September 2025

Evolving Together: Dover, Readsboro, Whitingham, & Wilmington

WINDHAM REGIONAL COMMISSION

UNIVERSITY OF MASSACHUSETTS 1863

CENTER FOR RESILIENT METRO-REGIONS

Communities by Design
an Architects Foundation program

Communities by Design

The Architect Foundation's Communities by Design (CxD) program brings together volunteer professionals (Design Assistance Teams) and citizens to build strategies that solve the most pressing issues facing the places we call home. The program has served hundreds of communities across the country, engaging thousands of volunteer professionals with local residents to build momentum for change. The community outcomes have created international renown for re-imagined places like the Pearl District in Portland, Oregon; Santa Fe's Railyard District revitalization and East Nashville's tornado recovery experience. The Communities by Design methodology is well-recognized and has been widely adapted for use all over the world. Today, the initiative encompasses direct work in over a dozen countries across 5 continents, including communities in 47 US states.

Through decades of work in hundreds of communities with tens of thousands of volunteers and community members, CxD Design Assistance Teams have proven that communities are at the heart of solutions to the world's most pressing issues. Every project is community-driven with meaningful public participation and an intensive process to match professional expertise with public values and aspirations for a place. Design Assistance Teams are made up of volunteer architects, planners, and other professionals with expertise customized to fit the local community context. The Design Assistance Team is honored to work with the citizens of Dover, Readsboro, Whitingham and Wilmington on this effort.

Center for Resilient Metro-Regions, University of Massachusetts-Amherst

The Center for Resilient Metro-Regions, based in the UMass Department of Landscape Architecture & Regional Planning, partners with governments, communities, and practitioners to conduct applied research, strategic and comprehensive planning, programmatic and code assessments, and project management. It's work advances placemaking, sustainability, resilience, multi-modal transportation, housing, economic development, and open space preservation.

Disclaimer

The ideas represented in the following report are those of the Architects Foundation's design assistance team, based on our observations of the community and its existing plans; the insights gleaned from City officials and residents; and the ideas shared with us about the area and the aspirations for it during the team's tour. This report represents our best professional recommendations in the public interest. We do not serve a client in this endeavor. The report, and the process that produced it, is a public service to the community. The ideas captured here represent three intensive days of work and the information available to us at the time of this writing. We do not expect this report to be followed as verbatim, prescriptive advice. It should be understood as a developmental tool, and we expect the community will expand and amend these ideas as it moves forward.

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Introduction

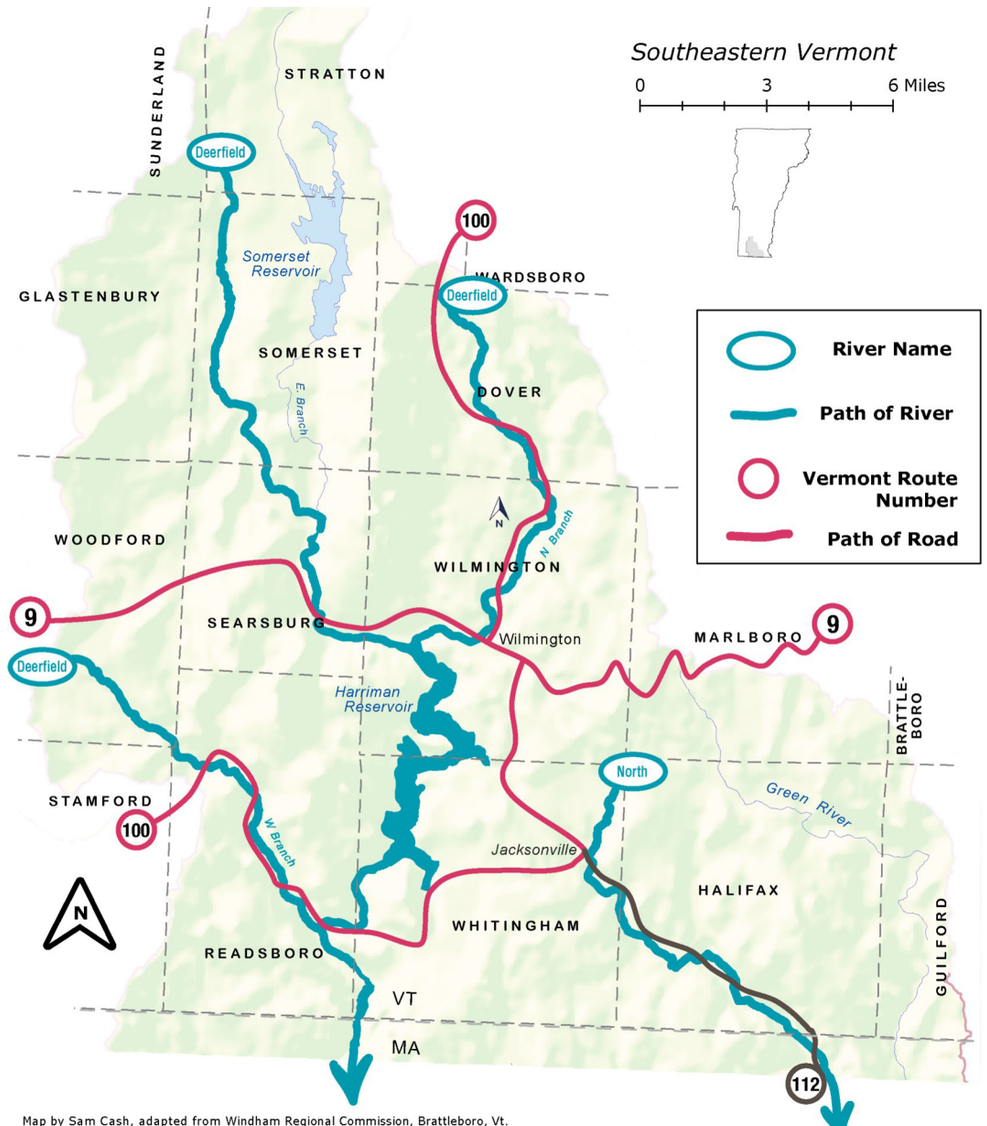
Climate Change in Vermont

Climate change is having profound impacts on Vermont. According to the Vermont Climate Assessment, the average temperature has increased by almost 2°F and average annual rainfall has increased by 21% since 1900. Rainfall has increased almost 6 inches since the 1960s, with mountainous regions experiencing the largest increases. Precipitation has also demonstrated dramatic variability in the past decade, with both extreme rainfall events and drought conditions becoming more common. On average, Vermont experiences 2.4 additional days of heavy precipitation than in the 1960s. Winter precipitation has increased, but it is falling more often as rain than as snow. Yet almost 60% of Vermont is in severe drought currently and this August was the driest on record in Vermont since 1895. This is climate change in action – and it is projected to worsen. The National Climate Assessment projects that average temperatures in Vermont will increase by 4°F over the century and extreme rainfall events will dump between 20% to 25% more precipitation than in the recent past.

Climate change is transforming Vermont, and we must adapt to meet the challenge. It is more important than ever to assess vulnerability to climatic events and begin planning to adapt to dramatic changes. Vermont has a higher share of homes and buildings in vulnerable floodplains than most other states. As a result, the state has averaged more than one federally declared disaster annually since 2000 as extreme events have had larger impacts on the built environment. Hurricane Irene remains a barometer in collective memory for historic events, as its impacts included loss of life, over $750 million in property damage, and destruction of critical infrastructure, with over 500 miles of roadways and 200 bridges impacted. Vermonters should expect ever increasing impacts unless dramatic actions begin now to adapt to the new realities. The urgency to adapt is further reinforced by the state's growing population of vulnerable residents. By 2030, it is projected that one in every three Vermonters will be 60 years of age or older. This context informs the focus of our work with the Windham Regional Commission and the communities of Dover, Readsboro, Whitingham and Wilmington.

Background on the Process

The Windham Regional Commission (WRC) serves 27 towns in Windham, Windsor and Bennington Counties. In 2024, the WRC brought the Center for Resilient Metro-Regions (CRM) and Communities by Design (CxD) program to the region to provide assistance on affordable housing and community resilience to the towns of Jamaica, Londonderry, Weston and Winhall. It followed the preparation of a Housing Needs Assessment by UMass Amherst's Department of Landscape Architecture and Regional Planning. The effort has led to increased collaboration focused on housing opportunities across the participating jurisdictions. In February 2025, the Commission began discussions with the CRM and CxD program about expanding assistance to the towns of Dover, Readsboro, Whitingham and Wilmington with a focus on climate resilience and adaptation. Each participating jurisdiction had completed updates to their existing Hazard Mitigation Plans at a town level, so the focus of this process was framed as an opportunity to apply a wider lens to local adaptation efforts and cross-town collaboration. In September 2025, CRM, the Communities by Design program and UMass Amherst's Department of Landscape Architecture and Regional Planning partnered to conduct a three-day community process across the four towns to identify both town-specific strategies and broader shared priorities to improve future resilience and long-term adaptation. An interdisciplinary team of regional and national professionals assembled to provide adaptation expertise engaged with residents across the area to learn about local challenges and opportunities. The process included site tours and stakeholder meetings in each town and regional public workshops held at the Old School Community Center in Wilmington. These events informed the team's work over the three-day process. At the conclusion, the team presented its initial findings during a public presentation at the Old School



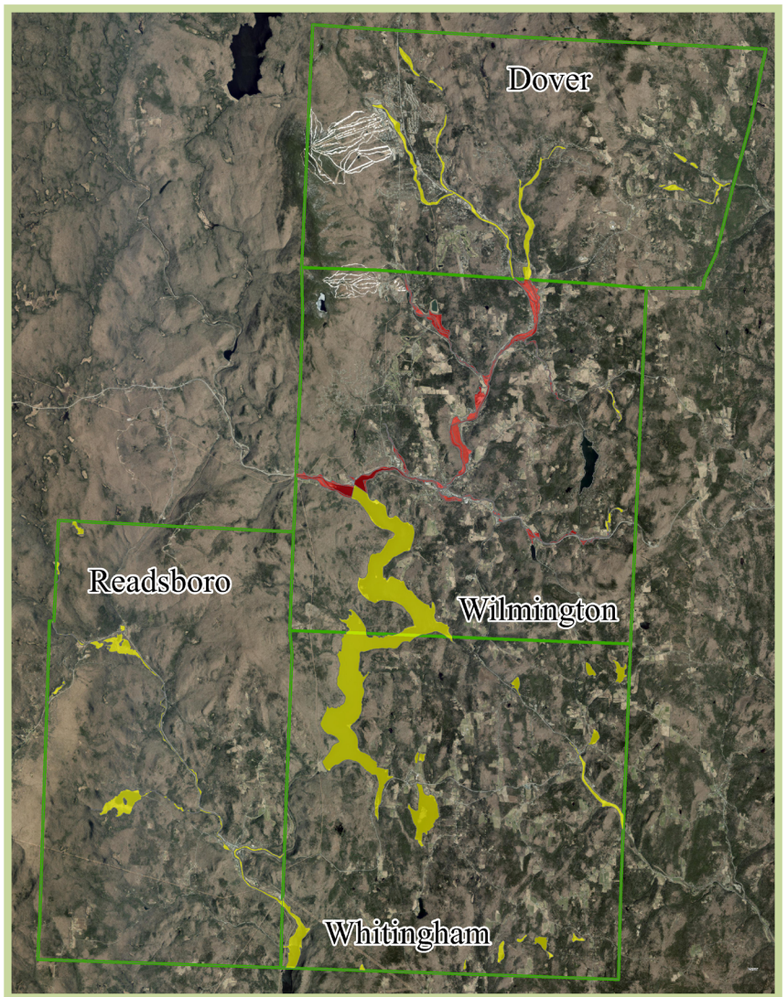
Map by Sam Cash, adapted from Windham Regional Commission, Brattleboro, Vt. August 2011; c:\projects\basin12\watershedVT_8x11_color.mxd

Community Center. The following report captures the key recommendations in further detail, outlining strategies and action steps the towns can take to improve their adaptation efforts over time.

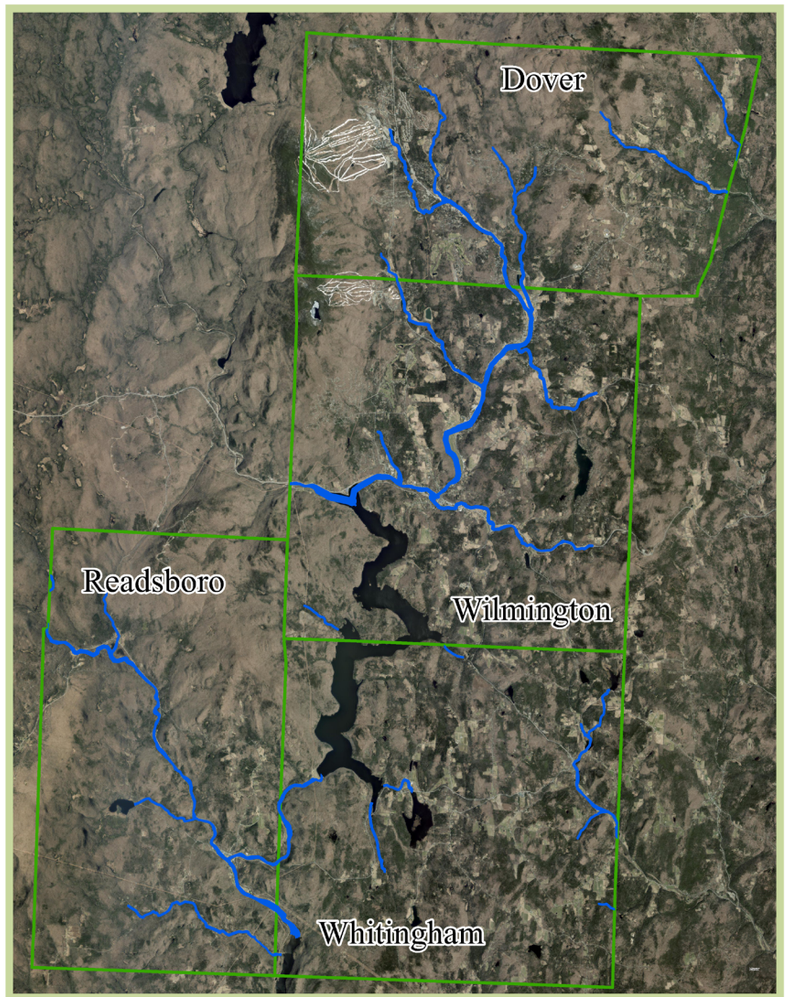
Unique yet connected along the Deerfield Valley and Route 100

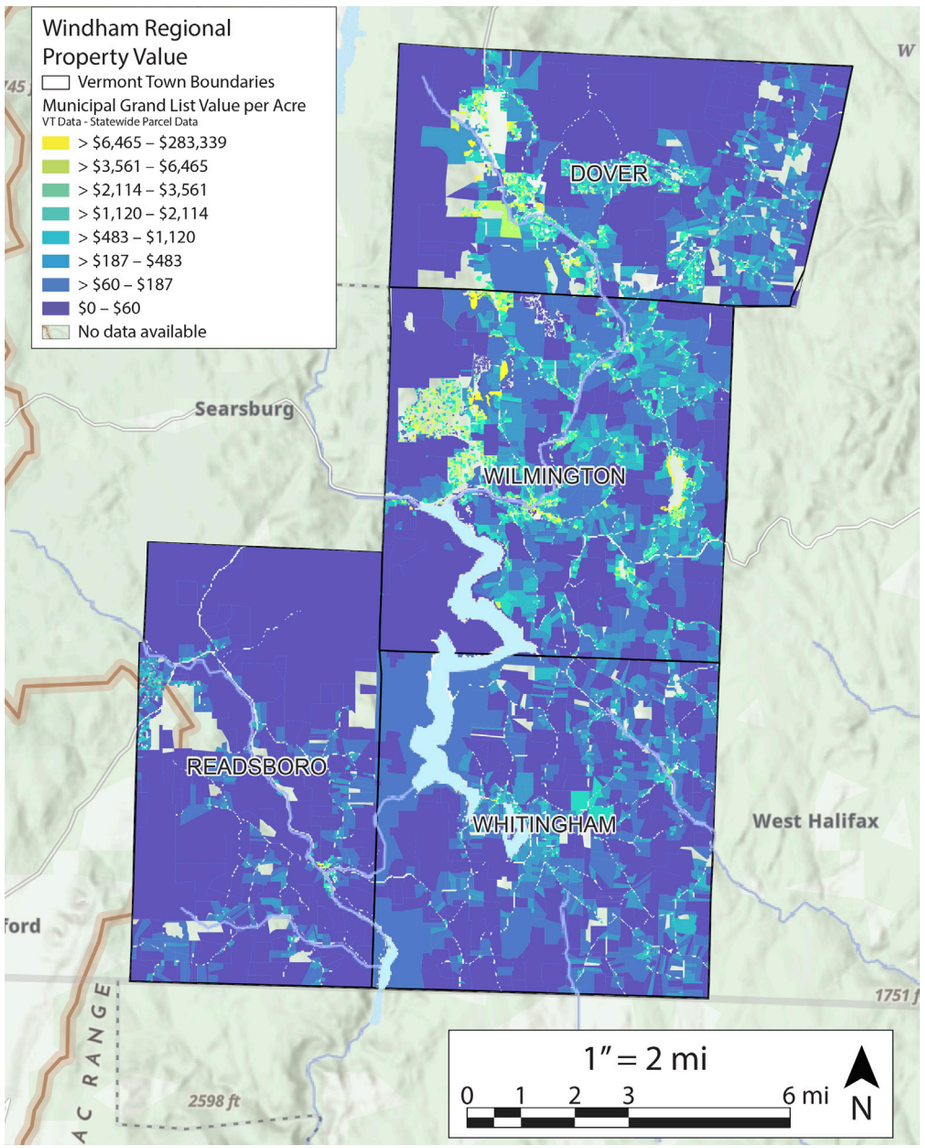
Dover, Readsboro, Whitingham, and Wilmington are distinct communities, each with its own feel and economic and housing niche. Together with neighboring towns, they offer the mix of economies, housing, shopping, recreation, and the diversity of experiences that attract both residents and visitors.

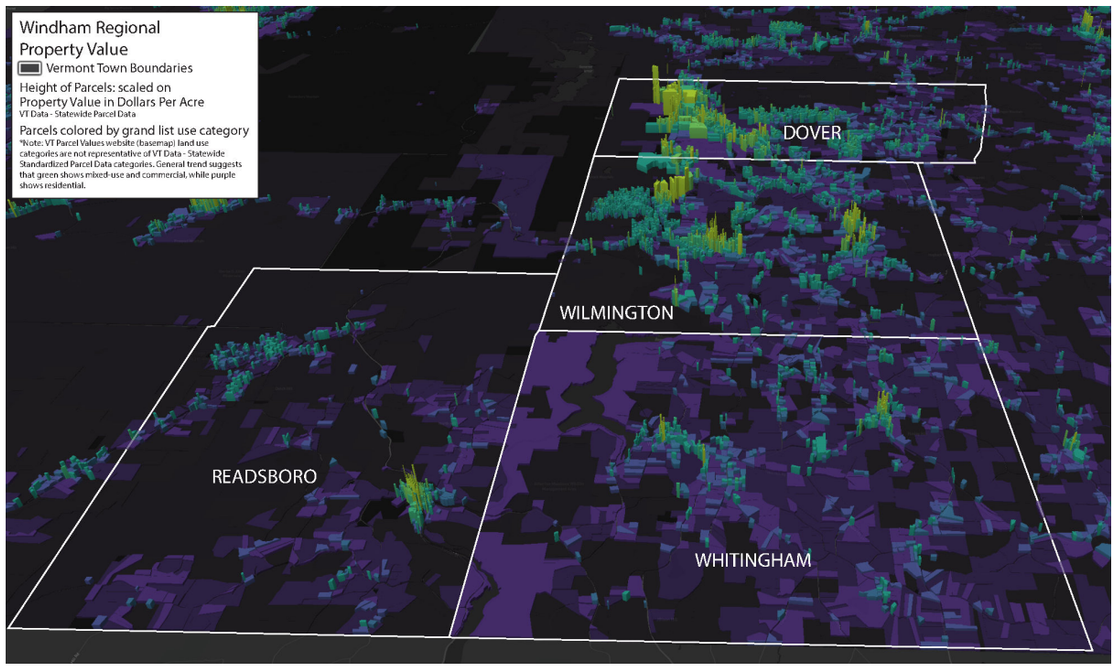
FEMA Flood Hazard Areas



River Corridors







Many of the communities collaborate through shared consortiums (e.g., Dover and Wilmington for economic development, participation in their respective regional school districts, and informal information sharing). In addition, they benefit from critical infrastructure, from easy road access from major population centers to surplus sanitary sewage capacity. These assets are missing in many Vermont communities.

The towns are closely linked along Route 100 and the Deerfield River Valley. Development and economic activity are heavily concentrated in beautiful but flood prone river valleys, especially in the village centers. The higher property values in the village centers makes development outside the flood hazard areas BUT IN AND ADJACENT TO THE VILLAGE CENTERS the most critical to economic viability. Because of flood hazards, it is critical to promote denser development in the limited walkable areas in and adjacent to village centers that are not vulnerable to flood and erosion hazards. The adjacent map shows property values per acre.

Unfortunately, the towns also share increasing hazards from flooding and stream erosion, threatening many beloved buildings, commercial centers, critical infrastructure, and economic vitality.

There are different approaches that the towns, individually and collectively, can take to address these hazards.

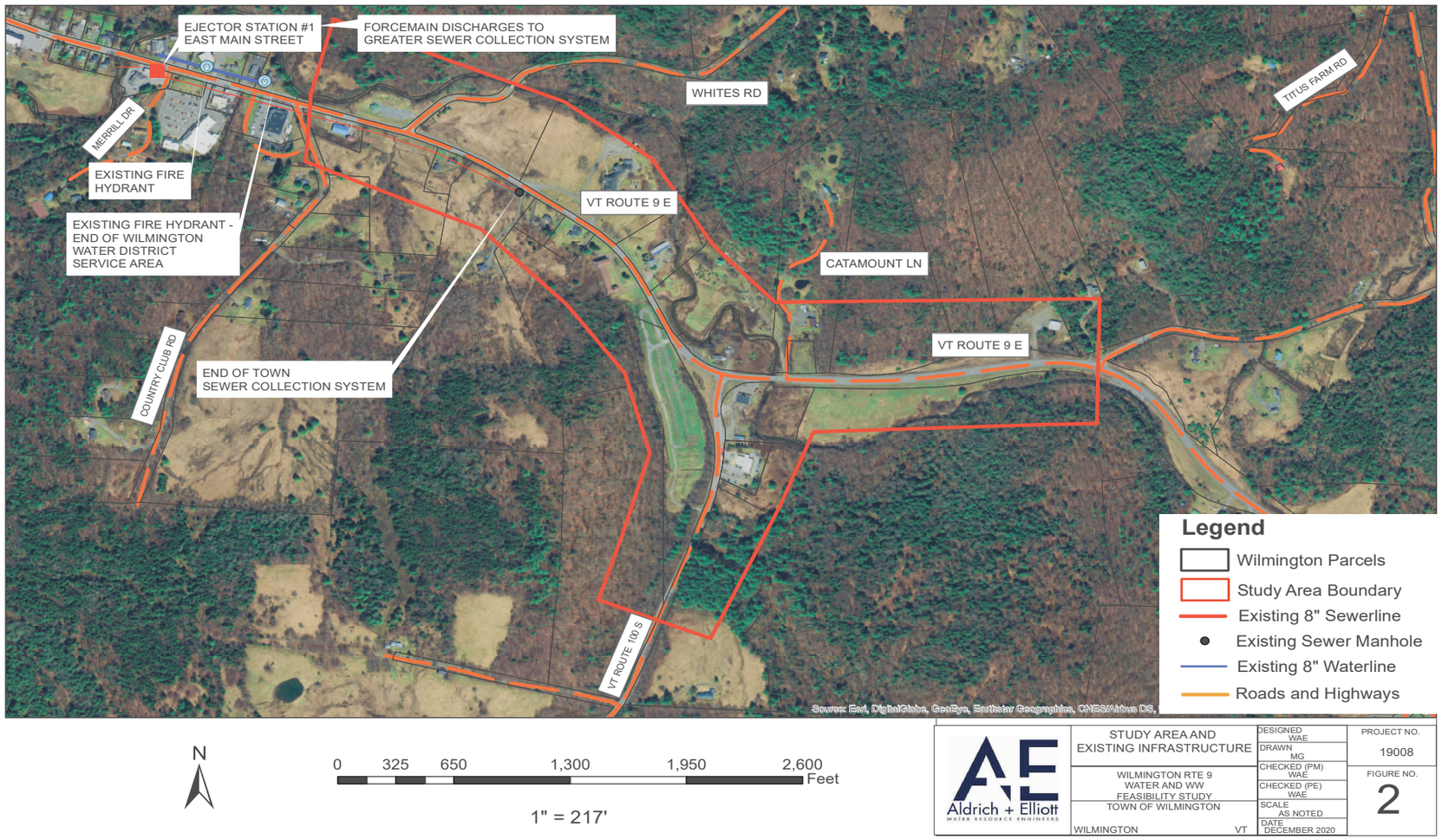
- Building new town centers away from flooding is not a viable option for the foreseeable future. Too much has been invested in existing town centers and infrastructure and growth is too slow to drive the kind of massive investment necessary.

- The slow evolution status quo, acting on risks with existing resources, is also not viable. It is too risky to region's health and the market-driven responses could simply encourage sprawl and make the region less attractive. Culvert replacement and enlargement, lining of drainage ditches, limited buyouts, and other actions underway are all critical, but not sufficient.

- An aggressively managed evolution, combined with limited managed retreat appears to be the only viable option. This strategy focuses on encouraging new development at a walkable, village-scale density, typically adjacent to flood prone areas, while accepting that the most vulnerable buildings will be damaged or potentially lost. Managed retreat will occur with zoning, infrastructure policies, the relocation of critical public facilities, and occasional buyouts when federal funds are available. Much of the retreat, however, is likely to be private sector driven as investors abandon high risk properties. Without significant federal support, this retreat will be more fragmented and haphazard than a fully managed retreat.

Governmental actions, private sector investments, and community actions are necessary to drive a faster managed evolution reducing hazards, building a strong economy and housing market for all, and making the region more desirable and resilient. Of course, this includes a wide selection of possible public and private approaches that must be considered.

Wilmington, for example, has an opportunity to channel new growth to some areas that are not subject to flooding and erosion, within a portion of their current water and sanitary sewer extension project. That opportunity can lead to an expansion of the walkable



village and provide new opportunities for mixed-income workforce housing. If this opportunity is not well managed, however, it could also encourage new non-resilient sprawl.

Moving forward, the communities need to think about their long-term visions, often well encapsulated in their town plans (prepared in accordance with the Vermont Planning and Development Act, 24 V.S.A. Chapter 117). This vision needs to be coupled with strategic actions at all time scales, from actions today that build momentum to longer term actions.

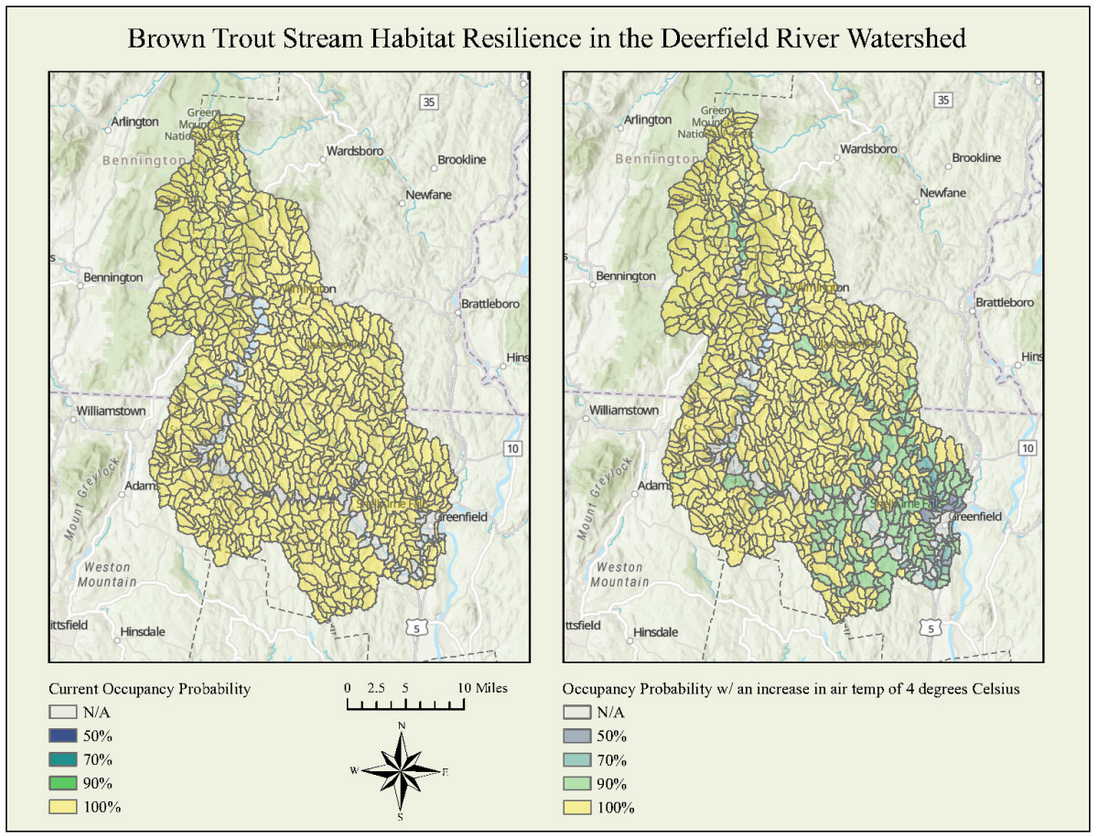
Actions that are needed include addressing flood and river erosion hazards, improving the ability of housing to serve all market needs including those of valley residents, and building a stronger economy.

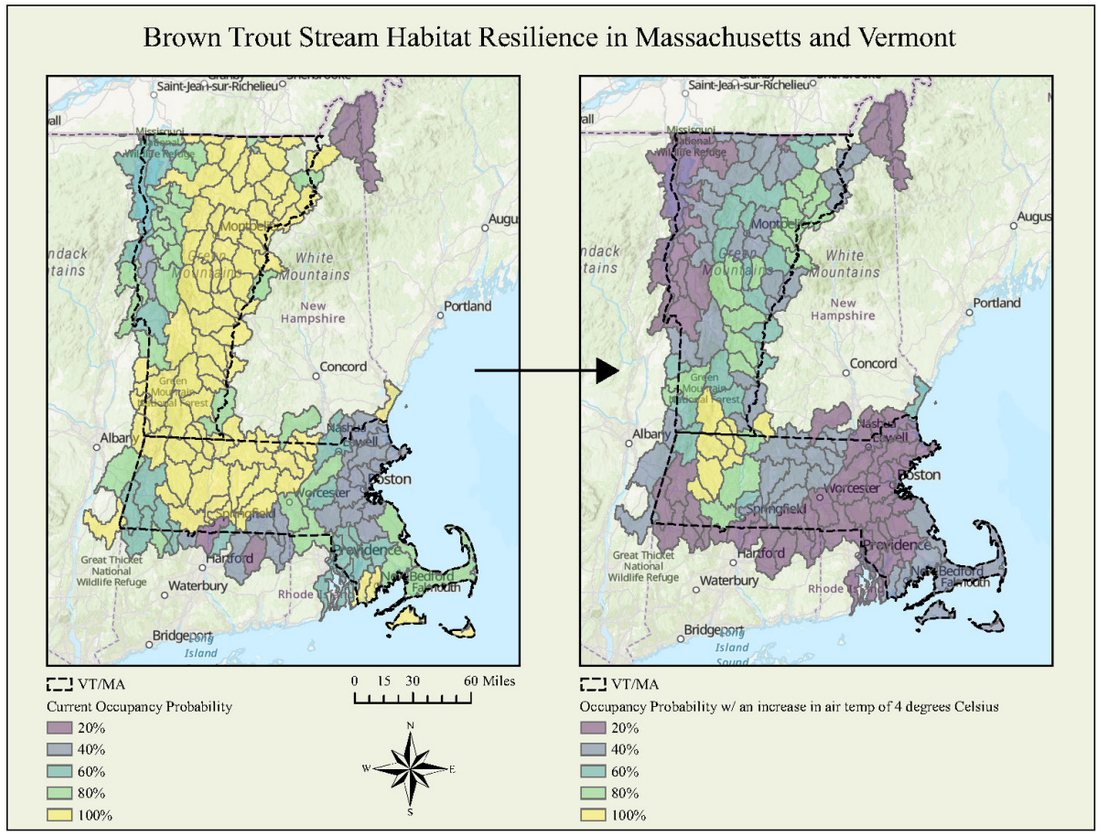
The Deerfield Valley village centers have evolved over the past century (see Wilmington comparison map below as an example), but the reality is with the inevitable loss of some buildings due to flood and erosion damage and the under-investment due to investment risk and flood insurance costs, that rate of evolution is going to speed up. That makes it critical to get it right since the evolving development patterns, for good or bad, are going to remain with us for a long time.

A Changing Climate – Risks and Adaptations

Flooding and stream channel erosion are among the most prominent effects of today's changing climate. There are also other challenges and opportunities.

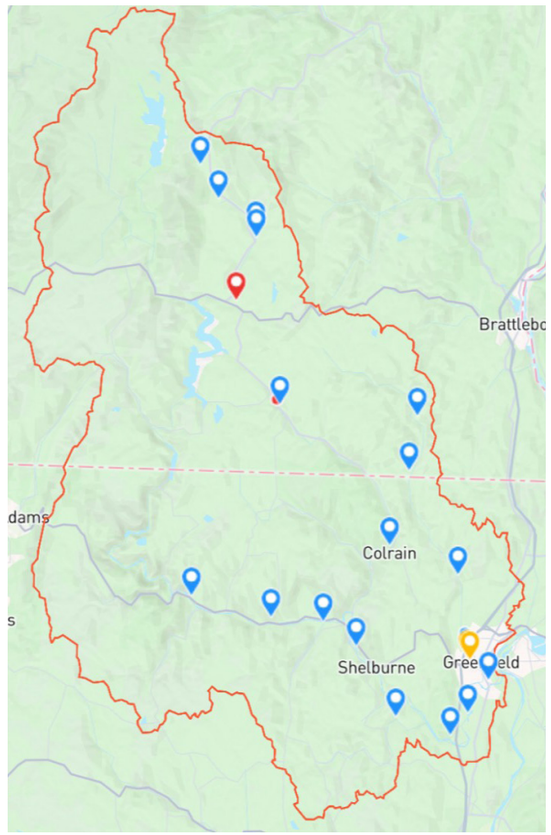
The Deerfield River in Vermont, especially the mainstem in Readsboro and all the branches west of the study area, is one of the premier trout streams in Vermont and New England. Trout is a cold water fish which is challenged by increasing stream temperatures. The Deerfield, again especially the mainstem and the westerly branches, is especially resilient, with deep water and shading, to increasing temperature. This makes it valuable for recreation and will attract more attention as other trout streams see a trout decline. Newer hydropower dam relicensing has come with requirements for greater minimum stream flow, which may help guard trout populations as those 40-license come up for renewal.





Water quality is affected by temperature and by the resulting loss in oxygen at higher temperatures. This can be countered by improving shading on the river, eliminating for example the former Mount Snow snowmaking pond in the Deerfield River as is currently being discussed, improving natural buffering, for example building a natural vegetation buffer between the Mount Snow parking lots and the river, and reducing both non-point sheet flow of contaminants into the river and point/concentrated source contaminants.

The Connecticut River Conservancy's Water Quality Monitoring Program identified Beaver Brook off Route 9 in Wilmington, a few hundred feet upriver of the confluence with the Deerfield River and far upstream from the town's wastewater treatment plant, as the most contaminated sampling site of all their collection sites in the entire Deerfield River watershed. The Deerfield River & Lower Connecticut River Tactical Basin Plan identified additional water quality challenges based on benthic organisms, those living at the bottom of the river. Addressing these challenges can improve water quality and fishing and swimming opportunities.

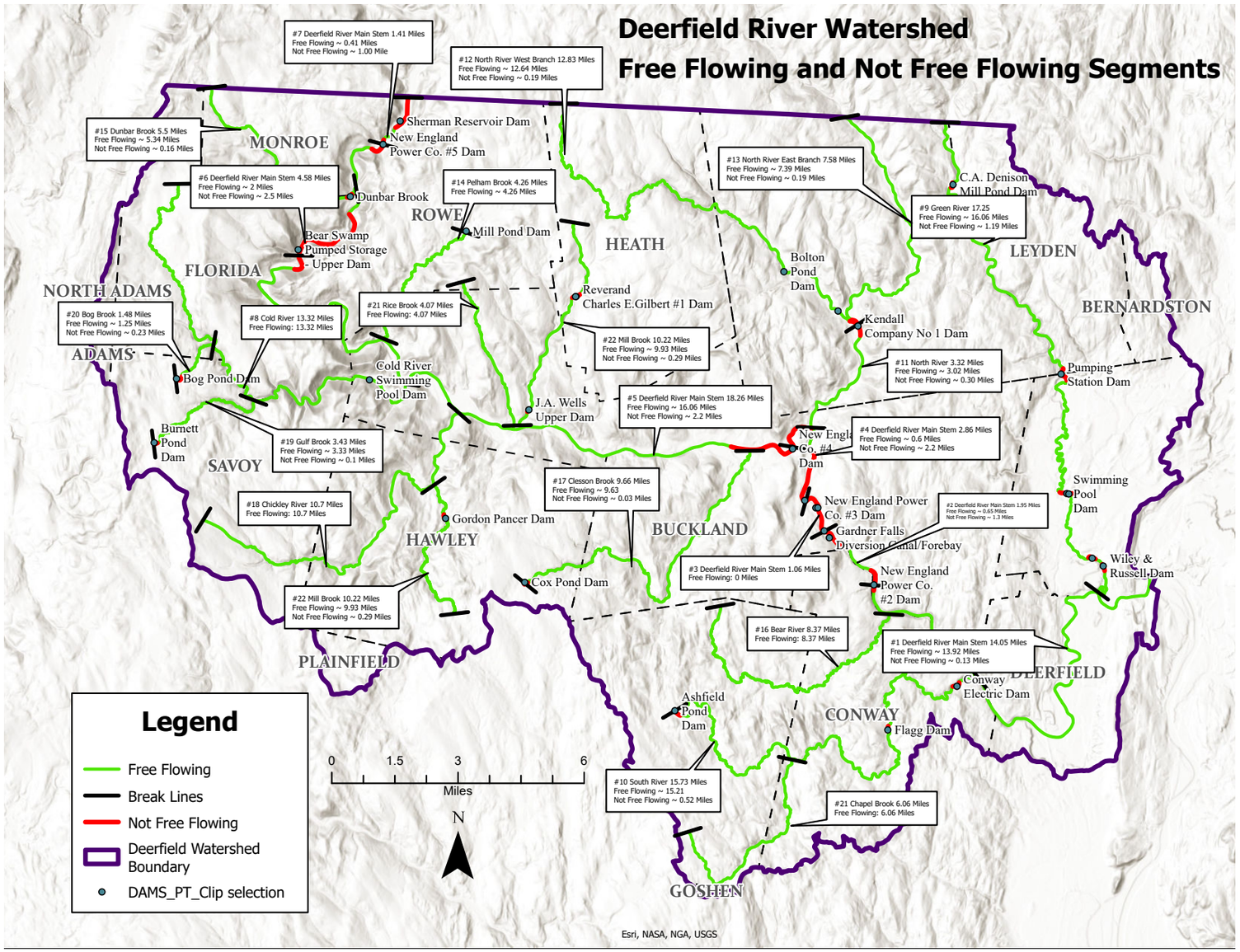


Increasing temperatures increase flooding risks by increasing the amount of water that the atmosphere can carry. In the long run, such temperature increases will reduce the length of the skiing season and put some marginal businesses at risk. This requires an increasing focus on year-round recreation and diversifying the economy. Regardless of the weather, the area has the resources to serve its residents while serving as a paying playground for many millions of people (49 million people within the range of today's electric cars). As a result, communities and businesses need to evolve to remain vibrant.

A future National Wild and Scenic River designation for free-flowing sections of some of the branches of the Deerfield River and the North River and their tributaries is a way to celebrate success. Wild and Scenic designation encourages regional cooperation, brings in a small amount of federal funding for management, and ensures that federal permits which are already required for water resources projects consider the values of the river.

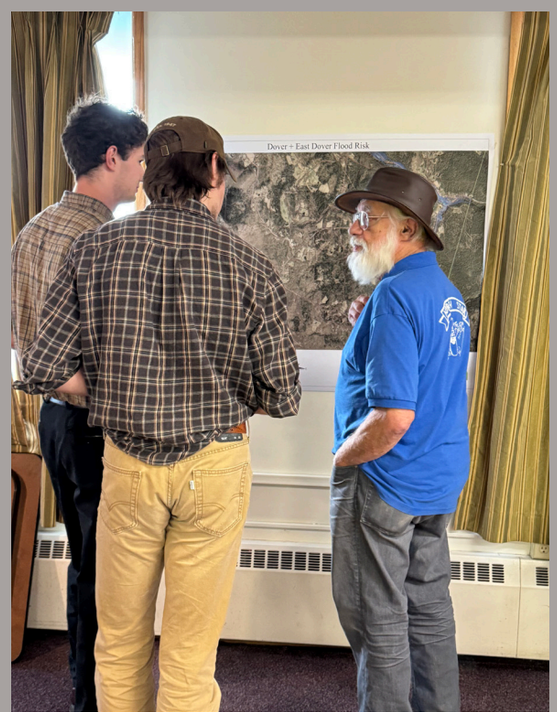
The National Park Service is currently undergoing a high level reconnaissance survey to start the process. Vermont's entire congressional designation has come together to cosponsor legislation studying this opportunity in more detail. That legislation passed the U.S. Senate in December 2024 by unanimous consent and then died in the House when they adjourned in January 2025. It was reintroduced in the 2025 session.

The designation has been supported by almost all of the communities and tribes within the Massachusetts section of the watershed (see map below). Many towns in Vermont have already endorsed the study process in Vermont, but that portion of the project is not as far along.


Deerfield River Watershed
Free Flowing and Not Free Flowing Segments
#7 Deerfield River Main Stem 1.41 Miles
Free Flowing ~ 0.41 Miles
Not Free Flowing ~ 1.00 Mile
#12 North River West Branch 12.83 Miles
Free Flowing ~ 12.64 Miles
Not Free Flowing ~ 0.19 Miles
#15 Dunbar Brook 5.5 Miles
Free Flowing ~ 5.34 Miles
Not Free Flowing ~ 0.16 Miles
#6 Deerfield River Main Stem 4.58 Miles
Free Flowing ~ 2 Miles
Not Free Flowing ~ 2.5 Miles
#14 Pelham Brook 4.26 Miles
Free Flowing ~ 4.26 Miles
#13 North River East Branch 7.58 Miles
Free Flowing ~ 7.39 Miles
Not Free Flowing ~ 0.19 Miles
#9 Green River 17.25
Free Flowing ~ 16.06 Miles
Not Free Flowing ~ 1.19 Miles
#20 Bog Brook 1.48 Miles
Free Flowing ~ 1.25 Miles
Not Free Flowing ~ 0.23 Miles
#8 Cold River 13.32 Miles
Free Flowing: 13.32 Miles
#21 Rice Brook 4.07 Miles
Free Flowing: 4.07 Miles
#22 Mill Brook 10.22 Miles
Free Flowing ~ 9.93 Miles
Not Free Flowing ~ 0.29 Miles
#11 North River 3.32 Miles
Free Flowing ~ 3.02 Miles
Not Free Flowing ~ 0.30 Miles
#5 Deerfield River Main Stem 18.26 Miles
Free Flowing ~ 16.06 Miles
Not Free Flowing ~ 2.2 Miles
#4 Deerfield River Main Stem 2.86 Miles
Free Flowing ~ 0.6 Miles
Not Free Flowing ~ 2.2 Miles
#19 Gulf Brook 3.43 Miles
Free Flowing ~ 3.33 Miles
Not Free Flowing ~ 0.1 Miles
#17 Clesson Brook 9.66 Miles
Free Flowing ~ 9.63
Not Free Flowing ~ 0.03 Miles
#18 Chickley River 10.7 Miles
Free Flowing: 10.7 Miles
#2 Deerfield River Main Stem 1.95 Miles
Free Flowing ~ 0.65 Miles
Not Free Flowing ~ 1.3 Miles
#3 Deerfield River Main Stem 1.06 Miles
Free Flowing: 0 Miles
#22 Mill Brook 10.22 Miles
Free Flowing ~ 9.93 Miles
Not Free Flowing ~ 0.29 Miles
#16 Bear River 8.37 Miles
Free Flowing: 8.37 Miles
#1 Deerfield River Main Stem 14.05 Miles
Free Flowing ~ 13.92 Miles
Not Free Flowing ~ 0.13 Miles
#10 South River 15.73 Miles
Free Flowing ~ 15.21
Not Free Flowing ~ 0.52 Miles
#21 Chapel Brook 6.06 Miles
Free Flowing: 6.06 Miles
Sherman Reservoir Dam
New England Power Co. #5 Dam
Dunbar Brook
Bear Swamp Pumped Storage Upper Dam
Mill Pond Dam
Reverand Charles E.Gilbert #1 Dam
Bolton Pond Dam
C.A. Denison Mill Pond Dam
Kendall Company No 1 Dam
Pumping Station Dam
Bog Pond Dam
Cold River Swimming Pool Dam
J.A. Wells Upper Dam
Burnett Pond Dam
New England Co. #4 Dam
New England Power Co. #3 Dam
Gardner Falls Diversion Canal/Forebay
Swimming Pool Dam
Gordon Pancer Dam
Cox Pond Dam
New England Power Co. #2 Dam
Wiley & Russell Dam
Conway Electric Dam
Ashfield Pond Dam
Flagg Dam
MONROE
ROWE
HEATH
LEYDEN
BERNARDSTON
FLORIDA
NORTH ADAMS
ADAMS
SAVOY
HAWLEY
BUCKLAND
PLAINFIELD
CONWAY
DEERFIELD
GOSHEN
Legend
Free Flowing
Break Lines
Not Free Flowing
Deerfield Watershed Boundary
DAMS_PT_Clip selection
0
1.5
3
6
Miles
N
Esri, NASA, NGA, USGS

What the Team Heard

Dover, Wilmington, Whitingham and Readsboro face complex challenges including balancing economic development, particularly tourism and second-home ownership, with the need for affordable workforce housing and maintaining local character. Towns are grappling with significant flood risks and infrastructure vulnerabilities, exacerbated by climate change and historic development patterns, often relying on FEMA and state grants for mitigation efforts. Furthermore, limited administrative capacity, declining and shifting populations, and the need for regional collaboration on issues like planning, emergency services, and economic development contribute to flood adaptation & mitigation challenges.



"It just doesn't make sense." (in reference to the Readsboro bridge project)

"VTrans doesn't care about our lives." (in reference to state laws barring a crosswalk at an important and dangerous crossing in town)

"Locals are realizing their children won't be able to live here."

"We don't... It's hard. It's hard to make a living up here."

"How do you make a small fortune in VT? Start with a big one."

"I shouldn't have been allowed to rebuild... nobody should build or be allowed to rebuild in a floodplain. To rebuild after you're flooded, you're a fool... I was a fool."

"The National Forest is a huge part of the identity of West Dover. The town is like fingers sticking into the national forest."

A Connected Economy & Housing Trends

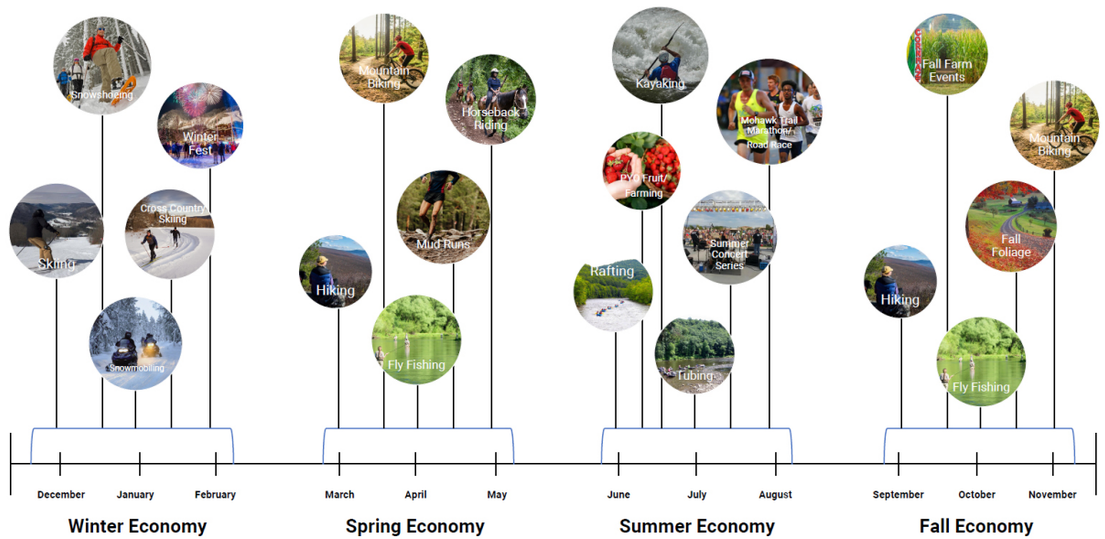
Valley Towns' Connections Reach Beyond Water and Infrastructure

The Valley Towns are connected in a variety of ways, some of which may be obvious while others may not. It is important to recognize these connections as they exist in physical, environmental, economic, and social ways that tie the four communities together. In the wake of past natural disasters some of those connections have been physically severed and can take years to repair. This section reflects the ways the four towns are connected through a shared economy, and the role housing plays in supporting both seasonal and year-round residents.

Economic Connectivity

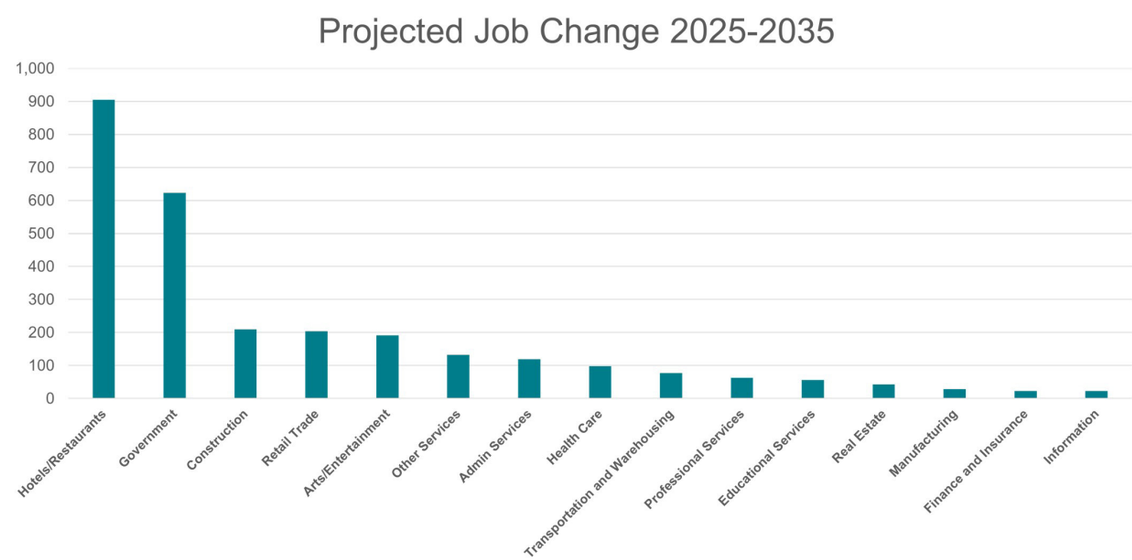
The natural beauty and outdoor recreation assets have created a strong tourism-based economy in the Valley, which relies heavily on winter season activities with the presence of Mt. Snow and smaller ski areas like the Hermitage at Haystack Mountain. However, as temperatures rise and natural snowfall decreases, other outdoor recreation activities across all four seasons are on the rise and are critical to future economic growth. Popular activities like fishing, hiking, boating, and mountain biking can happen in the spring, summer, and fall months, bringing a steadier stream of outdoor enthusiasts to the region.

Jobs across the four Valley towns are dominated by service sector employment and industry sectors that support the seasonal nature of the economy. Four of the five highest employment sectors include jobs in hotels and food services, construction, retail, and arts and entertainment. These sectors are supporting visitors to the Valley region, the food they eat, the items they purchase, and the places they choose to stay or live. Over the next 10 years, those same industry sectors are projected to continue to dominate the local economy



Top Occupations in the Valley

Food Preparation and Serving Related	**446**	**$39,064**
Education Instruction and Library	**324**	**$49,469**
Office and Administrative Support	**294**	**$44,706**
Building and Grounds Cleaning and Maintenance	**285**	**$35,228**
Management	**208**	**$89,975**
Sales and Related	**165**	**$38,695**
Construction and Extraction	**163**	**$54,146**
Transportation and Material Moving	**162**	**$43,682**
Installation, Maintenance, and Repair	**139**	**$55,723**
Personal Care and Service	**116**	**$35,018**
Business and Financial Operations	**107**	**$71,211**



making it that much more important that towns find ways to work together to market the region, build and sustain supportive infrastructure for the region, and ensure employees in these industry sectors can find housing options that are affordable to what they earn.

One of the biggest challenges in seasonal economies nationwide is the rising competition for a limited stock of housing and the significant price increases to both ownership and rental housing (particularly post-COVID). As more seasonal homeowners and investors look for housing in rural locations with recreation amenities, housing prices increase and seasonal workers are squeezed. Even today, the majority of employees in the Valley towns can't afford purchase or rent prices of most newer housing units. The majority of occupations today earn between $35,000 and $56,000 a year, which is not enough to be able to afford the region's current median home sale price of $386,000. Approximately 84% of workers across these occupations could not afford to purchase a home in the Valley at today's median sales price. That means workers are either renting, living in shared housing arrangements, or are forced to live further away and commute in, adding to their transportation costs.

To truly support the workers that make the economy move, housing needs to be provided at a range of price points with employee supportive housing serving those between 50% and 80% of the area median income. This housing could be subsidized through state and federal programs such as the Low Income Housing Tax Credit (LIHTC) program or programs through Vermont Housing Finance Agency (VHFA) that target household incomes at or below 80% AMI.

Area Median Income Ranges in the Valley

	30% AMI	50% AMI	80% AMI	100% AMI
2 Person	$24,900	$41,500	$66,400	$96,600
3 Person	$28,000	$46,650	$74,700	
4 Person	$32,150	$51,850	$82,950	

Working on both housing and economic opportunities will benefit all four towns in the Valley given their interrelated reliance on jobs, housing, and a shared workforce. This is exemplified in the commuting patterns of working residents across all four towns. The graph below on the left illustrates where residents of all four towns commute to work, while the graph on the bottom right illustrates where workers in all four towns are commuting from.

In Dover, Wilmington, and Whitingham, between 30% - 50% of all working residents commute to one of the three towns for work. Wilmington is the most popular work destination for Valley town residents with just over 45% of their local workforce coming from within the four town region. Whitingham on the other hand has very few of its residents working in town, but many commute to nearby Wilmington and Dover for work. This graphic illustrates the interconnected nature of the economy in the Valley and how town boundaries do not necessarily represent economic or housing market boundaries.

As we continue to examine the impact of the seasonal economy on the local housing and job market, it is important to recognize the macro changes in demographics that are occurring in the background for year-round residents of the Valley towns. Over the past 10 years, the population of the four towns has dropped by a combined 342 residents, and the median age of that population is four years older. With 61% of the housing stock occupied by seasonal residents (those living here for less than six months a year), it is becoming more difficult for younger people and families to find price appropriate housing options. The limited rental housing stock in these towns also constrains housing options for those looking to move into this region.

As the population of the towns continues to age and families find it more difficult to move in, the average household size continues to drop. Today, the average household size across the four towns is 2.2 persons per household. New for-sale homes built in the four towns

Housing for a Changing Demographic

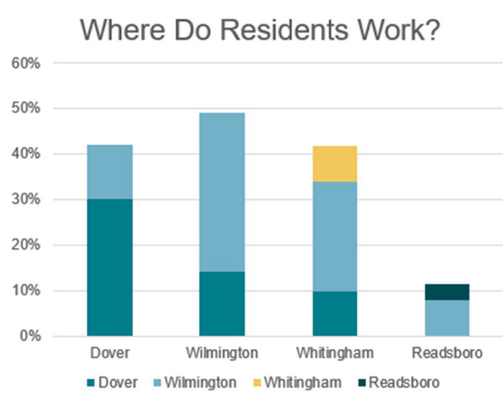
-342 Residents
We Have a Declining Population

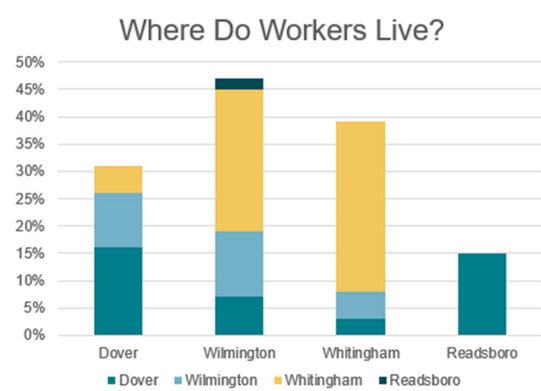
2 Persons per HH
We Have Smaller Households

4 Years Older Median Age
We Have an Aging Population

1976 Median Year Built
We Have an Aging Housing Stock

Commute Patterns of Valley Town Workers





today tend to be large and expensive, likely beyond what households need and can afford. The two examples illustrate both the size and design of new homes which are selling for far more than a typical household income could support. These homes are often selling to seasonal owners or investors willing to pay a higher price to have a second home in this market.

Economic and Housing Strategies to Consider

Although the four towns face challenges, there are local and regional solutions that could be explored by working together and expanding resources and capacity. On the **economic front**, the four towns may want to consider the following options:

- Expand the Bi-Town Economic Development and Marketing Initiative to include all four towns. Bring employers to the table to create public-private partnership.
- Identify the unique assets and niche roles each community can play in tourism, outdoor recreation, and other local economic development targets.
- Identify opportunities for shared trails, bike paths, water access points that can benefit all towns and create a connected/shared network.
- Explore revenue-sharing models for tourism and economic development.
- Site complementary attractions in smaller towns (Readsboro, Whitingham) like arts and culture, childcare, trailheads.

On the **housing front**, the four towns may want to consider these options:

- Expand the Bi-Town Housing Group to include membership from all four towns.
- Identify priority sites for housing or mixed-use outside flood zones.
- Identify priority zoning and permitting changes to ease pathway to building housing.
- Streamlined Accessory Dwelling Units
- Incentives for Flood Resilient Designs
- Tax Incentives for Workforce Housing
- Consider tax relief for owners who make improvements to their property.
- Leverage 1% sales tax for downpayment assistance program in addition to home repair program.

Working together and in partnership with the regional planning commission, financial and staff resources can be leveraged to accomplish more together than could be likely be done individually. This not only works for infrastructure and climate resiliency, but for housing and the regional economy too. Some of these action items the towns could undertake today, including regulatory reform and advancing regional conversations, whereas some will take far longer and may require legislative authority.

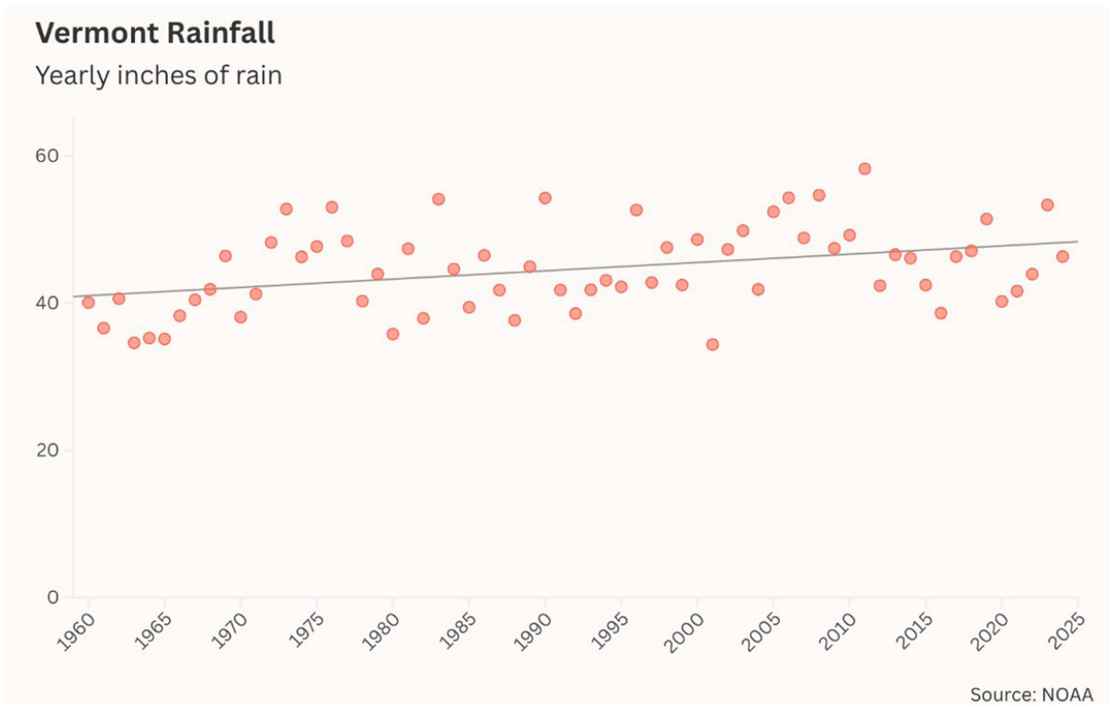
Hazard Mitigation for Flooding & Erosion

Flooding and Erosion Risk

Towns across Vermont are taking flooding and fluvial erosion more seriously as the frequency and severity of these hazardous events have increased. Vermont has seen annual average rainfall totals increase by 6 inches since the 1960s. The **Vermont Rainfall figure** (below) shows this data.

Extreme precipitation events (defined as 1.5 inches of heavy rainfall or melted snowfall in a day) are projected to increase in the Northeast by as much as 52 percent by 2100 (https://home.dartmouth.edu/news/2023/06/extreme-precipitation-northeast-increase-52-2099). Between 2011 and 2023, Vermont ranked 7th among all states in the number of disaster declarations. The severe storms for which these major federal disasters are declared have included rainfall of up to 9 inches in a day.

While Tropical Storm Irene remains the most severe flood event to impact the Deerfield Valley in the past 15 years, Dover, Wilmington, Whitingham, and Readsboro understand that more severe and frequent flood events are likely in the future. Flood inundation threatens low-lying roads, structures, and village centers. Fluvial erosion threatens roads and structures within the river corridor, even with small streams.



Mingle, Jonathan. 2025. "In Vermont, a Push to Prevent Flooding or Get Out of the Way", YaleEnvironment360: https://e360.yale.edu/features/vermont-floods, citing NOAA data)

Current Conditions for Vulnerability

Vermont's mapping of vulnerable roads shows high vulnerability roads in each of the towns, as seen in the **Vulnerable Roads map** on the following page (https://roadfloodresilience.vermont.gov/#/map).

The Special Flood Hazard Area (SFHA) is the area mapped by FEMA as having a 1% chance of annual flooding (also known as the 100-year floodplain) based on historic flood patterns, but not projecting into the future. With climate change, precipitation events causing 100-year floods are now occurring much more frequently. The State's Flood Ready website publishes Community Reports that tabulates structures in the Special Flood Hazard Area (SFHA) and the percentage of insurance policies in force. The **Buildings Vulnerable to Flooding table** shows that Dover, Wilmington, and Whitingham all have a significant number of buildings highly vulnerable to flooding, with 4 – 5% of all buildings in town located in the SFHA. Each of these towns has at least one critical public building located in the SFHA. The rate of adoption of National Flood Insurance policies is low across all towns, with Wilmington having the highest rate of adoption at 6%.

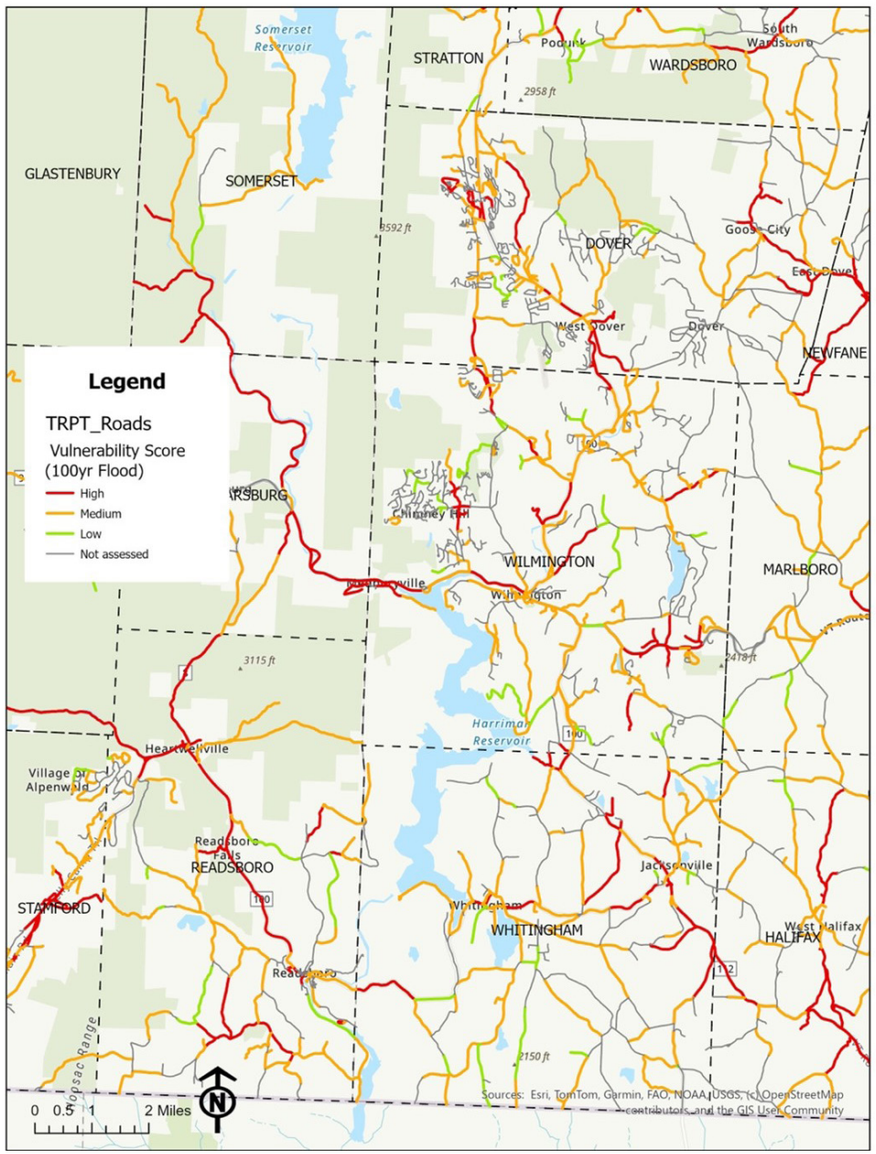
Each of the four towns have historic village centers located partially in the floodplain or river corridor that are civically, culturally, and/or economically vital to the community. GIS analysis of downtown Wilmington shows that 57% of the 43 acres of downtown are either in the SFHA or river corridor, as shown in the map. (Wilmington's Downtown boundary designated by the Vermont Department of Housing and Community Development, available on the Vermont Open Geodata Portal, served as a proxy for the town's downtown village for this exercise.)

Buildings Vulnerable to Flooding

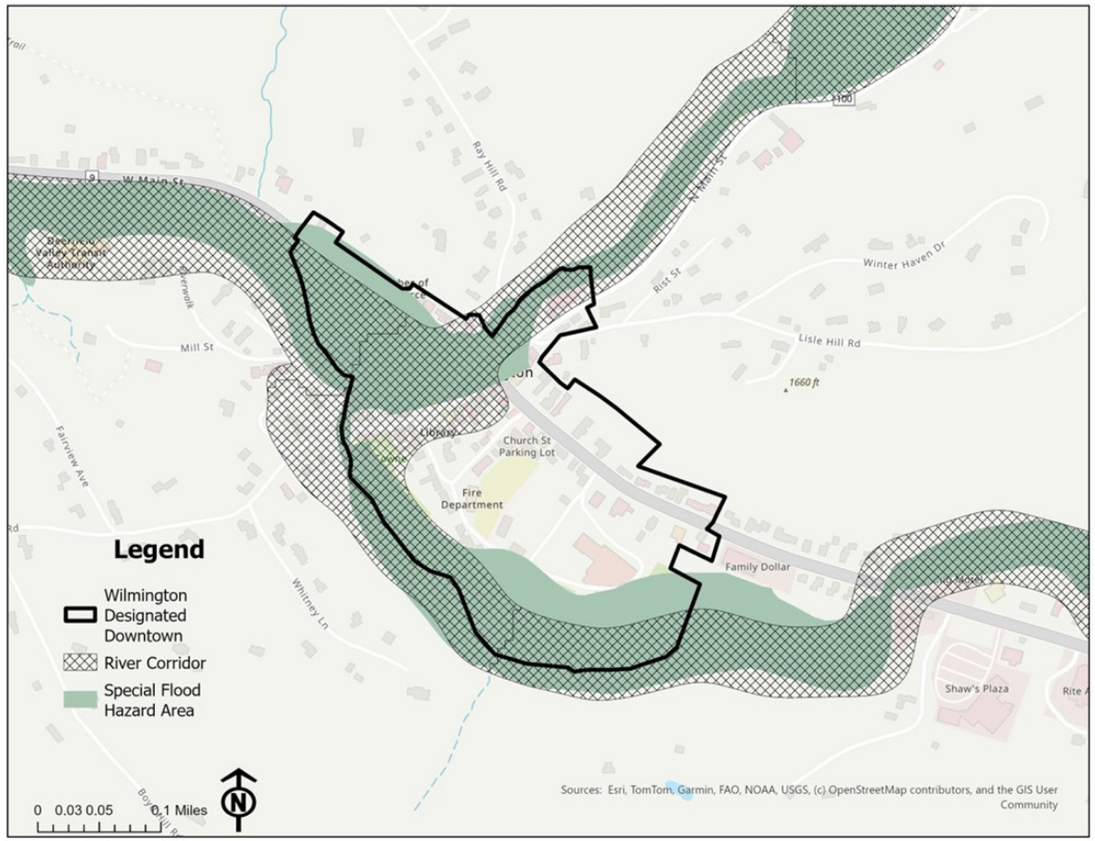
Town	Dover	Wilmington	Whitingham	Readsboro
Buildings in SFHA (% of total buildings)	101 (4%)	149 (5%)	53 (4%)	2 (<1%)
Critical Buildings in SFHA	1	3	2	0
Flood Insurance Policies in SFHA (% in force)	1 (1%)	9 (6%)	2 (4%)	0 (0%)

Source: https://floodready.vermont.gov/assessment/community_reports#Expanded

Vulnerable Roads



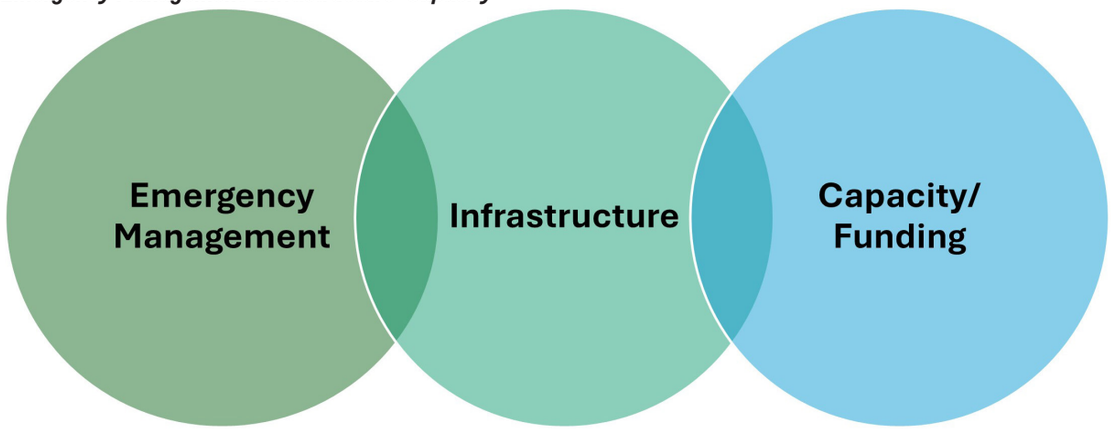
SFHA & River Corridor Map of Wilmington



Hazard Mitigation Planning Across the Four Towns

Each of the four towns has completed a Local Hazard Mitigation Plan (LHMP) within the past six years (Dover 2022; Wilmington 2020, currently being updated; Whitingham 2024; Readsboro 2024). LHMPs focus on community resilience to multiple natural and man-made hazards and climate change. A review of all four towns' LHMPs for flooding and erosion hazard mitigation identified specific themes showing up in each of the plans, which were then organized into three overarching categories: Emergency Management, Infrastructure, and Funding (see **Emergency Management-Infrastructure-Capacity table** on the following page). One benefit of identifying the strengths and vulnerabilities reported by the LHMPs for each town is to highlight opportunities for mentorship or collaboration among the four communities. (See also the Social Resilience section for discussion of social infrastructure in the context of hazard mitigation and resilience planning.)

Emergency Management-Infrastructure-Capacity



Emergency Management Coordination	**Flood Protocol**	**Capital Planning & Emergency Funds**
Emergency Management Training	**Harriman Lake & Dam**	**Volunteers for Committees & Projects**
Mutual Aid – Public Works & Emergency Services	**Road & Culvert Improvements**	**Flood Insurance**

Emergency Management

- ***Emergency Management Directors, Emergency Management Coordination, Emergency Operation Centers.*** Wilmington's plan cites having an effective Emergency Management Director, operations center, and good interagency coordination in recent years, but needing a shared channel between fire, police, and highway. Readsboro identified the need to clarify their Emergency Operations Center and stipend their Emergency Management Coordinator. Readsboro has interoperable radios for their Fire Department, Town Garage, and Town Office but their handheld radios are on the same bandwidth, which presents issues particularly when cell service is spotty. Multiple towns are also looking to sign more residents up with the VT-Alert system.

- ***Emergency Management Training***. Wilmington and Readsboro describe limited emergency response training or town staff and volunteers as a barrier to implementation of hazard mitigation actions. Whitingham wants to encourage more Town employees to take the basic Incident Command System (ICS) training offered through Vermont Emergency Management (VEM).

  Most towns identified a need for more emergency management training for the full range of emergency responders. For trainings that must be held in person, banding together to request trainings in the area, or arranging travel for participants from multiple towns to attend trainings together could help reduce the barriers to receiving training and foster conversation between emergency responders from different towns.

- ***Mutual Aid for Public Works & Emergency Services.*** Each of the Towns' Hazard Mitigation Plans cite strong volunteer Fire Departments and effective fire emergency mutual aid agreements with surrounding towns. Multiple towns' plans cite having informal mutual aid agreements for public works departments, who often act as first responders in road-related emergencies. Towns expressed interest in but currently have no mutual aid agreements for emergency services. It would be beneficial for all towns to have formalized agreements in place before needs arise. Not having this creates unnecessary legwork during and following events.

Infrastructure

- ***Road Infrastructure Improvements & Culvert Right-Sizing.*** All four towns share the experience of having a large percentage of roads vulnerable to stormwater and fluvial erosion. Rebuilding bridges, right-sizing culverts, fortifying retaining walls, and installing good stormwater erosion prevention measures are a priority of all four towns. In Dover, roads are over 80% compliant with the municipal roads general permit (MRGP) and the Town highway superintendent reports that his department has been able to maintain a healthy pace replacing and up-sizing culverts. In Wilmington, the Town reports having replaced or upgraded 62 culverts between 2015 and 2018. Wilmington's plan indicates that the Town standard is that culverts designed to handle 25-year floods be replaced with those designed for 100-year floods (no design storm indicated). Whitingham has recently worked on a landslide stabilization project.

  Some town plans noted having culvert assessments completed that are now out of date. If Town highway staff do not have a culvert assessment protocol, they could request the service from Windham Regional Commission, who could consider using federal transportation funds to conduct assessments for the Towns, as is done in neighboring Franklin County, Massachusetts by the regional planning agency.

- ***Flood Protocol.*** Wilmington has a flood protocol that the Emergency Management Director estimates is put into place on average three times per year. The flood protocol requires that flood doors be closed, cars and dumpsters moved, and propane tanks in the floodplain be shut down. In Readsboro, Great River Hydro has installed an emergency alert system for flooding and other hazards.

- ***Harriman Lake Dam.*** The Town of Wilmington would like a better understanding of the decision behind raising or lowering the level of Lake Harriman and would like Great River Hydro to understand the town's concerns with the Lake. The Town of Readsboro noted that communication with Great River Hydro feels effective to them.

Capacity & Funding

- ***Capital Planning & Emergency Funds.*** With different economies and tax bases, the four towns have different degrees of financial capacity for hazard mitigation projects. Dover has three capital funds through which it plans for hazard mitigation and emergencies, some of which is level-funded through taxes. Wilmington's plan reports that there is no mitigation fund set up currently. It also notes that taxes are high because of second home population, which makes the Town not eligible for certain grant funded programs, limiting access to outside grant funding that would benefit the town. Readsboro's plan cites a grant-matching fund.

- ***Volunteers for Town Committees and Projects.*** As in many small towns across New England, reliance on volunteers to serve on committees and boards and/or help with projects can be a barrier to mitigation planning, coordination, and implementation. See the Social Resilience section of this report for some ideas for recruiting more involvement in Town committees and projects.

- ***Flood Insurance.*** According to their Community Reports, only 5% and 6% of buildings in the SFHA in Dover, Wilmington, and Whitingham have flood insurance in force. Dover reported that people find flood insurance too expensive.

  With National Flood Insurance adoption rates that range from 0% - 6% in the four communities, the four towns could consider banding together to educate residents and promote flood insurance adoption. Collaborating on outreach could be more effective than each town working on its own.

Land Use Evolution

Less explicit but woven throughout the plans and the meetings held with the communities are themes that address the need to slowly evolve land uses and investment up and away from floodplains and the river corridor. Actions that support land use evolution vary in the degree to which they can be or will be managed and influenced by town and state decisions versus driven by individual investment decisions.

- ***Flood & River Corridor Zoning.*** Dover, Wilmington, and Whitingham have flood hazard regulations in their zoning. Readsboro regulates development in both the SFHA and the Harriman Dam inundation zone with a standalone regulation. Of the four towns, only Readsboro has adopted regulations that control development in the mapped river corridor, according to their Community Report. By 2028, per the 2024 Vermont Flood Safety Act (Act 121), the state will assume the responsibility of regulating development in river corridors, though towns will have the option of administering river corridor development rules themselves if they can demonstrate they have the capacity to do so.. These forthcoming rules are designed to promote only flood-safe development within village centers.

- ***Moving Critical Infrastructure.*** All four towns are working to move critical public infrastructure to higher ground or otherwise mitigate flood risk to these structures. Wilmington has moved its Fire and Police Departments out of the floodplain and river corridor. Whitingham has three critical structures in the floodplain but is currently resizing culverts around the Municipal Center to reduce flood risk. Readsboro is looking for a location for its Highway Garage out of the floodplain and river corridor.

- ***Voluntary Buyouts.*** Both Wilmington and Readsboro have either aready conducted buyouts or cite the need for buyouts in their LHMPs. Whitingham has identified in their plan two buyouts that they see as important to the community. The Town is responsible for submitting the application for voluntary buyouts and must weigh the benefits of the buyout against the administrative burden and potential loss of tax revenue.

  Voluntary property buyouts reduce the impacts of flooding. When organized at a neighborhood level, buyouts can produce a complete area of open space that can more effectively serve as flood storage or a location for a river restoration project. The towns could consider collaborating with the Windham Regional Commission to strategize about where more systematic buyouts should be planned to gain the full benefits of the restored flood plain and open space.

- ***Floodplain & River Corridor Projects.*** All four town Local Hazard Mitigation Plans include proposed actions to protect and restore the floodplain and river corridor. These projects cover conservation easements to protect floodplains in agricultural and forest lands, floodplain improvements along parking lots, removing old bridge abutments and berms, strengthening stream buffers along agricultural lands, acquiring properties for floodplain restoration projects, and conducting building buyouts.

  Multi-town collaboration on flood resilience projects at the watershed scale could allow towns that are watershed neighbors to pool resources, networks, and ideas to build flood resilience. Working together, towns can more easily prioritize, coordinate, and leverage work and funding to reduce flood damage. The Resilient Deerfield River Watershed Coalition, working in the lower half of the Deerfield River Valley in Franklin County, MA, has formed this kind of partnership and could be a resource for developing this kind of collaboration: https://frcog.org/boards-committees/resilient-deerfield-river-watershed-coalition/

- ***Wet Floodproofing.*** The Town of Wilmington has applied the principles of wet floodproofing to Memorial Hall in the village. Wet floodproofing allows floodwaters to enter and exit a structure to equalize internal and external hydraulic pressure and minimize structural damage, uses flood-resistant materials in floors, elevates mechanical equipment above freeboard, and requires that items prone to being damaged by flood water be moved to higher floors. It is an alternative to dry floodproofing for structures that might not withstand the force of water being held back by dry floodproofing.

Multi-town collaboration for emergency management, infrastructure, and capacity improvements, improved zoning and regulatory systems that mitigate risk exposure by limiting development in flood and erosion hazard areas, property buyouts, and relocating critical infrastructure out of the flood hazard zone all support hazard risk reduction. Those actions and driving investments to flood- and erosion-safe areas will allow the town to strengthen their resilience evolution.

Building Resilient Town Corridors

Patterns First, Then Projects

Given the multiple challenges faced by Deerfield Valley towns related to housing affordability, chronic flooding, job opportunities, and population aging, Evolving Together is focused on development patterns that support combined social and ecological resiliency. To solve for these intersecting challenges as well as for future uncertainty, it is important to think first in terms of planning patterns, and then individual projects. The other way around will not yield the needed solutions. Town making in New England, for instance, exhibits an exemplary application of pattern languages, offering enduring lessons in placemaking and economic order. Whether centralized around a green common, a main street, a lakefront, or linearly along a river—each town morphology (structure) projects a strong individual identity without sacrificing a clear planning order. Each pattern language reflected a prudent use of resources. Here, town patterns articulated a clear walkable network of centers, edges, appropriate placement of public space and institutions, mixed-use building compounds, neighborhood districts, and proximate farms and riverfront manufacturing facilities. Essential services are accessible within the recognized pedestrian shed encompassing a one-half-mile radius, part of each town's genius and charm. As Deerfield Valley towns develop to safer ground unaffected by flooding, how can the incremental transition away from the traditional compact center occur without becoming sprawl or random development? How might new development secure greater economic and social resilience through the prudent use of resources that have served the New England town so well?

Sprawl and its primary tool of entitlement—single-use or Euclidean zoning codified in the 1920s—replaced the form-based wisdom of pre-1920s town planning. Sprawl and zoning operate without pattern language, substituting pedestrian-centered place making with scattered auto-centric land-use development. Sprawl is unnecessarily costly to both public and private budgets, and its footprint consumes land and depletes ecosystem functioning (erosion control and hydrological cycling along with the 15 other ecological services all healthy ecosystems deliver). Moreover, sprawl is isolating, hindering the development of social life and the care needed by youth, seniors, and communities experiencing chronic stress. Single-use zoning is in big part responsible for the extraordinary amount of ugly development generated over the last four generations; the other responsible parties are towns and cities that never demanded anything better or smarter. A generation of studies have shown that sprawl and single-use zoning make us economically and socially poorer (see the fast-paced best-seller: Arbitrary Lines: How Zoning Broke the American City and How to Fix It by M. Nolan Gray . . . the story of zoning was never so interesting and relevant as this). Zoning and individual projects considered on their own will not ensure the affordable, compact, and conservation-oriented development needed by the region's full-time residents.

Due to geography, Valley towns are linear developments along river corridors with mixed-use compact town centers at crossroads. Valley towns will continue to grow along highway corridors, though without clear order or coherence if planning patterns are not followed. Single-use zoning is an index, not a pattern. How might new development reproduce the lessons of the Valley's traditional town centers to make the corridors attractive and walkable? The region's identity comes, in part, from its strong tradition of aggregating buildings into compounds. Imagine, for instance, highway segments converted into context-sensitive streets of successive village centers!

Regardless of the specific sites earmarked for new development, we encourage upholding the following three principles in design and development processes toward supporting affordability combined with social and ecological resiliency.

1. **Ensure that development is walkable where essential services are easily reached by residents.**

2. **Ensure that development is mixed use to optimize land use, support local entrepreneurship, and facilitate greater social vitality.**

3. **Ensure that development is affordable for full-time residents by providing a wide range of housing typologies, delivering shared benefits and services beyond the detached single-family home.**

The U.S. developed an extraordinary tradition of urbanism with a consistently high level of quality in the construction of hamlets, towns, and cities across the continent. The genius of American town planning before the advent of single-use zoning in the 1920s was that shared planning patterns and building typologies were implemented by the non-professional but educated developer, contractor, and designer using popular pattern books. Development patterns exhibiting good town form offer the community's best chance to optimize its return on investment in infrastructure, employment opportunities, disaster preparedness, and general livability. Everything is changing; and everything is connected. Solving for pattern creates multiplier benefits within communities as Wendell Berry observes in "Solving for Pattern" in The Gift of Good Land: "a good solution in one pattern preserves the integrity of the pattern that contains it."

Traditional Building Aggregations in Deerfield Valley Town Centers

If the Western town reflected the rugged individual—the pioneer's search for independence, wealth, and resources—the New England town reflected "a consensual communalism" according to historian Michael Zuckerman. Regional idioms of multi-family housing and mixed-use building compounds are prevalent development patterns in the Valley's heritage, both inside and outside its town centers. These walk-up building types (front doors facing streets or yards) with porches and stoops/terraces fit well in both low-density neighborhoods and moderate-density town centers with commercial buildings. Regional housing typologies contain flexible and diverse unit floor plans serving residents with various housing needs throughout different phases of their lives. Indeed, walk-up housing typologies are the building blocks of interesting and socially vital neighborhoods. Yet, they have been ignored over the past 80 years in favor of subdivision building typologies (suburban single-family houses, garden apartments, condominiums, motels, etc.) favored by planning policy and readily financed through the mortgage market. So-called "missing middle" walk-up housing typologies—a planning lexicon formulated by David Parolek of Opticos—have made a comeback in town and city revitalizations nationwide because they have a great track record of success (see the book Missing Middle Housing by Daniel Parolek with Arthur C. Nelson, or the website: https://missingmiddlehousing.com/). Walk-up housing typologies, of which there are many regional variations to the missing middle diagram, make for great places while remaining affordable. See also Vermont Homes for All Toolkit for examples at https://accd.vermont.gov/current-initiatives/homesforall/toolkit.

Introducing the Pocket Neighborhood as a Planning Pattern: The New Popular Living Experience

To achieve affordability, sense of place, and housing diversity, we recommend that new housing investments

follow pocket neighborhood planning. Like bungalow courts, pocket neighborhoods organize five to twenty-five dwelling units around a central green, while automobile parking is discretely tucked inside the development along alleys or drives. In the best pocket neighborhoods, the neighborhood green is open to the street as a community asset rather than hidden within the block interior. Pocket neighborhoods are pedestrian-centered developments motivated by clarity in the expression of shared space more than convenience in car circulation and storage (for noteworthy precedents, see Ross Chapin's Pocket Neighborhoods: Creating Small-Scale Community in a Large-Scale World). Pocket neighborhoods are especially compatible in places with a strong tradition of vernacular building development like Deerfield Valley. Similar to attached townhouses, pocket neighborhoods can be designed as fee-simple parcels, though a Homeowners Association (HOA) is necessary to manage shared facilities related to the green and parking. Like urban infill, compact pocket neighborhoods are efficient users of infrastructure, yet not dense enough to preclude use of septic systems. Pocket neighborhoods are flexible in their ability to sponsor diverse housing typologies and ownership tenures, ranging from single-family houses with ADUs (Accessory Dwelling Units) to duplexes, townhouses, triplexes, four-squares, and mansion apartments up to 12 units. All housing units along the neighborhood green typically have a porch or other building frontage that creates a place and encourages social exchange.

Pocket neighborhoods are one of the fastest growing real estate alternatives to subdivision neighborhoods where the latter's development is simply the sum of individual houses. The detached single-family home subdivision consumes more land and infrastructure per dwelling unit than mixed-use or in-town development, and these planning and ownership decisions are never fair-costed by town authorities (i.e., town residents end up subsidizing suburban lifestyles). Pocket neighborhoods appeal to residents seeking more communal and convivial forms of living, though less complicated than co-housing and congregate housing that do not preserve household autonomy. Pocket neighborhoods also appeal to a large population, young and aging alike, who are committed to downsizing and do not want to spend time maintaining a yard. Inexplicably, housing supply is not keeping up with the demand for lifestyles structured around sharing economies.

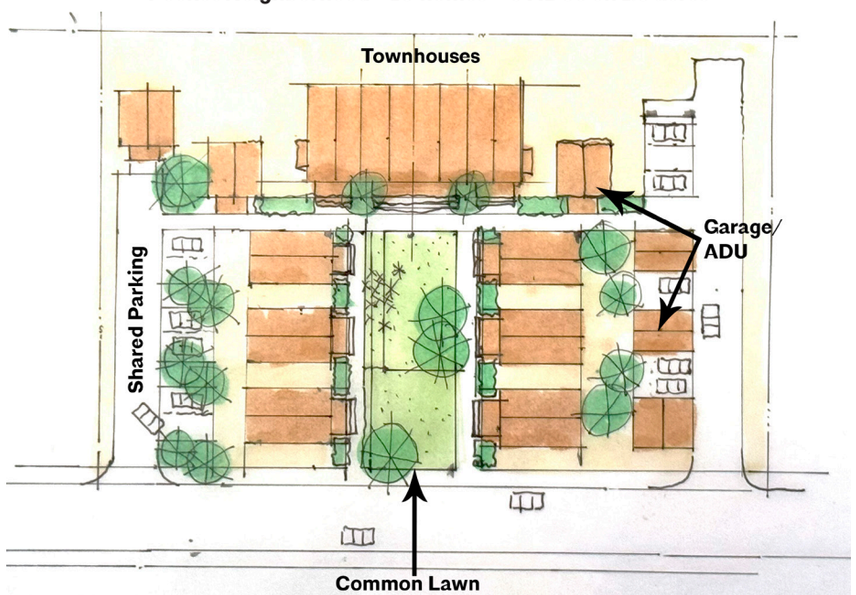
Pocket neighborhoods offer the following multiplier benefits.

- **Pocket neighborhoods promote compact conservation-oriented living** as a way of staying out of the floodplain and river corridor.
- **Pocket neighborhoods aggregate homes around a shared green**, creating a communal orientation in housing desired by many. Parking is shared, whether cars are stored under carports, garages, or in open spaces that allow a savings of $80,000-120,000 in standard two-car garage construction cost.
- **Pocket neighborhoods use walk-up housing types**, including single-family and/or multi-family housing typologies. Deerfield Valley has a wide range of vernacular housing typologies that fit very well in the pocket neighborhood format.

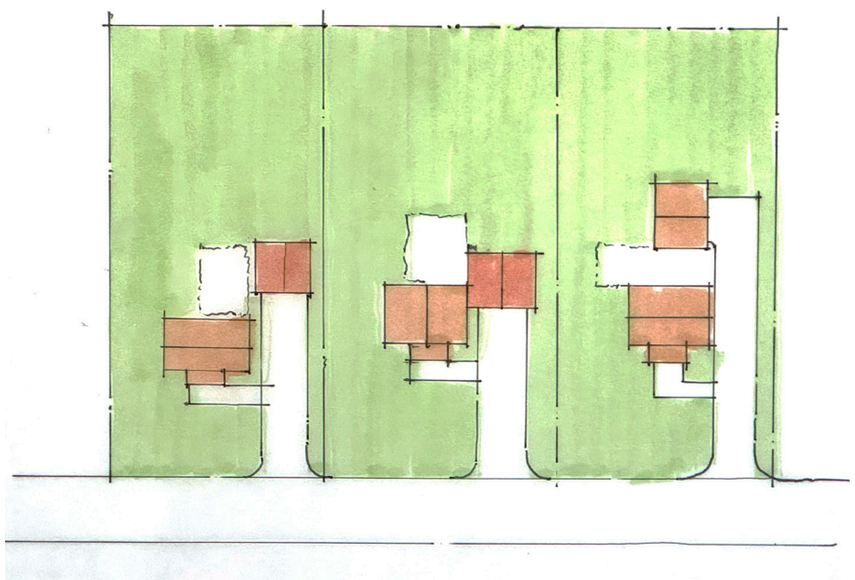
Mixed-Use Enclaves: Pocket Neighborhoods + Non-Residential Development Along Town Corridors

Town corridors outside floodplains could become the new main streets. We recommend the combination of pocket neighborhoods with non-residential uses in land development to replicate the vitality of the village center. Unlike traditional town centers where housing over shops is a common pattern, these new mixed-use developments should arguably be horizontally integrated rather than vertically integrated. Modern building codes, especially the International Building Code (IBC), entail more expensive construction when residential and non-residential uses are stacked, elevating the cost of housing. The soft densities and moderate land prices in the Deerfield Valley likely makes expensive vertical mixed-use arrangements unfeasible.

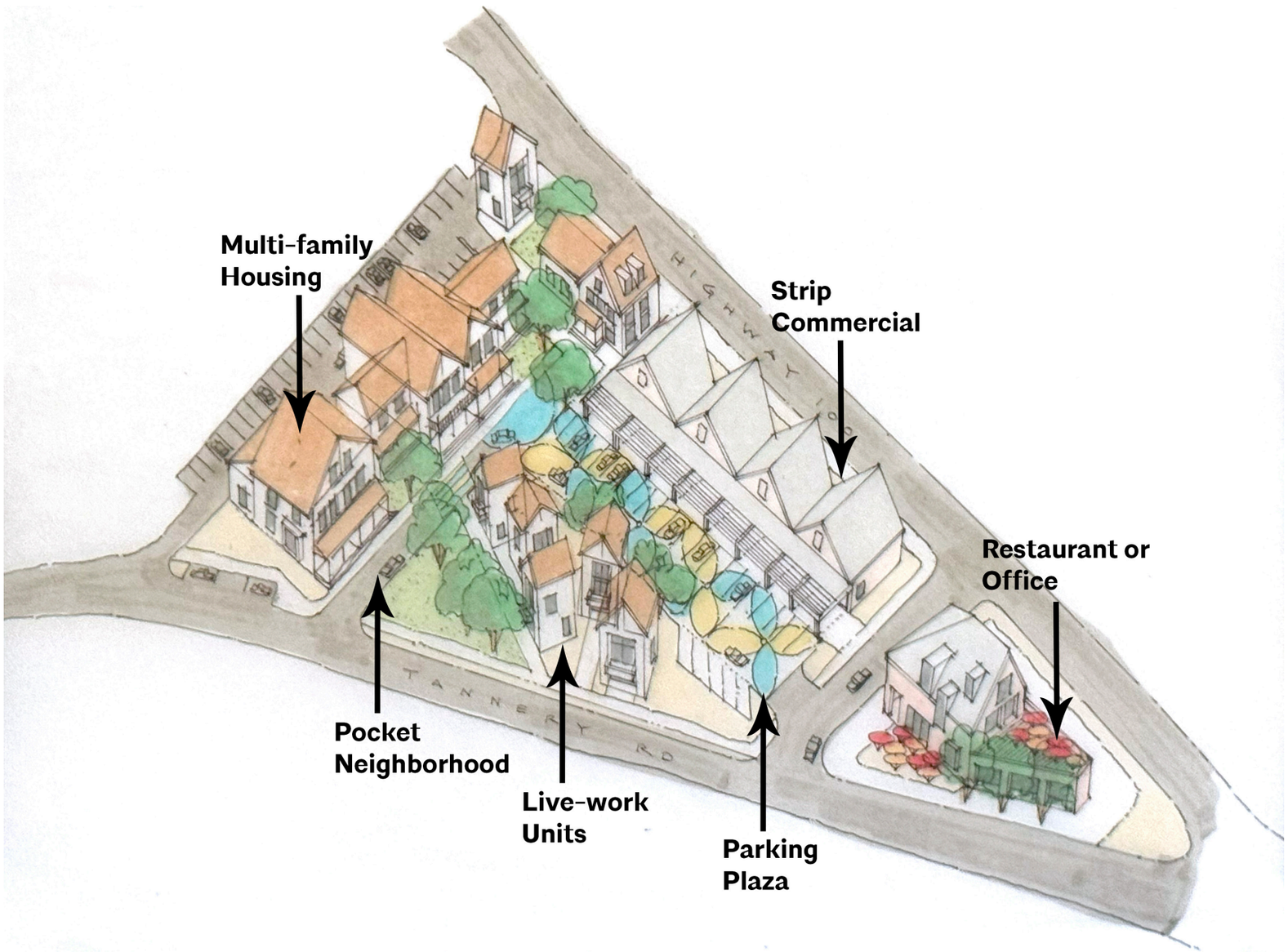
Pocket Neighborhood - 10 homes + 6 ADUs on 1.5 acres



Conventional Development - 3 homes on 1.5 acres



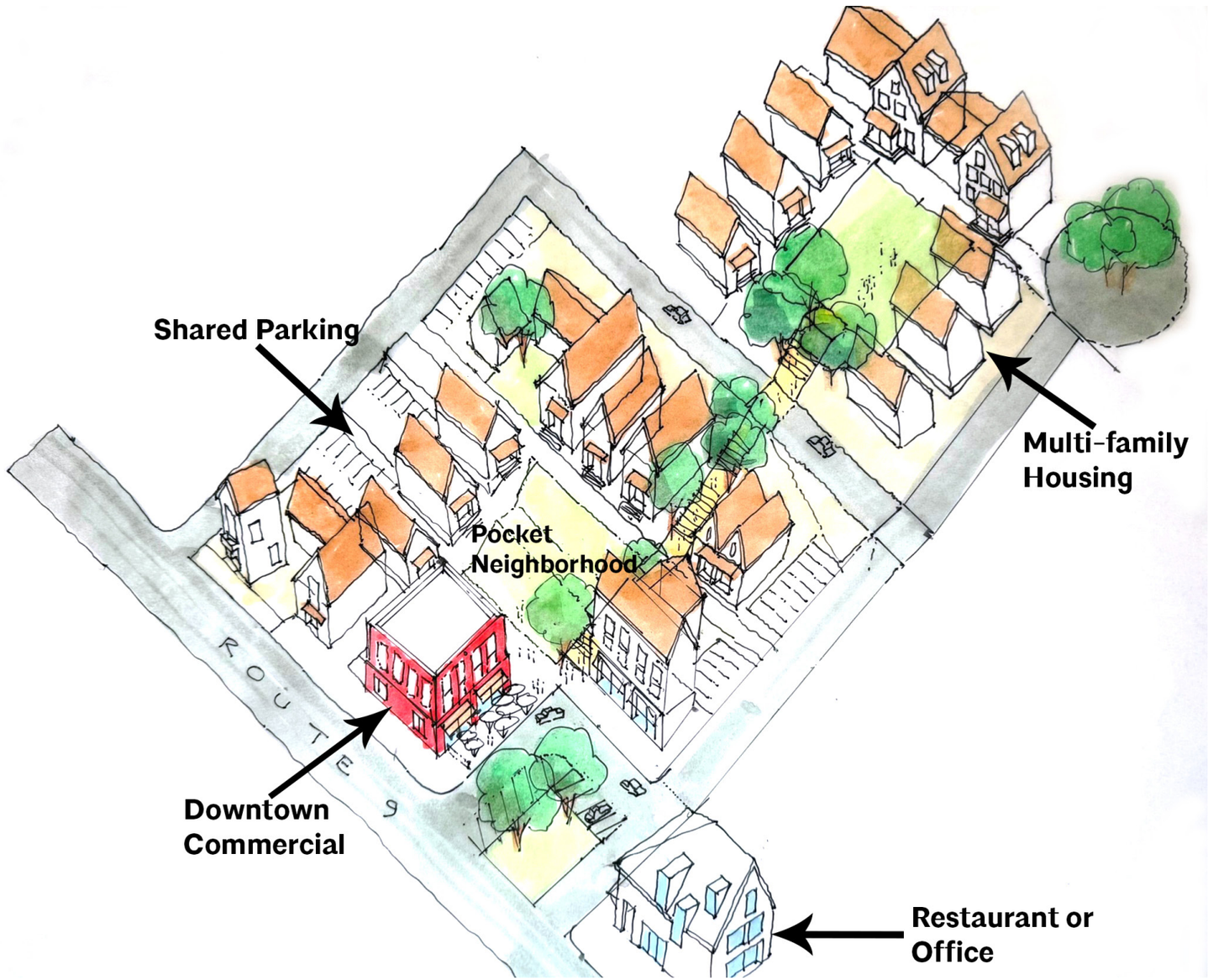
Horizontal mixed-use projects incrementally developed are most compatible with small town entitlement processes, small developer capital financing, and contractors holding residential-grade licenses. To create vital town corridors outside the town center, development should create double-faced frontages—one to the corridor and another to the block interior. Like pocket neighborhoods, mixed-use enclaves should feature a public space for wayfinding and the creation of a strong identity. The public space provides a coherent strategy for aggregating mixing uses, including residential, retail, offices, professional services, institutional, and light manufacturing, among others. Parking solutions should be clear, discrete, and reinforce the public space concept. While street parking is useful, parking should be distributed and not its own singular land use or the primary development frontage in large parking lot formats. This is important for recapturing a sense of place and human-centeredness in future development. Yet, proximity alone is not enough to nudge people to walk; the environment must be interesting, safe, and well-designed, thereby rewarding the election to walk.



Corridor enclaves could feature a high rate of housing diversity, densities, and formal typologies in the creation of the new context-sensitive streetscape. Commercial establishments would benefit from having residents within easy walking distance. Housing could feature flexibility though live-work units where the ground floor can be switched between residential use and non-residential uses including commercial, office, light manufacturing, or art production functions. Live-work housing can take on many forms, but should be generic to adapt to multiple scenarios, while possessing architectural quality (not unlike abandoned warehouses that became residential lofts). Live-work buildings provide yet another community resilience solution for adapting to market uncertainty.

It is worth citing at length the observation on the relationship between the generic and the adaptive—which vernacular building exemplifies so well—by Stewart Brand, co-founder and editor of the Whole Earth Catalog. In his *How Buildings Learn: What Happens After They're Built*, Stewart states:

"All buildings are predictions. All predictions are wrong. . . . Buildings can be designed and used so it doesn't matter when they're wrong . . . The product of skilled scenario work is not a plan but a strategy. Where a plan is based on prediction, a strategy is designed to encompass unforeseeably changing conditions. A good strategy ensures that, no matter what happens, you always have maneuvering room. . . . Vision is generic, and generic is adaptive."


Shared Parking
Multi-family Housing
Pocket Neighborhood
ROUTE 9
Downtown Commercial
Restaurant or Office

A Note on Seasonal Labor Housing: Mount Snow Grand Summit Resort

There are three discernible housing markets constituting the Deerfield Valley: one encompassing second-home residents, another for full-time Valley residents (the focus of our study), and the third accommodating seasonal labor. Rather than simply treat workforce housing as a utility, we encourage all markets to treat housing as an opportunity to express regional or geographic character. Here, housing for seasonal labor can be a straightforward expression of the topography defining the procession up to Mount Snow. Rather than begin the visitor experience at the lodge's front door, why not begin the visitor experience at the bottom of the hill in the parking lot with the worker housing as a constituent component or gateway in the resort's dramatic hillside expression? Creating a place-based harmony between landscape and worker housing is good branding, which also translates into good recruiting for seasonal labor. Never waste a building opportunity on just one function.

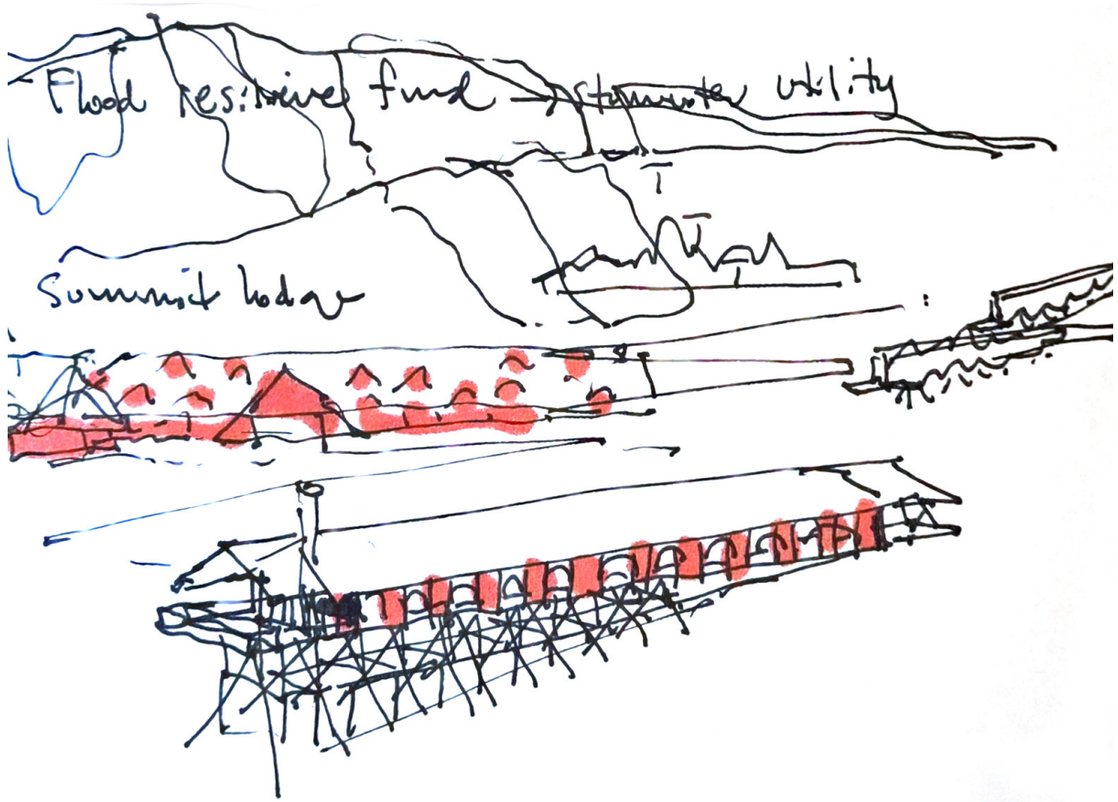
Coding Resilient Town Corridors

Pocket neighborhoods and mixed-use enclaves are likely not supported by the prevailing land development codes governing Deerfield Valley towns. Subdivision codes and single-use zoning do not support these recommended forms of development, requiring some code reform. We recommend the following steps toward facilitating the development patterns suggested herein.

1. **Enact a pocket neighborhood code to enable their development such that this living style becomes a by-right real estate product.** For an example of a model coding ordinance, please see "Pocket Neighborhood Community Development Zoning Ordinance" by Ross Chapin at https://rosschapin.com/wp-content/uploads/2017/10/PNCD-Zoning-Draft-1711.pdf#:~:text.

2. **Enact Form-Based Codes (FBC) in place of single-use zoning to support the development of mixed-use enclaves.** FBCs regulate integral urban form rather than land use zoning, the latter operating through division and separation. FBCs are ideal for promoting a high-quality public realm through physical design of building frontages and buildings' relationship to streets and parks. FBCs can be applied as spot-zoning for specific areas or sites. For more information and next steps on FBCs, please consult the Form-Based Codes Institute now the Center for Zoning Solutions at https://smartgrowthamerica.org/zoning/. Alternatively, modernize the existing zoning to focus on the form of buildings and the public realm even without FBC.

Beyond code reform, the incenting of walkable mixed-use development will likely involve resolving other permitting barriers that may hinder traditional mixed-use development. One step that some communities have taken to ensure desirable forms of development is to commission open-source housing plans with construction documents for free use by property owners (see for example, Bryan, Texas; Fayetteville, Arkansas; South Bend, Indiana; Kalamazoo, Michigan; and Lebanon, New Hampshire). Known as pattern zoning, this planning approach provides pre-approved building plans that maintain town and neighborhood character, while streamlining the construction approval process. This technique is particularly useful for walk-up multi-family housing (the "missing middle" type referenced earlier), the hardest housing product to finance and permit. Pattern zoning harkens back to the time when pattern books provided the formulas for building American towns and cities before zoning in the 1920s. Property owners save on soft costs associated with engineering, architectural, and development/entitlement fees. Towns reduce their administrative time in issuing permits, while communities enjoy a higher quality of housing and neighborhood formation at different levels of affordability.



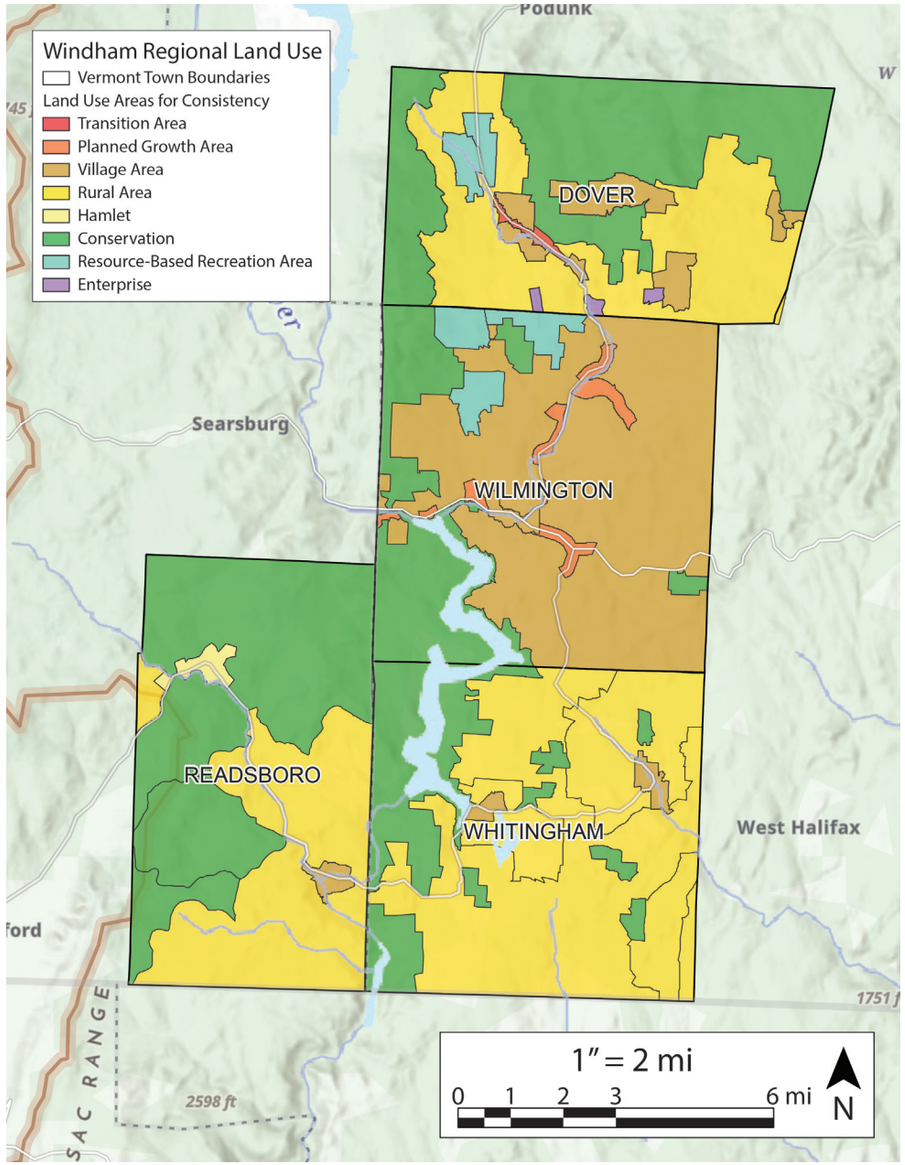
Regulatory Diagnostic

There are opportunities to amend regulatory code (zoning and other bylaws and regulations) to advance community resilience. The examples here are provided as guidance for easy wins and quick changes. A more comprehensive regulatory diagnostic could identify many more opportunities.

The guiding principles for a regulatory diagnostic could include, at a minimum:

- Reducing friction and hurtles for desired land use patterns
- Increasing friction and hurtles for undesirable land use patterns
- Understanding that uncertainty is the enemy of good planning and good development
- Advancing consistency with Town Plan and Hazard Mitigation Plans
- Ensuring compliance with Vermont Act 47
- Managing a limited retreat from hazard areas and evolving land use patterns
- Advancing workforce housing
- Regulating to reduce adverse impacts and encourage good experiences, not to provide an unnecessary focus on the specific land uses within village areas
- Providing opportunities to model regulations to share among towns

There are consistent opportunities in all four communities in the study area. These can provide quick wins with a minimum amount of work and cost, and potentially with state financial assistance.



Zoning Opportunities for Dover, Readsboro, Whitingham, & Wilmington	
Two family duplexes permitted by-right at year-round single family home dimensional standards.	Required by Home Act of 2023, Act 47. Y (2023). Bylaw Modernization Grants are available.
Multifamily housing up to four units permitted by-right.	Required by Act 47 for areas with allowed residential with sewer and water. Bylaw Modernization Grants available.
Residential density village centers with reduced or eliminated lot size per unit.	Height and setbacks can preserve community sense. Unit limits only serve to incentive larger more expensive units.
Measurable environmental performance standards (i.e., dark-sky lighting, flood hazards, stormwater, and steep slopes).	Current focus on discretionary conditional use permits limits certainty for developers and abutters.
Mitigate stormwater flow increases from development above a 2,000 to 3,000 sq. feet threshold.	Require that 10 and 100-year design storm post-development peak flows do not exceed pre-development peaks.
Expand use of Site Plan Approval with detailed standards.	Site Plan approval regulates the details of a site, not the land use.
Reduce requirement for Conditional Use permits.	List allowed uses eliminating discretion, with site plan approval on the details.
Bring signs into conformance with free speech requirements.	Sign regulations must be content neutral (except traffic control devices) per Reed v. Town of Gilbert, 576 U.S. 155 (2015).
Adopt subdivision regulations.	Create infrastructure requirements for subdividing land to protect resources and raise the Act 250 thresholds (1 to 10 acres).

In addition, there are unique opportunities in each town. These options, below, are samples of possible quick wins. A more detailed analysis and comparison to Town Plans could identify more wins.

Dover's zoning is generally strong. There are opportunities to allow and encourage more affordable and attainable housing and improve the environmental and site performance of new projects.

Dover is one of the region's economic engines. That demand, however, has driven up the price of housing and reduced the incentive for policy makers to create clear standards. Instead, regulators have relied on discretionary permits because it is less obvious that discretionary permit requirements are limiting opportunities.

Readsboro has new well-written zoning. There are, however, many opportunities to make the zoning less complicated and easier to use, as well as to match the zoning to actual practice.

Readsboro, with excess water and sewer capacity, and lower cost land and buildings than most of the communities, has an opportunity to attract development that can help it build the critical mass necessary for economic viability and to cover the cost of its water and sanitary sewer system. Zoning as written, however, adds unnecessary complexity and uncertainty that can discourage some investment opportunities.

Whitingham does not have the commercial and residential pressures of Wilmington and Dover to the north nor the disinvestment risk of Readsboro to the west. Its zoning while clear is not as clear as it could be for investors wanting to development consistent with the Town Plan.

Wilmington has a year-round economy and the most defined town center. The zoning has many strengths, but detailed standards and a clear path for encouraging development consistent with its town plan are lacking.

Additional Sample Zoning Opportunities for Dover	
Accessory apartments by right (merge with ADUs)	Encourages lower cost housing. Alternatively, duplexes by right (above) can allow elimination of accessory apartments as a separate category.
Add Multifamily Affordable to Employee Housing exemption	All multifamily affordable is needed, not only housing provided by employers.
Add site plan standards	Dover has no site plan standards.

Additional Sample Zoning Opportunities for Readsboro	
Simplify the regulations.	The zoning reads as if it was a much larger community.
Amend the approval process to allow more by-right uses.	Most uses, even those that are desired, require Conditional Use permits.
Merge the Hamlet vs. Village zoning districts	The differences between the two districts are minor. Merging would simplify.

Additional Zoning Opportunities for Whitingham	
Be consistent with the requirements that apply to two related uses: Government and Municipal Buildings.	This is a minor point, but it is an example of where the zoning is unclear. There is no apparent justification for treating these uses differently.
Reduce reliance on conditional use in village (e.g., health care C vs. office building P)	The reliance on Conditional Use permits when not necessary is the biggest disincentive to development.
More guidance for multi-family housing and/or incentives for affordable workforce housing	The town wants and needs more lower cost housing, but what it is looking for is not clear and would discourage investment.

Additional Zoning Opportunities for Wilmington	
More measurable site plan standards	The lack of site plan standards can lead to bad projects and uncertain outcomes.
Increase predictability and consistency (e.g., height limitations) and replacing some discretionary approvals	The lack of clear standards makes outcomes uncertain and drives the need for uncertain discretionary approval.
Focus on the kind and size of buildings in the Village District, not on the uses.	Requiring Conditional Use permits for changing the use of existing buildings makes redevelopment of all buildings, including historical buildings, less likely.
Remove or reduce frontage requirements in the Village District.	Infill development in the Village District off of hazard area can be encouraged, not discouraged.
Eliminate density limits for affordable housing in the Village District.	Affordable housing is desired, but the density limits make it economically impossible.
Allow affordable housing with only site plan approval and otherwise allow as-of-right.	The discretionary approval currently discourages the housing the town wants.

Local utility and enterprise funding opportunities

Public utilities, such as municipal water and sanitary sewer service, are typically funded primarily from user fees. This user-pays principle, in theory, creates an equitable cost share and encourages users to consume less.

Municipal water and sanitary sewer service is available in most of the villages. Unfortunately, small systems typically cost more per user than larger systems because there are fewer users to share fixed costs. This is especially true in Readsboro with very few users and a water system that relies on surface water instead of groundwater.

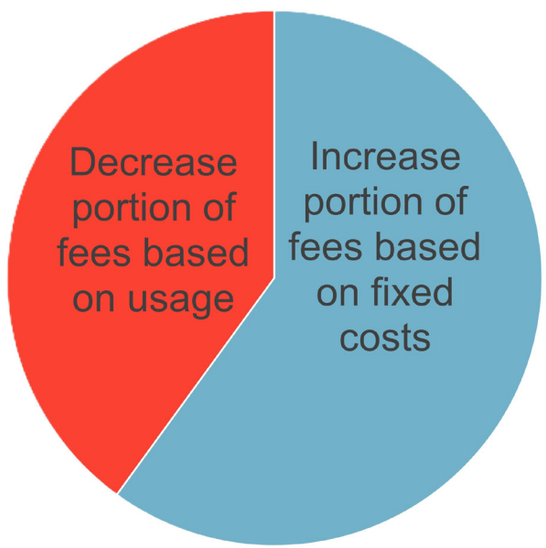
While water and sewer are supported by user fees, in none of the four towns are stormwater costs paid for by user fees. Instead, stormwater is treated as a general municipal cost paid for from the general fund, yet some users with large roofs, long driveways, and large paved or impervious surface generate more runoff than other users. Since runoff requires higher costs for culvert replacements, ditch digging and lining, and erosion of river channels, this creates inequities.

There are a few options to consider to help fund these costs more equitably.

First, the towns can increase the portion of user fees that is based on the fixed cost of service. In most user fee water and sanitary sewer systems, the costs are calculated both by the amount of service consumed (water in and sewage out) and the fixed costs of service (having large pipes and infrastructure available whether or not they are used). In areas where most people are year-round residents, having the costs based primarily on consumption is equitable since larger volume users cost the system more. In areas with a large amount of seasonal and part-time housing, however, this approach transfers the costs to year-round residents and away from the units that generate much of the infrastructure cost. Pipes must be available to reach homes at the highest elevation with adequate water pressure, yet when those homes are used rarely they are not contributing much to the cost.

Increasing the ration of user fees based on fixed costs does not increase fees per se, just the distribution of who pays. With a fairer distribution of costs, however, it may be easier to raise overall fees when necessary.

Second, the towns can add a sewer benefit and/or water benefit assessment or charge even for non-users in the community. All residents benefit from having a compact village center, so paying some of the costs for water and sewer service in the village is fair. A new Route 100 bridge benefits all Readsboro residents, but only water and sewer users are paying for moving the pipes necessary to serve the bridge. All residents in all communities benefit from cleaning up water contamination from legacy infrastructure, such as surface water leaking into sanitary sewer pipes, yet only users in the village center are paying these costs.



Communities in Vermont as diverse as Montgomery and Montpelier, for example, have adopted a sewer benefit assessment or charge reflecting the benefits to and obligations of non-users from the centralized system.

Third, the towns can create a stormwater utility/stormwater enterprise fund based on impervious surface coverage. More impervious surface coverage creates more stormwater runoff, increasing public works costs of drainage (e.g., culverts, ditches, bridges) and increasing river channel erosion and flooding. This user fee is similar to that for water and sewer. It could exempt small uses (e.g., below 2,000 or 3,000 square feet) or utilize an increasing block structure, with higher fees above that lower threshold.

The state legislature granted the authority for local stormwater fees over two decades ago (Act 109, 2002, 24 V.S.A. c. 97, 101, 105). An increasing number of communities have adopted or are considering adopting these fees (e.g., Burlington, Colchester, Montpelier, Shelburne, South Burlington, Williston). Shelburne, for example, with 7,500 people, is projecting over $125,000 in stormwater utility fees this year.

The Vermont Municipal Stormwater Implementation Program (10 V.S.A.§ 928) can potentially fund the costs of establishing a stormwater utility. Because of the administrative costs of such a system, there are benefits of a multi-town shared effort to calculate impervious areas.

Social Resilience

Civic Stress Test

Small towns across America are facing enormous challenges in the face of new climate realities, expanding housing crises, increasing uncertainty regarding federal funding, and limited local resources and capacity to address a myriad of common stressors. The cumulative impact of such challenges can pose a 'civic stress test' for towns as they stretch limited capacities and can lead to residents feeling paralyzed and overwhelmed. Much of the discourse the team heard reflects those kinds of dynamics:

"If there's no plan, I'm lost."

"You can go years without hearing from anybody."

"Local residents are realizing that their children will not be able to live here"

"Who knows?" fits a lot of conversations about how things will be funded"

"We've been using the head-in-the-sand approach"

"We are applying the head-in-the-sand approach here"

"What are simple things that we can do that can actually get done?"

These concerns are not unique – they are common across the country. The good news is that the issues that Deerfield Valley towns face are not dissimilar to other areas of the country. Even given the scale of the challenges, there are some low-cost approaches to building community that can have a massive return on investment if implemented across towns and help everyone improve community resilience over time as adaptation strategies are devised.

Social Resilience

Research from all over the world has affirmed that social capital and community connections have a key role to play in resilience. A wealth of studies have shown that communities with high levels of connectedness perform better during disaster events and recover more quickly after events. In short, they are more resilient than communities that lack social capital and connectedness shared across residents. As a result, there are a broad spectrum of intentional initiatives to improve resilience by building systems of social connection in urban and rural areas and in small towns. Many of these systems can be easy to organize through volunteers, requiring limited resources beyond the time and effort needed to identify, organize and scale connections across a community. While mainly organized to improve outcomes during disaster events and recovery efforts, these systems have co-benefits that improve a community's ability to address common stressors and ongoing challenges. The four towns in this study already have some of the components in place to make such systems successful. For instance, the Wilmington Works Newcomers Mixers and Readsboro picnics serve as archetypes of the kinds of social events these systems utilize to begin building relationships.

Block Captain Systems

Many communities are deploying Block Captain systems to address emergency operations challenges and build community capacity and social capital. The systems provide co-benefits for ongoing stresses and challenges at the local level because they build social connectedness infrastructure and neighborhood relationships at a block and at a community scale. The systems have been utilized in both urban and rural settings, customized to fit local context. For instance, in Marin County, California, Neighborhood Response Groups are organized with assistance from local government. In Santa Rosa, CA, it is called Communities Organized to Prepare for Emergencies (COPE). Cool Petaluma represents another block captain effort.

Sonoma County describes block captain systems as "a collaboration of neighbors working together to help each other become more prepared. These groups learn about… how they can assist others and be assisted through pooling of resources and skills. For example, one group, an offshoot of the West End Neighborhood Prep Team, finds its roots in the West End Neighborhood Association that was created in the 1980's to represent their community. After the 2017 fires, the County Supervisors in the fire affected areas organized Block Captains for residents who lost their homes. Each Block Captain is a leader in their neighborhood and attends regular meetings with County Staff and guest speakers and disseminates information to their neighbors. Individuals meet to share rebuilding questions, resources, and needs specific to their community. At these meetings, they learn from builders, surveyors, soils engineers, utilities and other community stakeholders. Some of these self-identify or are selected by neighbors to become block captains who can report out updates and information to their community."

Each block system is generated through social events that bring neighbors together to launch the effort and build relationships. By having assigned block captains who are both disseminating information and collecting information at a granular level, emergency operations leaders have access to an efficient communications system to push out important information and receive critical information on community needs. It also provides a system whereby neighborhood/area leaders can receive training and resources as a group, allowing for cross-town partnerships that realize economies of scale in delivering needed assistance to communities at a meaningful scale and reaching targeted vulnerable populations effectively with the resources they need.

There may be philanthropic funds that local organizations in the valley can target for resources to help organize the efforts and complete related projects, such as the following:

- Apply to T-Mobile Hometown Grant Program: https://www.t-mobile.com/brand/hometown-grants
- Apply for a Civic Hub Grant: https://trustforciviclife.org/grants/#about-our-grants

Resource Links:

- Marin County Resource Links: https://www.nrgmarin.org/nrg-materials
- Sonoma County Links: https://socoemergency.org/get-ready/neighborhood-programs/#captain
- https://fireadaptednetwork.org/block-captains-community-leaders-emerge-in-the-wake-of-the-2017-sonoma-fires/

Community Change in Deerfield Valley

The valley changing demographics have broad impacts across community awareness, connectedness and collective memory. Occupational data from the 2019 joint housing study for Dover and Wilmington documented the high percentage of seasonal residents. The study observed that 78% of units in Dover are seasonally vacant and 62% are seasonally vacant in Wilmington. These figures compare to 32% at the county level, 16% at the state level, and only 4% nationally. The study noted that short-term rentals experienced a drastic increase from 2016 to 2019, rising 506% in Dover and 471% in Wilmington. Between one-third and a half of residents in the area have no memory of Hurricane Irene's flooding, have not experienced the dramatic recent storm events and may lack an awareness and wisdom about preparedness that full-time residents have developed living through these historic events. Many seasonal and new residents bring with them significant resources and technical expertise that could make a significant difference for their communities – if they are incorporated into the life of the community to become engaged residents. They bring challenges, however, as newcomers who are not aware of rural life and its realities and will need education and outreach to support their transition to become effective local citizens.

Guides to Rural Living

In the 1990s, a Larimer County, Colorado commissioner authored a 'Code of the West' to teach newcomers about rural life following struggles with a growing population of new residents that didn't understand many aspects of life in rural jurisdictions. The code hearkened back to writer Zane Grey's original use of the term and its western values of self-reliance. The Code of the West is introduced with the following broad guidance for newcomers:

"It is important for you to know that life in the country is different from life in the city. County governments are not able to provide the same level of service that city governments provide. To that end, we are providing you with the following information to help you make an educated and informed decision to purchase rural land."

The Larimer County version of the Code of the West contains five major sections covering the following topics:

Access

- Example, Section 1.7: In extreme weather, county roads can become impassable. You may need a four-wheel drive vehicle with chains for all four wheels to travel during those episodes. Please understand that the County cannot plow everyone's road at 7:00 A.M. Also, there will be a snow ridge at your driveway which we cannot control.
- Example, Section 1.8: Natural disasters, especially floods, can destroy roads. Grand County will repair and maintain county roads, however, subdivision roads are the responsibility of the landowners who use those roads. A dry creek bed can become a raging torrent and wash out roads, bridges, and culverts. Residents served by private roads and/or bridges have been hit with large bills for repairs and/or reconstruction after floods.

Utility Services

- Example, Section 2.12: Power outages can occur in outlying areas with more frequency than in more developed areas. A loss of electric power can also interrupt your supply of water from a well. It is important to be able to survive for up to a week in severe cold with no utilities if you live in the country.
- Example, Section 2.13: Trash removal can be much more expensive in a rural area than in a city. It is illegal to create your own trash dump, even on your own land. It is good to know the cost for trash removal as you make the decision to move into the country. In some cases, your only option may be to haul your trash to the landfill yourself.

The Property

- Example, Section 3.1: Easements may require you to allow construction of roads, power lines, water lines, sewer lines, etc. across your land. There may be easements that are not of record. Check these issues carefully. The County does not have deeds for most of our County Roads and old roads may not be depicted on title searches.
- Example, Section 3.8: The surrounding properties will probably not remain as they are indefinitely. You can check with the Grand County Planning and Zoning Office to find out how the properties are zoned and to see what future developments may be in the planning stages.

Mother Nature

- Example, Section 4.4: The topography of the land can tell you where the water will go in the case of heavy precipitation. When property owners fill in ravines, they have found that the water that drained through that ravine now drains through their house.
- Example, Section 4.5: A flash flood can occur, especially during the summer months, and turn a dry gully into a river. It is wise to take this possibility into consideration when building.

Agriculture

- Example, Section 5.2: Operations can cause dust, especially during windy and dry weather.
- Example, Section 5.4: Animals can cause objectionable odors. What else can we say?

As some of the cheeky language suggests, the Code is both informative and educational while also being a tongue-in-cheek guide to local identity. Using an approach like this can serve educational purposes while also reinforcing local civic identity and place brands for visitors. This code has become so popular that over 150 jurisdictions across the West have adopted it in some form because it speaks to some common challenges with newcomers that are not informed about rural life. While the team certainly wouldn't recommend that the Valley towns adopt this code – some of it wouldn't even be relevant to Vermont – we do recommend that you use it as inspiration for the creation of a guide to rural living for seasonal residents, newcomers and visitors.

Resource Links:

- Larimer County 'Code of the West': https://www.larimer.gov/planning/documents/code-west

Recommendation: Adapt These Ideas for a Vermonting 101 Guide to Rural Living

The team recommends that a cross-town collaboration form to create a 'Vermonting 101' guide to rural living that can serve as a resource for seasonal residents, visitors, and newcomers.

Expanding the Toolbox with a Three-Part Approach

The team recommends that the block captain system and 'Vermonting 101' guidance be used in combination and expanded to include two additional components that are focused on seasonal residents. Unlike the Code of the West's central focus on individual responsibility and self-reliance, we recommend that 'Vermonting 101' encourage self-awareness, interdependence and mutual support among neighbors as well as civic engagement and service/volunteerism for one's community. In addition to promoting greater awareness and education for seasonal residents and newcomers, we recommend incorporating an intentional effort to promote community connectedness and volunteerism as components of a 3-part system:

1. **Awareness**. Accessing 'Vermonting 101' awareness and education for rural life success can improve seasonal residents' experience and address aggregate challenges the region is facing from uninformed part-time residents and newcomers.
2. **Connectedness**. Connecting to your community via the block captain system and social infrastructure in order to build relationships with neighbors and extend the system of mutual support that is essential to a vibrant community. Rather than being along in your struggles, Vermonting 101 should actively encourage neighbors to connect and support one another.
3. **Volunteerism**. Valley towns need civic contributions from everyone, and many seasonal residents have both significant family resources and a combination of education and expertise that can make a critical difference in expanding local capacity – even on a seasonal basis. Just because you are a seasonal resident doesn't mean you can't embrace full citizenship and service.

Telling your story through the Built Environment

The Wilmington Town Hall building has two historic flood markers represented on its exterior – demarcating the 1938 floodline and the 2011 flood from Irene. These simple markers provide visual cues with multiple lenses. First, they provide a tangible reference point to the dangers of flooding for visitors and newcomers that have not experienced the events and provide an important warning that can improve awareness about

vulnerability. Second, they mark important historical references that begin to tell the story of the towns' major events for both residents who have memories and lived experiences that relate to the event and for visitors to gain an understanding of the history and life of the town. These modest flood markers could be expanded through an Art in Public Places approach to improve awareness and interpret history. Through a variety of similar installations, each town could contribute to a narrative of the valley that reinforces the destination brand you are promoting while establishing a cohesive narrative of the landscape and community. These stories can be told through sculpture, murals, street designs and other creative installations that reflect a collaborative approach to narrative building across towns.

Taking it to Scale

By creating block captain system infrastructure and Vermonting 101 outreach mechanisms, the four towns can begin to position their communities for more ambitious collaborations that expand to other appropriate partner jurisdictions across the region. Some of the natural opportunities for wider collaboration surround economic development and tourism promotion, environmental management, transportation infrastructure and growth and development concerns. One example of this scale of regional collaboration comes from the Mid-Coast Maine area. That region faced challenges with seasonal populations and a tourism economy and the fact that it is made up of a series of small towns that had fragmented and disjointed planning, lacked collaboration, wasted funds through inefficient approaches to common challenges and had results with unintended consequences like increased congestion and loss of scenery. When the state's transportation agency responded to these issues with a proposal to widen the US Route 1 corridor that connects all of the towns, they came together to build an alternative that could serve the region more effectively. Through the Gateway 1 Corridor Action Plan, 21 separate towns all agreed to a plan to preserve the economy while protecting the environment and local quality of life. Every town adopted the regional plan as town policy by adopting it into their comprehensive plan. The initiative won a national Smart Growth Award from the EPA and became the basis for a more coherent approach to their shared infrastructure and growth.

Addressing Long-term Vulnerability through Cross-town Collaboration

"Do unto those downstream as you would have those upstream do unto you." - Wendell Berry

The four towns of this study – Wilmington, Whitingham, Dover and Readsboro – share interdependence due to adjacency, topography and watershed, economy, infrastructure and a host of social connections. Some of these dynamics are dramatically clear. What happens in Whitingham matters to Readsboro. For instance, if dams upstream in Whitingham (or Somerset or Searsburg) fail, Readsboro Village faces a dire emergency. However, it has been less clear to some that what happens in Readsboro has similar impacts upstream – not regarding flooding risk, but other factors such as economic performance and housing are influenced by interdependent dynamics across the region. As a result, neighboring towns should take an interest in Readsboro's contemporary challenges, because there is risk to everyone if the town fails or declines. There is an opportunity for Readsboro to play a complementary and supportive role to the regional tourism economy because it has both developable land for new housing and a current supply of comparatively affordable housing. However, the town also has notable populations of vulnerable citizens who will need support and limited collective capacity to meet existing community needs right now. This carries risk beyond the town borders, with potential disruption to the entire area if the town suffers a sudden decline beyond the tipping point of viability. It is a wakeup call for the entire valley. The need for greater cross-town collaboration serves a healthy Dover or Whitingham or Wilmington as much as Readsboro. Every jurisdiction across the region should be taking a renewed interest in cross-town partnerships because external factors impacting the state appear likely to continue having adverse effects over time. The combined impacts of declining population numbers, an aging population and increasing probabilities for major climate events demand greater cross-town collaboration at an unprecedented scale. By 2030, one in three Vermonters will be over 60, representing an increasingly vulnerable population. As residents age in place, it will require more cooperation and stronger community relationships to provide the supportive social infrastructure to continue to thrive. The aging population also means that Vermont is experiencing more annual deaths than births, putting downward pressure on population growth. The state has lagged national trends in growth and may face future challenges with population decline that reach tipping points where scarce public dollars are spread too thinly to make a difference. The current federal retreat from FEMA funding is already creating incredible state and local pressures. The best way to mitigate these challenges is through greater cross-town partnerships, linking jurisdictions across the valley and wider region in common effort around shared issues.

Funding & Next Steps

There are a variety of national, state, and regional funding opportunities that can help the four towns implement flood adaptation and mitigation strategies. As the role of the Federal Emergency Management Agency (FEMA) evolves, the importance of taking a regional approach for planning for disaster preparedness and mitigation has become more evident (Campany, 2025). Vermont specifically faces significant challenges from climate-driven extreme weather, with ongoing efforts to improve its infrastructure and community preparedness, often relying on a combination of state and federal support.

The largest source of funding for flood related mitigation and adaptation has traditionally been FEMA. A range of federal and state programs exist to support communities before, during, and after disasters, but navigating these opportunities can be complex.

- **FEMA Public Assistance (PA):** VEM administers FEMA's PA program, which reimburses municipalities for at least 75% of eligible costs for debris removal, emergency protective measures, and repair/replacement of damaged public facilities.
- **Hazard Mitigation Funding:** Section 406 (PA): Provides funding for mitigation measures "completed in conjunction with the repair of disaster-damaged facilities."
- **Section 404 (Hazard Mitigation Grant Program - HMGP):** A FEMA-funded grant program managed by the State, where Vermont receives 20% of the total federal share of declared disaster damage for future prevention. The "entire state - not just presidentially declared counties - are eligible." A FEMA-approved Local Hazard Mitigation Plan is required for eligibility.
- **FEMA Act of 2025 Reforms:** Expands eligibility for mitigation projects to include "utility resilience, broadband infrastructure and cybersecurity." It also offers "Building Code Incentives" for communities adopting modern codes and expands FEMA's Hazard Mitigation Revolving Loan Fund.

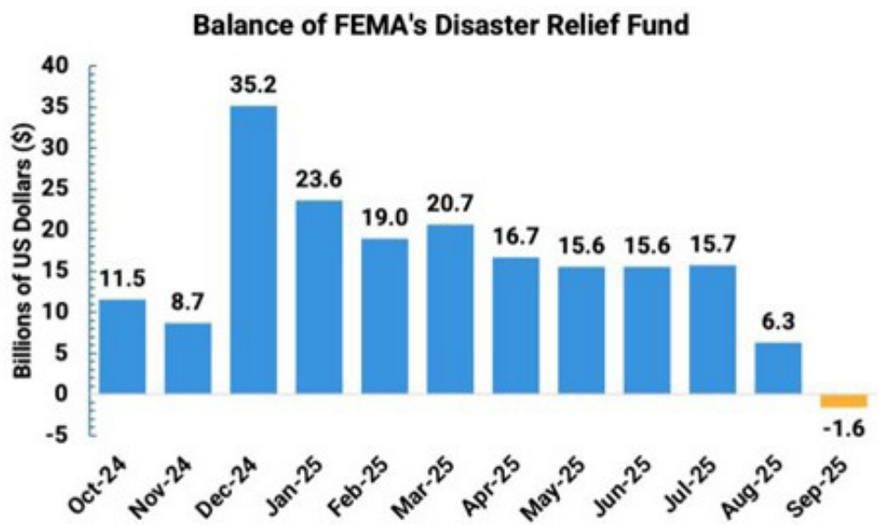
In addition to the FEMA programs listed above, other Federal and State Funding Opportunities include:

- **USDA Natural Resources Conservation Service (NRCS):** Offers technical and financial assistance for emergency watershed protection, including debris removal, streambank protection, and purchasing EWP Buyouts.
- **Vermont Housing and Conservation Board (VHCB):** Supports projects improving water quality, including river corridor and floodplain restoration and protection.
- **Vermont Agency of Transportation (VTrans):** Provides funding for highway and stormwater mitigation programs, including bridge and culvert work.
- **Vermont Department of Housing and Community Development (DHCD):** Offers grants for disaster relief, long-term recovery, and infrastructure/housing restoration in impacted areas, prioritizing low- and moderate-income households.
- **Vermont Bond Bank:** Provides low-interest financing for water infrastructure systems and grants for small public drinking water system resilience.

A SolaVida.org study on "The Cost of Climate Change in Vermont" found that while over 110 state-based climate mitigation and resilience programs exist, funding is disproportionately allocated. "The majority of the state's programs address climate challenges pertaining to energy and transportation. Issues that have been more moderately addressed are in the arenas of food systems and land use. Water management and public health are the least addressed areas of work." Economic vitality for vulnerable industries is "largely overlooked" (Gehrung & Quinlan, 2020).

FEMA's role in disaster management is undergoing significant reform, driven by lessons learned from past catastrophic events like Hurricane Katrina. The proposed "FEMA Act of 2025" (H.R. 4669) aims to modernize disaster assistance programs and enhance aid delivery, recognizing the agency's need for greater effectiveness and transparency. However, FEMA funding is precipitously declining (as seen in Figure X). Recent reporting also suggests that FEMA funding for disasters is expected to remain low or non-existent as the federal government shutdown continues (Campany, 2025; Dance, 2025; Gelles, 2025). Declining FEMA funding will negatively impact the four towns as it directly impacts Vermont's Emergency Relief and Assistance Fund (ERAF). ERAF provides state aid for flood damage costs. The level of state aid (7.5%, 12.5%, or 17.5% of the required local match) depends on the municipal disaster preparedness actions, such as having an approved Local Hazard Mitigation Plan and river corridor protection ordinances. Among the four towns, only Readsboro currently qualifies to receive the highest match award of 17.5%. However, if FEMA ceases to provide money for disaster relief or flood mitigation and planning efforts, ERAF funding will no longer be available to communities without changes at the State level.

Given the changes to FEMA and the uncertainty surrounding funding, other sources of funding to support mitigation and adaptation will become central to the success of planning efforts for these four communities. Given their shared location along the Route 100 corridor, transportation related grants are potentially important in addressing the gap in funding. The Vermont Department of Transportation offers several funding opportunities and plays a crucial role in enabling flood adaptation projects, particularly those related to transportation infrastructure and broader community resilience.



(FEMA Disaster Relief Fund, 2025)

1. VTrans Grant for Federal-Aid Highways and Roads on Federal Lands (FHWA Emergency Relief Program):

- ***Purpose***: Supports the **repair or reconstruction** of Federal-aid highways and roads on Federal lands that have suffered serious damage due to natural disasters or catastrophic failures.
- ***Eligibility***: Sites generally need a minimum of $5,000 in repair costs. VTrans staff assist in identifying what constitutes a "site".
- ***Match:*** Emergency repair work (within the first 270 days) requires a **0% match**. Permanent repair work (after 270 days) requires a **10% match**. The Emergency Relief and Assistance Fund (ERAF) ratings do not apply to this program.
- ***Notes:*** FHWA reimbursements are typically based on pre-disaster conditions. However, "betterments" (mitigation actions, or added protective features/changes to the facility's function or character from its pre-disaster state) are eligible if justified through a cost-benefit analysis and approved by FHWA. Municipalities **must work through their VTrans District** to access this funding.

2. VTrans State Aid for Non-Federal Disasters:

- ***Purpose:*** Funds the **repair, building, or reconstruction** of Class 1, 2, or 3 town highways and for the **repair or replacement of drainage structures**, including bridges on Class 1, 2, 3, and 4 town highways damaged by natural or man-made disasters. Drainage structures on Class 4 roads are eligible if the town documents prior maintenance.
- ***Eligibility:*** The disaster cannot qualify for assistance from FEMA Public Assistance or FHWA Emergency Relief programs. Damages must be greater than 10% of the town's overall highway budget (excluding winter maintenance). The Secretary of Transportation must determine that State aid is reasonable and necessary due to the disaster's magnitude.
- ***Match:*** **10% of eligible costs**.
- ***Funding Amount:*** The greater of either 90% of repair/replacement costs or eligible repair/replacement costs minus an amount equal to 10% of the overall total highway budget (minus the winter maintenance budget).
- ***Apply Via:*** Contact the VTrans District Office.

3. VTrans Transportation Alternatives Program:

- ***Purpose:*** Funds scoping (feasibility) studies, design, and construction for projects such as on- and off-road pedestrian and bicycle facilities, conversion of abandoned railroad corridors to trails, and **environmental mitigation activities related to stormwater and highways**, including eligible salt and sand shed projects.
- ***Funding Amount:*** Up to $600,000; up to $500,000 for salt sheds.
- ***Match:*** **20% of total project cost**.
- ***Notes:*** Approximately 50% of program funds are reserved for pollution mitigation projects relating to stormwater and highways.

4. VTrans Municipal Highway and Stormwater Mitigation Program:

- ***Purpose:*** Supports **any environmental mitigation activity** with a transportation link, including pollution prevention and abatement activities, and mitigation to address **stormwater management, control, and water pollution prevention or abatement related to highway construction or highway runoff**. Sample projects include planning studies, salt/sand sheds, **bank and streambank stabilization, culvert replacement/re-sizing**, detention ponds, check dams, swirl separators, permeable pavers, infiltration basins, gravel wetlands, subsurface detention systems, biofilters, and bio retention systems.
- ***Funding Amount:*** No minimum or maximum specified; past awards ranged from $60,000 to over $1,000,000.
- ***Match:*** **20% of total project cost**. Force Account labor is generally not allowed as project match.

5. VTrans Better Connections Program:

- ***Purpose:*** Funds **master planning efforts** (physical plans) focused on improved multimodal connectivity, active transportation, access management, traffic calming, parking, wayfinding, rehabilitation of buildings, redevelopment of sites, housing, land use planning, and **stormwater management**.
- ***Clean Water Funding Option:*** Applicants can compete for an **additional $90,000 in Clean Water funding** (max $30,000 per community) provided by the Department of Environmental Conservation (DEC) to engage in Clean Water planning within their proposed Better Connections project area.
- ***Match:*** **10% of total project cost.**
- ***Eligibility:*** Serves municipalities located outside of Chittenden County.

6. Vermont Economic Development Authority (VEDA) State Infrastructure Bank Program (Loan):

- ***Purpose:*** Provides loans for the **construction or reconstruction of highways, roads, bridges**, and pedestrian facilities, among other transportation-related infrastructure.
- ***Match:*** Requires a **10% to 20% equity contribution**.
- ***Funding Amount:*** Based on the borrower's ability to carry debt.

VTrans's Broader Role in Flood Adaptation and Project Eligibility:

- **Hazard Mitigation Plans (HMPs):** VTrans is involved in developing and updating the **Vermont State Hazard Mitigation Plan**, which assesses climate change risks to state infrastructure and designates specific projects to address these risks. Adopting VTrans's most recent standards for resilient roads and bridges is one of the mitigation measures that can increase a municipality's state match from the **Emergency Relief and Assistance Fund (ERAF)** after a federally declared disaster, potentially covering **up to 12.5% or 17.5%** of public costs, reducing the municipal share.
- **Research, Planning, and Maintenance:** VTrans directs funds toward **climate adaptation research** in transportation and related infrastructure and organizes staff training on **extreme weather risks**, including design, construction, and oversight of infrastructure. They also use tools like the **Flood Modeling Program** and the **Vermont Transportation Resilience Planning Tool (TRPT)** to assess infrastructure vulnerability and integrate this information into planning and spending prioritization.
- **Coordination and Standards:** VTrans district offices assist towns with transportation infrastructure. Coordination with VTrans is required for projects proposing work in the State highway right-of-way under the Municipal Planning Grant program. VTrans also conducts a statewide inventory of **60,000 culverts** on state roads to prioritize upgrades, working with the Agency of Natural Resources (ANR) to incorporate fluvial erosion hazards and design for fish passage. They update project prioritization to include flood risk.

- **Federal Highway Administration (FHWA) Bridge Investment Program:** While a federal program, VTrans consultation is encouraged prior to applying for grants that support projects to improve bridge and culvert condition, safety, efficiency, and reliability, including culvert replacement or rehabilitation.

These various grants and loan programs, along with VTrans's role in planning, research, and standard-setting, provide multiple avenues for funding flood adaptation projects that impact transportation infrastructure in Vermont.

Next Steps

Interviews with stakeholders and community engagement reveal difficulties in intermunicipal collaboration. While mutual aid for emergency responses has typically been a coordinated effort, there is a recognized need to "identify regional priorities to support coordination." FEMA and its state and local partners are grappling with the increasing frequency and intensity of natural disasters driven by climate change. While federal reforms aim to improve efficiency and transparency, the effectiveness of these changes will depend on their implementation and ongoing coordination. For Vermont, proactive local planning, robust documentation, and strategic leveraging of diverse funding sources are essential for building resilience and mitigating future risks, especially given the identified gaps in addressing certain climate challenges and vulnerable populations. Continued focus on updated flood mapping, integrated mitigation strategies, and strengthened intergovernmental collaboration will be critical for the state's long-term flood resilience. Towns are planning for flood resilience through a multi-faceted approach that involves various planning documents, regulatory measures, infrastructure improvements, and participation in state and federal programs.

The Master of Regional Planning graduate studio at the UMass Department of Landscape Architecture and Regional Planning, alongside the Windham Regional Commission (WRC), is partnering with these four towns to engage in a scenario planning effort that recognizes the uncertainties and challenges described in this report and prepares tools for each town and a prioritization action plan for the region. These deliverables will enable the four towns to continue updating their Local Hazard Mitigation Plans (LHMPs), Local Emergency Plans (LEMPs), Comprehensive Plans, and Zoning ordinances to reflect new state guidelines for river corridor protection, updated FEMA flood maps, and fluvial erosion hazard zones. In addition, the studio will provide recommendations for storm water management, capital improvement planning that prioritizes culvert placement and armoring of buildings, a coordinated approach to property buy outs to promote floodplain restoration, and community engagement that emphasizes education. These deliverables will be paired with a searchable grant database to ensure that towns can access available funding and technical assistance to implement their flood resilience strategies.

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Team Roster

Wayne Feiden, FAICP

Wayne Feiden is Director of the Center for Resilient Metro-Regions and Lecturer of Practice at the University of Massachusetts Amherst, where he focuses on assisting communities in placemaking, resilience, downtown revitalization, housing, economic development, transportation, open space preservation, regulatory streamlining, and community engagement.

Previously he was Director of Planning and Sustainability for Northampton. He led that city to earn a LEED for Cities GOLD rating and the nation's first Five-STAR Communities rating for sustainability. Wayne's publications include five American Planning Association PAS reports: Strategic Planning, Planning Management, Assessing Sustainability, Planning for On-Site and Decentralized Wastewater Treatment, and Performance Guarantees, as well as other peer-reviewed and research papers. Wayne's Eisenhower Fellowship to Hungary, Fulbright specialists to South Africa and to New Zealand, German Marshall Fund Fellowship to Europe (2015), State Department Fellowship Exchanges to Indonesia and Malaysia, and Bellagio Residency in Italy all focused on planning and resilience. Wayne has a BS in Natural Resources from the University of Michigan and a Master of City and Regional Planning from the University of North Carolina.

Camille Barchers, AICP

Camille Barchers has practiced as a regional planner throughout Florida, the Southeast and mid-Atlantic. Prior to joining LARP, Camille taught in the Leadership Education and Development program at the Georgia Institute of Technology. Camille's work examines how planners use technology and how it changes the way we engage with the public. Her research interests include community engagement via information & communication technology, big data applications for equitable long-range planning, and the interaction between land use & transportation planning.

At UMass, Camille serves as a member of the School of Earth and Sustainability Steering Committee, is part of the faculty team at the Northeast Center for Coastal Resilience, and was an ADVANCE Faculty Fellow for the 2022-2023 academic year.

Tamsin Flanders

Tamsin Flanders is a Senior Land Use & Natural Resources Planner at the Franklin Regional Council of Governments (FRCOG) in Greenfield, where she specializes in community climate resilience, hazard mitigation, open space, outdoor recreation, and watershed-based planning, including climate-resilient stormwater and river management. Tamsin holds a Master of Science in Ecological Landscape Design and Planning from the Conway School of Landscape Design and a Master of Regional Planning from UMass Amherst, where her thesis examined the enforcement of flood hazard zoning in Vermont towns.

Eric Halvorsen, AICP

Eric Halvorsen AICP, is a principal at RKG Associates and has a wide range of planning and economics experience, including working on projects at the municipal and regional level repositioning sites both large and small. Eric has experience working complex, multi-disciplinary projects that bring together economic development, land use zoning, and transportation to create successful, active, and vibrant communities. He has worked on commercial and residential market analyses and has developed a specialty for market-rate and affordable housing strategies up and down the east coast. Eric holds a Bachelors of Science in Environmental Planning and Design from Rutgers University and a Master of Urban and Regional Planning from University of Illinois.

Stephen Luoni, Assoc. AIA

Stephen Luoni is Director of the University of Arkansas Community Design Center (UACDC) where he is the Steven L. Anderson Chair in Architecture and Urban Studies and a Distinguished Professor of Architecture. UACDC is an outreach center of the Fay Jones School of Architecture and Design is one of a few university-based teaching offices in the United States dedicated to delivering urban design work. His work at UACDC specializes in interdisciplinary public-interest design combining ecological, urban, and architectural design. UACDC has developed nine place-making platforms to shape civic design and public policy, including work in housing-neighborhood complexes, agricultural urbanism, transit-oriented development, arboreal urbanism, context-sensitive street design, watershed urbanism, low impact development, sprawl repair, and cultural mapping.

While the center's projects are primarily located in Arkansas, UACDC has conducted planning and urban design projects for clients in Hawaii, Texas, South Dakota, Rwanda, and Cairo. Under Luoni's direction since 2003, UACDC's work has won more than 200 awards for urban design, research, and education, including Progressive Architecture Awards, American Institute of Architects Honors Awards for Regional and Urban Design, Charter Awards from the Congress for the New Urbanism, American Society of Landscape Architecture Awards, Environmental Design Research Association Awards, American Architecture Awards, The PLAN Awards, and the international LafargeHolcim Awards.

Luoni authored the center's books: Houses for Aging Socially, Conway Urban Watershed Framework Plan, and Low Impact Development: a design manual for urban areas—which has been translated into Chinese. His work has been published in Architectural Record, Landscape Architecture, Progressive Architecture, Architect, Places, and in international journals. Luoni was appointed a 2012 United States Artists Ford Fellow. In 2015 he hosted the Mayors' Institute on City Design regional session and periodically serves as an MICD resource team member. Luoni has a BS in Architecture from Ohio State University and a Master of Architecture from Yale University.

AF Staff

Joel Mills

Joel Mills is Senior Director of the Architect Foundation's Communities by Design program. The program has catalyzed billions of dollars in sustainable development across the United States, helping to create some of the most vibrant places in America today. Joel's 29-year career has been focused on strengthening civic capacity, public processes, and civic institutions. This work has helped millions of people participate in democratic processes, visioning efforts, and community planning initiatives. He has delivered presentations, training content, workshops, and public processes in over a dozen countries across 5 continents. In the United States, Joel has provided consultative services to hundreds of communities, leading participatory processes on the ground in over 100 communities across 38 states. His work has been featured in over 1,000 media stories. Joel has served on dozens of expert working groups, boards, juries, and panels focused on civic discourse and participation, sustainability, and democracy. He was a founding Board Member of the International Association for Public Participation's United States Chapter. He has spoken at numerous international events and conferences concerning democratic urbanism and the role of democracy in community success, including serving as the Co-Convener of the Remaking Cities Congress in 2013. Joel is an Academician of the Academy of Urbanism in London, UK. He is the author of numerous articles on the relationship between democracy, civic capacity, and community.

Erin Simmons

Erin Simmons is Senior Director of Design Assistance for Communities by Design, a program of the Architects Foundation. For more than 17 years, Erin has provided technical assistance to hundreds of communities around the world, leading democratic planning processes and training workshops focused on empowering citizens to create equitable, sustainable, and resilient communities. Her work has been featured in hundreds of news articles and publications, and she has spoken extensively as a subject matter expert on the topics of participatory planning, sustainability, and community revitalization.

Prior to her work with Communities by Design, Erin worked as historic preservationist and architectural historian for an environmental and engineering firm, where she practiced preservation planning, created historic district design guidelines, and conducted historic resource surveys. She holds a Bachelor of Arts degree in History from Florida State University and a Master's degree in Historic Preservation from the University of Georgia. Erin is an Academician of the Academy of Urbanism in London, UK.

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