

Flood Resilience Checklist

Is your community prepared for a possible flood? Completing this flood resilience checklist can help you begin to answer that question. This checklist was developed as part of the U.S. Environmental Protection Agency's Smart Growth Implementation Assistance project in the state of Vermont. More information about the project can be found by reading the full report, *Planning for Flood Recovery and Long-Term Resilience in Vermont*, at <https://www.epa.gov/smartgrowth/planning-flood-recovery-and-long-term-resilience-vermont>.

What is the Flood Resilience Checklist?

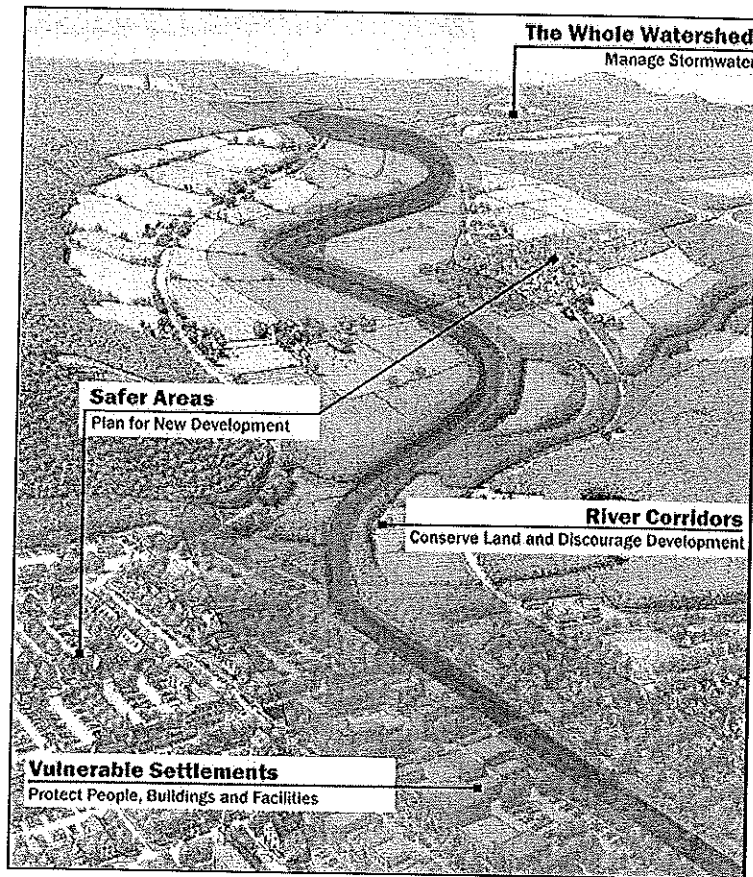
This checklist includes overall strategies to improve flood resilience as well as specific strategies to conserve land and discourage development in river corridors; to protect people, businesses, and facilities in vulnerable settlements; to direct development to safer areas; and to implement and coordinate stormwater management practices throughout the whole watershed.

Who should use it?

This checklist can help communities identify opportunities to improve their resilience to future floods through policy and regulatory tools, including comprehensive plans, Hazard Mitigation Plans, local land use codes and regulations, and non-regulatory programs implemented at the local level. Local government departments such as community planning, public works, and emergency services; elected and appointed local officials; and other community organizations and nonprofits can use the checklist to assess their community's readiness to prepare for, deal with, and recover from floods.

Why is it important?

Completing this checklist is the first step in assessing how well a community is positioned to avoid and/or reduce flood damage and to recover from floods. If a community is not yet using some of the strategies listed in the checklist and would like to, the policy options and resources listed in the *Planning for Flood Recovery and Long-Term Resilience in Vermont* report can provide ideas for how to begin implementing these approaches.



This graphic illustrates the four categories of approaches to enhance resilience to future floods. Credit: Vermont Agency of Commerce and Community Development.

FLOOD RESILIENCE CHECKLIST

Overall Strategies to Enhance Flood Resilience

(Learn more in Section 2, pp. 9-11 of

Planning for Flood Recovery and Long-Term Resilience in Vermont)

1. Does the community's comprehensive plan have a hazard element or flood planning section?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
a. Does the comprehensive plan cross-reference the local Hazard Mitigation Plan and any disaster recovery plans?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
b. Does the comprehensive plan identify flood- and erosion-prone areas, including river corridor and fluvial erosion hazard areas, if applicable?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
c. Did the local government emergency response personnel, flood plain manager, and department of public works participate in developing/updating the comprehensive plan?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
2. Does the community have a local Hazard Mitigation Plan approved by the Federal Emergency Management Agency (FEMA) and the state emergency management agency?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
a. Does the Hazard Mitigation Plan cross-reference the local comprehensive plan?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
b. Was the local government planner or zoning administrator involved in developing/updating the Hazard Mitigation Plan?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
c. Were groups such as local businesses, schools, hospitals/medical facilities, agricultural landowners, and others who could be affected by floods involved in the Hazard Mitigation Plan drafting process?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
d. Were other local governments in the watershed involved to coordinate responses and strategies?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
e. Does the Hazard Mitigation Plan emphasize non-structural pre-disaster mitigation measures such as acquiring flood-prone lands and adopting No Adverse Impact flood plain regulations?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
f. Does the Hazard Mitigation Plan encourage using green infrastructure techniques to help prevent flooding?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
g. Does the Hazard Mitigation Plan identify projects that could be included in pre-disaster grant applications and does it expedite the application process for post-disaster Hazard Mitigation Grant Program acquisitions?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
3. Do other community plans (e.g., open space or parks plans) require or encourage green infrastructure techniques?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

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4. Do all community plans consider possible impacts of climate change on areas that are likely to be flooded?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
5. Are structural flood mitigation approaches (such as repairing bridges, culverts, and levees) and non-structural approaches (such as green infrastructure) that require significant investment of resources coordinated with local capital improvement plans and prioritized in the budget?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
6. Does the community participate in the National Flood Insurance Program Community Rating System?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

Conserve Land and Discourage Development in River Corridors
 (Learn more in Section 3.A, pp. 14-19 of
Planning for Flood Recovery and Long-Term Resilience in Vermont)

1. Has the community implemented non-regulatory strategies to conserve land in river corridors, such as:		
a. Acquisition of land (or conservation easements on land) to allow for stormwater absorption, river channel adjustment, or other flood resilience benefits?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
b. Buyouts of properties that are frequently flooded?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
c. Transfer of development rights program that targets flood-prone areas as sending areas and safer areas as receiving areas?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
d. Tax incentives for conserving vulnerable land?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
e. Incentives for restoring riparian and wetland vegetation in areas subject to erosion and flooding?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
2. Has the community encouraged agricultural and other landowners to implement pre-disaster mitigation measures, such as:		
a. Storing hay bales and equipment in areas less likely to be flooded?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
b. Installing ponds or swales to capture stormwater?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
c. Planting vegetation that can tolerate inundation?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
d. Using land management practices to improve the capability of the soil on their lands to retain water?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
3. Has the community adopted flood plain development limits that go beyond FEMA's minimum standards for Special Flood Hazard Areas and also prohibit or reduce any new encroachment and fill in river corridors and Fluvial Erosion Hazard areas?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

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4. Has the community implemented development regulations that incorporate approaches and standards to protect land in vulnerable areas, including:		
a. Fluvial erosion hazard zoning?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
b. Agricultural or open space zoning?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
c. Conservation or cluster subdivision ordinances, where appropriate?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
d. Other zoning or regulatory tools that limit development in areas subject to flooding, including river corridors and Special Flood Hazard Areas?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Protect People, Buildings, and Facilities in Vulnerable Settlements

(Learn more in Section 3.B, pp. 19-26 of

Planning for Flood Recovery and Long-Term Resilience in Vermont)

1. Do the local comprehensive plan and Hazard Mitigation Plan identify developed areas that have been or are likely to be flooded?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
a. If so, does the comprehensive plan discourage development in those areas or require strategies to reduce damage to buildings during floods (such as elevating heating, ventilation, and air conditioning (HVAC) systems and flood-proofing basements)?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
b. Does the Hazard Mitigation Plan identify critical facilities and infrastructure that are located in vulnerable areas and should be protected, repaired, or relocated (e.g., town facilities, bridges, roads, and wastewater facilities)?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
2. Do land development regulations and building codes promote safer building and rebuilding in flood-prone areas? Specifically:		
a. Do zoning or flood plain regulations require elevation of two or more feet above base flood elevation?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
b. Does the community have the ability to establish a temporary post-disaster building moratorium on all new development?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
c. Have non-conforming use and structure standards been revised to encourage safer rebuilding in flood-prone areas?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
d. Has the community adopted the International Building Code or American Society of Civil Engineers (ASCE) standards that promote flood-resistant building?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
e. Does the community plan for costs associated with follow-up inspection and enforcement of land development regulations and building codes?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

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<p>3. Does the community require developers who are rebuilding in flood-prone locations to add additional flood storage capacity in any new redevelopment projects such as adding new parks and open space and allowing space along the river's edge for the river to move during high-water events?</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>4. Is the community planning for development (e.g., parks, river-based recreation) along the river's edge that will help connect people to the river AND accommodate water during floods?</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>5. Does the comprehensive plan or Hazard Mitigation Plan discuss strategies to determine whether to relocate structures that have been repeatedly flooded, including identifying an equitable approach for community involvement in relocation decisions and potential funding sources (e.g., funds from FEMA, stormwater utility, or special assessment district)?</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

Plan for and Encourage New Development in Safer Areas

(Learn more in Section 3.C, pp. 26-27 of

Planning for Flood Recovery and Long-Term Resilience in Vermont)

<p>1. Does the local comprehensive plan or Hazard Mitigation Plan clearly identify safer growth areas in the community?</p>	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<p>2. Has the community adopted policies to encourage development in these areas?</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>3. Has the community planned for new development in safer areas to ensure that it is compact, walkable, and has a variety of uses?</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>4. Has the community changed its land use codes and regulations to allow for this type of development?</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>5. Have land development regulations been audited to ensure that development in safer areas meets the community's needs for off-street parking requirements, building height and density, front-yard setbacks and that these regulations do not unintentionally inhibit development in these areas?</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>6. Do capital improvement plans and budgets support development in preferred safer growth areas (e.g., through investment in wastewater treatment facilities and roads)?</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>7. Have building codes been upgraded to promote more flood-resistant building in safer locations?</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

FLOOD RESILIENCE CHECKLIST

Implement Stormwater Management Techniques throughout the Whole Watershed

(Learn more in Section 3.D, pp. 27-31 of

Planning for Flood Recovery and Long-Term Resilience in Vermont)

1. Has the community coordinated with neighboring jurisdictions to explore a watershed-wide approach to stormwater management?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
2. Has the community developed a stormwater utility to serve as a funding source for stormwater management activities?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
3. Has the community implemented strategies to reduce stormwater runoff from roads, driveways, and parking lots?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
4. Do stormwater management regulations apply to areas beyond those that are regulated by federal or state stormwater regulations?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
5. Do stormwater management regulations encourage the use of green infrastructure techniques?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
6. Has the community adopted tree protection measures?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
7. Has the community adopted steep-slope development regulations?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
8. Has the community adopted riparian and wetland buffer requirements?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No