

# Revising Local Codes to Facilitate Low Impact Development

## Creating LID—Local Development Code Connections Will Assist With Implementation

Many municipalities now view low impact development (LID)—also known as green stormwater infrastructure—as an essential stormwater management tool. LID practices are designed to capture, filter and infiltrate runoff onsite using soils, vegetation and other media. So, why aren't rain gardens and vegetated swales popping up in every small city and town? Because complex local development codes, developed over decades, frequently stand in the way. Fortunately, a comprehensive review of local development codes can identify where and how the codes should be adjusted to work in tandem with and facilitate the use of LID.

### What's the Problem?

In many local governments, a disconnect exists between the development code and LID. Often, key stakeholders lack the information to grasp why this disconnect occurs, which can lead to confusion about the problem and its solutions (see sidebar on common myths). What's the source of the disconnect? Local codes are complex and ever-evolving. The different sections are often developed and modified over decades to address a web of local government departmental and operational needs, such as fire and public safety (e.g., street widths for emergency vehicle access), public works (e.g., street standards for stormwater management), and planning (e.g., open space and parking requirements). As a result, a typical development code can include provisions that inadvertently discourage, limit, or even prevent the use of LID.

Many codes require developers to build unnecessarily wide streets, which increases impervious pavement and runoff volume. The wording of existing codes sometimes prevents vegetative LID practices, such as rain gardens, from being used to comply with open space and landscaping requirements on a development site. If unable to count LID practices as required green elements, developers might be less likely to include LID because of possible increased costs/decreased profits and added delays.

### What's the Solution?

Performing a careful and comprehensive code review can help local government staff identify the code's top LID obstacles and modify them to allow LID and facilitate its use. **Help your community make the LID—local development code connection!**

### FAQ

**Don't development codes prevent the use of LID?**



#### **Barrier Busted!**

Review of local codes can identify and remove obstacles to LID.

EPA's LID Barrier Busters fact sheet series... helping to overcome misperceptions that can block adoption of LID in your community



### Common Myths about LID Obstacles in Local Codes

**Myth #1.** *Most local development codes contain only a few obstacles to LID.* Not true. A review of local codes typically identifies numerous obstacles.

**Myth #2.** *Adopting a stormwater ordinance will solve the problem.* It's not that simple. Even if stormwater ordinances require the use of LID, they can be ineffective if blocked by conflicting code requirements elsewhere. For example, LID barriers often exist in the local development code's landscaping, open space, perimeter screening, street, parking and lot setback requirements.

**Myth #3.** *Government staff members can simply waive the conflicting code requirements.* Not likely. A costly approval procedure is required for each individual conflicting element, and a single LID project might present 15 to 20 conflicts.

Fear not! By educating key stakeholders and engaging them in the code review effort, you can facilitate greater LID use in your community. See pages 3-8 to learn how.

# Does Your Code Need Updating?

## Can You Spot the LID Obstacle in these Codes?

Review the following examples of “typical” development code wording, then compare them to the photos. Which of the LID practices shown in the pictures would be illegal under these code requirements? (Hint: All of them.)

1. “A buffer strip of dense evergreens a minimum of five (5) feet in width shall be planted along the property line.” Did you spot the LID obstacle?

**Potential code solution:** Including vegetated LID in the list of practices that may be built in the required perimeter screening areas.

2. “All shoulders and easements shall be graded smooth and established in grass.” Did you spot the LID obstacle?

**Potential code solution:** Allowing LID practices, such as swales and curb cuts, to be constructed in the street right-of-way.

3. “All parking lot islands shall be surrounded by a minimum five (5) inch continuous curb.” Did you spot the LID obstacle?

**Potential code solution:** Allowing curb cuts in the parking lot islands so water can flow into a LID practice such as a bioretention area.

4. “Street Materials: The base course shall consist of asphaltic concrete, which shall be primed with suitable asphaltic material. The roadway shall be surfaced with asphaltic concrete wearing surface.” Did you spot the LID obstacle?

**Potential code solution:** Allowing the use of permeable surfaces (such as pavers) on parking areas, streets and/or alleyways.

## You Are Not Alone—Code Reviews Are Happening Nationwide

A growing number of municipalities are reviewing their development codes to identify and remove obstacles to LID, including places such as Raleigh, N.C.; Alpharetta, Ga.; San Antonio, Texas; and Phoenix, Ariz. Using tools such as guidebooks, checklists and other resources, diverse communities across the country are working to make the LID—local development code connection, which is essential to building and maintaining a strong local LID program.

The next six pages describe important elements in the code review process. As noted on pages 3 and 4, this includes educating community members about the potential benefits of LID and explaining how existing local development codes can sometimes deter LID use. Once stakeholders understand the need for code revision, localities can use several tools (described on page 5) to identify specific elements of their development code that prevent or impede LID implementation. Pages 6 and 7 offer example language that localities can use to overcome the code constraints and, if desired, to offer incentives for LID use. Finally, page 8 emphasizes the need for localities to build the operational capacity necessary to implement the new code provisions and maintain a successful LID program.



Stormwater infiltration trench, Stafford County, Virginia



Stormwater retention area, Saint Paul, Minnesota



Parking lot island with curb cuts, Portland, Oregon



Permeable pavers, Los Angeles Zoo, California

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# LID Barrier-Busting in Action: Overcoming Local Code Constraints

## Creating the LID–Local Development Code Connection in Your Community

### Getting Started: Educating Your Community

Before jumping into local code review and revision, share information with key stakeholders about the benefits of LID and how LID can support your community’s values and goals.

- **Comprehensive Plan Policies.** Review your community’s Comprehensive Plan. Does it include policies or actions that will implement LID? Are there other policies in the plan that would be strengthened by LID? Because the local development code is intended to reflect the Comprehensive Plan, these policies can help make the case for revising the local code.
- **Communicate LID’s multiple benefits.** LID can provide benefits beyond stormwater management by providing recreation areas and green space, increasing property values, creating habitat for wildlife and birding, and keeping local waterways cleaner. Other fact sheets in EPA’s [LID Barrier Busters Fact Sheet Series](#) can help readers understand the benefits of LID.
- **Highlight potential cost saving for developers.** Numerous studies show that LID can be more economical than conventional stormwater practices. See EPA’s fact sheet on the [Costs of LID](#).
- **Build support for LID by showing benefits through local demonstration projects.** Seeing a project in action helps residents understand that LID can aesthetically enhance the neighborhood and improve water quality. See EPA’s fact sheet on the [Aesthetics of LID](#).
- **Offer a local cost comparison.** Review a recent local development and “redesign” it with LID elements to compare the costs. Include local engineers/designers in the exercise. The city of San Antonio did this in 2014 as a part of a code review and found a 10 percent savings with LID.



K. Phillips, Tetra Tech

Rain barrels provide water for garden and landscape plants, Mt. Crawford, Virginia

### Communicating Code Complexity to Stakeholders

When communicating the benefits of revising development codes, it’s a good idea to help stakeholders understand how the codes evolved and why they contain the requirements they do. Local codes are complex tools that were developed by communities over many decades to meet different local departments’ operational needs or local government objectives. Changing the local code to promote or require LID isn’t easy when it conflicts with other core goals or needs. To be successful, LID code revision efforts must consider other community goals, core departmental functions and development needs. Crafting proposed code revisions will require input and negotiations from multiple local government programs or divisions as well as representatives from the development and design community, homebuilders’ associations, environmental groups and other key community stakeholders.



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Stormwater planters capture roof runoff and add beauty to an urbanized area, Emeryville, California

# Helping Communities Overcome Common Misconceptions About LID and Local Codes

Local government representatives and community members often assume that removing obstacles to LID from their local codes is as simple as passing a stormwater ordinance or waiving a few conflicting restrictions. Unfortunately, the process is often more complicated. Before the code review process even begins, it's a good idea to provide local stakeholders with the relevant facts. The top three most common misconceptions about LID and local codes include:

## 1. Stakeholders often believe that only a few obstacles to LID exist in local codes.

Typically, a local code review identifies numerous obstacles to LID woven throughout a local code. These obstacles include provisions that actively limit or prevent the use of LID; provisions that create ambiguity about the use of LID; and/or helpful provisions that do not yet exist, but could better enable or facilitate the use of LID, if added. The most common code obstacles identified include:

- No allowance for vegetated LID practices to count toward open space and landscaping requirements.
- No allowance for vegetated LID practices to be constructed in the parcel's designated open space, landscaping and perimeter screening.
- Overly prescriptive requirements for off-street parking, landscaping and screening.
- Requirements for overly large streets, rights-of-way and parking lots.
- Rigid setback, side yard and rear yard requirements.
- Insufficient stream buffer requirements.
- Requirements for curbs and gutters. No allowance for curb cuts.

Local code restrictions often force vegetated LID practices to compete with open space, landscaping, setbacks, screening, trees and other vegetation requirements on a development site, unnecessarily making LID an "extra cost." Taken together, these barriers affect the feasibility, effectiveness and cost of implementing LID.

## 2. Many local governments assume it will be sufficient to revise their stormwater ordinance to facilitate or require LID practices and related stormwater BMP design standards.

In addition to revising the stormwater ordinance language, local planners will likely need to implement other changes to establish LID as a commonly used stormwater management tool, such as removing barriers to LID, adding incentives to make LID use a cost-effective development option, educating local government staff and cultivating a wider public acceptance of LID through outreach.

## 3. People assume that local government staff can easily waive the specific elements of a development code that conflict with LID.

Local governments developed their codes over time to protect their community, and compliance is mandatory. A developer must apply to the local board of adjustment for a variance for each item in the development plan that does not comply with the existing code. For a development project proposing LID practices in a community where the code has not been revised to remove obstacles, 15 or more variance requests/applications might be needed. This process creates unacceptable uncertainty, time delays, and extra costs for developers, leading them to conclude that proposing LID is not worth the effort. Therefore, LID elements that conflict with codes are often simply omitted from development plans.



Local zoning code allows for curb cuts, Harrisonburg, Virginia



Zoning code allows for LID practices and limited setback between homes, Seattle, Washington

K. Phillips, Tetra Tech

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# Identifying LID Obstacles in Your Local Codes

## Tools for Code Review

Once your community understands the need to revise the local codes to create a useful pathway to LID, the process may begin. Numerous tools, such as guidebooks and checklists from federal, state and local governments, are available to help you. EPA lists many resources on its [Low Impact Development](#) and [Green Infrastructure](#) webpages. Some communities complete the code review process on their own, and some seek outside assistance. Four free resources designed to help with code review are:

- **Tackling Barriers to Green Infrastructure: An Audit of Local Codes and Ordinances (2017).** Developed by Wisconsin's Sea Grant, this [workbook](#) is intended to help local governments identify and revise local codes and ordinances to allow for and support green infrastructure.
- **The Green Infrastructure Opportunities Checklist Tool.** This [checklist](#) can be used to evaluate local development codes and manuals to identify obstacles and opportunities for LID. It primarily focuses on the development site scale. The tool is designed to help users identify key provisions in codes that support or impede the use of LID.
- **Low Impact Development: Code Update and Integration Toolkit (July 2014).** This [toolkit](#), developed by Washington Department of Ecology, provides worksheets and other resources to help jurisdictions integrate LID into local codes, rules, standards and other enforceable documents. It provides a step-by-step approach, addressing (1) who should be included in the effort, (2) what topics should be addressed, (3) where LID-related codes are usually found, (4) how to fill the gaps, (5) how to ensure review and adoption of codes, and (6) how to successfully implement the code.
- **EPA's Water Quality Scorecard (2009).** This [scorecard](#) is a tool for a local government to use to evaluate its water quality program. The evaluation is at three scales: site, neighborhood/district and whole community/watershed. It uses five topic areas to score the program: open space, compact development, green streets, green parking and LID development. The Scorecard covers more than 230 policies, code provisions and incentives.

## Green Infrastructure Opportunities Checklist Tool: Phoenix Example

GOAL #1 KEY QUESTIONS	DEGREE OF IMPORTANCE	COMMENTS (INDICATE ORDINANCE FINDINGS "YES" OR "NO." WHEN "NO," NOTE SPECIFIC LOCATION OF BARRIER IN CODE)
<b>Streets</b>		
1. For residential development, are the street pavement widths allowed to be between 18 to 22 feet, with curb pullouts for passing of large vehicles?	●	<b>Code Findings: No</b> City of Phoenix Street Planning and Design Guidelines. Local Single Family Residential Streets: 28 to 32 feet of pavement width is required; Minor residential collector streets: 40 feet are required.
2. Are travel lanes allowed to be from 12 to 10 feet (or less), with curb pullouts for passing of large vehicles?	●	<b>Code Findings: No</b> City of Phoenix Street Planning and Design Guidelines. Local Single Family Residential Streets: 14 to 16 feet are required.
3. Are curb bumpouts/extensions allowed near intersections and mid-block for traffic-calming and bioretention opportunities?	◐	<b>Code Findings: Yes</b> City of Phoenix Street Planning and Design Guidelines. Traffic calming devices include several standard drawings of curb bumpout and planters that could accommodate bioretention.
4. Is pervious paving allowed for on-street parking and alleyways?	○	<b>Code Findings: No</b> City of Phoenix Street Planning and Design Guidelines. Alleys, on-street parking lanes and on-street bike lanes require asphalt.
5. Are grass swales or bioretention swales allowed instead of curb and gutter or with curb cuts (where slopes allow)?	◐	<b>Code Findings: Not expressly allowed or prohibited, but appears limited</b> City Code 32-289A. Urban density of 3 or more lots per gross area must have paved and curb streets. Note: There is no express allowance for bioretention or swales in those cases where curb is not required

The Green Infrastructure Opportunities Checklist helps localities identify elements of a development code that prevents the use of LID. Because the checklist is constantly being revised to reflect new information, the most up-to-date version is available to localities for free upon request by emailing [gicodereviewchecklist@tetrattech.com](mailto:gicodereviewchecklist@tetrattech.com).

## EPA's Water Quality Scorecard: Example Section

3. DESIGN COMPLETE, SMART STREETS THAT REDUCE OVERALL IMPERVIOUSNESS			
3.B GREEN INFRASTRUCTURE ELEMENTS AND STREET DESIGN			
QUESTION:	Pts. Avail.	Pts. Rec. or N/A	Notes and Local References
3.B.2 GOAL: Build and retrofit these surfaces with pervious materials to reduce stormwater runoff and its negative impacts. NOTE: While eliminating sidewalks or placing sidewalks on only one side of the road can reduce impervious cover, this strategy is typically most appropriate for rural areas. However, other effective strategies can achieve the same runoff reductions that will not limit residents' options for recreation and transportation.			
WHY: Streets, sidewalks, and other hard surfaces contribute a large portion to a municipality's total imperviousness. Making these impervious surfaces more permeable protects water quality, reduces flooding, and can recharge groundwater.			
<b>ADOPT PLANS/EDUCATE:</b>			
Sponsor/approve pilot programs to determine appropriate pervious materials for different paving areas (e.g., permeable concrete for sidewalks), as well as process for installation and maintenance.	1	1	Taylor Mall, Helen Drake Senior Center, Manzanita Park, for example. City does approve and sponsor such pilot programs on a case-by-case basis.
Pilot project results incorporated into standard practice for all new paved areas and retrofits of existing paved surfaces.	1	0	City has not incorporated into standard practice for all new paved areas and retrofits of existing paved surfaces; is currently evaluating the implementation of the City's Complete Streets Program with GI.
Adopt policy to replace impervious materials with pervious materials where practical.	1	0	City has not yet adopted a policy to replace impervious materials with pervious materials. O&M aspects still need to be evaluated.
<b>REMOVE BARRIERS:</b>			
Technical street specifications allow pervious paving materials in appropriate circumstances (e.g., not allowed over aquifer recharge areas).	1	0	City of Phoenix Street Planning and Design Guidelines do not allow pervious paving materials.
<b>ADOPT INCENTIVES:</b>			
Create formal program offering incentives (e.g., cost sharing, reduction in street widths/parking requirements, assistance with maintenance) to property owners who utilize pervious pavement elements.	1	0	Currently, the City doesn't have any such formal program that offers any incentives.
<b>ENACT REGULATIONS:</b>			
Adopt requirement that some percentage of parking lots, alleys, or roads in a development utilize pervious materials.	1	0	City of Phoenix Street Planning and Design Guidelines do not allow pervious paving materials.
Development approvals that allow/require use of pervious materials include requirements for ongoing maintenance/cleaning of pervious surfaces.	1	0	City of Phoenix Street Planning and Design Guidelines do not allow pervious paving materials.
		1	<b>Out of 7 possible points</b>

EPA's Water Quality Scorecard offers fill-in-the-blank forms to help localities evaluate whether development codes are LID-friendly.

# Removing Code-Related LID Obstacles

Once your community has identified the LID obstacles in its code, the process of removing them can begin. Some of the easier code fixes include revising text so it offers site design flexibility that explicitly allows or facilitates LID (see Easier Code Fixes, below). Some local governments take on more challenging code fixes, such as those involving negotiation between multiple parties (see More-Challenging Types of Code Revisions, next page). Finally, many local governments opt to include incentives in their code for LID (see Adding LID Incentives through Offsets or Credits, next page).

## Easier Code Fixes

The following local code samples highlight improvements that are relatively easy to enact. These code fixes provide site design flexibility and explicitly favor LID; however, they do not include bonus incentives for the preferential use of LID (as show in the next section). [Note: Code samples are illustrative and do not indicate an EPA recommendation for any particular locality.]

### Sample Code for Landscaping, Streetscape and Tree Preservation

To promote multifunctional LID practices and provide incentives for their use, bioretention areas, vegetated swales, planter boxes, rainwater harvesting systems, and other approved vegetated LID practices may be used to meet landscaping, buffering, streetscape, and tree preservation requirements in this chapter, and may be constructed in designated landscape, buffering, streetscape, and tree preservation areas if part of an approved stormwater management plan for the site. The dimensional and plant standards for landscaping areas and landscape strips in this chapter may accommodate LID features if they are part of an approved stormwater management plan for the site.

### Sample Code for Bufferyards

LID may be used to comply with bufferyard (i.e., vegetative screening of adjacent properties) requirements of section X. The city shall allow vegetated LID practices in buffer types A, B, and C. LID practices shall be allowed in the first ten (10) feet of bufferyards D, E, and F, as measured from the interior of the site. The minimum plant materials required in table X shall be met in the overall bufferyard area. The permanent irrigation requirements of this chapter shall not apply to LID practices that use native plants. Bufferyard areas with LID practices that use native plants and drought-tolerant vegetation and that do not install a permanent irrigation system shall provide a detailed alternative irrigation plan and schedule for the establishment and maintenance of the bufferyard.

### Sample Code for Property Setback, Side Yard and Rear Yard

To accommodate LID practices and optimize LID site design, required setback, side yards, and rear yards in table X of this chapter may be reduced as long as such reductions meet fire code standards. The reductions may not compromise public safety such as the sight distance triangles defined in section X of this chapter.

### Sample Code for Curb and Edge Treatment

Where a portion of a project or public improvement has been designed specifically as a LID stormwater management feature, curb only, saw tooth curb, and curb cut edge treatments are allowed and encouraged.

### Sample Code for Parking Area Landscaping, Buffering and Shading

To promote multifunctional LID practices and provide incentives for their use, bioretention areas, vegetated swales, planter boxes, rainwater harvesting systems, natural channel design and other vegetated practices may be used to meet parking area landscaping areas required in this section. These may be constructed in designated landscape areas if part of an approved stormwater management plan.



Landscaped detention area, Seattle, Wash.



Sidewalk retention area, Los Angeles, Calif.

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## More Challenging Types of Code Revisions

The following code revisions require more intensive negotiation between local government departments and with other local stakeholders and are more challenging to enact. Often, the departments have codes, policies, standards and enforceable documents that will need to be identified and updated to allow for LID. Because codes develop over time in response to needs of different departments (e.g., planning and inspections, stormwater, drinking water, wastewater, transportation/streets, fire safety, solid waste, recreation, economic development), crafting proposed code revisions requires input and agreement by all of them. LID practices that affect numerous departments and require coordination and negotiation during code revisions include:

- Allowing narrower street pavement widths.
- Allowing LID practices in rights-of-way.
- Adding required retention or LID performance standards.
- Requiring wider stream buffers.
- Providing stormwater credit for LID practices installed in the privately maintained area of rights-of-way.

The documents highlighted in the Tools for Code Review section ([page 5](#)) offer approaches and advice for working through these issues.

## Adding LID Incentives

Local governments might decide to further promote greater adoption of LID. To reward a developer for using LID practices, a locality could reduce the applicable stormwater fee, expedite necessary reviews, offer higher parkland or landscaping credits, or award development density and parking reduction bonuses. (For more ideas, see EPA's fact sheet on [Encouraging LID](#).) Localities typically provide incentives for *private development requirements* as shown in the following code text examples.

### **Sample Code for LID Landscaping Credit Incentive**

Areas with LID practices will receive 1.5 credit acres for landscaping requirements of this section. Irrigation requirements of this chapter shall not apply to LID practices that use native or drought-tolerant plants. If an irrigation system is not installed, the landscape plan shall provide a detailed alternative irrigation plan and a schedule for the establishment and maintenance of the landscape.

### **Sample Code for LID Parkland Credit Incentives**

LID practices will receive 1.5 credit acres towards parkland requirements for up to 20 percent of the site's parkland requirements. The parkland dimensional requirements may be reduced up to 10 percent to accommodate use of LID practices. Linear trails may receive 1.5 parkland credit acres for up to 50 percent of the site's required parkland area, if such trails are connected to a portion of the development's remaining parkland area via a pedestrian way. Such linear trails may deviate up to 10 percent from dimension requirements of this chapter.

### **Sample Code for LID Parking Incentive**

Minimum parking may be reduced by one parking space for each tree 12 inches in diameter or larger that is preserved on-site. A maximum of two parking spaces, or 10 percent of the total number required, may be reduced, whichever is greater.



M. Frey, Tetra Tech

Curb bump-out creates narrower streets and captures runoff, Gresham, Oregon



A. Goldstein

A trail winds through neighborhood parkland, Lenexa, Kansas



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Development includes open spaces and decentralized stormwater control, Wilsonville, Oregon



A great way to increase the use of LID in your community is to revise your stormwater ordinance to include a retention requirement or volume control requirement; to meet the requirement, the developer would need to use some type of LID or hybrid LID plus traditional stormwater practices.

## Additional Resources: Zoning Codes and Smart Growth

- [Codes That Support Smart Growth Development](#). EPA website providing examples of adopted zoning codes and guidelines that support smart growth and LID implementation.
- [Essential Smart Growth Fixes for Urban and Suburban Zoning Codes](#) (2009). EPA guidance document outlining zoning codes fixes to develop more environmentally responsible urban and suburban communities.
- [Essential Smart Growth Fixes for Rural Planning, Zoning, and Development Codes](#) (2012). EPA guidance document providing policy options to help rural communities strengthen their economies while preserving the area's rural character.



Visitors learn about a roadside rain garden from experts at the University of Maryland, College Park

## Next Steps: Build Local Capacity to Implement LID

### Code change alone will not lead to LID implementation. Staff training and operational planning is necessary to ensure success.

Once you have identified and removed the most important obstacles to LID in your community's local development code, you might assume your new LID program will run smoothly on autopilot. It is important to note that, along with code revisions, your community also needs to build the operational capacity to implement the new code provisions. To equip your local government staff and the community with the tools they need, consider offering employee training for LID plan review and inspections, hosting developer/design community LID training, developing a LID design manual, and creating an operation and maintenance agreement template. It is also critical to establish a long-term funding mechanism for inspections, operations and maintenance, and to establish clear lines of departmental responsibility for these functions. These steps will ensure the staff can do its job and the development community understands the new provisions of the local development code—allowing LID to become a routine part of development in your community.

The good news is that you're not alone. Your biggest resource is the team of local staff that helped negotiate the new local code provisions. Key things they can do include:

- Develop an action plan for building operational capacity over a 5- to 10-year period.
- Reach out to neighboring jurisdictions or the state to see if they have already developed design manuals, plan review checklists, tracking systems for LID practices, etc., that you can build on.
- Ask your local college or university, state environmental agency or U.S. Environmental Protection Agency office if they have LID training or workshop materials available for local staff and the development community.



Building and maintaining a LID program requires cooperation and coordination between local government and community stakeholders