

Town of Clinton

Recommended Model Development Principles for Protection of Natural Resources in the Hudson River Estuary Watershed *Consensus of the Local Site Planning Roundtable*



A partnership among:

Town of Clinton, Dutchess County, New York

Dutchess County Environmental Management Council

Wappinger Creek Watershed Intermunicipal Council

NYSDEC Hudson River Estuary Program

Center for Watershed Protection, Maryland



June 2006

Table of Contents

Acknowledgements.....	2
Executive Summary and Highlights	3
Introduction.....	5
Membership Statement of Support	8
Recommended Model Development Principles.....	9
Residential Streets, Parking and Lot Development	9
Principle #1: Street Width.....	9
Principle #2: Street Length	10
Principle #3: Right-of-Way Width.....	11
Principle #4: Cul-de-Sacs	12
Principle #5: Vegetated Open Channels	14
Principle #6: Parking Ratios	14
Principle #7: Parking Codes.....	15
Principle #8: Parking Lots	15
Principle #9: Structured Parking.....	15
Principle #10: Parking Lot Runoff.....	16
Principle #11: Open Space Design	17
Principle #12: Setbacks and Frontages	17
Principle #13: Sidewalks.....	18
Principle #14: Driveways.....	18
Principle #15: Open Space Management.....	18
Principle #16: Rooftop Runoff.....	19
Conservation of Natural Areas	20
Principle #17: Buffer Systems	20
Principle #18: Buffer Management.....	21
Principle #19: Clearing and Grading	22
Principle #20: Tree Conservation	23
Principle #21: Conservation Incentives	24
Principle #22: Stormwater Outfalls	24
Appendix 1 – Model Shared Parking Agreements	27
Appendix 2 - Model Shared Driveway Agreement	31
Appendix 3 - Conservation Incentives Used in New York State.....	33
Appendix 4 - Plant Lists	36
References.....	44

Cover photos: Dutchess County EMC: Wappinger Creek headwater stream
Center for Watershed Protection: Rain garden, residential subdivision

Acknowledgements

The Town of Clinton Site Planning Roundtable would not have been possible without the time and effort spent by the roundtable members and the generous support of the New York State Department of Environmental Conservation's Hudson River Estuary Program and the Dutchess County Environmental Management Council.

We would also like to thank the Town of Clinton, the Dutchess County Department of Public Works, the Dutchess County Department of Planning and Development, and the Center for Watershed Protection (CWP) for their partnership and assistance in this Site Planning Roundtable. Special thanks to Central Hudson for providing the funding for a meeting space, materials and catering services for the initial presentation of CWP recommendations and principles at the Site Designing for Natural Resources Workshop on April 15, 2005.

Staff for the project included Barbara Kendall of the NYSDEC's Hudson River Estuary Program, David Burns, Dave Foord, Vicky Buono of the Dutchess County Environmental Management Council, and Sky Shook, intern from the Student Conservation Association.

Copies of this document are available from:

New York State Department of Environmental Conservation
Hudson River Estuary Program
21 South Putt Corners Road
New Paltz, New York 12561
845-256-3016
email: hrep@gw.dec.state.ny.us
website: <http://www.dec.state.ny.us/website/udson/hrep.html>

Contacts for additional information:

New York State implementation of Better Site Design and the Stormwater Phase II program:
Barbara Kendall, Stormwater Outreach Specialist
New York State Department of Environmental Conservation
Hudson River Estuary Program
21 South Putt Corners Road
New Paltz, NY 12561
845-256-3163

Wappinger Creek Watershed Intermunicipal Council:
Eileen Sassman, Chair
10 Clinton Street
Wappingers Falls, NY 12590
Eileen@leverageinc.biz

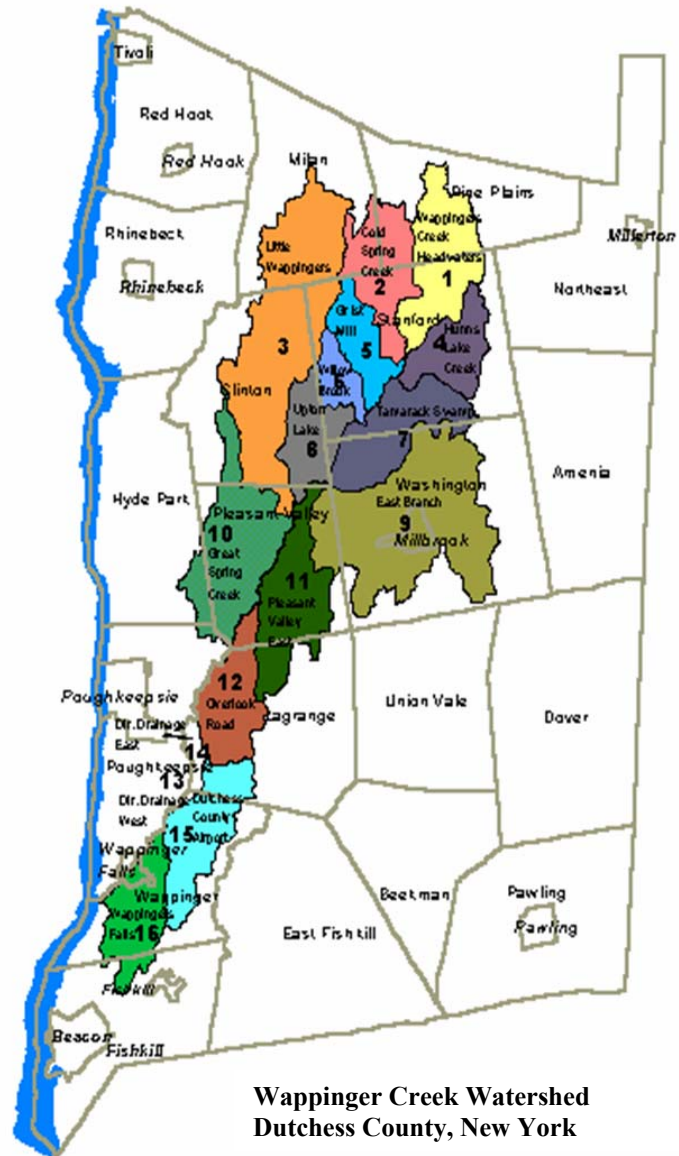
Better Site Design publications and information:
Center for Watershed Protection
8390 Main St., 2nd Floor
Ellicott City, MD 21043
410-461-8324
<http://www.cwp.org/>

Dutchess County environmental programs:
David Foord, Interim Environmental Program Leader
Cornell Cooperative Extension Dutchess County
2715 Route 44, Suite 2
Millbrook, NY 12545
dmf44@cornell.edu

Executive Summary and Highlights

Executive Summary

This document, a product of the Town of Clinton Site Planning Roundtable, is the result of a year-long consensus process initiated by the Wappinger Creek Watershed Intermunicipal Council. The purpose of the project was to review existing development codes and identify regulatory barriers to environmentally sensitive residential and commercial development at the site level within the bounds of the Wappinger Creek Watershed. A cross-section of local government, non-profit, environmental, business, and community professionals formed the membership of the Roundtable. Through a consensus process, members of the Roundtable adapted 19 out of 22 Better Site Design Principles to meet the needs and current conditions within the Town of Clinton. Roundtable recommendations include specific code and ordinance revisions for 13 of the Principles that would increase flexibility in site design standards and support the implementation of environmentally beneficial practices in accordance with the Town's current zoning and subdivision laws.



The 19 Better Site Design Principles adapted by the Town of Clinton Site Planning Roundtable are designed to meet the following objectives:

- (1) reduce overall site impervious cover;
- (2) preserve and enhance existing natural areas;
- (3) integrate stormwater management, and
- (4) retain a marketable product.

Code modifications and other Roundtable recommendations for 13 of the Principles were crafted to provide flexibility, support, and guidance for developers implementing Better Site Design. The Roundtable process focused on model development principles that were deemed pertinent to local conditions.

Highlights

Streets, Parking and Lot Development

- Discourages creation of excess impervious surface by reducing minimum required street pavement width of low-volume local roads to 20 feet using the American Association of State Highway and Transportation Officials (AASHTO) guidelines.
- Encourages efficient street and driveway layouts to reduce impervious surfaces.
- Encourages use of alternative cul-de-sac designs to reduce impervious surface. Where used, round cul-de-sacs should incorporate center landscaped islands and stormwater management practices.
- Encourages use of vegetated swales by allowing swales as an alternative to enclosed stormwater drainage pipe.
- Encourages shared parking to reduce parking lot size and includes references for development of shared parking language.
- Encourages use of stormwater management practices such as bioretention in parking areas.
- Supports flexible design standards for sidewalks and driveways through existing local codes.
- Encourages use of shared driveways to reduce overall lot imperviousness by suggesting use of a Model Shared Driveway Agreement.
- Recommends formation of a committee to explore potential updates to the Town of Clinton Subdivision Regulations and Zoning Law to further define allowable and unallowable uses of open space and open space management.
- Encourages on-lot stormwater treatment to reduce and infiltrate runoff.

Conservation of Natural Areas

- Recommends that the Planning Board and Zoning Board of Appeals require vegetated stream and wetland buffers be shown on site plans, subdivision maps and special use permit applications. For building permit applications, buffers should be shown where appropriate.
- Supports protection of vegetated buffers by recommending that forested buffers be flagged during construction.
- Recommends implementation and enforcement of existing provisions in the zoning law that regulate disturbed project sites near water resources.
- Recommends funding for education to local boards and the public on the importance of forested buffers for water resource protection.
- To minimize impacts of clearing and grading, recommends the use of site fingerprinting techniques.
- Promotes conservation of native trees and other vegetation by recommending that lists of native plants and invasive species should be provided to homeowners and developers.
- Recommends that the committee formed to further define open space management also explore development of flexible subdivision provisions incorporating conservation incentives that are allowed in New York State.
- Recommends that all construction site owners and operators be reminded to file for coverage under New York State's SPDES General Permit for Stormwater Discharges from Construction Activity (GP-02-01) and submit the required Stormwater Pollution Prevention Plan (SWPPP) to the Town of Clinton when the proposed project disturbs one acre or more of soil.

Introduction

Purpose

This document presents specific recommendations on how to foster more environmentally sensitive local site design within the Town of Clinton. The recommendations were crafted in conjunction with community residents representing a wide variety of local interests, both public and private, that participated in the Site Planning Roundtable initiated by the Wappinger Creek Watershed Intermunicipal Council (WIC).

Background

Every year, more than 2 million acres of land are altered as a result of development in the United States, leading to degradation in water quality and biological integrity (NRCS, 2001). The impacts of watershed urbanization on the water quality, biology, and physical conditions of aquatic systems have been well documented (CWP, 2003). The development radius around many of our cities and smaller municipalities continues to widen at a rapid rate, far outpacing the rise in population (Leinberger, 1995). These effects are especially pronounced in coastal communities associated with river estuaries such as the Hudson. In the New York City metropolitan region, population grew only 8 percent between 1970 and 1990, while urban land area increased by 65 percent (Beach, 2002). As a result, local codes and ordinances that promote reduced impact of development on local water resources are critical to future sustainability of the Hudson River Estuary and its tributaries such as the Wappinger Creek.

Protecting water resources and landscape character under a continued growth scenario requires local governments, developers, and site designers to fundamentally change the way that land is developed. Deciding where to allow or encourage development, promote redevelopment, and protect natural resources are difficult issues that jurisdictions have to balance. While effective zoning and comprehensive planning are critical, communities should also explore measures to minimize the impact of impervious cover, maintain natural hydrology, and preserve contiguous open space on sites where development is to occur.

Toward this end, the Wappinger Creek Watershed Intermunicipal Council (WIC) established a set of goals including the following: *“With the active assistance of the development community, we will each review our municipal codes for inconsistencies and regulations that induce sprawl; and promote low impact development and green site designs to minimize the creation of new impervious surfaces by 2006.”* Using grant funds from the NYSDEC Hudson River Estuary Program and support from the Dutchess County Environmental Management Council, the WIC commissioned the Center for Watershed Protection (CWP) in Maryland to examine the codes of the two member municipalities as a pilot project to determine if they encourage or discourage the green site design principles.

The Town of Clinton was selected by the WIC membership as one of the communities to be studied since it represents a rural community in the watershed and most of the Town lies within the watershed. The Town of Wappinger was selected as the second community to participate in the code study since it represents a suburban community and, similarly, a majority of the Town lies within the watershed. The Center for Watershed Protection analyzed the municipal codes for the Town of Clinton and presented the results at an all-day seminar sponsored by Central Hudson in April 2005.

The next phase of the project, as recommended by the Center for Watershed Protection, was to convene Roundtables in each community to determine how or if the results of the codes analysis should be implemented through a consensus-building process. The purpose of a local site planning roundtable is to adapt the 22 Better Site Design principles for local application by identifying how local codes and ordinances can be modified to meet three basic objectives:

1. Reduce overall site imperviousness.
2. Preserve and enhance existing natural areas.
3. Integrate stormwater management.

To implement this phase the WIC, in concert with the NYSDEC Hudson River Estuary Program and the Dutchess County Environmental Management Council, convened Local Site Planning Roundtables for the Town of Clinton and the Town of Wappinger, NY. This document provides the results and recommendations of the Local Site Planning Roundtable for the Town of Clinton.

The 22 Better Site Design Principles act as benchmarks upon which more specific code and ordinance recommendations were adapted for the Town of Clinton. The benefits of applying these principles are summarized in the following table:

Benefits of Applying the Model Development Principles	
<p>Local Government:</p> <ul style="list-style-type: none"> ▪ Increase local property tax revenues ▪ Facilitate compliance with wetlands and other regulations ▪ Assist with stormwater regulations compliance <p>Homeowners:</p> <ul style="list-style-type: none"> ▪ Increase property values ▪ Create more pedestrian-friendly neighborhoods ▪ Provide open space for recreation. ▪ Result in a more attractive landscape ▪ Reduce car speed on residential streets ▪ Promote neighborhood designs that provide a sense of community 	<p>Developers:</p> <ul style="list-style-type: none"> ▪ Flexibility in design options ▪ Reduce development costs ▪ Allow for more sensible locations for stormwater facilities ▪ Facilitate compliance with wetlands and other regulations <p>Environment:</p> <ul style="list-style-type: none"> ▪ Protect sensitive forests, wetlands, and habitats from clearing ▪ Preserve urban wildlife habitat ▪ Protect the quality of local streams, lakes, and estuaries ▪ Generate smaller loads of stormwater pollutants ▪ Help to reduce soil erosion during construction

From: Recommended Model Development Principles for East Hempfield, West Hempfield and Manor Townships, and Lancaster County, Pennsylvania

Clinton Site Planning Roundtable Process

Clinton Site Planning Roundtable members convened many times over an eight-month period to become familiar with the Better Site Design Principles, to review existing codes and ordinances, to work in subcommittees, and to reach consensus on a final set of recommendations. The Roundtable consisted of 28 dedicated members representing a wide range of professional backgrounds and experience related to local development issues. The process included the following steps:

Review of Local Codes – September 2004 – March 2005

Supported by a grant from the NYSDEC Hudson River Estuary Program to the Dutchess County Environmental Management Council, the Center for Watershed Protection's Code and Ordinance Worksheet was used to analyze the local codes, laws and ordinances in the Town of Clinton in relation to 22 Better Site Design Principles.

Roundtable #1 - Joint Clinton/Wappinger Kickoff Meeting - April 15, 2005

About 75 interested parties from across Dutchess County participated in this meeting and Better Site Design workshop. Almost every major stakeholder group was represented, including those from the towns of Clinton and Wappinger, members of the Wappinger Creek Watershed Intermunicipal Council, the development community, environmental agencies, government officials, and state government agencies. The kickoff meeting introduced attendees to the Better Site Design Principles, put into context the aims of the roundtable process within the Wappinger Creek watershed, and presented a comparative analysis of the Code and Ordinance Worksheets for both Clinton and Wappinger.

Clinton Roundtable #2 – June 6, 2005

Roundtable participants from the Town of Clinton met and reviewed the goals and objectives of the project. Roundtable members then split into two subcommittees according to expertise and interest:

- Residential Streets & Lots
- Conservation of Natural Areas

The subcommittees discussed which Principles they would accept or decline to work on and identified possible code reform to discuss in subsequent meetings.

Subcommittee Meetings and Consensus Building – June - October 2005

Both subcommittees met three to five times from June through October and came to a consensus on recommendations related to a subset of the 22 Better Site Design Principles.

Clinton Roundtable #3 – November 7, 2005

The Clinton Roundtable participants from the two subcommittees met together to review the subcommittee draft recommendations and recommend modifications.

Roundtable #4 - Joint Clinton/Wappinger Final Meeting – January 18, 2006

The Clinton Roundtable participants reached consensus on the full suite of recommendations and shared experiences with the Wappinger Roundtable participants.

Membership Statement of Support

This document of recommended development principles was created by a cross-section of professionals representing local government, environmental, non-profit, development, and town residents who participated in the Town of Clinton Site Planning Roundtable.

Members of the Roundtable provided technical expertise required to craft and polish the model development principles for the Town of Clinton. These recommendations reflect our professional and personal experience with land development and do not necessarily carry the endorsement of the organizations and agencies represented by their members. Endorsement implies support of the principles and recommendations as a package and does not necessarily imply an equal level of support among individual recommendations by all Roundtable members.

The members of the Town of Clinton Site Planning Roundtable endorse the model development principles set forth in this document, known as the Recommended Model Development Principles for Town of Clinton, Dutchess County, New York.

Joan Carbonaro
Town of Clinton Zoning Board
of Appeals

Barbara Cleary
Town of Clinton

Jack Cleary
Town of Clinton

Norene Coller
Town of Clinton Conservation
Advisory Council

Art DePasqua
Town of Clinton Planning
Board

Bill Dickett
Town of Clinton

Edna Lachmund
Town of Clinton Zoning Board
of Appeals

Joseph Malcarne
Town of Clinton Zoning Board
of Appeals

Barbara Mansell
Town of Clinton Conservation
Advisory Council

Thomas Myers
Town of Clinton Planning Board

Bob Messerich
Town of Clinton Conservation
Advisory Council

Karl Muggenberg
Town of Clinton Zoning Board of
Appeals

Andrew Papp
Town of Clinton Conservation
Advisory Council

Bill Relyea
Town of Clinton

George Sanderson
Town of Clinton

June Sanderson
Town of Clinton

Eileen Sassman
Chair, Wappinger Creek Watershed
Intermunicipal Council

Barbara Seelbach
Town of Clinton Town Board

Theron Tompkins
Town of Clinton Highway Supt.

Joel Tyner
Dutchess County Legislator

Carol Valentine
Town of Clinton

Tresa Veitia
Town of Clinton Planning Board

Arthur Weiland
Town of Clinton Zoning Board of
Appeals

Eliot Werner
Town of Clinton Planning Board

Lynette Wacker
Dutchess County Department of
Planning & Development

Barbara Kendall, Facilitator
NYS Department of Environmental
Conservation Hudson River Estuary
Program

David Burns, Facilitator
Dutchess County Environmental
Management Council

Sky Shook, Facilitator
Student Conservation Association

Recommended Model Development Principles

Through a consensus process, members of the Town of Clinton Site Planning Roundtable adapted 19 out of 22 Better Site Design Principles to meet the needs and current conditions within the Town of Clinton. Roundtable recommendations include specific code and ordinance revisions for 13 of the Principles that would increase flexibility in site design standards and support the implementation of environmentally beneficial practices in accordance with the Town's current zoning and subdivision laws. The Principles are divided into two categories: Residential Streets, Parking and Lot Development; and Conservation of Natural Areas.

Residential Streets, Parking and Lot Development

Principle #1: Street Width

Design residential streets for the minimum required pavement width needed to support travel lanes; on-street parking; and emergency, maintenance and service vehicle access. These widths should be based on traffic volume.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

1. The Town of Clinton should reduce the minimum required street pavement width for new subdivision roads to 20 feet.
2. New subdivision roads should include shoulders designed to Town Highway Specifications or American Association of State Highway and Transportation Officials (AASHTO) standards that are a minimum width of 3 feet on each side, or unpaved gravel or grass shoulders 5 feet wide where needed for snow removal and drainage, to be determined at the discretion of the Highway Superintendent.

Rationale

Residential streets are often unnecessarily wide and these excessive widths contribute to the largest single component of impervious cover in a subdivision (Center for Watershed Protection, 1998). Narrower street widths not only reduce impervious cover, but also promote lower vehicular speeds and increased safety and can reduce construction and maintenance costs.

A minimum pavement width of 22 feet and shoulder width of 6 feet (each side) for rural/suburban roads is specified in the Town Highway Specifications for Dutchess County, which presently serve as the adopted highway specifications for the Town. The Town Highway Specifications for Dutchess County were last updated in 1976. The Town Highway Superintendent has the ability to differ from the County Specifications as long as the differing specifications are based on a nationally known standard. The

Cornell Local Roads Program and the Dutchess County Department of Public Works¹ recommend the standards published by the American Association of State Highway and Transportation Officials (AASHTO). The latest AASHTO standards for Local Roads and Streets (Rural Roads) of less than 400 average daily trips (AASHTO, 2004) allow for a total minimum width of the traveled way of 20 feet and shoulder width of 2 feet when the design speed is 50 mph or less (Fig. 1). Using 10-12 for the average daily trips (ADT) per house² and considering that most proposed subdivisions in the Town of Clinton are less than 20 lots, the ADT would range from 200 (10 trips x 20 lots = 200 trips) to 240 (12 trips x 20 lots = 240). Therefore ADT for new subdivisions will be well under the maximum of 400 for low volume local roads, supporting 20-foot road widths with 2-foot shoulders.

Figure 1. Minimum width of traveled way (feet) for specified design volume (vehicles per day)				
Design speed (miles per hour)	Under 400	400 to 1500	1500 to 2000	Over 2000
15	18	20 ¹	20	22
20	18	20 ¹	22	24 ³
25	18	20 ¹	22	24 ³
30	18	20 ¹	22	24 ³
40	18	20 ¹	22	24 ³
45	20	22	22	24 ³
50	20	22	22	24 ³
55	22	22	24 ³	24 ³
60	22	22	24 ³	24 ³
Width of graded shoulder on each side of road (feet)				
All speeds	2	5 ^{1,2}	6	8

¹ For roads in mountainous terrain with design volume of 400 to 600 vehicles/day, use 18-foot traveled way width and 2-foot shoulder width.

² May be adjusted to achieve a minimum roadway width of 30 feet for design speeds greater than 40 mph.

³ Where the width of the traveled way is shown as 24 feet, the width may remain at 22 feet on reconstructed highways where alignment and safety records are satisfactory.

From: *A Policy on Geometric Design of Highways and Streets*, (Exhibit 5-5. Minimum Width of Traveled Way and Shoulders) 2004, by the American Association of State Highway and Transportation Officials, Washington, D.C. Used by permission.

Principle #2: Street Length

Reduce total length of residential streets by examining alternative street layout to determine the best option for increasing the number of homes per unit length.

¹ Personal communication, Lynne Irwin, Director, Cornell Local Roads Program and Don Bartles, Jr., P.E., Dutchess County Department of Public Works.

² Personal communication, Chris Holme, Frederick P. Clark Associates, Town of Wappinger planning consultants.

Recommendation

The Roundtable supports this principle; however, no local code changes are recommended since the Town of Clinton Hamlet Design Guidelines, Appendix D of the Subdivision Regulations (Town of Clinton, 2000), provide enough support for the Planning Board to implement this principle.

Principle #3: Right-of-Way Width

Wherever possible, residential street right-of-way widths should reflect the minimum required to accommodate the travel-way, sidewalk, and vegetated open channels. Utilities and storm drains should be located in the right-of-way wherever feasible.

Recommendation

The Roundtable supports portions of this principle within the limitations of New York State Highway Law.

1. The Roundtable recommends that utilities in new subdivisions be required to install lines underground and to share one trench. Suggested language from the Town of Wappinger Subdivision Law: *“Underground utilities. In order to assure greater safety and improved appearance, all utility lines and related equipment for providing power and communication services shall be installed underground in the manner prescribed by the regulations of the utility company having jurisdiction.”*

2. The Roundtable recommends that the 50-foot minimum right-of-way width for new subdivision roads in the Town Highway Specifications be retained.

Rationale

Utility trenches: Underground utilities are safer and more aesthetically pleasing, and sharing one trench will reduce the clearing and disturbance necessary to install three separate utilities.

Right-of-way width: New York State Highway Law Article 8 §171 and §180 specify that a town highway³ must not be less than three rods in width (16.5 feet per rod x 3 rods = 49.5 feet). To reduce the three-rod requirement in NYS Highway Law a local government would need to petition the Commissioner of Transportation for a certificate stating that a reduced width was necessary (NYS Highway Law Article 8 §171). In addition, both town and county highway officials have emphasized that the 50 right-of-way is needed for snow removal, stormwater management and maintenance of the right-of-way. For these reasons the Roundtable recommends that the 50-foot minimum right of way be retained in the local highway specifications.

³ The definition of highway in NYS Highway Law Article 1 §2 includes drains, ditches, waterways, embankments, retaining walls and culverts. Therefore the definition of “highway” in NYS Highway Law encompasses the functions of the “right-of-way” as used in better site design.

Principle #4: Cul-de-Sacs

The use of residential cul-de-sac streets should be discouraged. Where cul-de-sac streets are necessary to protect natural resources, accommodate infill development, or best serve the community, they should incorporate innovative designs, such as landscaped islands and bioretention, in lieu of a fully paved turnaround. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

1. Language should be added to the subdivision regulations and town highway specifications stating that in addition to the cul-de-sac design in the Town Highway Specifications, other alternative cul-de-sac and turn-around designs may be approved by the Town of Clinton Planning Board and the Town Board upon the recommendations of the Town Highway Superintendent. Cul-de-sacs should be designed to meet, at a minimum, the most recent AASHTO standards for single-unit (SU) delivery trucks (AASHTO, 2004) (Fig. 2).
2. Installation of a vegetated center island in the cul-de-sac is encouraged to reduce impervious area, and, where feasible, applicants should design the island to include stormwater management practices, such as bioretention areas. The design of the bioretention area, including sizing and planting specifications, should follow the New York State Stormwater Management Design Manual (NYSDEC, 2001). Ownership and maintenance of the stormwater management practice should be approved by the Planning Board and included in the final plans and specifications.

Rationale

While the design of cul-de-sacs in the Town Highway Specifications currently meets Better Site Design size recommendations, alternatives and stormwater management practices are not encouraged in the code. The most recent AASHTO guidelines (the standard recommended by Dutchess County Department of Public Works) include dimensions for traditional and alternative cul-de-sac designs and include landscaped islands (AASHTO, 2004). Landscaped islands designed for stormwater management can be used for snow storage, stormwater infiltration, and stormwater treatment to reduce pollutant loading to adjacent waterways. The New York State Stormwater Management Design Manual includes the most recent research on design of stormwater management practices and is the technical standard required for developers under New York State stormwater regulations.

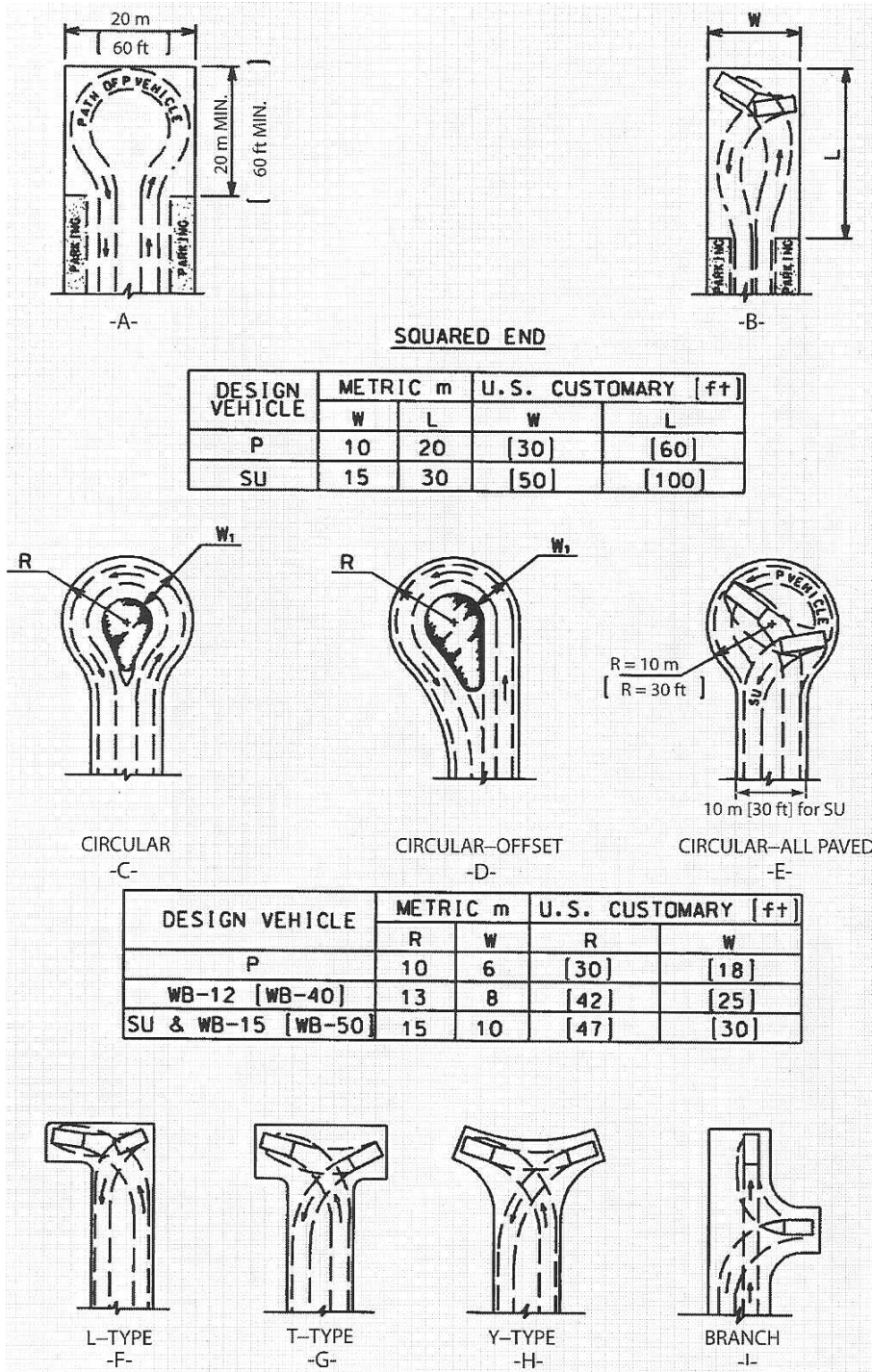


Figure 2. Types of Cul-de-sacs and Dead-End Streets
 From *A Policy on Geometric Design of Highways and Streets*, 2004, by the American Association of State Highway and Transportation Officials, Washington, D.C. Used by permission.

P = Passenger Car

SU = Single-Unit Truck

WB = Wheel Base - applies to semitrailer trucks

Principle #5: Vegetated Open Channels

Where density, topography, soils and slope permit, vegetated open channels should be used in the street right-of-way to convey and treat stormwater runoff.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

The Planning Board should encourage the use of vegetated swales where practical in new subdivisions and site plans. The Highway Superintendent should consider vegetated swales for use in highway projects. Swales should be designed according to the New York State Stormwater Management Design Manual (Fig. 3).

Rationale:

Vegetated swales are beneficial for treatment of stormwater runoff before it is discharged to stormwater management practices or local water resources. In residential developments, streets contribute higher loads of pollutants to stormwater than any other source area (Bannerman, et al., 1993 and Steuer, et al., 1997). Vegetated swales will reduce the pollutant load from adjacent streets by filtering stormwater as it moves through the grass-lined channel and by allowing infiltration into the ground where soils are suitable. Vegetated swales also reduce the volume of stormwater runoff generated from a source area before it is discharged to local waterbodies or other stormwater management practices. The New York State Stormwater Management Design Manual includes the most recent research on design of vegetated swales and is the technical standard required for developers under New York State stormwater regulations.

Principle #6: Parking Ratios

The required parking ratio governing a particular land use or activity should be enforced in order to curb excess parking space construction. Existing parking ratios should be reviewed for conformance taking into account local and national experience to see if lower ratios are warranted and feasible.

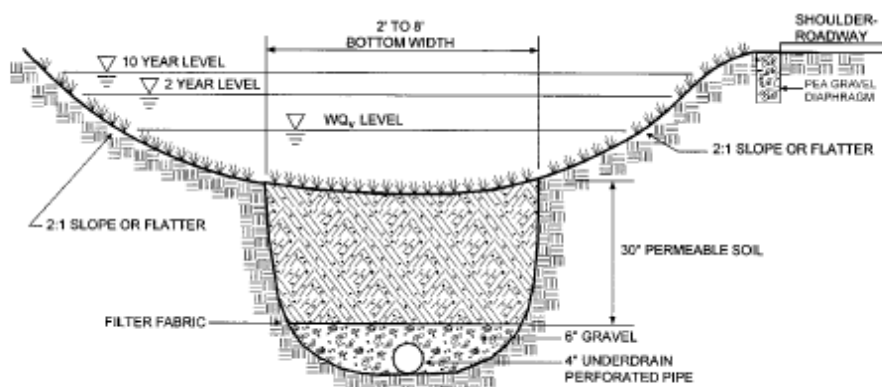


Figure 3. Dry Swale Cross-Section (NYSDEC, 2001)

The Roundtable felt that changes to the parking ratios in the zoning code were not needed because there is a limited amount of commercial development in the Town of Clinton. In addition, the zoning law already encourages reducing the size of parking spaces upon approval by the Planning Board, the Hamlet Design Guidelines are already being used by the Planning Board to limit parking where appropriate and shared parking is already supported in the zoning law, Sections 5.36.C.3 and 5.36 J. 1.

Recommendation to support current practice:

To further encourage the use of shared parking and ensure that maintenance responsibilities are carried out the Roundtable recommends that the Planning Board provide a Model Shared Parking Agreement to applicants (Appendix 1).

Principle #7: Parking Codes

Parking codes should be revised to lower parking requirements where mass transit is available or enforceable shared parking arrangements are made.

The Roundtable felt that changes in parking requirements were not needed since there are no mass transit facilities in the Town and shared parking is already supported in the zoning law (Sections 5.36.C.3 and 5.36 J. 1.).

Recommendation to support current practice:

To further encourage the use of shared parking and ensure that maintenance responsibilities are carried out the Roundtable recommends that the Planning Board provide a Model Shared Parking Agreement to applicants (Appendix 1).

Principle #8: Parking Lots

Reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

The Roundtable supports this principle; however the members felt that the present parking standards were sufficient to provide reduction of impervious surfaces in proposed development. Section 5.36.D.1 of the zoning law encourages reducing the size of parking spaces upon approval by the Planning Board, section 5.36.F.1. of the zoning law specifies that parking facilities should be built and maintained to reduce stormwater runoff impacts, and the Hamlet Design Guidelines encourage the use of permeable surfaces “wherever possible”.

Principle #9: Structured Parking

Provide meaningful incentives to encourage structured and shared parking to make it more economically viable.

The Roundtable felt that this Principle was not applicable to the Town of Clinton due to the limited amount of commercial development in the Town.

Principle #10: Parking Lot Runoff

Wherever possible, provide stormwater treatment for parking lot runoff using bioretention areas, filter strips, and/or other practices that can be integrated into required landscaping areas and traffic islands.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

1. The Planning Board should continue to encourage the integration of low-impact development practices (bioretention areas, swales, filter strips) into landscaped areas where appropriate to help manage and treat stormwater runoff. Properly engineered at-grade or depressed planting islands with gaps in the curbs should be encouraged to allow for stormwater treatment before discharging into the storm drain system, streams, wetlands or groundwater. Developers and engineers should be referred to the New York State Stormwater Management Design Manual for detailed specifications.
2. The Planning Board should continue to use Greenway Guides E-1 and E-3 (Dutchess County Department of Planning & Development, 2000) to provide standards for parking lot landscaping. Greenway Guide E-3 recommends that for larger parking lots, at least 15% of the inside area of parking lots be landscaped, and that a tree be installed for every 6 to 10 parking spaces. Rather than changing the zoning code to standardize parking lot landscaping recommendations, the Roundtable preferred to leave flexibility to the Planning Board to require various levels of landscaping and stormwater treatment practices in parking lots where appropriate and necessary, as is the practice now and is supported by section 5.34.C of the zoning law.

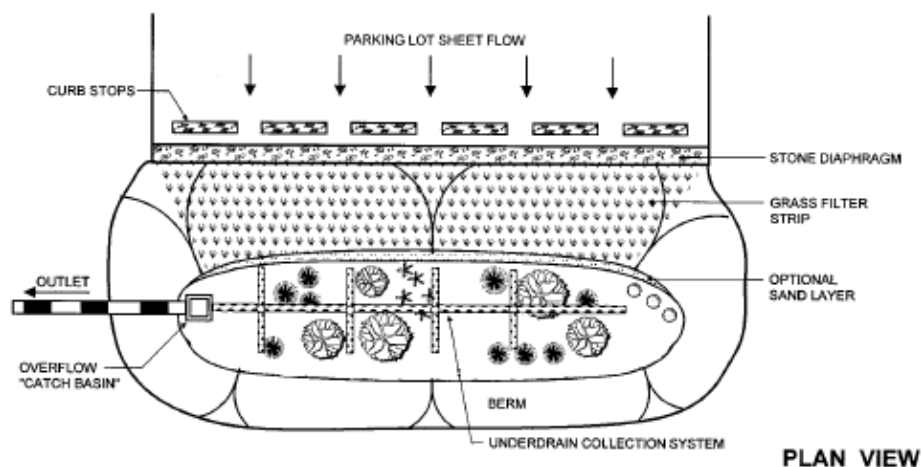


Figure 4. Bioretention Area (NYSDEC, 2001)

Rationale

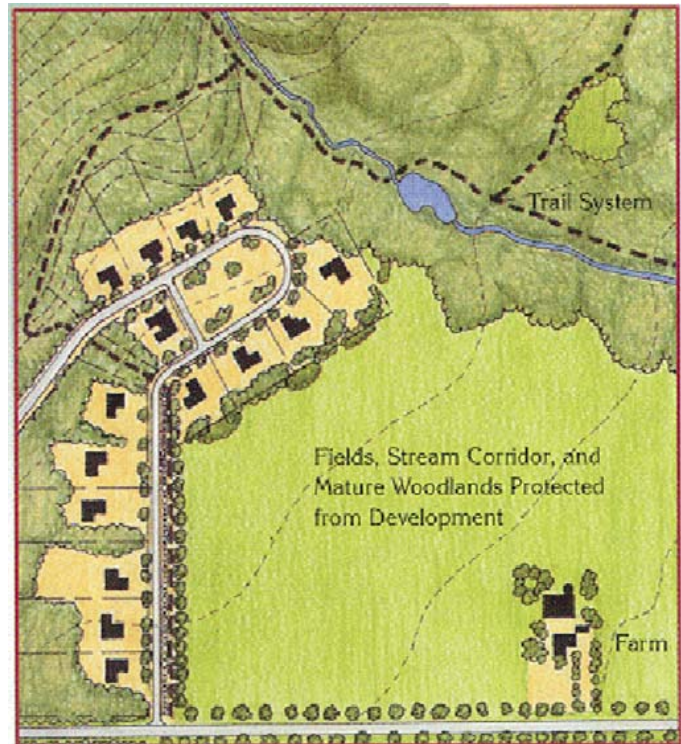
Parking lots generate high volumes of stormwater runoff and high levels of stormwater runoff contamination from pollutants deposited on the lot surface. Stormwater management practices designed and installed per current specifications (such as the New York State Stormwater Management Design Manual) can provide water quantity and water quality control.

Principle #11: Open Space Design

Advocate development that minimizes total impervious area, reduces infrastructure construction costs, conserves natural areas, provides community recreational space, and promotes watershed protection.

The Roundtable supports this principle, however the members felt that the present standards for open space and cluster subdivisions in Article V of the Subdivision Law and Sections 3.5 and 5.16 of the zoning law are more than adequate to encourage open space and cluster subdivision proposals that are appropriate for the Town of Clinton. The Planning Board presently considers “modified” cluster development that reflects the fact that Town has no water or sewer infrastructure, but will still meet the objectives of minimizing impervious area, conserving natural areas, providing community recreational space, and promoting watershed protection (Fig. 5).

Figure 5: Example of an Open Space or “Cluster” Subdivision (Dutchess County Dept. Planning & Development, 2000)



Principle #12: Setbacks and Frontages

Relax side-yard setbacks and allow narrower frontages to reduce total road length in the community and overall site imperviousness. Relax front-setback requirements to minimize driveway lengths and reduce overall lot imperviousness.

The Roundtable felt that this Principle was not applicable due to the rural character of the Town of Clinton. Changes to the zoning code related to setbacks and frontages are not necessary at this time since there are very few cluster subdivisions being proposed and 90% of the Town of Clinton is in 3- and 5-acre zoning districts.

Principle #13: Sidewalks

Promote more flexible design standards for residential subdivision sidewalks. Where practical, consider locating sidewalks on only one side of the street and providing common walkways linking pedestrian areas.

The Roundtable supports this principle; however the members felt that the present code language allows enough flexibility for the Planning Board to limit increases in impervious surface due to sidewalks. Section 70-2 of the Town Highway Specifications indicates specifications for sidewalks “wherever required.” Due to the rural nature of the Town of Clinton, the Planning Board rarely requires sidewalks and curb and gutter in most areas of the town, except in commercial hamlet areas for pedestrian safety. Section 14-E of the Subdivision regulations also provides flexibility by permitting the Planning Board to require pedestrian pathways (paved or non-paved) in a rural subdivision as an alternative to sidewalks.

Principle #14: Driveways

Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

The Roundtable members support this principle; however the members felt that the Subdivision Regulations Section 16.I provides the authority for the Planning Board to allow shared driveways where appropriate. Driveways are defined as “paved or unpaved” in the Subdivision Regulations, further encouraging reduction in impervious surfaces.

Recommendation to support current practice:

To further encourage the use of shared driveways and ensure that maintenance responsibilities are carried out the Roundtable recommends that the Planning Board provide a Model Shared Driveway Agreement to applicants (Appendix 2).

Principle #15: Open Space Management

Clearly specify how community open space will be managed and designate a sustainable legal entity responsible for managing both natural and recreational open space.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

The Town of Clinton Town Board should form a committee to explore potential updates to the Town of Clinton Subdivision Regulations and Zoning Law to further define allowable and unallowable uses of open space and open space management for open space and cluster development in all zoning districts. The committee should review provisions for open space management from other municipalities in New York State and other states, such as Vermont’s Scenic Ridgeline Protection Law. The committee should

explore ways to promote the consolidation of open space to preserve habitat corridors and create a network of interconnected protected open space.

Rationale

Open space management and the allowed uses in open space areas are not clearly defined in the Town of Clinton Subdivision Regulations and Zoning Law. Clearer regulations will lead to better management of these areas by the entity that is responsible, such as a local land trust or other non-profit organization, a homeowner's association, or other entities.

Principle #16: Rooftop Runoff

Encourage homeowners to direct rooftop runoff to pervious areas such as yards, open channels or vegetated areas.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

1. The Planning Board and Building Department should continue to encourage use of Section 70.9 of the Town Highway Specifications which presently supports discharge of rooftop runoff to pervious areas within an existing lot.
2. When development projects are proposed, local boards should encourage the use of on-lot stormwater treatment practices such as bioretention areas and rain gardens, infiltration practices, and rain barrels. Developers and engineers should be referred to the New York State Stormwater Management Design Manual for detailed specifications (Fig. 6). Management responsibility and management schedules for these on-lot stormwater practices should be included on the approved plans.

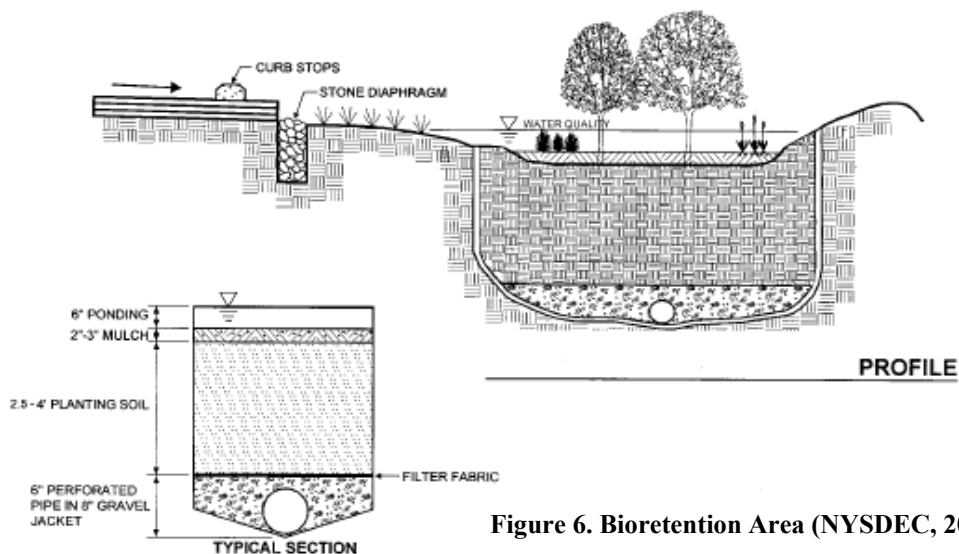


Figure 6. Bioretention Area (NYSDEC, 2001)

Rationale

Bioretention areas and “rain gardens” (a type of bioretention area), infiltration practices, and rain barrels installed on individual lots can result in a 50% annual reduction in runoff volume from residential development projects and can reduce the amount of pollutants entering local water resources (Pitt, 1987).

Conservation of Natural Areas

Principle #17: Buffer Systems

Create a naturally vegetated buffer system along all water resources that also encompasses critical environmental features and supports the Town’s commitment as a Greenway Community (Greenway Guide D2 (DCP&D, 2000)). The buffer system should be designed to protect the Town of Clinton’s water quality and quantity.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

1. The term “forested buffer” or “stream buffer” should be defined and included in appropriate places when the Town of Clinton Zoning Law is updated.
2. The Subcommittee recommends protecting wetlands down to a half-acre with an appropriate buffer. The definition of wetlands should be based on the Federal wetlands delineation manual (Environmental Laboratory, 1987).
3. Implement the provisions included in section 5.51 of the Town of Clinton Zoning Law, and train the Zoning Administrator for inspection of disturbed project sites near water resources. Section 5.51 of the Town of Clinton Zoning Law provides that certain activities taking place within 100 feet of a watercourse, lake, pond or DEC-regulated wetland may adversely affect those areas. Activities include but are not limited to, “Clearcutting of trees or vegetation, at once or over time, not regulated under Section 5.44, Soil Erosion & Sediment Control”; “Alteration or modification of natural features and contours or natural drainage patterns”; and “Any other activity that may impair the natural function(s) of a wetland, watercourse, lake, pond or floodplain.”
4. The Planning Board and Zoning Board of Appeals should require that buffers be shown on site plans, subdivision maps and special-use permit applications. For building permit applications, buffers should be shown where appropriate.
5. Forested buffers should be flagged during construction.

Rationale

Riparian buffers restore and maintain the chemical, physical and biological integrity of water resources such as streams, lakes, wetlands or vernal pools. The streamside vegetation in a forested buffer system shades the stream and keeps the water cool; and the tree roots help stabilize the stream banks. Trees use excess nutrients before they reach the stream, soil particles trap pollutants, and the organic soils remove nitrogen. Porous

grass-covered land within the buffer can increase infiltration and water storage, absorb nutrients, control concentrated runoff, and evenly spread surface flow. The benefits of riparian buffers can be summarized as follows:

Benefits of Riparian Buffer Protection

1. Filter sediments, nutrients (phosphorus and nitrogen), pesticides, and other pollutants in runoff.
2. Stabilize stream banks and bed, and reduce erosion.
3. Increase community-wide property values.
4. Provide shade, which helps keep summer water temperatures cool. This is of critical importance for native brook trout as well as the introduced brown trout. Together these species account for most of the recreational stream fishing in Dutchess County. The Marist College Bureau of Economic Research estimated that the Wappinger Creek contributes 1.2 million dollars annually to the Dutchess County economy in a normal water year (Black and Winne, 1998).
5. Provide food and habitat for terrestrial and aquatic life.
6. Reduce flood damage and flood damage claims.
7. Protect quality of drinking water supplies.
8. Help maintain stream flows in summer.
9. Provide linear natural areas which provide valuable habitat for mammals, reptiles, amphibians and birds.
10. Provide for infiltration of storm water runoff.
11. Support recreation and tourism industries by providing pleasant areas to fish and enjoy the streams.
12. Help maintain the "rural character" of Dutchess County.

Principle #18: Buffer Management

The riparian stream buffer should be preserved or restored with native vegetation. The buffer system should be maintained throughout the plan review, delineation, construction, and post-development stages.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

1. For all construction projects, the 100-foot buffer associated with a watercourse, lake, pond or DEC-regulated wetland, as specified in Section 5.51 of the zoning law, should be flagged prior to any land disturbance in order to show the equipment operators where to stop.
2. The committee recommends that for all Planning Board approvals, a pre-construction meeting with the Town Engineer be arranged prior to commencing construction.
3. For other approvals done directly through the Building Inspector, the Building Inspector should meet with the project owner prior to commencing construction. At this meeting the Town Engineer (for Planning Board approvals) or Building Inspector (for other approvals) would outline the buffer protections and ensure they are properly marked on site.

4. Educational funding should be included in the town budget to provide an annual mailing to new residents about the importance of forested buffers to the town's biological, aesthetic and water resources.
5. Information on forested buffers and requirements for delineation on plans and in the field should be available in the Town Hall and provided to developers and property owners that submit applications to the Planning Board and Building Department.
6. Town personnel should be trained on the importance of forested buffers and how to successfully implement the program.
7. Develop and implement a plan for more effective enforcement of existing regulations.

Rationale

In many communities that have stream buffer ordinances, the buffer is merely a line drawn on a map, which is virtually invisible to contractors and landowners. The key to effective preservation and management of a local buffer program is development of a strong buffer ordinance that outlines the legal rights and responsibilities of the local entity that is responsible for the long-term management of the buffer.

Principle #19: Clearing and Grading

Clearing and grading of forests and native vegetation at a site should be limited to the minimum amount needed to build lots, allow access, and provide fire protection. A fixed portion of any community open space should be managed as protected green space in a consolidated manner.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

1. The Town Board should review and consider proposed changes to the Town of Clinton code that relate to driveways which were presented to the Town Board in 2003.
2. Although mentioned in the Town of Clinton Zoning Law sections 5.34(c)(2), 5.44 and 5.51 (B)(2)(i); clearing and grading and tree preservation requirements should be clarified by requiring that the limits of clearing and grading be delineated both on project plans and in the field.
3. Site fingerprinting should be employed. Site Fingerprinting is a development approach using two main steps: 1) Environmentally sensitive areas (wetlands, streams, steep slopes), future open spaces, tree save areas, future restoration areas, and temporary and permanent vegetative forest buffer zones are shown on plans and delineated in the field (Fig. 8). 2) Ground disturbance is confined to areas where structures, roads, and rights-of-way will exist after construction is complete.
4. Low-impact development (LID) techniques (as defined below) should be encouraged within the building envelope.

Rationale

Conservation of natural areas and existing hydrology within a development site through site fingerprinting and LID techniques can reduce erosion and sedimentation as well as clearing and grading costs, while maintaining natural features of the site and protecting

environmentally sensitive areas. LID integrates site ecological and environmental goals and requirements into all phases of planning and design from the individual residential lot level to the entire watershed. LID is based on maintaining or restoring the hydrologic integrity and functions of each site by using small-scale source controls that are designed to address specific water quality objectives.

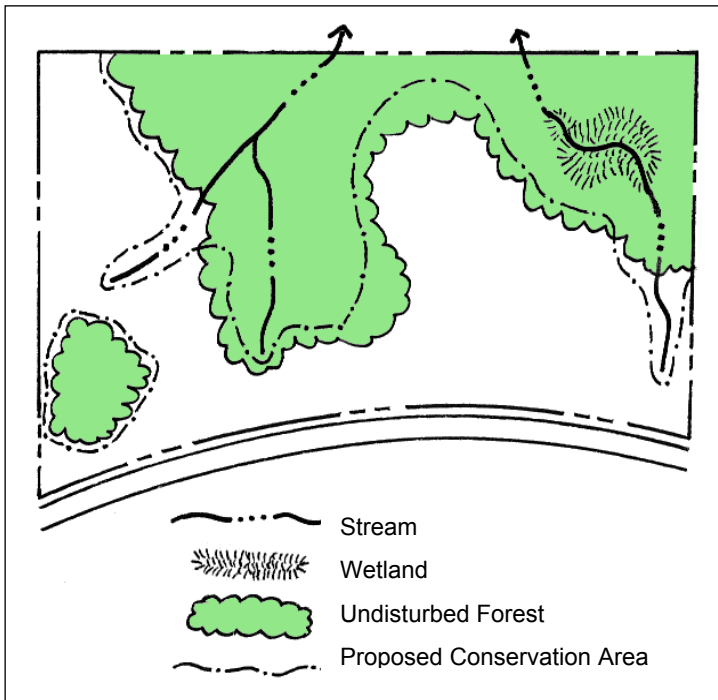


Figure 8. Site Fingerprinting (Source: Georgia Stormwater Manual, 2001)

Principle #20: Tree Conservation

Conserve trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native plants. Wherever practical, manage community open space, street right-of-way, parking lot islands, and other landscaped areas to promote natural vegetation.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

1. Provide an invasive species plant list to homeowners, developers and in education programs to discourage the incorporation of invasive and/or non-native species in landscaping design (for references see Appendix 4).
2. Develop and periodically update a list of native trees and shrubs for new plantings to homeowners, developers and in education programs. Appendix H of the New York State Stormwater Management Design Manual (SWDM) is one example of a native tree and shrub list (for a copy of SWDM Appendix H and additional references see Appendix 4 of this document).
3. Implement the recommendations outlined in Principle 19 (Clearing and Grading), such as site fingerprinting to encourage preservation of naturally forested areas.

Rationale

Native trees, shrubs and grasses are important contributors to the overall quality and viability of the environment. In addition, they can provide noticeable economic benefits to developers and homeowners.

Principle #21: Conservation Incentives

Incentives and flexibility in the form of open space and cluster development should be encouraged to promote conservation of stream buffers, forests, meadows, wetlands and other areas of environmental value.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

1. The Town of Clinton should promote conservation incentives. Two examples are Section 17.D of the Subdivision Regulations (payment in lieu of land reservation) and Resolution 15 of 2004 (Policy for Open Space Protection).
2. The Open Space Committee recommended in Principle #15 should explore development of flexible subdivision provisions that would be adopted as amendments to the zoning law Sections 5.16.A., 5.16.B., and 5.16.C.3. and Subdivision Regulations Article V (Cluster Development). These amendments would refer to NYS Town Law § 261-b (Incentive Zoning) and/or NYS Municipal Home Rule Law § 10(1)(ii)(d)(3) and § 22(1). See Appendix 3 - *Conservation Incentives Used in New York State* for more information on Incentive Zoning and Cluster Development.

Rationale

Incentives and flexibility are an effective way to promote adoption of conservation and protection measures. Flexible subdivisions allow units to be clustered on those portions of the property most suitable for development, while leaving substantial portions undeveloped as open space.

Principle #22: Stormwater Outfalls

Stormwater from development projects should be managed to reduce water quality and water quantity impacts to local water resources and important natural areas. New stormwater outfalls should not discharge unmanaged stormwater into wetlands regulated by federal, state or local government, sole-source aquifers, or other water bodies.

Recommendation

The Roundtable supports this principle and endorses the following recommendations:

1. Discharge of untreated stormwater from development projects to lakes, ponds, streams and wetlands should be prohibited. All construction site owners and operators should be reminded to file for coverage under New York State's SPDES General Permit for Stormwater Discharges from Construction Activity (GP-02-01) and submit the required Stormwater Pollution Prevention Plan (SWPPP) to the Town of Clinton when the proposed project disturbs one acre or more of soil.

2. Through the better site design (also known as LID) techniques recommended in this document, on-site stormwater infiltration should be encouraged and required where necessary.

Rationale

1. Pollutants in untreated stormwater can damage the natural ecological processes and resulting benefits of lakes, ponds, streams and wetlands. Under New York State's stormwater requirements for construction sites, discharge of untreated stormwater into Federal and State regulated wetlands is not allowed. New York State administers stormwater management requirements for construction projects that disturb more than one acre of soil through the SPDES General Permit for Stormwater Discharges from Construction Activity, GP-02-01. The Town of Clinton can contribute to this process by ensuring that all construction site owners and operators file for coverage under GP-02-01 and prepare the required Stormwater Pollution Prevention Plan (SWPPP). The site-specific SWPPP must include design and installation details for stormwater management practices such as wet ponds (Fig. 9), bioretention areas (Fig. 4&6), and swales (Fig. 3) that prevent discharge of untreated stormwater into jurisdictional wetlands during and after construction. In addition, the permit (GP-02-01) requires that the construction site owner or operator submit a copy of the SWPPP to the Town of Clinton, allowing for review by the Planning Board and Code Enforcement Officer.

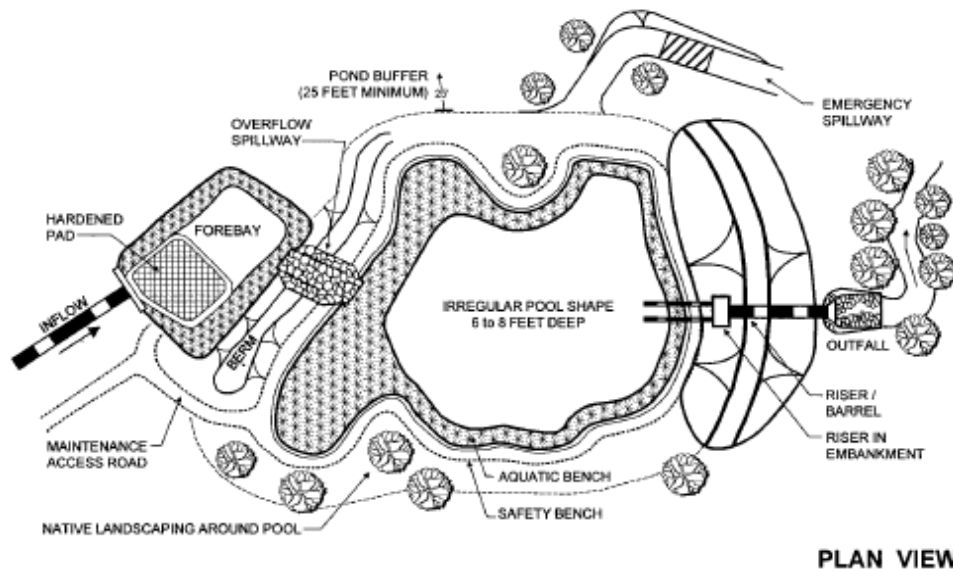


Figure 9. Wet Pond for Stormwater Management (NYSDEC, 2001)

2. Better site design (BSD), also known as LID, is an integrated management approach to landscape design and environmental protection that focuses on how the developed site is planned and designed to minimize hydrological impacts. BSD/LID techniques incorporate and go beyond stormwater management requirements by utilizing conservation design, riparian buffers and on-lot treatment measures such as rain-gardens and swales to reduce impervious area, increase infiltration and provide natural

stormwater treatment (Fig. 10). Where soils and land uses are suitable, infiltration of stormwater contributes to recharge of groundwater supplies.

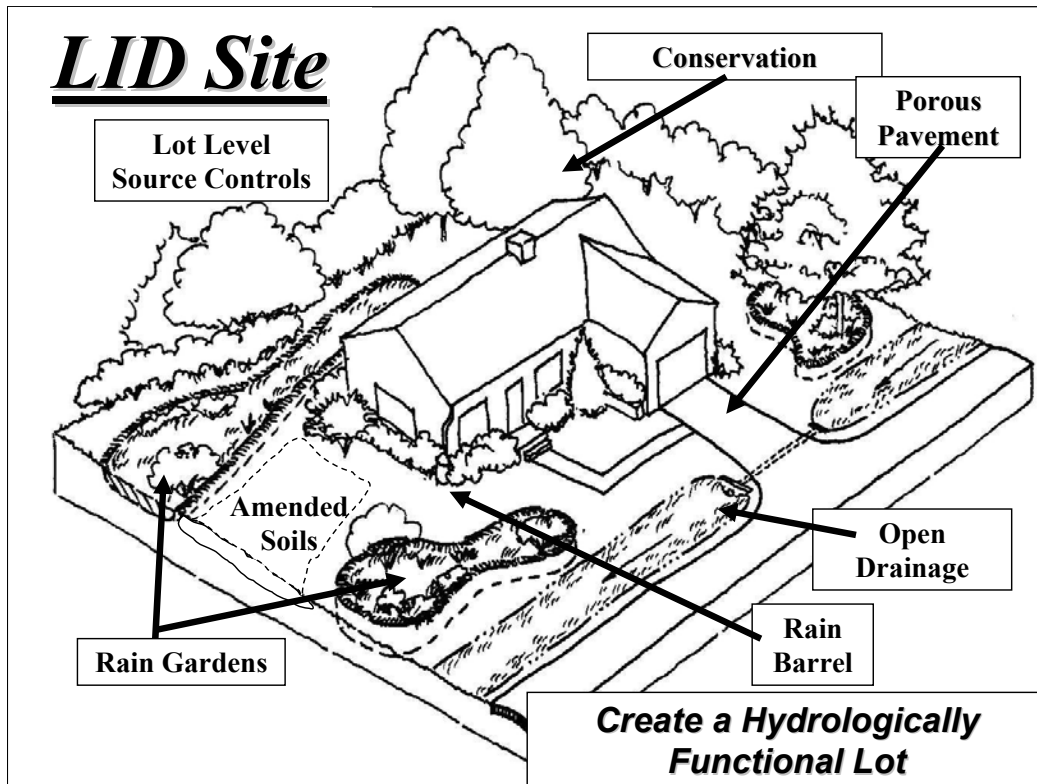


Figure 10. Residential Development using Low-Impact Development /Better Site Design Techniques (Coffman, 2003)

Appendix 1 – Model Shared Parking Agreements

Example 1: Model Legal Shared Parking Agreement

EASEMENT FOR SHARED PARKING

WHEREAS, the parties to the easement wish to take advantage of the shared parking provisions of Chapter _____ of the *(City, Town Village)* of _____ Municipal Code.

1. For consideration of Ten Dollars (\$10.00) paid in hand, present and future benefits to be derived by Grantor and other good and valuable consideration, receipt of which is hereby acknowledged, Grantor, _____,
(Name)
doing business as _____,
(Name)
hereby conveys and warrants to Grantee, _____,
(Name)
doing business as _____,
(Name)

its successors, heirs and assigns, a nonexclusive, perpetual easement for motor vehicle parking on the following described real property:

[Legal Description of Servient Estate]

situated in the *(City, Town Village)* of _____, _____ County, New York for the benefit of Grantee's property described as:

[Legal Description of Dominant Estate]

situated in the *(City, Town Village)* of _____, _____ County, New York.

Such parking easement shall be applicable only to the following parking lot(s) located on the above-described servient estate. *[Include a map or sketch of the lots or parking facilities applicable to this easement, should more than one exist upon the subject property.]*

SUBJECT TO THE FOLLOWING:

1. This easement shall not be altered or terminated without the express written permission of the *[Pick one but should match the local code language: Planning Board, Code Enforcement Officer]* of the *(City, Town, Village)* of _____ or his/her designee.

2. Grantor covenants that there are _____ (#) of motor vehicle parking spaces on the above-described property and that Grantor shall not decrease that number of parking spaces without the express written permission of the *[Pick one but should match the local code language: Planning Board, Code Enforcement Officer]* of the *(City, Town, Village)* of _____ or his/her designee.

3. Grantee shall post and maintain signage on the dominant and servient estates directing its customers and employees to parking.

4. Grantor may temporarily close the subject parking lot(s) for maintenance and repair. Cost of repair and maintenance shall be paid by _____.

5. Neither Grantee nor Grantor shall change, alter or expand the use of their respective properties described above so as to require additional parking under the provision of the *(City, Town, Village)* of _____ Municipal Code in excess of existing parking spaces without the express written permission of the *[Pick one but should match the local code language: Planning Board, Code Enforcement Officer]* or his/her designee.

DATED this _____ day of _____, 20__.

GRANTOR

(Signature)

(Print Name)

GRANTEE

(Signature)

(Print Name)

Adapted for New York from the *Better Site Design Handbook* (Center for Watershed Protection, 1998) and Wells, 1995.

Example 2: Model Shared Use Agreement for Parking Facilities

Effective: _____

This Shared Use Agreement for Parking Facilities, entered into this ___ day of _____, between _____, hereinafter called lessor and _____, hereinafter called lessee.

In consideration of the covenants herein, lessor agrees to share with lessee certain parking facilities, as is situated in the (*City, Town, Village*) of _____. County of _____ and State of _____, hereinafter called the facilities, described as:

[Include legal description of location and spaces to be shared here, and as shown on attachment 1 - map].

The facilities shall be shared commencing with the ___ day of _____, 20___, and ending at 11:59 PM on the _____ day of _____, 20___, for *[insert negotiated compensation figures, as appropriate]*. The lessee agrees to pay at *[insert payment address]* to lessor by the ___ day of each month *[or other payment arrangements]*. Lessor hereby represents that it hold legal title to the facilities.

The parties agree:

1. USE OF FACILITIES

Lessee shall have exclusive use of the facilities between the hours of ___ *[AM/PM]* _____ *[day]* through _____ *[AM/PM]* _____ *[day]*. Lessor shall have exclusive use of the facilities between the hours of *[AM/ PM]* _____ *[day]* through _____ *[AM/PM]* _____ *[day]*.

2. MAINTENANCE

Lessor shall provide, as reasonably necessary asphalt repair work. Lessee and Lessor agree to share striping, seal coating and lot sweeping at a 50%/50% mutual split based upon mutually accepted maintenance contracts with outside vendors. Lessor shall maintain lot and landscaping at or above the current condition, at no additional cost to the lessee. *[Revise as necessary to meet local needs]*

3. UTILITIES and TAXES

Lessor shall pay all taxes and utilities associated with the facilities, including maintenance of existing facility lighting as directed by standard safety practices. *[Revise as necessary to meet local needs]*

4. SIGNAGE

Lessee may provide signage, meeting with the written approval of lessor and the *[City, Town, Village]* of _____, designating usage allowances. *[Revise as necessary to meet local needs]*

1. ENFORCEMENT

Lessee may provide a surveillance officer(s) for parking safety and usage only for the period of its exclusive use. Lessee and lessor reserve the right to tow, at owners expense, vehicles improperly parked or abandoned. All towing shall be with the approval of the lessor. *[Revise as necessary to meet local needs]*

6. COOPERATION

Lessee and lessor agree to cooperate to the best of their abilities to mutually use the facilities without disrupting the other party. The parties agree to meet on occasion to work out any problems that may arise to the shared use.

7. INSURANCE

At their own expense, lessor and lessee agree to maintain liability insurance for the facilities as is standard for their own business usage. *[Revise as necessary to meet local needs]*

8. INDEMNIFICATION

[This section should describe indemnification as applicable and negotiated. Legal counsel should be consulted for appropriate language to every agreement].

9. TERMINATION

If lessor transfers ownership, or if part or all of the facilities are condemned, or access to the facilities is changed or limited, lessee may, in its sole discretion, terminate this agreement without further liability by giving Lessor not less than 60 days prior written notice. Upon termination of this agreement, Lessee agrees to remove all signage and repair damage due to excessive use or abuse. Lessor agrees to give lessee the right of first refusal on subsequent renewal of this agreement. *[Revise as necessary to meet local needs]*

10. SUPPLEMENTAL COVENANTS

[This section should contain any additional covenants, rights, responsibilities and/or agreements.]

IN WITNESS WHEREOF, the parties have executed this Agreement as of the Effective Date Set forth at the outset hereof.

[Signature and notarization as appropriate to a legal document and as appropriate to recording process negotiated between parties.]

Adapted for New York from the Model – Shared Use Agreement for Parking Facilities developed by Stein Engineering, 1997, in the document: *Model Zoning Regulations for Parking for Northwest Connecticut, Northwest Connecticut Parking Study – Phase II*. Northwestern Connecticut Council of Governments, 2003.

Appendix 2 - Model Shared Driveway Agreement

SHARED DRIVEWAY AND MAINTENANCE AGREEMENT

Background of Agreement

Users are owners of adjacent properties in the *(City, Town, Village)* of _____. New York. User One: _____ is owner of the property at _____ (address) _____ (tax parcel number). User Two: _____ is owner of the property at _____ (address) _____ (tax parcel number). The Users own properties that abut each other and have access from _____. There is a driveway that serves both properties. The Users have determined that it is in their mutual interest to have executed and recorded an agreement for sharing the costs of maintenance and repair of the driveway. The purpose of this Agreement is to place into writing the mutual rights and obligations of the Users of the jointly used driveway.

Agreement

NOW THEREFORE, in consideration of their mutual promises and intending to be legally bound, the Users (parties) agree as follows:

1. **Grant of Easement.** Each party grants to the other a permanent easement over and across their respective properties for the purpose in ingress and egress to their adjoining properties.

2. **Sharing of Costs and Expenses.** The parties shall share the expenses as follows: _____, his/her successors and assigns shall pay one-half of the maintenance and repair of the driveway that is jointly used. _____, their successors and assigns shall pay one-half of the costs of maintenance and repair of the jointly used driveway that is used solely by them.

3. **Binding Effect.** This Shared Driveway Agreement shall not be modified except in writing signed by the parties, their successors or assigns. This Agreement and its obligations and benefits shall run with the land and shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns.

This Agreement dated this _____ day of _____, 20__.

(Signature – User One)

(Print Name – User One)

(Signature – User Two)

(Print Name – User Two)

Adapted for New York from the Township of Halfmoon, Centre County, Pennsylvania.

Appendix 3 - Conservation Incentives Used in New York State

1. Open Space Development and Density Bonuses

- Enabling legislation in New York State:
 - Incentive Zoning – “A system of zoning incentives to land developers in exchange for the provision of community benefits by those developers,”¹ such as open space or parks, affordable housing, day care or elder care. The developer is allowed to build a greater number of homes than otherwise permitted by the zoning law. To implement, the local legislature (Town Board, Village Board of Trustees, City Council) must show that the adoption of incentive zoning in certain zoning districts is still in conformance with the comprehensive plan; districts must be designated in the zoning map; the local legislature must find that each of the districts have the capacity to absorb the development, as well as other requirements. NYS Town Law § 261-b, NYS Village Law § 7-703, NYS General City Law § 81-d
 - Cluster Development – A subdivision “in which the applicable zoning ordinance or local law is modified to provide an alternative permitted method for the layout and design of lots, infrastructure, parks and landscaping “in order to preserve the natural and scenic qualities of open lands.”² Cluster development “may not allow greater density than if the land were subdivided into lots conforming to the minimum lot size and density of the zoning district in which the property is located.”³ NYS Town Law § 278, NYS Village Law § 7-738, NYS General City Law § 37.
 - Local governments also have separate authority in NYS Municipal Home Rule Law to supersede or “go beyond” general state law statutes for zoning, subdivision or the cluster and incentive zoning provisions cited above. These provisions allowed for incentive zoning even before the Incentive Zoning provisions were adopted in the early 1990's into NYS Town, Village and City Law. NYS Municipal Home Rule Law § 10(1)(ii)(d)(3) (Authority) and § 22(1) (Procedures).
 - Implementation - Common provisions incorporated in the zoning law –
 - Increased density allowed on one portion of a site in exchange for protected open space elsewhere on the site (usually 50% open space required)
 - Zoning law specifies which districts open space development is allowed in and the standards for this type of development (By-right), therefore additional variances or approvals beyond the normal process are not required.

2. Transfer of Development Rights (TDR)

¹Well-Founded: Shaping the Destiny of the Empire State by John R. Nolon, 1999.

² Well-Founded: Shaping the Destiny of the Empire State by John R. Nolon, 1999.

³ Well-Founded: Shaping the Destiny of the Empire State by John R. Nolon, 1999.

- Enabling legislation in New York State:
 - Transfer of Development Rights – “The process by which development rights are transferred from one lot, parcel, or area of land in a sending district to another lot, parcel, or area of land in one or more receiving districts.”⁴ The local legislature must identify the “sending district” and “receiving district.” The purpose is to protect the natural, scenic or agricultural qualities of open lands, to enhance special sites, and encourage flexibility of design. TDR potentially allows a community to grow in a more cost-effective manner. Town Law § 261-a, Village Law § 7-701, General City Law § 20-f.
 - Local governments also have separate authority in NYS Municipal Home Rule Law to supersede or “go beyond” general state law statutes for zoning, subdivision or the TDR provision cited above. These provisions allowed for TDR even before the TDR provisions were adopted in the early 1990's into NYS Town, Village and City Law. NYS Municipal Home Rule Law § 10(1)(ii)(d)(3) (Authority) and § 22(1) (Procedures).

3. Reduced stormwater management requirements for environmentally sensitive development – “Stormwater Credits”

- New York State Regulation – NYSDEC requires preparation of a full stormwater pollution prevention plan (SWPPP) under SPDES General Permit GP-02-01 at multi-family, commercial, industrial, and institutional project development sites that disturb one acre or more of soil; and single-family home project development sites and subdivisions that disturb five or more acres of soil. Single-family home projects between one and five acres require a basic SWPPP (erosion and sediment control only) unless they are in certain watersheds, in which case the project requires a full SWPPP. The required minimum technical standards for stormwater practice design are in the New York State Stormwater Management Design Manual (SWDM). NYSDEC has also developed a “Stormwater Credits” guidance document. The “Stormwater Credits” document provides suggested guidance to developers and engineers, and state and local agencies to allow for reduced stormwater sizing requirements when certain techniques are used:
 - Natural Area Conservation
 - Stream and Wetland Buffers
 - Vegetated Open Channels
 - Overland Flow Filtration to Groundwater Recharge Zones
 - Environmentally Sensitive Rural Development
 - Riparian Reforestation
- Local Regulation – Some municipalities in New York State already have in place Stormwater Management ordinances or local laws. If municipalities do not have a Stormwater Management local law, or if the municipality is interested in updating existing Stormwater Management local laws, it is recommended that the “Sample Stormwater Management and Erosion and Sediment Control Local Law” developed by NYSDEC and NYS Department of State be adopted as amendments to zoning, site plan, and subdivision laws. This Sample Law takes into account the EPA and NYSDEC

⁴ Well-Founded: Shaping the Destiny of the Empire State by John R. Nolon, 1999.

Stormwater Phase II requirements and uses the NYSDEC Stormwater Management Design Manual as the technical standards for the local law. To incorporate stormwater credits that promote low-impact site design, local governments are encouraged to adopt all or portions of the “Stormwater Credits” document mentioned above as part of a local stormwater management law.

4. Property Tax Reduction

- Local governments may consider reducing property tax assessments for wetland property to encourage wetland protection. For wetlands regulated under the NYS Freshwater Wetlands Act, Section 24-0905 of the Act (Tax Abatement), states:
 - *“Any freshwater wetland subject to land-use regulations pursuant to section 24-09-3 of this article or subject of a cooperative agreement pursuant to section 24-0901 of this article shall be deemed subject to a limitation on the use of such wetlands for the purpose of property tax evaluation in the same manner as if an easement or right had been acquired pursuant to the general municipal law. Assessment value shall be based during the duration of such agreement or regulations on the uses remaining to the owner thereof.”*

While Section 24-0905 does not provide a direct tax exemption, it does recognize that the constraints of the NYS Freshwater Wetlands Act may influence allowed land use which should be a consideration during real property valuation. See the NYSDEC publication, “Wetlands and Real Property Valuation: What does it mean for your property taxes?” for more information.

- NYS Forest Tax Law, Section 480-A of the Real Property Tax Law, provides landowners with 50 or more acres of forest land with a reduced assessment and potential property tax exemption. Section 480-A requires that a forest management plan prepared by a qualified forester be prepared and that the land remain in forest management for 10 years.

Appendix 4 - Plant Lists

Invasive Species Plant Lists

The following websites provide invasive species plant lists for New York State:

United States Department of Agriculture –
http://plants.usda.gov/cgi_bin/noxious.cgi#state

Brooklyn Botanic Garden –
http://www.bbg.org/gar2/pestalerts/invasives/worst_nym.html

Invasive Plant Council of NYS –
<http://www.ipcnys.ene.com/sections/about/>

New York State Invasive Species Task Force –
<http://www.dec.state.ny.us/website/dfwmr/habitat/istf/index.html#Final>

Native Plant Lists

Table H.5. *Native Plant Guide for Stormwater Management Areas (NY)* from Appendix H of the New York State Stormwater Management Design Manual is provided in this document (SEE NEXT PAGE) and may also be found on the following website:
<http://www.dec.state.ny.us/website/dow/toolbox/swmanual/#Downloads>

Additional sources of native plant lists can be found at the New York State Department of Transportation website:
<http://www.fhwa.dot.gov/environment/rdsduse/ny.htm>

Table H.5 Native Plant Guide for Stormwater Management Areas (NY)

Plant Name	Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
Trees and Shrubs						
American Elm <i>(Ulmus americana)</i>	4,5,6	Dec. Tree	yes	Irregular-seasonal saturation	High. Food (seeds, browsin g), cover, nesting for birds & mammals	Susceptible to disease (short-lived). Sun to full shade, tolerates drought and wind/ice damage.
Arrowwood Viburnum <i>(Viburnum dentatum)</i>	3,4	Dec. Shrub	yes	yes	High. Songbirds and mammals	Grows best in sun to partial shade
Bald Cypress <i>(Taxodium distichum)</i>	3,4	Dec. Tree	yes	yes	Little food value, but good perching site for waterfowl	Forested Coastal Plain. North of normal range. Tolerates drought.
Bayberry <i>(Myrica pensylvanica)</i>	4,5,6	Dec. Shrub	yes	yes	High. Nesting, food, cover. Berries last into winter	Coastal Plain only. Roots fix N ₂ Tolerates slightly acidic soils.
Black Ash <i>(Fraxinus nigra)</i>	3,4,5	Dec. Tree	yes	Irregular-seasonal saturation	High. Food (seeds, sap), cover, nesting for birds & mammals. Fruit persists in winter	Rapid growth. Requires full sun. Susceptible to wind/ice damage & disease. Tolerates drought and infrequent flooding by salt water.
Black Cherry <i>(Prunus serotina)</i>	5,6	Dec. Tree	yes	no	High. Food	Moist soils or wet bottomland areas
Blackgum or Sourgum <i>(Nyssa sylvatica)</i>	4,5,6	Dec. Tree	yes	yes	High. Songbirds, egrets, herons, raccoons, owls	Can be difficult to transplant. Prefers sun to partial shade
Black Willow <i>(Salix nigra)</i>	3,4,5	Dec. Tree	yes	yes	High. Browsing and cavity nesters.	Rapid growth, stabilizes stream-banks. Full sun
Buttonbush <i>(Cephalanthus occidentalis)</i>	2,3,4,5	Dec. Shrub	yes	yes	High. Ducks and shorebirds. Seeds, nectar and nesting.	Full sun to partial shade. Will grow in dry areas.
Common Spice Bush <i>(Lindera benzoin)</i>	3,4,5	Dec. Shrub	yes	yes	Very high. Songbirds	Shade and rich soils. Tolerates acidic soils. Good understory species

Table H.5 Native Plant Guide for Stormwater Management Areas (NY)

Plant Name	Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
Eastern Cottonwood (<i>Populus deltoides</i>)	4,5	Dec. Tree	yes	yes	Moderate. Cover, food.	Shallow rooted, subject to windthrow. Invasive roots. Rapid growth.
Eastern Hemlock (<i>Tsuga canadensis</i>)	5,6	Conif. Tree	yes	yes	Moderate. Mostly cover and some food	Tolerates all sun/shade conditions. Tolerates acidic soil.
Eastern Red Cedar (<i>Juniperus virginiana</i>)	4,5,6	Conif. Tree	yes	no	High. Fruit for birds. Some cover.	Full sun to partial shade. Common in wetlands, shrub bogs and edge of stream
Elderberry (<i>Sambucus canadensis</i>)	3,4,5,6	Dec. Shrub	yes	yes	Extremely high. Food and cover, birds and mammals.	Full sun to partial shade.
Green Ash, Red Ash (<i>Fraxinus pennsylvania</i>)	4,5	Dec. Tree	yes	yes	Moderate. Songbirds.	Rapid growing streambank stabilizer. Full sun to partial shade.
Hackberry (<i>Celtis occidentalis</i>)	5,6	Dec. Tree	yes	some	High. Food and cover	Full sun to partial shade.
Larch, Tamarack (<i>Larix laricina</i>)	3,4	Conif. Tree	no	yes	Low. Nest tree and seeds.	Rapid initial growth. Full sun, acidic boggy soil.
Pin Oak (<i>Quercus palustris</i>)	3,4,5,6	Dec. Tree	yes	yes	High. Tolerates acidic soil	Gypsy moth target. Prefers well drained, sandy soils.
Red Choke Berry (<i>Pyrus arbutifolia</i>)	3,4,5	Dec. Shrub	no	yes	Moderate. Songbirds.	Bank stabilizer. Partial sun.
Red Maple (<i>Acer rubrum</i>)	3,4,5,6	Dec. Tree	yes	yes	High seeds and browse. Tolerates acidic soil.	Rapid growth.
River Birch (<i>Betula nigra</i>)	3,4,5	Dec. Tree	yes	yes	Low. Good for cavity nesters.	Bank erosion control. Full sun.
Shadowbush, Serviceberry (<i>Amelanchier</i>)	4,5,6	Dec. Shrub	yes	yes	High. Nesting, cover, food. Birds and	Prefers partial shade. Common in forested

Table H.5 Native Plant Guide for Stormwater Management Areas (NY)

Plant Name	Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
<i>canadensis</i>					mammals.	wetlands and upland woods.
Silky Dogwood (<i>Cornus amomium</i>)	3,4,5	Dec. Shrub	yes	yes	High. Songbirds, mammals.	Shade and drought tolerant. Good bank stabilizer.
Slippery Elm (<i>Ulmus rubra</i>)	3,4,5	Dec. Tree	rare	yes	High. Food (seeds, buds) for birds & mammals (browse). Nesting	Rapid growth, no salinity tolerance. Tolerant to shade and drought.
Smooth Alder (<i>Alnus serrulata</i>)	3,4,5	Dec. Tree	no	yes	High. Food, cover.	Rapid growth. Stabilizes streambanks.
Speckled Alder (<i>Alnus rugosa</i>)	3,4	Dec. Shrub	yes	yes	High. Cover, browse for deer, seeds for bird.	
Swamp White Oak (<i>Quercus bicolor</i>)	3,4,5	Dec. Tree	yes	yes	High. Mast	Full sun to partial shade. Good bottomland tree.
Swamp Rose (<i>Rosa Palustris</i>)	3,4	Dec. Shrub		Irregular, seasonal, or regularly saturated	High. Food (hips) for birds including turkey, ruffed grouse and mammals. Fox cover.	Prefers full sun. Easy to establish. Low salt tolerance.
Sweetgum (<i>Liquidambar styraciflua</i>)	4,5,6	Dec. Tree	yes	yes	Moderate. Songbirds	Tolerates acid or clay soils. Sun to partial shade.
Sycamore (<i>Platanus occidentalis</i>)	4,5,6,	Dec. Tree	yes	yes	Low. Food, cavities for nesting.	Rapid growth. Common in floodplains and alluvial woodlands.
Tulip Tree (<i>Liriodendron tulipifera</i>)	5,6	Dec. Tree	yes	no	Moderate. Seeds and nest sites	Full sun to partial shade. Well drained soils. Rapid growth.
Tupelo (<i>Nyssa sylvatica vari biflora</i>)	3,4,5	Dec. Tree	yes	yes	High. Seeds and nest sites	Ornamental

Table H.5 Native Plant Guide for Stormwater Management Areas (NY)

Plant Name	Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
White Ash (<i>Fraxinus americana</i>)	5,6	Dec. Tree	yes	no	High. Food	All sunlight conditions. Well drained soils.
Winterberry (<i>Ilex verticillata</i>)	3,4,5	Dec. Shrub	yes	yes	High. Cover and fruit for birds. Holds berries into winter.	Full sun to partial shade. Seasonally flooded areas.
Witch Hazel (<i>Hamamelis virginiana</i>)	4,5	Dec. Shrub	yes	no	Low. Food for squirrels, deer, and ruffed grouse.	Prefers shade. Ornamental.
Herbaceous Plants						
Arrow arum (<i>Peltandra virginica</i>)	2,3	Emergent	yes	up to 1 ft.	High. Berries are eaten by wood ducks.	Full sun to partial shade.
Arrowhead, Duck Potato (<i>Sagittaria latifolia</i>)	2,3	Emergent	yes	up to 1 ft.	Moderate. Tubers and seeds eaten by ducks.	Aggressive colonizer.
Big Bluestem (<i>Andropogon gerardi</i>)	4,5	Perimeter	yes	Irregular or seasonal inundation.	High. Seeds for songbirds. Food for deer	Requires full sun.
Birdfoot deervetch (<i>Lotus Corniculatus</i>)	4,5,6	Perimeter	yes	Infrequent inundation	High. Food for birds.	Full sun. Nitrogen fixer.
Blue Flag Iris (<i>Iris versicolor</i>)	2,3	Emergent	yes	Regular or permanently, up to ½ ft or saturated	Moderate. Food muskrat and wildfowl. Cover, marshbirds	Slow growth. Full sun to partial shade. Tolerates clay. Fresh to moderately brackish water.
Blue Joint (<i>Calamagrotis canadensis</i>)	2,3,4	Emergent	yes	Regular or permanent inundation up to 0.5 ft.	Moderate. Food for game birds and moose.	Tolerates partial shade
Broomsedge (<i>Andropogon virginicus</i>)	2,3	Perimeter	yes	up to 3 in.	High. Songbirds and browsers. Winter food and cover.	Tolerant of fluctuation water levels & partial shade.
Bushy Beardgrass (<i>Andropogon glomeratus</i>)	2,3	Emergent	yes	up to 1 ft.		Requires full sun.
Cardinal flower (<i>Lobelia cardinalis</i>)	4,5,6	Perimeter	yes	Some. Tolerates saturation up to 100% of season.	High. Nectar for hummingbird, oriole, butterflies.	Tolerates partial shade

Table H.5 Native Plant Guide for Stormwater Management Areas (NY)

Plant Name	Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
Cattail (<i>Typha sp.</i>)	2,3	Emergent	yes	up to 1 ft.	Low. Except as cover	Aggressive. May eliminate other species. Volunteer. High pollutant treatment
Coontail (<i>Ceratophyllum demersum</i>)	1	Submergent	no	yes	Low food value. Good habitat and shelter for fish and invertebrates.	Free floating SAV. Shade tolerant. Rapid growth.
Common Three-Square (<i>Scirpus pungens</i>)	2	Emergent	yes	up to 6 in.	High. Seeds, cover. Waterfowl and fish.	High metal removal.
Duckweed (<i>Lemna sp.</i>)	1,2	Submergent/ Emergent	yes	yes	High. Food for waterfowl and fish.	High metal removal.
Fowl mannagrass (<i>Glyceria striata</i>)	4,5	Perimeter	yes	Irregular or seasonal inundation	High. Food for waterfowl, muskrat, and deer.	Partial to full shade.
Hardstem Bulrush (<i>Scirpus acutus</i>)	2	Emergent	yes	up to 3 ft.	High. Cover, food (achenes, rhizomes) ducks, geese, muskrat, fish. Nesting for bluegill and bass.	Quick to establish, fresh to brackish. Good for sediment stabilization and erosion control.
Giant Burreed (<i>Sparganium eurycarpum</i>)	2,3	Emergent	rare	Regular to permanently inundated. up to 1 ft.	High. Food (seeds, plant) waterfowl, beaver & other mammals. Cover for marshbirds, waterfowl.	Rapid spreading. Tolerates partial sun. Good for shoreline stabilization.. Salinity <0.5 ppt
Lizard's Tail (<i>Saururus cernuus</i>)	2	Emergent	yes	up to 1 ft.	Low, except wood ducks.	Rapid growth. Shade tolerant
Long-leaved Pond Weed (<i>Potamogeton nodosus</i>)	1,2	Rooted submerged aquatic	yes	up to 1-6 ft. depending on turbidity	High. Food (seeds, roots) waterfowl, aquatic fur-bearers, deer, moose. Habitat for fish	Rapid spread. Salinity <0.5 ppt. Flowers float on surface, Aug.-Sept.

Table H.5 Native Plant Guide for Stormwater Management Areas (NY)

Plant Name	Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
Marsh Hibiscus (<i>Hibiscus moscheutos</i>)	2,3	Emergent	yes	up to 3 in.	Low. Nectar.	Full sun. Can tolerate periodic dryness.
Pickernelweed (<i>Pontederia cordata</i>)	2,3	Emergent	yes	up to 1 ft.	Moderate. Ducks. Nectar for butterflies.	Full sun to partial shade.
Pond Weed, Sago (<i>Potamogeton pectinatus</i>)	1	Submergent	yes	yes	Extremely high. Waterfowl, marsh and shorebirds.	Removes heavy metals.
Redtop (<i>Agrostis alba</i>)	3,4,5	Perimeter	yes	Up to 25% of season	Moderate. Rabbits and some birds.	Quickly established but not highly competitive.
Rice Cutgrass (<i>Leersia oryzoides</i>)	2,3	Emergent	yes	up to 3 in.	High. Food and cover.	Full sun although tolerant of shade. Shoreline stabilization.
Sedges (<i>Carex spp.</i>)	2,3	Emergent	yes	up to 3 in.	High waterfowl, songbirds.	Many wetland and upland species.
Tufted Hairgrass (<i>Deschampsia caespitosa</i>)	3,4,5	Perimeter	yes	Regular to irregular inundation.	High.	Full sun. May become invasive.
Soft-stem Bulrush (<i>Scirpus validus</i>)	2,3	Emergent	yes	up to 1 ft.	Moderate. Good cover and food.	Full sun. Aggressive colonizer. High pollutant removal.
Smartweed (<i>Polygonum spp.</i>)	2,3,4	Emergent	yes	up to 1 ft.	High. Waterfowl, songbirds. Seeds and cover.	Fast colonizer. Avoid weedy aliens such as <i>P. perfoliatum</i> .
Soft Rush (<i>Juncus effusus</i>)	2,3,4	Emergent	yes	up to 3 in.	Moderate.	Tolerates wet or dry conditions.
Spatterdock (<i>Nuphar luteum</i>)	2	Emergent	yes	up to 3 ft.	Moderate for food but high for cover.	Fast colonizer. Tolerant of fluctuating water levels.
Switchgrass (<i>Panicum virgatum</i>)	2,3,4,5,6	Perimeter	yes	up to 3 in.	High. Seeds, cover for waterfowl, songbirds.	Tolerates wet/dry conditions.

Table H.5 Native Plant Guide for Stormwater Management Areas (NY)

Plant Name	Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
Sweet Flag <i>(Acorus calamus)</i>	2,3	Herbaceous	yes	up to 3 in.	Low.	Tolerant of dry periods. Not a rapid colonizer. Tolerates acidic conditions.
Waterweed <i>(Elodea canadensis)</i>	1	Submergent	yes	yes	Low.	Good water oxygenator. High nutrient, copper, manganese and chromium removal.
Wild Celery <i>(Valisneria americana)</i>	1	Submergent	yes	yes	High. Food for waterfowl. Habitat for fish and invertebrates.	Tolerant of murky water and high nutrient loads.
Wild Rice <i>(Zizania aquatica)</i>	2	Emergent	yes	up to 1 ft.	High. Food for birds.	Prefers full sun
Wool Grass <i>(Scirpus cyperinus)</i>	2,3	Emergent	yes	Irregularly to seasonally inundated	Moderate. Cover, Food.	Requires full sun. Can tolerate acidic soils, drought. Colonizes disturbed areas, moderate growth.

Source:

New York State Stormwater Management Design Manual, Appendix H (NYSDEC, 2001)

References

- American Association of State Highway and Transportation Officials (AASHTO). *A Policy on Geometric Design of Highways and Streets*, p.384, 395. Washington, D.C., 2004.
- Bannerman, et. al. "Sources of Pollutants in Wisconsin Stormwater." *Water Science Technology*, (1993) 28(3-5):241-259.
- Black, Geoffrey, and Peter Winne. *Recreational Use and Economic Impact of the Wappingers Creek Watershed*. Bureau of Economic Research, School of Management, Marist College, Poughkeepsie, NY. 1998.
- Center for Watershed Protection. *Better Site Design: A Handbook for Changing Development Rules in Your Community*. Ellicott City, MD. August 1998.
- Coffman, Larry S. *LID Overview -PowerPoint Presentation*. Presented at Let Nature Do the Work II: On-Site Stormwater Management Conference sponsored by Westchester County Department of Planning and others, October 17, 2003, Westchester County Center.
- Dutchess County Department of Planning and Development. "Greenway Guides - A1: Fitting into the Landscape; D2:Stream Corridor Protection; .E1:Landscaping; and E3:Parking Lots." In *Greenway Connections: Greenway Compact Program and Guides for Dutchess County Communities*. Poughkeepsie, NY. 2000.
- Environmental Laboratory. *Corps of Engineers Wetland Delineation Manual*, Technical Report Y-87-1, US Army Engineer Waterway Experiment Station, Vicksburg, Miss. 1987.
- New York State Department of Environmental Conservation. *New York State Stormwater Management Design Manual*, Albany, NY, 2001 or most recent version.
- Nolon, John R. *Well Grounded: Shaping the Destiny of the Empire State – Local Land Use Law and Practice*. Pace University School of Law, White Plains, NY. March 1999.
- Pitt, Robert E. *Small Storm Urban Flow and Particulate Washoff Contributions to Outfall Discharges*. Doctorate Thesis. University of Wisconsin-Madison. 1987.
- Sample Local Law for Stormwater Management and Erosion & Sediment Control*, in the Stormwater Management Guidance Manual for Local Officials, NYSDEC and NYS Department of State, 2004, *Sample Local Law* revised 2006.
- Steuer, et. al. *Sources of Contamination in an Urban Basin in Marquette, Michigan and an Analysis of Concentrations, Loads, and Data Quality*. U.S. Geological Survey Water Resources Investigation Report No. 97-4242. 1997.
- Town of Clinton Local Law #4 of 2000. *Town of Clinton Subdivision and Lot Line Adjustment Regulations, Appendix D: Hamlet Design Guidelines*. Town of Clinton, New York., Nov. 2000.
- Wells, C. *Impervious Surface Reduction Study: Final Report*. City of Olympia Public Works Department. Water Resources Program. Olympia, WA. 1995.