak Terrace Preserve

CONS:

- Educational and informational need
- Cost
- Geographic/hydrologic challenges
- Regulatory process is harder

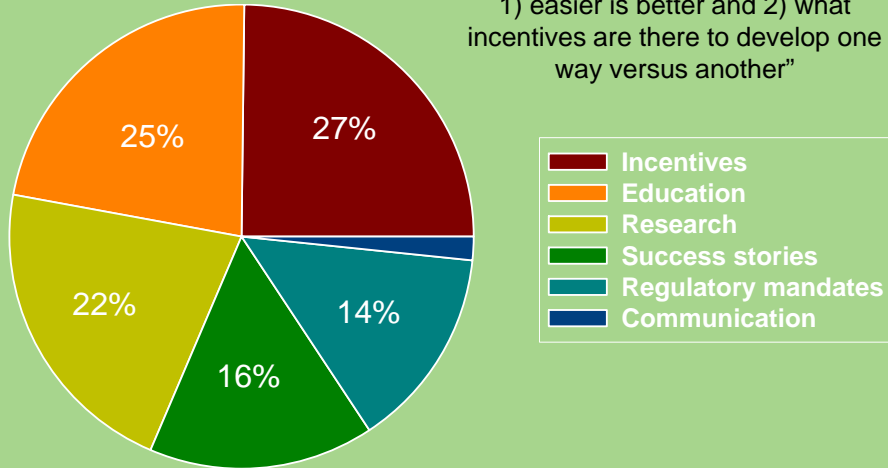


Constructed wetland,
SCDOT Rivers Avenue



Options for increasing LID use

“When developing the mindset is:
1) easier is better and 2) what
incentives are there to develop one
way versus another”



LEED certification as a marketing tool for LID practices

- “People want green to say they are saving the world, but they don’t understand what it really is”
- “LEED is a branding, the stormwater portion is not”
- “Buyers are interested in the visible, tangible things associated with LID, they don’t notice the advantages of stormwater LID practices”



Overcoming the obstacles

- **REGULATORY SUGGESTIONS**
 - Incentives for LID (e.g., tax incentive, reduced impact fees, bonus density, expedited review, consumer incentives-lower stormwater utility bill)
 - Flexibility in Federal and State regulations
 - Include LID in local comprehensive plans
 - Guidelines for LID design, permitting, construction phasing, maintenance, & enforcement
- **REGIONAL RESEARCH NEEDS**
 - Long-term performance and efficiency
 - Development of models and standards
 - Identification of long-term maintenance standards
 - Success stories

Overcoming the obstacles

- **EDUCATIONAL NEEDS**
 - Regulators, Municipal officials, Contractors, Engineers, Developers, Consumers/Homeowners
 - Forums: ULI, ASCE, ASLA, APA, Sustainability Institute, Carolina Clear, Lowcountry Earth Force
 - College level education (engineers)
 - Homeowner education (maintenance) & marketing
- **ADDITIONAL COMMENTS**
 - Refine definition of LID
 - Consumer market has to support LID practices
 - There is no “one-size fits all” solution to stormwater management

Additional Resources

- **USEPA website**
 - www.epa.gov/nps/lid/
- **Low Impact Development Center, Inc.**
 - www.lowimpactdevelopment.org/
 - Policy factsheet:
www.lowimpactdevelopment.org/lidphase2/pubs/LMI%20LID%20Report.pdf
- **NC State University**
 - www.bae.ncsu.edu/people/faculty/hunt/#Demosites
- **Watershed Education for Community Officials (WECO-NCSU)**
 - Policy factsheet: www.ces.ncsu.edu/depts/agecon/WECO/transylvania/WECO_LID_policy_factsheet.pdf
 - Economics factsheet: www.psparchives.com/publications/our_work/stormwater/lid/2009_Local_Assistance/005_Appendices/LID%20Economic%20Factsheet_WECO.pdf
- **Withers & Ravenel, Hunter Freeman**
 - LID spreadsheet: www.dnr.sc.gov/marine/NERR/presentLID/Freeman.pdf
- **Oak Terrace Preserve Research Project**
 - lisa@inlet.geol.sc.edu

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