Low Impact Development

Code Update and Integration Toolkit

Worksheets and resources to help Phase II jurisdictions integrate Low Impact Development into local codes, rules, standards, and other enforceable documents

DEPARTMENT OF ECOLOGY
State of Washington

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Introduction

About this toolkit

The new Municipal Stormwater National Pollutant Discharge Elimination System (NPDES) general permits require widespread adoption of Low Impact Development (LID) techniques into local development codes. These new practices and codes require significant changes in the way the private development community plans, designs, and builds sites, as well as the way the public sector enforces, operates, maintains, and inspects stormwater facilities.

To help jurisdictions comply with the new NPDES permits, the Washington State Department of Ecology is offering eight **LID Code Update and Integration** trainings throughout the state. These trainings are designed to help Western Washington Phase II jurisdictions update and revise their codes to require and allow for the use of LID. In Eastern Washington, trainings will provide an opportunity for Phase II jurisdictions to voluntarily update their codes and better understand how to incorporate LID into future projects.

This toolkit was assembled to accompany these **LID Code Update and Integration** trainings. The following pages provide jurisdictional staff with tools such as worksheets, sample codes, and other resources to ease the integration process of LID into local codes, rules, standards, and other enforceable documents.

How to use this toolkit

This toolkit is organized into six sections designed to assist jurisdictional staff and streamline the code update process:

- **Implementation Worksheet for Integrating LID into Local Codes –** This checklist identifies the six steps described in the *Integrating LID into Local Codes: A Guidebook for Local Governments,* and provides a list of easy to follow actions for each of the steps.
- **Code Review Form Template -** This form provides a template for tracking the review process for integrating LID into local codes, rules, standards, and other enforceable documents.
- **Subtopic Focus Sheets-** These focus sheets provide additional information on the importance of each subtopic and include questions to consider during the review process. These sheets should be used in conjunction with the **Code Review Form**.

- **Code and Ordinance References –** This section provide examples of regional and national codes and ordinances divided by relevance for Eastern and Western Washington jurisdictions.
- **Communicating with Your Elected Officials and City Managers –** This section provides tips and talking points for engaging elected officials and city managers in the code update and adoption process.
- **Resource List for Jurisdiction Staff –** This list includes other relevant resources developed to help jurisdictions integrate LID including case studies.

Implementation Worksheet for Integrating LID into Local Codes

Six Steps to LID Integration

Purpose of the Worksheet

The purpose of this checklist is to identify key concepts from *Integrating LID into Local Codes: A Guidebook for Local Governments*[1] ("the Guidebook") for Phase II municipal stormwater managers in Washington as they incorporate low impact development (LID) into local codes, rules, standards, and other enforceable documents. The checklist identifies the six steps described in the Guidebook and provides a list of easy to follow actions for each of the steps. The six steps are:

Step 1 – {**Who**} Assemble the Project Team
Step 2 – {**What**} Understand General Topics to Address
Step 3 – {**Where**} Review Existing Codes and Standards
Step 4 – {**Fill the Gaps**} Amend Existing Codes and Develop New Codes
Step 5 – {**Review and Adopt**} Public Review and Adoption Process
Step 6 – {**Implement**} Ensure Successful Implementation

[1] Puget Sound Partnership, 2012, Integrating LID into Local Codes: A Guidebook for Local Governments, prepared by AHBL for the Puget Sound Partnership, July 2012.

Step 1 – {Who} Assemble the Project Team

Who should be part of your Project Team?

A comprehensive project team of key internal team members and potential key external stakeholders is critical to the process of integrating and adopting LID into local codes. The initial review and update of existing codes and regulations will largely be conducted by internal team members. External stakeholders will be involved in providing comments and feedback on the proposed changes to help facilitate the adoption process. Certain external stakeholders may also be involved in the initial review state. In addition, consider involving participants (internal and external) who have expressed reservations about LID as they will help the team identify and address concerns and barriers early in the process. The size of your team will vary depending on the size of your jurisdiction and the extent of your required updates.

☐ Designate a project team lead

Internal Team (review & update codes)

☐ Identify internal team members involved in the following:

- Public Works (stormwater, street, grading and site work, public buildings)
  - Stormwater engineering review
  - Streets/roads engineering
  - Public facility operations
  - Maintenance and inspection
- Planning
  - Development review
  - Policy
  - Construction inspection
- Fire and public safety (police) (street widths, access for emergency response, street layouts, and street surfacing)
- Building Department (green roofs, minimal excavation foundations, rainwater re-use systems)
  - Inspection and review

☐ Consider adding an internal team member from each of the following:

- Council members or commissioners, including planning commission
- City manager or equivalent
- Natural resources
- Parks department
- Legal department

External Stakeholders (comment & facilitate approval process)

☐ Consider involving external stakeholders from groups such as:

- State/local health department
- Utility providers (water, sewer, etc.)
- Agencies owning and maintaining streets (County, WSDOT)
- Site designers/engineers
- Major property owners/developers
- Citizen's or neighborhood groups
- Environmental groups
- Special districts

☐ Fill in the following table with your project team:

Name	Job title	Department	Contact Information	Role on Team

☐ Bring the internal project team up to a common level of understanding of LID and the code update objectives by attending trainings and using the resources listed in the *Guidebook*

Step 2 – {What} Understand General Topics to Address

What topics should your project team review?

Once the project team is assembled and a common level of understanding of LID has been established among internal project team members, the next step is to establish a work program that identifies **what** topics of a jurisdiction's codes, policies, standards, and enforceable documents need to be updated to integrate LID. Topics will vary from jurisdiction to jurisdiction. Examples of topic areas that affect the use of LID are described in the table below (see Table 1. Major Topic Areas, Associated Review Categories, and Recommended Subtopics). The table should be modified to suit the needs of each jurisdiction. Once the table is complete, the topic areas and subtopics will be used to review existing code, policies, standards, and enforceable documents in Step 4.

Review Categories

The Western Washington National Pollutant Discharge Elimination System (NPDES) Phase II Permit (Phase II Permit) requires your report to the Washington Department of Ecology (Ecology) to be organized into the following three review categories:

Measures to minimize impervious surfaces

Measures to minimize loss of native vegetation

Other measures to minimize stormwater runoff

The Guidebook provides a list of major topic areas that should be reviewed. Each of these major topic areas falls into one or more of the review categories outlined in the NPDES Phase II Permit (see graphic above). Recommended subtopics for review are identified under each of the major topic areas listed below.

☐ Review and modify the table below to identify additional topics areas and subtopics that may be relevant to your jurisdiction. Each topic area and subtopic listed in the table below will help you identify areas of your code (and other documents) that need to be updated to integrate LID. **(See Subtopic Focus Sheets to learn more about each subtopic)**

Table 1. Major Topic Areas, Associated Review Categories, and Recommended Subtopics

Site Planning and Assessment

- Building locations
- Parking area locations
- Stormwater treatment/flow control BMP/facility locations
- (add subtopic as necessary)

Healthy Soils

- Protecting and restoring healthy soil
- Compost amendments
- Compaction
- (add subtopic as necessary)

Landscaping, Native Vegetation, and Street Landscaping

- Tree preservation
- Screening
- Landscaping requirements for street frontages
- Landscaping requirements for parking lots
- (add subtopic as necessary)

Hard and Impervious Surfaces

- Maximum impervious surface allowances
- Shared driveways
- Minimum driveway width
- Use of permeable pavement for driveways
- Two-track driveway design
- (add subtopic as necessary)

Bulk and Dimensional Considerations

- Building setbacks
- Height limits
- Maximum square footage
- Clustering
- (add subtopic as necessary)

Clearing and Grading

- Protecting existing infiltration
- Conserving native vegetation/soils
- Construction sequencing
- (add subtopic as necessary)

Streets and Roads

- Travel lane widths
- Right-of-way (ROW) widths
- Use of permeable pavement for streets and roads
- Placement of utilities under paved areas in the ROW
- Required turn around area (e.g., Fire, USPS)
- Sidewalk widths
- Sidewalk slope
- Minimum cul-de-sac radius
- Alternatives to cul-de-sacs
- (add subtopic as necessary)

Parking

- Minimum/maximum parking ratios
- Use of permeable pavement for parking lots (e.g., parking stalls, driving aisles)
- Parking stall dimensions
- Driving aisle dimensions
- Off-street parking regulations
- (add subtopic as necessary)

Design Guidelines and Standards

- Trees and bioretention
- Continuous curb requirements
- Curb radii
- (add subtopic as necessary)

Stormwater Management and Maintenance

- Maintenance provisions
- Inspection access (covenants, easements)
- Enforcement
- (add subtopic as necessary)

Subdivision and Planned Unit Development

- Individual open space requirements
- Passive vs. active open space requirements
- Opportunities for Performance Based Designs (PUDs)
- (add subtopic as necessary)

Critical Areas and Shoreline Management

- Allowance of LID best management practices (BMPs) in critical areas/shorelines when compatible
- (add subtopic as necessary)

(Add Topic Area as necessary)

- (Add review category symbol(s))
  - (Add subtopics as necessary)

Note – the discussion of topic areas and subtopics in Step 2 will typically include comments from various team members on specific jurisdictional codes and documents. The team lead (or designee) should take notes during the Step 2 discussions to expedite the review process in Step 3.

Step 3 – {Where} Review Existing Codes and Standards

Where are the gaps?

Once your internal team members identify **what topics** should be addressed to fully integrate LID in Step 2, the next step is to determine **where those topics occur** in a jurisdiction's policies, regulatory code, and standards. This step focuses on the review of codes and standards against the identified topics from Step 2 to determine where changes are needed for LID integration of LID. You may want to consider reviewing the LID report submitted to Ecology as part of your 2011 Annual Report to revisit barriers to LID that your jurisdiction has already identified.

☐ Develop a list of codes, rules, standards, and enforceable documents for review (**Complete Table 2. Document Review – Existing Codes and Standards below)**. Examples include:

- Comprehensive or Planning Documents
  - Stormwater Comprehensive or Management Plans
  - City or County-wide Comprehensive Plan
- Standard Details
  - Standard Plans and Specifications
- Engineering and Street Standards
- Development Design Guidelines and Requirements
- Zoning, Development, and Subdivision Code
  - Street and Sidewalk Use
  - Stormwater Code
  - Land Use Code
  - Building Code
  - Mechanical Code
  - Plumbing Code
  - Housing Code
  - Subdivision Code
  - Grading Code
  - Fire Code
  - LID Code
  - Tree and Vegetation Management Requirements
  - Landscaping Requirements
  - Right-of-Way Requirements

Look at the Subtopic Focus Sheets for further detail

☐ Assign internal team members specific documents to conduct an initial review using the topics identified in Step 2 and fill out a review form for **each** code, rule, standard, or enforceable document from the list you have created above (**See Review Form**)

☐ When reviewing each code, rule, standard, or enforceable document, make sure to reference the following LID Considerations:

Document Name	LID Considerations
Comprehensive or Planning Documents	- Goals and policies should promote LID - Goals and policies that present barriers to LID should be modified or removed - Policies that support dual use of landscaping or open space and LID should be added - Policies should support minimizing impervious areas
Subdivision Code	- Allow or require use of LID, where feasible - Include measures to preserve on-site natural features, native vegetation, open space, sensitive environmental areas - Encourage clustering and minimizing impervious areas - Require applicants to conduct LID Site Analysis - Include soil testing for individual facility design
Zoning Code	- Include native vegetation retention standards based on land use and density - Include plant lists, replanting standards, management plan specifications, and maintenance requirements for vegetation - Include tree protection, conservation, and planting standards - Promote preservation of open space where possible - Include impervious surface standards for a range of zoning classifications - Include building footprint, height limits, and setbacks that help meet density goals - Site Plan Review Code should include LID site analysis components - Parking Code should allow permeable/pervious surfaces in parking areas and should look for opportunities to reduce the number and/or size of parking spaces - Encourage clustering development
Engineering and Street Standards	- Outline construction sequencing methods, phasing, and/or bonding for protecting LID BMPs during construction - Include maintenance responsibilities for any LID BMPs - Include provisions for including LID on small residential sites where flow control and/or treatment of stormwater may not be required - Eliminate requirement for approval of variances or deviations to accommodate LID in the public right-of-way - Should not present a barrier to LID (for example, require curb and gutter on all streets) - Include standard to minimize impervious surface and provide opportunity to manage stormwater using LID techniques - Should not conflict with other goals or code (such as International Fire Code, native vegetation retention, minimizing site disturbance)
Standard Details	- Include street sections that shows LID facilities, parking lanes, driving lanes, and sidewalks - Include cul-de-sac plan that includes pervious sidewalks and bioretention islands or other LID facilities - Include details for curb cuts, vertical curb with breaks - Include location of hydrants and other utilities within an LID road right-of-way - Include landscape planting templates for sidewalks and curb extensions, - Include plans and details for LID facilities incorporated into curb extensions, bioretention facilities, swales, permeable pavement, and other LID facilities

- ☐ Meet with others on your internal team to discuss the review results
- ☐ Finalize review forms based on input from your internal team
- ☐ Consider presenting your results to Council or external stakeholders
- ☐ Fill in the following table with your list of documents and the date that the initial and final reviews were completed (this information is useful to track so that it can be incorporated into your report to Ecology):

Table 2. Document Review – Existing Codes and Standards

Document Name	Date	Initial Review Completed	Final Review Completed	Name & Title

Step 4 – {Fill the gaps} Amend Existing Codes and Develop New Codes

Take steps to FILL THE GAPS

After the project team identifies **where** there are gaps and barriers in existing codes and standards, the next step is to **fill the gaps** and remove any barriers by amending existing codes and developing new code language.

- ☐ Refer to the LID considerations listed under Step 3, the subtopic focus sheets, and the examples in the step 4 of the Guidebook to redline and update each code, standard, and enforceable document to integrate LID
- ☐ Update the Review Form to reflect what actions were taken to address gaps and barriers
  - Amend existing code
  - Develop new code
  - Decided not to incorporate any changes (and why)
- ☐ Fill in Table 3. Address the gaps with your list of documents and the actions that were taken to address gaps and barriers (this information is useful to track so that it can be incorporated into your report to Ecology):

Table 3. Addressing the Gaps

Document Name	Brief Summary of Revisions Made

☐ Consider presenting your results to Council or external stakeholders

Step 5 – {Review and Adopt} Public Review and Adoption Process

Make sure that codes and standards have been thoroughly reviewed before starting the adoption process

Once the project team has developed new codes or modified existing codes and standards to **fill the gaps** in addressing LID, the next step is to **review and adopt** the new codes and standards. Each jurisdiction has their own process for reviewing and adopting codes and standards, so only the basic steps are provided here.

☐ Understand the amendment process schedule

☐ Begin amendment process early to allow for rounds of internal and external review

Internal Review:

☐ Department Managers should review proposed changes to the standards

☐ Planning commissions should be briefed on the proposed changes to the standards

External Review:

☐ **Stakeholder input:** Provide an informal review opportunity for external team members and stakeholders (identified in Step 1) of proposed code changes prior to adoption. Provide background information and proposed code changes. Make any changes to amendments based on input.

☐ **Public Review:** Conduct a formal public review according to your jurisdiction's specific formal public review process. Consider using a variety of outreach and communication tools to reach different target audiences.

Step 6 – {Implement} Ensure Successful Implementation

Implement the changes

After the new regulations have completed the public review and adoption process and standards have been administratively updated, the next step is to **implement** the new regulations and standards successfully.

- ☐ Identify and prioritize a list of implementation needs including training, internal and external outreach, application materials, enforcement mechanisms, and any other needs identified by the team
- ☐ Create a timeline to ensure that staff have adequate time to address LID project review, implementation, and ongoing maintenance
- ☐ Consider sharing training resources and successful approaches with other local jurisdictions
- ☐ Train internal staff on key changes to codes, rules, standards, and enforceable documents
- ☐ Train external applicants, designers, and contractors on key changes to codes, rules, standards, and enforceable documents
- ☐ Review and revise application materials, permit review bulletins, process flow charts, and permitting information available to the public

Review Form Example Template

Name of Document/Code/Policy Reviewed:_____

Purpose of Review Form: The purpose of this review form is to provide a template for tracking the review process for integrating low impact Development (LID) into local codes, rules, standards, and other enforceable documents. A separate form is recommended for each code chapter (or subsection) and document that is reviewed. The form is organized into the major topic categories identified in *Integrating LID into Local Codes: A Guidebook for Local Governments*. Recommended subtopics for review are identified under each of the major topic categories. Refer to the **Subtopic Focus Sheets** for more information on the importance of each subtopic and questions to consider during the review process. A similar form was successfully used by the City of Seattle and the City of Arlington during their review processes. This form is not required to be used for permit compliance and can be modified, as needed, to incorporate additional review topics or tracking items.

Step 1 | Step 5 | Step 6

Step 2—{WHAT}		Step 3—{WHERE}				Step 4—{Fill the GAPS}
WHAT topics did you review?		**WHERE are the gaps?**				**What steps have you taken to FILL THE GAPS?**
Topic/Sub Topics	*Topic Reviewed*	*Conflict/Gap Identified*	*Section/Page Reference*	*Summary of Existing Text*	*Summary of Conflict/Gap*	*Steps Taken*
Topic: Site Planning and Assessment						
Building locations	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Parking area locations	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Stormwater treatment/flow control BMP/facility locations	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Topic: Healthy Soils						
Protecting and restoring healthy soil	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Step 2—{WHAT}		Step 3—{WHERE}				Step 4—{Fill the GAPS}
WHAT topics did you review?		**WHERE are the gaps?**				**What steps have you taken to FILL THE GAPS?**
Topic/Sub Topics	*Topic Reviewed*	*Conflict/Gap Identified*	*Section/Page Reference*	*Summary of Existing Text*	*Summary of Conflict/Gap*	*Steps Taken*
Compost amendments	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Compaction	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Topic: Landscaping, Native Vegetation, and Street Landscaping

Tree preservation	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Screening	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Landscaping requirements for street frontages	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Landscaping requirements for parking lots	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Step 2—{WHAT}		Step 3—{WHERE}				Step 4—{Fill the GAPS}
WHAT topics did you review?		**WHERE are the gaps?**				**What steps have you taken to FILL THE GAPS?**
Topic/Sub Topics	*Topic Reviewed*	*Conflict/Gap Identified*	*Section/Page Reference*	*Summary of Existing Text*	*Summary of Conflict/Gap*	*Steps Taken*

Topic: Hard and Impervious Surfaces

Maximum impervious surface allowances	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Shared driveways	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Minimum driveway width	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Use of permeable pavement for driveways & driveway encroachments	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Two-track driveway design	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Topic: Bulk and Dimensional Considerations

Building setbacks	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Step 2—{WHAT} Step 3—{WHERE} Step 4—{Fill the GAPS}

WHAT topics did you review?		WHERE are the gaps?				What steps have you taken to FILL THE GAPS?
Topic/Sub Topics	*Topic Reviewed*	*Conflict/Gap Identified*	*Section/Page Reference*	*Summary of Existing Text*	*Summary of Conflict/Gap*	*Steps Taken*
Height limits	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Maximum square footage	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Clustering	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Topic: Clearing and Grading

Protecting existing infiltration	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Conserving native vegetation/soils	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Construction sequencing	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Step 2—{WHAT} Step 3—{WHERE} Step 4—{Fill the GAPS}

WHAT topics did you review?		WHERE are the gaps?				What steps have you taken to FILL THE GAPS?
Topic/Sub Topics	*Topic Reviewed*	*Conflict/Gap Identified*	*Section/Page Reference*	*Summary of Existing Text*	*Summary of Conflict/Gap*	*Steps Taken*

Topic: Street and Roads

Travel lane widths	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Right-of-way (ROW) widths	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Use of permeable pavement for streets and roads	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Placement of utilities under paved areas in the ROW	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Required turn around area (e.g., Fire, USPS)	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Sidewalk widths	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Sidewalk slope	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Step 2—{WHAT} Step 3—{WHERE} Step 4—{Fill the GAPS}

WHAT topics did you review?		WHERE are the gaps?				What steps have you taken to FILL THE GAPS?
Topic/Sub Topics	*Topic Reviewed*	*Conflict/Gap Identified*	*Section/Page Reference*	*Summary of Existing Text*	*Summary of Conflict/Gap*	*Steps Taken*
Use of permeable pavement for sidewalks	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Minimum cul-de-sac radius	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Alternatives to cul-de-sacs	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Topic: Parking

Minimum/maximum parking ratios	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Use of permeable paving	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Parking stall dimensions	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Driving aisle dimensions	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Step 2—{WHAT}		Step 3—{WHERE}				Step 4—{Fill the GAPS}
WHAT topics did you review?		**WHERE are the gaps?**				**What steps have you taken to FILL THE GAPS?**
Topic/Sub Topics	*Topic Reviewed*	*Conflict/Gap Identified*	*Section/Page Reference*	*Summary of Existing Text*	*Summary of Conflict/Gap*	*Steps Taken*
Off-street parking regulations	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Topic: Design Guidelines and Standards

Trees and bioretention	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Continuous curb requirements	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Curb radii	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Topic: Stormwater Management and Maintenance

Maintenance Provisions	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Inspection Access (covenants, easements)	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Step 2—{WHAT} Step 3—{WHERE} Step 4—{Fill the GAPS}

WHAT topics did you review?		WHERE are the gaps?				What steps have you taken to FILL THE GAPS?
Topic/Sub Topics	*Topic Reviewed*	*Conflict/Gap Identified*	*Section/Page Reference*	*Summary of Existing Text*	*Summary of Conflict/Gap*	*Steps Taken*
Enforcement	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Topic: Subdivision and Planned Unit Development (PUD)

Individual open space requirements	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Passive vs. active open space requirements	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :
Opportunities for Performance Based Designs	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Topic: Critical Areas and Shoreline Management

Sub Topic	*Topic Reviewed*	*Conflict/Gap Identified*	*Section/Page Reference*	*Summary of Existing Text*	*Summary of Conflict/Gap*	*What steps have you taken to FILL THE GAPS?*
Allowance of LID BMPs in critical areas/shorelines when compatible	☐ Yes ☐ No ☐ Does not apply	☐ Yes ☐ No ☐ Does not apply				☐ Amended existing code ☐ Developed new code ☐ Decided not to incorporate any changes If you decided not to incorporate any changes, explain why :

Additional Notes:

Subtopic Focus Sheets

Purpose

Purpose of Subtopic Focus Sheets: The purpose of these subtopic focus sheets is to provide additional information on the importance of each subtopic and questions to consider during the review process. These subtopic focus sheets are organized into the major topic categories identified in *Integrating LID into Local Codes: A Guidebook for Local Governments* and should be used in conjunction with the example **Review Form**. Use of these subtopic focus sheets is not required for permit compliance.

Focus on Site Planning and Assessment

Subtopic	Why is this important?	What should I consider during my review?
Building locations	Locating buildings away from critical areas and soils that provide effective infiltration to preserve and protect these areas and provide potential locations for infiltrating LID facilities	- Can the code be revised to require that buildings are located away from critical areas and preserve soils with good infiltration potential for stormwater management?
Parking area locations	Locating parking areas to minimize site grading can preserve natural water courses, native vegetation, and native soils on site	- Can the code be revised to encourage positioning parking areas near the entrance to the site to reduce long driveways? - Are there any incentives to developers to provide parking within garages rather than surface parking lots?
Stormwater treatment/flow control BMP/facility locations	Infiltrating LID facilities should be constructed in soils that have good infiltration potential. Stormwater management facilities should be located along the natural drainage path to reduce site grading and maintain natural hydrology of the site.	- Can the code be revised to require infiltrating LID facilities in areas with good infiltration potential? - Can the code include a site planning approach that emphasizes prioritizing the location of stormwater management facilities on site?

Focus on Healthy Soils

Subtopic	Why is this important?	What should I consider during my review?
Protecting and restoring healthy soil	Protecting soils during construction activities will preserve their ability to absorb and infiltrate and disperse stormwater runoff	- Is a soil management plan in place that identifies soil protection zones and describes quantities of compost amendment? - Are protection areas required to be fenced?
Compost amendments	Compost can be used to amend soil and provide additional nutrients that aid in uptake of pollutants	- Can code be revised to require amendment of disturbed soils? - Could compost be provided to incentivize small projects?
Compaction	The infiltration potential is reduced when soils are compacted, resulting in lower infiltration rates and increased runoff and erosion	- Can the code be revised to include types of equipment for clearing and grading that minimize compaction of soils? - Can clearing, grading, and soil disturbance outside the building footprint be limited or restricted? - Consider requiring contractors to reestablish permeability of soils that have been compacted by construction vehicles.

Resources:

Building Soil: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13: http://www.buildingsoil.org/

Integrating LID into Local Codes

Focus on Landscaping, Native Vegetation, and Street Landscaping

Subtopic	Why is this important?	What should I consider during my review?
Tree preservation	Trees provide flow control by intercepting stormwater. Currently, many codes focus on preservation of significant or heritage trees instead of conifers.	- Are there regulatory controls over tree clearance and removal of mature trees/forest stands? - Can the code be revised to place greater emphasis on preservation of conifers? - Can the code include strategies to orient retained vegetation and open space to disconnect impervious surfaces?
Screening	Codes typically focus on screening in terms of aesthetics (reducing visual impacts), but screening can also emphasize native vegetation preservation or replanting, which can improve stormwater infiltration and dispersion.	- Can the screening requirements be revised to include provisions for retaining native vegetation or replanting? - Can vegetation planted within LID facilities count towards site, parking, or perimeter screening requirements?
Landscaping requirements for street frontages	Codes often only include requirements for street trees, not LID or other vegetation between the sidewalk and the street.	- Can the street frontage code be revised to include other landscaping between the sidewalk and the street? - Can vegetation planted within LID facilities count towards open space or landscaping requirements?
Landscaping requirements for parking lots	Codes may not include landscaping requirements for parking lots. Trees can provide flow control by intercepting stormwater, reduce the heat island effect, and also results in a reduction in total impervious area.	- Are minimum tree canopy or vegetation requirements specified for parking lots?

Focus on Hard and Impervious Surfaces

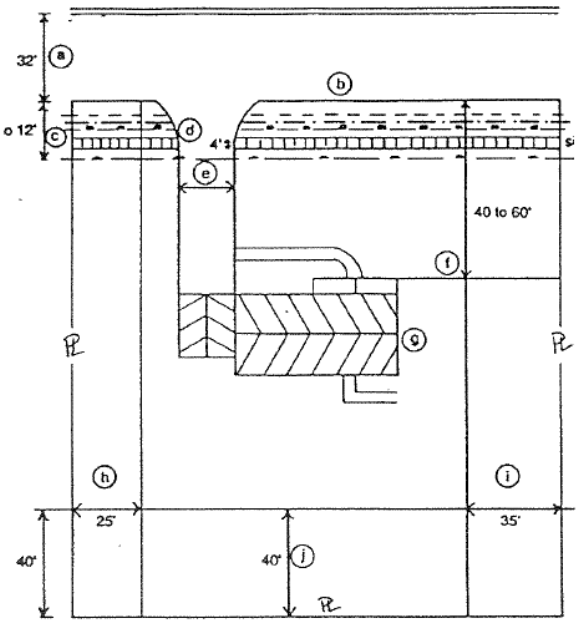
Subtopic	Why is this important?	What should I consider during my review?
Maximum impervious surface allowances	High impervious surface allowances result in larger volumes of stormwater runoff.	- Does the code include maximum impervious surface limits for different land use types? - Can the maximum impervious surface limits be reduced in residential areas? - Can a portion of the impervious surface be designated as non-pollution generating impervious surface?
Shared driveways	Individual driveways account for a large portion of the total impervious area (up to 20 percent) in residential areas. Shared driveways can reduce overall lot impervious surface coverage.	- Are shared (or common) driveways for multiple single-family dwellings, multi-family structures, and/or commercial development allowed? - Can the use of shared driveways (for up to 4 or 6 houses) be incorporated?
Minimum driveway width	A modest reduction in driveway width requirements can result in a significant reduction in total impervious area.	- Is a minimum driveway width specified? - Can the minimum driveway width be reduced to 9 feet or less (one lane), 18 feet (two lanes), or 16 feet (shared driveway)?
Use of permeable pavement for driveways	Permeable pavement is applicable to low-volume, low-traffic surfaces, and allows for infiltration of stormwater.	- Are alternative surfaces (other than conventional concrete or asphalt) allowed? - Can the code be revised to include incentives for use permeable pavement for driveways?
Two-track driveway design	Providing a pervious strip in a standard driveway design can reduce impervious surface.	- Is a two-track driveway design allowed?

Integrating LID into Local Codes

Focus on Bulk and Dimensional Considerations

Subtopic	Why is this important?	What should I consider during my review?
Building setbacks	Front yard setbacks (which dictate how far houses must be from the street) can extend driveway length and increase the impervious coverage of the lot. Side yard setbacks and wide frontages increase the total road length and overall impervious coverage.	- Can setback distances be minimized in residential areas to increase flexibility in regard to house location? (See Figure 12.1 for the geometry of a typical 1-acre lot) - Can frontage areas requirements be reduced in open space residential developments? - Are irregular lot shapes (e.g., pie, flag, zipper, angled z) allowed? (See Figure 12.2 for examples of irregular lot shapes)
Height limits	Limiting building height can result in increased building footprints. Encouraging developers to build up, instead of out, can help meet density goals and reduce impervious coverage.	- Can the maximum building height be increased if building footprints are reduced?
Maximum square footage	Large building footprints result in less available area for LID facilities and native vegetation/ landscape retention.	- Can code be revised to incentivize or encourage minimizing building footprints?
Clustering	Clustering of buildings in subdivisions can reduce the total site footprint and help maintain natural hydrologic characteristics of the site.	- Are cluster development designs allowed? - Are cluster development designs allowed "by right" (no special permit or zoning variance required)? - Are flexible site design criteria available for developers that utilize cluster design options?

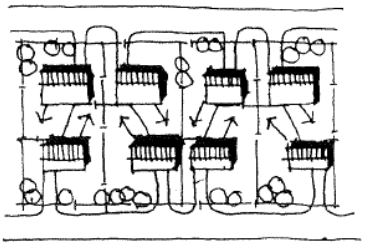
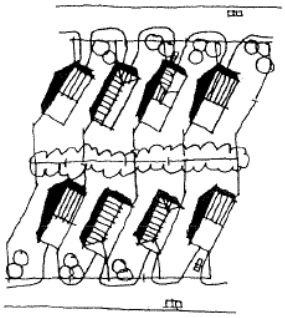
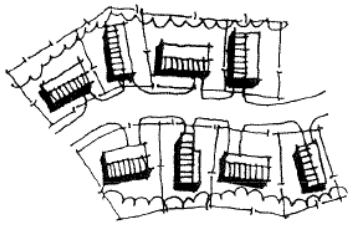
Figure 12.1: Geometry of a Typical One Acre Lot (Schueler, 1995)



LEGEND

a	minimum street width
b	minimum lot frontage
c	minimum right-of-way, one side of the street, not including pavement
d	minimum sidewalk width
e	minimum driveway width
f	minimum front yard setback
g	maximum lot footprint
h	side yard setback
i	side yard setback
j	rear yard setback

Figure 12.2: Nontraditional Lot Designs (ULI, 1992)

Zipper Lots	Angled Z-Lots	Alternative Lot Widths
		

Integrating LID into Local Codes

Focus on Clearing and Grading

Subtopic	Why is this important?	What should I consider during my review?
Protecting existing infiltration	Protecting existing infiltration rates will preserve natural hydrologic characteristics of the site.	- Do clearing and grading regulations include provisions for minimizing site disturbance and protecting native vegetation and soils?
Conserving native vegetation/soils	Native vegetation and soils provide natural stormwater management and pollutant removal.	- Is there an existing ordinance that requires or encourages the preservation of natural vegetation? - Is wholesale clearing (mass grading) or sites prohibited or limited? - Are developments required to set aside an undeveloped portion of the site? - Are there specific native vegetation retention standards based on land use and density? - Is there any incentive to developers or landowners to conserve land (open space design, density bonuses, stormwater credits, or lower property tax rates)? - Does the native vegetation definition (or other code section) include minimum tree density, minimum retention requirements, protecting native vegetation areas, replanting requirements, soil amendment standards, management plan specifications, and maintenance requirements?
Construction sequencing	Proper construction sequencing can minimize construction impacts on future LID facilities by reducing potential for soil erosion and compaction.	- Does the code include methods for effective construction sequencing to minimize site disturbance and soil compaction? - Do engineering and street standards outline construction sequencing and practices for protecting pervious areas and LID BMPs during construction? - Can the code be revised to limit clearing to the building footprint and area needed for maneuvering machinery?

Integrating LID into Local Codes

Focus on Streets and Roads

Subtopic	Why is this important?	What should I consider during my review?
Travel lane widths	Travel lanes are often wider than necessary to provide safe access for larger vehicles. Impervious surface coverage can be reduced by narrowing minimum travel lane widths.	- What minimum travel lane widths are required based on street classification? - Is the travel lane wider than required by the fire department or other emergency responders? - Can street widths be reduced for local access streets? - Are narrower pavement widths allowed along sections of roadway where there are no houses, building, or intersections, and where on-street parking is not anticipated? - Are queuing lanes (i.e., cars wait between parked cars while the approaching traffic passes) allowed? (See Figure 1.2 for examples of queuing lanes)
Right-of-way (ROW) widths	ROW width (and impervious surface coverage) can be reduced by narrowing travel lane widths, revising sidewalk requirements, and reducing grass border areas	- Can the minimum ROW width be reduced or include flexibility for LID considerations? (See Figure 3.2 for examples of narrower ROW design options for residential streets) - Can sidewalks be placed on one side of the street only in low-density residential areas? - Can alternate pedestrian networks (e.g., trails through common areas) be substituted for sidewalks?
Use of permeable pavement for streets and roads	Use of permeable pavement on streets and roads provides stormwater infiltration and reduces stormwater runoff.	- Can permeable pavement be used for road shoulders, parking lanes, and emergency parking areas? - Does the code require or encourage use of permeable pavement for future street/road resurfacing projects?
Placement of utilities under paved areas in the ROW	Utilities and storm drains located within the paved section of the ROW result in fewer conflicts for installation of roadside LID BMPs.	- Does the code allow utilities to be placed under the paved section of the ROW?
Required turnaround area (e.g., Fire, USPS)	Required turnaround radius or street width can conflict with minimizing impervious surfaces	- Is the minimum street section necessary for safe access and emergency response being used?

Subtopic	Why is this important?	What should I consider during my review?
Sidewalk widths	Reducing sidewalk widths reduces total impervious area and required ROW width.	- What is the minimum sidewalk width allowed? - Can sidewalk width requirements be reduced in areas where LID BMPs are present?
Sidewalk slope	Sidewalks slopes can be adjusted to drain towards a LID BMP or native vegetation area along the roadway instead of directly into the street.	- Does the code contain sidewalk slope direction requirements?
Use of permeable pavement for sidewalks	Use of permeable pavement on sidewalks provides stormwater infiltration and reduces stormwater runoff.	- Is permeable pavement allowed for sidewalks?
Minimum cul-de-sac radius	Reducing minimum cul-de-sac radii can decrease impervious surface.	- What is the minimum cul-de-sac radius? (a radius of 35 feet is optimal, depending on emergency vehicle access needs) - Can a landscaped island be placed in the center of the cul-de-sac and used for stormwater flow control and treatment?
Alternatives to cul-de-sacs	Alternatives turnarounds result in less impervious surface coverage compared to a circular cul-de-sac.	- Can hammerhead (T-shaped) turnarounds or loop roads be used instead of standard cul-de-sacs? (See Figure 4.1 for examples of turnaround options for residential streets and the impervious area associated with each turnaround option)

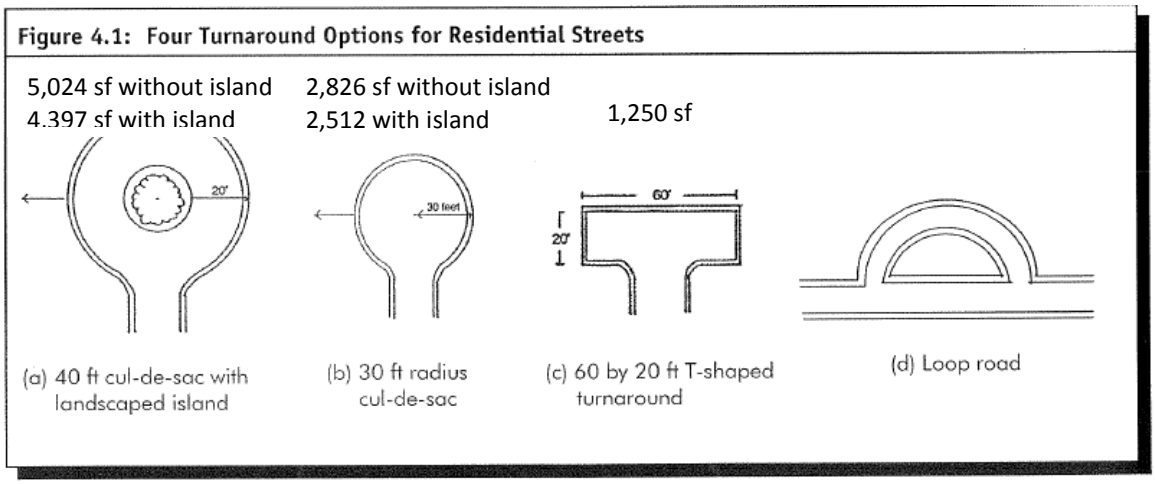


Figure 1.2: A Comparison of Queuing Streets vs. Traditional Streets [Source: Portland (OR) Office of Transportation, 1994]

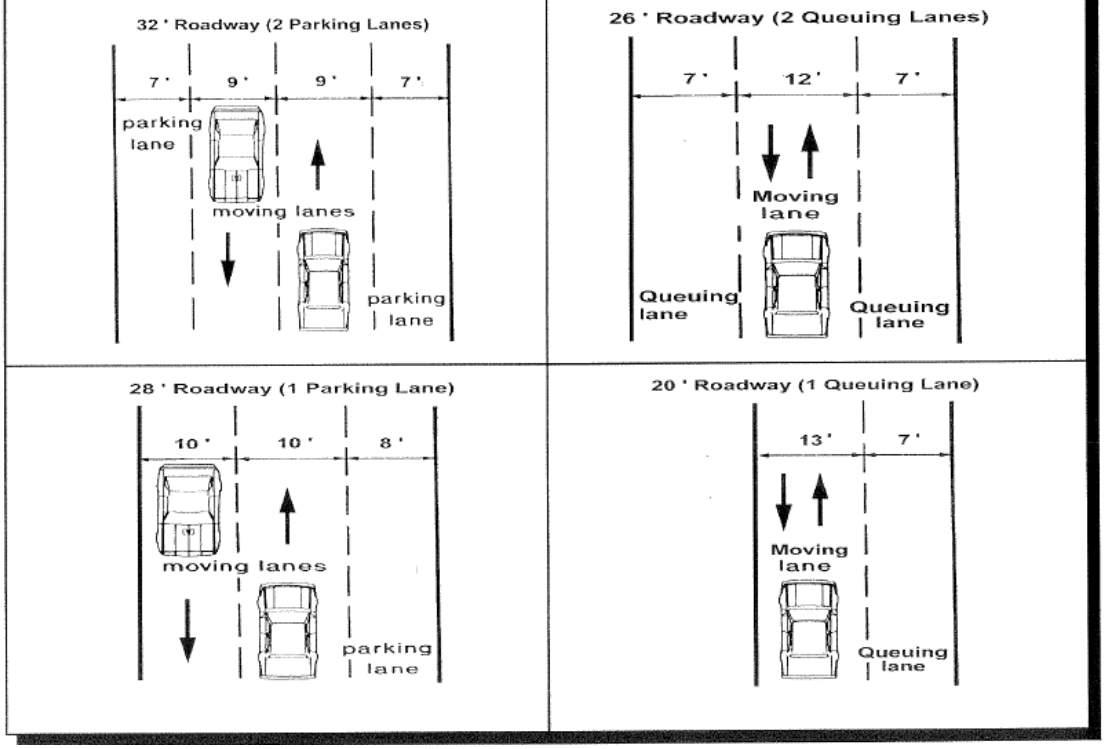
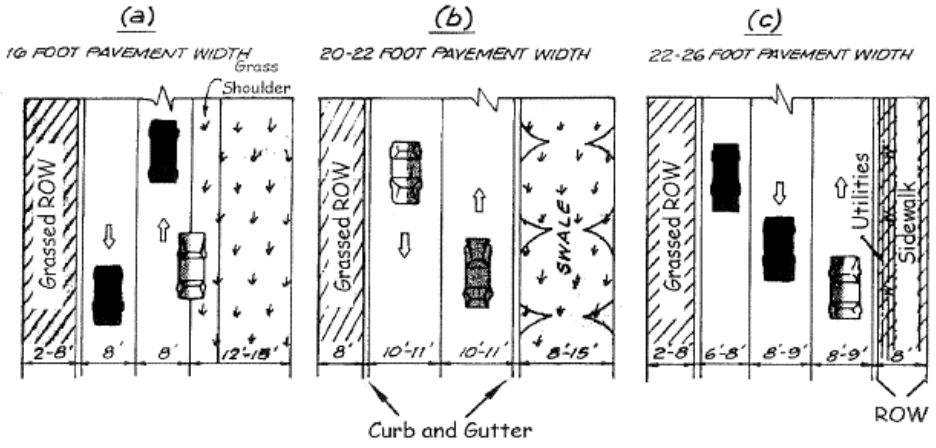


Figure 3.2: Potential Design Options for Narrower ROW on Residential Streets (Schueler, 1995)



Integrating LID into Local Codes

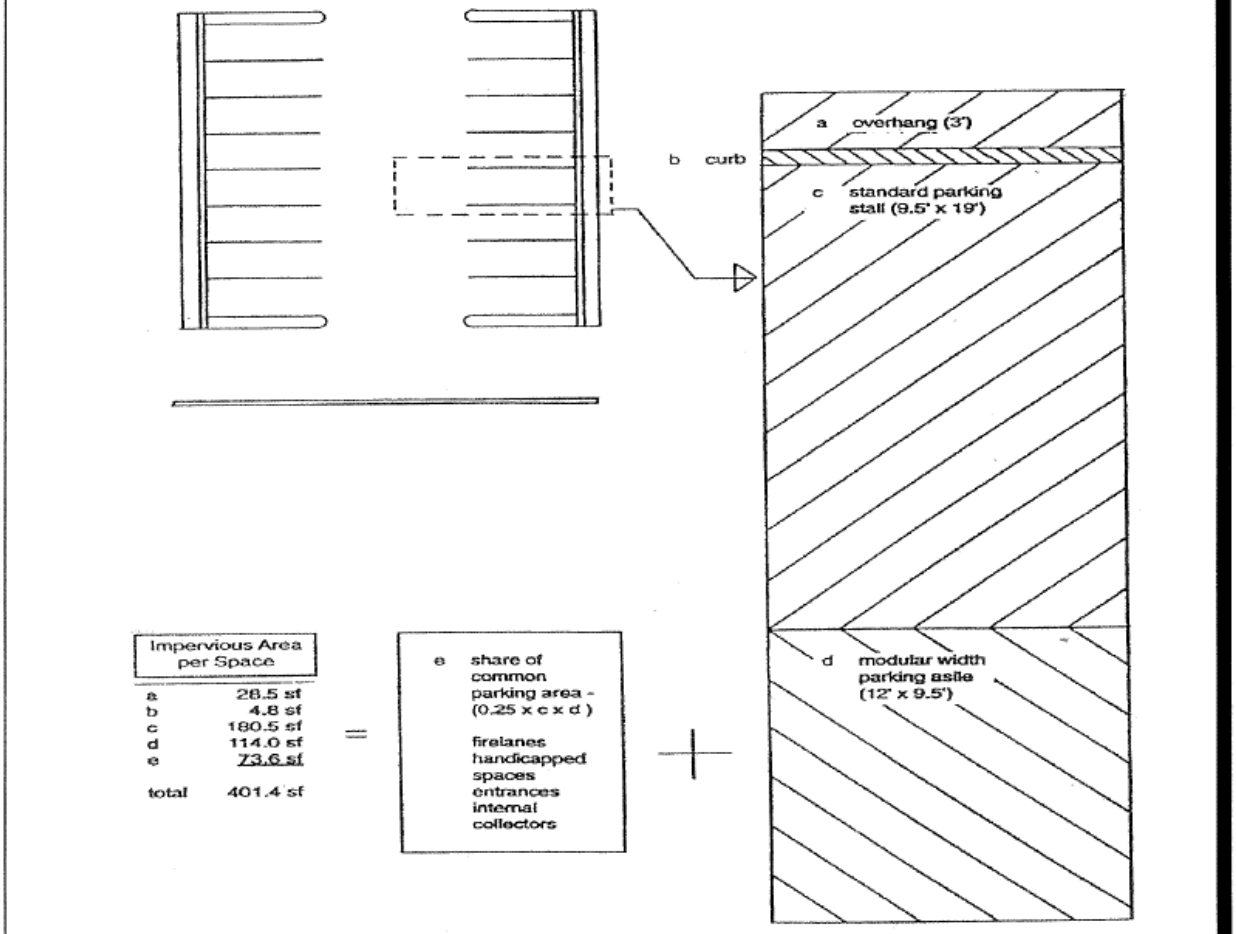
Focus on Parking

Subtopic	Why is this important?	What should I consider during my review?

Minimum parking ratios	Adjusting minimum parking ratios can reduce the amount of impervious surface and ensure that you are not requiring more parking than is needed.	- What is your minimum parking ratio for the following:
		  ○ Professional office building
		  ○ Shopping center
		  ○ Single family home
		- Can the number of required parking spaces be reduced due to shared parking, proximity to transit, car sharing, etc.?

Maximum parking ratios	Establishment of a maximum parking ratio can be an effective strategy for reducing large and underutilized parking areas.	- Are the parking requirements set as maximum or median (rather than minimum) requirements? - Can a maximum number of parking spaces be specified?
Permeable paving use	Permeable pavement is applicable to low-volume, low-traffic surfaces, and allows for infiltration of stormwater.	- Can permeable pavement be used for parking areas, parking lanes, and/or parking spaces? - Can permeable pavement be incentivized for spillover (infrequently used) parking areas?
Parking stall dimensions	Impervious surface area can be reduced with: compact spaces/narrowing of the parking space; reduced length; reduced width.	- What is the minimum stall length and width for a standard parking space? (See Figure 8.1 for a breakdown of the total impervious area needed to support a single parking stall) - Can the parking stall length and/or width be reduced? - Are a fixed percentage of stalls (15 to 35%) assigned to compact cars?
Driving aisle dimensions	A reduction in driving aisle width can have a significant impact in overall impervious surface coverage.	- Is the driving aisle wider than required by the fire department or other emergency responders? - Can one-way aisles be used in conjunction with angled parking stalls instead of two-way aisles?
Off-street parking regulations	Focused on establishing a minimum number of off-street parking spaces based on specific land uses or zones.	- Can mechanisms be integrated to reduce parking requirements (e.g., shared parking, proximity to transit, car share, etc.)? - Can structured or tuck-under parking be incentivized?

Figure 8.1: The total impervious area needed to support a single parking stall.



A parking stall is supported by a larger parking space that includes the (a) overhang, (b) curb, (c) stall, (d) parking aisle needed to get into the stall, and (e) the stall's share of common parking area, such as entrances, internal collectors, fire lanes and handicapped parking spaces. When these extra features are added in, the approximately 180 ft^2 needed for each parking stall increases to over 400 square feet.

Source of above figure (Figure 8.1 - The total impervious area needed to support a single parking stall): Center for Watershed Protection (1998), Better Site Design: A Handbook for Changing Development Rules in Your Community

Focus on Design Guidelines and Standards

Subtopic	Why is this important?	What should I consider during my review?
Trees and bioretention	Some street trees are not compatible for use in bioretention areas due to variable moisture conditions.	- Are specific street tree species included in the design guidelines and standards? - Can flexibility be incorporated to allow alternative tree species that are compatible with bioretention and can also meet similar street tree aesthetic requirements?
Continuous curb requirements	Continuous curb requirements do not allow flexibility in street design, making integration of roadside bioretention difficult.	- Are conventional curbs and gutters required? - Can the curb and gutter requirement be eliminated or adjusted to allow the use of curb cuts (breaks that allow runoff to flow into bioretention cells) or "invisible" curbs (flush with the road surface)?
Curb radii	Curb radii requirements may restrict use of LID BMPs adjacent to roadways and sidewalks.	- Are minimum curb radii requirements specified for street intersections or pedestrian bulbs? - Can curb radii requirements be reduced to provide additional space for LID BMPs?

Focus on Stormwater Management and Maintenance

Subtopic	Why is this important?	What should I consider during my review?
Maintenance Provisions	In order to maintain the benefits of LID facilities over time, clearly written maintenance standards and procedures need to be in place.	- Does the adopted stormwater manual outline maintenance standards and/or procedures?
Inspection Access (covenants, easements)	A jurisdiction's code may require a covenant or easement agreement for the construction of a stormwater facility. The agreement may require the facility owner to perform certain maintenance activities and grants the jurisdiction limited authority to access the site (through an easement or agreement) for facility inspection, maintenance, or repair work.	- Does the code allow access to inspect, maintain, and repair the facility if a private property owner fails to maintain the facility?
Enforcement	Enforcement is necessary to proper construction procedures and long-term maintenance of LID BMPs.	- Does the code include mechanisms to ensure reimbursement for any maintenance activities conducted? - Are public easements, maintenance covenants, or other legal agreements required? - Are incentives (reduction in stormwater fees) provided for private property owners that meet their maintenance requirements?

Focus on Subdivision and Planned Unit Development (PUD)

Subtopic	Why is this important?	What should I consider during my review?
Individual open space requirements	Open space requirements typically specify a percentage of area that is required to be set aside in a subdivision. This can result in a reduction in the amount of impervious area within a development.	- Does a minimum percentage of open space have to be managed in a natural condition? - Can the open space requirement be increased? - Are open space areas required to be consolidated into larger units?
Passive vs. active open space requirements	Active recreation areas include playgrounds, ball fields, pools, and skate parks which involve large impervious or pollution-generating pervious areas. Passive recreation areas include undeveloped or minimally developed areas such as rustic picnic areas, benches, and trails. Integrating LID into subdivision codes can allow designers to count bioretention areas, dispersion areas, and other conserved open space toward passive open space requirements.	- Are allowable and prohibited uses for open space defined? - Can LID BMPs such as bioretention count towards passive open space requirements? - Are native vegetation areas that integrate pervious passive recreation areas, stormwater dispersion facilities, and/or stormwater restoration projects allowed?
Opportunities for Performance Based Designs/PUDs	Performance based designs (often called PUDs) allow for flexibility to cluster uses in exchange for increased open space, and to increase opportunities for implementing LID techniques.	- Are PUDs required for high density areas, such as city centers? - Are native vegetation and maximum impervious surface standards for PUDs and high density dwellings specified?

Focus on Critical Areas and Shoreline Management

Subtopic	Why is this important?	What should I consider during my review?
Allowance of LID BMPs in critical areas/shorelines when compatible	Some regulations may not allow for LID techniques within critical areas, shorelines, sensitive areas, or their associated buffers; however, if designed and maintained properly, LID facilities located within or adjacent to these areas can have a positive impact on these areas.	- Are allowable or prohibited uses of buffers defined? - Are LID BMPs allowed within or adjacent to critical areas/shoreline/sensitive area/wetland buffers? - Can native vegetation associated with LID BMPs be used to meet buffer enhancement requirements?

Code and Ordinance References

This document provides a selection of model ordinances along with examples of existing code language to help jurisdictions in Washington State integrate LID into local codes, rules, standards, and other enforceable documents. The example codes and ordinances are divided by relevance for Western and Eastern Washington jurisdictions.

For Western WA Jurisdiction Staff

- Model Ordinance - Off Street Parking
  www.psp.wa.gov/downloads/LID_Guidebook/Parking_Draft.pdf
- Model Subdivision Ordinance
  www.pca.state.mn.us/index.php/view-document.html?gid=7429
- Landscaping Requirements examples (not considered to be "model code language," but provided as examples of existing code language on this topic):
  - City of Bothell Municipal Code, Chapter 12.18 – Tree Retention and Landscaping: www.codepublishing.com/WA/Bothell
  - City of Edmonds Community Development Code, Chapter 20.13 – Landscaping Requirements: www.codepublishing.com/wa/edmonds
  - City of Poulsbo Municipal Code, Section 18.90.050 – Site Planning and Design: www.codepublishing.com/wa/poulsbo
- Parking code examples (not considered to be "model code language," but provided as examples of existing code language on this topic):
  - City of Auburn Municipal Code, Chapter 18.52 – Off-street Parking and Loading: www.codepublishing.com/wa/auburn
  - City of Bothell Municipal Code, Chapter 12.16 – Parking, Loading, Transit Access, and Pedestrian Circulation: www.codepublishing.com/WA/Bothell
  - City of Olympia Municipal Code, Chapter 18.38 – Parking and Loading: www.codepublishing.com/wa/olympia
  - LID-Specific Code Chapter (Snohomish County, Chapter 30.63C – Low Impact Development) www.codepublishing.com/wa/snohomishcounty
- Local Regulation Assistance Project (Puget Sound Partnership 2005-2008):
  - Town of Coupeville (2008 recipient; adopted many of the recommendations to Chapter 16 – Development Regulations): https://library.municode.com/index.aspx?clientId=16301
  - City of Lake Stevens (2008 recipient; adopted many of the recommendations to Chapter 14 – Land Use Code): www.codepublishing.com/WA/LakeStevens
  - City of Marysville (2005 recipient; adopted many of the recommendations to Title 12 – Streets and Sidewalks, Title 14 – Water and Sewers, Title 19 – Zoning, and Title 20 – Subdivisions): www.codepublishing.com/wa/marysville

- City of Mill Creek (2008 recipient; adopted many of the recommendations to Chapter 15 – Buildings and Construction, Chapter 16 – Subdivisions and Plats, and Chapter 17 – Zoning): www.codepublishing.com/wa/millcreek
- City of Port Orchard (2006 recipient; adopted many of the recommendations to Title 16 – Land Use Regulatory Code): www.codepublishing.com/WA/PortOrchard

For Eastern WA Jurisdiction Staff

- Model Water Use Conservation Ordinance, 2010
  www.cmap.illinois.gov/documents/10180/11537/model_water_use_conservation_ordinance.pdf/e28c8492-b127-4466-a9fb-439501c939de
- Parking code examples (not considered to be "model code language," but provided as examples of existing code language on this topic):
  - City of Spokane Municipal Code, Chapter 17C.230 – Parking and Loading: https://beta.spokanecity.org/smc
  - City of Yakima Municipal Code, Chapter 15.06 – Off-street Parking and Loading: www.codepublishing.com/WA/yakima
  - Spokane County Zoning Code, Section 14.802 – Off-street Parking and Loading Standards: www.spokanecounty.org/data/buildingandplanning/lud/documents/Zone%20Code%202008%20for%20internet.pdf

Communicating with Your Elected Officials and City Managers

Western Washington

Elected officials and city managers play an important role in the code update and adoption process, therefore it is critical to engage them early and keep them updated as the process progresses. This handout provides: 1) key information that your elected officials and city managers need to know about LID and the code update process, and 2) a step-by-step approach to **what** your elected officials and city managers need to know, and **how** they can support the process. The information presented below is organized based on the 6 steps in *Integrating LID into Local Codes: A Guidebook for Local Governments.*

General tips to get their attention and keep it:

1. Make contact early in the project, and at key milestones as the project progresses.
2. Be concise and to the point.
3. Focus on key implications for internal and external stakeholders. Both positive outcomes and potential areas of conflict.
4. Remind elected officials what LID is, why it is important, and why codes are being updated each time you speak with them.
5. Be prepared to propose ways that elected officials and city managers can support the process.

General information about what they need to know:

Each elected official or city manager will have a different level of knowledge about the LID code update process. Below are suggested talking points on the NPDES permit requirements, followed by web links for additional information on why we are doing LID.

Code updates – where we are today:

- Codes are being reviewed and updated to integrate changes required by the new Washington State Department of Ecology NPDES Western Washington Municipal Stormwater Permit. These changes are required and each jurisdiction is obligated to comply by the deadlines.
  - Your jurisdiction is part of the Phase II permit which went into effect on August 1, 2013.
  - LID will be required to be evaluated by project applicants for use on new development, redevelopment, and infrastructure projects like roads and parking lots.

- Most Phase II jurisdictions will need to implement changes adopted and effective by December 31, 2016. (Variations to this deadline apply to: Lewis & Clark Counties' deadline is 6/30/17; New permittees' deadline is 12/31/17; and city of Aberdeen's deadline is 6/30/18)
- There are potential budget and work plan implications.

- As part of these updates, LID will be required to be evaluated first for managing stormwater runoff.
  - LID will be required to be evaluated by project applicants for use on new development, redevelopment, and infrastructure projects like roads and parking lots.
  - If LID is not feasible, justification will need to be provided

LID – why we are doing it

- For talking points regarding why we are doing LID, please visit: www.awcnet.org/portals/0/documents/lid/TalkPointsWhyDoingLID0513.pdf
- For a complete list of LID resources for elected officials and city managers, please visit: http://www.awcnet.org/TrainingEducation/LowImpactDevelopment.aspx

The Six Steps: What elected officials and city managers need to know and how they can get involved.

Step 1 {Who} Assemble the Project Team

Step 1 involves assembling a comprehensive team of key internal staff and potential key external stakeholders to assist with the process of integrating LID into local codes.

What elected officials and city managers need to know:

1. The code update process is a big undertaking that requires significant staff time and multiple staff.
   - To support the code review and updates, internal team members may include staff from the planning, public works, parks, fire and public safety, and building departments. Optional team members from city council, planning commission, and legal department departments.
   - To provide comment and facilitate the approval process, external stakeholders may include State/local health department, utility providers, agencies owning and maintaining streets, site designers and engineers, major property owners and developers, citizen's or neighborhood groups, environmental groups, and special districts.

- Getting this variety of professionals and stakeholders at the table together and up front in the process is critical to identifying issues and solutions that will in turn save time and frustration at the end of the process.

How elected officials and city managers can support the process:

1. Encourage and support (and allow time for) staff participation.
2. Bring resistant parties on board by showing top down support for the process.
3. Identify and reach out to key stakeholders.
4. Ask for support in recruiting internal team members and external stakeholders to participate in the code update process.

Step 2 {What} Understand General Topics to Address & Step 3 {Where} Review Existing Codes and Standards

Step 2 establishes a work program that identifies what topics of a jurisdiction's codes, policies, standards, and enforceable documents, and operating procedures need to be updated to integrate LID. Step 3 identifies where the topics for review occur.

What elected officials and city managers need to know:

1. Examples of the types of codes, policies, standards, enforceable documents, and operating procedures that you have identified as needing to be updated.
2. Who and what kinds of projects the code updates are likely to affect (positively or negatively).
3. Any possible areas of concern, complexity, conflict, etc. at this stage of the project.

How elected officials and city managers can support the process:

1. Take specific questions or concerns to external stakeholders or external team members and provide feedback.
2. Provide consultation and comment on certain sections of code.
3. Help resolve any issues or internal debates/conflict, where appropriate.

Step 4 {FILL THE GAPS} Amend Existing Codes and Develop New Codes

Step 4 fills in the gaps and addresses the barriers in existing codes and standards by amending existing codes and developing new code language.

What elected officials and city managers need to know:

1. Briefings on the extent of and kinds of amendments that are being proposed, including examples of revised language.

2. Details on how the code updates are likely to affect people or projects (positively or negatively).
3. Any problems and proposed corrective actions at this stage of the project.

How elected officials and city managers can support the process:

1. Provide consultation and comment on certain code sections or policies.
2. Take specific questions or concerns to external stakeholders or external team members and provide feedback.
3. Help resolve any possible issues, where appropriate.

Step 5 {REVIEW & ADOPT} Public Review and Adoption Process

Step 5 reviews and adopts the new codes and standards. Each jurisdiction has its own process for reviewing and adopting codes and standards.

What elected officials and city managers need to know:

1. The plan and timeline for public review.
2. The types of internal staff and external stakeholders required for review of updated code language.
3. Potential adoption challenges and solutions.

How elected officials and city managers can support the process:

1. Help to engage external team members, stakeholders, and the public in the review process.
2. Help by being an advocate for code update process and LID.

Step 6 {IMPLEMENT} Ensure Successful Implementation

Step 6 implements the new regulations and standards.

What elected officials and city managers need to know:

1. The timing and extent of the resources needed for the successful implementation of the code updates, including issues such as staffing, equipment, training, and outreach.

How elected officials and city managers can support the process:

1. Get involved in public outreach and/or public project that include LID components.
2. Reach out to neighboring jurisdictions to identify possible collaborations such as sharing of staff trainings, lessons learned, and maintenance equipment.

Communicating with Your Elected Officials and City Managers

Eastern Washington

Elected officials and city managers play an important role in any code update and adoption process, therefore it is critical to engage them early and keep them updated as the process progresses. This handout provides: 1) key information that your elected officials and city managers need to know about LID and the code update process, and 2) a step-by-step approach to **what** your elected officials and city managers need to know, and **how** they can support the process. The information presented below is organized based on the six steps described in *Integrating LID into Local Codes: A Guidebook for Local Governments.* It also provides general information about the Eastern Washington Phase II permit that became effective on August 1, 2014 and the requirement to allow LID as a viable stormwater management technique. Although code updates are not specifically required in Eastern Washington at this time, allowing for LID will likely involve code updates.

General tips to get their attention and keep it:

- Make contact early in the project, and at key milestones as the project progresses.
- Be concise and to the point.
- Focus on key implications for internal and external stakeholders. Both positive outcomes and potential areas of conflict.
- Remind elected officials what LID is, why it is important, and why codes are being updated each time you speak with them.
- Be prepared to propose ways that elected officials and city managers can support the process.

General information about what they need to know:

Each elected official or city manager will have a different level of knowledge about the LID code update process. Below are suggested talking points on the NPDES permit requirements, followed by web links for additional information on why we are doing LID.

Code updates – where we are today:

The Eastern Washington Phase II permit became effective on August 1, 2014.The Washington Department of Ecology is encouraging jurisdictions to expand their stormwater management techniques to enable developers to use and allow innovative approaches to managing stormwater. Jurisdictions in Eastern Washington will have to comply with the following new permit requirements by December 31, 2017:

- Implement a policy of encouraging project proponents to maintain natural drainages to the maximum extent possible, including reducing the total amount of impervious surfaces.
- Allow non-structural preventative actions and source reduction approaches such as LID techniques, measures to minimize the creation of impervious surfaces, and measures to minimize the disturbance of native soils and vegetation.
- Require projects approved to retain runoff generated on-site for, at a minimum, the 10-year, 24-hour rainfall event or a local equivalent.

Although code updates are not specifically required in Eastern Washington at this time, allowing LID as a viable stormwater management technique will likely involve code updates.

The implementation of LID requirements in Eastern Washington is an incremental approach with a strong focus on harmonizing the stormwater management techniques across jurisdictions in Eastern Washington. The Washington State Department of Ecology will continue to work with jurisdictions and industry members to evaluate the results of new permit requirements before expanding to more prescriptive requirements.

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The Six Steps: What elected officials and city managers need to know and how they can get involved.

Step 1 {Who} Assemble the Project Team

Step 1 involves assembling a comprehensive team of key internal staff and potential key external stakeholders to assist with the review of local codes and procedures to assess the need to revise regulations or processes to better allow LID. This team will also assist with the process of integrating LID into local codes if deemed necessary.

What elected officials and city managers need to know:

1. The code update process is a big undertaking that requires significant staff time and multiple staff.
   - To support the code review and updates, internal team members should include staff from the planning, public works, parks, fire and public safety, and building departments. Optional team members from city council, planning commission, and legal department departments.
   - To provide comment and facilitate the approval process, external stakeholders may include State/local health department, utility providers, agencies owning and maintaining streets, site designers and engineers, major property owners and developers, citizen's or neighborhood groups, environmental groups, and special districts.
   - Getting this variety of professionals and stakeholders at the table together and early in the process is critical to identifying issues and solutions that will save time and frustration at the throughout the update.

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Step 2 {What} Understand General Topics to Address & Step 3 {Where} Review Existing Codes and Standards

Step 2 establishes a work program that identifies what topics of a jurisdiction's codes, policies, standards, enforceable documents, and operating procedures need to be reviewed and possibly updated to integrate LID. Step 3 identifies where the topics for review occur.

What elected officials and city managers need to know:

1. Examples of the types of codes, policies, standards, enforceable documents, and operating procedures that you have identified as needing to be updated.
2. Who and what kinds of projects the code updates are likely to affect (positively or negatively).
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How elected officials and city managers can support the process:

1. Get involved in public outreach and/or public project that include LID components.
2. Reach out to neighboring jurisdictions to identify possible collaborations such as sharing of staff trainings, lessons learned, and maintenance equipment.

Resource List for Jurisdiction Staff

This resource list was developed to help jurisdictions in Washington State integrate LID into local codes, rules, standards, and other enforceable documents. Resources are divided into the following categories: General LID Resources, LID Integration into Codes, LID Case Studies, and Barriers to Implementing LID.

General LID Resources

- Better Site Design Manual– divided into Part 1 and Part 2 (Center for Watershed Protection 1998)
  www.cwp.org/online-watershed-library?view=docman
- Central Coast Low Impact Development Initiative (LIDI) website
  www.centralcoastlidi.org/Central_Coast_LIDI/Home.html
- Green Stormwater Infrastructure (GSI) Program Overview and Annual Report (Seattle Public Utilities 2013)
  www.seattle.gov/util/groups/public/@spu/@drainsew/documents/webcontent/01_028743.pdf
- LID Administrative Tools and Guidance video (Herrera Environmental Consultants 2014)
  www.youtube.com/watch?v=Oz4OT-SX3nQ&feature=youtube_gdata
- LID Manual for Michigan, Chapter 4, Integrating LID at the Community Level (Southeast Michigan Council of Governments 2008)
  www.semcog.org/uploadedfiles/programs_and_projects/water/stormwater/lid/lid_manual_chapter4.pdf

LID Integration into Codes

- Integrating LID into Local Codes: A Guidebook for Local Governments (Puget Sound Partnership 2012)
  www.psp.wa.gov/downloads/LID_Guidebook/20120731_LIDguidebook.pdf
- Integrating LID into Local Development Codes: Lessons Learned (University of California, Davis 2012)
  www.drycreekconservancy.org/documents_downloads/LID_PDFs/1B_InglisLessonsLearnedCodeUpdates_Final_PP03.pdf
- LID Guidance Manuals and LID Code Review (University of Texas 2011)
  www.tceq.texas.gov/waterquality/nonpoint-source/projects/statewide-low-impact-development-workshops
- Massachusetts Low Impact Development Toolkit (Metropolitan Area Planning Council 2010)
  www.mapc.org/sites/default/files/LID_Local_Codes_Checklist.pdf

LID Case Studies

- Seattle 2010 NPDES Phase 1 Municipal Stormwater Permit, Program Evaluation, pp. 31-34 (Seattle Public Utilities 2010)
  www.seattle.gov/util/groups/public/@spu/@drainsew/documents/webcontent/01_012401.pdf
- EPA Green Infrastructure Case Studies: Municipal Policies for Managing Stormwater for Green Infrastructure, pp. 25-30 (Environmental Protection Agency [EPA] 2010)
  http://water.epa.gov/polwaste/green/upload/gi_case_studies_2010.pdf
- Water Quality Scorecard, pp. 43-49 (EPA 2009)
  http://epa.gov/smartgrowth/pdf/2009_1208_wq_scorecard.pdf

Barriers to Implementing LID

- Benefits of LID: How LID Can Protect Your Community's Resources (EPA 2012)
  http://water.epa.gov/polwaste/green/upload/bbfs1benefits.pdf
- Terminology of LID: Distinguishing LID from Other Techniques that Address Community Growth Issues (EPA 2012)
  http://water.epa.gov/polwaste/green/upload/bbfs2terms.pdf
- Costs of LID: LID Saves Money and Protects Your Community's Resources (EPA 2012)
  http://water.epa.gov/polwaste/green/upload/bbfs3cost.pdf
- Aesthetics of LID: LID Technologies Can Benefit Your Community's Visual Environment (EPA 2012)
  http://water.epa.gov/polwaste/green/upload/bbfs4aesthetics.pdf
- Effectiveness of LID: Proven LID Technologies Can Work for Your Community (EPA 2012)
  http://water.epa.gov/polwaste/green/upload/bbfs5effectiveness.pdf
- Maintenance of LID: Communities are Easily Managing LID Practices (EPA 2012)
  http://water.epa.gov/polwaste/green/upload/bbfs6maintenance.pdf
- Encouraging LID: Incentives Can Encourage Adoption of LID Practices in Your Community (EPA 2012)
  http://water.epa.gov/polwaste/green/upload/bbfs7encouraging.pdf