

Watershed-friendly Planning and Zoning

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Watershed Planning Across Political Boundaries
4.21.10

WATERSHED GOALS

- **Protect water resources**
- **Minimize flooding** and its impacts
- Appropriately **manage stormwater** to prevent erosion and sedimentation and to maximize recharge

WATERSHED GOAL

Protect Water Resources



Surface Water Protection

Goals:

- *Safeguard water quality*
- *Maintain natural hydrology*
- *Minimize physical disturbance*

Objectives

- Vegetated buffers
- Permanently protect critical areas
- Manage land uses, activities within watershed
- Minimize impervious surfaces

Groundwater Protection

Goals:

- *Maximize recharge capability*
- *Safeguard groundwater quality*

Objectives

- Minimize impervious surfaces within recharge areas
- Manage land uses and activities within areas of influence
- Permanently protect critical areas

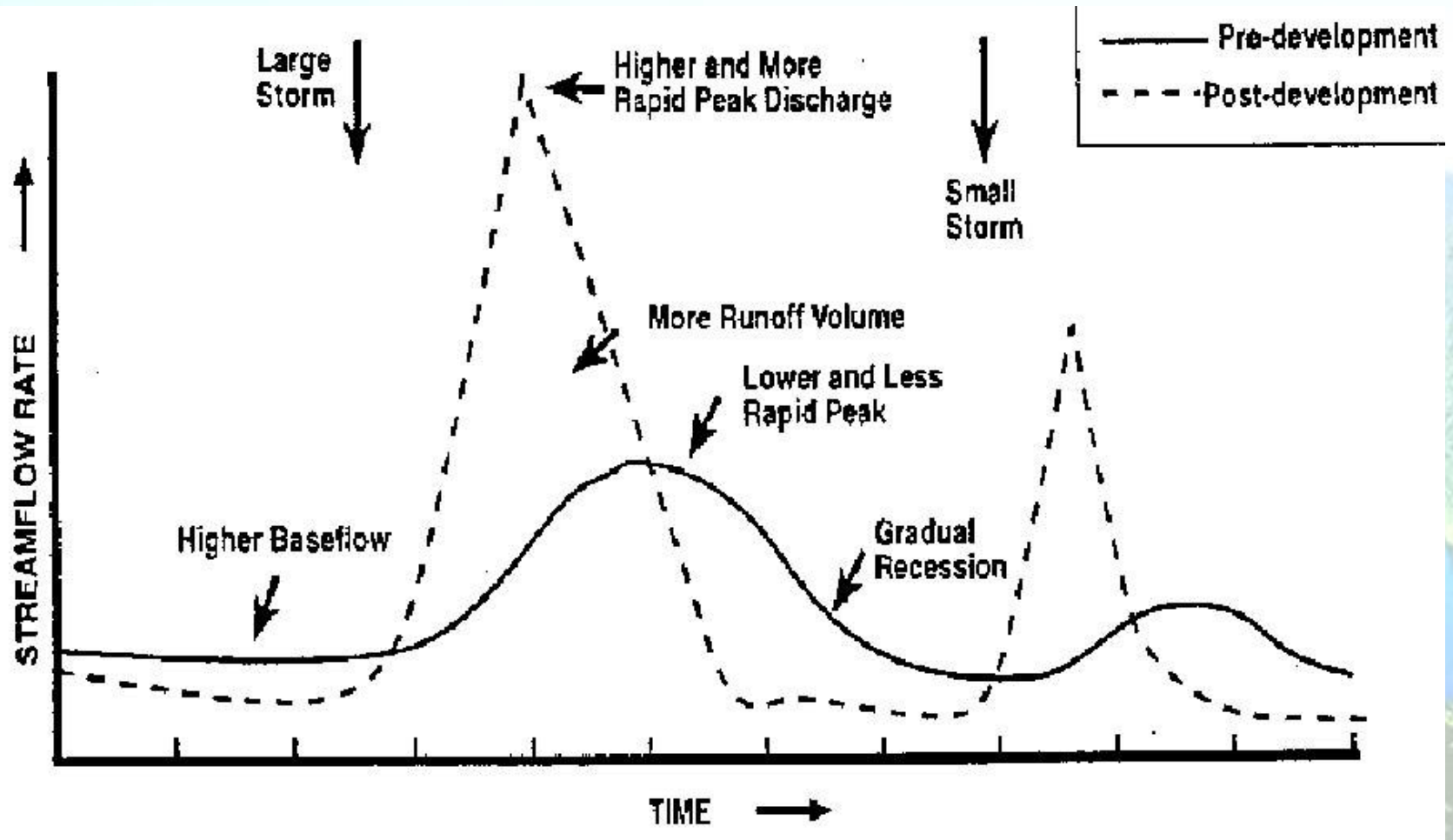
WATERSHED GOAL

Minimize Flooding and its Impacts

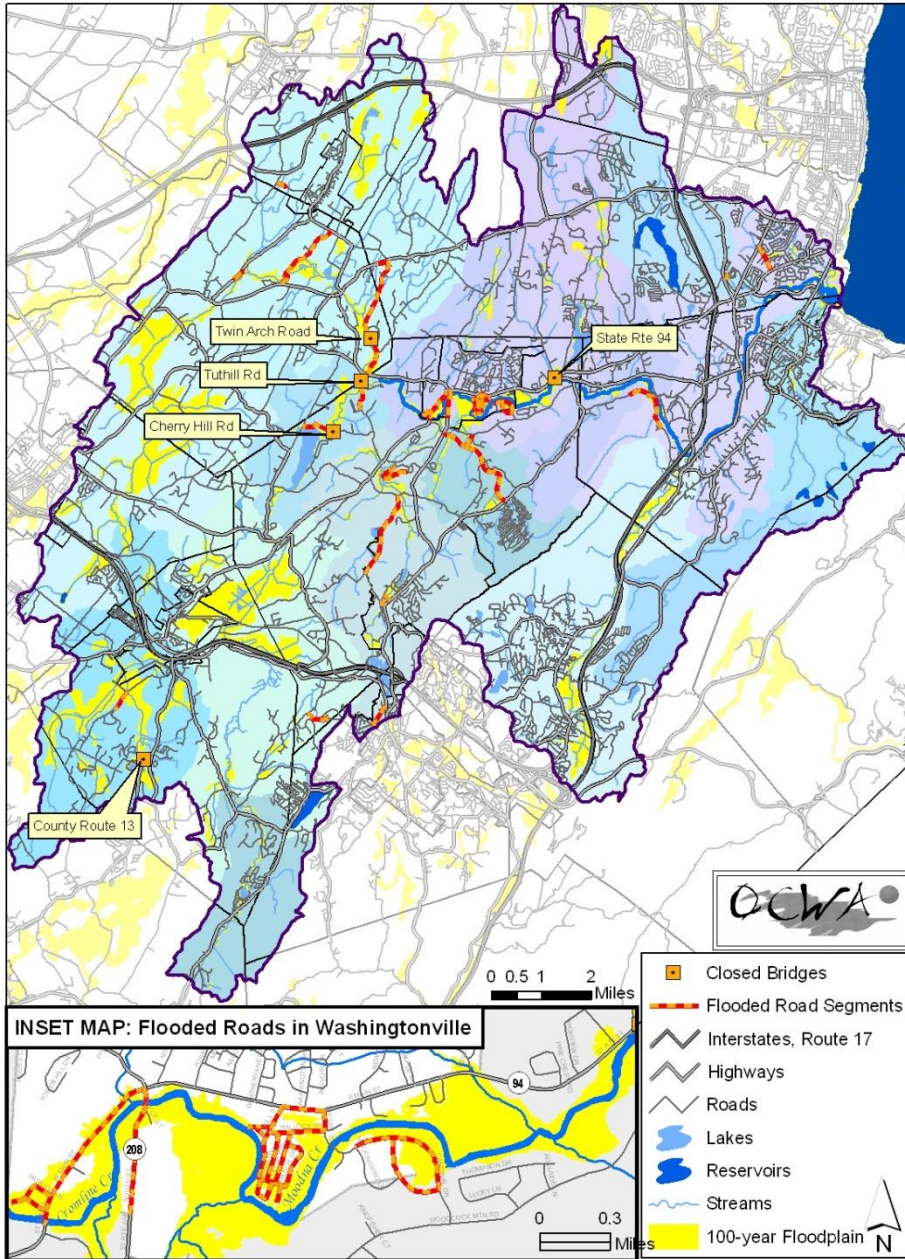
Minimize flood levels, velocities and damage caused by flooding

Objectives

- Restrict development, filling, and disturbances in floodplains
- Minimize upstream impervious surfaces
- Control upstream erosion
- Develop coordinated approach to water releases from dams, water control structures
- Manage hydraulic constrictions



Map 15: Flooded Roads and Bridges: Flood Event of April 2007



WATERSHED GOAL:

Minimize Flooding and its Impacts

WATERSHED GOAL

Manage Stormwater

Goals:

- *Minimize erosion and reduce stormwater pollutant loads*
 - *Safely convey extreme floods*
 - *Maintain groundwater recharge*
 - *Reduce stormwater velocities*

Low Impact Development (LID) Techniques

(aka: Better Site Design)

Goal: *Improve and maintain overall watershed health through implementation of 27 Principles*

Objectives

- Preserve undisturbed areas
- Reduce impervious cover
- Source control for stormwater management

LID Techniques

- Bioretention areas (e.g. rain gardens)
- Vegetated swales
- Infiltration basins, trenches
- Permeable pavement
- Rain barrels, green roofs
- Stormwater wetlands



Enabling Legislation for Intermunicipal Cooperation

NYS General Municipal Law §119-u allows creation of consolidated/shared:

Overlay districts

Comprehensive plans

Land use regulations

Planning boards

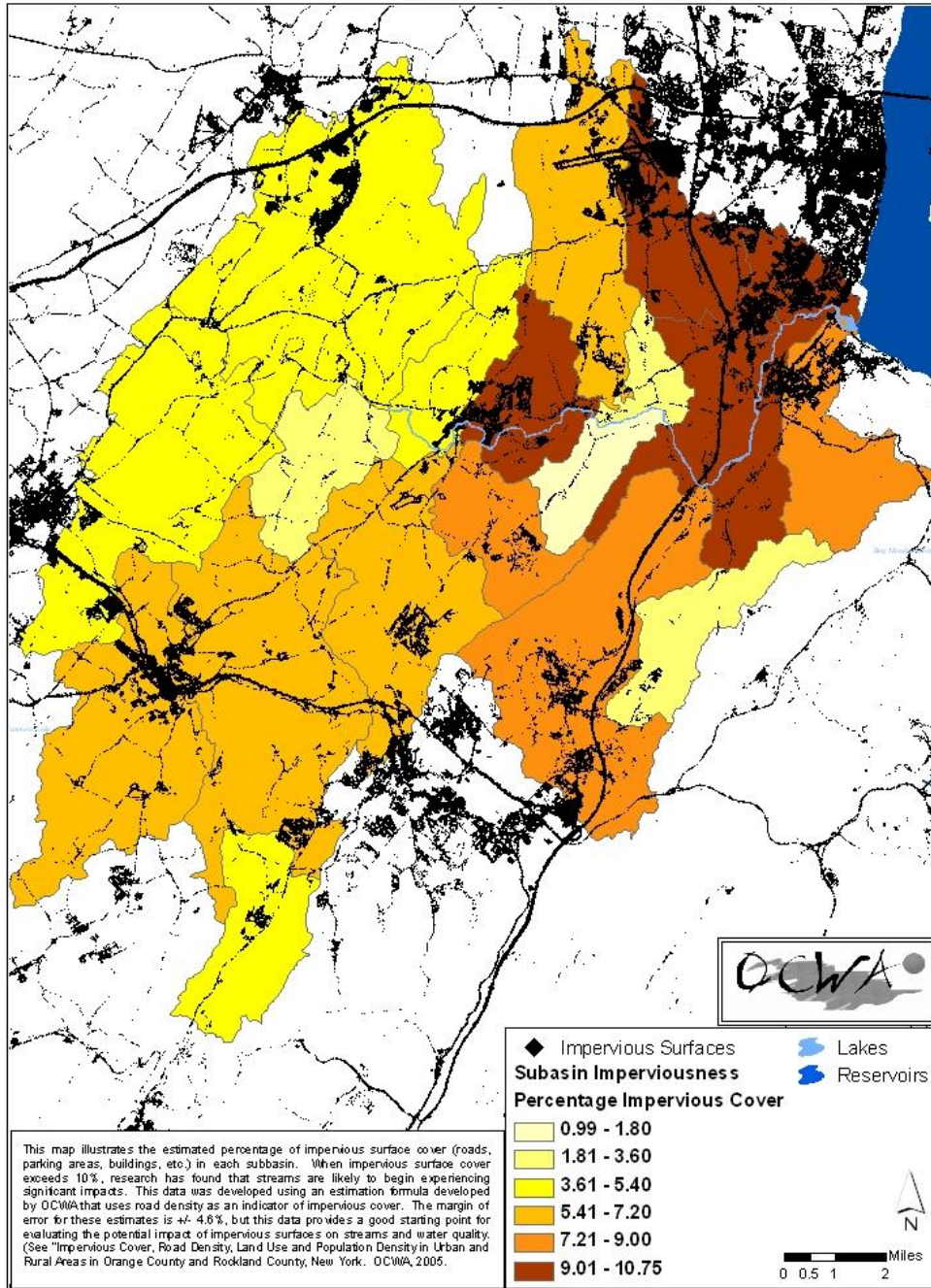
ZBAs

Watershed management method : Planning

- Master plans
- Natural Resource Inventory
- Strategic plans
- Watershed plans



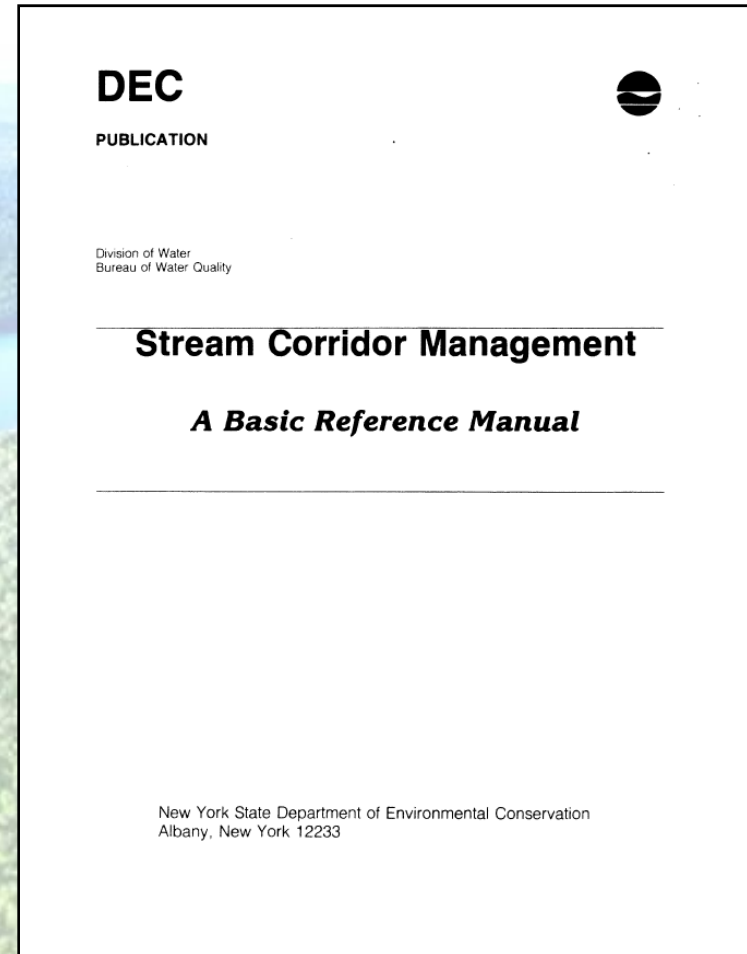
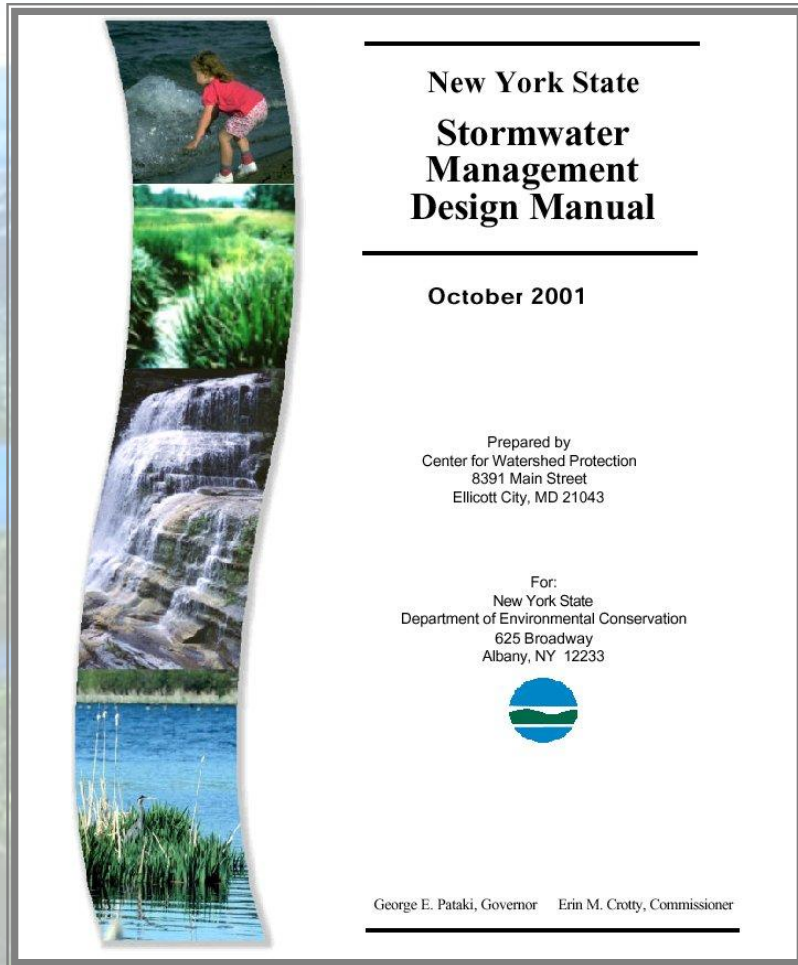
Map 4. Impervious Surfaces



Watershed management method : Land conservation

- Purchase of land
- Conservation easements (PDR)
- Transfer of Development Rights (TDR)

Watershed management method: Guidance documents



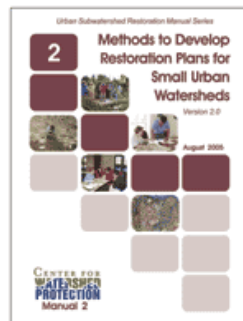
Urban Subwatershed Restoration Manual No. 1: An Integrated Framework to Restore Small Urban Watersheds (Version 2.0)

Authors: T. Schueler **Released:** 2005

Cost: \$30 **Add to Cart**

Download for Free: [Manual 1](#) 

Introduces the basic concepts and techniques of urban watershed restoration, and sets forth the overall framework we use to evaluate subwatershed restoration potential. The manual emphasizes how past subwatershed alterations must be understood in order to set realistic expectations for future restoration. Presents a simple subwatershed classification system to define expected stream impacts and restoration potential. Defines seven broad groups of restoration practices, and describes where to look in the subwatershed to implement them. Presents a condensed summary of a planning approach to craft effective subwatershed restoration plans.



Urban Subwatershed Restoration Manual No. 2: Methods to Develop Restoration Plans for Small Urban Watersheds (Version 2.0)

Authors: T. Schueler, A. Kitchell **Released:** 2005

Cost: \$45 **Add to Cart**

Download for Free: [Manual 2](#) 

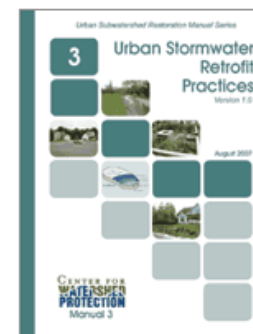
Manual 2 contains detailed guidance on how to put together an effective plan to restore urban subwatersheds. The manual outlines a practical, step-by-step approach to develop, adopt and implement a subwatershed plan in your community. Within each step, the manual describes 32 different desktop analysis, field assessment, and stakeholder involvement methods used to make critical restoration management decisions.

Urban Subwatershed Restoration Manual No. 3: Urban Stormwater Retrofit Practices (Version 1.0)

Authors: T. Schueler, D. Hirschman, M. Novotny, J. Zielinski **Released:** 2007

Download for Free: [Manual 3](#)  [Appendices](#) 

Outlines the basics of retrofits, describes the 13 unique locations where they can be found, and presents rapid methods to find, design and deliver retrofits to meet a wide range of subwatershed objectives. The manual contains updated costs for retrofit practices, updated pollutant removal data for stormwater treatment options, a design point method to estimate individual retrofit removal rates, and practical tips to support the design, permitting and construction of retrofit projects. In short, the manual provides all the resources needed to develop an effective local retrofit program. Hardcopy will be available soon.





CONSERVATION THRESHOLDS FOR LAND USE PLANNERS



ENVIRONMENTAL
LAW INSTITUTE®

Conservation Area Overlay District

A Model Local Law



Metropolitan Conservation Alliance

a program of



MCA Technical Paper Series: No. 3

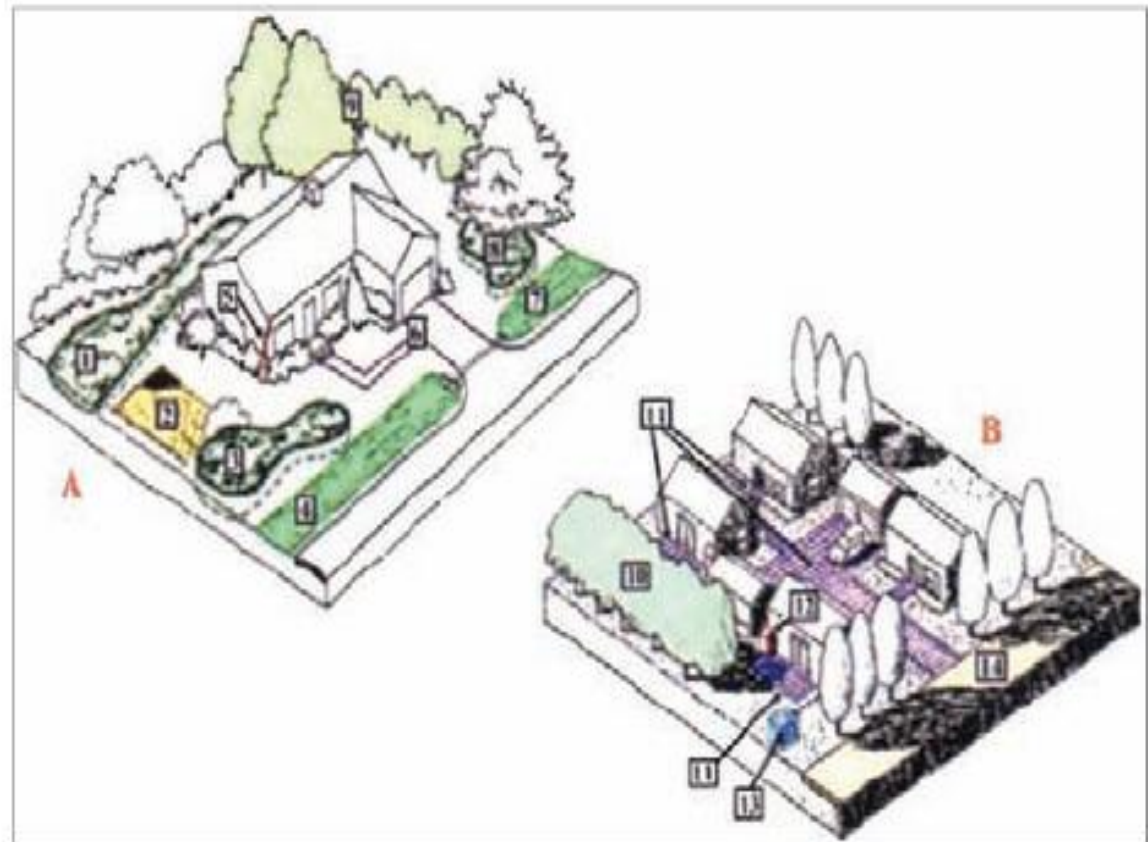
G61 LID Residential Applications

A: Low Density Residential

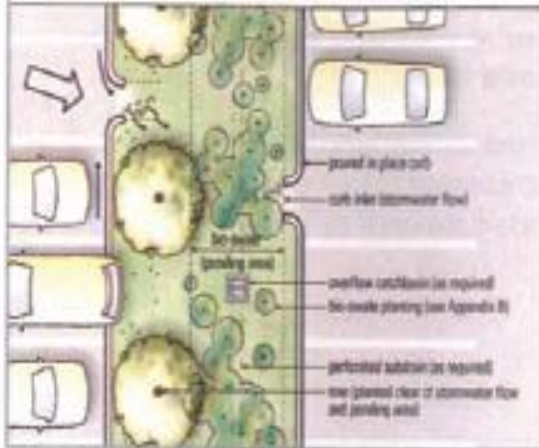
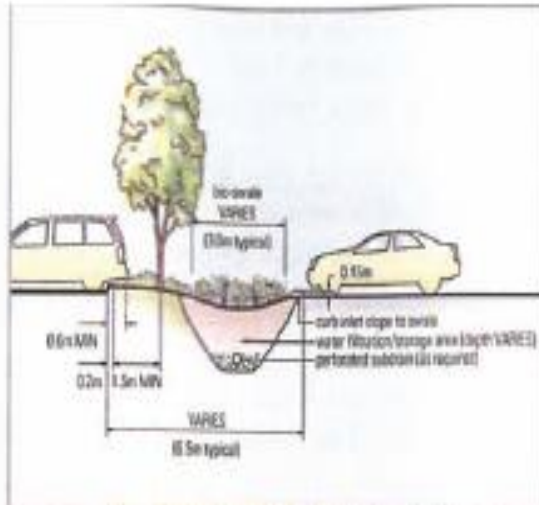
1. Bioretention / Rain Garden
2. Soil Amendments
3. Bioretention / Rain Garden
4. Grassed Swale
5. Disconnectivity (Rain Barrel)
6. Permeable Pavers
7. Grassed Swale
8. Bioretention / Rain Garden
9. Conservation

B: High Density Residential

10. Conservation
11. Permeable Pavers
12. Permeable Pavers
13. Disconnectivity (Rain Barrel)
14. Disconnectivity (Dry Well)
15. Minimizing Imperviousness (Reduced street width)



G60 LID Applications – Residential



Design concept for bio-retention swale with tree planting

G51 Typical Bioswale for Parking

Examples of permeable pavings:



Open joint pavers



Porous asphalt

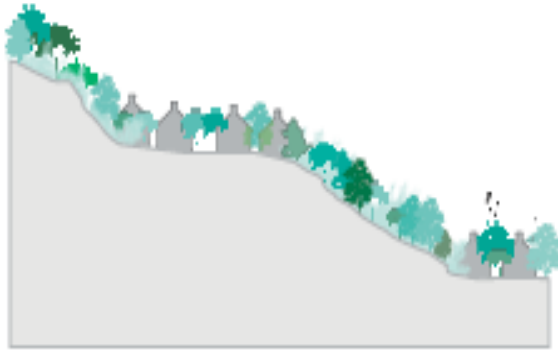


Pervious concrete



Turf grid

G52 Permeable Pavings



G40 Place More Density on Gradual Slopes

It is easier to build on gradual slopes (1% to 15%) than it is to build on steep ones. Steer intense development to gradual slopes as “table-flat” lands are often either best suited to agriculture or are environmentally sensitive. Reduce requirements for flat land in each lot to maximize land efficiency and to minimize earthworks. Connect developed terraces with streets that either follow the contours or that climb steeply over short distances.



G41 Use High Points Carefully

High points are very visible and desirable locations. When development leaves them unbuilt, environmental impacts are reduced while access to these points can be available to all. Capitalize on the district’s high points in a district by preserving them for the whole community.



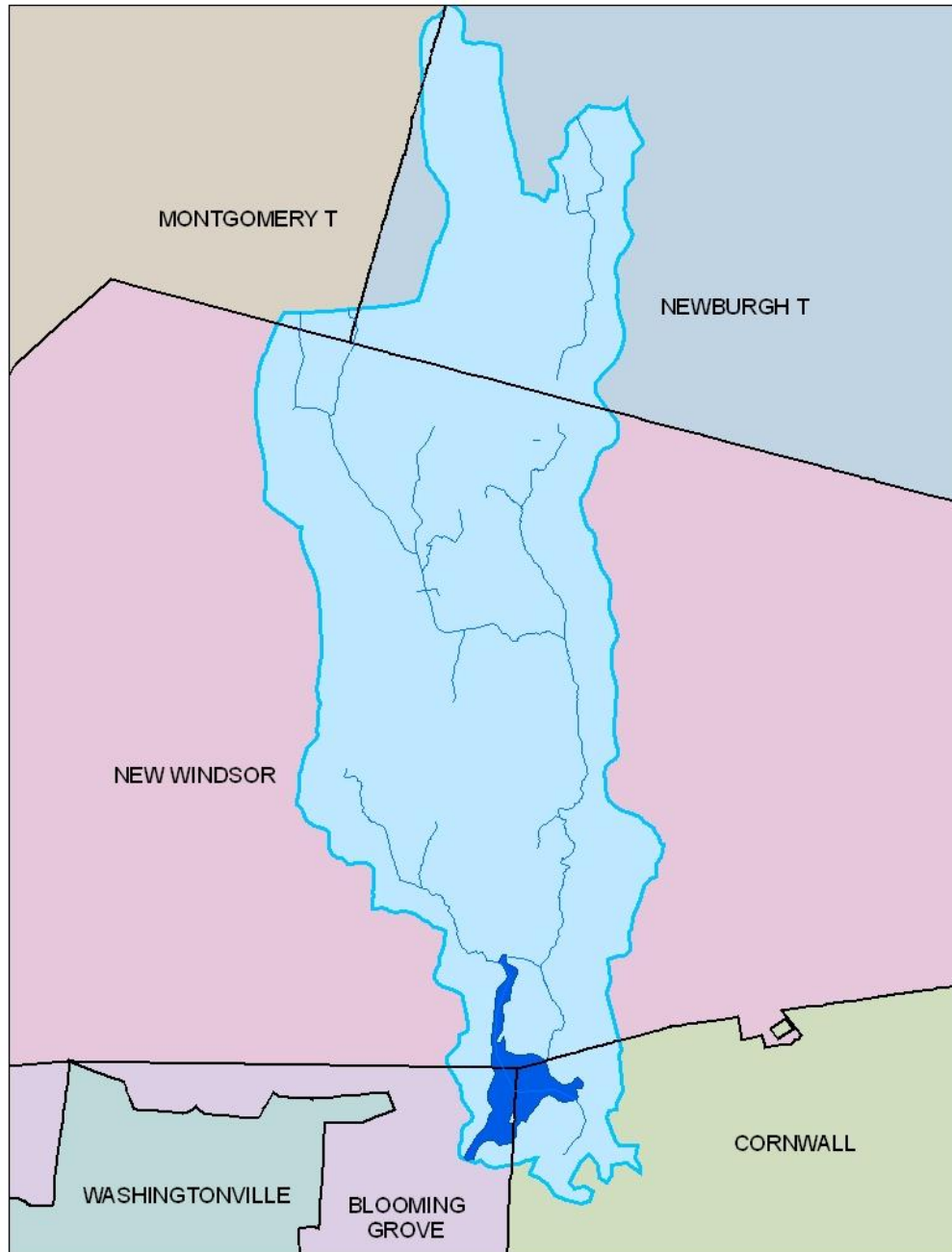
G42 Buffer

Most people greatly value having nature close to home. Green systems should be protected for their social, economic, and ecological value. Streams require wide forested buffers in order to maintain water temperature and to ensure a food supply for fish. Human use in these areas must be carefully controlled, and in some cases, prohibited to preserve natural function and to maintain the qualities that give these areas their value.

Watershed management method : Regulations

- Local Laws
- Zoning - Overlay zones
- Subdivision & site plan regulations

*Regulations can be required or incentivized
(voluntary)*



In Summary...

- Cooperation across multiple jurisdictions is key
- NYS gives broad authority to local governments to cooperate, join forces
- Regional entities are often willing to assist in facilitation.
- Models exist for watershed-friendly land use policies and regulations.

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Online resources

www.landuse.law.pace.edu

www.generalcode.com

www.cwp.org

www.dos.state.ny.us

<http://www.elistore.org>