

**Strategy for a Flood Resistant  
Southern Tier Central Region**

# **Municipal Land Use Strategies for Improving Flood Resilience**

Guidance for Protecting Health, Safety, and Welfare



Steuben County Emergency Management Office

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*This guide presents ideas and practical guidance for municipalities in the Southern Tier Central region of New York. It is not intended to be a thorough guide to proper floodplain or land use management.*

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# Strategy for a Flood Resistant Southern Tier

## *Municipal Land Use Strategies*

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# Strategy for a Flood Resistant Southern Tier

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### I. Introduction

#### ***Government has an affirmative duty to prevent harm.***

The basic role of government is to defend people against common threats. Within the Southern Tier Central region of New York (Chemung, Schuyler, and Steuben Counties), hazard analyses have repeatedly found that flooding is the most significant local hazard. This guide provides ideas and resources to help local governments meet the challenge of defending their communities from flood risks. Costly mitigation projects are beyond the reach of most small municipalities (even when grant funding is available), but local land use authorities give communities powerful and cost-effective tools for preventing flood damage.

New York State municipal law gives cities, towns, and villages the authority to regulate land uses, and in so doing, explicitly states that regulations shall secure safety from flooding and other dangers.<sup>1</sup> Flood safe development is essential for maintaining public safety, the future stability of the tax base, the local economy, and the quality of life in the Southern Tier Central region. The challenge for local governments is to plan for appropriate development to occur while also protecting people and property from the impacts of flooding. The simplest way to ensure safer communities might be to prohibit building in hazardous areas. However, uncertainty exists about where future flooding will occur and stopping development altogether in high risk areas is not always feasible. Local governments are thus faced with the challenge of integrating the protection of public health and safety with other important goals, such as economic development and the provision of affordable housing.

**An independent study by the National Institute of Building Sciences found that every dollar spent on mitigation saves society an average of four dollars.<sup>2</sup> Therefore, it should be seen as a fiduciary responsibility of local government to thoughtfully consider initiatives that reduce the potential impacts of hazards within their jurisdictions.**

The late Dr. Gilbert White famously observed, “Floods are an act of God, but flood losses are largely an act of man.” In other words, damage and suffering are the result of decisions to develop in areas that are prone to flooding. So the most effective strategy for managing flood risks is to better manage where and how development occurs.

What is meant by flood resilience? A flood resilient community is one in which residents and institutions have the capacity to prepare for, respond to, and recover from flooding with minimal outside assistance. By becoming more resilient, communities are not just prepared to survive a major event, but are poised to adapt to ever-changing conditions and thrive.

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<sup>1</sup> “Guide to Planning and Zoning Laws of New York State,” James A. Coon Local Government Technical Series, New York State Department of State, June 2011, [www.dos.ny.gov/lg/publications/Guide\\_to\\_planning\\_and\\_zoning\\_laws.pdf](http://www.dos.ny.gov/lg/publications/Guide_to_planning_and_zoning_laws.pdf).

<sup>2</sup> “Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities,” Multihazard Mitigation Council of the National Institute of Building Sciences, 2005, [https://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/MMC/hms\\_vol2\\_ch1-7.pdf?hhSearchTerms=%22Natural+and+hazard+and+mitigation+and+saves%22](https://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/MMC/hms_vol2_ch1-7.pdf?hhSearchTerms=%22Natural+and+hazard+and+mitigation+and+saves%22).

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This strategy proposes that flood risks be reduced through a combination of the following approaches:

- **Manage water where it falls.** Land use activities throughout a watershed should utilize good stormwater management practices that prevent rapid runoff into streams and rivers. This may be as simple as maintaining soil cover and vegetation to slow water down and allow it to soak into the ground. When the soil is covered with buildings, pavement, or other impervious surfaces, engineered stormwater management practices may be needed.
- **Make room for water.** The highest risk areas near rivers, streams, wetlands, and lakes should be kept free from vulnerable development. The natural functions of these areas are to store and slow floodwaters, thus providing relief for other areas.
- **Live with floods.** In flood-prone areas with existing development and areas where future development will be permitted, measures can be taken to enhance safety and reduce the potential for damage.
- **Educate the public.** If residents and business owners are knowledgeable about potential flood risks, they can make informed decisions that balance those risks with other concerns.

What is No Adverse Impact (NAI) floodplain management? No Adverse Impact is a floodplain management principle (developed by the Association of State Floodplain Managers) in which **the actions of one property owner are not allowed to adversely affect the rights of other property owners.** Communities can use this principle to promote responsible development by identifying potential impacts of new development proposals and then implementing actions to either avoid or mitigate those adverse impacts before they occur:

- **Prevent adverse impacts to other properties,** such as increased flooding or higher velocities.
- **Prevent adverse impacts to safety and health** by maintaining effective emergency operations, safe evacuation procedures, water quality, traffic safety, etc.
- **Prevent adverse impacts to natural floodplain functions,** which reduce flood severity by enabling storage and slowing of flood waters, along with other environmental benefits.
- **Preserve undeveloped floodplains** so that new development is located outside of high risk areas.

NAI how-to guides and other resources are available on the Association of State Floodplain Managers website, [www.floods.org/index.asp?menuID=460&firstlevelmenuID=187&siteID=1](http://www.floods.org/index.asp?menuID=460&firstlevelmenuID=187&siteID=1).

This guide focuses on the land use authorities of local governments in New York State, presenting recommendations and examples of techniques that can be used to reduce flood risks. These approaches are targeted primarily at protecting future development by preventing some types of development in flood-prone areas, directing growth to safer areas, and establishing standards for safer development. Land use tools can also be used to protect natural features that reduce flood risks. Recommendations for protecting people, property, and facilities within already-developed floodplains are included in countywide Hazard Mitigation Plans and can also be incorporated into other local plans and municipal programs. Public education is addressed in a separate “Flood Education Plan” (by Southern Tier Central Regional Planning and Development Board, December 2014, [www.stcplanning.org/usr/Program\\_Areas/Flood\\_Mitigation/Education/FloodEducationPlan.pdf](http://www.stcplanning.org/usr/Program_Areas/Flood_Mitigation/Education/FloodEducationPlan.pdf)).

Each community has a unique culture, landscape, and history, so the tools and strategies included in this guide will not all be appropriate for all municipalities. The approach for improving flood resilience will

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need to be tailored to fit within the local context of any particular community. Regulatory tools may be appropriate in some communities, while others prefer to rely on education and incentives.

This document is not a guide for how to develop various kinds of local plans, regulations, and programs. In-depth references are available for each of the tools described. Rather it is the intent of this guide to provide inspiration, ideas, and assistance to enable communities to leverage municipal planning and land use tools to reduce the local impacts of flooding.

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### II. Planning for Flood Resilience

#### Why plan?

Good planning makes better places to live. Good planning protects the natural environment while enhancing economic well-being and the quality of life in general. Planning helps communities document their current conditions, visualize what their communities could be in the future, and develop strategies to meet those goals.

In keeping with the duty to protect the health, safety, and welfare, local governments should address flood hazards whenever any type of plan is developed for areas with flood risks. Integrating flood safety into a community's plans provides a basis for addressing these issues through policies, practices, regulations, and investment decisions.

**“Vision without action is a daydream. Action without vision is a nightmare.”**  
**Japanese proverb**

#### Planning considerations for flood-prone areas

Federal regulations for floodplain management (44 Code of Federal Regulations § 60.22) require that any community participating in the National Flood Insurance Program “must take into account flood, mudslide (i.e. mudflow) and flood-related erosion hazards, to the extent that they are known, in all official actions relating to land management and use”<sup>3</sup> and “shall assure that its comprehensive plan is consistent with the floodplain management objectives of this part.”<sup>4</sup> The code also provides the following list of issues and measures for communities to consider when developing local plans. These are not things that communities must implement, but they are things that the community **shall consider** as part of the planning process.

*In formulating community development goals and in adopting flood plain management regulations, each community shall consider at least the following factors –*

- (1) *Human safety;*
- (2) *Diversion of development to areas safe from flooding in light of the need to reduce flood damages and in light of the need to prevent environmentally incompatible flood plain use;*
- (3) *Full disclosure to all prospective and interested parties (including but not limited to purchasers and renters) that (i) certain structures are located within flood-prone areas, (ii) variances have been granted for certain structures located within flood-prone areas, and (iii) premium rates applied to new structures built at elevations below the base flood substantially increase as the elevation decreases;*
- (4) *Adverse effects of flood plain development on existing development;*
- (5) *Encouragement of floodproofing to reduce flood damage;*
- (6) *Flood warning and emergency preparedness plans;*
- (7) *Provision for alternative vehicular access and escape routes when normal routes are blocked or destroyed by flooding;*

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<sup>3</sup> 44 Code of Federal Regulations § 60.1, Purpose of subpart, Section (c).

<sup>4</sup> 44 Code of Federal Regulations § 60.2, Minimum compliance with flood plain management criteria, Section (g).

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- (8) *Establishment of minimum floodproofing and access requirements for schools, hospitals, nursing homes, orphanages, penal institutions, fire stations, police stations, communications centers, water and sewage pumping stations, and other public or quasi-public facilities already located in the flood-prone area, to enable them to withstand flood damage, and to facilitate emergency operations;*
- (9) *Improvement of local drainage to control increased runoff that might increase the danger of flooding to other properties;*
- (10) *Coordination of plans with neighboring community's flood plain management programs;*
- (11) *The requirement that all new construction and substantial improvements in areas subject to subsidence be elevated above the base flood level equal to expected subsidence for at least a ten year period;*
- (12) *For riverine areas, requiring subdividers to furnish delineations for floodways before approving a subdivision;*  
[Note: The floodway is “the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.”]
- (13) *Prohibition of any alteration or relocation of a watercourse, except as part of an overall drainage basin plan. In the event of an overall drainage basin plan, provide that the flood carrying capacity within the altered or relocated portion of the watercourse is maintained;*
- (14) *Requirement of setbacks for new construction within Zones V1-30, VE, and V on a community's FIRM;*  
[Note: Not applicable to the Southern Tier; V zones are coastal floodplains.]
- (15) *Requirement of additional elevation above the base flood level for all new construction and substantial improvements within Zones A1-30, AE, V1-30, and VE on the community's FIRM to protect against such occurrences as wave wash and floating debris, to provide an added margin of safety against floods having a magnitude greater than the base flood, or to compensate for future urban development;*  
[Note: Additional elevation of 2 feet is required by New York State’s mandatory Uniform Fire Prevention and Building Code.]
- (16) *Requirement of consistency between state, regional and local comprehensive plans and flood plain management programs;*
- (17) *Requirement of pilings or columns rather than fill, for the elevation of structures within flood-prone areas, in order to maintain the storage capacity of the flood plain and to minimize the potential for negative impacts to sensitive ecological areas;*
- (18) *Prohibition, within any floodway or coastal high hazard area, of plants or facilities in which hazardous substances are manufactured.*
- (19) *Requirement that a plan for evacuating residents of all manufactured home parks or subdivisions located within flood prone areas be developed and filed with and approved by appropriate community emergency management authorities.<sup>5</sup>*

**“Floods are an act of God, but flood losses are largely an act of man.”**  
**Gilbert F. White**

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<sup>5</sup> Source: 44 Code of Federal Regulations § 60.22, Planning considerations for flood-prone areas, Section (c), <https://www.law.cornell.edu/cfr/text/44/60.22>.



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### III. Countywide Hazard Mitigation Plans

What is a Hazard Mitigation Plan? State and local governments develop Hazard Mitigation Plans to review the hazards facing a community and recommend long-term actions to reduce threats to safety health, and property. A local Hazard Mitigation Plan that is approved by the Federal Emergency Management Agency (FEMA) is a prerequisite to obtaining FEMA mitigation funding. New York State promotes development of Hazard Mitigation Plans at the county level. Guidance is provided by the New York State Office of Emergency Management: [www.dhSES.ny.gov/recovery/mitigation/planning.cfm](http://www.dhSES.ny.gov/recovery/mitigation/planning.cfm).

Chemung, Schuyler, and Steuben Counties have each prepared countywide Hazard Mitigation Plans to facilitate coordinated implementation of activities that will reduce future damages from multiple hazards affecting the county.<sup>6</sup> The hazard assessment conducted as part of this planning process identified flooding as the highest priority hazard in each county. The flood risks include the overflow of major waterways, flash flooding of tributary streams, washouts of road ditches and other drainageways, and inundation of poor drainage areas. In addition to water damage, erosion of streambanks and road ditches is also a major concern. The goals and strategies in each county’s hazard mitigation plan include recommendations to protect new development from flood hazards by managing land use through local plans and land use regulations.

#### Types of mitigation actions<sup>7</sup>

Mitigation Type	Description	Examples
Local Plans and Regulations	These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.	<ul style="list-style-type: none"><li>• Comprehensive plans</li><li>• Land use ordinances</li><li>• Subdivision regulations</li><li>• Development review</li><li>• Building codes and enforcement</li><li>• NFIP Community Rating System</li><li>• Capital improvement programs</li><li>• Open space preservation</li><li>• Stormwater management regulations and master plans</li></ul>

<sup>6</sup> “Chemung County Hazard Mitigation Plan”, May 2012, [www.chemungcounty.com/index.asp?pagelD=522](http://www.chemungcounty.com/index.asp?pagelD=522).  
“Schuyler County Hazard Mitigation Plan 2015-2020,” [www.schuylercounty.us/documentcenter/view/5087/](http://www.schuylercounty.us/documentcenter/view/5087/).  
“Steuben County Hazard Mitigation Plan,” June 2009, [www.steubencony.org/pages.asp?PID=285](http://www.steubencony.org/pages.asp?PID=285).

<sup>7</sup> Source: FEMA, Local Mitigation Planning Handbook, March 2013.



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Structure and Infrastructure Projects	These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards. Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance program.	<ul style="list-style-type: none"> <li>• Acquisitions and elevations of structures in flood prone areas</li> <li>• Utility undergrounding</li> <li>• Structural retrofits</li> <li>• Floodwalls and retaining walls</li> <li>• Detention and retention structures</li> <li>• Culverts</li> <li>• Safe rooms</li> </ul>
Natural Systems Protection	These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.	<ul style="list-style-type: none"> <li>• Sediment and erosion control</li> <li>• Stream corridor restoration</li> <li>• Forest management</li> <li>• Conservation easements</li> <li>• Wetland restoration and preservation</li> </ul>
Education and Awareness Programs	These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions.	<ul style="list-style-type: none"> <li>• Radio or television spots</li> <li>• Websites with maps and information</li> <li>• Real estate disclosure</li> <li>• Presentations to school groups or neighborhood organizations</li> <li>• Mailings to residents in hazard-prone areas</li> <li>• StormReady Communities</li> <li>• Firewise Communities</li> </ul>

Countywide multi-hazard mitigation plans are updated on a 5-year cycle. In order to qualify for mitigation grants from the Federal Emergency Management Agency (FEMA), a municipality must participate in the planning process and adopt the hazard mitigation plan. This municipal involvement enables incorporation of local priorities, concerns, and recommendations. In order to facilitate implementation, it is recommended that the findings and recommendations also be integrated into comprehensive plans and municipal operations. The hazard mitigation plan can also be a valuable source of information about local hazards, vulnerability of communities to those hazards, and recommendations for mitigating the risks.

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### IV. Comprehensive Planning

What is a Comprehensive Plan? A comprehensive plan (or master plan) presents the long-term vision for a municipality, along with goals and policies to help achieve that vision. It is used as a strategic tool for guiding development and investment decisions to achieve a healthy and balanced community. A comprehensive plan serves three key functions:

- **Expression of a community's desires:** Comprehensive plans can address a variety of issues, including land use, housing, community services, public safety, economic development, transportation, infrastructure, natural resources, and recreation.
- **Guide to decision-makers:** The comprehensive plan is the blueprint upon which municipal land use regulations are based.
- **Legal document:** Provides evidence of coordinated effort and rationale for adoption of specified actions. New York's zoning enabling statutes (the state statutes which give cities, towns and villages the power to enact local zoning laws) require that zoning laws be adopted in accordance with a comprehensive plan.

The New York State statutes that address local comprehensive planning are Town Law § 272-a, Village Law § 7-722, and General City Law § 28-a. Guidance is provided in "New York State Comprehensive Plan Development: A Guidebook for Local Officials," by Environmental Finance Center, Syracuse University, 2015: <http://efc.syr.edu/wp-content/uploads/2015/03/ComprehensivePlanning.pdf>.

Municipalities can lay the foundation for improved flood resilience through their comprehensive plans. The plan specifies how a community should be developed and where development should not occur. The planning process provides an opportunity to assess flood risks, integrate flood safety into the community's goals, balance flood risks with other community priorities, and develop strategies for prohibiting or mitigating flood-prone development. Uses of the land can be tailored to match the land's hazards, directing development to areas that are less vulnerable. Hazardous areas can be reserved for parks, golf courses, backyards, wildlife refuges, natural areas, or similar compatible uses.

#### Steps in Comprehensive Planning

1. **Research:** This includes mapping of natural and human-made features; documentation of existing conditions, assessment of probable future trends, anticipation of potential problems, analysis of environmental and economic constraints, and identification of key issues.
2. **Community goals and objectives:** The process of setting goals and objectives should be an open one that includes citizens and groups who have a stake in the outcome. The plan must strike a balance between multiple interdependent issues and diverse viewpoints. A future land use map can be developed to illustrate how the community intends to grow over time.
3. **Policy formation:** Assess the options available for achieving the goals and objectives, including land use regulations, capital projects, development guidelines, and operating procedures.
4. **Plan implementation:** A comprehensive plan is not a law and cannot be enforced. It only has an effect when implemented through regulatory and non-regulatory actions.
5. **Review and updating:** Because conditions change over time, it is important for the community to conduct a periodic review of problems and progress and update the plan when warranted.

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### Research—analysis of existing conditions

**Planning starts with fact finding.** Comprehensive plans provide an opportunity for assembling information about local risks from flooding and other hazards, as well as features that mitigate flood risks. By compiling and evaluating the best available data, the community is establishing a sound basis for making recommendations, including any new standards.

**Inventory existing plans.** The starting point for developing a comprehensive plan is to review the existing plan (if it exists) and any other local plans that may exist for hazard mitigation, economic development, watershed management, infrastructure planning, or other purposes. In terms of flood risks, review these plans for the following elements:

- **Recommendations that support flood resilience** such as keeping the floodplain free from development or expanding open space in the floodplain.
- **Recommendations that reduce flood resilience** such as promoting higher density in the floodplain.
- **Failure to mention flood issues** when addressing topics that could incorporate flood resilience actions.

**Use maps to delineate areas that may flood.** Because the desired goals may not be the same for all areas that could possibly flood, try to include information about the potential frequency and severity of flooding in different locations. Information about flood hazards and vulnerable areas that can be included in the plan includes:

- **Mapped flood hazard areas:** The regulated 100-year floodplain is shown on the Flood Insurance Rate Map (FIRM) developed for each community by FEMA. Some FIRMs also show the 500-year floodplain. (Source: FIRM should be on file in the municipal office; also available at FEMA's Map Service Center, [www.msc.fema.gov](http://www.msc.fema.gov); maps and approximate digital floodplain boundaries are available from county and regional planning offices.)
- **Regulatory floodway:** Central portion of some riverine floodplains is mapped as the floodway. This area should be kept free of obstructions to allow for the passage of water so there are additional constraints on development. (Only available if detailed flood studies were conducted for the community's FIRM. Source: Shown on FIRM or on a separate Flood Hazard and Floodway Map; maps should be on file in the municipal office and at county and regional planning offices.)
- **Local drainage problems** that affect roads or other development. (Source: Highway department staff, residents.)
- **Historic flooding or erosion problems.** Sedimentation, erosion, channel migration, and ice jams often cause flood hazards that are not adequately reflected on the Flood Insurance Rate Maps. In addition, changing land use, climate, and other factors can result in events of a greater magnitude than the model flood depicted on the maps. Because locations that flooded in the past may flood again, it is helpful to identify and map those flood-prone areas that are not already included in the regulated flood zone. (Source: Residents, historical societies, emergency personnel. U.S. Geological Survey maps of flood extent for the 1972 Tropical Storm Agnes flood along the region's rivers are available from STC, [stcrpdb@stcplanning.org](mailto:stcrpdb@stcplanning.org).)
- **Flood insurance data:** The number of flood insurance policies, the type of policies, claim history, and number of repetitive loss properties (with two or more significant flood insurance claims within a 10-year period) provide information about the severity of prior flood damages and the extent to which flood losses may be covered by insurance. (Source: NYS Department of

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Environmental Conservation (NYS DEC) floodplain management staff can provide National Flood Insurance Program data; contact the Elmira office at 607-732-2214.)

- **Drainage structures:** Culverts, bridges, and stormwater management practices require ongoing maintenance so that structural failures do not contribute to flooding problems. (Source: Highway and public works departments. The Chemung County Stormwater Coalition maintains a database of drainage systems and stormwater facilities in the urban communities.)
- **Flood control levees:** Levees and floodwalls provide valuable protection for many communities in the river valleys. Because these structures could fail or be overtopped (as occurred during the 1972 Tropical Storm Agnes flood), communities should be familiar with the locations of these levee systems and the areas that are protected. (Source: National Levee Database includes maps and data for levee systems, as well as an approximate representation of the area protected, called the leveed area; <http://nld.usace.army.mil>. Additional information can be obtained from the levee operator, which is the NYS DEC for many levees in the STC region; contact the Elmira office at 607-732-2214.)
- **Dams:** The hazard classification of dams is based on the potential for damage or loss of life in the event that the structure fails (not the likelihood of failure). Awareness of the locations and hazard potential classifications of dams within and upstream of the community can enable consideration of the increased flood risks in downstream areas that could be inundated in the event that a dam fails. (Source: The NYS Department of Environmental Conservation dam inventory, with locations and other information about state-permitted dams, can be accessed online at [www.dec.ny.gov/pubs/103459.html](http://www.dec.ny.gov/pubs/103459.html). Flood control staff may be able to provide additional information; contact the Elmira office at 607-732-2214.)

What are natural floodplain functions? **Flooding is a natural process.** The amount of water in a stream or river varies seasonally and with intermittent extreme events. Natural features of an undeveloped stream system, including the floodplain, can moderate the severity of extreme events:

- **Stream channels** adjust to changing conditions (amount of water and sediment) to establish a dynamic equilibrium. Relocating a stream or disrupting the natural features within the channel can contribute to increased flooding or erosion damage while the channel adjusts its location and shape to restore a balanced condition.
- **The floodplain** is an important part of a stream system because it provides a place for water to spread out during high flows. This slows down the water and dissipates energy, which reduces the potential for streambank erosion. Storage of water on the floodplain also reduces the amount of flooding that occurs downstream. A river or stream that becomes disconnected from its floodplain due to berms or high banks is often a stream with erosion problems and downstream flooding.
- **Floodplain vegetation** enhances the ability of the floodplain to slow down and store water, while also stabilizing the stream system. Above ground, the trunks and leaves slow down the flow and dissipate energy, while the roots stabilize the soil and banks. Retaining or restoring plants along the bank of a stream, called a riparian buffer, is the easiest and most effective way to protect a stream system.
- **Wetlands** are areas that contain shallow water during all or part of the year. Whether they are located in the floodplain or in upland areas, wetlands store water and slow down the rate at which water reaches streams, and thus alleviate the flood potential. Wetlands also improve water quality and provide habitat for wildlife.

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**Natural systems can play a major role in mitigating hazards.** An important flood damage reduction strategy is to preserve and restore the flood protection capacity of natural systems. Retention of natural floodplain features lessens the severity of flooding and also means that those areas do not contain development that will be susceptible to flood damage. Preservation of natural features outside of the floodplain can also help to reduce flooding. Communities may also capitalize on undeveloped land for recreational use, scenic value, and wildlife benefits.

What landscape features affect flooding? The amount of flood water depends on the amount of water that drains off the landscape. So preservation or restoration of natural drainage features anywhere in the landscape can attenuate flood peaks. Natural features to consider include:

- **Wetlands** can be located near streams or in other parts of the watershed. Regardless of location, they are valuable for slowing down and storing water.
- **Forests:** Vegetation throughout the watershed, especially mature forests, uses large amounts of water, reducing the amount that drains into streams. Plants also slow down runoff, especially on slopes, which spreads out the timing of water reaching streams and reduces peak flows. Vegetation also serves as a carbon sink, removing CO<sub>2</sub> from the atmosphere (and thus mitigating climate change). Harvesting of timber, like other land use changes, should incorporate drainage controls to avoid downhill and water quality impacts.
- **Soil:** During rainfall and snow-melt events uncompacted soil absorbs large amounts of moisture. Some water infiltrates downward and recharges groundwater resources. Additional soil moisture is returned to the atmosphere by plants. Any activity that includes grading, soil compaction, or concentration of runoff can contribute to down-slope drainage problems or flooding.
- **Slopes:** Development on steep slopes can be challenging due to difficulties with managing drainage and preventing erosion, as well as safe access roads. Disturbance of vegetation and soils in these areas may contribute to water quality impairment, downslope drainage or sediment problems, and even landslides.

**Map natural features that may increase or decrease flood risks.** Mapping and assessment of natural assets can help the planning committee identify areas that warrant protection:

- **Streams and lakes:** All waterbodies, even streams that are dry part of the year, have the potential to overflow their banks and flood surrounding areas. Many small streams do not have mapped floodplains, but still pose some risk of flooding and/or erosion of adjacent areas.
- **Riparian buffers and undeveloped floodplains:** Vegetated stream corridors and floodplains can provide valuable protection against streambank erosion and mitigation of downstream flooding. In addition, if these flood-prone areas are not developed, they are places where there is not development at risk of flooding. Stream and river corridors can be ideal locations for trails or wildlife migration corridors.
- **Wetlands:** New York State has mapped the wetlands that are subject to state regulations. A federal permit may also be needed for disturbance of additional wetland areas, as determined by a field survey. National Wetland Inventory (NWI) mapping indicates areas that may be federally-regulated wetlands.
- **Slope of the land:** Mapping of areas with steep and moderate slopes helps planners to identify those areas that may be unsuitable for development or where additional protections may be warranted to protect downslope properties from drainage problems.
- **Groundwater resources:** New York has mapped “primary aquifers” (highly productive aquifers that are being used as sources of water supply by major public water supply systems) and

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“principal aquifers” (potentially highly productive aquifers that are currently less heavily used). If infiltration or wellhead protection areas have been identified, they should be shown on a map.

- **Parks and other protected open space:** Some floodplains and natural areas may already be preserved because they are owned by government or conservation organizations and used as parks, state forest land, recreation areas, wildlife preserves, etc. Other areas may be preserved by conservation easements that limit development of privately-owned land.
- **Other natural resource areas:** Other natural areas that may be valued by the community include: forests, open fields, scenic vistas, critical habitats, and recreation areas.

(Source: County and regional planning offices can assist with mapping of natural features.)

### **Map and analyze existing conditions:**

- **Land use and land cover:** Maps of existing land use patterns, along with other flood information, can be used to identify vulnerable development that may be at risk. If historic land use information is also available, this may enable assessment of trends. (Source: County and regional planning offices can help with mapping of land uses. Historic aerial photography may be available at county Soil and Water Conservation District offices.)
- **Infrastructure:** Existing transportation, sewer, water, and drainage infrastructure support existing development. Mapping of these features can help the planning committee assess the extent to which this infrastructure is susceptible to flood damage and also whether it promotes flood-safe development patterns. (Source: County and regional planning offices can help with infrastructure mapping.)
- **Critical facilities and development:** “Critical development is that which is critical to the community’s public health and safety; is essential to the orderly functioning of a community; store[s] or produce[s] highly volatile, toxic or water-reactive materials; or house[s] occupants that may be insufficiently mobile to avoid loss of life or injury. Examples of critical development include jails, hospitals, schools, daycare facilities, public and private utilities, fire stations, emergency operation centers, police facilities, nursing homes, wastewater treatment facilities, water plants, gas/oil/propane storage facilities, hazardous waste handling and storage facilities and other public equipment storage facilities.”<sup>8</sup>
- **Vulnerability assessment:** Hazard identification and risk assessment information in the countywide Hazard Mitigation Plan can inform the planning process. Of particular interest is the identification and quantification of community assets that are vulnerable to flooding and other hazards. If the countywide plan includes relevant projections and loss estimates, this information can be included in the comprehensive plan or incorporated by reference. (Source: County Emergency Management Offices; Chemung County [www.chemungcounty.com/index.asp?pageId=522](http://www.chemungcounty.com/index.asp?pageId=522); Schuyler County [www.schuylercounty.us/DocumentCenter/View/5087](http://www.schuylercounty.us/DocumentCenter/View/5087); Steuben County [www.steubencounty.org/pages.asp?PID=285](http://www.steubencounty.org/pages.asp?PID=285).)

### **Involve the public**

**Public engagement is essential for developing an effective comprehensive plan.** The planning committee can solicit the knowledge, insights, and recommendations of residents through surveys,

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<sup>8</sup> Source: “A Guide for Higher Standards in Floodplain Management,” Association of State Floodplain Managers, 2013, [www.floods.org/ace-files/documentlibrary/committees/3-13\\_Higher\\_Standards\\_in\\_Floodplain\\_Management2.pdf](http://www.floods.org/ace-files/documentlibrary/committees/3-13_Higher_Standards_in_Floodplain_Management2.pdf).

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interviews, public meetings, and discussion groups, and also at the public hearings required before adopting a plan. These public engagement techniques are used to survey residents about the issues that concern them. There is also an educational component of this public engagement process, which includes opportunities for raising awareness about existing conditions, such as the threat of flooding. Participants who review community maps and data can attain a better understanding of the interconnected issues addressed by the comprehensive plan. This helps to build community support for implementation of the flood resiliency recommendations.

If there has not been a recent flood event, flooding will probably not be part of the recent collective consciousness and thus may not be mentioned by residents during the public engagement process. However, the lack of flood-related responses to community surveys does not mean that residents are not concerned about safety and property protection. Local interest will undoubtedly increase when a flood occurs, particularly if there is a perception that the municipality could have done more to ensure their safety.

Strategies for introducing flood risks into the public engagement process for a comprehensive plan include:

- **Effective communication:** Written materials, presentations, and other interactions should be conducted in lay terms and focused on local issues. Explain and ask for comments on big issues rather than technical details. Then use the input received to develop a credible plan that addresses the concerns and priorities of the community.
- **Maps:** Include streams, floodplains, and other hazard information on maps that are distributed to residents or available at public meetings. Without this information, people may forget that those areas are prone to flooding.
- **Historic flood photographs:** Photographs of past floods or visualization tools showing possible future floods can help people to visualize the potential risks.
- **Survey:** Public surveys are used to ask residents about the issues that concern them. Include questions in the resident survey, not to ask if flooding is an important issue, but asking how these risks can be addressed. For example, a question about the importance of various land use and development issues could include “Protection of wetlands and stream corridors.” Or residents can be asked about various strategies for protecting infrastructure investments from future flood damage.

### Vision for a safe community

**It is the civic duty of local governments  
to protect the health, safety, and welfare of the people who are served.**

**A primary function of local government is to protect life and property.** When articulating a vision, don't forget to include the obvious, which is to be a safe community. If this is explicitly stated in the community's vision and/or goals, it provides a solid foundation for recommendations that promote flood safety and resilience. Possible language to include:

- Protect life and property.
- Floodplains are meant to flood.
- Make room for water.



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### **Develop goals and objectives that aim high**

When developing recommendations for how to improve safety and flood resilience, the community should aim high by thinking beyond the usual solutions or the FEMA-mapped flood zone.

Because communities vary greatly, comprehensive plan goals will vary as well. The goals should be derived from the data collected and the priorities articulated by residents. When considering how to integrate flood resiliency with other community goals, consider if there are high risk areas that simply should not be developed, no matter how resilient the structures. Are there recreational needs that are compatible with the flood risks in those areas? What can be done to protect existing development in the floodplain or near streams? Can improved safety and reduced flood damage be achieved with public education and technical assistance? Does the county Hazard Mitigation Plan include goals and recommendations that should also be included in the Comprehensive Plan? The following flood resiliency approaches may provide ideas that help with developing goals and objectives applicable to your community.

#### **Public safety/hazards:**

- Prevent unnecessary exposure of people and property to flood damage.
- Direct new growth away from designated flood hazard risk areas and regulate new development to reduce the risk of flood damage.
- Identify high risk areas that should be kept free of development because of frequent flooding, high velocity flow, erosion, sediment, or other threats.
- Consider acquisition or relocation of existing development in high risk areas and creation of parks or other public amenities in these locations.
- Develop a policy for post-flood evaluation of structures that have been repeatedly or severely flooded to determine whether relocation or acquisition is desirable.
- Review options for improving safety by revising development standards, improving emergency services, stream restoration, public education, and other means.
- Provide technical assistance to floodproof existing non-elevated buildings in the floodplain.
- Increase public awareness of the residual flood risks in areas protected by levees.
- Educate residents about flood safety, including the need for family emergency plans and dangers of driving on flooded roads.



Steuben County Emergency Management Office

#### **Land use and growth** (see also the future land use map information below):

- Promote land use patterns that reduce exposure to hazards and keep vulnerable development out of floodplains and other known hazard areas.
- Reserve FEMA designated flood hazard areas for agricultural and natural resource conservation uses.
- Identify appropriate areas outside of the floodplain for higher-density mixed-use hamlets and recommend policies to encourage their development.
- Promote the use of cluster development and/or conservation subdivisions.

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- Consider updating floodplain development regulations and incorporating no adverse impact requirement that increase flood protection for existing and new development.
- Promote the use of green infrastructure and other stormwater management practices to reduce runoff that contributes to flooding.
- Preserve trees through an urban forestry program.
- Review and revise land use regulations to specifically permit and provide incentives for green infrastructure stormwater management practices (making it easier for developers to comply with stormwater management permit requirements).

### **Housing:**

- Provide affordable housing in safe areas that are not prone to flooding.
- Ensure that the design of new and improved housing complies with current building codes and with potential hazards in mind.
- Prevent new residential construction and remove existing housing from the highest risk areas of the floodplain.

### **Transportation and infrastructure:**

- Build resiliency measures into transportation and infrastructure projects to improve drainage and withstand flooding.
- Use transportation policy and infrastructure design to guide growth away from hazardous areas.

### **Economic development:**

- Support business continuity by directing commercial or industrial growth to areas that are less vulnerable to damage from flooding.
- Communicate the short- and long-term economic benefits of planning for hazards and developing resilient communities.
- Make community resilience a key feature in attracting, expanding, and retaining businesses and industry.

### **Community facilities and services:**

- Use natural features (green infrastructure) to manage runoff from municipal buildings.
- Locate facilities for public safety—such as police, fire stations, and emergency operations centers—in low hazard areas where they can operate during a major hazard event.

### **Recreation and open space:**

- Conserve vegetation and discourage development along stream and river corridors.
- Develop trails, bike paths, parks, and other recreational opportunities along streams and in floodplains to help connect people to the water and accommodate water during floods.
- Protect natural features that attenuate flood peaks, including riparian buffers, floodplains, wetlands, and mature forests.
- Preserve natural vegetation and woodlands on steep slopes to reduce the likelihood of dangerous landslides, protect viewsheds, and maintain existing drainage.



Steuben County Department of Public Works

*The largest single source of flood losses in the United States, both in terms of cost and number of people affected is damage to transportation infrastructure. Infrastructure damage also represents the greatest public safety hazard. Yet road departments are generally constrained by limited resources, expertise, and staff.*

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- Protect forest land for multiple benefits (including timber production, watershed management, flood abatement, wildlife habitat, scenic value, and recreation) and promote good forest management practices.

### **Future land use map**

A future land use map is a means of illustrating how the community intends to grow over time. It identifies appropriate areas for future growth and development, often accompanied by supporting details such as types of land uses and appropriate densities. A clear future land use map can set the stage for regulatory changes that support the stated policies of the comprehensive plan. Floodplains and other known hazard areas should be included on these maps to ensure that future development patterns are consistent with the known risks.

Development of a future land use map can be a challenging process during which the community reconciles any conflicts between development strategies and mitigation strategies in order to promote safe growth. The future land use map should identify the following areas:

- **Undevelopable areas** where development should be avoided due to environmental or safety concerns. This could include part or all of the floodplain (especially the floodway or areas subject to frequent, deep, or high velocity flooding), stream corridors (particularly those with erosion or flash flood risks), wetlands, steep slopes, wellhead protection zones, and other sensitive areas. If these areas are currently developed, the community should consider a strategy for protecting or relocating this development.
- **Constrained areas** where development is possible, but natural features limit use of the land. This may include slopes, stream corridors, floodplains, brownfields, areas with poor soils, etc.
- **Targeted growth areas** that are most suitable for various types of development, including hamlets (with compact multi-use development), residential neighborhoods, commercial, and industrial facilities.
- **Areas targeted for recreational development**, such as floodplains, stream corridors, and pathways for future trails.

### **Develop feasible recommendations**

The comprehensive plan should recommend actions that are affordable and within the capabilities of the community to implement. If the resources are not there to implement what needs to be done, the plan should identify where the resources could come from, such as a grant or a cooperative effort with other communities. This does not conflict with the recommendation above that the plan's goals should aim high. Rather it recognizes that significant achievements are accomplished one step at a time.

**Recommendations that meet multiple community goals and objectives are often more supported by the community.** For example, many communities recommend parks, trails, or other recreational opportunities in floodplains, stream corridors, or other locations where more intense development is constrained by natural features. Hamlets or cluster development can concentrate the built environment in safe locations, while meeting other smart growth objectives and also preserving open space and natural functions in environmentally sensitive areas.

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Recommended actions for achieving the community's goals and objectives can take many forms:

- **Revised or new land use regulations:** Municipal land use authorities provide tools for managing the uses in high risk areas. Depending on the level of risk in a particular area, some uses may be prohibited, others may be allowed with special conditions to improve safety, and other uses (such as trail systems or agriculture) may be encouraged. Other sections of this guide contain suggestions and ideas for addressing flood risks through land use regulations.
- **Municipal operations and facilities:** Examples include: drainage improvements at municipal facilities, revising the application and permit process, improved inspection and maintenance procedures for roadway drainage, floodproofing of amenities at a municipal park, development of a trail, participation in the Community Rating System (in which activities that reduce flood risks enable reduced insurance premiums), etc.
- **Outreach and education based on desired behavior changes:** Some community objectives may be achieved through voluntary actions by informed residents and businesses. Additional information about public education messages and strategies is in a separate "Flood Education Plan" (by Southern Tier Central Regional Planning and Development Board, December 2014, [www.stcplanning.org/usr/Program\\_Areas/Flood\\_Mitigation/Education/FloodEducationPlan.pdf](http://www.stcplanning.org/usr/Program_Areas/Flood_Mitigation/Education/FloodEducationPlan.pdf))
- **Data collection or technical reports:** Additional information may be needed to document vulnerable areas, such as updated flood hazard mapping, mapping of erosion hazard areas along streams, assessment of roadway vulnerabilities, hydrologic study of a particular area, etc.
- **Pursue grant funding for identified projects:** Major projects, such as relocation of a critical facility to a safer location, will require additional funding, so the immediate recommendation may be to research costs and potential funding sources and then apply for grant funding.
- **Additional planning:** The comprehensive plan is broad in scope, so more detailed planning may be warranted to address a particular area or issue.

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### V. Emergency Action Plan

The best way to prepare for flooding is to develop a proactive plan for storm response. An Emergency Action Plan outlines procedures and chains of command during any disaster, including flooding, in order to facilitate effective and efficient response. Municipalities can work with county agencies, local fire departments, school districts, and other entities to develop or update a plan.

What is included in an Emergency Action Plan? Although every plan is different, an Emergency Action Plan should include the following:

- Identify known hazards and steps that can be taken to reduce their occurrence or impact.
- Contain a notification system for officials and agencies who are designated to respond to emergencies.
- Describe emergency operations procedures, such as the activation and coordination of resources, and basic strategies for responding to various incidents.
- Describe how the community's resources will be organized, lines of authority and chain of command.
- Describe the communications systems that will be used.
- Assign responsibilities for various aspects of emergency response.
- Contain resource lists to quickly obtain information, contacts and equipment.

Detailed guidance on developing an Emergency Action Plan is provided in "Emergency Planning Guide for Community Officials," by the New York State Office of Emergency Management and the New York State Emergency Management Association:

[www.dhse.ny.gov/planning/state/emergency.cfm](http://www.dhse.ny.gov/planning/state/emergency.cfm).

Information to assist with flood response activities that can be incorporated into an Emergency Action Plan includes:

- **Flood inundation maps:** A flood inundation map shows where flooding may occur for a range of water levels in a particular stream or river. The mapping is tied to a particular river gauge, so the user can see the area likely to be flooded for the currently observed river level and for forecast river levels. Paper inundation mapping is available for some of the developed river corridors in the Southern Tier Central region. (Contact the county Emergency Management Office.)
- **Dam Emergency Action Plans:** Owners of intermediate hazard potential dams (Class B) and high hazard potential dams (Class C) are required to prepare an Emergency Action Plan for the dam. If there is a Class B or C dam in or upstream of your jurisdiction and you do not have a copy of this plan, contact the dam owner and/or the NYS Department of Environmental Conservation Dam Safety Program (518-402-8185). (Information about the state dam safety program is on the NYS Department of Environmental Conservation website, [www.dec.ny.gov/lands/4991.html](http://www.dec.ny.gov/lands/4991.html).)
- **Leveed areas:** The community should have an evacuation plan for any areas that are protected by flood control levees. (National Levee Database includes maps and data for levee systems, including an approximate representation of the area protected, called the leveed area; <http://nld.usace.army.mil>. Emergency planning should be coordinated with the levee operator, which is the NYS DEC for many levees in the Southern Tier; contact the Elmira office at 607-732-2214.)
- **Bridges and culverts:** A prioritized list should be developed of bridges, culverts, and other parts of the road system with potential for flooding or erosion problems. Efforts should be made to inspect these sites before, during, and after a flood. Prior to a storm, it may be possible to



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remove debris or woody material within or immediately upstream that could result in blockage of flow. Potential problem sites should also be monitored during a flood so that unsafe roads can be closed to traffic. Post-flood inspections are needed to identify and prioritize any needed repairs. Inspection forms for this drainage infrastructure can be used to document the time of inspection, observations, and any actions taken.

- **Stream protection measures:** Rock riprap, in-stream rock structures, and other practices should be inspected before a storm (if time permits) and after a flood to ensure they are functioning properly.
- **Regulated streams and wetlands:** Include a list or map of classified streams and state-regulated wetlands to facilitate easy determination of the need for permits.
- **Post-flood emergency stream intervention:** The Upper Susquehanna Coalition (USC) has developed training to prepare local highway and public works staff to respond to stream damage from storms. Staff should obtain this training and consult with the county Soil and Water Conservation District when additional assistance is needed to address stream problems. Resources to assist with post-flood stream assessments and interventions should be included (or referenced) in the Emergency Action Plan. (Information about the USC Emergency Stream Intervention Program and Stream Team is available at [www.u-s-c.org/html/Streamteam.htm](http://www.u-s-c.org/html/Streamteam.htm).)

Emergency work in and near streams. When planning work in or near streams, the first rule is: **Don't do more than necessary.** Streams exist in a delicate balance, and when people make changes the stream will often compensate with unexpected reactions. Dredging or re-aligning a section of stream may cause the stream to erode upstream or downstream to regain equilibrium. (Learn more about streams from "Stream Processes: A Guide to Living in Harmony with Streams," [www.stcplanning.org/usr/Program\\_Areas/Water\\_Resources/StreamProcessesGuide.pdf](http://www.stcplanning.org/usr/Program_Areas/Water_Resources/StreamProcessesGuide.pdf).)

When is a permit needed for work in or near a stream or wetland? If debris can be removed from a stream by hand, this can usually be done without a permit. However, it may be necessary to get permits for disturbance of a stream or wetland, including debris removal with heavy equipment, rebuilding of infrastructure, and stream stabilization projects. If a true emergency exists, government entities can get an Emergency Authorization from the NYS Department of Environmental Conservation (NYSDEC) to undertake emergency actions. (County Soil and Water Conservation districts may assist with stream and wetland permits from the U.S. Army Corps of Engineers and the NYSDEC.) When work is undertaken within a regulated floodplain, the municipality is responsible for ensuring that all floodplain development standards are met, including assuring that the project will not cause damage to other properties. It is important to note that even if permit approvals are not required for a project, work shall not result in the degradation or contravening of water quality standards of streams or waterbodies. Stabilize any disturbed areas promptly after construction; and take all necessary precautions to prevent contamination of the stream or waterbody.

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### VI. Recovery Planning—Build Back Safer and Stronger

What is a Disaster Recovery Plan? After a flood or other disaster, there may be opportunities and community support for taking actions that reduce the affected areas' exposure to future damages. A Disaster Recovery Plan can allow communities to plan for safe reconstruction following a natural disaster. If a community identifies in advance the desired land use in various parts of the floodplain, they are prepared to pursue funding for buyouts of flood damaged structures in areas more suitable for use as open space. The goals of recovery planning are generally to

- increase the speed of recovery,
- promote effective use of resources, and
- increase the opportunity for community betterment.

How-to guidance: "Planning for Post-Disaster Recovery: Next Generation," American Planning Association, PAS Report 576, [www.fema.gov/media-library/assets/documents/103445](http://www.fema.gov/media-library/assets/documents/103445).

When should a Disaster Recovery Plan be prepared? Ideally, the Recovery Planning process is conducted during normal times, without the pressures of disaster response and recovery. However, most municipalities lack the capacity and interest to undertake pre-disaster recovery planning beyond the broad community goals included in Hazard Mitigation and Comprehensive Plans and short-term recovery recommendations in an Emergency Action Plan. It is more likely that Recovery Planning by municipalities will be conducted in the aftermath of a severe flood or other disaster.

**A flood is always an opportunity to highlight where changes are needed.** During and after a flood or other disaster, emergency management activities focus on protecting lives and property, then getting things back to "normal" as quickly as possible. However, if the community is restored to the "normal" that existed before the flood, then the same flood problems are likely to occur again and the opportunity for improving the community and building resilience will be lost.

A post-disaster Recovery Plan must **quickly address the following questions:**

- What areas should be cleared or not restored to pre-disaster conditions?
- What areas should incorporate retrofitting as part of reconstructions?
- What areas could be allowed to repair without delays?
- What changes should be made during rebuilding to make the community more resilient or sustainable?

The **key points to remember** while making these planning decisions are:

- The area will flood again someday.
- It could be worse next time.
- The community can do things to make it better next time.

Incorporating planning into the busy flood recovery process will take time, leadership, and participation of local stakeholders (elected officials, emergency personnel, planners, businesses, human service providers, civic organizations, and—of course—residents). To buy time, a **temporary reconstruction moratorium** can freeze reconstruction in the affected area until decisions can be made about who can rebuild, who must mitigate, and who can make repairs and reoccupy right away.



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**Public information and involvement are essential for developing a successful flood recovery plan.** The plan will address subjects that are central to the lives of those who live in the affected area. It will determine where they live and work in the future, and their lives may be held in limbo until the plan is completed. Dealing with the needs and emotional responses from these residents needs to be conducted in a “listen and gather information” mode rather than a “plan presentation” mode.

### **Planning considerations flood recovery**

The federal regulations (44 Code of Federal Regulations § 60.22) for floodplain management specify the following issues and measures for communities to consider when developing flood recovery goals.

*In formulating community development goals after the occurrence of a flood disaster, each community shall consider -*

- (1)** *Preservation of the flood-prone areas for open space purposes;*
- (2)** *Relocation of occupants away from flood-prone areas;*
- (3)** *Acquisition of land or land development rights for public purposes consistent with a policy of minimization of future property losses;*
- (4)** *Acquisition of frequently flood-damaged structures;<sup>9</sup>*

The recovery plan should build on any relevant goals, objectives, and recommendations in the comprehensive plan, county Hazard Mitigation Plan, and other local plans. Add to this the lessons learned from the flood that just occurred and long-range consideration of higher floods that may occur in the future.

The following policy considerations relate to long-term recovery decisions that can be addressed in a flood recovery plan (developed before or after a disaster):

- Are there areas that should not be re-built because high flood velocities or erosion threats pose safety concerns?
- Are there opportunities to restore natural environmental functions that provide protection from hazards, such as restoration of wetlands and floodways?
- Are there opportunities to replace damaged development with parks or other recreational uses, which would be beneficial to the community, but subject to less damage from future floods?
- If reconstruction will be discouraged or prevented in some areas, where are the locations in the community to which businesses and property owners can relocate?
- Should repairs and re-construction in flood-damaged areas incorporate higher standards for flood protection? If so, which standards will be required; and which will be recommended?
- Are there opportunities to incorporate mitigation or long-term improvements in infrastructure repair projects?
- Are there sufficient opportunities/locations for temporary housing, if needed?
- Are there continuity plans for maintaining adequate

*When bridges or culverts wash out or roads alongside streams are damaged, it is tempting to quickly rebuild the same infrastructure to get traffic flowing again. However, sometimes it is better to upgrade to improve resilience and prevent problems in the future.*

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<sup>9</sup> Source: 44 Code of Federal Regulations § 60.22, Planning considerations for flood-prone areas, Section (b), [www.law.cornell.edu/cfr/text/44/60.22](http://www.law.cornell.edu/cfr/text/44/60.22).

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capacity for health care, education, and social services?

- Is there a need for assistance to businesses that are directly or indirectly impacted by a flood, such as business counseling, relocation assistance, and workforce retention?
- Is there a “window of opportunity” to re-assess economic development strategies, target industries, and incentive programs? Would revised priorities or rebranding support improved community resiliency and sustainability?
- What partnerships and funding opportunities are available to assist with recovery, reconstruction, and mitigation?
- What educational tools and networking opportunities should be used to assist residents, businesses, civic organizations, and others with recovery and reconstruction?

### Resources for flood recovery and recovery planning:

- “Planning for Post-Disaster Recovery: Next Generation,” American Planning Association, PAS Report 576, [www.fema.gov/media-library/assets/documents/103445](http://www.fema.gov/media-library/assets/documents/103445). How-to guidance for communities to start their mitigation planning and disaster recovery planning processes.
- “Planning and Building Livable, Safe & Sustainable Communities: The Patchwork Quilt Approach,” Natural Hazard Mitigation Association, <http://nhma.info/publications>. Information about programs that provide technical assistance and funding to support post-disaster recovery.
- “NAI How-To Guide for Planning,” Association of state Floodplain Managers, July 2014, [http://floods.org/ace-images/PlanningFinal6\\_16\\_16.pdf](http://floods.org/ace-images/PlanningFinal6_16_16.pdf). Planning tools and case studies to help communities develop plans that “aim high” and reduce adverse impacts from flooding.
- FEMA webpage, “Part 2. Recovery Planning,” [www.fema.gov/resources-plan-post-disaster-recovery](http://www.fema.gov/resources-plan-post-disaster-recovery). Links to tools, case studies, example plans, and other resources to help communities with post-disaster recovery planning.

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### **VII. Other Local Plans and Programs**

Communities undertake a variety of planning efforts, each focused on particular assets or concerns. Since the objective of each plan is to improve the community in some way, long-term resilience should be a consideration for any local plan. In the flood-prone Southern Tier Central region, planning for long-term resilience must include consideration of flood risks. Recommendations in the previous sections of this guide can be used to integrate flood resilience into other local planning efforts, including:

- Watershed plan
- Economic development strategy
- Capital improvement plan
- Local waterfront revitalization plan
- Open space or natural resource plan
- County water quality strategy
- Facility plan

#### **Community Rating System**

The Community Rating System (CRS) is a FEMA financial incentive program to promote adoption of stronger policies to reduce flood damage. If communities document that they have policies and programs that reduce the risk of flood damage, they can be rewarded with a reduced flood insurance rate for all landowners within the municipality. Information about this program is at:

[www.fema.gov/national-flood-insurance-program-community-rating-system](http://www.fema.gov/national-flood-insurance-program-community-rating-system).

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### VIII. Local Law for Flood Damage Prevention (Floodplain Law)

Almost all municipalities in the Southern Tier Central region contain mapped flood hazard areas. Development in these known hazard areas should be managed to reduce costly damage and destruction, as well as loss of life. Moreover, regulation of floodplain development is required for participation in the National Flood Insurance Program.

What is the National Flood Insurance Program (NFIP)? The National Flood Insurance Program was established to fill a need for flood insurance, which was not available from private insurers. The program has three mutually dependent parts:

- **Mapping:** Federal flood hazard mapping identifies high risk areas with a 1% probability of flooding in any given year (100-year floodplain). This is the regulated floodplain within which flood insurance may be required and floodplain management standards should be enforced. In some mapped floodplains the elevation of water during this model flood was also calculated.
- **Insurance:** The federal government makes flood insurance available, which can be purchased from insurance agents for any building and contents, but only if the local municipalities adopts and enforces development standards within the mapped high risk (1% annual probability) floodplain. The cost of flood insurance is based on the mapped flood hazard information and building characteristics.
- **Floodplain management:** Local municipalities (who have land use authority) enact and enforce floodplain development requirements based on minimum federal standards. New York State has incorporated the federal standards into a model local law for municipalities to adopt.

What is a 100-year or 1% annual probability flood? Although the term “100-year flood” is widely used, this term is misleading. A more accurate description is a flood that has a 1% probability of occurring in any given year at a particular location. This can occur multiple times in a single year and/or in nearby locations. A location with the 100-year floodplain has a 26% or greater chance of flooding over the life of a 30-year mortgage. And some areas within the 100-year floodplain are also within 10-year and 50-year floodplains where flooding is expected to occur more frequently.

Each municipality is responsible for regulating development within areas mapped as having a 1% or greater probability of being flooded in any given year (e.g., the 100-year floodplain indicated on Flood Insurance Rate Maps). Regulation of development in these high hazard areas is intended to ensure that new development is (1) reasonably safe from flood damage and (2) will not result in physical damage to other property. Protection from flood damage is generally accomplished by elevating buildings above flood elevations.

A floodplain development permit is required from the municipality for any “development” in the regulated floodplain, based on the following definition from federal regulations:

**Development** means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.<sup>10</sup>

<sup>10</sup> Source: 44 Code of Federal Regulations § 59.1, Definitions, [www.law.cornell.edu/cfr/text/44/59.1](http://www.law.cornell.edu/cfr/text/44/59.1).

# Strategy for a Flood Resistant Southern Tier

## *Municipal Land Use Strategies*

Municipal regulation of floodplain development must meet or exceed federal standards. A series of floodplain management fact sheets to assist with implementation of floodplain management requirements were developed by Southern Tier Central Regional Planning and Development Board (STC) and are available at [www.stcplanning.org/index.asp?pageId=108](http://www.stcplanning.org/index.asp?pageId=108). (For additional technical assistance, contact STC at 607-962-5092 or the NYS Department of Environmental Conservation Elmira office at 607-732-2214.)

### **Planning considerations for flood-prone areas**

The federal regulations (44 Code of Federal Regulations § 60.22) for floodplain management specify the following issues and measures for communities to consider when adopting floodplain management regulations.

*The flood plain management regulations adopted by a community for flood-prone areas should:*

- (1)** *Permit only that development of flood-prone areas which (i) is appropriate in light of the probability of flood damage and the need to reduce flood losses, (ii) is an acceptable social and economic use of the land in relation to the hazards involved, and (iii) does not increase the danger to human life;*
- (2)** *Prohibit nonessential or improper installation of public utilities and public facilities in flood-prone areas.*<sup>11</sup>

It is worth noting that the NYS Model Law for Flood Damage Prevention (like those of other states) establishes standards for protecting development from flood damage, but does not address these planning considerations of whether the proposed use is compatible with the flood hazard. It is suggested in Section IX (Zoning) that these considerations can be applied to proposed uses within a floodplain overlay zone.

### **Updating the Local Law for Flood Damage Prevention**

Each municipality in the Southern Tier Central Region has a local law regulating floodplain development that enables participation in the National Flood Insurance Program. However, many of these local laws were adopted decades ago and are not consistent with current standards in New York State. The New York State Department of Environmental Conservation (NYSDEC) has developed a Model Local Law for Flood Damage Prevention that enables municipalities to comply with federal standards for floodplain management (which are contained in 44 CFR § 60.1 through § 60.6<sup>12</sup>). Some of these standards are also included in the New York State Uniform Code for buildings. The NYS Uniform Code and current model local law include elevation requirements that exceed the minimum federal standards by requiring that the lowest floor of buildings be elevated two feet or more above the base flood elevation (called 2 feet of freeboard). It is recommended that any local floodplain regulations that pre-date this freeboard requirement (which was enacted in 2008) be updated for consistency. The most recent version of the state model law can be obtained from DEC (contact the Elmira office at 607-732-2214). Southern Tier Central Regional Planning and Development Board (STC) has developed optional language for revising

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<sup>11</sup> Source: 44 Code of Federal Regulations 60.22, Planning considerations for flood-prone areas, Section (a), [www.law.cornell.edu/cfr/text/44/60.22](http://www.law.cornell.edu/cfr/text/44/60.22).

<sup>12</sup> 44 Code of Federal Regulations Part 60 Subpart A, [www.law.cornell.edu/cfr/text/44/part-60/subpart-A](http://www.law.cornell.edu/cfr/text/44/part-60/subpart-A).

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the model ordinance to improve clarity and facilitate enforcement (contact STC at 607-962-5092 or [stcrpdb@stcplanning.org](mailto:stcrpdb@stcplanning.org)). The Flood Damage Prevention regulations can be adopted as a zoning overlay district or as a stand-alone law.

### **Locally regulated floodplain**

The Flood Insurance Rate Map (FIRM) for each community delineates the flood zone (1% annual probability or 100-year floodplain) within which the community must regulate floodplain development. However, this mapped flood zone does not represent all areas that may be prone to flooding.

**Flood damage is not always confined to the flood hazard areas identified by FEMA.** A flood with a 1% annual probability of occurring may sound like a very unlikely event, but flood damage beyond this mapped zone is relatively common—In fact FEMA reports that these areas make up more than 20% of flood insurance claims.<sup>13</sup> The engineering models used to map flood zones are useful, but they fail to account for all of the factors that influence flooding: debris that blocks flow, stream bank erosion, sediment deposition, changes to weather patterns, changing land use, runoff flooding (before water reaches a stream), or flash flooding of small tributary streams.

Municipalities can adopt more stringent flood protection standards by adopting a “locally regulated floodplain” that includes areas outside of the FEMA-mapped 100-year floodplain boundaries. To apply flood protection development standards to additional areas, the community must first have a map delineating the areas of concern. The appropriate development standards can be determined based on the nature of the flood risk and the amount of available data. In areas without flood elevation data, it may be appropriate to apply Zone A development standards. A different flood zone may be appropriate if there are documented historical flood elevations or a reliable source of flood heights that can be used to determine flood protection levels. Or the community may choose to establish a new kind of flood zone with appropriate development standards.

To include additional floodplain areas in the community’s floodplain regulations, the definition of “area of special flood hazard” would have to be amended to include the additional locally-defined floodplains and specify the applicable flood zone (Section 2, Definitions, of the NYS Model Law for Flood Damage Prevention). In addition, the map and other supporting documentation would need to be added to the list of documents that define areas of special flood hazard (Section 3.2, Basis for Establishing the Areas of Special Flood Hazard, of the NYS Model Law). In some cases, the community may choose to include additional or revised development standards for these locally-defined floodplain areas.

**Designation of additional floodplain areas for local regulation of development does not affect flood insurance requirements or flood insurance costs,** which are based on the effective FEMA map.

Additional hazard areas that can be included in the locally regulated floodplain:

- **500-year (0.2 percent probability) floodplain:** Some communities use the 500-year floodplain shown on the FIRM as the locally regulated floodplain, with elevation standards based on the 500-year flood elevation. Adoption of this approach in New York would mean that development within the mapped boundary of the 500-year floodplain would be protected to a level two feet above the 500-year flood elevation indicated in the profile in the community’s Flood Insurance

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<sup>13</sup> Source: [www.floodsmart.org](http://www.floodsmart.org).

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Study. A community could apply this 500-year flood standard to critical facilities and development.

- **Erosion hazard areas:** The state of Vermont has mapped erosion hazard zones for the state's streams and incorporated development standards for these areas into a model floodplain development law. This approach could be replicated in the Southern Tier of New York, where active streams can cause significant erosion damage.
- **Dam inundation areas:** The potential consequences of dam failure are a function of the land use in the impacted area. Although the New York State Dam Safety Program works to reduce the risk of dam failure, the state does not have the authority to regulate downstream areas. Local communities can reduce risks by regulating development below dams. The potential inundation area that would be flooded if a dam fails can be included in a community's regulated floodplain. A dam failure inundation map may have been developed for the dam's Emergency Action Plan, but is generally only required for high hazard potential (Class C) dams. This potential inundation area could be regulated as approximate A Zones (where no base flood elevations are available and the lowest floor of new buildings must be 3 or more feet above the highest adjacent grade). Or an impact analysis can be required for any proposed development in the dam failure inundation zone.
- **Levee protected areas:** Flood protection standards could be developed for new construction in areas that would be subject to flooding in the event of a levee failure. However, the approach preferred by most communities is to provide information and education to property owners and developers. A useful handout is "Guidelines for Levee-Protected Areas" (by Southern Tier Central Regional Planning and Development Board, [www.stcplanning.org/usr/Program\\_Areas/Flood\\_Mitigation/Education/LeveedAreaGuidelines.pdf](http://www.stcplanning.org/usr/Program_Areas/Flood_Mitigation/Education/LeveedAreaGuidelines.pdf)).
- **Floodplain buffer zone:** A community could choose to extend the boundaries of the regulated floodplain by requiring flood protections in a buffer around the 100-year floodplain (within 50 or 100 feet of the floodplain boundary) or where ground elevations are only slightly higher than the modeled base flood elevation.
- **Flood-prone soils:** Soil survey maps identify some soil types as prone to flooding and others as poorly drained hydric soils. Areas with these soil types can be included in areas of flood hazard and regulated as areas of shallow flooding or Zone A.

### **Higher standards for floodplain development**

The federal standards for floodplain management are minimum requirements for participation in the National Flood Insurance Program (NFIP). However, the Federal Emergency Management Agency (FEMA) encourages local communities to adopt floodplain management standards that exceed NFIP minimum requirements and provides incentives through the Community Rating System (see Section VII). FEMA has calculated that buildings built to the federal minimum standards suffer 70% less flood related damage than unprotected buildings. However, they can still suffer damage, so higher protection levels are warranted in most instances. Floods can be higher than the base flood elevation for various reasons, including larger storms, downstream obstructions, increased watershed development, and floodplain filling. Setting higher standards protects against these risks.



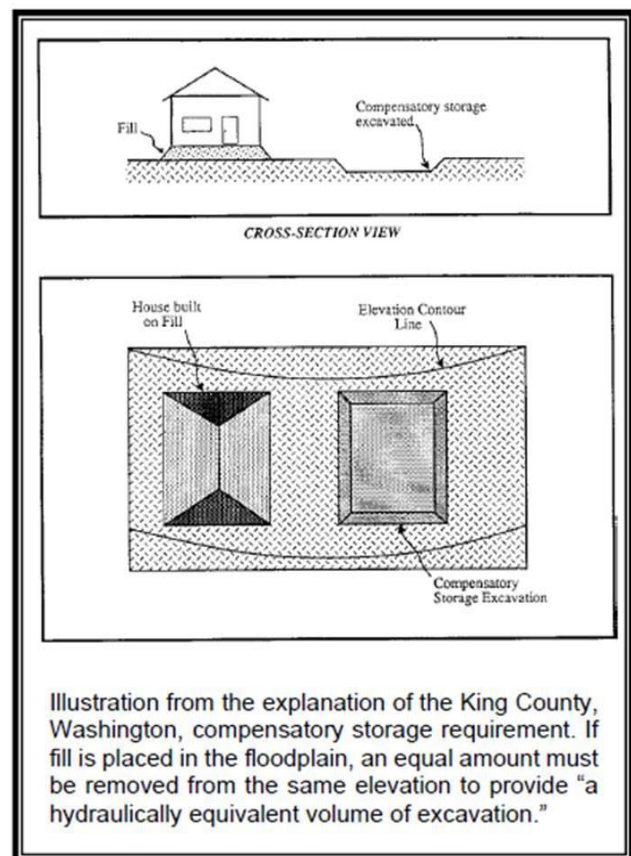
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Is it ok to make changes to the model ordinance? The New York State Model Local Law for Flood Damage Prevention complies with the floodplain management requirements of the National Flood Insurance Program contained in federal regulations. Any changes to this model ordinance must be submitted to NYSDEC floodplain management staff for review prior to enactment. In addition, if a local government enacts standards pertaining to construction that are more restrictive than the provisions contained in the NYS Uniform Fire Prevention and Building Code, the municipality must petition the State Fire Prevention and Building Code Council within 30 days of enactment ([www.dos.ny.gov/DCEA/mrls.html](http://www.dos.ny.gov/DCEA/mrls.html)).

The following suggestions for higher standards can be incorporated into a Local Law for Flood Damage Prevention to promote safer development. Southern Tier Central Regional Planning and Development Board has developed optional language for implementing many of these recommendations (see Resources for higher standards below).

- **Compensatory storage:** When fill or other development reduces the capacity of floodplain areas to store floodwater, this can result in increased flooding in nearby or downstream areas. Restrictions on development within areas mapped as floodway are intended to reduce—but not eliminate—these adverse impacts. Development, including fill, is allowed in the flood zone outside of floodways (called the floodplain fringe) and can cause the flood depth to increase by as much as one foot. Some communities may wish to avoid that potential increase in flood elevations by requiring that the placement of fill or other development that encroaches into the floodplain be compensated for by increasing the flood storage capacity of adjacent areas.
- **Foundation protection for buildings on fill:** Elevation requirements for buildings located in the regulatory floodplain are often met by elevating the structures on fill. This fill can be eroded during a flood, undermining the structure. In order to protect the foundation from settling and scour, supporting soils and fill should be properly compacted and have appropriate erosion protection.
- **Cumulative substantial improvement:** For buildings that pre-date current floodplain development standards, the NFIP allows improvements valued at up to 50% of the building's pre-improvement value to be permitted without meeting the flood protection requirements. Over the years, a community may issue a succession of permits for different repairs or improvements to the same structures, which can greatly increase the overall flood damage potential for the structure. The community may wish to define "substantial improvement"



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cumulatively so that once a threshold of improvement within a certain length of time is reached, the structure is considered to be substantially improved and must meet flood protection requirements. In order to enforce the cumulative substantial improvement requirement, the municipality must maintain records of the cost of all building improvements in the regulatory floodplain so that the history of improvements to a particular structure can be checked before the next permit is issued.

- **Additions to existing structures:** An addition or other change to an existing building may not trigger the substantial improvement requirements (if the value of the improvement is less than 50% of the pre-improvement value of the structure). However, it can be argued that any improvements should be designed and built to minimize the potential for damage from flooding. In particular, when an addition is added to an existing structure, the new portion of the building can be elevated to protect it from flood damage. A section about existing structures can be added to a local floodplain law to establish requirements for improvements to existing structures and also require that any addition be elevated (or, for non-residential structures, floodproofed) to or above the level required for new construction.
- **Critical facilities and hazardous materials:** In order to reduce threats to life and health, certain types of facilities should be protected to a higher standard than other development. This includes:
  - Facilities that are vital to flood response activities or critical to the health and safety of the public before, during and after a flood.
  - Facilities that, if flooded, would make the flood problem and its impacts much worse, such as a hazardous materials facility, power generation facility, water utility, or wastewater treatment plant.

Critical facilities should be located outside of flood hazard areas so that critical services are not interrupted, floodwaters are not polluted by hazardous materials, and health risks are minimized. Current requirements for federally-funded projects specify that critical facilities be protected to the 500-year flood level. This standard can be included in local regulations or a community can provide greater protection by prohibiting new critical facilities anywhere within the mapped 100- and 500-year floodplains.

- **Non-conversion agreement for enclosures:** If a floodplain building is constructed on an elevated foundation or has an attached garage, the area below the elevated living space or the garage is referred to as an “enclosed area below the lowest floor.” This type of enclosure is below the flood protection level and thus subject to flooding. Enclosures below elevated buildings are allowed if they are designed and constructed in a manner that allows water to enter and exit the area with minimal damage. This space must be unfinished and used solely for parking, storage, and/or building access. Permanent openings are required so that flood water can flow freely into and out of the enclosure. Any “enclosed area” that is built in compliance with these standards should not be subsequently altered to render it non-compliant, and thus more susceptible to flood damage. Communities can discourage subsequent alteration of enclosed areas by requiring non-conversion agreements whereby owners agree not to modify the enclosed area to make it more susceptible to flood damage. This agreement gives the community the right to enter the property and inspect the inside of the enclosure periodically. It must be filed with the deed and other property records so that it will remain effective as the ownership of the property changes in the future.
- **Evacuation plan:** When a floodplain development proposal would result in significant additional occupancy of the floodplain, this could necessitate the need for additional emergency evacuations during a flood. This could be addressed by an emergency action plan for the facility

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(such as a business) and/or by inclusion in the municipality's Emergency Action Plan. Although recreational use of floodplains is generally encouraged, a campground with overnight occupancy could pose safety concerns for campers, who may not be familiar with the area. Recreational vehicles are an additional concern because they are not required to meet the elevation and anchoring requirements for buildings if they are either on site for fewer than 180 consecutive days or are fully licensed and ready for highway use. A campground should thus have an emergency plan to facilitate removal of any recreational vehicles in the event of a flood.

- **Basement restrictions:** Basements with a floor below grade on all sides are prohibited for new construction within the regulated floodplain. Because there are generally no restrictions on basements outside of this flood zone, buildings near the floodplain may have basement floors that are below the base flood elevation and susceptible to flood damage. This could be addressed by prohibiting basements within the 500-year floodplain.
- **Flood study requirement:** In mapped floodplains where the base flood elevation was not determined, development of 50 lots or 5 or more acres requires a detailed study to determine the base flood elevation. This threshold could be reduced. For example, a community could require a detailed flood study for developments of 5 lots or 2 acres.
- **Determination of floodway boundary:** A community could require delineation of a floodway for any project for which the developer is required to develop a base flood elevation.
- **Alteration of natural site characteristics:** Floodplain vegetation slows down floodwaters, so its removal can result in higher velocity flows. In order to prevent damage to neighboring properties, the definition of "development" could be revised to include removal of 10% or more of the native vegetation or alteration of natural site characteristics. These activities would not be prohibited, but would require a Floodplain Development Permit, which should only be issued if the proposed activity would not result in physical damage to any other property.

Resources for higher floodplain management standards:

- "Higher Floodplain Development Standards: Recommendations for the Town of Southport," [www.stcplanning.org/usr/Program\\_Areas/Flood\\_Mitigation/Floodplain%20Management/Southport\\_Proposed\\_FP\\_Standards.pdf](http://www.stcplanning.org/usr/Program_Areas/Flood_Mitigation/Floodplain%20Management/Southport_Proposed_FP_Standards.pdf) and "Higher Floodplain Development Standards: Recommendations for the Town of Horseheads," [www.stcplanning.org/usr/Program\\_Areas/Flood\\_Mitigation/Floodplain%20Management/THorseheads\\_Proposed\\_FP\\_Standards.pdf](http://www.stcplanning.org/usr/Program_Areas/Flood_Mitigation/Floodplain%20Management/THorseheads_Proposed_FP_Standards.pdf), Southern Tier Central Regional Planning and Development Board.
- "A Guide for Higher Standards in Floodplain Management," Association of State Floodplain Managers, 2013, [www.floods.org/ace-files/documentlibrary/committees/3-13\\_Higher\\_Standards\\_in\\_Floodplain\\_Management2.pdf](http://www.floods.org/ace-files/documentlibrary/committees/3-13_Higher_Standards_in_Floodplain_Management2.pdf).
- "Model Local Law for Flood Damage Prevention: Optional Additional Language," NYS Department of Environmental Conservation, [http://nj.gov/drbc/library/documents/Flood\\_Website/FRES/NYSDEC-OptionalLanguage.pdf](http://nj.gov/drbc/library/documents/Flood_Website/FRES/NYSDEC-OptionalLanguage.pdf).

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### IX. Zoning

What is zoning? Zoning is a land use tool that regulates development by dividing a community into zones or districts and setting development criteria for each zone or district. The zoning law specifies the uses that are permitted in each zone, requirements for structural characteristics, site layout requirements, and procedural matters. Dimensional requirements may include minimum lot sizes, building setbacks, lot coverage restrictions, and building height requirements. Special zoning techniques include:

- Special use permits (Town Law § 274-a, Village Law § 7-725-b, and General City Law § 27-b)
- Incentive zoning (Town Law § 261-b, Village Law § 7-703, and General City Law § 81-d)
- Overlay zoning
- Performance zoning
- Floating zones
- Planned unit development (Town Law § 261-c, Village Law § 7-703-a, and General City Law § 81-f)
- Transfer of development rights (Town Law § 261-a, Village Law § 7-701, and General City Law § 20-f)

Guidance about various zoning tools and smart growth concepts is provided in “Creating the Community You Want: Municipal Options for Land Use Control,” James A. Coon Local Government Technical Series, New York Department of State, revised 2009,

[www.dos.ny.gov/lg/publications/Creating\\_the\\_Community\\_You\\_Want.pdf](http://www.dos.ny.gov/lg/publications/Creating_the_Community_You_Want.pdf).

Because zoning is a tool for directing different kinds of development to appropriate areas within a community, zoning regulations can be used to prevent flood damage and to protect natural resources by limiting uses in high-risk and environmentally-sensitive areas.

#### Zoning districts

A property’s zoning district designation identifies the land use activities that may take place on the site. This is an important tool for implementing the comprehensive plan and other supporting plans and policies. If sensitive areas are marked for preservation, then their zoning classifications should only allow appropriate densities and uses.

- **Density controls:** Zoning districts intended for high-density development should be located in safer areas that are not subject to flooding or other natural hazards. Flood-prone areas can be zoned for lower density development that puts fewer residences and their occupants at risk. Larger lot sizes also allow greater flexibility to locate structures on safer parts of a lot (farther from a waterbody, higher, or outside of the floodplain).
- **Uses that may be incompatible with flood risks,** such as critical facilities or facilities that store significant amounts of hazardous substances, should not be permitted “as-of-right” in zones that include mapped floodplains or other areas with known flood hazards. These uses could be “not permitted” in flood-prone or other environmentally sensitive zones and permitted under site plan approval or special use permit in other zones.
- **Open space uses:** Open space can be encouraged by explicitly listing low-impact recreation, forest uses, timber harvesting, and agriculture as allowed uses in rural zones.

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- **Conservation zone:** A conservation or open space zone can be established to protect natural features and prevent vulnerable development in high hazard or environmentally sensitive areas. The allowed uses within this zone should be those with low damage potential. Several Chemung County municipalities use this tool to limit development in the regulatory floodway, particularly along the Chemung River. Southern Tier Central Regional Planning and Development Board developed recommended language to help towns utilize conservation districts to manage flood risks by limiting development and promoting low-intensity recreation and agricultural uses. (Reports were prepared for revising an existing conservation zone in the Town of Southport, [www.stcplanning.org/usr/Program\\_Areas/Environmental%20Planning/Southport\\_Proposed\\_C\\_Zone\\_changes.pdf](http://www.stcplanning.org/usr/Program_Areas/Environmental%20Planning/Southport_Proposed_C_Zone_changes.pdf); existing conservation and recreation zones in the Town of Big Flats, [www.stcplanning.org/usr/Program\\_Areas/Environmental%20Planning/Special\\_Report\\_Big\\_%20Flats\\_Conservation\\_Zones.pdf](http://www.stcplanning.org/usr/Program_Areas/Environmental%20Planning/Special_Report_Big_%20Flats_Conservation_Zones.pdf); and a proposed new conservation zone in the Town of Horseheads, [www.stcplanning.org/usr/Program\\_Areas/Environmental%20Planning/THorseheads\\_Proposed\\_Conservation\\_Zone.pdf](http://www.stcplanning.org/usr/Program_Areas/Environmental%20Planning/THorseheads_Proposed_Conservation_Zone.pdf).)

### Overlay zoning

An overlay zone can be established to apply a common set of standards to a designated area that cuts across several “underlying” zoning districts. The underlying zone determines the types of uses permitted and the minimum dimensional requirements of lots and buildings. An overlay zone complements this by establishing additional requirements within a specified area based on the objectives for the overlay zone and mapping of its boundaries. For flood risk management objectives, overlay zoning can be use in the following ways:

- **Floodplain management standards:** Regardless of the underlying zoning in place, areas that are subject to flooding require special attention. Many communities incorporate floodplain development standards (Local Law for Flood Damage Prevention; see Section VIII) in the zoning ordinance as an overlay zone. This facilitates greater awareness and enforcement of floodplain development standards.
- **Planning considerations for floodplain overlay zone:** A floodplain overlay zone can be used to supplement the standards for floodplain development with additional criteria regarding the proposed use. The Village of Cohocton zoning law includes a list of additional considerations for any proposed development within the floodplain overlay zone (Village of Cohocton Zoning Law, Considerations on pages 22-23, <http://nebula.wsimg.com/df3fe296fa5600fee781b2d991c62452?AccessKeyId=53D5200D53685A826052&disposition=0&alloworigin=1>). The planning considerations specified in federal regulations for local floodplain management (44 Code of Federal Regulations § 60.22; quoted in Section VIII) could be used as review criteria for proposed uses in a Floodplain Overlay Zone as follows:

Development within the Floodplain Overlay Zone shall only be permitted if, in addition to the standards for floodplain development set forth in other sections of these regulations, the proposed use:

- (1) Is appropriate in light of the probability of flood damage and the need to reduce flood losses;
- (2) Is an acceptable social and economic use of the land in relation to the hazards involved;
- (3) does not increase the danger to human life; and

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- (4) does not include nonessential or improper installation of public utilities and public facilities in flood-prone areas.
- **Use restrictions in floodplain overlay zone:** A floodplain overlay zone could include the following prohibited uses:
  - (1) New construction of any residential or nonresidential structures in floodway areas.
  - (2) Storage or processing of hazardous, flammable, or explosive materials in areas of special flood hazard.
  - (3) Critical development in areas of special flood hazard. [Note: Must also adopt a definition for “critical development.”]
- **Landscaping requirements in floodplain overlay zone:** Floodplain vegetation slows down floodwater, so its removal can result in increased flood velocities. A floodplain overlay zone can include landscaping requirements that prohibit extensive removal of trees, shrubs, and foliage.
- **Environmentally sensitive areas:** Overlay zones can be used to establish standards for waterfronts, stream corridors (see Section XII), hillsides, steep slopes, or other environmentally sensitive areas.

### **General standards for all zones**

General standards are regulations that apply equally to all districts within a zoning ordinance. These standards can deal with issues such as stormwater management, stream setback requirements, stream corridor protection, landscaping, driveways, steep slopes, and other issues. An example of activities prohibited in all districts:

- A. No effluent or matter of any kind shall be discharged into any watercourse or body of surface water which:
  - 1. Violates established watercourse requirements of the NYS Department of Environmental Conservation or otherwise causes odors or fumes or which is poisonous or injurious to human, plant, or animal life; or
  - 2. Causes an increase in projected flood heights.<sup>14</sup>

### **Special use permits**

Allowed uses within a zoning district include those that are permitted “as-of-right” with no discretionary review and other uses that require a special use permit. The special use permit standards set forth in the zoning regulations are designed to allow the community to review specific development proposals in order to avoid possible negative impacts.

### **Incentive zoning (bonus zoning)**

A municipality can provide for a system of zoning incentives or bonuses (such as adjustments to the permissible population density, area, height, open space, use, or other provisions of a zoning ordinance or local law) in exchange for amenities of benefit to the residents. Community benefits can include preservation of open space or establishment of parks, which can be tools for protecting flood-prone areas.

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<sup>14</sup> Big Flats, New York—Code of Ordinances, § 17.12.020, Activities prohibited in all districts, [www.municode.com/library/ny/big\\_flats/codes/code\\_of\\_ordinances?nodeId=TIT17ZO\\_CH17.12DIUSRE\\_17.12.020\\_ACPRALDI](http://www.municode.com/library/ny/big_flats/codes/code_of_ordinances?nodeId=TIT17ZO_CH17.12DIUSRE_17.12.020_ACPRALDI).

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### **Development impact fees**

A development impact fee requires the developer to pay for engaging in development. This payment is designed to rebuild infrastructure or otherwise protect the environment in proportion to the development's impact on the community and the environment.

### **Transfer of development rights**

Transfer of development rights is a tool in which areas that the municipality has identified as needing preservation or in which development should be avoided (e.g., floodplain, agricultural land, municipal drinking water supply protection areas, etc.) are established as "sending districts." Owners of land in these designated areas may sell the rights to develop their lands and those development rights may be transferred to "receiving districts" that the municipality has determined are appropriate for increased density. This is a complex growth management technique that enables some economic return for owners of land targeted for preservation. It may be useful in areas where there is demand for development.



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### X. Site Plan Review

What is site plan review? Site plan review is a regulatory technique that requires municipal approval of the layout and design of the proposed use for a single parcel of land. General site design criteria can be set forth in the zoning ordinance or in a separate site plan review law. In order to protect the public, neighboring property owners, and public infrastructure, standards may be established for vehicular and pedestrian circulation; safe ingress and egress from the public highway; adequacy of parking; stormwater management; buffering from adjacent land uses; and other criteria. Site plan review does not supersede other zoning requirements. Rather, it is another layer of review primarily applied to commercial and multi-family development proposals.

The New York state statutes that address local site plan review are Town Law § 274-a, Village Law § 7-725-a, and General City Law § 27-a. Guidance is provided in "Site Plan Review," James A. Coon Local Government Technical Series, New York Department of State, revised May 2012, [www.dos.ny.gov/lg/publications/Site\\_Development\\_Plan\\_Review.pdf](http://www.dos.ny.gov/lg/publications/Site_Development_Plan_Review.pdf).

Municipal site plan review regulations specify both the information that must be submitted by the applicant and review standards that the municipality will use to judge the merits of proposals. In order to evaluate the safety of a proposal, the site plan should indicate any characteristics that affect flood risks and drainage, such as streams, wetlands, drainage ways, regulated floodplain, regulatory floodway, and steep slopes. Review standards related to flood safety could include:

- Preserve naturally vegetated buffers along streams, rivers, shorelines, and wetlands.
- Avoid disturbance of sensitive resource areas such as floodplains, steep slopes, erodible soils, wetlands, mature forests, and critical habitats by locating development to fit the terrain in areas that will create the least impact.
- Whenever practical, structures should not be located in the 100-year floodplain (e.g., 1% annual probability flood zone) or in a drainage way.
- Any development within the 100-year floodplain (e.g., 1% annual probability flood zone) shall comply with all provisions in the municipal Local Law for Flood Damage Prevention.
- New streets should be located outside of the 100-year floodplain (e.g. 1 % annual probability flood zone) or elevated to or above the base flood elevation when necessary to enable emergency vehicle access during a flood.
- Critical facilities should be kept out of the 100- and 500-year floodplain if at all possible. If a floodplain location is unavoidable, the facility and critical operations should be protected to the 500-year flood level or the flood of record, whichever is greater.
- Stormwater and drainage facilities shall be adequate for runoff reduction and treatment; provisions shall be made for long-term maintenance of any permanent stormwater management practices.

Additional standards can be specified for shoreline lots, riparian buffers, or other sensitive areas.

A site plan review checklist to assist with consideration of green infrastructure stormwater management techniques has been developed by Genesee/Finger Lakes Regional Planning Council, "Green Infrastructure Planning Design Guidelines," 2016, [www.gflrpc.org/uploads/5/0/4/0/50406319/giplanningdesignguidelines.pdf](http://www.gflrpc.org/uploads/5/0/4/0/50406319/giplanningdesignguidelines.pdf).

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### XI. Subdivision of Land

What are subdivision regulations? Subdivision regulations control how parcels of land are divided into smaller lots. The municipality regulates the layout of lots and the improvements that will be installed to serve the new lots. Subdivision standards are intended to ensure that the lots created are safe, accessible, and buildable. The municipality must approve a plat map of the property that shows, at a minimum:

- road layout
- lot layout and approximate dimensions
- topography
- drainage
- proposed facilities

Subdivision regulations can also stipulate additional requirements for community standards, such as stormwater drainage standards. The New York state statutes that address local subdivision regulations are Town Law § 276, 277, 278, and 279; Village Law § 7-728, 7-720, 7-732, and 7-738; and General City Law § 32, 33, 34, and 37. Guidance is provided in “Subdivision Review in New York State,” James A. Coon Local Government Technical Series, New York Department of State, 2015, [www.dos.ny.gov/lg/publications/Subdivision\\_Review\\_in\\_NYS.pdf](http://www.dos.ny.gov/lg/publications/Subdivision_Review_in_NYS.pdf).

Local review of subdivision proposals provides an opportunity to promote development patterns that are resilient to flood risks. In fact, the state standards for review of subdivision plats (set forth in Town Law §277, Village Law 7-730 and General City Law §33) include the requirement that:

“The land shown on the plat be of such character that it can be used safely for building purposes without danger to health or peril from fire, flood, drainage or other menace to neighboring properties or the public health, safety and welfare.”

Adopting local subdivision standards enables municipalities to enact more detailed site layout standards that integrate hazard mitigation into subdivision requirements. Examples include:

- **Suitability of land for subdivision:** Land subject to flooding or other natural hazards shall be identified and shall not be subdivided until the hazards have been mitigated or will be mitigated by the subdivision and construction plans.
- **Subdivision design hierarchy:** Cluster subdivisions with no lots in the floodplain are recommended wherever possible. If floodplain development is unavoidable, all lots created should have adequate buildable area on natural high ground above the 100-year flood level. If lots must be partially or entirely in the floodplain, clustering is recommended on the area of shallowest flooding.
- **Slopes:** Steep land (with slopes of 15 percent or greater) or land subject to landslides or other hazards shall not be platted or developed for residential or other uses that may endanger life unless appropriate provisions, as deemed necessary by the municipality, are made to eliminate or control the hazard.
- **Natural features or sensitive areas:** Subdivisions or development shall protect waterways (lakes, rivers, and streams), wetlands, vegetation, and other natural features or vistas.
- **Areas of special flood hazard:** No subdivision shall be approved in a mapped special flood hazard area without evidence that it meets all other flood damage protection regulations to the satisfaction of the Floodplain Administrator.

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- **Riparian setbacks:** Naturally vegetated buffers shall be preserved along perennial streams, rivers, shorelines, and wetlands
- **Stormwater management:** Drainage shall be managed to meet or exceed New York State design standards, utilizing green infrastructure approaches for site layout and treatment to the extent practicable. Provisions must be made for maintenance of all permanent practices.

As with other planning tools, subdivision standards that address flood mitigation must also strike a balance with other community objectives and private property rights.

Resource: Many detailed recommendations for mitigating flood hazards within subdivision design are included in “Subdivision Design and Flood Hazard Areas,” American Planning Association, PAS Report 584, [www.planning.org/publications/report/9112664/](http://www.planning.org/publications/report/9112664/).

### **Cluster subdivisions**

What is a cluster subdivision? Cluster development is a subdivision in which the same number of housing units allowed in a conventional subdivision are concentrated—or clustered—at a higher density in the most appropriate portion of the property, leaving larger areas to remain open and undeveloped. This allows flexibility in the design and subdivision of land, while reducing expenses related to development and maintenance of roads and infrastructure.

What is a conservation subdivision? A conservation subdivision is a type of cluster subdivision that is designed to permanently protect a large portion of a site with important environmental areas or cultural features, while clustering compact building lots on the remainder of the land. Conservation subdivisions are specifically designed around each site’s most significant natural and cultural resources. A process of designating primary and secondary conservation areas is used to set aside half or more of a parcel for open space or parkland. Open space planning to support the conservation subdivision process can include: inventory of natural and scenic resources for preservation, open space plan, and recreation and trail planning. New York State statutes do not specifically mention conservation subdivisions, which are achieved through the cluster subdivision process.

When part of a parcel is in the floodplain or contains a stream corridor, cluster development has the potential to encourage protection of these resources and location of clustered development on safer parts of the parcel. The municipal board can authorize cluster development at the developer’s option or at the municipality’s option and can designate the areas subject to cluster subdivision. Planning goals that can be articulated in local cluster development requirements include:

- preventing development in flood-prone areas
- preserving riparian corridors, wetlands, and other environmentally sensitive areas
- protection of open space, scenic views, agricultural lands, woodlands, and other open landscapes
- avoiding development on steep slope areas
- providing for greater recreational opportunities

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### XII. Waterbodies and Buffers

What is a riparian buffer? A riparian buffer is the area along a stream, river, or lakeshore where vegetation is retained to act as a buffer between the water and the adjacent land. Because it is natural for streams to flood and for stream channels to change course over time, keeping this buffer area free of development means that buildings and roads are located away from the waterbody in safer locations. Preventing development near streams and lakes also preserves many natural benefits, particularly if the riparian buffer contains a variety of types of plants—trees, shrubs, grasses, and forbs. The beneficial functions of vegetated stream buffers include:

- Slow water during high flows
- Stabilize banks
- Reduce erosion
- Promote sediment deposition in the floodplain
- Filter nutrients and other pollutants
- Moderate water temperature
- Provide wildlife habitat and corridors
- Enhance the scenic beauty

*Locating development away from stream and river banks is the most effective way to protect the development from the frequent flooding and erosion that occur along streams.*

**AND**

*Well-established vegetation on streambanks and in adjacent riparian areas is generally the best and least expensive long-term protection for a stream system.*

Streams and rivers are active systems that cause flooding and erosion of adjacent areas. Maintaining a vegetated buffer adjacent to streams, rivers, wetlands, and lakes keeps development away from these high risk areas, while providing multiple benefits for water quality, stream functions, and wildlife. Local ordinances and codes can be used to limit or prohibit certain types of (or all) development within stream corridors or near waterbodies. These local restrictions can be adopted as part of a zoning code, as a stand-alone ordinance, or as part of other regulations.

What is a wetland? Wetlands are areas that are submerged much of the time and support unique forms of vegetation. Because wetlands store stormwater runoff, their preservation can have valuable flood protection benefits. Development in or adjacent to wetlands is regulated by state and federal permit programs, which local governments can support by providing information and assistance as needed. A municipality can also enact a local wetland law. However, local involvement in regulating wetlands is generally limited to indirect regulation through subdivision and site plan review laws, which should guide development so as to avoid areas of a site that would inappropriately affect a wetland.

**How wide should a riparian buffer be?** Buffer recommendations vary widely, depending on local conditions and the desired benefits, but there is general agreement that the wider the buffer, the greater the benefits. The New York State Stormwater Design Manual recommendation is: “Ideally, riparian buffers should be sized to include the 100-year floodplain as well as steep banks and freshwater wetlands. The buffer depth needed to perform properly will depend on the size of the stream and the

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surrounding conditions, but a minimum 25-foot undisturbed vegetative buffer is needed for even the smallest perennial streams, and a 50-foot or larger undisturbed buffer is ideal. Even with a 25-foot undisturbed buffer, additional zones can be added to extend the total buffer to at least 75 feet from the edge of the stream.” For filtering runoff, the required minimum width of undisturbed riparian buffer ranges from 50 feet to 100 feet, depending on the slope.<sup>15</sup>

### **Setback requirements from waterbodies**

Setback requirements can be used to restrict development close to streams or other waterbodies.

- **Fixed-width setback:** The simplest approach is to prevent all buildings within a set distance of any waterbody. For example, “All new buildings shall be set back a minimum of one hundred (100) feet from the bank of any perennial or intermittent stream or the shore of any lake.” The streams and lakes that this requirement applies to should be shown on the zoning map or another map that is referenced in the law.
- **Variable-width setback:** A community may adopt a sliding-scale standard in which the setback distance depends on the size of the contributing drainage area or the classification of the waterbody. Or the setback distance could be greater for certain intensive uses and less for other uses.
- **Site Plan Review:** Site Plan Review can be required for activities in a buffer area that are not covered by the setback requirement, enabling municipal discretion regarding acceptable risks and impacts. For example, “Site Plan Review is required for any other development within one hundred (100) feet of a streambank, such as roads, grading, shaping, or removal of woody vegetation.”
- **Wetland setback:** Although wetlands are protected by state and federal permit programs, some municipalities enact additional local protections by establishing setback requirements from mapped wetlands. The NYS Freshwater Wetlands Act requires a 100-foot buffer for state-regulated wetlands.

### **Riparian buffer regulations**

Stream buffers can be protected with regulations that provide more detailed guidance for preventing vulnerable development, protecting natural features, and managing vegetation within stream corridors. Strategies include:

- **Two-tiered stream protection requirements:** The Town of Southport zoning law specifies allowed and prohibited uses within a 50-foot Riparian Buffer of native vegetation along all perennial and intermittent streams delineated on USGS maps within any zoning district. Along perennial streams, a Setback Area extends an additional 50 feet within which landscaping, minor recreational structures, and agricultural operations are permitted. (Zoning Law of the Town of Southport, New York, § 525-126, Stream protection, <http://ecode360.com/print/SO2246?guid=9627365&children=true#31280385>).
- **Detailed stream setback standards:** The Town of Ithaca enacted stream setback standards ranging from 35 to 100 feet that are applicable to all zoning districts. The setback widths vary depending on the size of the drainage area and parcel size, as well as the presence of wetlands or steep slopes. Specific criteria are established for a stream side zone and an outer setback

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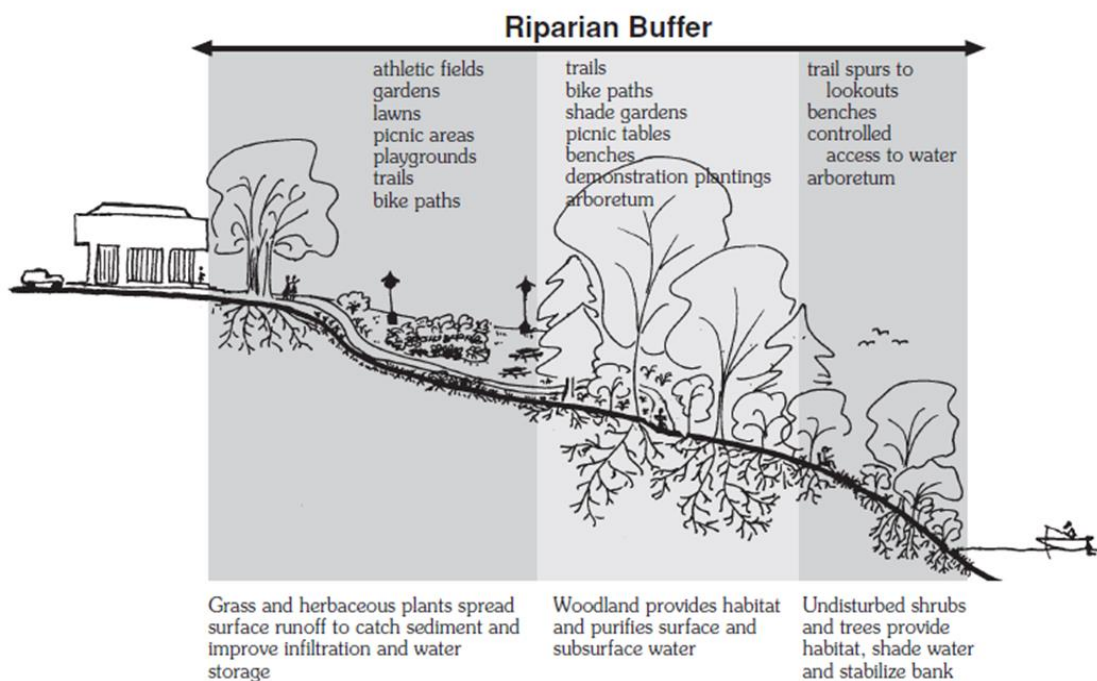
<sup>15</sup> Source: “New York State Stormwater Design Manual,” 2010, [http://www.dec.ny.gov/docs/water\\_pdf/swdm2010entire.pdf](http://www.dec.ny.gov/docs/water_pdf/swdm2010entire.pdf).

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zone. (Town of Ithaca Zoning Ordinance, § 270-219.5, Stream setback, <http://ecode360.com/16064379>)

- **Stream corridor overlay zone:** The Town of Erwin uses a Stream Corridor Overlay Zone that applies within 100 feet of the mean high water mark of designated waterbodies and wetlands. Standards for this overlay zone relate to structures, utilities, changes of grade, and removal of vegetation. (Code of the Town of Erwin, New York, § 130-38, Stream [www.erwinny.org/Chapter130%20 10\\_11-05.pdf](http://www.erwinny.org/Chapter130%2010_11-05.pdf))
- **Model code language:** Model code language and commentary developed for Colorado communities includes suggestions for development standards and procedures (“Planning for Hazards: Land Use Solutions for Colorado,” Stream Buffers and Setbacks Model and Commentary, <https://planningforhazards.com/stream-buffers-and-setbacks-model-and-commentary>).



*From Connecticut River Joint Commission*

Additional guidance:

- “River Banks & Buffers: Guidance for Communities in the Connecticut River Watershed,” Connecticut River Joint Commission, [www.crtc.org/buffers/Guidance%20for%20Communities.pdf](http://www.crtc.org/buffers/Guidance%20for%20Communities.pdf).

### **Erosion hazard zone**

The Association of State Floodplain Managers developed a White Paper to encourage state and local governments to begin mapping riverine erosion hazard areas in their communities. Several state and local programs have been established to map erosion hazard areas and then restrict new development in high risk areas. The White Paper includes discussion of the issues, recommendations, and information about existing programs (“ASFPM Riverine Erosion Hazards White Paper,” February 2016, [www.floods.org/ace-images/ASFPMRiverineErosionWhitePaperFeb2016.pdf](http://www.floods.org/ace-images/ASFPMRiverineErosionWhitePaperFeb2016.pdf)).



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### Private stream crossings

Private driveways across streams are often susceptible to flood damage, and may result in damage to downstream properties as well. Strategies for promoting safe private stream crossings include:

- **Building Permit:** The residential code of New York State includes requirements for emergency vehicle access, including: “Driveways, including bridges and other supporting structure of driveways, shall be constructed to support fire apparatus in all weather conditions.” (NYS Building Standards and Codes, 2016 Uniform Code Supplement, § 511.2.4, Stability)
- **Floodplain Development Permit:** If a bridge is proposed over a stream that has a mapped floodplain, issuance of a Floodplain Development Permit should be contingent on professional certification that the proposed design will be safe from flood damage and will not result in damage to other properties. If the proposed bridge would change the floodplain, the municipality can require a Conditional Letter of Map Revision from FEMA prior to issuing the permit.
- **Protection of Waters Permits:** A permit from New York State is required for a project that will disturb the bed or banks of any protected stream (Class C(t) or higher). The regulated streambank may extend 50 feet from the stream bed, so a private bridge over a protected stream will probably require state approval. This permit requirement can be referenced in local land use regulations. For example, “Any activity within fifty (50) feet of a New York State protected stream will comply with all permit requirements of the New York State Department of Environmental Conservation.”
- **Planning Board review:** Private stream crossings can be addressed within municipal zoning, site plan review, and subdivision regulations. For example, “Private stream crossings should be avoided wherever possible. When such crossings are necessary, they should be adequately designed and installed to provide a stable flow path during all water level conditions. Planning Board review and Town/Village/City approval is required for any bridge or culvert built as a private stream crossing on any perennial or intermittent stream. If professional engineering and/or review are necessary, incurred costs are the responsibility of the property owner.”
- **Education and technical assistance:** Some communities rely on their ability to educate residents and provide the technical assistance needed for installation of culverts or small bridges.

### Stream dumping regulations

Dumping of material in or near streams can obstruct flow and contribute to water quality problems. Examples of local regulations to prevent this include:

- **Town of Elmira Littering and Dumping Law:** In order to address stream dumping problems, the Town of Elmira enacted a stand-alone law to prohibit “the placement of any refuse, yard waste (leaves, grass clippings, brush, etc.), tires, containers, appliances, fill, or other obstructions in any storm sewer, ditch, stream, river, drainage swale, or detention basin that regularly or periodically carries surface water runoff.” It also prohibits “the placement of any refuse, yard waste, tires, containers, lumber, firewood, or other loose materials within 25 feet of the top of any streambank or riverbank.” (Code of the Town of Elmira, New York, §138, Local Law Prohibiting Littering and Dumping, <http://www.ecode360.com/14378746>)
- **Town of Horseheads Dumping Regulations:** The Town of Horseheads dumping law prohibits dumping or disposal in “any drainageway, basin, watercourse, stream or ditch.” (Code of the Town of Horseheads, New York, §98, Dumping, <http://ecode360.com/13990882>)



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## *Municipal Land Use Strategies*

### **Easements and land acquisitions**

Additional strategies for protecting flood-prone or environmentally sensitive lands from development include:

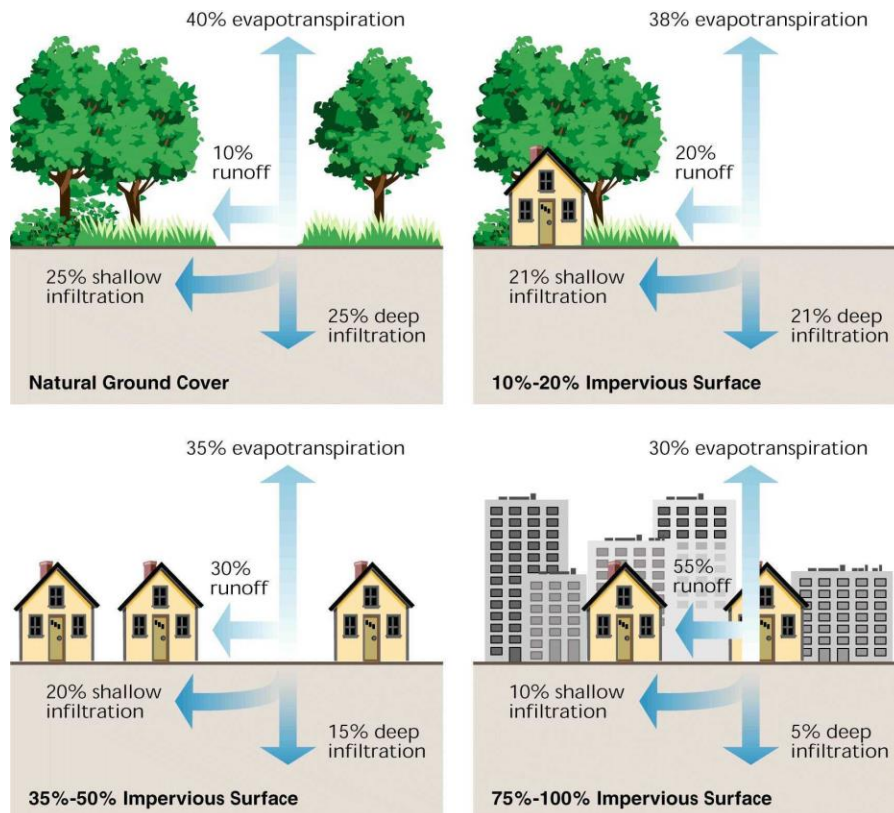
- **Conservation easement:** A conservation easement is a specific type of restriction placed on land to protect open spaces and sensitive resources, such as areas prone to hazards. An easement limits the ability to use or develop the land in some way, while still allowing the property owner to live on and use the land, sell it, or pass it on to heirs. The property is legally protected, usually permanently, for certain types of uses or development that would harm the resources. Conservation easements are generally managed by land trusts, such as the Finger Lakes Land Trust, [www.fllt.org/](http://www.fllt.org/). Grant funding is sometimes available to assist with the expenses.
- **Agricultural conservation programs:** The USDA Natural Resources Conservation Service administers a number of conservation programs that help people reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters. One such program is the NYS Conservation Reserve Enhancement Program (NYS CREP), which helps agricultural landowners to voluntarily plant trees shrubs, and grasses on streambanks. Landowners are compensated for the loss of productive agricultural land through annual rental payments and upfront incentive payments. Contracts can either be 10 or 15 years, during which the buffers must be maintained by the contracted individual. (For additional information, contact the county Soil and Water Conservation District or go to [www.nys-soilandwater.org/crep/](http://www.nys-soilandwater.org/crep/).)
- **Land acquisition:** The simplest, most effective way for government to protect an area is to acquire it. Land acquisition can protect against hazards by removing the development potential from vulnerable areas. Once purchased, natural features can be restored or the land can be used for public recreation (e.g., park, trail, fishing access, boat launch, etc.). The initial land purchase may be part of a building buyout with mitigation grant funding.

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### XIII. Runoff from the Watershed

**Runoff can worsen flooding.** If a stream is flooding frequently, it is possible that development in the surrounding area might be contributing to the problem. Development often converts pervious surfaces (such as soil), which might have previously absorbed rainfall, to impervious surface (such as concrete or pavement), which increases stormwater runoff. Grading, lawns, roads, drainage ditches, and other drainage “improvements” can also increase the speed of runoff, resulting in more water reaching the creek at the same time. Managing stormwater onsite reduces additional flow to flood-prone areas, while also protecting water quality.



From "Stream Corridor Restoration: Principles, Processes, and Practices," 10/98, by the Federal Interagency Stream Restoration Working Group.

What is poor drainage or urban flooding? Poor drainage flooding is when heavy rainfall or snowmelt overwhelms drainage systems. This is sometimes called urban flooding (or pluvial flooding), but it occurs in rural areas also. Because damage is caused by runoff before it reaches a stream, it can cause damage far from streams in areas where the flood risk is not shown on floodplain maps.

Factors that contribute to flood and erosion damage from poor drainage include:

- Increased runoff due to pavement and other impermeable surfaces that prevent water from soaking into the soil.
- Increased runoff due to removal of vegetation. Bare ground can generate almost as much runoff as pavement, particularly if the soil is compacted. Mowed lawns are not nearly as effective at intercepting and soaking up water as forests.
- Concentrated flow due to grading and construction of drainage ways, which enable water to move at higher velocities, causing erosion and allowing water to reach streams quicker.

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The objective for development of any site should be to retain or replicate natural systems for managing water near where it falls. In other words, **use practices that will slow the water down, allow it to spread out, and enable it to soak into the ground.**

### **New York State Stormwater Permit for Construction Activities**

A New York State permit is required for any construction project that disturbs one or more acres of land or is part of a larger common plan of development that will ultimately disturb one or more acres of land (General Permit for Construction Activity). This permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP) specifying how erosion and sediment will be controlled during construction and (if required) the practices that will be used to permanently manage water quality and water quantity from the site (called post-construction stormwater management controls). Design standards are detailed in the “New York State Standards and Specifications for Erosion and Sediment Control” (Blue Book) and the “New York State Stormwater Management Design Manual.”

Although the SWPPP is developed for a state permit, the municipality is encouraged to request and review the SWPPP as part of the local review process for a subdivision or development project. In addition to technical engineering information, the SWPPP should contain planning and site design information that is relevant to the Planning Board’s site plan or subdivision review. There should be a narrative description of the stormwater planning process that enables evaluation of the rationale for selection of the proposed design over other possible options. Priority should be given to protecting stream corridors, floodplains, steep slopes, and other environmentally sensitive areas. Any concerns about this justification or the consistency of the proposed project with other community objectives can be communicated to the NYSDEC for consideration as part of their permit and project oversight responsibilities.

If permanent stormwater facilities will be built, the SWPPP must specify who will be responsible for long-term operation and maintenance of such facilities. The municipality should not approve a development proposal that lacks adequate assurances that the stormwater infrastructure will be properly and routinely maintained and that funding will be available if repairs are needed.

### **Local Stormwater Management Regulations**

What is an MS4? Certain municipalities (and other types of public or quasi-public government units) in or near urban centers have been designated as operators of Municipal Separate Storm Sewer Systems (MS4s) that must be covered by a state MS4 permit (General Permit for Stormwater Discharges from Municipal Separate Storm Sewer Systems). In the STC region, Chemung County and eleven Chemung County municipalities are designated MS4s (City of Elmira; Towns of Ashland, Big Flats, Elmira, Horseheads, Southport, and Veteran; and Villages of Elmira Heights, Horseheads, Millport, and Wellsburg). Under the MS4 permit, each of these municipalities must enact and enforce local stormwater management standards that are at least as stringent as the state standards. The MS4 municipalities are responsible for reviewing, approving, and ensuring compliance for all construction projects that require a SWPPP. The Chemung County Stormwater Coalition has been formed to provide technical assistance with the MS4 permit requirements and with other stormwater management issues throughout Chemung County ([www.chemungstormwater.org](http://www.chemungstormwater.org)).

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New York has prepared a model law for adoption by MS4 municipalities in order to comply with MS4 permit requirements. Communities may choose to incorporate more stringent requirements. For example, the City of Elmira requires development of a SWPPP and stormwater approval for smaller construction projects. This model law can also be adopted by non-MS4 municipalities. However, this is only recommended if the community has the technical capacity to review and enforce the stormwater management program requirements.

Stormwater management provisions can also be included in local zoning, site plan review, and subdivision regulations. These requirements can supplement the state permit requirements for construction projects by applying runoff management conditions to all projects, even those that do not require a state permit. Model Drainage System and Erosion Control Language developed by Southern Tier Central Regional Planning and Development Board is available at [www.stcplanning.org/usr/Program\\_Areas/Flood\\_Mitigation/model\\_drainage\\_2010\\_FINAL.pdf](http://www.stcplanning.org/usr/Program_Areas/Flood_Mitigation/model_drainage_2010_FINAL.pdf). Below is some of the proposed drainage system language that can affect runoff volumes and flood potential:

*The following standards are intended to ensure that storm water runoff is safely conveyed through a development site, to minimize streambank erosion, and to reduce flooding related to land development and urbanization. The standards for stormwater drainage systems are as follows:*

- (a) Any alteration of the hydrology of the site shall be minimized and/or mitigated so as to minimize the impact on water quality, peak discharge, groundwater recharge, and drainage patterns. To the extent possible, the quantity, quality, and timing of stormwater runoff during and after development shall not be substantially altered from pre-development conditions. The recommended technical standards for the design of post-construction structures are detailed in the "New York State Stormwater Management Design Manual," as revised.*
- (b) Any new or modified drainage channel or stormwater facility shall have sufficient capacity to accommodate the potential future runoff based upon the probable land use and ultimate development of the total watershed area upland of the development.*
- (c) Priority should be given to maintaining natural drainage systems, including perennial and intermittent streams, swales and drainage ditches.*
- (d) Any existing storm water management system including a swale, ditch, basin, pond, drywell, catch basin, stream or other system component shall be maintained in such a manner as to be functional.*

### **Stormwater Green Infrastructure**

What is green infrastructure? "Green infrastructure includes a wide array of practices at multiple scales that manage wet weather and that maintains and restores natural hydrology by infiltrating, evapotranspiring and harvesting and using stormwater. On a regional scale, green infrastructure is the preservation and restoration of natural landscape features, such as forests, floodplains and wetlands, coupled with policies such as infill and redevelopment that reduce overall imperviousness in a watershed. On the local scale, green infrastructure consists of site- and neighborhood-specific practices, such as bioretention, trees, green roofs, permeable pavements and cisterns." (Source: US Environmental Protection Agency website, [www.epa.gov/wifia/learn-about-wifia-program#questions](http://www.epa.gov/wifia/learn-about-wifia-program#questions).)

The "New York State Stormwater Design Manual" prioritizes the use of green infrastructure techniques for reducing and treating runoff based on the following techniques:

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1. **Avoid or minimize disturbance by preserving natural features or using conservation design techniques.** Preserving contiguous forests, stream buffers, floodplains, and wetlands can slow the rate of runoff and protect water quality by filtering and infiltrating polluted water.
2. **Reduce the impacts of development by decreasing impervious cover.** Reducing impervious surfaces such as buildings, roads, driveways, and parking lots, reduces the speeds and volumes of runoff as well as the amount of pollutants that are collected on site and washed into waterbodies.
3. **Manage the remaining impacts of development by using natural features and runoff reduction practices to slow down the runoff, promote infiltration and evapotranspiration, and minimize the need for structural “end-of-pipe” practices.** Using practices such as bioswales, rain gardens, rain barrels, green roofs, and vegetation can help manage runoff by allowing it to be collected, distributed, and filtered.

Municipal land use requirements can inadvertently make it more difficult for a developer to manage runoff using green infrastructure practices. For example, excessive parking space requirements may increase the impervious area. And requiring raised islands in parking lots can prevent use of these areas for some infiltration practices. It is recommended that municipal codes be reviewed for green infrastructure friendliness and revised where warranted in order to remove barriers and provide incentives for use of green infrastructure practices. This can make it easier and less costly for developers to comply with New York’s stormwater management requirements. STC has reviewed municipal codes for compatibility with recommended green infrastructure standards and developed recommendations for the Town of Southport

([www.stcplanning.org/usr/Program\\_Areas/Environmental%20Planning/GreenInfrastructure/GI\\_CodeRecommendations\\_Southport.pdf](http://www.stcplanning.org/usr/Program_Areas/Environmental%20Planning/GreenInfrastructure/GI_CodeRecommendations_Southport.pdf)) and the Town of Big Flats ([www.stcplanning.org/usr/Program\\_Areas/Environmental%20Planning/GreenInfrastructure/GI\\_CodeRecommendations\\_BigFlats.pdf](http://www.stcplanning.org/usr/Program_Areas/Environmental%20Planning/GreenInfrastructure/GI_CodeRecommendations_BigFlats.pdf)).

The green infrastructure approach for stormwater management should be incorporated into the early stages of review for development and subdivision proposals. Guidance and checklists to assist Planning Boards with this have been prepared by the Genesee/Finger Lakes Regional Planning Council, “Green Infrastructure Planning Design Guidelines,” 2016, [www.gflrpc.org/uploads/5/0/4/0/50406319/giplanningdesignguidelines.pdf](http://www.gflrpc.org/uploads/5/0/4/0/50406319/giplanningdesignguidelines.pdf).

**Trees are a critical part of the urban infrastructure** due to the value for reducing runoff, providing shade, improving air quality, greenhouse gas exchange, aesthetics, habitat, and other benefits. The Arbor Day Foundation ([www.arborday.org/](http://www.arborday.org/)) and USDA Forest Service ([www.fs.fed.us/managing-land/urban-forests/ucf](http://www.fs.fed.us/managing-land/urban-forests/ucf)) have urban and community forestry programs that provide technical assistance to help communities protect and plant appropriate tree species in developed areas.

### **Areas with known flooding problems**

New development should be designed and constructed in a manner that accommodates any known flooding or drainage problems, regardless of whether it is located within a mapped floodplain. This can be achieved by including the following requirement in zoning, site plan review, and subdivision regulations:

“When a land development project is within or adjacent to any area with known flooding problems or known high ground water, the elevations of buildings should be above the observed, anticipated or computed water levels. The effect of such development on upstream and downstream reaches of

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the watercourse and adjacent properties shall be considered and adequate protective measures shall be implemented.”

### **Public roads**

By their very nature, road systems are subject to flooding. Roads sometimes follow along waterways; bridges often constrict flood flows; and roadside drainage ditches intercept hillside drainage and concentrate it along the roadway. Flooded and washed out roadways can be extremely hazardous to the traveling public. The National Weather Service reports that **almost half of all flash flood fatalities occur in vehicles.**<sup>16</sup>

In the course of maintaining and repairing public roads, a community may have opportunities to improve flood resilience of the road system and reduce the impact on waterways. “Flood-Resistant Local Road Systems: A Report Based on Case Studies” (American Lifelines Alliance, January 2005, [https://www.floods.org/PDF/ALA\\_Flood\\_Roads\\_January2005.pdf](https://www.floods.org/PDF/ALA_Flood_Roads_January2005.pdf)) identifies the following practices that improve flood resistance:

- **Improving flood resistance: hydraulics:** Improvements to hydraulic performance are examined, and protection against scour is incorporated for every new crossing and for replacements of existing crossings.
- **Record keeping: labor, equipment, and materials:** Documentation of work performed, including labor, equipment, and materials, is maintained by road segment and crossing location; records are filed to facilitate identification of changes in conditions over time.
- **Periodic inspections:** A formalized program of periodic inspection of waterway crossings to identify, document, and monitor, over time, conditions known to contribute to vulnerability to flood damage is essential.
- **Functional partnerships: adjacent communities:** Interjurisdictional partnerships are formed to cost-effectively co-operate to provide for the overall safe functioning of local road networks.
- **Funds for flood recovery:** Provisions are made for some anticipated flood-related expenditures that exceed the normal budget so that funds are not diverted from routine maintenance and scheduled capital improvements.
- **Bridge construction crew and equipment:** In-house crew capabilities and available heavy equipment are sufficient to construct the types and sizes of the most prevalent waterway crossings in the local road system.
- **Partnerships: state and federal agencies:** Awareness of state and federal programs that provide technical and financial assistance is maintained; partnerships are identified and are pursued.
- **Watershed and stream morphology approaches to flood problems:** It is recognized that watersheds and streams are systems and that solutions to site-specific problems may involve off-site elements.
- **Staff development:** Personnel are trained and cross trained, both in-house and through external opportunities, in the skills required to perform agency tasks.

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<sup>16</sup> “Floods: The Awesome Power,” NOAA/PA 200467, NOAA’s National Weather Service, March 2005, <https://www.weather.gov/media/bis/Floods.pdf>.



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**“A strong body of research has consistently documented that ditches are contributing to flooding in streams, increasing peak stream heights by as much as 300 percent.”<sup>17</sup>**

**Roadside ditches** don't just capture road runoff. They also intercept about 20 percent of runoff from adjacent hillslopes. Each ditch provides a high velocity sluiceway that rapidly shunts water, debris, and contaminants into downstream waterways. These ditch networks increase the magnitude of peak stream heights and contribute directly to flooding. Road ditches also contribute to water pollution and degrade aquatic habitat. Information about “re-plumbing” roadside ditches to reduce contributions to flooding can be found in “Re-plumbing the Chesapeake Watershed: Improving roadside ditch management to meet TMDL water quality goals” ([www.chesapeake.org/pubs/349\\_Boomer2016.pdf](http://www.chesapeake.org/pubs/349_Boomer2016.pdf)) and on the Cornell Climate Change website (<http://climatechange.cornell.edu/re-plumbing-our-watersheds>).



Chemung County Soil and Water Conservation District

**Drainage from new roads** will often be addressed as part of the Stormwater Pollution Prevention Plan (SWPPP) developed for a subdivision or development. Road drainage standards can be included with other highway specifications in municipal regulations. Examples include:

- **Town of Southport:** “Specifications Relating to the Laying Out and Construction of Highways Prior to Their Dedication to the Town of Southport for Public Highways,” § A534-8, Drainage (<http://ecode360.com/9628121>).
- **Town of Erwin:** “Standard Specifications and Details for the Highway and Utility Construction,” Section 8.00, Storm Drainage ([www.erwinny.org/Erwin%20Specs%20and%20Drawings.pdf](http://www.erwinny.org/Erwin%20Specs%20and%20Drawings.pdf)).

Additional resources include:

- **Cornell Local Roads Program** ([www.clrp.cornell.edu/](http://www.clrp.cornell.edu/)) provides training, technical assistance and publications, including “Roadway and Roadside Drainage” (<https://cornell.app.box.com/v/clrp-ws-rrd>), “Stormwater Management” (<https://cornell.app.box.com/v/clrp-ws-sm>), and “Drainage Law and Drainage Situations and Problems in New York State” (<https://cornell.app.box.com/v/clrp-pb-dl>).
- **PennState Center for Dirt and Gravel Road Studies** has published a series of informational and technical bulletins ([www.dirtandgravel.psu.edu/general-resources/informational-and-technical-bulletins](http://www.dirtandgravel.psu.edu/general-resources/informational-and-technical-bulletins)).

### **Driveways**

A driveway should provide safe access to a site without contributing to drainage problems for neighboring properties or public roads. Natural drainage patterns should be maintained as much as possible. Driveway entrances onto public roads must be constructed so that water and debris are not

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<sup>17</sup> “Re-plumbing the Chesapeake Watershed: Improving roadside ditch management to meet TMDL water quality goals,” Schneider, R. and K. Boomer, 2016, STAC Publication Number 16-001, [www.chesapeake.org/pubs/349\\_Boomer2016.pdf](http://www.chesapeake.org/pubs/349_Boomer2016.pdf).



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discharged onto the road. Some municipalities require that driveway designs be approved by the Highway Department.

- **Entrances to state highways:** A permit from the NYS Department of Transportation (NYSDOT) is required to build or modify a driveway entrance onto a state highway. The “NYSDOT Residential Driveway Standards” ([www.dot.ny.gov/regional-offices/region4/Repository/residentialdriveways.pdf](http://www.dot.ny.gov/regional-offices/region4/Repository/residentialdriveways.pdf)) include the following drainage requirement: “A driveway shall not adversely affect the highway drainage or drainage of adjacent properties. Drainage and the stability of the highway subgrade shall not be impaired by driveway construction or roadside development. The drainage design of a construction project shall not be compromised by field adjustments to compensate for altered driveway location. In no case shall the construction of a driveway cause water to flow across the highway pavement, pond on the shoulders, or pond in the ditch.” The Standards also include requirements for highway drainage ditches and driveway culverts.
- **Culvert pipes for roadside ditch:** New York State and most local highway departments have policies for culvert sizing and installation when a driveway crosses a roadside ditch. An example of municipal ordinance language is: “Any culvert pipe required to be installed at such driveway entrance or exit shall be of corrugated metal pipe, or other construction pipe approved for such use, no smaller than fifteen (15) inches in diameter and no shorter than twenty (20) feet. If it's a twenty (20) foot driveway then the pipe shall be a single continuous length, one piece only and no loose joints.” (Big Flats, New York—Code of Ordinances, § 12.12.060, Driveway entrance specifications, [www.municode.com/library/ny/big\\_flats/codes/code\\_of\\_ordinances?nodeId=TIT12STSIPUPL\\_C H12.12LOCODRENEX](http://www.municode.com/library/ny/big_flats/codes/code_of_ordinances?nodeId=TIT12STSIPUPL_C H12.12LOCODRENEX)).
- **Driveway drainage:** Municipal codes can include drainage considerations with local code requirements for driveway entrances. An example is: “Driveways that originate on the uphill side of a roadway shall be graded in such a manner as to provide a one-percent reverse grade for a minimum distance of twelve (12) feet. All storm water drainage created as a result of constructing a driveway shall be directed in such a manner as to not drain directly on to the town road. This type of cut and subsequent drainage patterns shall be shown on the application map or plan.” (Big Flats, New York—Code of Ordinances, § 12.12.060, Driveway entrance specifications, [https://www.municode.com/library/ny/big\\_flats/codes/code\\_of\\_ordinances?nodeId=TIT12STSI PUPL\\_CH12.12LOCODRENEX](https://www.municode.com/library/ny/big_flats/codes/code_of_ordinances?nodeId=TIT12STSI PUPL_CH12.12LOCODRENEX)).
- **“Building a Rural Driveway”** is an information sheet with specific guidance on best practices for building a rural driveway (developed by the Rural Stormwater Coalition of Chemung, Schuyler and Steuben Counties, [www.stcplanning.org/usr/Program\\_Areas/Flood\\_Mitigation/Rural\\_driveway\\_FINAL\\_October\\_22\\_2009.pdf](http://www.stcplanning.org/usr/Program_Areas/Flood_Mitigation/Rural_driveway_FINAL_October_22_2009.pdf)).

### **Steep slopes**

Steep slopes are frequently developed because they have excellent views. However, excessive development on slopes can lead to landslides, wash-outs, stormwater redirection, and pollution due to excessive digging, the removal of vegetation, or the addition of impervious surfaces, such as driveways or patios. All of these effects may cause significant and costly property damage. Damage to public property, like roads and trails, can also put a financial burden on local municipalities, stretching budgets and reducing the quality of public services.

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### How do we define a steep slope?

- 0-10% grade = Gradual
- 10% - 15% = Moderate
- 15%+ grade = Steep

Municipalities may regulate development on hillsides or steep slopes for aesthetic and safety purposes. Policy options include:

- **Zoning or other development laws:** Laws applying to steep slopes can regulate the amount of land that can be disturbed by any project or covered with impervious surfaces, generally as a percentage of the land. The construction process can also be regulated, including stormwater drainage and vegetation removal.
- **Zoning overlays:** Overlay districts can impose design guidelines and regulate allowable land uses to ensure safe development. Provisions applicable to this district can include minimum vegetation coverage, density limitations, drainage, grading, landscaping, impervious surface area, building height, or other concerns.
- **Site Plan Review and Subdivision Standards:** Standards for Site Plan Review or Subdivisions can include provisions specific to steep slopes that limit impacts and direct development to less sensitive areas.

Examples and resources for managing of steep slope development:

- **Town of Elmira:** Review standards for Subdivision of Land, § 198-26, Steep slopes ([www.ecode360.com/14379529](http://www.ecode360.com/14379529)).
- **Environmental Protection Agency:** Resources for controlling development on steep slopes, [https://wiki.epa.gov/watershed2/index.php/Controlling\\_Development\\_on\\_Steep\\_Slopes](https://wiki.epa.gov/watershed2/index.php/Controlling_Development_on_Steep_Slopes).
- **Keuka Lake Watershed Steep Slopes fact sheet:** [www.stcplanning.org/usr/Program\\_Areas/Water\\_Resources/KeukaLake/Steep%20Slopes%20Policy%20Sheet.pdf](http://www.stcplanning.org/usr/Program_Areas/Water_Resources/KeukaLake/Steep%20Slopes%20Policy%20Sheet.pdf)

### **Timber harvesting**

Well-managed forests provide a plethora of environmental benefits, including attenuation of runoff that would otherwise contribute to flood flows. In addition, forest-dependent industries, recreation, and scenic values are a vital to the regional economy and quality of life. Unfortunately, some local timber harvesting operations have contributed to road damage, stream disturbances, drainage problems, and erosion. Resources to help promote good forest management and timber harvesting operations include:

- **“Best Management Practices During Timber Harvesting Operations,”** is an educational guide developed by the Chemung County Soil and Water Conservation District (607-739-2009).
- **“New York State Forestry Best Management Practices for Water Quality”** is a field guide for timber harvesters, forest managers, and landowners ([http://www.dec.ny.gov/docs/lands\\_forests\\_pdf/dlfbmpguide.pdf](http://www.dec.ny.gov/docs/lands_forests_pdf/dlfbmpguide.pdf)).
- **“A Municipal Official’s Guide to Forestry in New York State”** describes how local governments can use planning and local land use regulations to support forestry and the multiple benefits of forests ([http://www.dec.ny.gov/docs/lands\\_forests\\_pdf/guidetoforestry.pdf](http://www.dec.ny.gov/docs/lands_forests_pdf/guidetoforestry.pdf)).

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- **Municipal timber harvesting regulations:** The following municipalities in the STC region have enacted timber harvesting laws to reduce environmental damage:
  - Town of Ashland
  - Town of Big Flats  
([www.municode.com/library/ny/big\\_flats/codes/code\\_of\\_ordinances?nodeId=TIT5BULRE\\_CH5.16TIHA](http://www.municode.com/library/ny/big_flats/codes/code_of_ordinances?nodeId=TIT5BULRE_CH5.16TIHA))
  - Town of Campbell  
([www.stcplanning.org/usr/Program\\_Areas/Local\\_Plans\\_Laws/Local\\_Laws/TownofCampbellTimberLaw.pdf](http://www.stcplanning.org/usr/Program_Areas/Local_Plans_Laws/Local_Laws/TownofCampbellTimberLaw.pdf))
  - Town of Caton  
([www.stcplanning.org/usr/Program\\_Areas/Local\\_Plans\\_Laws/Local\\_Laws/TownCatonTimberLawFeb102003.pdf](http://www.stcplanning.org/usr/Program_Areas/Local_Plans_Laws/Local_Laws/TownCatonTimberLawFeb102003.pdf))
  - Town of Corning  
([www.stcplanning.org/usr/Program\\_Areas/Local\\_Plans\\_Laws/Local\\_Laws/TIMBERFINAL.pdf](http://www.stcplanning.org/usr/Program_Areas/Local_Plans_Laws/Local_Laws/TIMBERFINAL.pdf))
  - Town of Elmira ([www.ecode360.com/16032696](http://www.ecode360.com/16032696))
  - Town of Horseheads (<http://ecode360.com/6722080>)
  - Town of Orange
  - Town of Southport (<http://ecode360.com/9627245>)

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### **XIV. Application Submittal Requirements**

Application submittal requirements are the materials that must be submitted to a local government to support the development review process. These requirements are usually specified in the zoning law or other applicable land use regulations. It may also be helpful to develop a separate document listing submittal requirements. It is important for this to include information about hazards and natural features so that baseline information is available up front to help the community make informed decisions about the proposed project.

Flood hazards should be identified and addressed as early in the planning and approval process as possible. A simple way to remind both the applicant and building department staff to consider flood hazards is to include a question about the flood zone on the Building Permit Application. Another approach is to post a map of the regulated floodplain in the building department office.

Submittal requirements are an excellent opportunity for a community to obtain information about where potential hazardous conditions may exist on a site. For example, where are steep slopes or the boundaries of the floodplain? Information that should be requested, when applicable, includes:

- **Flood zone:** A floodplain development permit is required for any development within the regulated floodplain on the community's effective Flood Insurance Rate Map (a zone beginning with A). The municipal floodplain administrator is responsible for determining if proposed development is located within this regulated floodplain and issuing floodplain development permits. However, if the proposed development is near the edge of the regulated flood zone, it is best to ask that a surveyor locate the floodplain boundary on a site map. If a subsequent determination is made that a building is within the flood zone, this could affect flood insurance requirements and costs, so it is important that the community obtain the information needed to make an accurate determination prior to approving development.
- **Floodway:** If all or part of a development site is within a floodplain for which the regulatory floodway is delineated on the Flood Insurance Rate Map or a separate Flood Boundary and Floodway Map, then the municipal floodplain administrator will need to determine whether it will constitute a floodway encroachment. To enable this determination, it may be necessary to ask that a surveyor locate the edge of the regulatory floodway on a site map.
- **Base flood elevation and proposed building elevation:** For building construction within a regulated floodplain for which a base flood elevation (BFE) is available (on the Flood Insurance Rate map and/or the accompanying Flood Insurance Study), the elevation requirements for construction are based on this elevation. Post-construction compliance will be documented on an Elevation Certificate completed by a Professional Surveyor or Engineer. In order to avoid errors, it is best to also request an Elevation Certificate prior to construction based on the BFE, surveyed ground elevations, and design documents.
- **Historical flood information:** Information about the extent and depth of flooding on a site may be gathered by consulting with previous property owners, neighbors, emergency personnel, or a local historical society.
- **Soil maps:** Soil maps identify hydric soils, soils that flood frequently, and other characteristics that may limit development potential. (Available online at <http://websoilsurvey.nrcs.usda.gov>.)
- **Topography:** Topographic contours show the direction of drainage at a site and may indicate a potential for ponding or development constraints due to steep slopes.
- **Waterbodies (streams, rivers, lakes):** Any waterbody has flooding potential. The location of rivers, streams, and other water features should be shown on the site map.

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- **Wetlands:** Wetlands regulated by New York State are mapped and can be viewed on the state's Environmental Resource Mapper ([www.dec.ny.gov/animals/38801.html](http://www.dec.ny.gov/animals/38801.html)). In addition, the National Wetland Inventory indicates other areas that may be wetlands. An on-site determination is needed to identify and delineate wetlands subject to federal regulations.
- **Technical reports:** The community should be able to request additional documentation about site characteristics when needed to review development proposals. The local floodplain development regulations specify additional information that may be required for a floodplain development permit, including: floodproofing information, professional engineering analysis for a floodway encroachment, engineering computations for watercourse alteration, technical analysis showing whether proposed development may result in physical damage to any other property, and calculated base flood elevations for some projects. When applicable, the need for this information should be communicated to the applicant early in the permit process.
- **Stormwater Pollution Prevention Plan (SWPPP):** The Stormwater Pollution Prevention Plan prepared for a state stormwater construction permit should be requested by the municipality.

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#### **XV. State Environmental Quality Review Act (SEQR)**

What is SEQR? The New York State Environmental Quality Review Act (SEQR) requires state and local agencies to consider impacts on the environment when making discretionary decisions to approve, fund or undertake an action. The SEQR review process is intended to identify potentially significant environmental impacts and to then mitigate those impacts. SEQR provides a procedural framework for achieving a suitable balance of social, economic and environmental factors. SEQR only applies if there is a local discretionary decision. Issuance of a building permit or floodplain development permit is based on compliance with specified standards and is thus not considered a discretionary action. Other land use laws may trigger the SEQR review process. Detailed guidance about the SEQR process is in the “SEQR Handbook,” New York State Department of Environmental Conservation, [www.dec.ny.gov/permits/6188.html](http://www.dec.ny.gov/permits/6188.html).

Many municipal land use approvals fall under the definition of “discretionary” decisions that trigger the SEQR review process. Some of these actions, such as large scale subdivisions, require review under SEQR to determine the potential for “significant adverse environmental impacts.” SEQR review can supplement other local controls when the environmental impacts of a project are not adequately addressed by existing local land use laws. If a municipality wants to conduct environmental reviews of projects not on the state list of Type I actions, they may adopt their own lists of Type I and Type II actions (but may not delete any action already on the state lists).

Natural features, such as streams or wetlands, and any potential flood hazards should be identified during the SEQR review process. Strategies should then be developed for protecting natural features or mitigating the impacts. This may include revised site layout, increased flood protection for development, erosion protection, or other accommodations. For the proposed development of a site in a natural hazard area, a mitigation plan may be requested (by a licensed professional if appropriate) specifying the techniques that will be used to reduce the risk from this hazard.

#### **Critical Environmental Area**

A municipality may, after public hearing and notice to the Department of Environmental Conservation, designate a specific geographic area as a Critical Environmental Area (CEA). Following this designation, the potential impact of an action on the environmental characteristics of the CEA must be evaluated in determining the significance of a proposed action under SEQR.