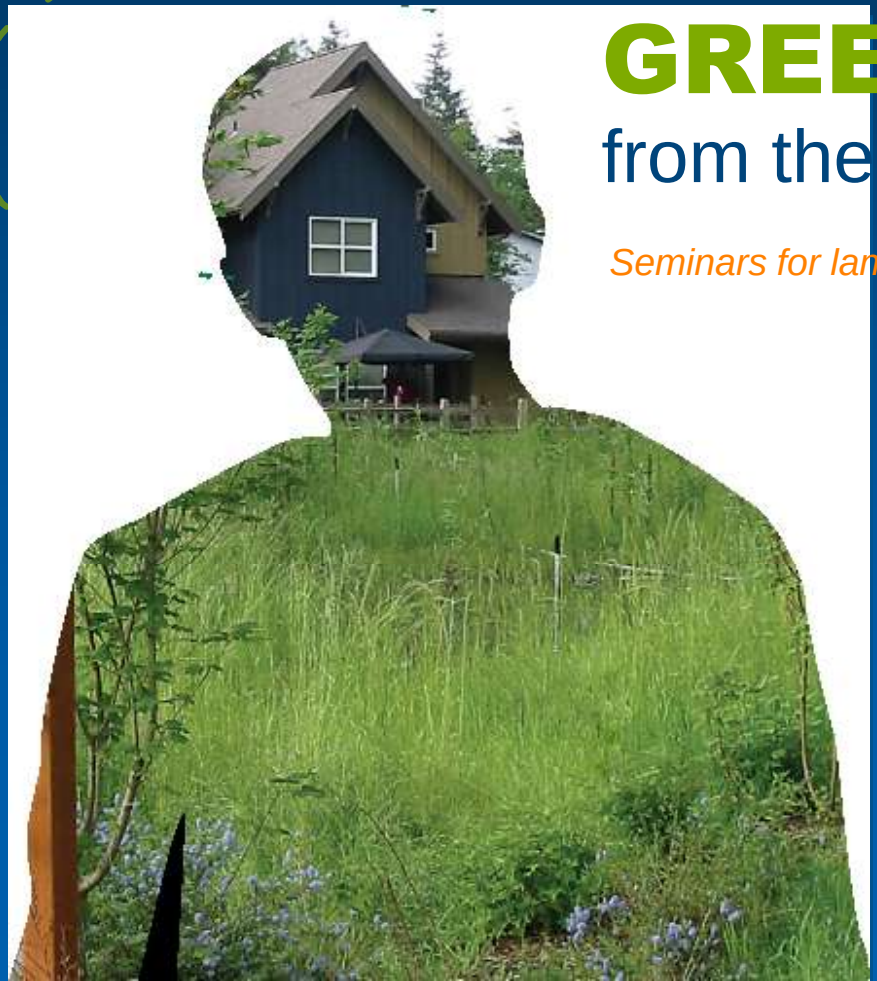
Let us put a bug in your ear



GREEN
from the Ground Up

Seminars for land-savvy developers

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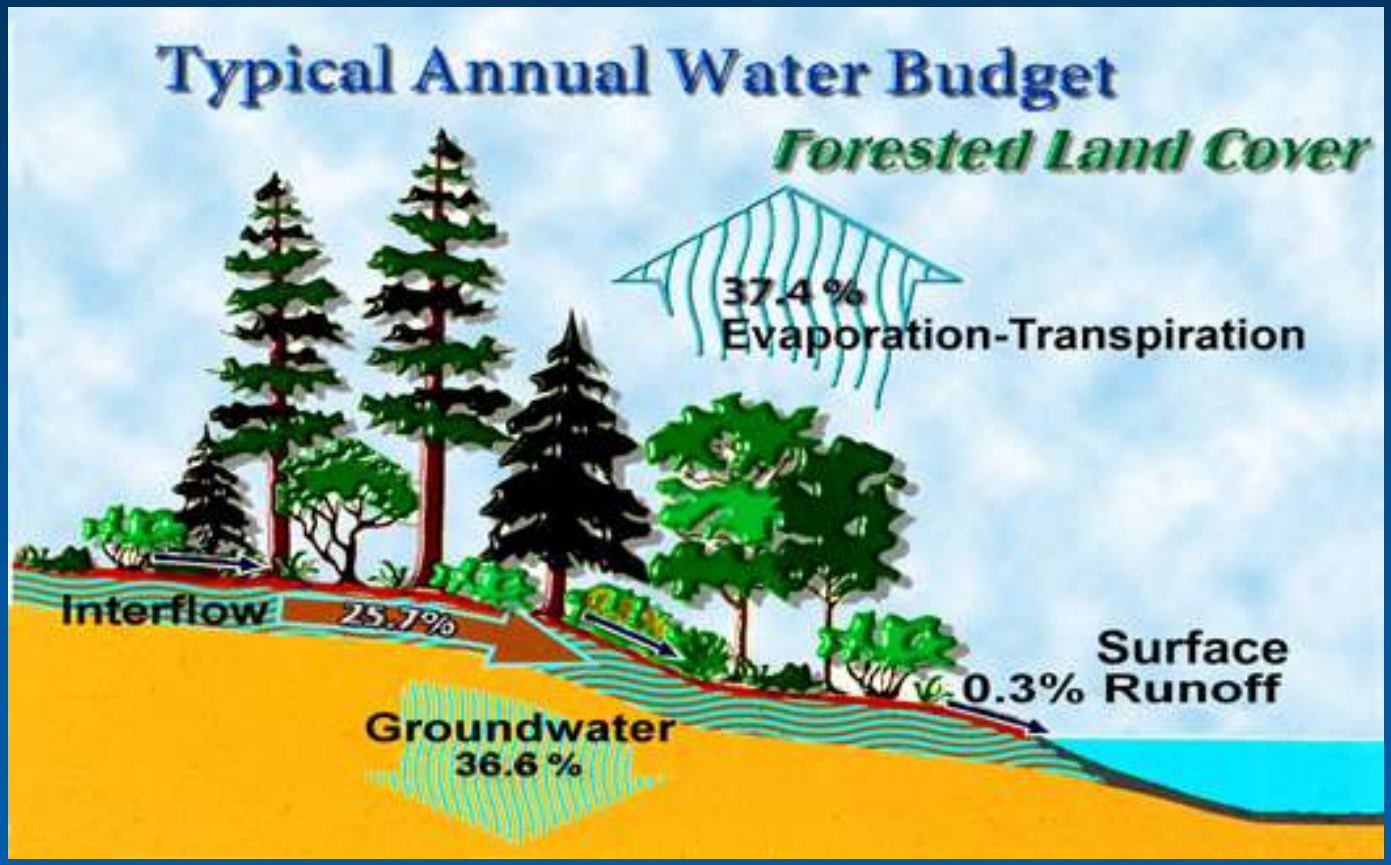
Low Impact Development Practices

Natural Conditions



Courtesy May, U of W

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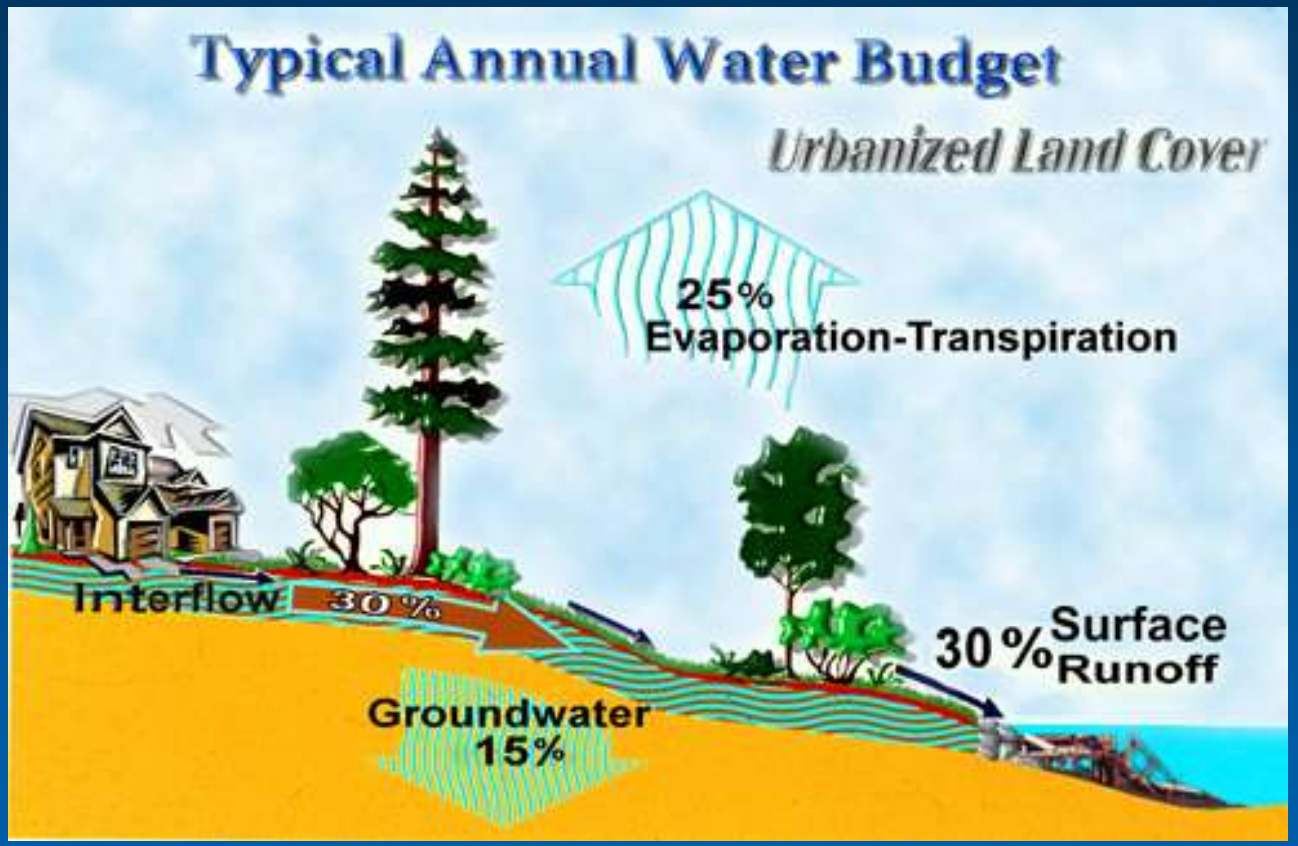
Developed Conditions



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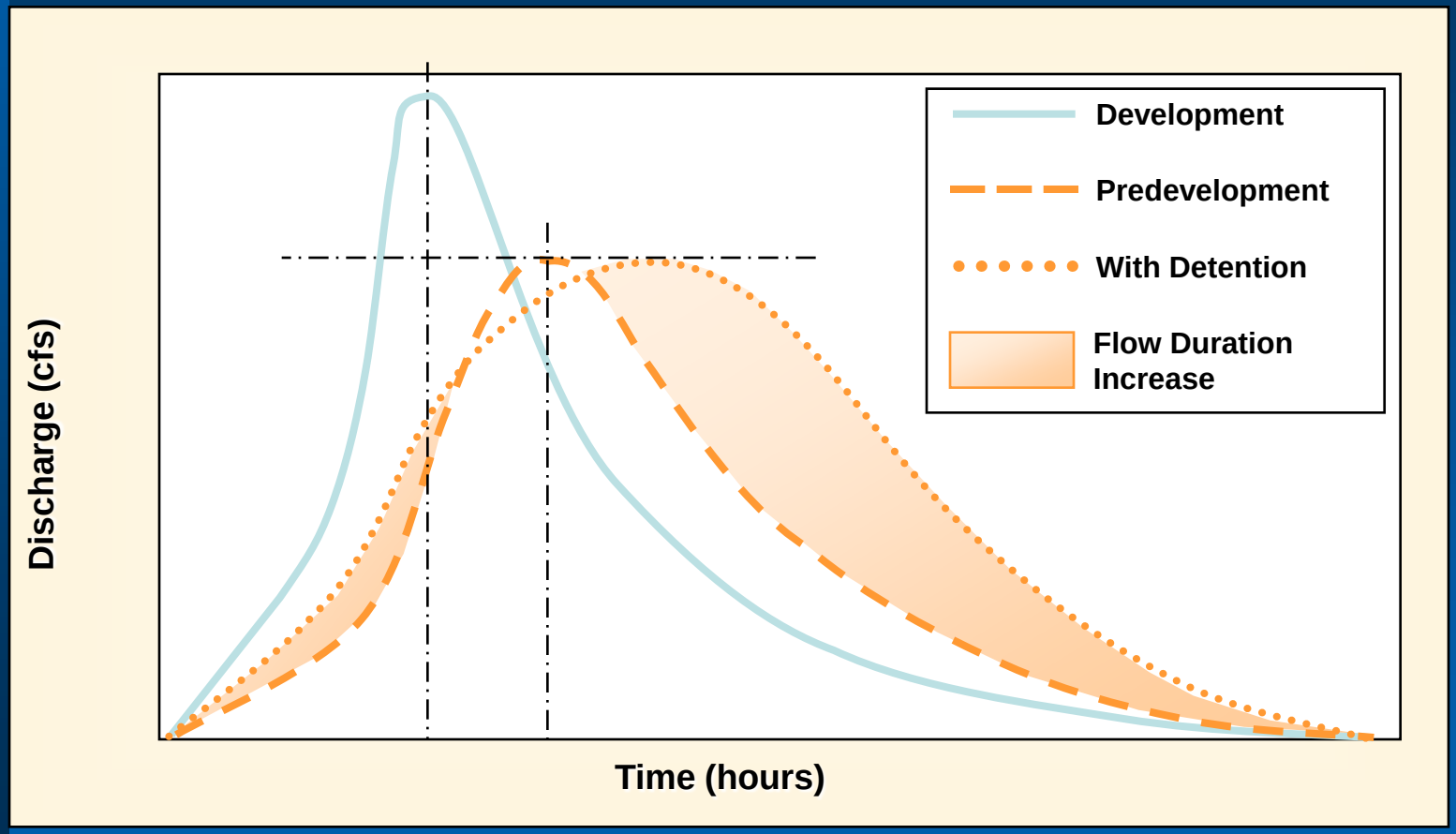
Why is this important?



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How building affects streams:
Quantity

Photo: Johnson Creek Watershed Council

Photo: Clackamas County WES

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Stream erosion

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How building affects streams:
Quality

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Urban and Industrial Stormwater:
Typical Pollutants

- Suspended solids/sediments
- Nutrients (nitrogen, phosphorus)
- Metals (copper, lead, zinc, cadmium)
- Oils & grease (PAHs)
- Bacteria
- Pesticides & herbicides
- Temperature

Photo: POVA

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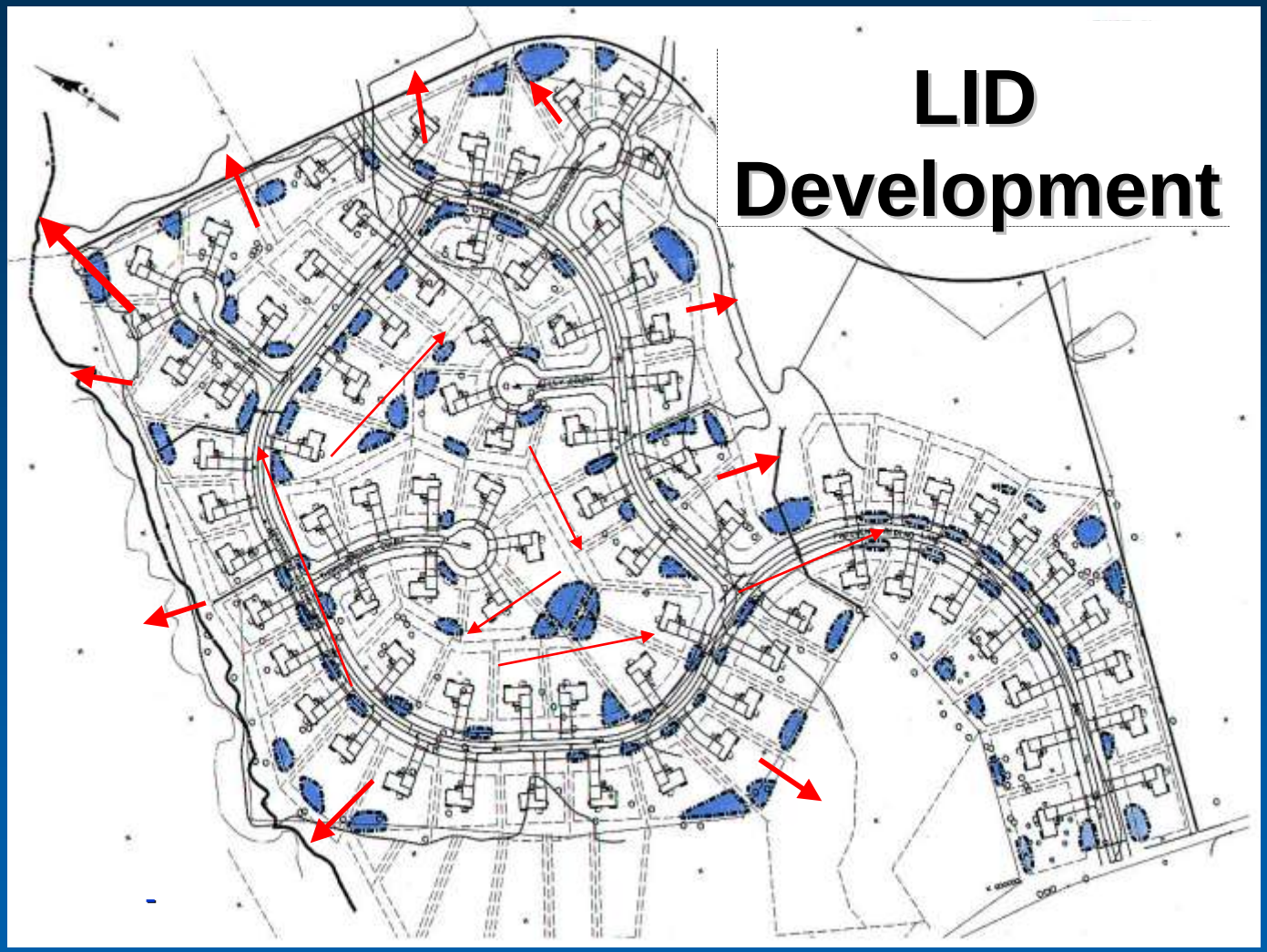
Conventional Runoff
Solution

Another Approach



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Objectives

- Mimic pre-development functions
  - Hydrological
  - Ecological

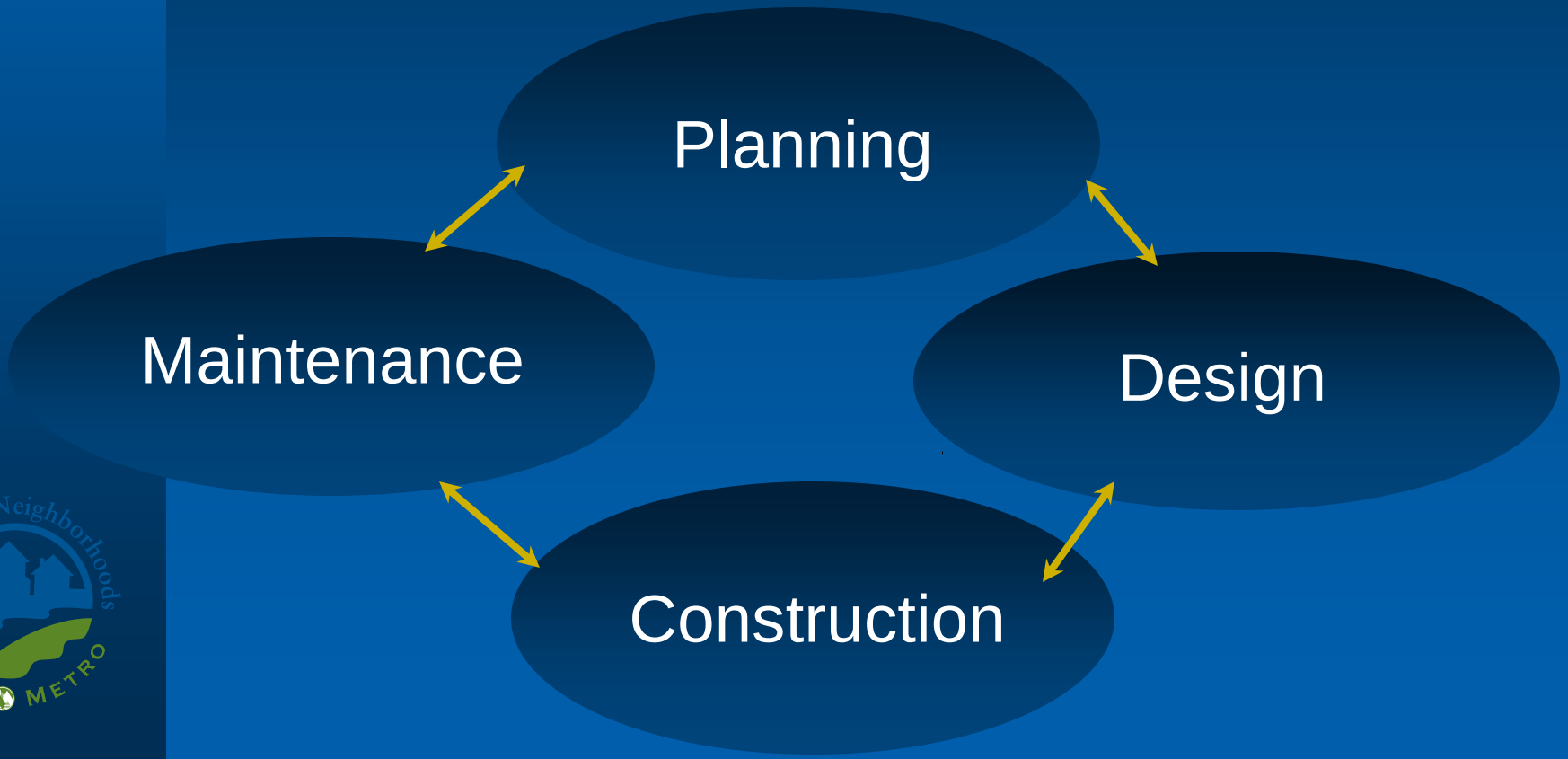
Musee du Quai Branly, Paris

The Practices

A broad range of development techniques and activities including:

1. Savvy site planning
2. Decentralized stormwater management integrated into site
3. Thoughtful designs around wildlife and fish habitat areas

Proper Application



Resources that add value

- Forest
- Stream corridors
- Wetlands
- Steep slopes
- Buffers
- Critical areas
- Parks
- Scenic areas
- Trails
- Shorelines
- Ag lands

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Savvy site planning

Avoidance

- On-site and off-site density transfers
- Clustering
- Varying building setbacks
- Trees increase

  property values

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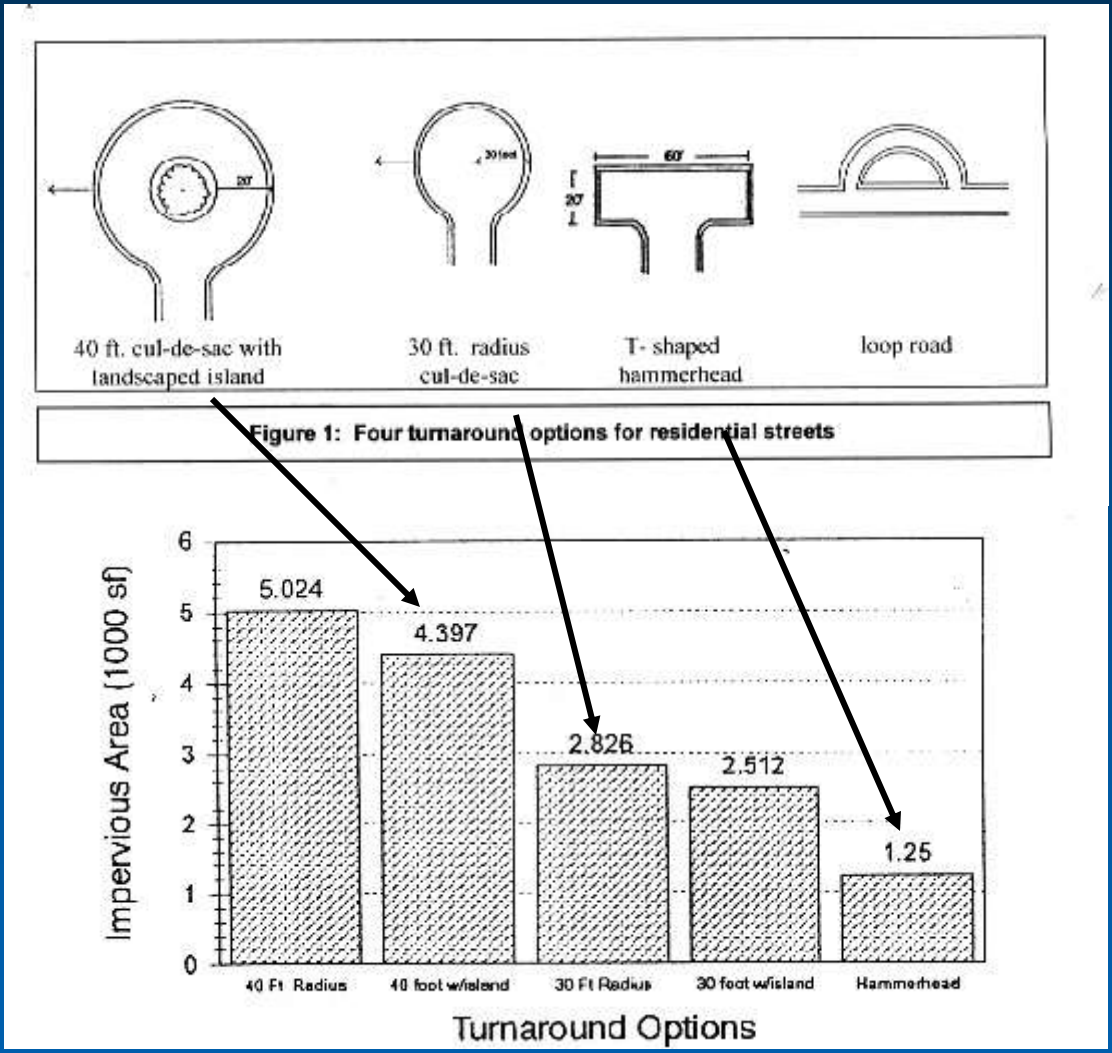
Minimize Impervious Area:

Alternative Turnarounds



(Source: Low Impact Development Center)

Minimize Hydrologic

Impacts-Principles

- Open drainage/swales
- Green space
- Gentle slopes
- Disperse drainage
- Lengthen flow paths
- Save headwater areas
- Set back from streams
- Amend soils

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Rain Garden

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Residential rain garden

Minimize Hydrologic Impacts

Rain garden-Infiltration

Photo: City of Portland BES

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Stormwater Planter

Also a rain garden-Infiltration

Photo: City of Portland BES

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Stormwater Planter

Also a rain garden-Flow-through

PSU Stormwater Planters

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Swales for Drainage and Storage

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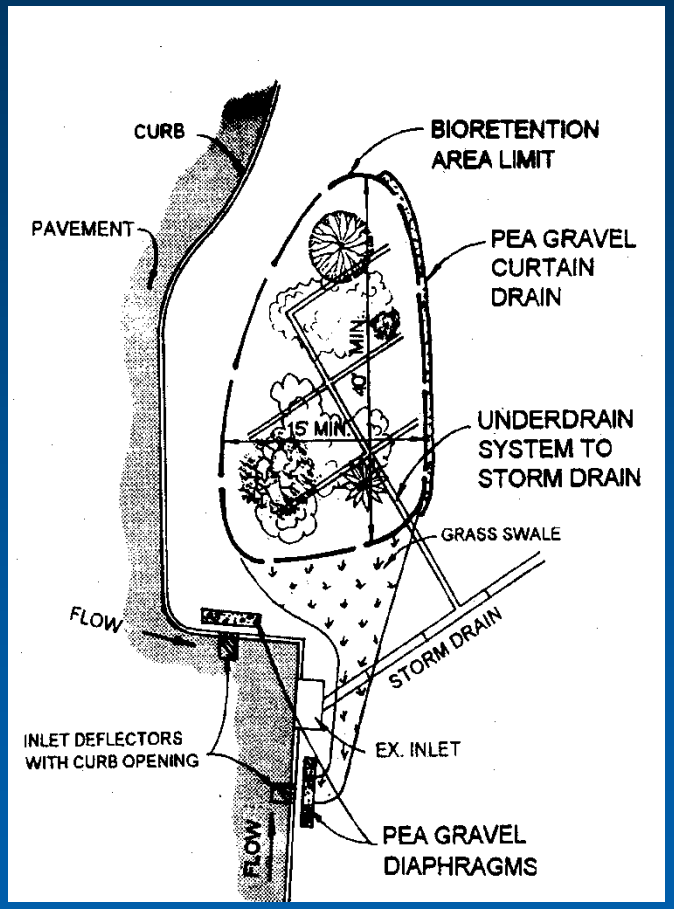
Swale-parking lot

Photo: Portland BES

All green space can be designed to be hydrologically functional and treat runoff.



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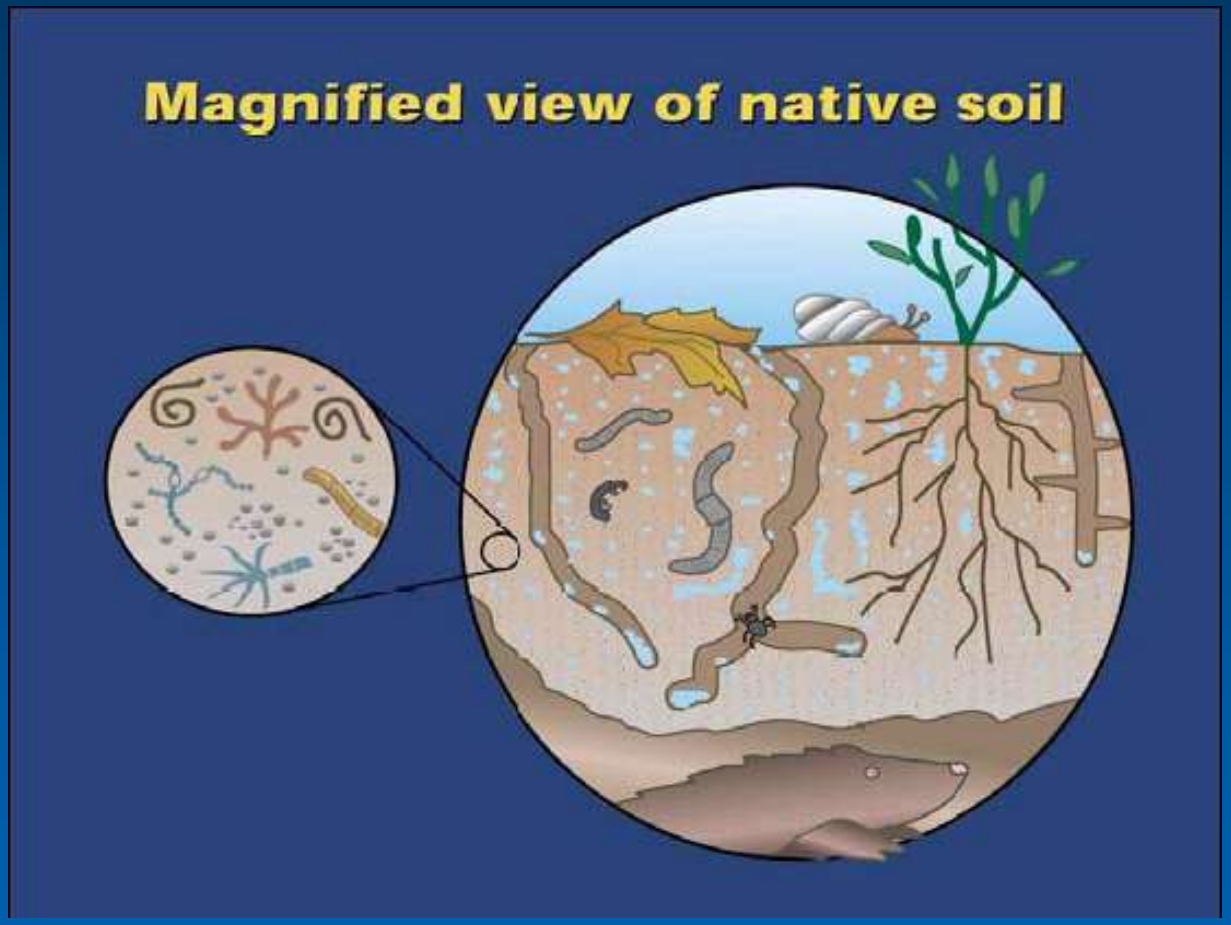
Minimize Hydrologic Impacts

-Avoid compaction

-Amend soils



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Soil Amendments

-Plastic grids that can be vegetated

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Minimize Hydrologic Impacts-

Pervious Pavement

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Minimize Hydrologic Impacts-

Pervious Pavement

Photo: WRG Design

Minimize Hydrologic Impacts-
Pervious Pavement

Photo: Clean Water Services

Photo: Low Impact Development Center

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Minimize Hydrologic Impacts-
Ecoroof

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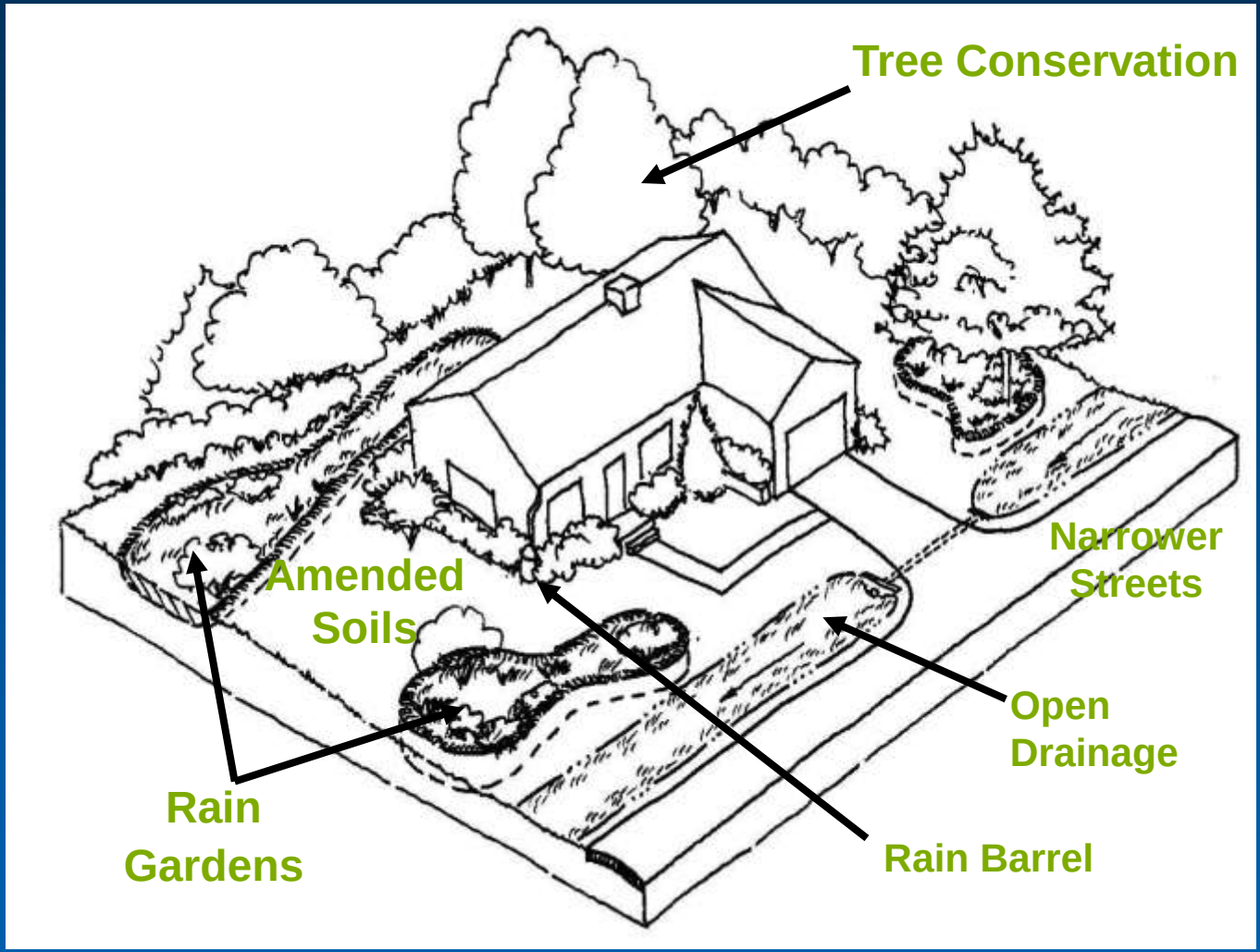
Lot Level Techniques

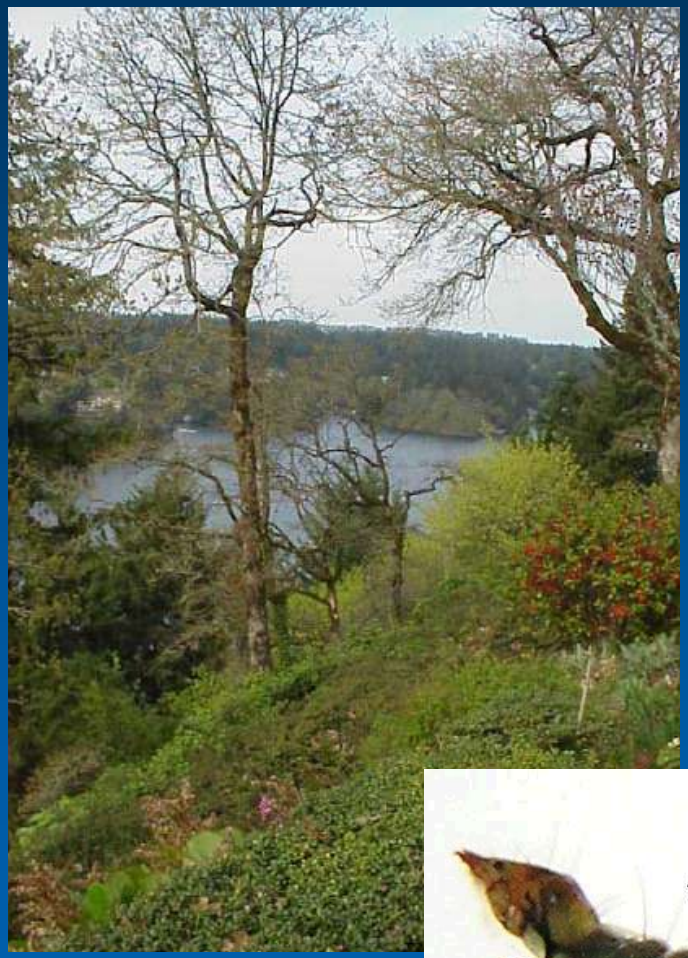


Site Construction Practices

Maximize infiltration potential!

- Minimize clearing
- Minimize grading
- Limit lot disturbance
- Minimize compaction

Minimize impacts and restore functions on wildlife and fish habitats



- Retain existing vegetation
- Protect clusters of trees
- Vegetated buffers on aquatic systems
- Naturescaping
- Timing
- Light

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Minimize Impacts on Wildlife Corridors and Fish Passage

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Maintenance

- Vegetated Practices-similar to other landscape maintenance
- Use Landscape Contractors knowledgeable and have experience with native plants
- CC & Rs or HOAs
- Consider maintenance upfront during design process.

Photo: Americast

Operations and Maintenance

- Attractive landscape practices—will be perceived by owner as adding value
- Educational efforts can engage the homeowner
- Need no special equipment to maintain

Source: Low Impact Development Center, Inc.

Cost Savings

When we:	We reduce the cost of:
Reduce impervious surfaces	Installation Stormwater management City of Portland Stormwater fees
Limit disturbance	Excavation Trenching Piping
Infiltrate	Detention pipe Loss of land area due to large detention/retention ponds
Plant native plants	Watering beyond a 3-year establishment period Replacing dead plants

Resources from Metro-
Development Center

- Technical assistance for habitat friendly practices
  - One-on-one assistance (design, RFPs, etc.)
  - Lists of practitioners
  - Studies on effectiveness, cost, maintenance
- Develop partnerships to promote habitat friendly design practices
- Education and signage

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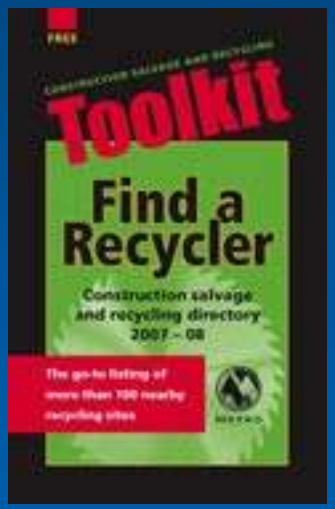
Resources from Metro-
Development Center and Sustainability Center

- TOD program
  - Funding/technical assistance for med to high density mixed use dvlpt near frequent transit routes, station areas, 2040 "centers"
  - Fill the gap betwn density and what market will support, draw transit ridership
- Nature in Neighborhoods Capital Grants
  - Funding for projects that "re-nature" or "re-green" neighborhoods on public property

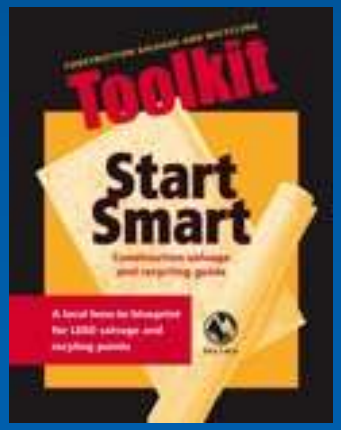
Deconstruction/Demolition/ Metro Paint

Bryce Jacobson, Solid Waste & Recycling



BONEYARD NW
Online Commercial Building Materials Exchange

MetroPaint



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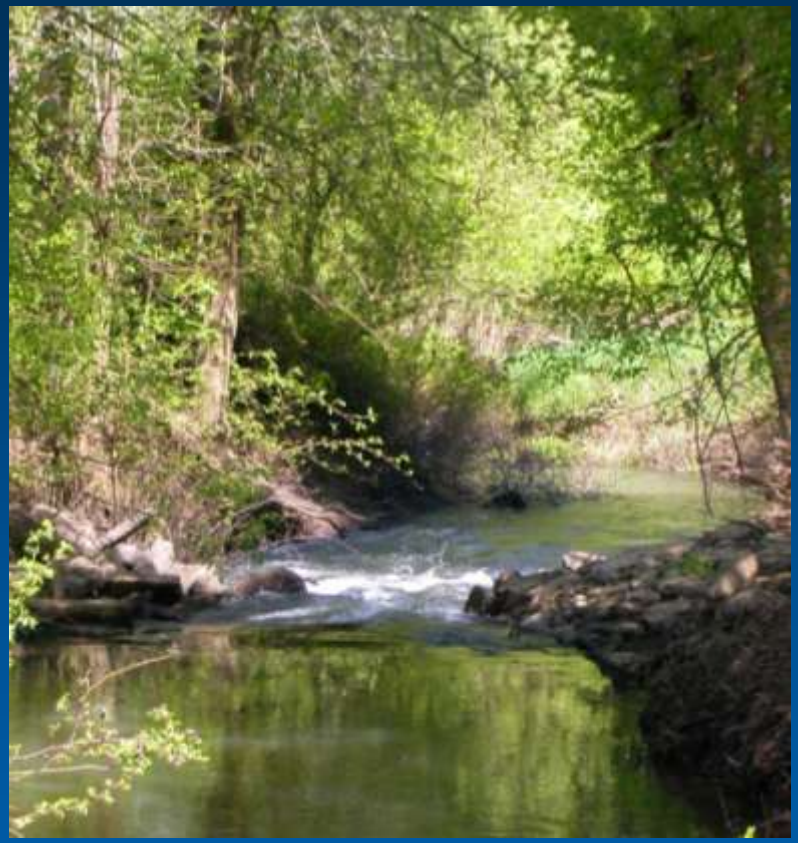
For more information



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