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# Green Infrastructure and Low Impact Development Evaluation and Implementation Plan

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## *Final Report*

Prepared for the Town of Walworth, NY

November 2011



STEARNS & WHEELER  
CLIENTS | PEOPLE | PERFORMANCE



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## Project Background

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### *An Overview of the Green Infrastructure and Low Impact Development Planning Project*

In 2009 Genesee/Finger Lakes Regional Planning Council was awarded funding for regional comprehensive water quality management planning activities as described in Section 604(b) of the Clean Water Act. This project was funded from the New York State Department of Environmental Conservation's appropriations from the American Recovery and Reinvestment Act (ARRA). A full description of 604(b) ARRA awards and project requirements can be found on the NYSDEC website at the following address: <http://www.dec.ny.gov/lands/58603.html>.

The purpose of this *Genesee-Finger Lakes Green Infrastructure and Low Impact Development Evaluation* project was to produce a reliable inventory and assessment of potential stormwater "green infrastructure" retrofit projects within selected municipalities and to provide an assessment of the local regulatory framework to ensure compatibility with Low Impact Development (LID) practices. The following white paper summarizes the results of this inventory and assessment process.

This information can be used to help plan for local stormwater needs, meet existing stormwater regulations or water quality goals, and apply for implementation funds if and when they become available. To date, several municipalities – including the Town of Parma and the Villages of LeRoy and Penn Yan – have used the findings of this study to apply for funds made available through the NYS Environmental Facilities Corporation Green Innovation Grants program.<sup>1</sup>

A total of 9 municipalities in the Genesee-Finger Lakes region were selected to participate in this project. Project staff conducted field visits in these municipalities in the spring and summer of 2011 to identify and assess potential locations for green infrastructure stormwater facilities utilizing a standard approach created by the Center for Watershed Protection (CWP).<sup>2</sup> During that same time staff also assessed the body of local regulations within each project municipality utilizing the Center for Watershed Protection's Code and Ordinance Worksheet.<sup>3</sup>

This paper includes a brief explanation of the concepts of stormwater green infrastructure and Low Impact Development followed by a summary of the findings of this project relevant to the Town of Walworth. These findings are intended for use by the Town of Walworth and other project municipalities as they see fit.

***Stormwater Retrofits are stormwater management practices in locations where stormwater controls did not previously exist or were ineffective.***

***Green Infrastructure management approaches and technologies infiltrate, evapotranspire, capture and reuse stormwater to maintain or restore natural hydrologies.***

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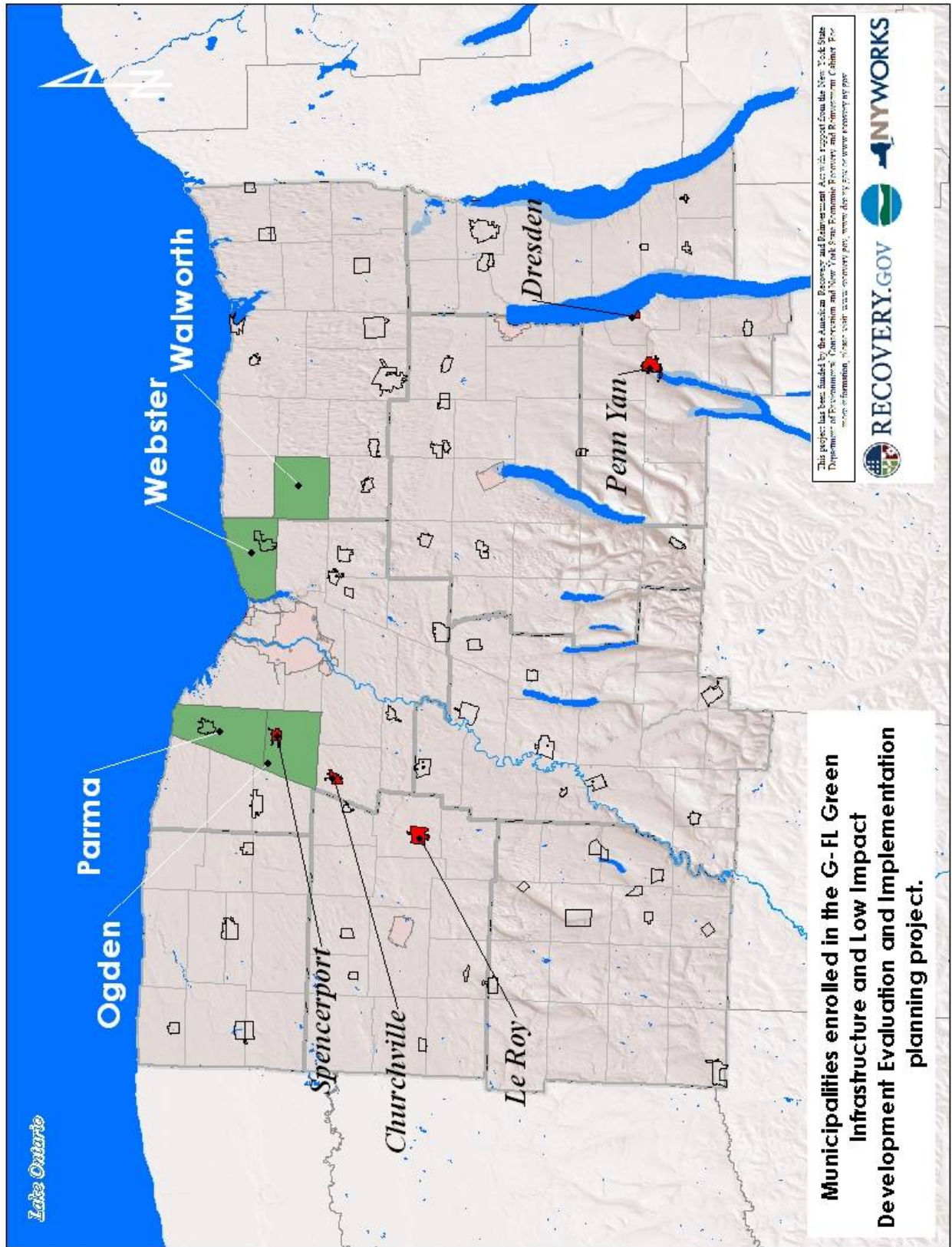
<sup>1</sup> NYSEFC Green Grants. <http://www.nysefc.org/GreenGrants.aspx>

<sup>2</sup> CWP's "Retrofit Reconnaissance Investigation" forms identified in Manual 3 of CWPs *Urban Subwatershed Restoration Manual Series* <http://www.cwp.org/categoryblog/92-urban-subwatershed-restoration-manual-series.html>

<sup>3</sup> CWP's "Codes and Ordinances Worksheet," available online at the following address [http://www.cwp.org/documents/cat\\_view/77-better-site-design-publications.html](http://www.cwp.org/documents/cat_view/77-better-site-design-publications.html)

# Project Background

An Overview of the Green Infrastructure and Low Impact Development Planning Project



## What is Stormwater Green Infrastructure?

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*Why It Matters: An Excerpt from Managing Wet Weather with Green Infrastructure – US EPA<sup>1</sup>*

Existing development, especially in urbanized and urbanizing areas, is responsible for currently degraded water quality and stream conditions. Changes in land cover and the increased imperviousness of the urban environment have resulted in larger volumes of runoff traveling at faster velocities. This has caused serious streambank erosion and has compromised aquatic habitat. Many of these areas were developed without adequate stormwater controls and must be addressed if urban streams are to be restored and water quality is to be improved.

Retrofits to stormwater infrastructure will be necessary to reduce runoff and pollution, but the capital investment is daunting. Upgrades to stormwater and combined sewer systems, like other utilities, are capital-intensive projects. The EPA has estimated that current wastewater infrastructure requires an investment in excess of \$200 billion, with \$10 billion needed for stormwater management and \$60 billion needed for combined sewer overflow (CSO) correction. While this needed investment presents a significant economic burden, it also presents an opportunity to re-evaluate the most efficient way to invest in infrastructure and environmental programs.

Using green infrastructure for urban stormwater retrofits can reduce stormwater pollution while simultaneously reducing the burden and demand on existing infrastructure. However, water quality and quantity benefits are not the only advantages green infrastructure has to offer. Green infrastructure enhances communities by bringing aspects of the natural environment into inhabited space. Trees provide shade, act as wind breaks and noise barriers, and improve air quality. In many instances, green infrastructure has been found to be less costly than or cost-competitive with traditional infrastructure. Green infrastructure provides additional environmental and economic benefits for the investment rather than traditional stormwater management approaches that literally bury the investments out of sight. The additional benefits that green infrastructure provides include:

- Green infrastructure effectively counteracts urban heat island by substituting soils and vegetation for hard, heat absorbing materials common in urban areas, creating shade, and emitting water vapor.
- Green roofs and other vegetation incorporated on and around buildings, help shade and insulate buildings from wide temperature swings, decreasing the energy needed for heating and cooling.
- Green infrastructure improves air quality as vegetation absorbs gaseous air pollutants and absorbs particulates.
- Research indicates that property values increase when street trees are planted and vacant lots are greened, providing private benefits to homeowners, increased property tax revenue, and more livable communities.

The distributed green infrastructure network is designed to limit the conversion of precipitation to runoff by capturing rainwater where it falls, managing stormwater at the surface, and maximizing soil and vegetation contact during treatment. This combination allows green infrastructure to reduce stormwater volumes, peak flow rates, and pollutant concentrations.

Stormwater green infrastructure facilities work through a combination of

- Encouraging the infiltration of stormwater into the ground
- Encouraging evapotranspiration of stormwater through increased vegetation, and
- Capture and use

## What is Stormwater Green Infrastructure?

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### *Why It Matters*

Green infrastructure is implemented through a variety of specific applications, including:

- Bioretention and Vegetated Swales
- Porous or Pervious Concrete and Asphalt and Permeable Block Pavers
- Rain Gardens
- Trees and Expanded Tree Boxes
- Reforestation and Canopy Restoration
- “Green Streets” which incorporate many of the above practices into one linear streetscape
- Green Roofs, Cisterns and Rain Barrels installed in individual homes and businesses

### ***What is Low Impact Development (LID)?***

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Green infrastructure also includes better construction and design practices within new residential and commercial developments. This concept is explained through the comprehensive approach to development known as *Low Impact Development*.

Low Impact Development (LID) is an ecologically-friendly approach to site development and storm water management that aims to mitigate development impacts to land, water, and air. The approach emphasizes the integration of site design and planning techniques that conserve natural systems and hydrologic functions on a site. The practice has been successfully integrated into many municipal development codes and storm water management ordinances throughout the United States. Specifically, LID aims to:

- Preserve open space and minimize land disturbance
- Protect natural systems and processes (drainage ways, vegetation, soils, sensitive areas)
- Reexamine the use and sizing of traditional site infrastructure (lots, streets, curbs, gutters, sidewalks) and customize site design to each site (known as ***Better Site Design***)
- Incorporate natural site elements (wetlands, stream corridors, mature forests) as design elements
- Decentralize and micromanage storm water at its source<sup>4</sup>

***Better site design*** (BSD) is a means of implementing Low Impact Development. BSD incorporates non-structural and natural approaches to new and redevelopment projects to reduce effects on watersheds by ***conserving natural areas, reducing impervious cover*** and ***better integrating stormwater treatment***.

Conventional design can be viewed as the style of suburban development that has evolved during the past 50 years and generally involves larger lot development, clearing and grading of significant portions of a site, wider streets and larger cul-de-sacs, enclosed drainage systems for stormwater conveyance and large “hole-in-the-ground” detention basins. The aim of better site design is to reduce the environmental “footprint” of the site while retaining and enhancing the owner/developer’s purpose and vision for the site.<sup>5</sup>



For further information regarding the concepts mentioned above, visit the *G/FLRPC Green Infrastructure Resource Guide*, available online at <http://www.gflrpc.org/GreenInfrastructureResourceGuide.htm>

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<sup>4</sup> Summary on LID taken from the Low Impact Development Center’s pamphlet *Municipal Guide to Low Impact Development*. [http://www.lowimpactdevelopment.org/lid%20articles/Municipal\\_LID.pdf](http://www.lowimpactdevelopment.org/lid%20articles/Municipal_LID.pdf)

<sup>5</sup> Summary on BSD taken from the NYSDEC Division of Water’s guidebook *Better Site Design*. [http://www.dec.ny.gov/docs/water\\_pdf/bsdcomplete.pdf](http://www.dec.ny.gov/docs/water_pdf/bsdcomplete.pdf)

## **Project Findings**

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This paper separates the findings for the Town of Walworth into two sections: *Stormwater Retrofit Reconnaissance Results* and *Code and Ordinance Assessment Results*.

### ***Stormwater Retrofit Reconnaissance Results***

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The following are the results of an assessment of potential green infrastructure demonstration and/or retrofit projects found within Walworth. This list is not comprehensive in scope; the number of potential retrofit projects that can be found within any given municipality are virtually limitless. This assessment focused on specific stormwater goals that were discussed in advance, including:

- Alleviation of flood conditions in the lower portion of the Town Hall complex
- Addressing other sporadic flooding issues in specific locations throughout the Town
- Further the Town's compliance with NYS stormwater regulations and improve its local stormwater program
- Local demonstration projects to educate DPW staff and the public on the design and function of green infrastructure stormwater facilities

A total of 25 potential projects were identified across the 9 project municipalities; five sites (along with a number of additional ancillary sites) were initially identified in Walworth by G/FLRPC staff and Town staff:

1. Town hall complex (sections along Lorraine Drive), including the sanitary lift station near Walworth-Penfield Road
2. Town Highway Garage parking lot on Canandaigua Road
3. Deer Meadow Run subdivision
4. Everwild Lane
5. Laurel Court

After sites were identified, the project consultant – Stearns and Wheler GHD – performed the majority of technical analysis associated with green infrastructure retrofit design. These initial sites were later narrowed down to three to four high-value sites (with a greater potential for ultimate successful implementation).

GHD conducted rapid field reconnaissance for each site listed above in order to gauge feasibility and then develop conceptual retrofit design sketches for the most feasible sites. In addition, GHD evaluated likely construction costs and the potential water quality benefits of each project, as well as other factors which may impact decision-making relative to the eventual construction of these facilities. Other factors include constructability, proximity to impaired waters, and other benefits, such as public education, diverting stormwater from municipal/private infrastructure, wildlife habitat, and flood storage capacity.

The assessment of individual sites includes a basic overview of site conditions, probable construction cost estimates, and conceptual plans of potential green infrastructure facilities.

## Project Findings

### *Stormwater Retrofit Reconnaissance Results*

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Each proposed retrofit project was assessed for water quality and other benefits. A total of six criteria were used to assess and evaluate these projects:

1. Nutrient Removal
2. Total Suspended Solids (TSS) Removal
3. Nutrient Export to Impaired Waters (TP – Total Phosphorous; TN – Total Nitrogen)
4. Constructability/Maintenance
5. Probable Construction Costs
6. Other Unique Benefits

The key criteria are based on improvements to water quality and are similar to factors outlined in the U.S. Army Corps of Engineering, Wetland Functions and Values Assessments (1999). These include Nutrient Removal, Total Suspended Solids (TSS) Removal, and Nutrient Export to Impaired Waters. The other factors affect the potential implementation of these practices and include Constructability, Probable Construction Costs, and Other Unique Benefits.

**The following is a description of the criteria used in this assessment.**

**1. Nutrient Removal.** Based on Simple Method assessment of existing conditions (land-use, acreage, and rainfall) and treatment practice removal rates, as presented in Table A.4 of the NYS Stormwater Management Design Manual resulting in an **estimated lbs/year of nutrients removed**. It should be noted that these data were developed from conceptual sketches prepared using field measurements and are intended for planning purposes only.

Based on the assessment of the conceptual designs, each site was given a relative score of High, Moderate, or Low according to the following:

- High – TP removed was greater than 2.0 lbs/year
- Moderate – TP removed ranged from 1.0 – 1.9 lbs/year
- Low – TP removed was less than 1.0 lbs/year

**2. TSS Removal.** Based on Simple Method assessment of existing conditions (land-use, acreage, and rainfall) and treatment practice removal rates outlined in Table A4 of the NYS Stormwater Management Design Manual resulting in an **estimated lbs/year of TSS removed**. It should be noted that these data were developed from conceptual sketches prepared using field measurements and are intended for planning purposed only.

Based on the assessment of the conceptual designs, each site was given a relative TSS removal score of High, Moderate, or Low according to the following:

- High – TSS removed was greater than 500 lbs/year
- Moderate – TP removed ranged from 100 to 499 lbs/year
- Low – TP removed was less than 100 lbs/year

**3. Nutrient Export to Impaired Waters.** Evaluated a project site's proximity to an **impaired or sensitive water body**. Impaired waters were determined based on a review of the NYS 303 (d) and 305 (b) lists. For this project, impaired waters include Red Creek. For this project, sensitive water bodies include **NYSDEC regulated wetlands**.



## Project Findings

### *Stormwater Retrofit Reconnaissance Results*

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Each site was given a relative score of High, Moderate, or Low based on proximity to impaired waters.

- High – Direct discharge to impaired waters
- Moderate – Potential discharge to impaired water or direct discharge to tributary of impaired waters
- Low – No direct connection to impaired waters

**4. Constructability/Maintenance.** Evaluated for the potential “constructability” for each retrofit project, as well as the anticipated long-term operations and maintenance requirements. For example, a small rain garden was considered to have somewhat simple construction (**High**), whereas a large wetland complex was considered to require engineering design, permitting, and long period of construction (**Low**). Each site was given a relative score of High, Moderate, or Low based on our assessment of the potential upfront engineering and permitting efforts, as well as anticipated complexity of construction and need for the long-term maintenance.

- High – Required significant engineering/permitting, as well as complex construction and significant O&M
- Moderate – Limited upfront engineering or permitting with some construction complexities, such as limited space
- Low – Little anticipated need for upfront engineering/permitting, simple construction with limited long-term O&M

**5. Probable Construction Costs.** Established unit costs for each type of retrofit practice based on published sources, such as the NYS Stormwater Management Design Manual (2008 and 2010). The probable construction cost was calculated by multiplying the unit costs by the conceptual size of the practice. Some minor variation of unit costs were taken into account based on project complexities. Probable construction costs were used to develop Cost per Pound of Nutrient (TN and TP) Removed and Cost per Pound of TSS Removed. It should be noted that probable construction costs were developed based on conceptual sketches and may fluctuate based on final site specific circumstances or other various factors. These costs are intended for planning purpose only.

The cost per pound of TN and TP removed per year varied based on project size and type. For the projects within this study, relative scores of High, Moderate, and Low were derived based on the ranges of costs as follows:

- High – Cost per pound of total nutrients (TN and TP) is less than \$5,000
- Moderate – Cost per pound of total nutrients (TN and TP) is between \$5,000 and \$15,000
- Low – Cost per pound of total nutrients (TN and TP) is greater than \$15,000

**6. Other Unique Benefits.** Local and regional water quality is at the core of this project. However, many of the proposed retrofit projects result in additional benefits beyond water quality improvements. These include opportunities for public education, diversion of stormwater from municipal/private infrastructure, enhanced wildlife habitat, and flood storage capacity.

These other benefits were given relative scores of High, Moderate, and Low based on the following:

- High – Direct potential for other benefits, such as sites located within parks
- Moderate – Potential for other benefits, such as improved wildlife habitat or improved aesthetics
- Low – Limited or no potential for other benefits beyond water quality improvements

## Project Findings

### *Conceptual Stormwater Retrofit Plans*

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Each stormwater retrofit design is documented on the attached *Conceptual Stormwater Retrofit Plans*. In addition, the benefits of each project are documented in the attached *Benefit Assessment Worksheet*.

In addition to the plans and worksheets, the retrofit projects were qualitatively ranked relative to one another, and this information is attached in the *Qualitative Assessment Table (QAT)*. It is important to note that the scoring in the QAT is relative to the retrofit projects in this assessment only. Further, these retrofit projects, regardless of score, all provide water quality and other unique benefits.

GHD has developed the conceptual design plans and has assessed each site based upon the above reference criteria. Based on our review, it appears the proposed projects can be divided into three categories based on type of stormwater practice: Filtration Practices (bioretention, rain gardens, bioswales), Stabilization (outlet protection, bank stabilization) and Stormwater Ponds/Wetlands. These types of practices vary significantly in terms of construction costs, engineering requirements, and water quality improvements. While each of these projects has a direct water quality permitting benefit and should be evaluated as part each municipality's long-term plan, some general distinctions about each group can be made.

It appears that filtration practices generally have the lowest cost per pound of nutrients removed with the cost per pound of nutrients (TN and TP) removed per year combined generally less than \$3,800. The stabilization projects appear to be the most cost effective at reducing TSS with the cost per pound of TSS removed typically below \$10. These stabilization practices also appear effective at preventing nutrient loading due to the significant level of anticipated soil stabilization. Also, large-scale stabilization project can be an efficient method of nutrient removal. While stormwater ponds and wetland do not have the lowest cost per pound of nutrients or TSS removed, these practices do allow for the most quantity of nutrient and TSS to be removed annually. For example, the least efficient stormwater wetland in this study is anticipated to remove more than 3 lbs of TP and 18 lbs of TN per year. This is far greater than the majority of the smaller scale filtration practices and should be considered when reviewing the entirety of these projects. Similarly, smaller projects, such as rain gardens around public buildings, have an aesthetic benefit and can be used to educate and engage the public.

Five initial sites were narrowed down to the following high-value site:

- 1. Town Hall (Porous Pavement).** The Walworth Town Hall complex consists of paved areas, roadways, recreation ball fields, amenities, open space, lawn, and wooded areas. The overall campus ultimately discharges to Red Creek (Impaired Water). At the center of the complex is the Town Hall and associated parking lots. These lots are nearing the end of use life cycle and will need to be repaved in the near future. One consideration is to retrofit these areas with porous pavement to reduce runoff and improve water quality.

In particular, a ½-acre area located to the southeast of the Town Hall could be converted to porous paving. An underdrain system could efficiently be installed and discharged to the existing adjacent storm drain system. Since this area is a Town-owned and operated facility, the maintenance of porous paving could be managed efficiently.

- 2. Town Hall (Constructed Wetland).** As stated above, the Walworth Town Hall complex consists of paved areas, roadways, recreation ball fields, amenities, open space, lawn, and

## Project Findings

### *Stormwater Retrofit Reconnaissance Results*

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wooded areas. At the northern end of the complex is a Town-owned sanitary pump station. This pump station was recently flooded with storm runoff from the Town Hall complex.

The site contains an existing drainage ditch which runs along the edge of the existing driveway, past the pump station to Red Creek (NYSDEC ON-41). The retrofit proposed includes a constructed stormwater wetland upgradient of the pump station site. The wetland is proposed in cells along the existing drainage ditch. The goal of the wetland is to provide storage capacity upstream and a potential flow diversion to reduce flooding at the pump station. In addition, a significant level of water quality improvements is anticipated.

- 3. Highway Garage.** The Town of Walworth Highway Garage discharges via sheet flow to a series of vegetated roadside swales. The site consists of building, paved parking area, and vegetated open space (lawn).

The retrofit at this site includes the installation of a bioswale (vegetated dry swale) along north edge of driveway west of existing salt storage area. Sheet flow from the salt storage area and main driveway will flow into this 2,100 square foot system, which will include a series of check dams and underdrains. The additional filtration of runoff is anticipated to result in water quality improvements and reduce runoff leaving the site.

- 4. Laurel Court.** Laurel Court is a medium density residential subdivision located adjacent to the Gananda Gold Course. Beyond the golf course is a tributary of Red Creek (NYSDEC Wetland ON-48). Also, a Town of Walworth sanitary forcemain is located below the adjacent golf course fairway.

At the end of the Laurel Court cul-de-sac, there is an existing stormwater outlet (12-inch CMP) without adequate scour protection. It appears over time that the flow from the outlet has eroded and scoured a significant portion of land between the homes and the golf course. To prevent long-term water quality degradation of the off-site wetlands as well as to avoid potential scouring of the sanitary line, a conceptual retrofit plan has been developed to stabilize the existing outlet using stones, grade controls, and turf reinforcement mat.



# Walworth Town Hall – Stormwater Wetland

## Benefit Assessment Worksheet

The retrofit includes a constructed stormwater wetland upgradient of an existing sanitary pump station site. The wetland is proposed in cells along an existing drainage ditch within the Walworth Town Hall complex. The goal of the wetland is to provide storage capacity upstream of the pump station, and provide a potential flow diversion to reduce flooding at the pump station. In addition, a significant level of water quality improvements is anticipated.



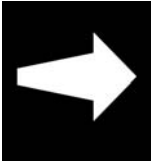
### Nutrient Removal

Baseline TN and TP are approximately 100.0 and 10.2 lbs/year, respectively. Anticipating 30 percent and 50 percent removal rate based on a stormwater wetland system, the **estimated pounds of TN and TP removed per year is 30.2 and 5.1**, respectively.



### TSS Removal

TSS for this site is approximately 1,400 lbs/year. Anticipating 80 percent removal rate based on a wetland system, the **estimated pounds of TSS removed per year is 1,100**.



### Nutrient Export To Impaired Waters

The project site is directly adjacent to **Red Creek, which is considered an impaired water**.



### Constructability/Maintenance

The construction of the stormwater wetland at the Walworth Town Hall complex will require significant engineering and permitting prior to construction. Also, the project requires additional piping, structures, and extensive earthwork. Because of this, the constructability for this practice is considered **Low**. In addition, the project is likely to require significant long-term maintenance and monitoring.



### Probable Construction Costs

A unit value of \$10 per square foot for a stormwater wetland within an open area was multiplied by the conceptual size of the retrofit practice (30,000 square feet) for a probable construction cost of \$300,000. This results in an anticipated **cost per Pound of nutrients (TN and TP) removed of \$8,400 and Cost per Pound of TSS removed of \$275**.



### Other Benefits

In addition to water quality improvement, this project could also provide for **enhanced wildlife habitat and additional flood storage**.



# Walworth Highway Garage – Bioswale

## Benefit Assessment Worksheet

The retrofit at this site includes the installation of a bioswale (vegetated dry swale) along north edge of driveway west of existing salt storage area. Sheet flow from the salt storage area and main driveway will flow into this 2,100 square foot system, which will include a series of check dams and underdrains. The additional filtration of runoff is anticipated to result in water quality improvements and reduce runoff leaving the site.



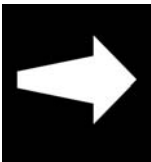
### Nutrient Removal

Baseline TN and TP are approximately 24.1 and 1.9 lbs/year, respectively. Anticipating 50 percent and 40 percent removal rate based on a bioswale (vegetated dry swale) sized for the water quality volume (5,500 cubic feet), the **estimated pounds of TN and TP removed per year is 12.0 and 0.8**, respectively.



### TSS Removal

Baseline TSS for this site is approximately 900 lbs/year. Anticipating an 85 percent removal rate based on a bioswale (vegetated dry swale) sized for the water quality volume, the **estimated pounds of TSS removed per year is 770**.



### Nutrient Export To Impaired Waters

The project site discharges to a roadside drainage ditch, which does not appear to drain to an impaired water.



### Constructability/Maintenance

The construction of the bioswale adjacent to the existing driveway is **High** and is likely to require only a limited amount of advance engineering and permitting. Overall construction of bioswale does not require major land disturbance, but does include the use of engineered soil medium and perforated underdrains. Project is not likely to require extensive routine maintenance.



### Probable Construction Costs

A unit value of \$17 per square foot for a bioswale retrofit was multiplied by the conceptual size of the retrofit practice (2,100 square feet) for a probable construction cost of \$35,700. This results in an anticipated **cost per Pound (TN and TP) removed of \$2,800** and **Cost per Pound (TSS) removed of \$50**.



### Other Benefits

The project is located at the highway garage and is not anticipated to yield significant public education or other benefits beyond water quality improvements.



# Walworth Laurel Court Outlet Protection

## Benefit Assessment Worksheet

An existing stormwater outlet (12-inch CMP) without adequate scour protection appears to have, over time, eroded and scoured a significant portion of land behind the Laurel Court cul-de-sac. To prevent long-term water quality degradation of the off-site wetlands as well as to avoid potential scouring of the sanitary line, a conceptual retrofit plan has been developed to stabilize the existing outlet using stones, grade controls, and turf reinforcement mat.



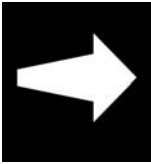
### Nutrient Removal

The level of anticipated TN and TP in mineral soils is expected be roughly 0.15 percent and 0.04 percent, respectively. Based on the amount of anticipated soils to be protected, the **estimated pounds of TN and TP prevented from entering off-site wetlands is removed per year is 2.3 and 0.6**, respectively.



### TSS Removal

Baseline TSS contributed from the eroded bank to the off-site wetlands is approximately 1,560 lbs/year based on estimated field measurements and estimated volume of erosion (cubic foot) multiplied by 78 pounds per cubic foot. Anticipating a 100 percent efficacy rate, the **estimated pounds of TSS prevented from entering off-site wetlands per year is 1,560**.



### Nutrient Export To Impaired Waters

The project site discharges to **sensitive off-site wetlands**. The wetlands are identified as NYSDEC Wetlands ON-48.



### Constructability/Maintenance

The constructability of the bank stabilization is **Moderate**, since it is not likely to require significant advanced engineering and environmental permitting. The work site has limited access and will require removal of two large trees. Project is not likely to require extensive routine maintenance, but may require annual monitoring.



### Probable Construction Costs

A unit value of \$250 per linear foot for a stabilization effort in a confined location was multiplied by the conceptual size of the retrofit practice (50 feet) for a probable construction cost of \$12,500 resulting in an anticipated **cost per Pound of nutrients (TN and TP) and TSS prevented from entering the off-site wetlands of \$4,300 and \$8**, respectively.



### Other Benefits

The project is set behind a residential neighborhood and does not exhibit significant for potential for public education or other additional benefits beyond water quality improvements.



## Project Findings

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### *Code and Ordinances Worksheet Findings*

Each project municipality's body of local laws and ordinances was reviewed utilizing the Center for Watershed Protection's (CWP) *Code and Ordinance Worksheet*. On average, most municipalities scored between 60 and 70 points out of 100 points, which denotes that opportunities exist to improve development rules in order to protect local aquatic resources in addition to the benefit of creating a site planning roundtable. Such a roundtable is described as a consensus process to encourage board members to make better choices in the design of their community. The primary tasks of a local roundtable are to systematically review existing development rules in the context of the model development principles, and then determine if changes can or should be made to the rules.

Genesee/Finger Lakes Regional Planning Council (G/FLRPC) collaborated with other regional entities, including the Stormwater Coalition of Monroe County, to identify the best methodology to use for this analysis. The CWP's *Code and Ordinance Worksheet* was selected due to its focus on the specific issue of local laws – namely, zoning, site plan review and subdivision law. The 77 site planning questions posed in the *Code and Ordinance Worksheet* are awarded specific points if the municipality's local law compares favorably with the benchmark.

Based on the 22 sections of the *Code and Ordinance Worksheet*, three major documents were necessary to fully complete it: the municipality's zoning ordinance, subdivision code, and design and construction criteria. In some cases, if the municipality is a regulated Municipal Separate Storm Sewer System (MS4), an erosion and sediment control ordinance and/or stormwater management ordinance was also reviewed.

The process established to complete the *Code and Ordinance Worksheet* was composed of two phases: the first phase allowed staff at G/FLRPC to complete the worksheet using the municipality's applicable local laws. The reviewer then sent this draft to the municipality's designated point-of-contact. The municipality then had the opportunity to review this draft before a meeting was set-up between the reviewer and the municipality. The dialogue between the reviewer and municipality was valuable in that many inconsistencies were found throughout the *Code and Ordinance Worksheet*.

The *Code and Ordinance Worksheet* clearly states that the reviewer “must identify the local, state, and federal authorities that actually administer or enforce the development rules within your community.” Municipal staff that interact daily with these development rules are significantly more aware of these rules than the reviewer. Municipal staff readily pointed out to the reviewer where inconsistencies could be found. For example:

- Dead-end fire apparatus access roads in excess of 150 feet must provide width and turnaround provisions in accordance with Table D103.4 of the New York State Fire Code. In this case, a cul-de-sac must have a 96-foot-diameter. In Section 4: Cul-de-Sacs, the *Code and Ordinance Worksheet* awards 3 points for a radius less than 35 feet and 1 point for an answer between 36 feet and 45 feet. Neither benchmark corresponds with the 48-foot-radius minimum requirement according to D103.4: Dead ends of the New York State Fire Code.
- According to 511.2.1: Dimensions of the New York State Fire Code, driveways must provide a minimum unobstructed width of 12 feet. Section 14: Driveways of the *Code and Ordinance Worksheet* awards one point only if the answer is below 9 feet.
- Fire apparatus access roads must also have an unobstructed width of not less than 20 feet, except for approved security gates, according to 503.2.1: Dimensions. Therefore, the benchmark set



## Project Findings

### *Code and Ordinances Worksheet Findings*

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for 18 to 22 feet for Section 1: Street Width of the *Code and Ordinance Worksheet* does not necessarily comply.

Another area of discrepancy is Section 13: Sidewalks of the *Code and Ordinance Worksheet* with the Americans with Disabilities Act (ADA). State and local government facilities must follow the 2010 Standards for Accessible Design as of March 15, 2012. Before that date, the 1991 Standards or the Uniform Federal Accessibility Standards (UFAS) were used for projects.

An accessible route is defined in Chapter 4 of the 2010 Standards as one or more of the following components: a walking surface with a running slope not steeper than 1:20, doorways, ramps, curb ramps excluding the flared sides, elevators, and platform lifts. The clear width of walking surfaces can be 36 inches. However, if a clear width less than 60 inches is provided, passing spaces must be made available at intervals of 200 feet. Passing spaces can be either 60 inches minimum by 60 inches or an intersection of two walking surfaces providing a T-shaped space where the base and arms of the T-shaped space extend 48 inches beyond the intersection. The 1991 Standards states the minimum clear width for single wheelchair passage is 32 inches at a point and 36 inches continuous with a 60 inch minimum width for two wheelchairs to pass. The minimum clear width of an accessible route as defined by UFAS is 36 inches with passing spaces at reasonable intervals not to exceed 200 feet if the accessible route is less than 60 inches in width. The *Code and Ordinance Worksheet* awards two points for a minimum width of 4 feet or less allowed in the community.

One final discrepancy in the *Code and Ordinance Worksheet* can be found in Section 8: Parking Lots regarding the minimum stall width and length for a standard parking space. The *Manual on Uniform Traffic Control Devices* (MUTCD) is published and has been administered by the Federal Highway Administration (FHWA) since 1971. The manual is a compilation of national standards for traffic control devices installed and maintained on all public streets, highways, bikeways, and private roads open to public traffic. It is updated periodically to address changing transportation needs in the nation. The MUTCD became effective in New York State on January 15, 2010 with a NYS Supplement adopted on March 16, 2010. In this manual, a typical parking space is recommended to be 8 feet wide by 22 to 26 feet in length and an end space as 8 feet by 20 feet. The *Code and Ordinance Worksheet* awards one point for a stall width less than 9 feet and one point for a stall length less than 18 feet.

Overall, most municipalities scored between 60 and 70 points out of a total 100. Several municipalities scored below 60 points, which states that “serious reform of the development rules is needed.” A score of 90 to 100 states that the community is “a real leader in protecting streams, lakes, and estuaries.” A score of 60 to 69 and 70 to 79 basically states the community doesn’t have adequate development rules to protect local aquatic resources and that significant opportunities exist. There were three questions that none of the municipalities scored any points on:

- At higher densities are parking lanes allowed to serve as traffic lanes (i.e., queuing streets). (Section 1: Street Width, 3 points available)
- If mass transit is provided nearby, is the parking ratio reduced? (Section 7: Parking Codes, 1 point available)
- Are there any incentives to developers to provide parking within garages rather than surface parking lots? (Section 9: Structured Parking, 1 point available)

## Project Findings

### *Code and Ordinances Worksheet Findings*

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As these questions seem “non-applicable,” they should be considered for removal from the *Code and Ordinance Worksheet* and total maximum points awarded to each municipality.

Another generalization about the *Code and Ordinance Worksheet* applies when dealing with a historic community versus contemporary ones. The Village of Spencerport, Le Roy, Penn Yan, Churchville and Dryden experienced growth and development much earlier than most towns participating in the local law analysis. A good deal of the land available in these villages has already been built upon; thus, street widths and lengths and lot setbacks and frontages have already been determined. These villages were also developed long before zoning and other standards and ordinances existed. The Towns of Ogden, Parma, Walworth and Webster are currently experiencing population growth due to suburban expansion. There are more opportunities with current regulatory processes to encourage low-impact design and development in these municipalities. Hence, the *Code and Ordinance Worksheet* may provide more opportunities for growing communities to score higher with new construction as opposed to historic communities with existing footprints. In this case, a scoring methodology that considers more retrofit-friendly frameworks, regulatory structures, and incentive programs is recommended in future reviews for historic communities.

Finally, each municipality discovered different strengths, weaknesses, and areas of opportunity through the *Code and Ordinance Worksheet* process. They are as follows:

#### **Town of Walworth**

Total: 70

##### Strengths:

- Section 11: Open Space Design
- Section 13: Sidewalks
- Section 15: Open Space Management
- Section 20: Tree Conservation
- Section 21: Land Conservation Incentives
- Section 22: Stormwater Outfalls

##### Weaknesses:

- Section 6: Parking Ratios
- Section 12: Setbacks and Frontages
- Section 17: Buffer Systems
- Section 18: Buffer Maintenance

##### Areas of Opportunity

- *Town of Walworth Comprehensive Plan* (December 1998) states as a development goal to “preserve scenic views of farmland, open space, drumlins and watercourses through development planning and site plan review of development projects.” The implementation of a buffer system aligns with the Town’s comprehensive plan and is an acceptable green

## Project Findings

### *Code and Ordinances Worksheet Findings*

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infrastructure planning practice for runoff reduction according to Chapter 5 of the *New York State Stormwater Design Manual*.

- Parking demand ratios that create more impervious cover greatly increase the volume of stormwater generated at parking lots. Town of Walworth could re-evaluate its parking code by conducting a local study to modify the amount of spaces required for professional office buildings and shopping centers (i.e. various business districts).

## Code and Ordinance Worksheets

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The following pages contain the summarized results of the CWP Code and Ordinance Worksheets. Those results are organized into the following major and minor categories:

- **Residential Streets and Parking Lots**
  - Street width and length
  - Right of way width
  - Cul-de-sacs
  - Vegetated open channels
  - Parking ratios
  - Structured parking
  - Parking codes
  - Parking lots
  - Parking lot runoff
- **Lot Development**
  - Open space design
  - Setbacks and frontages
  - Sidewalks
  - Driveways
  - Open space management
  - Rooftop runoff
- **Conservation of Natural Areas**
  - Buffer systems
  - Buffer maintenance
  - Clearing and grading
  - Tree conservation
  - Land conservation
  - Stormwater outfalls

Areas found to be deficient with regard to stormwater green infrastructure or LID have been checked (☑) as “to be revised.”

Where available, online resources have been cited under the “Notes” section and provide more information relevant to the category or subcategory. Interested readers should visit these resources to learn more about the issue and how their municipality can improve its local codes and operations therein.

**Project Findings**

*Code and Ordinances Worksheet Findings*

**RESIDENTIAL STREETS AND PARKING LOTS**

<p>1. and 2. Street Width and Length</p>	<p><b>Is the minimum pavement width for low traffic residential streets (&lt;500 average daily trips) between 18-22 ft.?</b>  <u>22</u> ft.  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Section: <u>Article VI: Design Standards, 151-31: Streets (B) Street design (1) Width of rights-of-way and pavements</u> <input type="checkbox"/> No Standard  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p> <p><b>Can parking lanes serve as traffic lanes in higher density areas?</b>  <input type="checkbox"/> Supportive language in code/ordinance Section: <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input checked="" type="checkbox"/> Typically not allowed <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes:</p> <p><b>Are alternatives to minimize street length allowed where appropriate (i.e. cluster developments, around cul-de-sacs, etc.)?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-31: (A) Street layouts</u> <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input type="checkbox"/> Typically not allowed <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	<p>Score: 5 out of 8 points</p>
<p>3. Right-of-Way Width</p>	<p><b>Is minimum ROW widths less than 45 ft. for a residential street?</b>  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Section: <u>151-31: Streets (B) Street design (1) Width of rights-of-way and pavements</u> <u>60</u> ft. <input type="checkbox"/> No Standard  <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes: <i>Right-of-Way Improvements Manual</i>, City of Seattle, Washington. Available at:  <a href="http://www.seattle.gov/transportation/rowmanual">http://www.seattle.gov/transportation/rowmanual</a>.</p> <p><b>Can utilities be placed below the paved section of the ROW?</b>  <input type="checkbox"/> Supportive language in code/ordinance Section: <u>151-31: (B) 3</u> <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input checked="" type="checkbox"/> Typically not allowed <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes:</p>	<p>Score: 1 out of 4 points</p>
<p>4. Cul-de-Sacs</p>	<p><b>Is the minimum required radius for cul-de-sacs less than 35 ft.?</b>  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Section: <u>151-31: Streets (8) No-outlet streets</u> <u>60</u> ft. <input type="checkbox"/> No Standard  <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes: <i>Impervious Surface Reduction: Cul-de-Sac Design</i>, prepared for the Metropolitan Council by Barr Engineering Company. Available at: <a href="http://www.barr.com/clientre/Archives/BMPs/BMPfiles/03RPPImpCuldeSac.pdf">http://www.barr.com/clientre/Archives/BMPs/BMPfiles/03RPPImpCuldeSac.pdf</a>.</p>	<p>Score: 2 out of 5 points</p>

## Project Findings

### Code and Ordinances Worksheet Findings

	<p><b>Are landscaped or bioretention islands allowed in the center of cul-de-sacs?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-31: (8)</u> <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input type="checkbox"/> Typically not allowed <i>Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</i>                  Notes:</p> <p><b>Are alternatives to cul-de-sacs such as “hammerheads” allowed for permanent turnarounds?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-31: (8)</u> <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input type="checkbox"/> Typically not allowed <i>Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</i>                  Notes:</p>	
5. Vegetated Open Channels	<p><b>Are curbs and gutters required for most residential streets?</b>  <input type="checkbox"/> Supportive language in code/ordinance Section: <u>151-31: Streets (B) Street design and 151-36: Drainage improvements</u>  <input type="checkbox"/> Site specific with Planning Board approval <input type="checkbox"/> Incentivized in code/ordinance  <input type="checkbox"/> Expressly allowed by design/construction specifications <input checked="" type="checkbox"/> Typically not allowed  <i>Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</i>                  Notes:</p> <p><b>Are modified curb or gutter systems such as vegetated swales or curb cuts with rain gardens allowed to provide for stormwater infiltration and evaporation?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-31: Streets (B) Street design and 151-36: Drainage improvements</u>  <input type="checkbox"/> Site specific with Planning Board approval <input type="checkbox"/> Incentivized in code/ordinance  <input type="checkbox"/> Expressly allowed by design/construction specifications <input type="checkbox"/> Typically not allowed  <i>Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</i>                  Notes:</p>	Score: 4 out of 4 points
6. Parking Ratios	<p><b>Are the minimum required number of parking spaces less than:</b>                  3 spaces per 1,000 sq. ft. for professional office building? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Section: <u>180-39: Off-street parking (A)</u>  <input type="checkbox"/> No Standard <i>Action: <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</i>                  4.5 spaces per sq. ft. for shopping centers? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Section: <u>180-39: Off-street parking (A)</u> <input type="checkbox"/> No Standard  <i>Action: <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</i>                  2 spaces per single family home? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Section: <u>180-39: Off-street parking (A)</u> <input type="checkbox"/> No Standard  <i>Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</i>                  Notes: <i>Parking Spaces / Community Places: Finding the Balance through Smart Growth Solutions, U.S. Environmental Protection Agency. Available at: <a href="http://www.epa.gov/dced/pdf/EPAParkingSpaces06.pdf">http://www.epa.gov/dced/pdf/EPAParkingSpaces06.pdf</a>.</i></p>	Score: 3 out of 5 points

## Project Findings

### Code and Ordinances Worksheet Findings

	<p><b>Are parking ratios expressed as both minimum and maximums?</b>  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No, minimum only <input type="checkbox"/> No, maximum only <input type="checkbox"/> No, Expressed as medians Section: <u>180-39: Off-street parking (A)</u>                  Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	
7. and 8. Structured Parking and Parking Codes	<p><b>Is the use of shared parking arrangements promoted?</b>  <input type="checkbox"/> Supportive language in code/ordinance Section: <input checked="" type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input checked="" type="checkbox"/> Expressly allowed by design/construction specifications  <input type="checkbox"/> Typically not allowed Action: <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes: Recommend inclusion with code/ordinance.</p>	Score: 2 out of 5 points
	<p><b>Are model shared parking agreements provided?</b>  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Section: <input type="checkbox"/> Shared parking not allowed                  Action: <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes: <i>Model Shared Parking Agreements</i>, Town of Clinton: Recommended Model Development Principles for Protection of Natural Resources in the Hudson River Estuary Watershed. Available at:  <a href="http://www.dec.ny.gov/docs/remediation_hudson_pdf/hrewbsdclin.pdf">http://www.dec.ny.gov/docs/remediation_hudson_pdf/hrewbsdclin.pdf</a>.</p>	
	<p><b>Are parking requirements reduced for shared parking arrangements, structured parking, areas near mass transit, and special districts?</b>  <input type="checkbox"/> Supportive language in code/ordinance Section: <input checked="" type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input checked="" type="checkbox"/> Expressly allowed by design/construction specifications  <input type="checkbox"/> Typically not allowed Action: <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes: Recommend inclusion with code/ordinance.</p>	
9. Parking Lots	<p><b>Are minimum stall dimensions for standard parking spaces 9 ft. x 18 ft. or less?</b> <u>9</u> ft. x <u>18</u> ft.  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Section: Section: <u>Construction Specifications and Design Standards</u> <input type="checkbox"/> No Standard                  Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	Score: 4 out of 5 points
	<p><b>Are smaller compact car stalls required for at least 30% of total parking spaces?</b>  <input type="checkbox"/> Supportive language in code/ordinance Section: <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input checked="" type="checkbox"/> Typically not allowed Action: <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes: <i>Impervious Surface Reduction: Parking Lot Design</i>, Twin Cities Metropolitan Council. Available at:  <a href="http://www.metrocouncil.org/environment/Water/bmp/CH3_RPPImpParking.pdf">http://www.metrocouncil.org/environment/Water/bmp/CH3_RPPImpParking.pdf</a>.</p>	

## Project Findings

### Code and Ordinances Worksheet Findings

	<p><b>Can pervious materials be used for spillover parking areas?</b></p> <p><input type="checkbox"/> Supportive language in code/ordinance Section: <input type="checkbox"/> Site specific with Planning Board approval</p> <p><input type="checkbox"/> Incentivized in code/ordinance <input checked="" type="checkbox"/> Expressly allowed by design/construction specifications</p> <p><input type="checkbox"/> Typically not allowed <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes: Recommend inclusion with code/ordinance.</p>													
10. Parking Lot Runoff	<p><b>Does a minimum percentage of parking lots need to be landscaped?</b></p> <p><input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>180-14: B-1 Districts: General Business (E) (3) Percentage of lot coverage and 180-15: B-2 Districts (F) (2) Lot coverage</u> <input type="checkbox"/> Site specific with Planning Board approval</p> <p><input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications</p> <p><input type="checkbox"/> Typically not allowed <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	Score: 4 out of 4 points												
	<p><b>Are bioretention islands or vegetated filter strips allowed within landscaped areas of parking lots?</b></p> <p><input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>180-14: B-1 Districts: General Business (E) (3) Percentage of lot coverage and 180-15: B-2 Districts (F) (2) Lot coverage</u> <input type="checkbox"/> Site specific with Planning Board approval</p> <p><input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications</p> <p><input type="checkbox"/> Typically not allowed <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>													
<p><b>Areas identified within Residential Streets and Parking Lots that are most in-line with Green Infrastructure principles:</b></p> <table border="0" style="width: 100%;"> <tr> <td><input checked="" type="checkbox"/> Street Width Codes</td> <td><input checked="" type="checkbox"/> Parking Ratios</td> <td><input checked="" type="checkbox"/> Street Length</td> <td><input type="checkbox"/> Parking</td> </tr> <tr> <td><input type="checkbox"/> Row Width</td> <td><input checked="" type="checkbox"/> Parking Lots</td> <td><input type="checkbox"/> Cul-de-Sacs</td> <td><input type="checkbox"/> Structured Parking</td> </tr> <tr> <td><input checked="" type="checkbox"/> Vegetated Open Swales</td> <td><input checked="" type="checkbox"/> Parking Lot Runoff</td> <td></td> <td></td> </tr> </table>			<input checked="" type="checkbox"/> Street Width Codes	<input checked="" type="checkbox"/> Parking Ratios	<input checked="" type="checkbox"/> Street Length	<input type="checkbox"/> Parking	<input type="checkbox"/> Row Width	<input checked="" type="checkbox"/> Parking Lots	<input type="checkbox"/> Cul-de-Sacs	<input type="checkbox"/> Structured Parking	<input checked="" type="checkbox"/> Vegetated Open Swales	<input checked="" type="checkbox"/> Parking Lot Runoff		
<input checked="" type="checkbox"/> Street Width Codes	<input checked="" type="checkbox"/> Parking Ratios	<input checked="" type="checkbox"/> Street Length	<input type="checkbox"/> Parking											
<input type="checkbox"/> Row Width	<input checked="" type="checkbox"/> Parking Lots	<input type="checkbox"/> Cul-de-Sacs	<input type="checkbox"/> Structured Parking											
<input checked="" type="checkbox"/> Vegetated Open Swales	<input checked="" type="checkbox"/> Parking Lot Runoff													

**Project Findings**

*Code and Ordinances Worksheet Findings*

**LOT DEVELOPMENT**

11. Open Space Design	<p><b>Are conservation subdivisions and/or cluster developments allowed?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>180-18: Cluster development and 180-17: Planned Development</u>  <input type="checkbox"/> Site specific with Planning Board approval <span style="float: right;"><input checked="" type="checkbox"/> Incentivized in code/ordinance</span>  <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float: right;"><input type="checkbox"/> Typically not allowed</span>  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p> <p><b>Is water quality or land conservation a major goal?</b>  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Section: <u>180-18: (A) Purpose and intent and (D) and 180-17: (B) Objectives</u> <span style="float: right;"><input type="checkbox"/> No Standard</span>  <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes: Recommend impervious cover reduction as a major goal for purpose and intent and objectives.</p> <p><b>Are the application requirements for conservation subdivisions and/or cluster developments greater than for conventional developments?</b>  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Section: <u>180-18: (E) Procedure and 180-17: (G) PD District application procedure and approval process</u> <span style="float: right;"><input type="checkbox"/> No Standard</span>  <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes:</p> <p><b>Are conservation subdivisions and/or cluster developments permitted by zoning without a public hearing?</b>  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Section: <u>180-18: (E) Procedure and 180-17: (G) PD District application procedure and approval process</u> <span style="float: right;"><input type="checkbox"/> No Standard</span>  <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes:</p>	Score: 6 out of 8 points
12. Setbacks and Frontages	<p><b>Are irregular lot shapes (i.e. pie-shaped, flag lots) allowed?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>180-12: Lot geometry</u>  <input type="checkbox"/> Site specific with Planning Board approval <span style="float: right;"><input type="checkbox"/> Incentivized in code/ordinance</span>  <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float: right;"><input type="checkbox"/> Typically not allowed</span>  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p> <p><b>Are reductions in frontage distances allowed where appropriate to minimize street length?</b>  <input type="checkbox"/> Supportive language in code/ordinance Section: <u>180-10, -11, -12, and -13</u> <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <span style="float: right;"><input type="checkbox"/> Expressly allowed by design/construction specifications</span>  <input checked="" type="checkbox"/> Typically not allowed <span style="float: right;"><i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</span></p> <p>Notes: <i>Better Site Design</i>, New York State Department of Environmental Conservation. Available at:  <a href="http://www.dec.ny.gov/docs/water_pdf/bsdcomplete.pdf">http://www.dec.ny.gov/docs/water_pdf/bsdcomplete.pdf</a>.</p>	Score: 1 out of 6 points



**Project Findings**

*Code and Ordinances Worksheet Findings*

	<p><b>Are reductions in setback distances allowed where appropriate to minimize driveway lengths?</b>  <input type="checkbox"/> Supportive language in code/ordinance Section: <u>180-10, -11, -12, and -13</u> <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input checked="" type="checkbox"/> Typically not allowed <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised                  Notes:</p>	
13. Sidewalks	<p><b>Is the minimum required width for a sidewalk 4 ft. or less?</b> <span style="float: right;">_____ 4 ____ft.</span>  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Section: <u>Construction Specifications and Design Standards</u> <input type="checkbox"/> No Standard  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised                  Notes: Continue to adhere to ADA Accessibility Guidelines.</p>	Score: 6 out of 6 points
	<p><b>Are sidewalks allowed on only one side of the street?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-31: (B) (2)</u> <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input type="checkbox"/> Typically not allowed <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised                  Notes:</p>	
	<p><b>Are sidewalks sloped so that stormwater drains into the front yard as opposed to the street?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-36</u> <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input type="checkbox"/> Typically not allowed <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised                  Notes:</p>	
	<p><b>Are alternative pedestrian pathway layouts allowed, rather than placement in road ROW?</b>  <input type="checkbox"/> Supportive language in code/ordinance Section: _____ <input checked="" type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input checked="" type="checkbox"/> Expressly allowed by design/construction specifications  <input type="checkbox"/> Typically not allowed <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised                  Notes: Recommend inclusion with code/ordinance.</p>	
14. Driveways	<p><b>Is the minimum driveway width 9 ft. or less (single lane) or 18 ft. (two lanes)?</b> <span style="float: right;">_____ 12 ____ft. _____ft.</span>  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Section: <u>80-43.2: Driveway design requirements</u> <input type="checkbox"/> No Standard  <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised                  Notes: <i>Impervious Surface Reduction: Driveway Design</i>, prepared for the Metropolitan Council by Barr Engineering Company. Available at: <a href="http://www.barr.com/clientre/Archives/BMPs/BMPfiles/04RPPImpDriveway.pdf">http://www.barr.com/clientre/Archives/BMPs/BMPfiles/04RPPImpDriveway.pdf</a>.</p>	Score: 4 out of 6 points
	<p><b>Are alternative materials and designs (i.e. porous pavers, two-track design, etc.) allowed?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-34: (E) Driveways and 80-43.2: Driveway design requirements</u>  <input type="checkbox"/> Site specific with Planning Board approval <input type="checkbox"/> Incentivized in code/ordinance  <input type="checkbox"/> Expressly allowed by design/construction specifications <input type="checkbox"/> Typically not allowed  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised                  Notes:</p>	

**Project Findings**

*Code and Ordinances Worksheet Findings*

	<p><b>Are shared driveways allowed?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-34: (E) Driveways and 80-43.2: Driveway design requirements</u>  <input type="checkbox"/> Site specific with Planning Board approval <span style="float: right;"><input type="checkbox"/> Incentivized in code/ordinance</span>  <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float: right;"><input type="checkbox"/> Typically not allowed</span>  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	
<p>15. Open Space Management</p>	<p><b>Does the community have requirements to allow homeowner associations or land trusts to manage open space?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>180-17: (E) Common property in the PD District</u>  <input type="checkbox"/> Site specific with Planning Board approval <span style="float: right;"><input type="checkbox"/> Incentivized in code/ordinance</span>  <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float: right;"><input type="checkbox"/> Typically not allowed</span>  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	<p>Score: 5 out of 6 points</p>
	<p><b>Are conservation subdivisions and/or cluster developments located in close proximity required to consolidate their open space?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>180-17: (C) 1. Minimum area</u>  <input type="checkbox"/> Site specific with Planning Board approval <span style="float: right;"><input type="checkbox"/> Incentivized in code/ordinance</span>  <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float: right;"><input type="checkbox"/> Typically not allowed</span>  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	
	<p><b>Does a minimum percentage of open space need to remain in its natural condition?</b>  <input type="checkbox"/> Supportive language in code/ordinance Section: <span style="float: right;"><input type="checkbox"/> Site specific with Planning Board approval</span>  <input type="checkbox"/> Incentivized in code/ordinance <span style="float: right;"><input type="checkbox"/> Expressly allowed by design/construction specifications</span>  <input checked="" type="checkbox"/> Typically not allowed <span style="float: right;"><i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</span></p> <p>Notes:</p>	
	<p><b>Are uses for open space in residential developments defined?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>180-17: (C) 4. Permitted uses</u>  <input type="checkbox"/> Site specific with Planning Board approval <span style="float: right;"><input type="checkbox"/> Incentivized in code/ordinance</span>  <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float: right;"><input type="checkbox"/> Typically not allowed</span>  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	

## Project Findings

### Code and Ordinances Worksheet Findings

16. Rooftop Runoff	<p><b>Can rooftop runoff be discharged to yard areas?</b></p> <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-35: Site grading and surface drainage</u> <input type="checkbox"/> Site specific with Planning Board approval <span style="float: right;"><input type="checkbox"/> Incentivized in code/ordinance</span> <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float: right;"><input type="checkbox"/> Typically not allowed</span> <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised	Score: 4 out of 4 points
	<p>Notes:</p> <p><b>Is temporary ponding of stormwater allowed in front yards or on rooftops?</b></p> <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-35: Site grading and surface drainage</u> <input type="checkbox"/> Site specific with Planning Board approval <span style="float: right;"><input type="checkbox"/> Incentivized in code/ordinance</span> <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float: right;"><input type="checkbox"/> Typically not allowed</span> <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised	
<p><b>Areas identified within Lot Development that are most in-line with Green Infrastructure principles:</b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <input checked="" type="checkbox"/> Open Space Design  <input checked="" type="checkbox"/> Open Space Management         </div> <div style="width: 30%;"> <input checked="" type="checkbox"/> Driveways  <input checked="" type="checkbox"/> Sidewalks         </div> <div style="width: 30%;"> <input type="checkbox"/> Setbacks and Frontages  <input checked="" type="checkbox"/> Rooftop Runoff         </div> </div>		

## CONSERVATION OF NATURAL AREAS

17. Buffer Systems	<p><b>Is there an ordinance that provides for a river or stream buffer to protect water quality and habitat in streams and rivers? _____ ft. (minimum)</b></p> <input type="checkbox"/> Supportive language in code/ordinance Section: _____ <span style="float: right;"><input type="checkbox"/> Site specific with Planning Board approval</span> <input type="checkbox"/> Incentivized in code/ordinance <span style="float: right;"><input type="checkbox"/> Expressly allowed by design/construction specifications</span> <input checked="" type="checkbox"/> Typically not allowed <span style="float: right;"><i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</span>	Score: 0 out of 4 points
	<p>Notes: Recommend a local buffer ordinance with 75 feet or more as minimum buffer width.</p> <p><b>Does the river or stream buffer include lakes, wetlands, and coastal waters to protect water quality and habitats?</b></p> <input type="checkbox"/> Supportive language in code/ordinance Section: _____ <span style="float: right;"><input type="checkbox"/> Site specific with Planning Board approval</span> <input type="checkbox"/> Incentivized in code/ordinance <span style="float: right;"><input type="checkbox"/> Expressly allowed by design/construction specifications</span> <input checked="" type="checkbox"/> Typically not allowed <span style="float: right;"><i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</span>	
18. Buffer Maintenance	<p><b>Does the ordinance require that the river or stream buffer remain in its natural condition?</b></p> <input type="checkbox"/> Supportive language in code/ordinance Section: _____ <span style="float: right;"><input type="checkbox"/> Site specific with Planning Board approval</span> <input type="checkbox"/> Incentivized in code/ordinance <span style="float: right;"><input type="checkbox"/> Expressly allowed by design/construction specifications</span> <input checked="" type="checkbox"/> Typically not allowed <span style="float: right;"><i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</span>	Score: 0 out of 4 points
<p>Notes: <i>Protecting Stream and River Corridors: Creating Effective Local Riparian Buffer Ordinances</i>, Carl Vinson Institute of Government, University of Georgia. Available at:  <a href="http://www.rivercenter.uga.edu/publications/pdf/riparian_buffer_guidebook.pdf">http://www.rivercenter.uga.edu/publications/pdf/riparian_buffer_guidebook.pdf</a>.</p>		

## Project Findings

### Code and Ordinances Worksheet Findings

	<p><b>Are uses in the buffer area defined by the ordinance?</b></p> <p><input type="checkbox"/> Supportive language in code/ordinance Section: <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input checked="" type="checkbox"/> Typically not allowed <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes: Recommend a local buffer ordinance and/or program.</p> <p><b>Does the ordinance specify enforcement or education mechanisms?</b></p> <p><input type="checkbox"/> Supportive language in code/ordinance Section: <input type="checkbox"/> Site specific with Planning Board approval  <input type="checkbox"/> Incentivized in code/ordinance <input type="checkbox"/> Expressly allowed by design/construction specifications  <input checked="" type="checkbox"/> Typically not allowed <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p> <p>Notes: Recommend a local buffer ordinance and/or program.</p>	
19. Clearing and Grading	<p><b>Are there clearing and grading requirements that limit the amount of exposed soil at residential development sites to reduce the potential for erosion and sedimentation?</b></p> <p><input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-41: Preservation of natural features</u>  <input checked="" type="checkbox"/> Site specific with Planning Board approval <input type="checkbox"/> Incentivized in code/ordinance  <input type="checkbox"/> Expressly allowed by design/construction specifications <input type="checkbox"/> Typically not allowed  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p> <p><b>Do reserve septic field areas need to be cleared of trees at the time of construction?</b></p> <p><input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-41: Preservation of natural features</u>  <input checked="" type="checkbox"/> Site specific with Planning Board approval <input type="checkbox"/> Incentivized in code/ordinance  <input type="checkbox"/> Expressly allowed by design/construction specifications <input type="checkbox"/> Typically not allowed  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	Score: 3 out of 3 points
20. Tree Conservation	<p><b>Are certain trees or stands required to be preserved at residential development sites?</b></p> <p><input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-41: Preservation of natural features</u>  <input checked="" type="checkbox"/> Site specific with Planning Board approval <input type="checkbox"/> Incentivized in code/ordinance  <input type="checkbox"/> Expressly allowed by design/construction specifications <input type="checkbox"/> Typically not allowed  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	Score: 3 out of 3 points

**Project Findings**

*Code and Ordinances Worksheet Findings*

	<p><b>Do construction plans provide adequate documentation to limit the clearing of natural vegetative cover?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>151-41: Preservation of natural features</u>  <input checked="" type="checkbox"/> Site specific with Planning Board approval <span style="float:right"><input type="checkbox"/> Incentivized in code/ordinance</span>  <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float:right"><input type="checkbox"/> Typically not allowed</span>  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>							
<p>21. Land Conservation Incentives</p>	<p><b>Can developers or landowners utilize open space design, density bonuses, lower property tax rates, and other tools and programs?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>180-18: Cluster development and 180-17: Planned Development</u>  <input type="checkbox"/> Site specific with Planning Board approval <span style="float:right"><input checked="" type="checkbox"/> Incentivized in code/ordinance</span>  <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float:right"><input type="checkbox"/> Typically not allowed</span>  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	<p>Score: 4 out of 4 points</p>						
	<p><b>Is design flexibility permitted to meet regulatory or conservation restrictions?</b>  <input checked="" type="checkbox"/> Supportive language in code/ordinance Section: <u>180-18: Cluster development and 180-17: Planned Development</u>  <input type="checkbox"/> Site specific with Planning Board approval <span style="float:right"><input checked="" type="checkbox"/> Incentivized in code/ordinance</span>  <input type="checkbox"/> Expressly allowed by design/construction specifications <span style="float:right"><input type="checkbox"/> Typically not allowed</span>  <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>							
<p>22. Stormwater Outfalls</p>	<p><b>Is stormwater required to be treated for quality before it is discharged?</b>  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Section: <u>139-15: Discharge of untreated wastewater</u> <input type="checkbox"/> No Standard <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>	<p>Score: 6 out of 6 points</p>						
	<p><b>Can stormwater be discharged directly into a jurisdictional wetland without pretreatment?</b>  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Section: <u>139-15: Discharge of untreated wastewater</u> <input type="checkbox"/> No Standard <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>							
	<p><b>Are there effective design criteria for stormwater best management practices?</b>  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Section: <u>Chapter 147: Stormwater Management</u> <input type="checkbox"/> No Standard <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>							
	<p><b>Does a floodplain management ordinance exist that restricts or prohibits development within the 100-year floodplain?</b>  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Section: <u>Chapter 88: Flood Damage Prevention</u> <input type="checkbox"/> No Standard <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p> <p>Notes:</p>							
<p><b>Areas identified within Conservation of Natural Areas that are most in-line with Green Infrastructure principles:</b></p> <table style="width:100%; border:none;"> <tr> <td style="width:33%;"><input type="checkbox"/> Buffer Systems</td> <td style="width:33%;"><input checked="" type="checkbox"/> Tree Conservation</td> <td style="width:33%;"><input type="checkbox"/> Buffer Maintenance</td> </tr> <tr> <td><input checked="" type="checkbox"/> Land Conservation Incentives</td> <td><input checked="" type="checkbox"/> Clearing and Grading</td> <td><input checked="" type="checkbox"/> Stormwater Outfalls</td> </tr> </table>			<input type="checkbox"/> Buffer Systems	<input checked="" type="checkbox"/> Tree Conservation	<input type="checkbox"/> Buffer Maintenance	<input checked="" type="checkbox"/> Land Conservation Incentives	<input checked="" type="checkbox"/> Clearing and Grading	<input checked="" type="checkbox"/> Stormwater Outfalls
<input type="checkbox"/> Buffer Systems	<input checked="" type="checkbox"/> Tree Conservation	<input type="checkbox"/> Buffer Maintenance						
<input checked="" type="checkbox"/> Land Conservation Incentives	<input checked="" type="checkbox"/> Clearing and Grading	<input checked="" type="checkbox"/> Stormwater Outfalls						

## Project Findings

*Code and Ordinances Worksheet Findings*

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**Total Score (out of 100): 67**

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**Residential Streets and Parking Lots Score (out of 40): 25**

**Lot Development Score (out of 36): 26**

**Conservation of Natural Areas Score (out of 24): 16**

### Scoring (Out of 100 points)

90 – 100: Congratulations! Your community is a real leader in protecting streams, lakes, and estuaries. Keep up the good work!

80 – 89: Your local development rules are pretty good, but could use some tweaking in some areas.


70 – 79: Significant opportunities exist to improve your development rules. Consider creating a site planning roundtable.

60 – 69: Development rules are inadequate to protect your local aquatic resources. A site planning roundtable would be very useful.

< 60: Your development rules definitely are not environmentally friendly. Serious reform of the development rules is needed.

## Summary of Green Infrastructure Sites

### Qualitative Assessment Table

		Relative Assessment Scores (see Notes)						
		Nutrient Removal	TSS Removal	Proximity to Impaired Water	Constructability/Maintenance	Probable Construction Costs	Other Unique Benefits	Total
Site	Practice							
Parma Town Hall	Bioswale (Water Qual Swale)	5	5	5	3	5	5	28
Parma Town Hall	Porous Paving	5	5	5	2	5	5	27
Parma Town Hall	Stabilization (Outlet)	1	5	5	5	5	5	26
Webster Town Hall	Stabilization (Bank)	5	5	3	2	5	5	25
Walworth Town Hall	Stormwater Wetlands	5	5	5	1	3	5	24
Churchville Village Hall	Rain garden (Filtration)	3	3	5	2	5	5	23
Webster Empire Blvd	Bioretention (Filtration)	5	5	1	4	5	3	23
LeRoy Mill Street Parking Lot	Bioretention (Filtration)	3	3	3	3	5	5	22
Spencerport Exempt Club	Rain garden (Filtration)	1	3	3	5	5	5	22
Ogden Maida Drive	Stormwater Wetlands	5	5	3	1	1	5	20
Parma Highway Garage	Bioretention (Filtration)	3	5	3	3	5	1	20
Penn Yan Spencer Street	Stabilization (Bank)	5	5	1	1	5	3	20
Walworth Laurel Court	Stabilization (Outlet)	1	5	5	3	5	1	20
Webster Finn Park	Stormwater Wetlands	5	5	3	1	3	3	20
Churchville DPW	Bioswale (Water Qual Swale)	1	3	5	3	5	1	18
Dresden Village Center	Rain garden (Filtration)	1	1	1	5	5	5	18
Leroy Elm Street	Bioretention (Filtration)	5	3	3	1	3	3	18
Penn Yan Lakeview Cemetery	Stormwater Wetlands	3	3	5	1	1	5	18
Walworth Highway Garage	Bioswale (Water Qual Swale)	1	5	1	5	5	1	18
Penn Yan Lake Street	Bioswale (Water Qual Swale)	3	3	1	4	5	1	17
Walworth Town Hall	Porous Paving	1	3	5	2	1	5	17
Torrey Highway Garage	Bioswale (Water Qual Swale)	1	3	1	5	5	1	16
Penn Yan Spencer Street	Stabilization (Outlet)	1	5	1	2	5	1	15
Webster Friar Tuck Lane	Stormwater Wetlands	3	3	3	1	1	3	14
Penn Yan Lake Street	Bioretention (Filtration)	1	1	1	4	5	1	13

Notes:

1. For description of criteria, see GHD Technical Memorandum dated September 2, 2011.
2. Scores: Low=1, Mod=3, High=5
3. Some variable of scores are present. High-Moderate = 4 & Moderate-Low = 2
4. Totals are relative to the projects included in this study.