

## CHAPTER 6

# Overcoming the Barriers to the Implementation of LID

**W**ater pollution associated with increasing development is perhaps the most pressing problem facing our surface waters today. During the last census, many coastal communities experienced as much as 25 percent population growth. This tremendous growth pressure is forcing municipalities and other watershed stakeholders to develop strategies for managing growth while maintaining watershed health. Population growth also corresponds to an increase in demands on infrastructure. In challenging economic times, revenue reductions can significantly impact a municipality's ability to implement innovative approaches to managing stormwater. To overcome many of the challenges at the local level, education of local officials and key decision makers is a critical element to successful implementation of innovative practices (Goodwin, 2008).

### **IDENTIFIED BARRIERS AND RECOMMENDATIONS TO OVERCOME**

In 2009, Project Investigators conducted a market survey of over 700 local decision makers from different coastal regions to determine the barriers to implementing LID. Participants were from Minnesota, Ohio, Massachusetts, New Hampshire, and Maine and represented elected and appointed officials, volunteer board members, and municipal staff. Data collection also came from a series of focus groups that included representatives from each region. The focus groups were comprised of a subset of the survey participants in order to obtain more detailed information than the survey could provide. Participation in the focus group was requested through the survey and through direct contact. Despite geographic and demographic differences, consistent topics came into view in the identification of barriers as well as suggestions for solutions.

To overcome many of the challenges at the local level, education of local officials and key decision makers is a critical element to successful implementation of innovative practices.

**The primary barriers to implementing LID were identified as:**

1. The perceived costs associated with the practices;
2. the need for education, training, or resources on the subject, primarily for the focus group participants, but secondarily for the general public;
3. a lack of political will to implement LID strategies due to the previous two points; and
4. concerns with respect to long-term function and maintenance.

**COST**

Cost is often identified as a significant barrier to the implementation of LID. Local governments are facing decreasing revenues and are seeking solutions for addressing water resource manage-

ment concerns on a community-wide scale. The up front costs of designing an LID system are often seen as one of the primary hurdles to implementation, especially when several redesigns may be necessary to obtain a final design. However, those costs may get recouped by the developer through the leaseholder or the end consumer.

The education of costs should extend beyond the up-front initial costs and include a discussion on the cost benefits of specific LID practices as well as the savings that can be realized through the elimination of structures such as pipes and catch basins.

Often, demonstrating the cost savings of implementing LID on a land development scale, as opposed to single practice costs, permits the audience to realize the savings in specific aspects of the development process. For example, a development project in the mid-Atlantic region was able to demonstrate considerable cost savings by implementing LID principles (ACB, 2005). Numerous case studies present cost savings from both commercial, residential, and municipal implementation of LID. Life cycle costs are rarely considered in development plans.

Connections between high levels of development and declining water quality are well established, and can result in financial impacts through the loss of natural resources within the community if they are not controlled or mitigated. Over time, communities will need to bear the costs of restoration and clean up, or risk federal fines. Even worse, they risk their economic vitality through lost revenue as a result of declining fishing, tourism, and other water-dependent industries.

Connections between high levels of development and declining water quality are well established, and can result in financial impacts through the loss of natural resources within the community if they are not controlled or mitigated.

## EDUCATION AND TRAINING

The 2009 market survey and direct interviews indicated many local officials voiced their need of information and training to better perform their role for the municipality, and indicated that they are likely to incorporate what they have learned into their decision making process. Based on the results of a market survey, local officials tend to obtain most of their environmental information through the use of the Web and from direct trainings or presentations. Additional research has identified other communication mediums such as radio or television as the most effective means to inform an audience as opposed to topic specific workshops (CWP, 2000). While the use of television may be most effective at behavior change, it can be cost prohibitive and is often generalized to meet the needs of a larger and more diverse audience. However, that audience may include key stakeholders that support locally elected officials. Intensive training through workshops conveys detailed information to a smaller audience that is seeking more complex information. The workshops can also be tailored to the specific needs of the immediate audience, though this requires more dedicated time from the trainer. Partner organizations such as the Nonpoint Education for Municipal Officials (NEMO), Coastal Training Programs (CTP) at the National Estuarine Research Reserves, and the Sea Grant Marine Extension provide detailed workshops on water quality programs and integrating land

conservation strategies. These organizations are experienced in providing various approaches to communicating the science of LID to various audiences.

Often, local officials have a vision for what they hope their community will look like, but may be focused on immediate issues such as declining budgets, road maintenance, and new school construction. One tool to assist in communicating the future is visual representation of a community built out in differing future scenarios based upon input from community leaders. These future scenarios provide the community an immediate ability to see the affects of local decisions.

Other types of engagement strategies may involve leading local officials, staff, and the public through a charrette process. Planning charrettes are collaborative processes in which a group of stakeholders develops a solution to a challenging problem. Planning charrettes utilize various scenarios to communicate possible outcomes and reach solutions through the exchange of dialogue between participants. These structured, hands on activities provide an opportunity for a group of people with a diverse background to share their perspective and provide solutions.

Additionally, the use of field activities for local officials provides an opportunity to dispel misunderstandings about LID through an outdoor classroom.

Local officials tend to obtain most of their environmental information through the use of the Web and from direct trainings or presentations.

**FIGURE 6-1**  
Discussion Group



Basic functional properties and the aesthetics of LID practices are often key factors that prevent local officials and the public from accepting and implementing LID (Nowacek, 2003). By offering a site-based experience for local officials that is less formal from their typical setting, the ability to communicate some of the aspects of LID can be successful. Understanding the design, functional features, and expectations for performance can be very effective for local officials.

## LANGUAGE

During the direct interviews with Municipal decision makers, it became apparent that there was a misunderstanding of how LID is typically defined. Focus group participants indicated that LID was not an applicable technique because

the community had completely built out its jurisdictions with no “new developments” planned. LID, as defined, is a stormwater management strategy that emphasizes conservation and the use of existing natural site features integrated with distributed, small scale stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial, and industrial settings (Goodwin, 2008). Upon further conversation and clarification, the techniques of LID were determined to be completely applicable in a built out scenario and are now currently being used as a water quality protection strategy. Using information and language that is relevant to the audience is the most effective method to being understood by local officials and managers, often referred to as science translation (TNC, 2009). Science

translation moves the conversation to the core values that individuals share, and permits the acceptance of the information more readily. While many educators would hope that local decisions are made based upon factual, logical information, many decisions are significantly influenced by emotional and personal bias (Feurt, 2006). In the case of the confusion as to the definition of LID, the relevant point was that despite the technical terminology, it was an approach to maintain clean water. Clean water, in this example, is the root interest of most communities, but for reasons more personal than practical.

### **POLITICAL WILL**

A barrier often limiting the implementation of LID at the local level is a lack of political will by local officials. Leaders are often reluctant to support a new concept without proper knowledge of the issue and backing from constituents. Many leaders may not understand the topic or have a misperception of it based upon limited or false information. Educational programs directed towards them can help clarify the issue but educational programs directed towards the general public are important, as elected officials are representatives of their constituents. This is the beginning of the development of social capital, a concept that Robert Putnam (2000) catalyzed as a means for public discussions around policy issues. Social capital is built upon community networks that each

individual has established and recognized, such as community assets. The development of social capital builds communities by allowing individuals to begin functioning as a group to form a social fabric, and not operate as a single individual. The process builds the ability for a community to share common values and ideas, furthering the growth of that community and enabling it to solve collective challenges. Social capital builds trust between those within a community because community members begin to see that their perspective is similar to those around them. To create political will, local officials need their constituents to support their decisions, and good, informed decisions require local officials to support collaborative public discourse.

### **LACK OF CAPACITY TO BUILD SOCIAL CAPITAL**

Building social capital requires a dedication to process and willingness to expend the time to reach the desired outcome. Social capital can be fostered through the use of public workshops, public dialogues, or collaborative problem solving activities that encourages public participation and discourse around specific issues or policy development relevant to the community. It also requires local decision makers

While many educators would hope that local decisions are made based upon factual, logical information, many decisions are significantly influenced by emotional and personal bias.

to support and request the concept of public engagement. Stakeholder participation can bring about delays and new challenges to in the decision making process, which can be costly and cause tension when discussing a specific policy or action.

Advocates, extension agents, education and outreach staff need to consider building their repertoire by facilitating collaborative public discourse processes. The concept of public issues education is a commonly accepted approach for engaging the public around public policy issues.

The success of stakeholder participation is predicated upon the invitation of participants with ranging viewpoints to participate in structured, facilitated dialogues to reach an outcome that is relevant to the community. A successfully led public issues education process requires an approach somewhat dissimilar to traditional educational programs. A typical outreach or educational program will present technical information followed by a question and answer session that relies upon the presenter to provide responses to directed requests for additional information. While this approach is successful for improving the comprehension of the material presented, it limits the audience's opportunity to understand various perspectives

from their neighbors. A public issues educational approach establishes ground rules for participants and outlines expectations for their participation in a dialogue regarding the topic. Following the presentation and brief questioning session, a series of questions to the audience begins the dialogue between the participants. This process may require the organizer of the session to obtain the assistance of an objectively removed facilitator. Or, the organizer may accept the additional role to facilitate the process and dialogue. In either case, the organizer has accepted the role of convener and program planner.

There is not a single means to build social capital and foster stakeholder participation. The tools used are based upon the desired outcome. If the outcome is to reach a policy decision, consensus or democratic-based voting may be the best approach. However, if the intent is to further the policy changes necessary and advance local change, the use of a facilitated discussion following the presentation may be useful to actively recruit participation. The Canadian Institute for Cultural Affairs developed a guide entitled *The Art of Focused Conversation*, which identifies several engagement strategies and processes. Several of these outcome-based processes are identified which seek to obtain workgroup participation through thorough questioning that follows a four level process framework. The intent is to employ the whole framework as a single tool approach to obtain community buy-in in the development of a solution.

The success of stakeholder participation is predicated upon the invitation of participants with ranging viewpoints to participate in structured, facilitated dialogues to reach an outcome that is relevant to the community.

## CREDIBILITY

The results of the market survey which asked local officials who they most trusted in terms of providing credible environmental information, identified universities as the top choice for reliable information. The survey placed relative equal value on state agency personnel and non-governmental organizations (NGOs). Upon further discussion with the focus groups, the consensus held that universities provide scientific, peer-reviewed information, but that the same level of information could also be delivered through other educational organizations. The groups identified previously, NEMO, CTP and the NEPs, were recognized by local officials as credible and reliable.

## MAINTENANCE AND OPERATIONS PLANS

Stormwater management practices often fail due to a lack of maintenance because the expense of maintaining most stormwater BMPs is relatively significant when compared to original construction costs. Improper maintenance decreases the efficiency of BMPs and may also detract from the aesthetic qualities of the practice. Proper operation and maintenance language within a stormwater ordinance can ensure that designs facilitate and require regular maintenance. However, there is often a disconnection between the requirements of the ordinance and what actually happens in the field. Some important elements of effective stormwater operation

and maintenance ordinance language include specification of an entity responsible for long-term maintenance, as well as reference to regular inspection visits. The ordinance should also address design guidelines that can help ease the maintenance burden, such as maintenance easements, pretreatment forebays, minimum side slopes (3:1), and clean-out processes. Other information that is in support of the ordinance, such as maintenance agreements and inspection checklists, are equally important to ensuring that stormwater BMPs perform well over time.

## OTHER IDENTIFIED BARRIERS

Additional barriers have been identified through survey results and feedback from the focus group process. These barriers include: negative perceptions of “new technologies”; concerns over long-term performance and liability; as well as reasonable doubt as to the performance and function of the technology.

Overcoming the negative perception of new technologies is a major challenge. Culturally, we often question new approaches because they are seen as untested or unproven. On a development project in the Town of Greenland, NH, local officials felt challenged by their lack of knowledge and experience with LID. The local officials and municipal staff considered requiring long-term performance bonds to be posted by the developer and held by the leaseholder to ensure performance of the technologies. This scenario raises the issue of whether

or not to hold innovative practices to a higher standard than existing practices. Volumes of data exist confirming the failure rates of conventional practices for protecting water quality, yet many local governments require long-term

Additional barriers include negative perceptions of “new technologies”; concerns over long-term performance and liability; and reasonable doubt as to the performance and function of the technology.

performance bonds for innovative practices. However, with the case in Greenland, NH, after the developers/engineers illustrated a performance record that consisted of over a decade of in-the-field application and research verifying the performance of LID, the community agreed to proceed without performance bonds. The community also requested

an indemnification of responsibility for the town, despite the fact that the LID application was being implemented on private property. Liability remains a concern for many local decision makers. For example, after acceptable winter performance data was established for a project in Pennsylvania incorporating porous pavement, the subject of reducing the need for deicing was raised. In order to reduce their legal responsibility in case of slip and fall accidents, the locality and the property leaser agreed to a limited liability waiver. Implementing proper designs, appropriate engineering oversight, and adequate long-term operations and maintenance plans can help overcome liability-based challenges and ensure success.

## REFERENCES

- Alliance for the Chesapeake Bay (2005). Forest Friendly Development, Chesapeake Bay Case Studies
- Dale, D.D. and Hahn, A.J. eds., (1994). *Public Issues Education: Increasing Competence in Resolving Public Issues*. Public Issues Education Materials Task Force of the National Public Policy Education Committee and PLC and PODC subcommittees of the Extension Committee on Organization and Policy. Madison, Wisconsin: University of Wisconsin-Extension.
- Feurt, Christine (2006). *Science translation for nonpoint source pollution control: A cultural models approach with municipal officials*, Wells NERR.
- Goodwin, Derek, et al. (2008). *Barriers and Opportunities for Low Impact Development: Case Studies from Three Oregon Communities*. OR Sea Grant.
- Metz, D. and Weigle, L. (2009). *The Language of Conservation: How to Communicate Effectively to Build Support for Conservation*, The Nature Conservancy
- Putnam, Robert (2000). *Bowling Alone: The Collapse and Revival of American Community*, New York: Simon and Schuster: 288-290.
- Schueler, T. and Holland, H.K. (2000). *On Watershed Education. The Practice of Watershed Protection: article 127, pp 629-635*