

## 6th Street LID Barriers and Strategies

Identified Barriers	Conceptual Strategies
"Mixed messages" from different governmental departments about LID implementation (planning, public works, parks, engineering, City leaders, etc...)	Create an LID Manual that explains the installation procedure, maintenance requirements, and associated costs. Provide to all necessary City Departments.
Americans with Disabilities Act considerations	Provide alternate surfaces for disabled access if there is potential for pervious surface to impede mobility.
Compatibility with existing developments that do not use LID practices	Involvement of Landscape Architects and Planners to better define "community identity and character."
Concerns with swelling soils, poor drainage and engineering issues	Better coordination with geotechnical engineers and consideration of soil treatment and amendments. Use system such as Freno system to get stormwater to infiltrate below soils that could shift and damage infrastructure. Use engineered soil that allows for rapid drainage. Understand there are some circumstances where LID is not feasible.
Conflicts with landscaping requirements and ordinance requirements	Better coordination with Landscape Architects.
Conflicts with municipal code requirements (i.e. curb and gutter required)	Consider expedited variance requirements where LID features are desired and conflict with standard code requirements.
Confusing nomenclature--lack of consistent names for practices (rain gardens versus porous landscape detention versus bioretention)	Develop glossary of LID terminology as a part of regional guidance.
Confusing or unclear ordinances related to LID and/or disconnected impervious area	Improved model ordinances and criteria.
Difficulty in measuring benefits of LID	Increased monitoring of LID hydrologic and water quality benefits on individual BMP and site scales (local data). Develop tools for quantifying effects of LID on sizing of other drainage facilities.
Education and training do not provide skills to design and implement LID	Expanded training courses through municipalities and professional organizations. Consider webinars, field tours, symposia.
Fear of liability (engineers, owners, reviewers)	More local examples of successful LID implementation. Consider in municipal projects to set example for private development community.
High groundwater table	Require submittal of geotechnical information including groundwater levels early in review process. Recognize that LID may not be feasible in all situations.
Lack of successful demonstration projects in area	Consider municipal demonstration projects to "showcase" LID.
LID "recommended" in guidance rather than "required"	Evaluate ordinances and requirements in other communities where LID has been more widely adopted. Start with minimum requirements.
LID not integrated early enough in planning process	Checklist at pre-application meeting to identify opportunities for LID.
Limited technical design guidance	Updated criteria and focus on planning and volume reduction. Development of detailed specifications templates. More involvement of engineers for construction observation/clarifications during construction.
Long and complex coordination process with planners, designers, landscapers and others is required	Early coordination between developers, engineer and municipal staff from multiple departments to define LID approach for project and identify specific barriers.
Long term ownership (private versus publicly owned and maintained)	Evaluate need for easements, deed restrictions, public authority to maintain/repair LID BMPs on private property and back-charge owners. Public education for property owners.
Maintenance and durability concerns	Long-term performance monitoring and documentation of maintenance activities for existing LID installations. LID maintenance manual. Create a maintenance fund managed by a Pearl District Business Owners Association that receives funds from sales tax or property tax breaks. The Association would be responsible for maintaining plantings, lawn, and irrigation for portions of the Pearl District.
No clear economic incentive for using LID	Develop incentives for LID implementation (reduced storage requirements for water quality event and potentially larger events) to provide credit. Consider expedited variances to shorten review process for proven methods. Create documentation of savings on LID projects in region. Possibly provide sales tax incentives for business owners that provide LID elements into private property, i.e. pocket parks with rainwater storage. Allow higher development densities for developers that install a green roof during construction. Impact fees and Mitigation fees may be imposed to offset 'green infrastructure' costs.
Other types of BMPs and drainage infrastructure may still be required even with LID	Examine potential reduced sizing of other "traditional" BMPs when LID measures are adopted.
Other water quality alternatives are "easier" to design, construct and maintain	Stress the importance of dealing with stormwater as close to area it falls as possible. Provide updated design details, specifications for City to adopt.
Perceived design, construction, maintenance costs	Provide City, developers, and public, case studies and examples showing successful projects from around region and nation.
Potentially longer review process	Integrate LID concepts as early as feasible in planning process. Improved familiarity of municipal reviewers with LID concepts and methods.
Public perception (temporary ponding on lots, standing water, mosquitoes and other factors)	Public education on benefits of LID. Better LID design can reduce nuisance water.
Reluctance to try something new	Municipal examples to lead the way. Publicity of successful implementation of LID.
Safety considerations	Generally not considered a major barrier, but evaluate safety, especially in areas where the general public will be in close physical proximity to LID BMPs (e.g. Drop off into infiltration swale between sidewalk and street in areas where street parking is likely).
Specialized construction techniques may be required	Examine construction techniques used for successful LID projects and construction techniques that have contributed to LID failures. Consider contractor education programs and/or certification within City. Make one engineer and one member of public works as LID leaders.
Standing water nuisance problems	Include underdrains in designs. Clearly define maintenance requirements. Avoid grading plans that specify very mild (unconstructable slopes).