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

Vermont has had 10 federally-declared weather-related disasters since the initial Climate Action Plan (CAP) was adopted in December, 2021.[1] While catastrophic flooding was the primary disaster, landslides, wind, and severe winter storms also caused harm to individuals and families, entire neighborhoods, municipalities, and critical public infrastructure. Vermonters were also subject to extreme heat events, a less obvious but deadly health risk, as well as drought. We are living the risks and hazards anticipated by climate assessments.

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

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

[1] https://www.fema.gov/locations/vermont#declared-disasters

- Information for decision making.
- Increased technical assistance for decision and action.
- Increased self-reliance at the household, municipal, and state levels.
- Recognition of housing as an essential element of community resilience.
- Detailed physical master and capital improvement planning of compact settlements, coupled with capital investment and financing strategies, at local and state levels.
- Full integration of conservation, working lands, and development planning to effect climate resilience and adaptation.
- Integrating actions required by recent statutes related to planning, housing, flood safety, and conservation.

Information for Decision Making

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

Increased Technical Assistance for Decision and Action

Information can increase knowledge but it is essential to support decision making at all levels that will ultimately lead to action. The increasing frequency and intensity of climate change-driven risks necessitates greater decisiveness. Providing access to information, coupled with effective facilitation and access to expertise to advise courses of action, can aid decisiveness. That coupling is essential. Vermont is fortunate to have a strong network of public, non-profit, and commercial entities that serve all levels. This network should be resourced and

reinforced, rather than reinvented, to provide decision-making support. Making people, municipal governments, businesses, and non-profits aware of this network *within the context of adaptation and resilience action* should be an ongoing effort. For example, the same local conservation district that assists farmers with advice on nutrient management can also advise a homeowner how to best manage their stream buffer to mitigate risks of bank erosion. Health workers, in addition to providing regular care, could as a matter of regular practice inform patients where cooling shelters are and when to go, and what should be included in a "go bag" should the need to evacuate arise suddenly. Regional planning commissions can encourage the development town plans that are more resilience and adaptation focused (too often municipalities separate town plans from local hazard mitigation plans), and can lead by example by prioritizing resilience in their future land use mapping.

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

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

At the household and business level, the catastrophic floods of 2023 and 2024 were severe enough that federal Individual Assistance (IA) Disaster declaration thresholds were exceeded. An IA declaration brings in federal resources to assist individuals and families, and businesses, with recovery that otherwise would not be available, as Vermonters in towns not included in the IA declarations discovered. This threshold, too, could and likely will increase. As we have learned, IA assistance is insufficient to support full-recovery. By design it is intended to be supplemented by local philanthropic and volunteer aid. It is imperative that Vermont establish policies and protocols and recovery structures so

Vermonters know *before* disaster strikes what support they can anticipate so they can better prepare beforehand. This will also establish a framework so state agencies, municipal governments, non-profits, businesses – everyone involved in response and recovery work – know their roles and responsibilities are when it comes to recovery of Vermonters, not just infrastructure. *Preparation is a form of adaptation and essential to resilience*.

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

Recognition of Housing as an Essential Element of Community Resilience

Vermont is in the midst of a full-blown housing crisis driven by high-demand and low-supply. At the same time, large areas of the state have lost significant numbers of housing units to flooding. Housing is a fundamental need. We need not only more housing, but housing where it is best suited to mitigate against climate risks, and the right types of housing for different life stages. The housing status quo threatens the resilience of our economy, social well-being, health and health care system, education system, senior care, public safety, and tax base, among others. The latest (June 2024) Vermont Housing Needs Assessment concludes that 36,000 primary homes are needed in the state in 2025-2029.[2] Developing such quantities of housing requires greater density as part of larger compact settlement development (i.e. "smart growth"). While this strategy should make the most of our existing

[2] https://accd.vermont.gov/housing/plans-data-rules/needs-assessmentment

historic compact settlements, all new settlement must minimize flood hazard and landslide risk.

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

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

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

Compact settlement planning should not be done in a vacuum. What happens in the landscape around the compact settlement influences its success as a desirable place to live, as well as its ability to both be a means of climate resilience and adaptation, and to be climate resilient and adaptive itself. The infrastructure that supports the compact settlement must promote resilience and be resilient. This includes accommodation of drinking water wellhead protection areas, and wastewater disposal sites that minimize energy consumption and minimize the risk of groundwater and surface contamination. Streets leading to, through, and from the settlement should promote, not impair, quality of life. Any development beyond the compact settlement should be well-planned so as not to exacerbate or create new hazards, such as stormwater runoff or impairment of surface or groundwater. Forest and habitat blocks, and habitat connectors, should be maintained and improved not only for the

habitat and working lands benefits, but also to sequester carbon and maintain land cover and soils that mitigate greenhouse gases and flood and drought risks. Floodplain conservation and improved floodwater access to the floodplain will help mitigate against both flood and drought. Planning compact settlement with river and brook channel migration – fluvial erosion – in mind is essential to avoid the state's primary and most violent hazard. And incorporating wildland fire-adapted community strategies into all aspects of development planning will help mitigate a lesser known but increasing risk in New England and the northeast.[3]

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

Integrating actions required by recently-passed statutes, rather than taking a piecemeal approach, creates the opportunity to achieve more holistic and comprehensive plans and actions to achieve climate adapted and resilient communities[4]. Taken together the statutes modernize Vermont's approach to regional and municipal planning to more uniformly and specifically designate areas suitable for development, encourage the construction of more housing where supported by infrastructure, establish the creation of a statewide land conservation plan, and support state regulation of river corridors, conservation of wetlands, planning for dam safety, and consideration of the efficacy of the current approach to flood hazard regulation. If brought together at the regional scale, in collaboration with planning at the municipal scale, the opportunity exists to:

- More intentionally plan for future land use that integrates conservation, flood safety, compact settlement and housing, while also identifying gaps and needs for infrastructure investment to make adaptive and resilient community development possible.
- Establish a more robust correlation between conservation, development, and infrastructure needs that transcends municipal boundaries.

[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)

- Create a statewide land use map by stitching together the new regional future land use maps, which can both guide development and tell the story of opportunities and barriers to making a more adaptive and resilient Vermont possible.

There are also initiatives underway at the University of Vermont that can help tell the story of where we are and where we need to go regarding adaptation and resilience. UVM is in the process of mapping zoning at the municipal level, the presence and location of community wastewater systems, and areas with flood hazard risks. By layering this information, Vermonters will be able to see if the infrastructure and local regulations exist to support development in areas best suited to resilience, especially flood resilience. It is anticipated that much of the current supporting infrastructure, and zoning that tracks with that infrastructure, presently directs development towards areas with relatively high flood risk.