

## **ADDENDUM TO THE 2014 WEST WINDSOR TOWN PLAN**

### **Adopted February 17, 2015**

*In accordance with 24 V.S.A. §4382(a)(12)(A) and §4385, West Windsor's municipal plan is hereby revised to include the following flood resilience element, which identifies flood hazard and fluvial erosion hazard areas, based on river corridor maps provided or recommended by the Secretary of Natural Resources pursuant to 10 V.S.A. §1428(a), and designates those areas to be protected, including floodplains, river corridors, land adjacent to streams, wetlands, and upland forests, to reduce the risk of flood damage to infrastructure and improved property; and recommends policies and strategies to protect the hazard areas identified and to mitigate risks to public safety, critical infrastructure, historic structures, and municipal investments.*

### **FLOOD RESILIENCE:**

On August 28, 2011, West Windsor and much of Vermont experienced significant infrastructure and personal property damage from Tropical Storm Irene. The West Windsor Volunteer Fire Department was flooded. The historic Bowers Covered Bridge was washed down stream. Twenty-four town roads and numerous culverts were washed out. The cost of repairing the damage to town infrastructure totaled \$750,000. Ninety-five percent of the cost was reimbursed by FEMA and the Vermont Agency of Transportation. For many Vermont towns, including West Windsor, "Irene" was the first major flood since 1973 but, if recent studies are correct, it won't be the last.

According to *Global Climate Change Impacts in the United States* by Thomas Karl, Jerry Melillo, and Thomas Peterson (2009), the amount of precipitation falling in very heavy events (defined as the heaviest 1% of all daily events) increased by 67% in the Northeast from 1958 to 2007. The increase was greater in the Northeast than in all other areas of the country.

In 2013, to encourage towns to prepare for future flood events, the Vermont legislature passed Act 16, which requires town plans adopted after July 1, 2014 to include a "flood resilience" element. Act 16 puts forth the following goals:

1. New development in identified flood hazard, fluvial erosion, and river corridor protection areas should be avoided. If new development is to be built in such areas, it should not exacerbate flooding and fluvial erosion.
2. The protection and restoration of floodplains and upland forested areas that attenuate and moderate flooding and fluvial erosion should be encouraged.
3. Flood emergency preparedness and response planning should be encouraged.

In Vermont there are generally two types of flooding, inundation and fluvial erosion. Inundation occurs when water rises onto low lying land. Fluvial erosion occurs when a river wears down its banks – sometimes gradually, sometimes suddenly - undermining or sweeping away adjacent development in the process. Inundation hazards are addressed by the National Flood Insurance

Program (NFIP) while fluvial erosion hazards are addressed by the Vermont ANR's River Corridor and Floodplain Management Program.

The NFIP provides subsidized flood insurance in communities that have adopted flood hazard area regulations to reduce the risk of property damage from inundation. West Windsor has adopted Flood Hazard Area Regulations. Flood insurance rates are based on Flood Insurance Rate Maps (FIRMs), which delineate areas likely to be inundated during a flood. FIRMs are available at the town office, at the FEMA Map Service Center ([www.msc.fema.gov](http://www.msc.fema.gov)) and on the Vermont Natural Resources Atlas (<http://www.anr.state.vt.us/site/html/maps.htm>). West Windsor residents or business owners with buildings in or near the floodplain may purchase flood insurance through the NFIP. All development in flood hazard areas requires local flood hazard review.

Two-thirds of Vermont flood damages occur outside of the special flood hazard area (SFHA) shown on the FIRM. This may be due, in part, to map inaccuracies (e.g. the FIRM does not delineate flood hazard areas on smaller streams where flash flooding has occurred in the past) but it is also due to the fact that FIRMs do not identify fluvial erosion hazard (FEH) areas. To correct this deficiency, the VT Agency of Natural Resources has developed River Corridor maps. The River Corridor maps are based on studies of each stream's physical condition and sensitivity to erosion. This addendum to the 2014 West Windsor Town Plan incorporates by reference the most recently published such maps. West Windsor is also participating in a Phase 2 geomorphic study of the Mill Brook watershed, which will provide additional information that can be used to further refine our local river corridor maps.

Flood maps and river corridor maps often differ. In some situations, the river corridor is narrower than the SFHA (as a result of bedrock that controls channel adjustments, for example). In other situations, the river corridor may extend beyond the SFHA. Special flood hazard areas are depicted on Town Plan map #4. River corridors are depicted on the attached maps.

## **NATURAL PROTECTION FROM FLOODING & FLUVIAL EROSION**

Upland forests, undeveloped floodplains, wetlands, and vegetated stream buffers help protect West Windsor from damage caused by flooding and fluvial erosion. These natural features also protect our downstream neighbor, the town of Windsor.

### **Upland Forests**

Much of the upland forest that comprises the Mill Brook Watershed is intact. Forests moderate the discharge of water from a watershed by intercepting precipitation, detaining rain and snow on leaves and branches, allowing snow to melt slowly in the shade, promoting the infiltration of water into the soil, replenishing groundwater, and releasing water into the air through leaves. A single mature oak tree can consume (transpire) over 40,000 gallons of water in a year.<sup>1</sup> If water is not intercepted and retained by forest land, the quantity of water running off the land and the speed with which it moves will increase. The more water there is and the faster it moves, the more flooding and erosion there will be.

---

<sup>1</sup> The Role of Trees & Forests in Healthy Watersheds, *Managing Stormwater, Reducing Flooding, and Improving Water Quality* by Vincent Cotrone, Urban Forester, Penn State School of Forest Resources

To minimize flooding and the associated risks to public safety and property, heavy cuts<sup>2</sup> in the Mill Brook Watershed should be prohibited. All other logging in the watershed should be selective, and restricted to maintain stocking above the B-level<sup>3</sup>, minimize the construction of skid roads, and avoid steep slopes and fragile soils, which are particularly vulnerable to the erosive effects of storm water runoff. According to the *Final Report for Watershed Hydrology Protection and Flood Mitigation, Phase I* prepared by Stone Environmental, Inc. for Vermont State Geologist Laurence Becker, “The magnitude and frequency of flood events can be affected by land use changes such as urbanization, logging, agriculture, and channelization.” Clearly it is in the best interest of the residents of West Windsor to prevent any increase in the magnitude or frequency of flood events. To the extent that constraints on logging can prevent future damage to vulnerable properties, those constraints should be pursued. “Forests in the watershed...help temper peak flows...Forests, particularly on higher and steeper locations, provide self-renewing areas that retain and delay water and reduce sediment loading.”<sup>4</sup> By passing Act 16, the Vermont legislature has acknowledged the critical role forests play in mitigating flood damages. In accordance with that Act, West Windsor should do everything possible to protect upland forest areas in the Mill Brook Watershed.

### **Undeveloped Floodplains**

Floodplains are a natural storage area for flood waters, allowing them to slow down, spread out, and infiltrate into the soil. Floodplains also capture sediment and debris. Generally, in-stream debris provides important wildlife habitat and should not be removed except to protect public safety or prevent severe property damage. When debris does threaten life or property, property owners should contact a Vermont River Management Engineer and request permission to remove it. In an emergency situation, the town may file an “emergency protective measure” report online.

Approximately ¾ of a mile of floodplain between Mill Brook and Route 44, west of Kimball Farm Road, is protected by a conservation easement. Additional easements along Mill Brook should be pursued, and the town should consider offering tax incentives to property owners who agree to conserve land in a floodplain or river corridor. A Phase 2 assessment of the Mill Brook watershed is currently being conducted by Fitzgerald Environmental Associates, LLC. If the assessment indicates areas where the stream can no longer access its floodplain, consideration should be given to restoring the connection as long as doing so would not threaten existing developed property, transportation infrastructure, or public safety, or have other negative impacts upstream or downstream.

---

<sup>2</sup> A "heavy cut" means a harvest leaving a residual stocking level of acceptable growing stock below the C-line, as defined by the United States Department of Agriculture silvicultural stocking guides for the applicable timber type. In general, it will take 10 years of growth for a forest stand stocked at the C-line to achieve the “B-line” (or B level).

<sup>3</sup> Forest stands stocked above the “A” level on a stocking chart are overstocked and should be thinned back to near the “B” level to increase tree growth rate. However, as a rule of thumb, no more than one-third of the basal area should be removed from a stand at any one time. <http://woodlandstewardship.org>

<sup>4</sup> [http://floodready.vermont.gov/flood\\_protection/watersheds\\_forests\\_stormwater](http://floodready.vermont.gov/flood_protection/watersheds_forests_stormwater)

## **Wetlands & Vegetated Stream Buffers**

Naturally vegetated riparian buffers are an integral part of river corridors. In addition to reducing flood hazards and stabilizing stream banks, buffers provide wildlife habitat and filter runoff. West Windsor's zoning regulations require a 50' vegetated buffer along all streams and wetlands. Riparian buffers should be "undisturbed" (i.e. earth-moving activities, the storage of materials, the removal of non-invasive trees and shrubs, and mowing should be avoided or prohibited in riparian buffers).

## **ENCROACHMENTS THAT CONTRIBUTE TO FLOODING & FLUVIAL EROSION**

Agricultural development, impervious surfaces, elevated ponds, and armored stream banks can contribute to flooding, fluvial erosion, and surface water pollution, with harmful effects both upstream and down.

### **Agricultural Development**

When it comes to floodplain management, agricultural development is a mixed blessing. On the one hand, undeveloped farm fields help maintain the function of floodplains, storing water and allowing it to spread out and slowly infiltrate into the ground. On the other hand, agricultural structures and uses are exempt from local zoning and flood hazard area regulations. As a result, it's not unusual for farm structures to be built in the floodplain and for farm materials and equipment (hay bales, tractors, etc.) to be stored in the floodplain. In West Windsor, hay bales stored in the floodplain were washed downstream during Tropical Storm Irene and exacerbated an already dangerous and destructive situation. The town should discuss with farmers the mutual benefits of storing hay bales and other materials and equipment outside of the special flood hazard area and the river corridor. It is certainly in the best interest of the farmer to protect his or her farm structures, equipment, livestock, feed stores, and crops. Any protective actions by the farmer will also protect town infrastructure and abutting property, and most likely reduce the farmer's insurance costs. In addition, to protect public safety and prevent future damage to public and private property, the town should consider adopting policies or ordinances addressing the storage of unsecured objects in the floodplain.

### **Impervious Surfaces**

Because impervious surfaces, such as paved parking lots, do not allow water to soak into the soil, they can increase flood levels if storm water is not properly managed through Low Impact Development or other best management practices. Other than Route 44, the Brownsville-Hartland Road, Hotel Road, and portions of Ski Tow, Seems, and Pierce Hill Roads, the roads in West Windsor are not paved. In addition, except in commercial areas (the resort, the pellet plant and the humane society) and in high-traffic areas in the village (the school, town hall, general store, fire station and post office), most parking areas are unpaved. As a result, the amount of impervious surface in West Windsor is relatively small. To prevent runoff from impervious surfaces from increasing flood levels and carrying pollutants into our waterways, additional paving in flood hazard areas and river corridors should be subject to conditional use review by the Development Review Board. Approval should be limited to high-traffic areas and conditioned on the use of porous pavement materials and riparian buffer enhancements. Any approval should specify that improvements may not be protected from future damage with channel constraints such as berms or armored stream banks.

## **Ponds**

Ponds located above the elevation of the adjacent roadway can damage the roadway if they overflow their banks or if their containment structures fail. West Windsor's zoning regulations currently require applications for such ponds to include a letter from the West Windsor Highway Foreman approving the proposed pond design. An unlined pond in a floodplain, outside the river corridor and below the level of the adjacent road, should not have an impact on the floodplain as long as fill is not placed above grade to create an embankment. Even so, pond construction should not be allowed if it would impact an existing wetland or a neighboring property. In a river corridor, the river may eventually migrate and "consume" the pond. As a result, ponds in river corridors should be prohibited and ponds in floodplains should be subject to conditional use review.

## **Berms & Armored Stream Banks**

While berms and stream bank armoring can protect existing development (homes, businesses, transportation infrastructure) from flood damage, such encroachments typically transfer flood water, stream sediments, and erosive energy to another location, increasing flood elevations and velocities and triggering channel adjustments and erosion downstream.<sup>5</sup> Because of their potentially damaging impacts, berms and stream bank armoring projects cannot be constructed without a Stream Alteration Permit issued by the State of Vermont. Avoiding new development in floodplains and river corridors should prevent the need for new berms and bank armoring projects.

## **DEVELOPMENT AT RISK FROM FLOODING & FLUVIAL EROSION**

Existing structures, transportation infrastructure, and public utilities in hazard areas are at risk from flooding and fluvial erosion. Single-access housing developments are also at risk, even if they are not located in a hazard area.

### **Existing Structures**

Not including bridges, there are currently 14 structures in the floodplain in West Windsor. These include homes, barns and sheds. The General Store and the Fire Station are also in the floodplain. In 2011, flooding from Tropical Storm Irene damaged the firehouse, the adjacent pump house and the parking area. Fortunately, the fire trucks had been moved to higher ground and were not damaged. Although the Fire Station is not owned by the town, it serves the public and is considered a critical facility. To ensure the safety of its citizens, the town should partner with the Fire Department in planning for the protection of the facility from future flood events. Alternate locations should be considered. If there are no suitable alternatives, consideration should be given to improving the building to minimize future flood damage. The fire station is insured through the Vermont League of Cities and Towns.

Abandoned or unusable buildings or other structures (e.g. partially demolished dams) located in the floodplain and/or the river corridor, especially those that have experienced damage more than

---

<sup>5</sup> VT Agency of Natural Resources, Department of Environmental Conservation, Flood Hazard Area and River Corridor Protection Procedure; October 6, 2014

once, should be considered for removal or relocation with funding from hazard mitigation programs. In 2014, West Windsor received grant funding to remove an inaccessible mobile home from the floodplain.

Some of the buildings damaged during Tropical Storm Irene were not in the floodplain. As noted above, two-thirds of the flood damage that occurs in Vermont occurs outside the floodplain. Local property owners are encouraged to review the flood hazard and river corridor maps and to consider purchasing flood insurance if their property is in (or near) a hazard area, or has experienced flooding in the past. Property owners can also flood proof their property and implement storm water management techniques to minimize damage caused by flooding. Reducing the amount of impervious surface on the property, directing runoff into rain gardens or swales, expanding vegetated buffers, and planting trees can all help manage storm water.

In the interest of public safety, Act 16 allows towns to prohibit accessory dwelling units in hazard areas. To minimize the number of residents at risk during flood events, the Planning Commission should consider revising West Windsor's zoning regulations to include the allowed restrictions on the creation of new accessory dwelling units.

### **Transportation Infrastructure**

The town should consider the factors that exacerbated past flood damage to transportation infrastructure (e.g. storage of hay bales in the floodplain, pond location) and pursue projects and policies that will help mitigate those factors in future flooding events. The town should also address the structural deficiencies of the infrastructure itself.

**Undersized Culverts.** As recent storms have revealed, West Windsor has a number of undersized culverts. Every two to three years, the Highway Department inspects the culverts and notes their condition in a culvert inventory. The inventory also indicates the size, type and location of all the culverts in town. Residents might be surprised to learn that West Windsor's transportation infrastructure includes more than 500 culverts. Eleven of these culverts are currently targeted for replacement. In the past, culvert replacement has not been incorporated into a long-range capital improvement plan. A long-range plan would help the town prioritize and budget for culvert replacements. Factors that should be considered when prioritizing culvert replacements include: the amount of traffic on the road, the presence or absence of an alternate route to the homes served by the road, past flood damage to the culvert, the degree to which the culvert is undersized, and the overall condition of the culvert. Hydraulic studies should be requested for all undersized culverts and replacement costs should be estimated and included in a capital budget.

**Bridges.** Repairing or replacing structurally deficient bridges will help them withstand flood forces and avoid collecting debris, which could form a temporary dam and increase flood levels upstream. New and replacement bridges are generally required to have a span equal to 1.2x bankfull width<sup>6</sup> in order to accommodate minor flood events. Exceptions are sometimes made for historic structures. The Bowers Covered Bridge was washed downstream during Tropical Storm Irene and both abutments were damaged. Because it wasn't possible to increase the span of the

---

<sup>6</sup> "bankfull width" is defined as the stream channel width when water just begins to overflow into the active floodplain.

bridge while maintaining its historic integrity, the new abutments were rebuilt one foot higher than the old abutments.

**Roads.** The topography of Vermont is such that, in many cases, the most practical location for a road is next to a stream. As a result, many roads are located in floodplains and river corridors. Roads that are not parallel to streams are usually bisected by them at one or more points along their length. Because relocating roads is generally impractical and prohibitively expensive, other means of protecting the road from the river should be explored. Ensuring that bridges and culverts are adequately sized in accordance with hydraulic studies is one way to protect the road. Armoring stream banks should only be considered when the stream bank is immediately adjacent to the road and erosion has undermined, or is threatening to undermine, the road base.

### **Public Utilities**

Sometimes it is necessary to place utilities in a floodplain or river corridor in order to serve an existing population center. In such cases, the utility can be designed and built in a way that will prevent it from being damaged by flood waters. In other situations, utilities were placed in a hazard area a long time ago and it is impractical or prohibitively expensive to move them. Green Mountain Power, for example, has a substation in the floodplain at the intersection of Route 44 and Churchill Road. When considering future utility installations (e.g. the placement of telephone poles or free-standing solar panels) towns and developers should keep in mind that such structures may not be appropriate for river corridors where they can be dislodged by fluvial erosion. On the other hand, they may be fine for floodplains provided that the foundation is secure in saturated soil conditions and vulnerable components (e.g. wires, panels, conduit, etc.) are located at least one foot above the base flood elevation or sealed to prevent infiltration.

### **Development with Limited Access**

Although many areas of town, including Yale Heights and Happy Canyon, were initially inaccessible following Tropical Storm Irene, most had adequate access restored within 48 hours. An exception was the Ascutney Mountain Resort. Because the storm washed out both Bridge #7 on Route 44 and the bridge over Mill Brook on Brook Road, the Resort was cut off from the rest of town for 12 days and therefore could not be effectively served by the West Windsor Volunteer Fire Department or the West Windsor FAST Squad. Fortunately the town has mutual aid agreements in place with the other towns in our area and there were no serious illnesses, injuries or fires during the time the resort was isolated from the rest of town.

A similar situation occurred in 2010, when flood waters prevented an ambulance from reaching an injured resident in Yale Heights. In this instance, the highway department was able to ferry EMTs and the patient across the flood waters in the bucket of the town's loader. However, both of these situations highlight the need to investigate alternative means of access to areas that may be cut off from emergency services in a future flood event.

### **EMERGENCY PREPAREDNESS & RESPONSE**

To the extent possible, municipalities have an obligation to protect their citizens from known risks. Recent experience has enabled local officials, town employees and emergency service providers to identify new risks, confirm known risks, assess response capacity, and evaluate the

effectiveness of existing plans and regulations. Armed with this knowledge, community officials have begun to address known deficiencies in infrastructure and policy and should continue to do so as resources allow.

The risks, both previously known and newly identified, have been enumerated in this document. Emergency response and hazard mitigation plans should be reviewed and updated as necessary to ensure that they adequately address these risks. Zoning and flood hazard area regulations should also be reviewed and updated to incorporate the newly released river corridor maps, recommended restrictions on new development in hazard areas, and requirements for the elevation and/or flood proofing of existing structures. A capital improvement plan should be developed and should include funds for the replacement of undersized culverts and structurally deficient bridges, the protection of vulnerable sections of public highways, the purchase of river corridor easements, and possibly the relocation of the Fire Station. The capital improvement plan should also allocate resources for the construction of a second access to the Ascutney Mountain Resort and other single-access developments. Where the construction of a second access is not possible, emergency service providers should develop contingency plans. Policies prohibiting heavy cuts in upland forest areas and the storage of unsecured objects in the floodplain should be adopted.

## **Plans**

West Windsor has an Emergency Management handbook (nicknamed the “Green Book”) that identifies the resources – people and equipment – needed to respond to a variety of emergency situations, including floods. The town also has a Local Emergency Operations Plan on file with the Vermont Division of Emergency Management and Homeland Security. Both of these plans are updated annually. The town’s All-Hazard Mitigation Plan is updated every five years in conjunction with local emergency service providers and the Southern Windsor County Regional Planning Commission.

Most of West Windsor is in the Mill Brook watershed, along with portions of Reading and Windsor. Because we share a watershed, the decisions that each town makes can affect the other two towns. Before new plans or regulations are adopted or major projects are approved, West Windsor should consider any potential negative impacts on Reading and Windsor and provide each town with an opportunity to comment.

## **Emergency Service Providers**

When the natural features that typically mitigate the effects of flooding (e.g. upland forests and floodplains) are overwhelmed, as in Tropical Storm Irene, rapid response by skilled employees and well-trained emergency service providers is critical. Fortunately, there were no fires or injuries during Tropical Storm Irene but the Fire Department was busy anyway. When they weren’t checking on the elderly and infirm, pumping out basements or loaning portable generators to those in need, they were working on the damaged fire station, which took a direct hit from Irene.



## **Highway Department**

West Windsor's experienced three-person highway department does an excellent job maintaining the town's roads and bridges under normal circumstances. To ensure that additional help will be available if needed, West Windsor maintains a mutual aid agreement with the municipalities of Orange and Windsor Counties and with adjacent New Hampshire municipalities. This agreement came in handy following Tropical Storm Irene when West Windsor both provided assistance to, and received assistance from, neighboring communities. In the wake of "Irene," the highway department also recruited a number of local contractors to help repair the extensive damage to the town's transportation infrastructure.

Going forward, the Highway Department will continue to evaluate culverts and replace them as funds allow. Town employees will also continue to participate in workshops and trainings that enhance their disaster response capabilities, and the Highway Foreman will assist the Selectboard in prioritizing larger projects for inclusion in a capital improvement plan.

## **REDUCING COSTS**

### **Minimizing Damage**

One way to reduce costs associated with flood damage is to prevent the damage from occurring in the first place. Prohibiting new construction in the floodplain and the river corridor, relocating critical facilities such as the fire station, replacing undersized culverts, and regulating the storage of unsecured objects in the floodplain are some of the ways West Windsor can prevent damage from occurring. Once damage has occurred, however, it's important for the town and its residents to be able to access the funding needed to rebuild without overburdening local taxpayers.

### **Obtaining State and Federal Assistance**

Repairing damaged transportation infrastructure can be very expensive. Fortunately there are systems in place to provide state and federal funding assistance for repairs when damages are of sufficient magnitude to warrant a presidential disaster declaration. Generally, the federal government covers 75% of the cost and the remaining 25% is covered by the state and the affected town. The amount provided by the state through the Emergency Relief and Assistance Fund (ERAF) varies depending on whether or not the affected town has adopted certain hazard mitigation measures. Towns that have adopted the following measures pay half of the required 25% match, or 12.5% of the total repair costs:

- Agency of Transportation Town Road and Bridge Standards;
- flood hazard regulations that meet or exceed minimum NFIP standards;
- a local Hazard Mitigation Plan; and
- a local Emergency Operations Plan.

Towns that have not adopted the measures listed above pay for 17.5% of total repair costs. Towns that are actively participating in FEMA's Community Rating System, or that have adopted river corridor regulations that meet or exceed state standards pay only 7.5% of total disaster repair costs. West Windsor has adopted all of the measures listed above and currently

qualifies for a 12.5% match. To further reduce the financial impact of disaster repairs on local tax payers, the town should update its Flood Hazard Area Regulations to include standards for development in river corridors.

For localized damage not resulting from a presidentially declared disaster, funding assistance is available through the Vermont Agency of Transportation's town highway emergency grant program. Without state and federal assistance, the costs associated with repairing storm-damaged roads and bridges could cripple a town financially. If West Windsor had not received state and federal aid following Tropical Storm Irene, the 2012 municipal tax rate would have had to increase by 72% to cover the \$750,000 in costs.

### **Insurance**

Because West Windsor participates in the National Flood Insurance Program, local property owners are eligible for flood insurance. However, owners with property in a special flood hazard area should be aware that, as a result of the 2012 Biggert-Waters Flood Insurance Reform Act, subsidized flood insurance rates are being phased out. Although the Biggert-Waters Act was amended in 2014 with the passage of the Homeowner Flood Insurance Affordability Act, flood insurance rates are still being increased by 5 to 18% per year for owner-occupied residences, and by 25% per year for vacation, rental and business properties. Currently, only two of the West Windsor property owners who have property in the floodplain are insured against flooding.

### **POLICIES**

1. To the extent possible, West Windsor has a responsibility to protect its citizens from known hazards.
2. In accordance with 24 V.S.A. §4302 (14), West Windsor restricts new development in special flood hazard areas and river corridors unless it can be shown that such development will not exacerbate flooding or fluvial erosion. All development in SFHAs requires review.
3. In conjunction with these restrictions, West Windsor requires the protection and encourages the restoration of river corridors, flood plains, wetlands and upland forest areas that attenuate and moderate flooding and erosion.
4. West Windsor discourages the removal of in-stream debris except as necessary to protect public safety or prevent property damage.
5. Property owners who make voluntary improvements to property in the floodplain or the river corridor may not protect their investment with channel constraints such as berms and bank armoring.
6. Subject to water and sewer availability, West Windsor encourages development in those portions of the Primary Growth District that are outside of the river corridor and the special flood hazard area.
7. Structural deficiencies in transportation infrastructure should be addressed as soon as possible.
8. Potential impacts on neighboring towns should be considered before new plans or regulations are adopted and before major projects are approved.

9. West Windsor encourages on-going emergency preparedness and response planning.

## **RECOMMENDATIONS**

1. Revise the West Windsor Zoning and Flood Hazard Area Regulations to:
  - limit new structures, including accessory dwelling units, in special flood hazard areas and river corridors;
  - prohibit heavy cuts in the Mill Brook Watershed and restrict logging to the extent necessary to protect upland forest areas that attenuate and moderate flooding and erosion;
  - require conditional use review for paving projects in the floodplain or the river corridor;
  - prohibit ponds in river corridors and require conditional use review for ponds in floodplains.
2. Establish a second entrance to the Ascutney Mountain Resort, and investigate alternative means of access to other developed areas that may be cut off from emergency services during a flooding event if the primary access is destroyed. If a second access cannot be established, develop contingency plans for emergency response.
3. Adopt policies to address the storage of unsecured objects (e.g. hay bales) in the floodplain.
4. Pursue conservation easements along Mill Brook and consider offering tax incentives to property owners who conserve land in a floodplain or a river corridor.
5. Where Mill Brook can no longer access its floodplain, consider applying for grant funding to restore the connection.
6. Seek funding to remove or relocate abandoned structures in the floodplain or river corridor.
7. Engage local farmers in discussions about the mutual benefits of storing hay bales and other materials and equipment outside of the special flood hazard area and river corridor.
8. Partner with the Fire Department to plan for the protection of the fire station from future flood events.
9. Review and update emergency response and hazard mitigation plans.
10. Encourage property owners to review the flood hazard and river corridor maps and consider flood proofing their property, implementing storm water management techniques, and/or purchasing flood insurance.
11. Review the culvert inventory to ensure that all undersized culverts have been identified.
12. Request hydraulic studies, estimate costs, and seek funding for the replacement of all undersized culverts.
13. Maintain mutual aid agreements with neighboring municipalities.
14. Develop a capital improvement plan that addresses: the replacement of undersized culverts and structurally deficient bridges, the protection of vulnerable sections of public highways, the purchase of river corridor easements, the relocation of the Fire Station, and the construction of a second access to single-access developments.