

1 Pathways for Adaptation and Building Resilience in Communities 2 and the Built Environment

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4 Vermont has had 10 federally-declared weather-related disasters since the initial Climate Action
5 Plan (CAP) was adopted in December, 2021.¹ While catastrophic flooding was the primary
6 disaster, landslides, wind, and severe winter storms also caused harm to individuals and families,
7 entire neighborhoods, municipalities, and critical public infrastructure. Vermonters were also
8 subject to extreme heat events, a less obvious but deadly health risk, as well as drought. We are
9 living the risks and hazards anticipated by climate assessments.

10
11 This plan update does not benefit from an in-depth characterization of the physical and mental
12 health, housing and shelter, and financial impacts of these disasters on individuals and
13 households that experienced these disasters. Nor does it capture the impacts on commercial and
14 non-profit enterprises, or municipalities, and the relative financial health of each post-disaster, or
15 disasters. It also doesn't benefit from a full understanding of how many homes have been
16 destroyed or rendered uninhabitable, how many people are living in substandard conditions
17 either directly or indirectly caused by the disasters, or how many people have been displaced
18 from their homes, communities, or even from the state. Understanding the breadth and depth of
19 climate disaster impacts should be priority going forward, but it is clear we are living what the
20 CAP and its underlying science and policy direction have anticipated. Critically, the climate
21 factors underlying these disasters have not been mitigated at the global scale. And while
22 mitigation measures have been taken to improve climate adaptation and resilience in Vermont,
23 the underlying settlement patterns that put large numbers of people and civic, economic, cultural,
24 and public infrastructure at risk have not changed to a meaningful degree. We know what the
25 risks are. We need the political, operational, and financial capacity to act.

26
27 For this plan update we focus on the following which are intended to address in the aggregate the
28 related climate adaptation and resilience pathways, strategies, and actions.

- 29 • Information for decision making.
- 30 • Increased technical assistance for decision and action.
- 31 • Increased self-reliance at the household, municipal, and state levels.

¹ <https://www.fema.gov/locations/vermont#declared-disasters>

- 32 • Recognition of housing as an essential element of community resilience.
- 33 • Full integration of conservation, working lands, and development planning to effect
- 34 climate resilience and adaptation.
- 35 • Integrating actions required by recent statutes related to planning, housing, flood safety,
- 36 and conservation.

37

38 **Information for Decision Making**

39 To be meaningful and broad-based, adaptation and resilience decision making is necessary at
40 the individual, household, municipal, regional, and state levels. Each ultimately informs the
41 other and builds a stronger foundation for action. Information should be tailored for each of
42 these levels, and should be clear, concise, plainly written, and easily accessible. Decision
43 making tools that have been developed, such as the Municipal Climate Change Vulnerability
44 Indicators Tool, should be evaluated to determine the extent to which they are being actively
45 and effectively used by the target audience, and to identify any barriers to their ongoing use,
46 including relevance. Creating a clearing house of existing tools across topics (i.e., health,
47 emergency preparedness, food access, etc.) in a way that maximizes the accessibility and
48 visibility of each will create an opportunity for greater awareness among users of both their
49 availability, and further topics that can be explored.

50

51 **Increased Technical Assistance for Decision and Action**

52 Information can increase knowledge but it is essential to support decision making at all levels
53 that will ultimately lead to action. The increasing frequency and intensity of climate change-
54 driven risks necessitates greater decisiveness. Providing access to information, coupled with
55 effective facilitation and access to expertise to advise courses of action, can aid decisiveness.
56 That coupling is essential. Vermont is fortunate to have a strong network of public, non-
57 profit, and commercial entities that serve all levels. This network should be resourced and
58 reinforced, rather than reinvented, to provide decision-making support. Making people,
59 municipal governments, businesses, and non-profits aware of this network *within the context*
60 *of adaptation and resilience action* should be an ongoing effort. For example, the same local
61 conservation district that assists farmers with advice on nutrient management can also advise
62 a homeowner how to best manage their stream buffer to mitigate risks of bank erosion.
63 Health workers, in addition to providing regular care, could as a matter of regular practice

64 inform patients where cooling shelters are and when to go, and what should be included in a
65 “go bag” should the need to evacuate arise suddenly. Regional planning commissions can
66 encourage the development town plans that are more resilience and adaptation focused (too
67 often municipalities separate town plans from local hazard mitigation plans), and can lead by
68 example by prioritizing resilience in their future land use mapping.

69

70 **Increased Self-Reliance at the Household, Municipal, and State Levels**

71 We are “Vermont Strong,” but the disaster, recovery, and mitigation aid landscape is
72 changing with both the sheer frequency, intensity and scale of events, and the quantity, terms
73 and conditions of funding. For example, the mitigation funding the state and municipalities
74 receive in the wake of disaster, *after* damage is done, is orders of magnitude greater than
75 what is normally available in the absence of a disaster. Indications are that long-relied upon
76 funding formulas could change, requiring state and local government to provide more of their
77 own funding for recovery and mitigation. It is also possible, or likely, that federal disaster
78 declaration thresholds will be elevated, thus decreasing the likelihood that federal aid will be
79 made available.

80

81 At the household and business level, the catastrophic floods of 2023 and 2024 were severe
82 enough that federal Individual Assistance (IA) Disaster declaration thresholds were
83 exceeded. An IA declaration brings in federal resources to assist individuals and families,
84 and businesses, with recovery that otherwise would not be available, as Vermonters in towns
85 not included in the IA declarations discovered. This threshold, too, could and likely will
86 increase. As we have learned, IA assistance is insufficient to support full-recovery. By
87 design it is intended to be supplemented by local philanthropic and volunteer aid. It is
88 imperative that Vermont establish policies and protocols and recovery structures so
89 Vermonters know *before* disaster strikes what support they can anticipate so they can better
90 prepare beforehand. This will also establish a framework so state agencies, municipal
91 governments, non-profits, businesses – everyone involved in response and recovery work –
92 know their roles and responsibilities are when it comes to recovery of Vermonters, not just
93 infrastructure. *Preparation is a form of adaptation and essential to resilience.*

94

95 Increasingly, federal and state funding that is intended for mitigation and adaptation is being
96 directed to support property buyouts to prevent future damage caused by flooding, fluvial
97 erosion, or landslides. In fact, the majority of mitigation funding is going towards buyouts.
98 While these buyouts can result in community-scale flood hazard mitigation outcomes, most
99 are at the individual property level rather than a floodplain or river corridor level. This is of
100 great benefit to Vermonters whose property has been or could be damaged or destroyed.
101 However, it is imperative that Vermont and Vermonters invest our own resources into
102 community-scale flood adaptation and resilience, including growing up and away from flood
103 hazards and brook and river channel migration. This is essential to develop and protect our
104 civic, economic, cultural, and housing infrastructure in anticipation of more frequent and
105 intense events that threaten our historic settlements that will continue to lie in harm's way.
106

107 **Recognition of Housing as an Essential Element of Community Resilience**

108 Vermont is in the midst of a full-blown housing crisis driven by high-demand and low-
109 supply. At the same time, large areas of the state have lost significant numbers of housing
110 units to flooding. Housing is a fundamental need. We need not only more housing, but
111 housing where it is best suited to mitigate against climate risks, and the right types of housing
112 for different life stages. The housing status quo threatens the resilience of our economy,
113 social well-being, health and health care system, education system, senior care, public safety,
114 and tax base, among others. The latest (June 2024) Vermont Housing Needs Assessment
115 concludes that 36,000 primary homes are needed in the state in 2025-2029.² Developing
116 such quantities of housing requires greater density as part of larger compact settlement
117 development (i.e. “smart growth”). While this strategy should make the most of our existing
118 historic compact settlements, all new settlement must minimize flood hazard and landslide
119 risk.
120

121 **Detailed Physical Master and Capital Improvement Planning of Compact** 122 **Settlements, Coupled with Capital Investment and Financing Strategies at** 123 **Local and State Levels.**

² <https://accd.vermont.gov/housing/plans-data-rules/needs-assessmentment>

124 Compact settlements must be well-planned, and require detailed physical master planning,
125 capital improvement and investment planning, and public financing strategies and tools to
126 create the conditions for development. Physical master planning takes into account the
127 appropriateness of land to support resilient development, and guides where infrastructure
128 ranging from water and wastewater, streets, power, and public spaces, should be located.
129 This will likely necessitate the development of public investment and system operations
130 structures that are intermunicipal, or regional, in nature. Solving this problem is foundational
131 to a broad array of state, regional, and local policy directives related to land use, energy
132 development and conservation, greenhouse gas reduction, land conservation, transportation,
133 education, and economic development.

134

135 **Full Integration of Conservation, Working Lands, and Development** 136 **Planning to Effect Climate Resilience and Adaptation**

137 Compact settlement planning should not be done in a vacuum. What happens in the
138 landscape around the compact settlement influences its success as a desirable place to live, as
139 well as its ability to both be a means of climate resilience and adaptation, and to be climate
140 resilient and adaptive itself. The infrastructure that supports the compact settlement must
141 promote resilience and be resilient. This includes accommodation of drinking water
142 wellhead protection areas, and wastewater disposal sites that minimize energy consumption
143 and minimize the risk of groundwater and surface contamination. Streets leading to, through,
144 and from the settlement should promote, not impair, quality of life. Any development
145 beyond the compact settlement should be well-planned so as not to exacerbate or create new
146 hazards, such as stormwater runoff or impairment of surface or groundwater. Forest and
147 habitat blocks, and habitat connectors, should be maintained and improved not only for the
148 habitat and working lands benefits, but also to sequester carbon and maintain land cover and
149 soils that mitigate greenhouse gases and flood and drought risks. Floodplain conservation
150 and improved floodwater access to the floodplain will help mitigate against both flood and
151 drought. Planning compact settlement with river and brook channel migration – fluvial
152 erosion – in mind is essential to avoid the state’s primary and most violent hazard. And
153 incorporating wildland fire-adapted community strategies into all aspects of development

154 planning will help mitigate a lesser known but increasing risk in New England and the
155 northeast.³

156

157 **Integrate Actions Required by Recent Statutes Related to Planning,** 158 **Housing, Flood Safety, and Conservation**

159 Integrating actions required by recently-passed statutes, rather than taking a piecemeal
160 approach, creates the opportunity to achieve more holistic and comprehensive plans and
161 actions to achieve climate adapted and resilient communities⁴. Taken together the statutes
162 modernize Vermont’s approach to regional and municipal planning to more uniformly and
163 specifically designate areas suitable for development, encourage the construction of more
164 housing where supported by infrastructure, establish the creation of a statewide land
165 conservation plan, and support state regulation of river corridors, conservation of wetlands,
166 planning for dam safety, and consideration of the efficacy of the current approach to flood
167 hazard regulation. If brought together at the regional scale, in collaboration with planning at
168 the municipal scale, the opportunity exists to:

- 169 • More intentionally plan for future land use that integrates conservation, flood safety,
170 compact settlement and housing, while also identifying gaps and needs for
171 infrastructure investment to make adaptive and resilient community development
172 possible.
- 173 • Establish a more robust correlation between conservation, development, and
174 infrastructure needs that transcends municipal boundaries.
- 175 • Create a statewide land use map by stitching together the new regional future land use
176 maps, which can both guide development and tell the story of opportunities and
177 barriers to making a more adaptive and resilient Vermont possible.

178 There are also initiatives underway at the University of Vermont that can help tell the story
179 of where we are and where we need to go regarding adaptation and resilience. UVM is in the
180 process of mapping zoning at the municipal level, the presence and location of community
181 wastewater systems, and areas with flood hazard risks. By layering this information,

³ <https://www.northeasternwildfire.net/fire-adapted-communities/>

⁴ Act 47 – HOME Act (<https://legislature.vermont.gov/bill/status/2024/S.100>); Act 181 Regional Planning Act (<https://legislature.vermont.gov/bill/status/2024/H.687>); Act 121 Flood Safety Act (<https://legislature.vermont.gov/bill/status/2024/S.213>); Act 59 Community Resilience and Biodiversity Protection Act (<https://legislature.vermont.gov/bill/status/2024/H.126>)

182 Vermonters will be able to see if the infrastructure and local regulations exist to support
183 development in areas best suited to resilience, especially flood resilience. It is anticipated
184 that much of the current supporting infrastructure, and zoning that tracks with that
185 infrastructure, presently directs development towards areas with relatively high flood risk.
186