

WELCOME

LID Briefing for NPDES Permittees (Cities & Counties) Western Washington



Introduction

AWC LID briefing — Western WA

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Introduction

PRESENTATION OVERVIEW

- I. Introduction
- II. Why we are here
- III. What is LID?
- IV. What do the new requirements mean to me
& my community?
- V. Questions & Evaluation

Introduction

PRESENTATION OVERVIEW

- Beginning of a 4-5 year training process
 - Permittees
 - Landscapers
 - Composters
 - Engineers
 - Realtors
- LID is coming. Start preparing now!
- Dept. of Ecology is prepared to help
- Feedback for what you need to move forward

Introduction

Learning Objective

- We are here to discuss the integration of LID into local codes and standards. This will include the steps needed to accomplish LID code integration, a primer on LID, and a solicitation of your feedback on future local training and support needs. *We are not here to discuss the merits of the permit and/or the previous PCHB rulings.*

Why are we here?



Why are we here?

Stormwater Regulation Changes

- Over the next 3-5 years — changes as to how stormwater is managed in western WA
- Steps you can take to prepare for the changes

Why are we here?

- Leading cause of water quality impairment in stormwater runoff
- Clean Water Act
 - Framework for stormwater management
- Manage stormwater for two primary purposes:
 1. Flow Control
 2. Water Quality

Why are we here?

Clean Water Act

- Permits are reissued every five years to comply with the Act's MEP standard
- Technology advances change what is deemed “practicable”
 - LID is example of an evolving science

Why are we here?

NPDES Phase I & Phase II permits

- Reissued Phase I permit & first issued Phase II permits in 2007
- The Western WA permits were appealed to the Pollution Control Hearings Board (PCHB)
- PCHB decisions compelled Ecology to prepare a requirement in the 2012 permits to require LID unless infeasible

Why are we here?

Variety of ways to manage stormwater :

— Traditional practices

- Centralized
- Constructed to collect & remove runoff quickly
- Traditionally to clear & grade the site

— LID practices

- Smaller
- Decentralized
- Integrated within the landscape

What is LID?



What is LID?

- Stakeholders participated in a 2-year process to define LID:

“Low-impact development (LID) is a stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation, and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design.”

*Source: Department of Ecology's
Phase II Municipal Stormwater Permit*

What is LID?

Challenges with conventional stormwater facilities

- Large facilities that take up a lot of room
- Aging infrastructure
- Increase runoff volumes
- Increase pollutant discharges
- Create “flashy” storm events
- Reduce groundwater recharge & results in lower stream flows in critical late summer months

What is LID?

Conventional stormwater facilities



What is LID?

LID stormwater facilities

- Reduces volume thereby minimizing high flows
- Removes pollutants from stormwater
- Replenishes streams and wetlands
- Reduces size of conventional stormwater facilities
- Increases open space
- Visually attractive
- Can result in construction and maintenance cost savings
- Can increase densities
- Can increase public safety

What is LID?

LID stormwater facilities

Multiple functions



What is LID?

LID stormwater facilities

Aesthetically pleasing



What is LID?

LID stormwater facilities

Size



What is LID?

LID stormwater facilities

Options for a variety of design challenges



What is LID?

LID stormwater facilities

Maintenance

- LID practices require maintenance
- May be less costly than conventional facilities

What is LID?

LID stormwater facilities

Maintenance



Conventional



LID

What do the new requirements mean
to me & my community?



What do the new requirements mean to me & my community?

Western WA Phase I & Phase II NPDES permit overview

- LID required, where feasible
- Review & amend local codes & standards
- Site & subdivision scale requirements
- Small, medium and large projects

What do the new requirements mean to me & my community?

LID BMPs identified in the permit

- Key best management practices (BMPs) required where feasible
- Optional BMPs that permittees may opt to allow or require
- Key LID principles

What do the new requirements mean to me & my community?

Required BMPs (unless infeasible)

Bioretention



What do the new requirements mean to me & my community?

Required BMPs (unless infeasible) Permeable Pavement



What do the new requirements mean to me & my community?

Required BMPs (unless infeasible)

Rain Gardens (small projects only)



What do the new requirements mean to me & my community?

Required BMPs (unless infeasible)

Dispersion



What do the new requirements mean to me & my community?

Required BMPs (unless infeasible)

Downspout Dispersion



What do the new requirements mean to me & my community?

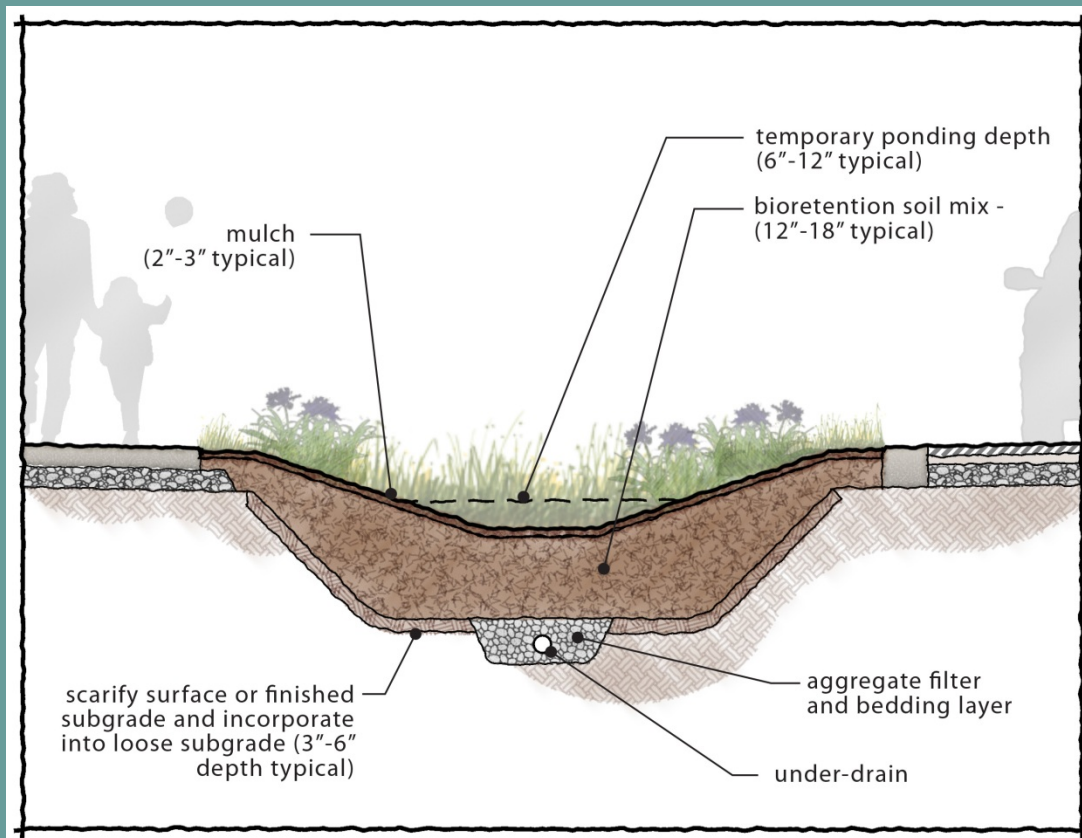
Required BMPs (unless infeasible) Sheet Flow



What do the new requirements mean to me & my community?

Required BMPs (unless infeasible)

Perforated stub-out connections



What do the new requirements mean to me & my community?

BMPs — permittees may opt to allow or require
Vegetated roofs



What do the new requirements mean to me & my community?

BMPs — permittees may opt to allow or require Rainwater Harvesting



What do the new requirements mean to me & my community?

BMPs — Permittees may opt to allow or require Minimal Excavation Foundations



What do the new requirements mean to me & my community?

Development Code Review & Amendment Goals

- Reduce impervious surface
- Protect native vegetation
- Reduce stormwater runoff
- Make LID the preferred and commonly used approach

What do the new requirements mean to me & my community?

Development Codes

- Directive
 - Prescriptive
- } Ecology included flexibility for developers & discretion for local government

What do the new requirements mean to me & my community?

LID Key Principles

- Permit requires non structural practices integrated into early stages of project design
- LID principles include:
 - Conserve Vegetation
 - Reduce & Disconnect Impervious Surfaces
 - Distribute small-scale techniques
 - Infiltrate on site

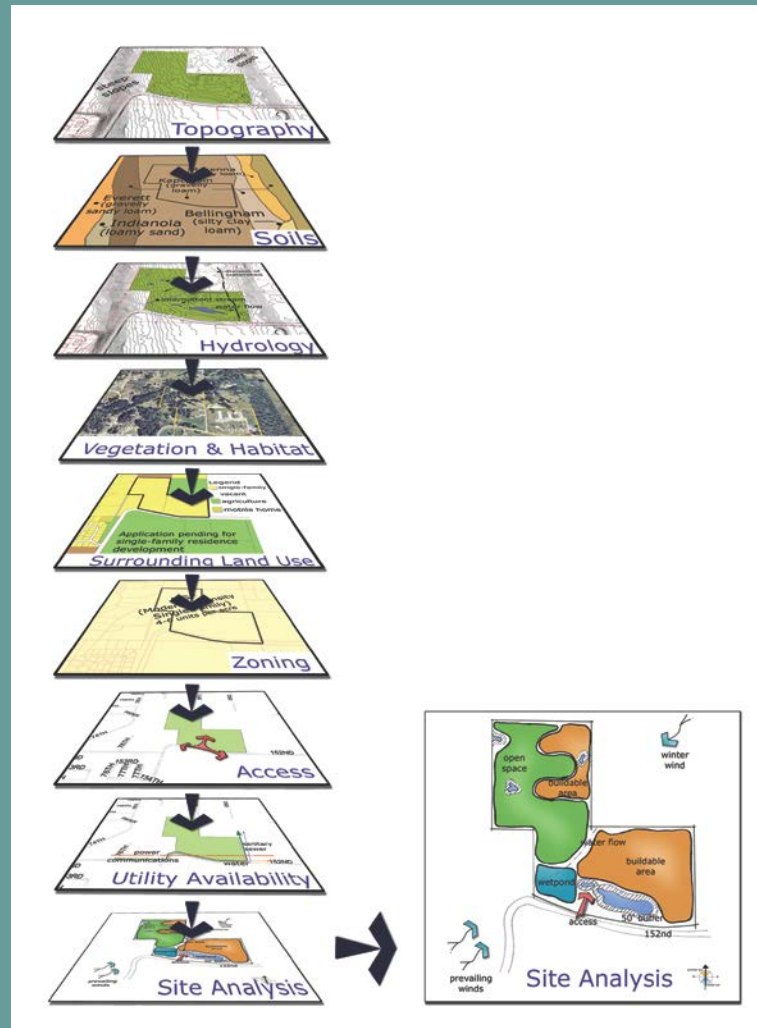
What do the new requirements mean to me & my community?

Code amendments for implementing LID principles

- Reduced road width
- Changes in road layout and orientation
- Clustering
- Higher building & smaller footprints
- Parking regulations
- Landscaping using bioretention

What do the new requirements mean to me & my community?

Site Analysis Code Language



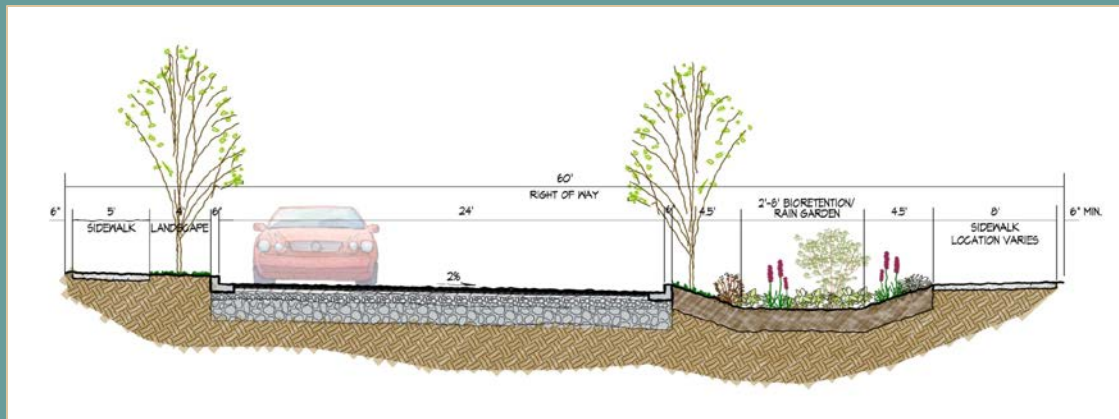
What do the new requirements mean to me & my community?

Narrow Road Standards



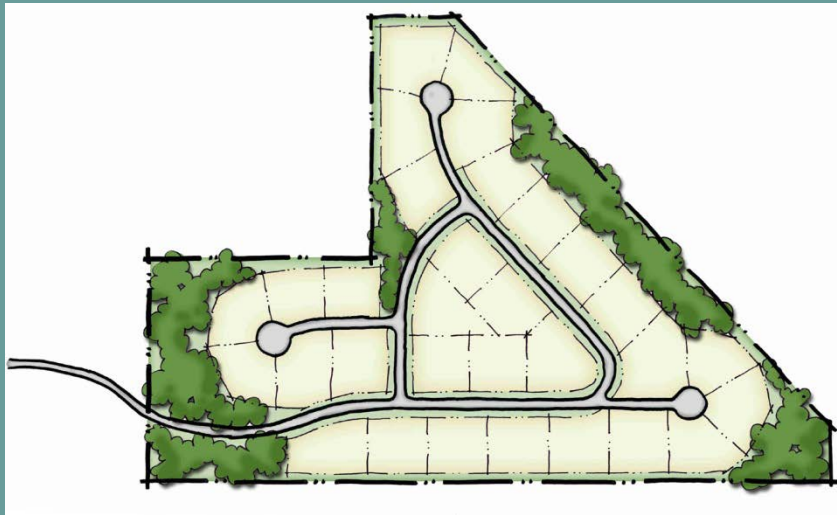
What do the new requirements mean to me & my community?

Road Layout & Orientation Standards

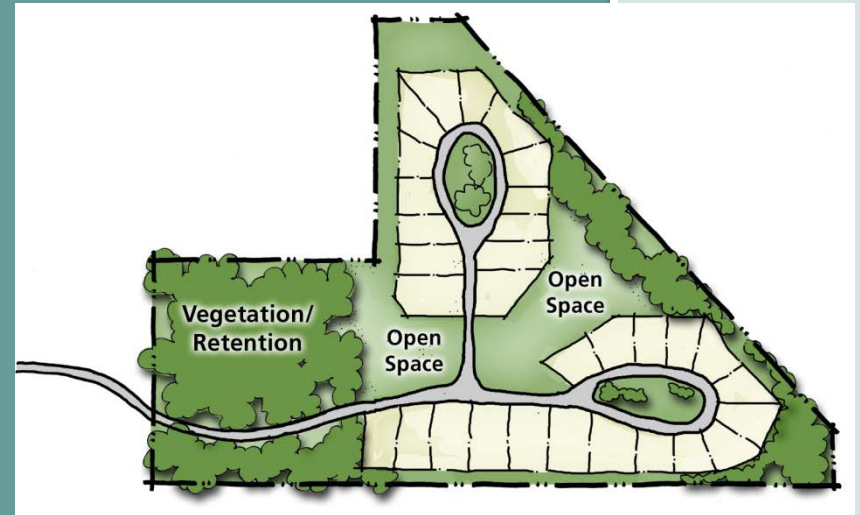


What do the new requirements mean to me & my community?

Clustering/PUD Code Provisions



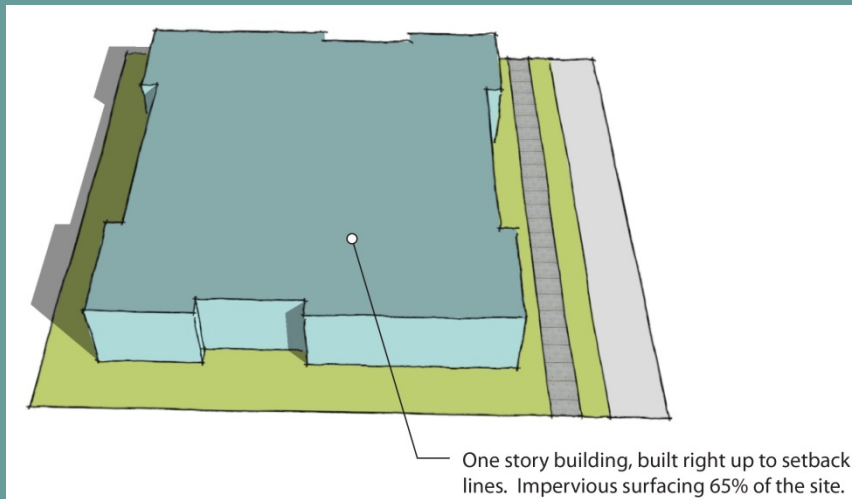
Conventional Design



Low-Impact Design

What do the new requirements mean to me & my community?

Minimizing Impervious Surfaces Through Taller Structures



What do the new requirements mean to me & my community?

Examining Existing Parking Regulations



What do the new requirements mean to me & my community?

Integrating Bioretention Into Required Parking Lot Landscaping



What do the new requirements mean to me & my community?

Development Code Review & Amendment

What do the new requirements mean to me & my community?

DEADLINES:

December 31, 2016 except;

Lewis and Cowlitz - June 30, 2017

Aberdeen - June 30, 2018

- Timing is to be coordinated with major 10 year GMA updates

What do the new requirements mean to me & my community?

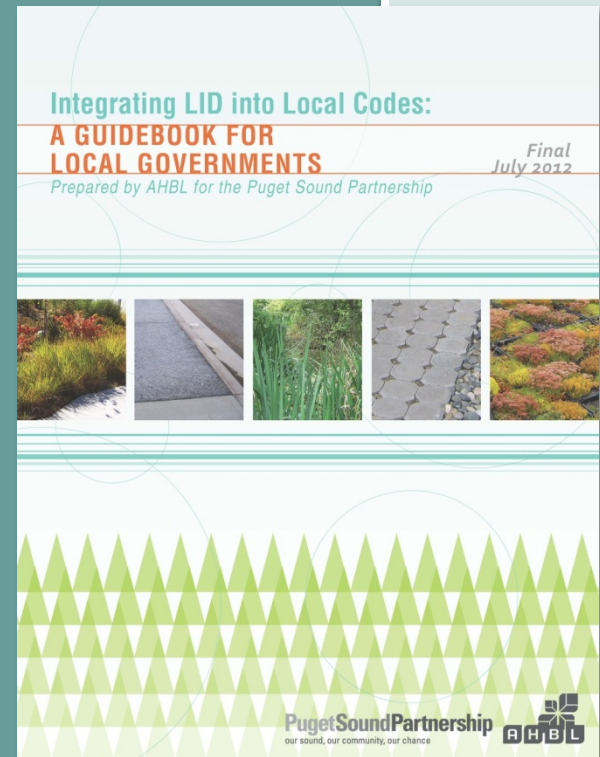
START NOW

- This process is not difficult, but will take time
- Begin thinking with the end in mind

What do the new requirements mean to me & my community?

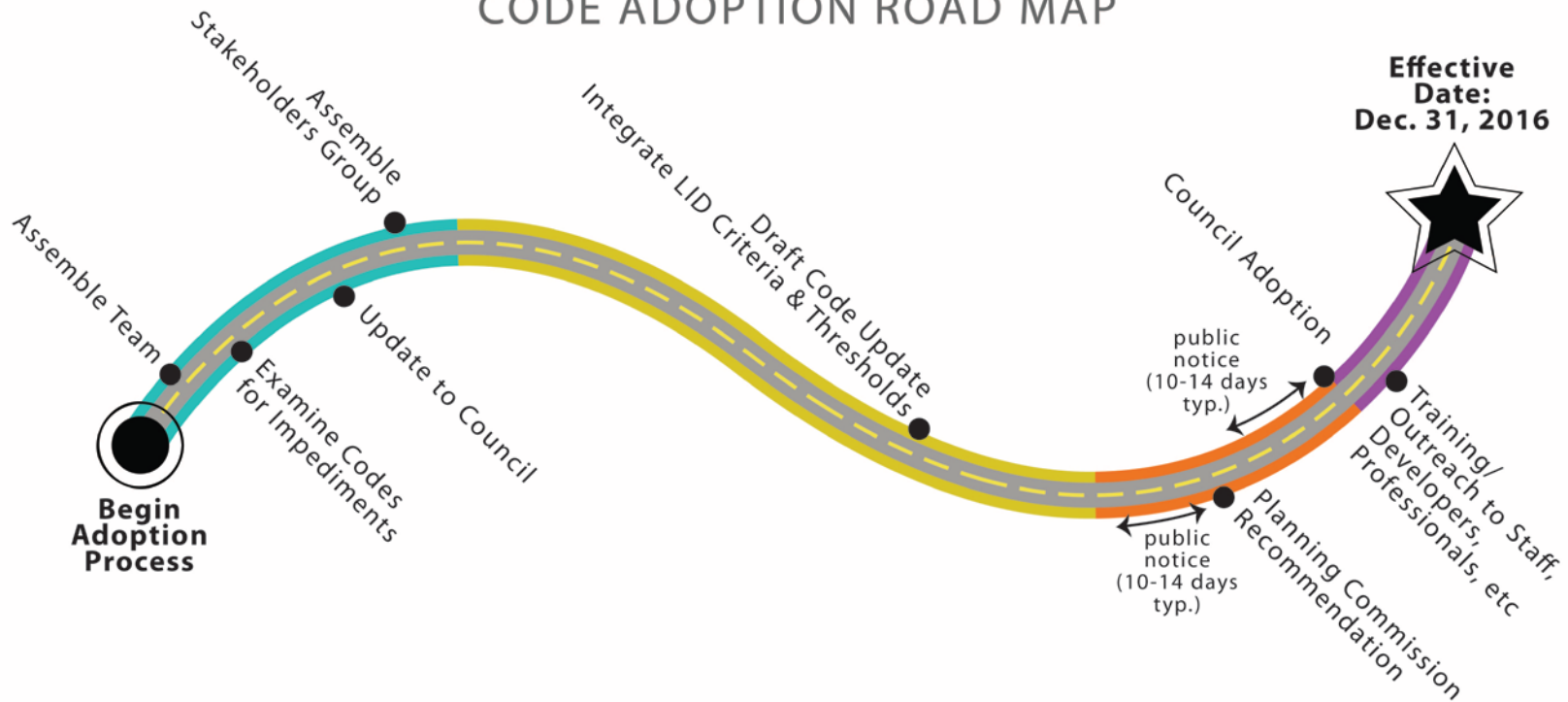
STEPS:

1. Assemble Team
2. Understand LID topics to Address
3. Review Existing Codes & Standards
4. Fill in the Gaps
5. Review & Adopt
6. Implementation



What do the new requirements mean to me & my community?

CODE ADOPTION ROAD MAP



LEGEND

- TEAM ASSEMBLY
- HEAVY LIFTING
- ADOPTION
- OUTREACH & EDUCATION

Except for:

Lewis County: June 30, 2017

Aberdeen: June 30, 2018

What do the new requirements mean to me & my community?

1. Assemble Team

- Large undertaking that will require you to assemble a team of various departments to work together
 - public works, planning, fire marshal, building, maintenance/inspections, etc.



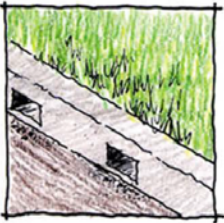
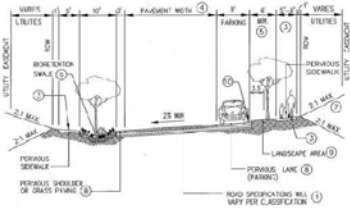
What do the new requirements mean to me & my community?

2. Understand LID topics to Address

- Site planning
- Healthy soils
- Landscaping, native vegetation & street landscaping
- Hard & impervious surfaces
- Bulk & dimensional standards
- Clearing & grading
- Streets & roads
- Parking
- Design Guidelines & Standards
- Stormwater & maintenance management
- Subdivision & planned use development
- Critical areas & shoreline management

What do the new requirements mean to me & my community?

3. Review Existing Codes & Standards

BENCHMARK/OBJECTIVE	CODE REFERENCE AND SUMMARY OF EXISTING STANDARD	GAP BETWEEN EXISTING STANDARD AND BENCHMARK (OPPORTUNITY TO IMPROVE)
<p>Are curb and gutters required for most residential street sections?</p> 	<p>§ 9-4.159 – Curbs, Gutters and Sidewalks</p> <p>Standard Drawing Nos. 401, 402, 405</p>	<p>Yes. Within the urban services line, residential street sections (local) are required to have curb and gutter. Outside the urban services line, rural street sections are not required to have curb and gutter.</p>
<p>Do adopted street sections allow for the use of open treatment and conveyance of stormwater within landscape strips?</p> 		<p>The code is silent on this design alternative.</p>

What do the new requirements mean to me & my community?

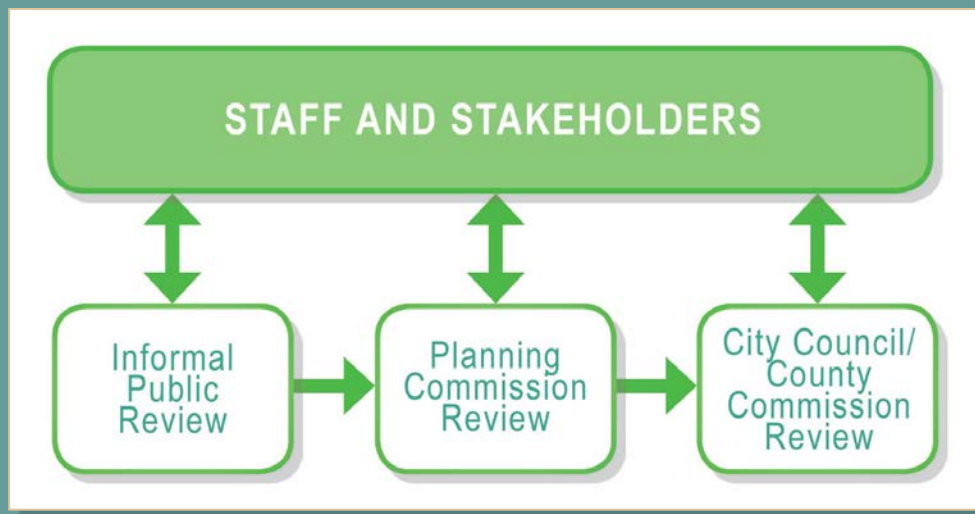
4. Fill in the Gaps

City of Newcastle. 18.21.080 Native vegetation areas.

- A. For the purposes of this Chapter, native vegetation areas shall have a tree density of one native tree for every 600 square feet.
- B. Native vegetation area includes native, undisturbed areas or rehabilitation of previously disturbed areas. Native vegetation areas may integrate passive recreation facilities. Active recreation areas shall not count towards native vegetation areas total.
- C. For the purposes of calculating the required native vegetation area required in 18.21.050-1, inundated lands shall not be included; however, other sensitive areas and their buffers may be included within the Native Vegetation Area boundaries. Land below an ordinary high water mark shall not be counted towards the required native vegetation.
- D. Native Vegetation Areas shall be forested or reforested.
 - 1. Native Vegetation Areas that do not contain sufficient tree canopy coverage shall be planted with native or near native trees at the minimum tree density specified in 18.21.080(A) and shall be replanted in accordance with 18.16.090(C) and (D) for broadleaf and evergreen trees, respectively. This requirement does not apply to areas addressed by Chapter 18.24.
 - 2. Native Vegetation Areas shall be planted with vegetation that is indigenous to the Pacific Northwest or suitable for the Pacific Northwest climate.
 - 3. A minimum of 25% replanted trees shall be of deciduous species and a minimum of 25% replanted trees shall be coniferous species.
- E. Existing native vegetation, forest litter, and understory shall be preserved to the extent possible in the Native Vegetation Areas in order to reduce flow velocities and encourage the dispersion of the storm water on the site. Runoff discharged into native

What do the new requirements mean to me & my community?

5. Review & Adopt



What do the new requirements mean to me & my community?

6. Implementation

- The change to LID will represent a paradigm shift that will affect the way you do business
 - Education & Training
 - Maintenance
 - Cost (short & long term)

What do the new requirements mean to me & my community?

TIMELINE:

1. Assemble Team: 1 to 3 months
2. Understand LID topics to address: 1 to 3 months
3. Review Existing Codes & Standards: 1 to 3 months
4. Fill in the Gaps: 3 to 9 months
5. Review & Adopt: 3 to 9 months
6. Implementation: Ongoing

What do the new requirements mean to me & my community?

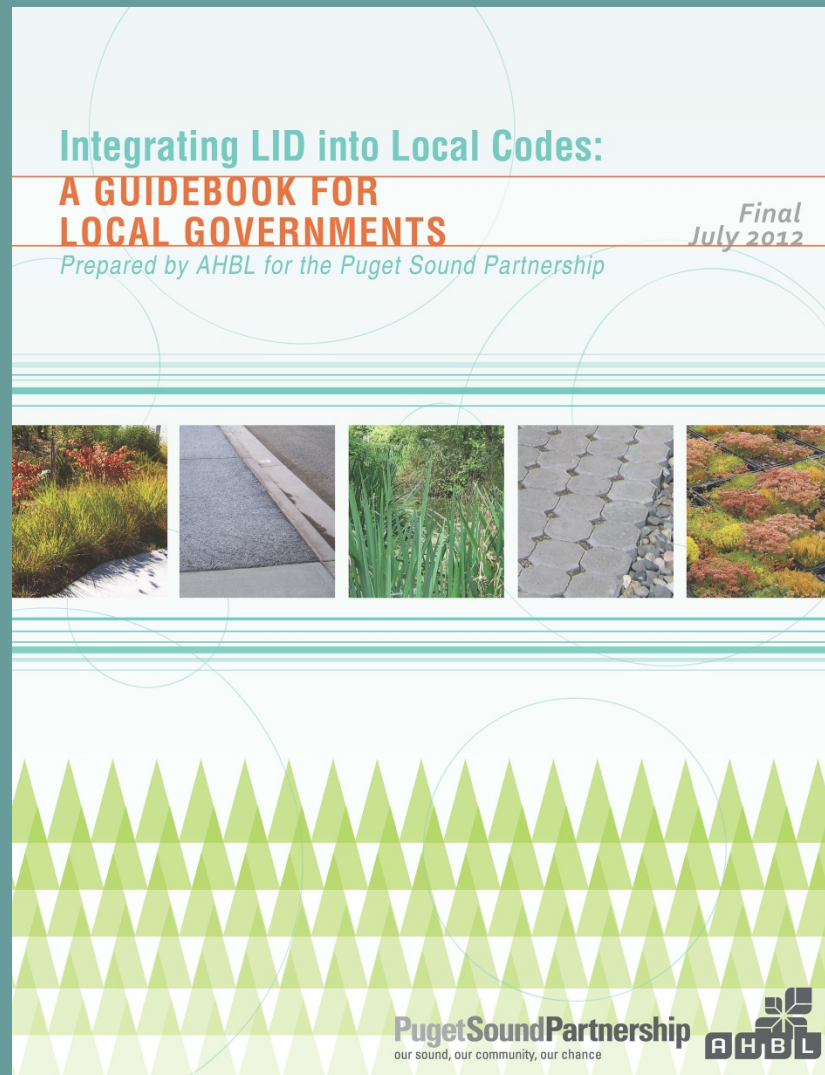
ASSISTANCE

- Ecology is aware of the work ahead of you and wants to help
 - Resources
 - Contact
 - Feedback

What do the new requirements mean to me & my community?

Integrating LID into Local Codes:

A Guidebook for Local Governments



What do the new requirements mean to me & my community?

Other Resources:

Ecology's stormwater website:

<http://www.ecy.wa.gov/programs/wq/stormwater/index.html>

Washington Stormwater Center LID portal:

<http://www.wastormwatercenter.org/low-impact/>

EPA's Green Infrastructure website:

<http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm>

Puget Sound Partnership's stormwater and LID website:

<http://www.psp.wa.gov/stormwater.php>

Puget Sound Partnership's Resource Center website:

http://www.psparchives.com/our_work/stormwater/stormwater_resources.htm#bio

Aesthetics of Low Impact Development
LID Technologies Can Benefit Your Community's Visual Environment

Low Impact Development (LID) Practices Add Natural Beauty
LID practices, which emphasize using natural vegetation to control runoff, can improve aesthetics and enhance property values. Communities that install traditional "grey" stormwater infrastructure (curbs, pipes, tanks) also typically take only the initial capital costs of installing the practices and do not evaluate the performance of the systems or fully account for operation and maintenance costs such as pond dredging and water quality monitoring and disposal. In contrast, LID practices typically require a lower initial investment and more ongoing maintenance—especially in the early years as vegetation becomes established in bioretention areas. Once established, LID practices can often be maintained in the same manner as other landscaping elements that require mowing, weeding and debris removal (Figures 1 and 2). Note that permeable pavements require frequent vacuum sweeping to maintain water quality benefits, but can still result in cost savings by avoiding the land space and costs needed to build ponds, etc.

FAQ
Isn't LID unattractive?

Costs of Low Impact Development
LID Saves Money and Protects Your Community's Resources

Are Low Impact Development (LID) Practices More Economical Than Conventional Practices?

FAQ
Isn't LID too costly?

Maintenance of Low Impact Development
Communities Are Easily Managing LID Practices

FAQ
Aren't maintenance costs for LID still unknown?

Barrier Busted!
Results show that life cycle costs of LID are usually less than traditional practices.

LID Barrier Busted! Fact sheet details how to overcome perceptions that can block adoption of LID in your community.

LID Can Be More Cost-Effective Over Time
When deciding whether to adopt LID practices on a wide scale, communities should consider life cycle costs and performance of traditional stormwater control practices versus LID. Grey infrastructure is typically designed to reduce flooding risk, but often does not adequately protect water quality and habitat. Incorporating LID practices provides many supplemental benefits, some of which are difficult to quantify, including improved aesthetics and community livability, expanded recreational opportunities, increased property values and a cleaner environment. Adding LID practices can also reduce the amount of grey infrastructure needed to manage flooding and combined sewer overflows and avoid expensive capacity expansions. Various models and tools are available to help communities anticipate costs associated with various types of LID practices. Tools include:

Best Management Practices and LID Whole Life Cost Models
www.ecy.wa.gov/bmpcost
To estimate life cycle costs for stormwater management, the Water Environment Research Foundation and EPA developed a set of spreadsheet tools to help users identify and compare capital costs and ongoing maintenance costs for stormwater best management practices (BMPs) and LID.

BMP-REALCOST
www.ahebl.org/downloads/software/BMP-REALCOST_v1.0.zip
This spreadsheet-based tool, developed by the Urban Drainage and Flood Control District in Denver, Colorado, analyzes the life cycle costs of BMPs for planning purposes. The tool incorporates the costs of construction, engineering, administration, land, maintenance and replacement of selected BMPs, including LID. The download includes a manual that describes its purpose and proper application.

Figure 1. A worker assesses whether a stormwater control practice is a stormwater pump-out strip or a bioretention area.

Figure 2. Soldiers with the U.S. Army in Brazil have been using bioretention areas by trimming bushes and removing weeds.

What do the new requirements mean to me & my community?

Association of Washington Cities LID website:

<http://www.awcnet.org/TrainingEducation/LowImpactDevelopment.aspx>

Other Resources:

Ecology studies:

LID Cost Analysis

Maintenance Manual

Raingarden Handbook (update)

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Maintenance of Low Impact Development
Communities Are Easily Managing LID Practices

FAQ: Aren't maintenance costs for LID still unknown?

Barrier Busted!
Results show that life cycle costs of LID are usually less than traditional practices.

LID Barrier Busters Fact Sheet Series

LID Can Be More Cost-Effective Over Time

Best Management Practices and LID Whole Life Cost Models

BMP-REALCOST



Questions & Evaluation

Questions & Evaluation

FEEDBACK

- What do you need from Ecology for your local government to make the transition?
- What does your community need?
 - Training for developers?
 - Public education?

Questions & Evaluation

THANK YOU!

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