

Integrating LID at the Community Level

This chapter provides guidance to communities on integrating LID into community plans and regulations and how to make LID a part of the institutional fabric of a community. LID is a new approach to land development that is best accomplished by incorporating LID principles into numerous local government processes, including the master plan, ordinances, and municipal programs.

Integrating LID at the community level provides the community with numerous economic, environmental, and social benefits as outlined in Chapter 2. Overall, LID can help communities meet their land use planning goals of health, safety, and welfare, as well as preserve community character and make desirable places for people to live and work. This chapter provides specific information on:

- Incorporating LID into the master plan,
- Introduction to the LID model stormwater ordinance,
- LID-friendly regulations,
- Using incentives to promote LID,
- LID and community good housekeeping practices, and
- Overcoming challenges: Opportunities for advancing LID in Michigan.



Clinton River near Lake St. Clair, MI

Source: Macomb County Planning and Economic Development

Incorporating LID into the master plan

By design, the master plan sets the course for a community and its residents for the future. It serves as a guide for community leaders in adopting capital improvement plans and annual operating budgets. Also, in Michigan, master plans are the basis for zoning ordinances.

While the master plan is the guide for a community's future, it is also the legal foundation for local land use laws. Therefore, it is important for the community's master plan to acknowledge the importance of LID and stormwater management and relate it to protecting the health, safety, and welfare of its residents. Examples of how using LID techniques can protect health, safety, and welfare include:

- Protection of water quality,
- Reduction of flooding and protection of property, and
- Protection of water features such as lakes, streams, and wetlands so that they can continue to perform the functions that people expect.

In addition to the master plan, there are additional opportunities to integrate LID into other community plans, (e.g., greenways plans, recreation plans, stormwater plans, and watershed management plans).

Master plan goals and policies

The goals and policies for LID and stormwater management should include elements that:

- Protect the land's natural ability to absorb, clean, and store stormwater,
- Minimize impervious surfaces in new construction and redevelopment projects to reduce the amount of runoff and improve infiltration,
- Use Best Management Practices (BMPs) throughout the community to reduce the impacts of stormwater,
- Implement community programs that improve water quality and educate the public about their role in water quality, and
- Link protection of water quality through stormwater management to the protection of residents' health, safety, and welfare.

Following are sample goals and policies that integrate LID practices into the master plan or other community plans.

Goal: Implement stormwater management practices, to protect the health, safety, and welfare of residents from the impacts of stormwater runoff.

Policy: Adopt and/or keep updated regulations to ensure that effective stormwater management techniques are used in new and redevelopment projects within the community.

Policy: Regulate stormwater runoff to provide for the following outcomes:

- Prevent flooding,
- Protect the stream channel,
- Improve and protect water quality, and
- Recharge groundwater.

Goal: Preserve existing natural features that perform stormwater management functions, such as wetlands, riparian vegetation, floodplains, and woodlands, to the greatest extent possible.

Policy: Inventory environmental areas as part of the site plan review process.

Policy: Adopt ordinances to protect environmentally sensitive areas.

Policy: Integrate natural areas, to the greatest extent possible, into the project design during the site plan review process.

Policy: Integrate and coordinate natural area preservation with other community plans such as greenway, recreation, and watershed plans.

Policy: Ensure the long-term sustainability and functioning of natural areas.

Goal: Minimize impervious surfaces in site designs. Minimize the use of enclosed storm sewer systems and eliminate impervious surfaces that are directly connected to surface waters where possible.

Policy: Encourage the use of cluster development, vegetated swales, downspout disconnection, and other practices that reduce impervious surfaces and increase stormwater infiltration.

Goal: Use best management practices to minimize, convey, pretreat, treat, and reduce the volume of stormwater runoff generated by development.

The Saugatuck Center for the Arts specifically included the following educational goal in their policy for redevelopment of the property, “Provide an interpretative opportunity to educate community residents, local schools and patrons regarding stormwater BMPs and the use of native vegetation in applied landscaping.”



Source: JFNew



Open Space Development at the Pokagonek Edawat Housing Development in Dowagiac, MI

Source: Pokagon Band of Potawatomi Indians

Policy: Where site conditions allow, use infiltration practices to reduce the volume of stormwater runoff.

Goal: Improve stormwater quality by implementing programs throughout municipal properties and the community that remove pollutants from stormwater and reduces the volume of stormwater.

Policy: Implement programs to reduce the impacts of stormwater from municipally owned or operated properties.

- Use lands owned and maintained by the community as demonstrations for desirable stormwater management practices.
- Implement street maintenance programs for roads owned or operated by the community.
- Work to (or coordinate with the county to) evaluate the amount of salt and/or sand applied to roads, and other paved surfaces, in the winter. Implement procedures to reduce the amount of salt/sand from entering the storm sewer system as much as possible.
- Collect leaves in the fall and compost them for use in community projects.
- Develop and follow building and vehicle maintenance procedures that keep hazardous substances and other pollutants out of storm drainage systems.
- Provide or send employees to training on reducing the impacts of stormwater runoff from municipal properties.

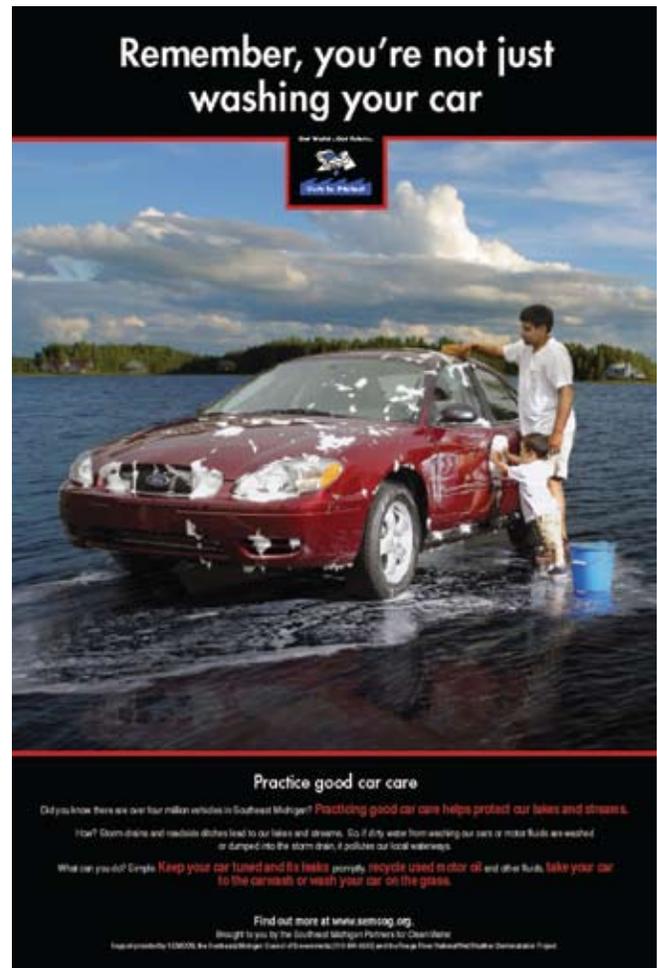
Goal: Educate the public about ecologically safe practices to follow around their homes and businesses.

Policy: Implement and/or publicize community programs that address stormwater issues.

- Initiate/publicize a household hazardous waste clean-up day.
- Distribute educational materials to residents that discuss the impacts of their actions on our water resources.
- Incorporate public education into community-sponsored events.

LID-friendly regulations

Once the master plan has included language supportive of LID, developing ordinances that directly support LID implementation is essential to ensuring community-wide implementation. Equally important is ensuring that existing ordinances are compatible with LID implementation.



Example residential educational campaign.

Model Stormwater Ordinance

Appendix H of this manual provides an example stormwater ordinance that incorporates various elements of LID. The ordinance refers to this manual for such issues as: BMP design, soil testing protocols, and stormwater calculations.

Develop regulations that encourage/require LID techniques

Developing new regulations is one mechanism for implementing LID community-wide. This could include adopting new regulations such as a stormwater ordinance and/or engineering standards.

When considering the adoption of a LID stormwater ordinance, the following items should be discussed within the local community:

- **What is the goal of the ordinance (e.g., protecting water quality, groundwater protection or recharge, channel protection, meeting state stormwater requirements)?**

Once you determine the goal for implementing an ordinance, you can better determine the specific standards that should be included. For example, the model ordinance includes recommended standards for achieving water quality protection, channel protection, flood control, and groundwater protection. The community can modify the standards in the model ordinance to fit their local needs. Note that Phase I and Phase II stormwater communities are required to have some regulation that addresses water quality and channel protection.
- **What is the coverage area of the ordinance?**

The community needs to decide the coverage area which could include all developments that undergo site plan review. Another consideration is that Phase I and Phase II stormwater communities must adopt stormwater regulations, and apply for new and redevelopment projects that disturb one acre or more.
- **Are all covered areas treated the same?**

The community also needs to decide if the standards are going to be applied the same across all covered areas. For example, is redevelopment going to be held to the same standards as new development? Are sensitive areas, (e.g., wellhead protection areas) going to be treated differently in the ordinance? (Additional watershed and site

factors that communities may want to review in answering this question can be found in Chapter 5, LID Site Design Process Checklist).

The model ordinance in this manual identifies specific places where these types of decisions need to be made. It also provides examples as to the different standards that could be used based on different scenarios (e.g., how redevelopment standards could be set up that are slightly different than standards for new or “greenfield” development).

- **Will the community give “credit” for implementing certain BMPs?**

Another decision a local community needs to make is integrating certain BMPs as credits in the ordinance. Some regulations do allow for additional credits to the developer for soil restoration and native plant revegetation. Chapter 9 provides detail information on the use of stormwater credits.



Black River Riparian Area in City of Bangor, MI
Source: Van Buren Conservation District

- **How will long-term sustainability of the stormwater system be ensured?**

Local communities will need to decide the mechanism to ensure long-term maintenance of the LID system. This can include maintenance agreements between the homeowners association and the local community. The process for long-term maintenance should be clearly stated in the regulation. Appendix G contains an example maintenance agreement. In addition, the Phase II stormwater permit requires maintenance to be addressed in the regulation.

The local community may also choose to implement a program at the community level to inspect structural controls at a certain frequency. Appendix F contains example inspection checklists that can be used as guidance.

In addition to developing stormwater regulations, LID implementation could include adopting other ordinances such as wetland, tree preservation, or riparian buffer ordinances. Appendix H provides example ordinances.

Integrating LID into existing regulations

Along with developing specific LID regulations, it's equally important to review current regulations and programs to ensure they are compatible with LID implementation. Following are suggested areas to review:

Parking

- Add to the purpose section that parking standards provide for effective management of stormwater runoff from vehicle areas.
- Require that landscaped areas be sufficiently large to provide stormwater management. Allow for depressed parking islands that can include curb cuts to allow stormwater into the islands. For example, the following sentences could be added if the community requires protective curbs around landscaping. "Curbs separating landscaped areas from parking areas may allow stormwater runoff to pass through them. Curbs may be perforated or have gaps or breaks."
- Allow for native plantings in landscaped areas.
- Include both minimum and maximum parking ratios and aisle standards to avoid construction of excess parking.
- Develop parking standards that reflect average parking needs rather than the possible maximum.

- Allow for shared parking when analysis shows parking needs will be met.
- Allow for multi-level parking.
- Allow for permeable material to be used in overflow parking, sidewalks, patios, etc. Assess if permeable material can be used in the main parking or road area during the site plan process.
- Allow the developer to land-bank parking. (The developer builds parking they believe is initially needed, but leaves enough undeveloped area for additional parking in the future).

Roads

- Design streets for the minimum required paved width needed to support travel lanes; on-street parking (if desired); and emergency, maintenance, and service vehicle access. The widths should be based on traffic volume.
- Reduce the total length of residential streets by examining alternative street layouts to determine the best option for increasing the number of homes per unit length.
- Allow for use of swales, instead of curb and gutter, as part of an integrated LID site design where density, topography, soils, and slope permit. Where feasible, allow curb cuts and swales on existing roadways.
- Incorporate LID-based stormwater infiltration into the center island of cul-de-sacs.

Lot setbacks/Lot width

- Allow for reduced setbacks if the development is part of a cluster development or includes LID techniques.



City of Empire, MI

Minimize impervious surfaces and front set backs.

Construction activity

- Minimize clearing and grading on a site. Consider allowing credits for developments meeting certain criteria. (See Chapter 9).
- Minimize soil compaction, especially on areas that will be used for infiltration and other LID practices. Consider allowing credits for developments meeting certain criteria, which could include soil restoration. (See Chapter 9).



Native vegetation along lake

Many native plants are well over 5-6 feet tall. Landscaping requirements should define what vegetation height requirements apply to so native vegetation can be utilized.

Source: JFNew

Landscaping

- Add reduction of stormwater pollution, temperature, and rate of volume of flow to the purpose section of landscaping/screening.
- Encourage use of native plants in landscaping requirements.
- Prohibit use of non-native, invasive species in landscaping requirements.
- Define the type of vegetation the height requirements apply to (as well as the type of vegetation it does not apply to). For example, remove the height requirement for native plants.
- Set screening criteria that uses vegetation, where appropriate, before walls or berms.

Natural areas/Open space

- Encourage cluster development (i.e., open space subdivisions) as a method for preserving natural areas and reducing impervious surfaces.
- Leave as much open space as possible in its natural condition. This provides stormwater infiltration and reduces maintenance.
- Link open space to existing wetlands, rivers, and other adjacent open space areas. This provides a buffer to these sensitive areas, allows scenic recreational opportunities, provides a wildlife corridor, and could provide a location for nonmotorized transportation opportunities in the community.
- Include requirements to re-establish vegetation in disturbed areas dedicated for open space.

Miscellaneous

- Allow for downspouts to be connected to vegetated areas on the property, not directly to the storm sewer.

Using incentives to promote LID

While some communities may choose to implement a regulatory mechanism, such as a stormwater ordinance requiring the use of LID, other stakeholders may choose to use an incentive program or a combination of regulations and incentives to encourage LID practices. Following are example incentives that could be implemented at various levels of government:

- Allow for a state income tax credit for qualifying LID techniques.
- Offer a bonus such as increased floor area (e.g., floor area ratio) if LID practices are used that accomplish stormwater management goals.



East Hills Center in Grand Rapids, MI

Recognition programs such as the Leadership in Energy and Environmental Design (LEED) certification is one way to encourage LID implementation.

- Accelerate plan reviews for site plans implementing LID techniques.
- Reduce fees charged to the applicant (e.g., plan review fees, utility fees) for site plans implementing LID techniques.
- Offer a density bonus (e.g., allow for an additional lot) to developments that implement LID practices.
- Initiate a recognition program for sites using innovative stormwater management.
- Provide free technical assistance to projects implementing LID techniques.
- Focus grant money on LID implementation such as funding demonstration projects, tours, Web sites, technical assistance, and other educational materials.
- Provide credits on stormwater utility fees to users implementing LID techniques.

LID and community good housekeeping practices

Many LID BMPs operate more effectively and require lower maintenance when pretreatment is provided to remove pollutants (e.g., sediment) that can clog the BMP. Pretreatment devices can include structural BMPs such as filter strips and water quality devices. Local communities can also employ good housekeeping practices that will reduce rehabilitation and replacement costs of stormwater BMPs by preventing or addressing problems early. For example, a street sweeping program will reduce the amount of sediment entering BMPs (e.g., bioretention, porous paving) that can become clogged from sediment deposition.

There is existing information to assist municipal staff and contractors in identifying and employing good housekeeping activities. Detailed fact sheets, training modules, presentations, and posters on individual good housekeeping practices can be downloaded at www.semcog.org/municipaltraining.

Table 4.1

Community good housekeeping practices

Activity	Impact
Street sweeping	Reduces sediment, nutrients, metals, trash, oil, and toxins
Catch basin cleaning	Reduces sediment, nutrients, metals, trash, oil, and toxins
Managing salt storage	Reduces chlorides
Equipment cleaning and maintenance	Reduces metal, oil, and toxins
Prevent soil erosion	Reduces sediment and nutrients
Proper storage and handling of chemicals and other materials	Reduces sediment, nutrients, metals, oil, grease, and toxins
Stream bank stabilization	Reduces sediment and nutrients, protects riparian vegetation and property
Dumpster maintenance	Reduces sediment, nutrients, bacteria, metals, trash, oil, and toxins
Bridge and road maintenance	Reduces sediment, nutrients, metals, trash, oil, and toxins



Catch basin cleaning in Bloomfield Township, MI



Street sweeping in Bloomfield Township, MI

The importance of street sweeping

For those stakeholders with jurisdiction over streets and parking lots, sweeping is an important good housekeeping practice that will keep your structural BMPs in good working order. When done regularly, street sweeping can remove 50-90 percent of street pollutants. Street sweeping also makes road surfaces less slippery in light rains and improves aesthetics by removing litter and sediment deposits.

Municipalities can choose between various types of street sweepers. The most common street sweepers are mechanical, vacuum filter, and regenerative air. It is important to keep in mind that the type of pollutant, types of surfaces, noise ordinances, and costs all factor into what kind of sweeper is purchased and used. Municipalities often find it useful to have each type of street sweeper in their fleet. Each has its advantages and disadvantages concerning pollutant removal effectiveness, traveling speed, and noise generation.

Material swept off streets often includes sand, salt, leaves, and chemicals. Debris removed from roads is classified as Solid Waste under the Solid Waste Management Act, known as Part 115. To properly dispose of street sweeping material, communities should take sweepings to a landfill. Municipalities should contact the landfill to obtain their individual testing requirements.

To evaluate the effectiveness of a street sweeping program, maintain accurate logs of the number of curb-miles swept and the amount of waste collected. Monthly or yearly intakes (per ton) can be measured per district, road, season, or mile.

Overcoming challenges: Opportunities for advancing LID in Michigan

There are numerous challenges that can occur when implementing LID. These barriers include:

- Number of institutions with jurisdiction over stormwater,
- Restrictive regulations that may not allow for LID techniques (see above section on LID-friendly regulations),
- Resistance from internal sources and/or the community,
- Lack of technical knowledge,
- Lack of resources, and
- Site constraints that may pose challenges to implementing LID (e.g., historical contamination, clay soils).

This section lists some of these challenges, but more importantly provides information on options for overcoming these challenges.

Number of institutions with jurisdiction over stormwater

Challenge: Implementing LID in Michigan can be complicated due to the number of organizations that have some jurisdiction over land use and stormwater decisions in a community. (Table 4.2 provides a summary of entities with stormwater jurisdiction). For example, in a township, the township has authority over land use decisions and can, therefore, implement LID through conservation design techniques, as well as, adopting stormwater regulations. In the same township, the county drain commission has jurisdiction over legally established county drains. The county can have its own set of regulations (e.g., stormwater rules) applying to stormwater discharges to the county drains. Since the county road commission owns many of the roads in a township, they have responsibility over the drainage of their roads. Add into the mix other organizations such as the Michigan Department of Transportation, public school districts, and other public entities and, suddenly, there's a myriad of authorities involved in managing stormwater within the community.

Opportunity: As each of these entities has some jurisdiction over land use, stormwater, or both within the State of Michigan, each has an opportunity to move LID forward within their purview. A major step forward in implementing LID is to develop process options that offer various institutional choices on how to engage in LID in a complementary way. Following are possible processes for moving LID forward in a complementary manner:

Use LID as a mechanism for implementing Michigan’s stormwater permit requirements

With over 250 communities in Michigan affected by the Phase II stormwater regulations, linking LID implementation with the Phase II regulations is a natural fit. There are numerous options on who can take the lead on implementing LID to meet Phase II. These include:

- A local community takes the initiative to demonstrate to other Phase II communities that implementing LID is a practical method for meeting the Phase II requirements. The community can then engage the county and other stormwater entities in implementing LID in their jurisdictions.
- County drain commissioners can take the lead for implementing LID in the county. The drain commissioner can develop regulations incorporating LID techniques that meet Phase II requirements. Local communities can then adopt the county standards for their jurisdiction.
- A watershed or subwatershed group, made up of communities, counties, road agencies, and public institutions, develops complementary LID techniques for their watershed/subwatershed.

Use LID as a mechanism for habitat protection, fisheries management, and enhancing recreational opportunities

LID offers the opportunity for those communities and agencies interested in habitat protection, fisheries management, and/or protecting recreational opportunities. For example, focusing on infiltration practices will reduce the thermal load of stormwater runoff to receiving waters, which would positively impact the native fishery.

Incorporate LID into greenways planning

An effective greenways program looks not only at the regional connectivity of green infrastructure, but also at the local connections. It is important for both humans and animals that green infrastructure be connected as much as possible. Using LID techniques such as open space planning, small building envelopes, and natural resource preservation, is one way to ensure this connectivity at a local level.



Macomb Orchard Trail in Macomb County, MI

Source: Macomb County Planning and Economic Development

Partner with state agencies (e.g., MDEQ, DNR, Agriculture) to support LID implementation

State agencies, such as MDEQ, can support LID implementation by providing technical assistance on LID techniques, providing grants and recognition programs, being a LID clearinghouse, and allowing LID techniques in meeting regulatory obligations.

A key starting point is for decision makers at various entities to consider adopting a policy supporting LID.

Resistance from internal sources and or the community

Challenge: Support of the public, elected officials, environmental organizations, etc., is imperative for moving LID forward in a community. Public education and participation are key features of a comprehensive stormwater management program.

Opportunity: There are numerous opportunities to gain support for LID both internally and at the community level.

Educational materials (e.g., signage, Web sites)

Educational materials can be used as a mechanism to inform the public and municipal staff on the benefits of LID and how these techniques can be attractive amenities to the community. Web sites, flyers, signage, and short videos are all means of quickly communicating LID to various audiences.

Demonstration projects and tours

Another way to gain support for LID is to set an example through demonstration projects on visible sites. Providing demonstration sites will show that certain technologies can be successful in Michigan and meet regulatory approval. Providing tours of these demonstration projects is another way to show real-life examples of successful LID implementation.

Public involvement opportunities

Inviting the public to become more involved in LID by participating in a LID project (e.g., planting a demonstration rain garden) is another way to gain support for LID. Not only will residents be more interested in a project that they had a “hand” in, but they will likely speak positively about it with their neighbors. Providing these opportunities also shows municipal staff and elected officials the interest of residents in embracing LID in the community.

Positive public relations/media relations

Working with the media on publicizing LID projects is one way to reach a large number of residents in the community. This again allows residents to see the benefits of LID, but also shows municipal staff and elected officials that this is a priority in the community.



Rain garden and porous asphalt educational signage

Source: City of Battle Creek



Rain garden plantings provide public involvement opportunities



Positive media relations from LID projects

Source: City of Troy

Lack of technical knowledge

Challenge: Both designing and reviewing LID projects require technical knowledge that can be an impediment in moving LID forward in Michigan.

Opportunity: This manual has been developed to assist both the designer and reviewer in the technical aspects of LID implementation. In addition, the manual contains a designer/reviewer checklist at the end of each BMP to further provide technical guidance.

In addition to this manual for Michigan, LID is becoming increasingly utilized throughout the country. Organizations such as the Center for Watershed Protection and the Low Impact Development Center, have been initiated at the national level to provide guidance. Locally, organizations such as GreenBuilt (www.greenbuiltmichigan.org) and Rain Gardens of West Michigan (www.raingardens.org) provide technical resources throughout the state.

Finally, implementation of LID techniques is increasing throughout the state. The case studies included in the manual, as well as demonstration projects and tours, can be utilized to learn more technical information about LID. Also, the members of the state LID committee and the reviewers providing technical review would often be able to provide certain technical information.

Communities interested in sustainable practices, including LID can invest in staff training and development. Local government organizations such as SEMCOG can help facilitate training opportunities.

Lack of resources

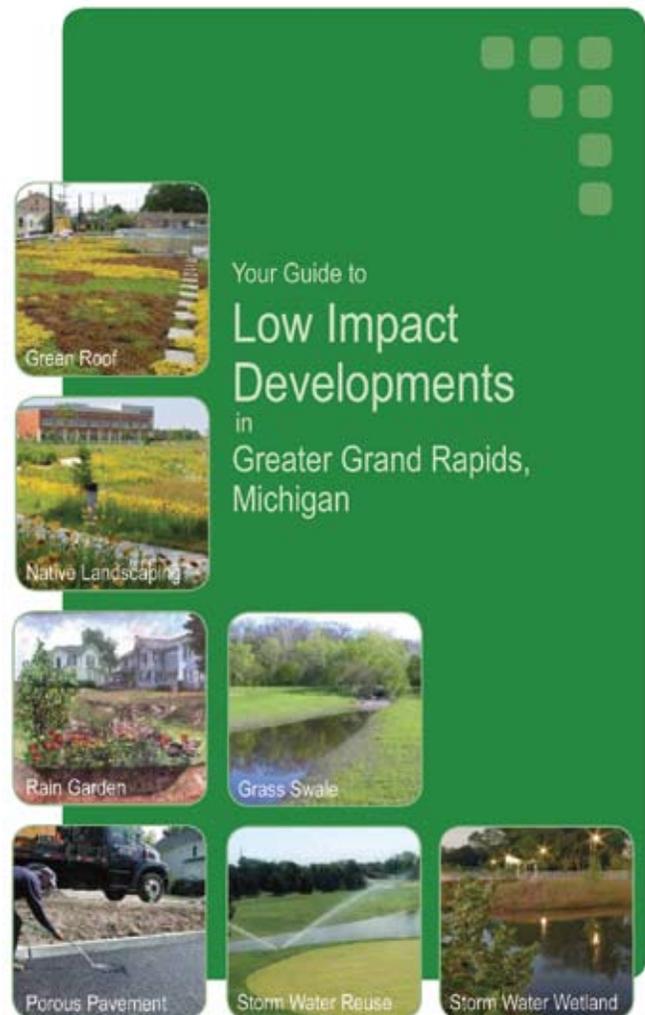
Challenge: Many Michigan communities are facing financial challenges. Providing core essential services is their focus. Spending financial resources and staff time on implementing LID can be a challenge. For example, overcoming LID impediments will often cause the community to expend additional resources (e.g., sponsoring LID tours, developing and printing educational materials, updating ordinances and plans).

Opportunity: Organizations such as SEMCOG are working to reduce the impediments of LID by providing information that can be utilized by local communities. For example,

- Brochures are available for developers, the public, and municipal officials on the benefits of implementing LID.

- Tours and technical workshops are being held by organizations such as SEMCOG and the Michigan Water Environment Association.
- An online web tool featuring locations of LID practices has been developed as a pilot for three counties in Michigan by Lawrence Technological University.
- A map and driving tour has been developed for the Grand Rapids area.
- Workshops were held throughout the Grand Rapids area with developers and realtors.
- State Clean Michigan Initiative money was used to fund numerous LID demonstration sites.

In addition, SEMCOG and other organizations are working on expanding the availability of financing mechanisms to support stormwater management.



Grand Rapids, MI, LID Tour Guide

Source: Fishbeck, Thompson, Carr, & Huber, Inc.

Site constraints that may pose challenges to implementing LID (e.g., historical contamination, clay soils)

Challenge: Large areas throughout Michigan have challenging soils and geology where the opinion is that LID “can’t be done” in their area.

Opportunity: One primary purpose of the manual (and a core principle) is that LID can be used anywhere. The manual strives to explain challenges that may occur on a site, but does provide options for incorporating LID principles. For example, Chapter 8 highlights some specific challenges, but provides specific information on utilizing LID in these challenging areas.



LID Tour in Washtenaw County, MI

Table 4.2

Entities with Stormwater Jurisdiction

Entity	Stormwater Jurisdiction
County Drain Commissioners	<p>The Drain Commissioner and staff are responsible for construction, operation, and maintenance of legally established county drains. A county drain can be closed or open. It can be natural or man-made if it has been petitioned in accordance with the provisions of Act 40 of 1956, as amended (the “Drain Code”), to be a county drain. Typically, a county drain may be an open ditch, stream, underground pipe, detention/retention pond, or swale that conveys stormwater. These systems are designed to provide stormwater management, drainage, flood prevention, and stream protection for urban and agricultural lands.</p> <p>Drain Commissioners can establish stormwater standards that apply to discharges to the county drain. Again, this discharge can be conveyed directly to the water body, but can also include “tap ins” into the drainage-district-owned storm drain system that is part of the county drain. These stormwater standards often require the entity responsible for the perpetual maintenance of the non-county drain storm sewer system be identified. In cases of platted subdivisions and manufactured housing communities, maintenance is often transferred to the property owners (e.g., subdivision association). However, there are cases where the stormwater controls are deeded to the County or local unit of government.</p> <p>In addition to plan reviews of drainage facilities that discharge to a county drain, the Drain Commissioner is also responsible for review and approval of stormwater management systems in platted developments under the Michigan Land Division Public Act 288 of 1967, as amended, and for private development in response to local government requests. The Drain Commissioner has the authority to ensure that proposed stormwater facilities within the plat and stormwater outlet facilities of the plat, be improved or protected to established standards and specifications.</p> <p>(County Drain Commissioners have authority to review plat plans for single-family residential and industrial developments. They do not have authority to review plans for commercial developments or multi-family developments such as condos, apartments, and mobile home parks, unless a county drain is directly involved).</p> <p>According to the Drain Code of 1956, a “drain” may include the “main stream or trunk and all tributaries or branches of any creek or river, any watercourse or ditch, either open or closed, any covered drain, any sanitary or any combined sanitary and storm sewer or storm sewer or conduit composed of tile, brick, concrete, or other material, any structures or mechanical devices that will properly purify the flow of such drains, any pumping equipment necessary to assist or relieve the flow of such drains and any levee, dike, barrier, or a combination of any or all of same constructed, or proposed to be constructed, for the purpose of drainage or for the purification of the flow of such drains, but shall not include any dam and flowage rights used in connection therewith which is used for the generation of power by a public utility subject to regulation by the public service commission.”</p>

Entity	Stormwater Jurisdiction
<p>Cities and Villages</p>	<p>Unlike townships, cities and villages, according to Michigan law, are allowed jurisdiction over roads within their boundaries. Over the years, some cities and villages have taken jurisdiction over some of the roads within their boundaries. Most often this has occurred at the time the community incorporated. The cities and villages have jurisdiction over all neighborhood or subdivision streets. Whether a city or village or the road commission has jurisdiction over major streets within the community depends upon a variety of factors and differs from community to community.</p> <p>The storm drainage system is typically along city/village-owned streets. The runoff enters the drainage system within the right-of-way (e.g., ditches, catch basins), but city/village jurisdiction continues until the runoff is outlet to a system with other ownership (e.g., county drain, waters of the state, private property). (However, most often the transfer of ownership happens at the end of the right-of-way). In addition, although the city/village may not own the system, they often provide operational maintenance under contract with the road commission.</p> <p>Finally, the city/village may own storm drainage systems in connection with municipally-owned property.</p> <p>Cities and villages also have the ability to manage stormwater runoff in their community through planning and zoning. For example, a stormwater ordinance is one tool cities/villages can use to ensure stormwater from new development and redevelopment projects meet water quality and quantity standards.</p> <p>These stormwater standards often require identifying the entity responsible for the perpetual maintenance of the storm sewer system. In many cases, maintenance is often transferred to the property owners (e.g., subdivision association). However, there are cases where the stormwater controls are deeded to the county or local unit of government.</p>
<p>Townships</p>	<p>Townships do not have jurisdiction over roads within their boundaries. Therefore, they are not responsible for the storm drainage system, as are county road commissions and cities/villages. However, some townships may own or operate a storm drainage system. These exceptions include:</p> <p>Townships may provide operational maintenance of the road/storm system instead of the County.</p> <p>Townships may own storm drainage systems in connection with municipally-owned property.</p> <p>Townships may accept transfer of ownership of the drainage system/structural controls from a private development.</p> <p>Townships do have the ability to manage stormwater runoff in their community through planning and zoning. For example, a stormwater ordinance is one tool townships can use to ensure stormwater from new development and redevelopment projects meet water quality and quantity standards.</p>
<p>Michigan Department of Transportation (MDOT)</p>	<p>MDOT has jurisdiction over the stormwater runoff leaving state highways that enter their storm drainage system. The runoff enters the drainage system within the right-of-way (e.g., ditches, catch basins), but MDOT jurisdiction continues until the runoff is outlet to a system with other ownership (e.g., private property, county drain, waters of the state). MDOT also may have jurisdiction of the culvert/easement area as its road passes over a waterway or waterbody.</p> <p>State highways include all highways with letters in their names, such as “M,” “US,” or “I.” Examples include M-24, M-1, M-5, US-24, I-75, I-696, etc. Generally, all freeways fall under MDOT jurisdiction, as do the major inter-county roads such as Woodward Ave. (M-1) and Telegraph Road (US-24).</p>

Entity	Stormwater Jurisdiction
County Road Commission	<p>The County Road Commission is responsible for stormwater runoff from county roads and their storm drainage system. The runoff enters the drainage system within the right-of-way (e.g., ditches, catch basins), but County Road Commission jurisdiction continues until the runoff is outlet to a system with other ownership (e.g., county drain, waters of the state, private property). Road Commissions also may have jurisdiction of the culvert and right-of-way as the road passes over a waterway or waterbody. In addition, although the County may not own the system, they often provide operational maintenance under contract with MDOT.</p> <p>The Road Commission can also regulate the quantity of water entering the right-of-way to ensure it does not adversely affect maintenance or safety concerns.</p> <p>Every county in Michigan has a road agency. All but one has County Road Commissions. In Wayne County, the Road Commission merged with county general government in the 1980s. In every other county, the Road Commission is a separate unit of government, removed from county general government. Road Commissions have jurisdiction over all roads in the townships in the county. Additionally, County Road Commissions have jurisdiction over many of the primary roads in cities and villages within that county. Most road ditches are under the jurisdiction of the Road Commission, but some are county drains.</p>
Public entities: jails, hospitals, schools	<p>Public entities that own or operate storm sewer systems within their property have sole jurisdiction over those systems, but they may grant authority to the local unit of government to manage the system according to local stormwater requirements and Phase II stormwater regulations.</p>

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