TECHNICAL PLANS

**VISION CONNECTION**

* **Affordability:** Flooding and other hazards drive up costs for the town and individuals, through property and infrastructure damage. Short-term resilience actions have big impacts for long-term affordability.
* **Mobility + Transportation:** Roadways often follow rivers and intersect streams, leaving them particularly vulnerable to flooding and washouts. At the same time, they contribute to runoff that makes flooding and pollution worse.
* **Natural + Working Lands:** Natural areas including rivers and steep slopes – and farms – are especially vulnerable to climate change and flood hazards. Strong and healthy ecosystems are one of the best solutions.
* **Safe + Resilient Community:** Building resilience to floods and other hazards involves physical improvements and community capacity that will help us address any challenge or threat.

### EMERGENCY Resilience

Resilience is defined as the ability of a community to respond to and recover from threats or challenges, whatever they may be. Building resilience means strategically strengthening our infrastructure and environment to mitigate or prepare for expected hazards, such as floods. But it also means building the community connections, skills, and capacity that will allow us to pull together and respond to any challenge that arises. Vermont has experienced 33 federally declared disasters since 1990 alone, nine of which were major floods causing major erosion and damage. Climate change projections predict more frequent and more intense precipitation in the future. That has big implications for Richmond’s safety, affordability, environment, and quality of life.

Richmond has worked with Chittenden County Regional Planning Commission (CCRPC) and the statewide organization Community Resilience Organizations (CROs) to assess the town’s risks from flooding and other hazards, to identify resilience strengths and weaknesses, and to identify hazard mitigation and preparedness actions. Flood resilience is the most important category for Richmond to consider, since it is the most common hazard and the greatest area of risk. Existing inventories in the hazard mitigation plan, CROs assessment, and elsewhere show that most municipal infrastructure (roads and critical facilities) are stable and able to withstand normal storms and minor floods, but may be vulnerable to more intense storms. A recent culvert assessment showed that 93% of Richmond’s culverts may be undersized, relative to severe storms and current conditions. Richmond likewise has many miles of roads that are prone to erosion and flood hazards, due to their location next to streams, rivers, or their steep grade.

Homes and other structures are also of great concern; Richmond has more than 99 buildings in the 1% (100-year) floodplain (mostly single-family homes), which makes it one of the 10 highest-risk towns in the State. Although statistically speaking, a 100 year storm is predicted to occur once in 100 years, they can, and do, occur much more frequently in reality. Storms of greater intensity, such as 500 year storms, also occur and must be considered. Richmond began participating in the National Flood Insurance Program in 1984 and some structures are insured, but flood insurance costs can be extreme. Many homeowners have no flood insurance, and their property is at risk of complete losses. Richmond does not yet participate in the Community Rating System – an incentive program, which would lower flood insurance costs for property owners. Property owners have participated in buyout programs for flood-prone properties, which allow them to start over in a safe location while the house or structure is removed and the property is protected from further development. Many structures in the special flood hazard area have been elevated or flood-proofed, to reduce risk. While Richmond does have regulations preventing new development in the special flood hazard area, the 2013 Vermont State Hazard Mitigation Plan notes that 75% of flood-related damages in Vermont are due to *fluvial erosion* (not inundation flooding), which occurs when rivers naturally change course and readjust. For example, it is more likely that a streambank or road washes out than for standing water to linger, which is due to our naturally varying elevations on the landscape. This is also why damages are not necessarily limited to the floodplain. River corridors are the areas within which the river may change course, and they do not necessarily align with floodplains, so current regulations do not necessarily prevent development in these critical areas. Development in these areas faces great risks, and also increases risks for others downstream.

Flooding is certainly not the only risk that the community must consider. Richmond is uniquely located in that it is bisected by a railway, interstate, the Winooski River, and is surrounded by steep terrain. Richmond is also in a climate where extreme weather conditions are expected, especially low temperatures and snow/ice storms. Extreme fluctuations in temperature have also cause major ice jams upstream and downstream of the town which have contributed to flooding and flood damages. Wind storms have also caused damage and risk for the town by knocking out power, felling trees, and creating debris. Although the railway has not yet caused a major disaster, a derailment of hazardous materials spill could happen. Our emergency medical service, Richmond Rescue, could be in direct danger of being affected or cut off in the instance of a train-related emergency. The railway runs through the heart of the village and is surrounded by residences and business on both sides in some areas. Because the river bisects the town, southern half of the community could be cut off from the northern half in the event of a flood. This is especially problematic due to the fact that the emergency shelter is located on the northern side of town at the middle school. Another unique hazard for Richmond is the Huntington Gorge in the Huntington River. Although the gorge is a beautiful attribute to the natural landscape, it can be extremely dangerous and deadly for those who choose to ignore warnings and swim there. Gorge incidents are not only dangerous or deadly for the person needing rescue or recovery, but it is especially precarious for our emergency personnel. The terrain, depths, and fast-moving water can result in more injuries or deaths. Richmond has been and is currently working to prevent such accidents. As a result of Richmond being a major convergence point of jurisdictions and transportation lines, there are a lot of players involved in the management of emergencies. Richmond must ensure that emergency plans and communication systems are implemented and that proper staff and volunteers are trained and equipped to carry out procedures or these emergency planning efforts could be futile. It is a major undertaking, but every fathomable scenario and stakeholder must be taken into account in order to create effective emergency management plans.

#### **GOALS & ACTIONS**

**GOAL 1: Reduce disruptions, injuries, and asset loss due to natural and man-made emergencies**

**ACTIONS:**

1. Maintain and update emergency response and preparedness plans including the Hazard Mitigation Plan and Emergency Operations Plan
2. Inventory vulnerabilities of municipal and critical facilities and ways to mitigate potential damages, include this in capital planning and hazard mitigation planning
3. Create a Richmond Emergency Management plan that encompasses all hazards, emergencies, and disasters, and train employees and emergency service providers on the plan and procedures
4. Participate in the Red Cross Ready Rating program and certify Camel’s Hump Middle School as a Red Cross ready shelter
5. Determine a sheltering plan for residents south of the Winooski River
6. Create a plan for domestic animal sheltering during emergencies and disasters
7. Include railway, interstate, hazmat, and other weather events in the emergency management plan
8. Ensure that critical facilities and personnel have adequate and proper backup power sources, equipment, and training for disasters, hazards, and emergencies, especially our most likely or common emergencies such as flooding or gorge rescues
9. Continue to support watershed management programs and projects that will help to mitigate flooding
10. Continue to strictly regulate development in the Special Flood Hazard Area
11. Educate property owners about flood risk, insurance, development options, and flood proofing, and educate residents about disaster and emergency protocol and resources
12. Maintain an emergency preparedness section on the town website as a resource for citizens on emergency resources and procedures
13. Create an emergency volunteer network and an emergency communication system to better coordinate procedures and notifications in the event of a hazard or disaster

**GOAL 2: Increase resilience of town infrastructure to be able to withstand a variety of hazards and disasters**

**ACTIONS:**

1. Maintain, upgrade, or implement stormwater systems and water conveyance systems such as ditches, culverts, and the municipal water and sewer systems to withstand at least 1% storms (100 year storms)
2. Maintain and upgrade bridges and roads to withstand inundation from at least 1% storms
3. Identify opportunities where increased levels of resilience are possible, such as improvements that could withstand a 500-year storm
4. Maintain and upgrade backup power and heating systems in town and critical facilities
5. Implement storm windows and storm doors where necessary in critical facilities
6. Ensure that critical facilities are structurally sound and able to withstand heavy snowfall and high speed wind gusts

(see also Transportation, Natural Resources, Housing, Utilities & Facilities, Future Land Use)