NORTHWEST REGIONAL PLAN

2023 - 2031

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Photo: David Juaire

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INTRODUCTION

Introduction

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Northwest Regional Planning Commission

The Northwest Regional Planning Commission (NRPC) was created and is governed by the municipalities of Franklin and Grand Isle Counties in northwestern Vermont. The commission was first formed in 1966 by the acts of Franklin County municipalities; Grand Isle County municipalities joined in 1973. Until 1995, NRPC was known as the Franklin-Grand Isle Regional Planning and Development Commission.

Since its inception, NRPC has been governed by appointed representatives from each of its member municipalities. The commission exists to serve the needs of its member communities and to advocate for responsible, sustainable development within the region. NRPC helps to identify and implement goals and opportunities shared by municipalities and related organizations within the region and the state.

Because of the depth and complexity of issues facing municipalities and the region, the work of NRPC continues to be crucial. Local action is needed to implement state goals in areas such as climate resiliency and water quality. NRPC provides services to support local capacity, education and training, and project implementation. Additionally, regional collaboration can be an effective and efficient way to address broad challenges.

Northwest Region Municipalities

Franklin County
Bakersfield
Berkshire
Enosburg Falls
Enosburgh
Fairfax
Fairfield
Fletcher
Franklin
Georgia
Highgate
Montgomery
Richford
St. Albans City
St. Albans Town
Sheldon
Swanton Town
Swanton Village

Grand Isle County
Alburgh Town
Alburgh Village
Grand Isle
Isle La Motte
North Hero
South Hero

In 2019 NRPC formed a supporting non-profit corporation, the Northwest Vermont Regional Foundation Inc. The purpose of the corporation is to support NRPC's efforts to promote the health, safety and welfare of the inhabitants of Franklin and Grand Isle Counties in Vermont by implementing its regional plan in support of a superior quality of life, a vibrant economy, a clean environment, excellent public health, and sustainable growth and development. The corporation is governed by a Board made up of NRPC Executive Committee members and up to three at-large members. It is used to take advantage of funding and partnership opportunities that would not be available to NRPC as a governmental organization.

The authority granted to NRPC to provide these services is enabled under state law and further defined by its Board of Commissioners. NRPC is permitted to receive and expend monies from any source, including funds made available by participating municipalities and by the state through annual appropriations and/or contract agreements. NRPC has no taxing or regulatory authority.

NRPC is legally mandated to prepare a regional plan pursuant to Title 24, Chapter 117, of the Vermont Statutes Annotated, commonly referred to as the Vermont Municipal and Regional Planning and Development Act. This regional plan consists of the Introduction, Economic Region, Social Region, Physical Region and Appendix I and II.

The Region

The "region" may be defined for planning purposes as "communities of shared interests, resources and landmarks working toward common goals."

~NRPC Board of Commissioners

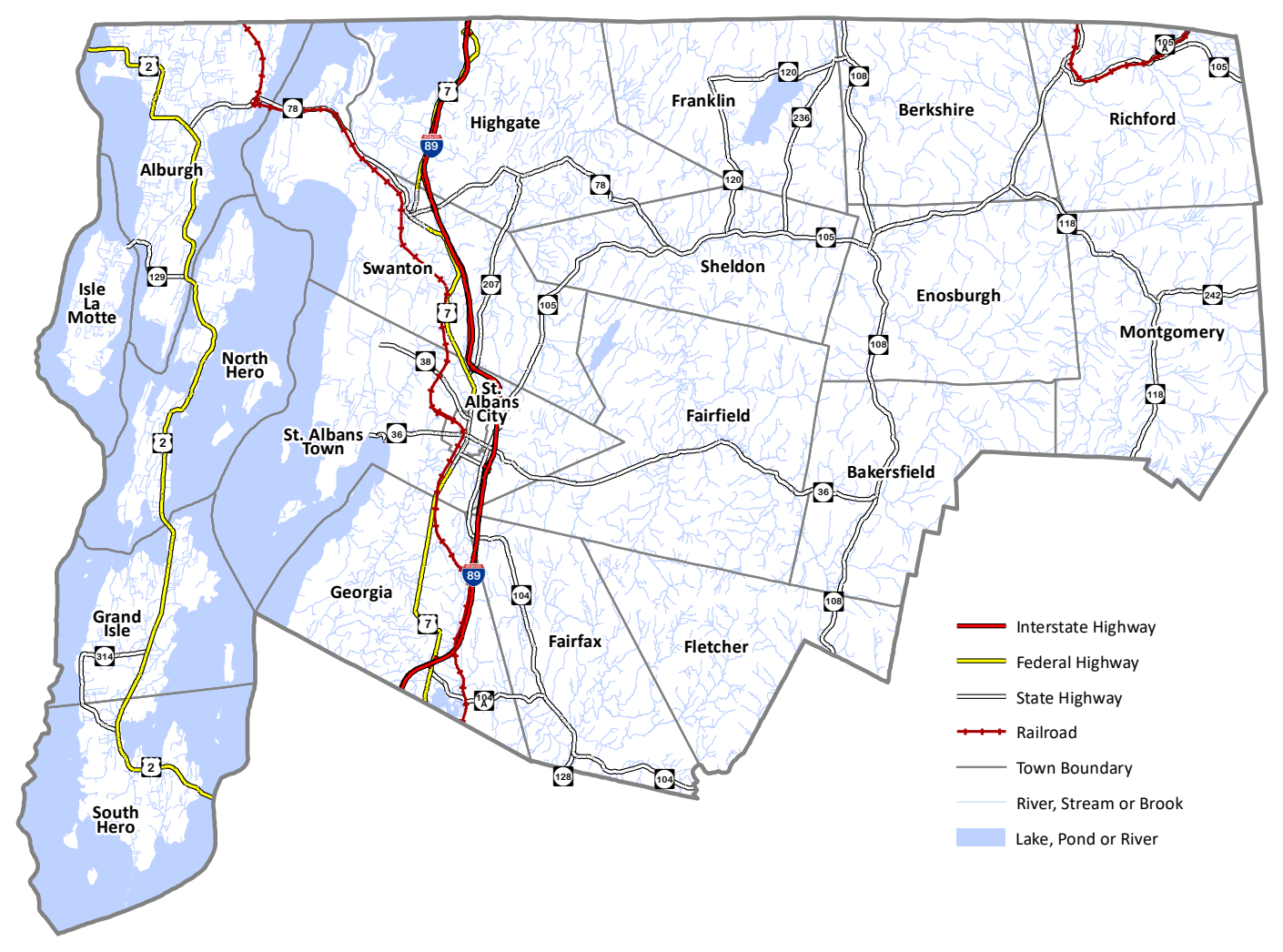
Plan Purpose and Vision

Northwestern Vermont's greatest assets are its healthy, clean environment; its mix of farms, forests, villages, and urban centers; and its strong employment base. Combined, these assets make the region a great place in which to live, work, and raise a family. NRPC's objective is to build upon these assets by implementing the goals and policies in this plan.

The region's citizens have a strong tradition of local planning and community development. Communities consider the needs of adjoining neighborhoods and the region as a whole, and they work together to ensure long-term economic, social, and environmental factors are balanced in the planning and decision-making process. This balance will ensure the region's continued growth and well-being by promoting a healthy and sustainable quality of life.

Grounded in Vermont law and good common sense, the purposes of the Northwest Regional Plan are multifold. It is intended for use as a guide for decision makers, as a vision for the region, and as an eight-year action plan to address issues of regional importance.

MAP 1: Northwest Region Base Map



SOURCE: *Vermont Open Geodata Portal*

This plan replaces the last comprehensive regional plan, which was adopted in 2015 and amended in 2017 to include an enhanced energy plan. NRPC's first regional plan was adopted for Franklin County in 1969, amended to include Grand Isle County in 1973, and subsequently amended and readopted in 2007.

The Northwest Regional Plan addresses the economic, social, and environmental factors that influence and sustain growth and development in the region. This plan has been prepared under the direction of NRPC's Board of Commissioners and the Regional Plan and Policy Committee. Key additions in this plan update include a focus on equity, evaluating the short- and long-term effects of the COVID-19 pandemic, and planning ahead for the impacts of climate change.

REGIONAL PROFILE

The future is founded on the past; in order to plan for our region's future over the next 10 to 20 years, we need to consider where we've been and take stock of where we are. The following section provides a listing of key demographic information and a brief description of the Northwest region, including its broader regional context.

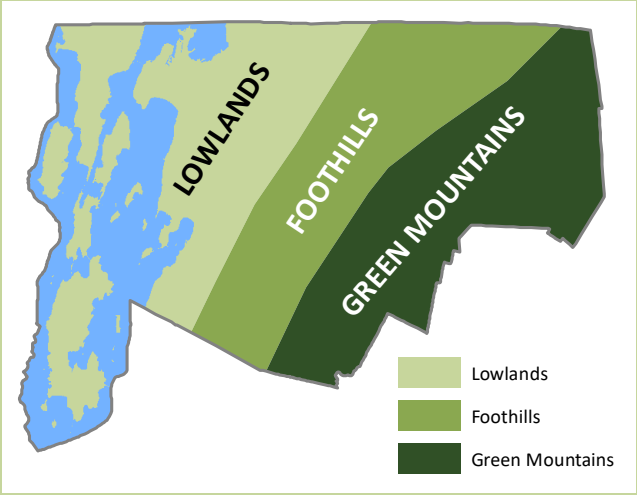
Northwest Region Municipal and Population Numbers

Largest Municipality: Fairfield, 67.8 square miles
Smallest Municipality: St. Albans City, 2 square miles
Largest Population: St. Albans Town, 6,988
Smallest Population: Isle La Motte, 488

The Northwest region of Vermont is defined by the 23 municipalities (19 towns, three incorporated villages, and St. Albans City) that make up Franklin and Grand Isle Counties, which are located in northwestern Vermont. The region is bordered by the province of Quebec to the north, New York State to the west, Chittenden and Lamoille Counties to the south and east, and Orleans County to the east. The city of Burlington, which is located 24 miles south of St. Albans, is the nearest metropolitan area. Plattsburgh, New York, is easily reached by ferry from Grand Isle or by crossing the bridge at Rouses Point, and the port of Montreal is less than a two-hour drive (70 miles) to the north of St. Albans.

Geographically, the region spans the 45th parallel and is located wholly within the Lake Champlain drainage basin—extending from the height of the northern Green Mountains westward to the shores of Lake Champlain. It includes roughly 7.8% of the state's total land area (720 square miles); however, its total area, which includes much of northern Lake Champlain, is significantly larger (887 square miles).

MAP 2: Physiographic Regions



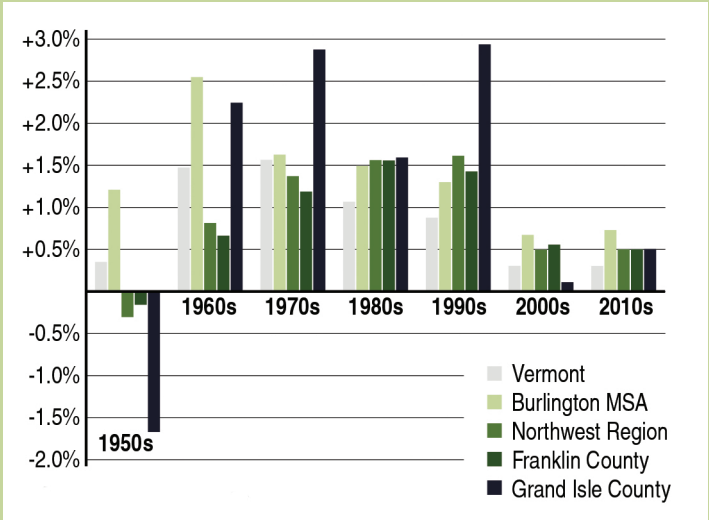
SOURCE: *NRPC Collected Data*

Past geologic events have shaped the region's topography, soils, and drainage patterns. This, in turn, has influenced patterns of regional development. The region is divided into three distinct physiographic regions (Map 2): the Champlain Lowlands, the Foothills, and the Green Mountains. The Champlain Lowlands, which include both the Champlain Valley and the Champlain Islands, have been heavily shaped by the flow of water and movement of glaciers over thousands of years. The result is an area that now supports some of the state's largest and most productive farms. The local topography of the Champlain Valley is also well suited to development—unlike the Champlain Islands, a large percentage of which is covered by prime agricultural soils, wetlands, and soils with limited suitability for septic systems.

People and Community

Franklin and Grand Isle Counties are demographically and socio-economically similar to other rural Vermont counties, but are experiencing a growth "spillover effect" due to their proximity and ease of access to Chittenden County. For example, the total population of Vermont grew by 2.8% between 2010 and 2020, while the total population of Chittenden County grew by 7.5%—and the two-county region's population grew by 4.6%, an annual growth rate of less than 0.5%. This rate of growth is in contrast to the high population growth of the late twentieth century, when the region's population grew three times faster, and Grand Isle County grew by almost 3% per year. There were 57,239 residents living in the two-county region in 2020. That was 2,523 more people than were counted in 2010.

FIGURE 1: Average Annual Population Growth Rate

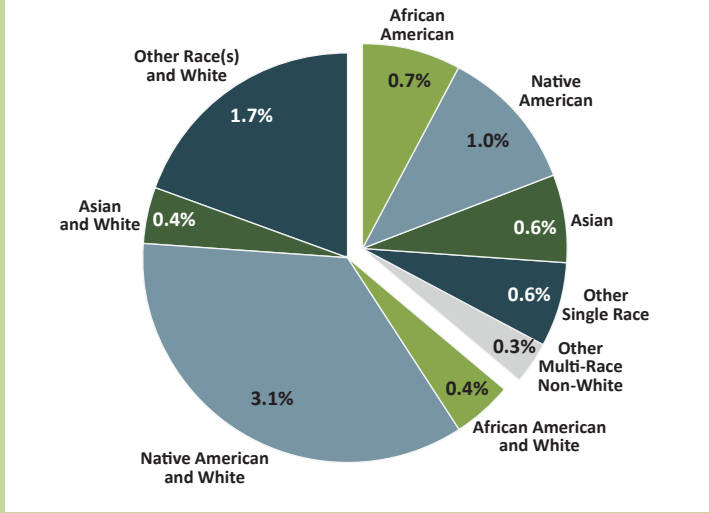


SOURCE: *Decennial Census, U.S. Census Bureau*

Population change across the two-county region during the past 20 years has been uneven. Overall, the region has been experiencing slow to no growth —averaging 0.5% annually between 2000 and 2020. St. Albans Town and Fairfax were the fastest growing communities, accounting for 64% of the region's 20-year population increase. Together, those two communities averaged 1.5% growth annually between 2000 and 2020.

Meanwhile, the population of St. Albans City declined by 10% between 2000 and 2020, although the timing and methods of the census may have resulted in an under-counting of residents. Isle La Motte and South Hero also experienced a small decline in the number of residents. Twelve of the 20 municipalities in the region saw their population increase by fewer than 200 people during the past 20 years.

FIGURE 2: Percent of Regional Residents Non-White - 2020



SOURCE: *2020 Census, U.S. Census Bureau*

Overall, the population of the two-county region is aging. The baby boomer generation continues to represent the largest share of region residents. The region, like the state as a whole, has fewer children and more people of retirement age than it did 20 years ago. The median age was estimated to be 40.5 years in Franklin County and 48.7 years in Grand Isle County in 2020. All municipalities in the region saw the median age of residents increase between 2000 and 2020. (American Community Survey)

While the population of the two-county region remains overwhelmingly white, there is some evidence that racial and ethnic diversification is occurring. The percentage of residents reporting as nonwhite (alone) in the region increased from 4.4% in 2000 to 8.7% in 2020. The 3,117 person increase in the nonwhite (alone) population represented 63% of the region's population growth between

2000 and 2020. The region's Hispanic or Latino population has tripled. The largest group of multi-racial residents identified as Native American and white. In 2020, there were 2,436 residents who identified as Native American either solely or in combination with another race, accounting for 73% of the nonwhite (alone) population. Larger concentrations of Native American residents are found in Swanton, St. Albans City, Highgate, and St. Albans town. There were 941 residents who identified as white and "some other race" on the 2020 census. St. Albans City is the most diverse municipality in the region, with residents who identify their race or ethnicity as something other than white (alone) accounting for more than 13% of the population in 2020. All statistics are from the 2020 U.S. Census.

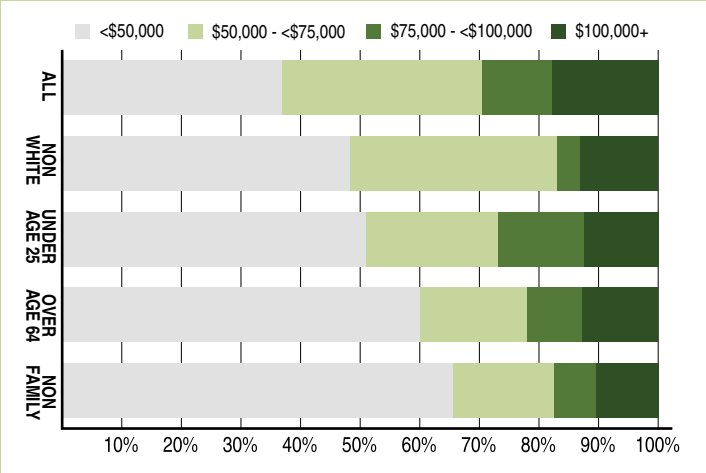
The Census Bureau estimates that nearly 13% of region residents have a disability (±7,000 residents), which is defined as a serious difficulty with hearing, vision, cognition, and mobility. That percentage is significantly higher for older residents. Data suggests that around half of residents age 75 or older have a disability.

TABLE 1: Population Change 2000 - 2020

	POPULATION			% CHANGE	
	2000	2010	2020	2000 - 2010	2010 - 2020
FRANKLIN COUNTY	**45,417**	**47,746**	**49,946**	**5.1%**	**4.6%**
Bakersfield	1,215	1,322	1,273	8.8%	-3.7%
Berkshire	1,388	1,692	1,4547	21.9%	-8.6%
Enosburg Falls	[1,473]	[1,329]	[1,356]	-9.8%	2.0%
Enosburgh	2,788	2,781	2,810	-0.3%	1%
Fairfax	3,527	4,285	5,014	21.5%	17%
Fairfield	1,800	1,891	2,044	5.1%	8.1%
Fletcher	1,179	1,277	1,346	8.3%	5.4%
Franklin	1,268	1,405	1,363	10.8%	-3%
Georgia	4,375	4,515	4,845	3.2%	7.3%
Highgate	3,397	3,535	3,472	4.1%	-1.8%
Montgomery	992	1,201	1,184	21.1%	-1.4%
Richford	2,321	2,308	2,346	-0.6%	1.6%
St. Albans City	7,650	6,918	6,877	-9.6%	-0.6%
St. Albans Town	5,324	5,999	6,988	12.7%	16.5%
Sheldon	1,990	2,190	2,136	10.1%	-2.5%
Swanton Town	6,203	6,427	6,701	3.6%	4.3%
Swanton Village	[2,548]	[2,386]	[2,328]	-6.4%	-2.4%
GRAND ISLE COUNTY	**6,901**	**6,970**	**7,293**	**1.0%**	**4.6%**
Alburgh Town	1,952	1,998	2,106	2.4%	5.4%
Alburgh Village	[488]	[497]	[593]	1.8%	19.3%
Grand Isle	1,955	2,067	2,086	5.7%	0.9%
Isle La Motte	488	471	488	-3.5%	3.6%
North Hero	810	803	939	-0.9%	16.9%
South Hero	1,696	1,631	1,674	-3.8%	2.6%
VERMONT	**608,827**	**625,741**	**643,077**	**2.8%**	**2.8%**

SOURCE: *U.S. Census: 2000, 2010, 2020. [ ]= subset population.*

FIGURE 3: Household Income - 2020



SOURCE: *American Community Survey, U.S. Census Bureau*

Ambulatory difficulties are the most common type of disability, affecting about 6% of the region's total population. It was not possible to identify any trends with regards to changes in the number and characteristics of residents living with a disability due to the limited availability of data for the two-county region. Additionally, the relatively small sample size of people with a disability reduces the reliability of data for the two-county region.

Income and Affordability

The Census Bureau estimated that median household income in Franklin County was $65,314 and in Grand Isle County was $81,667 in 2020. Median household income in Franklin County increased 4.5% above the rate of inflation between 2000 and 2020. The data shows much larger gains in Grand Isle County with a jump of 26.5% over the 20-year period.

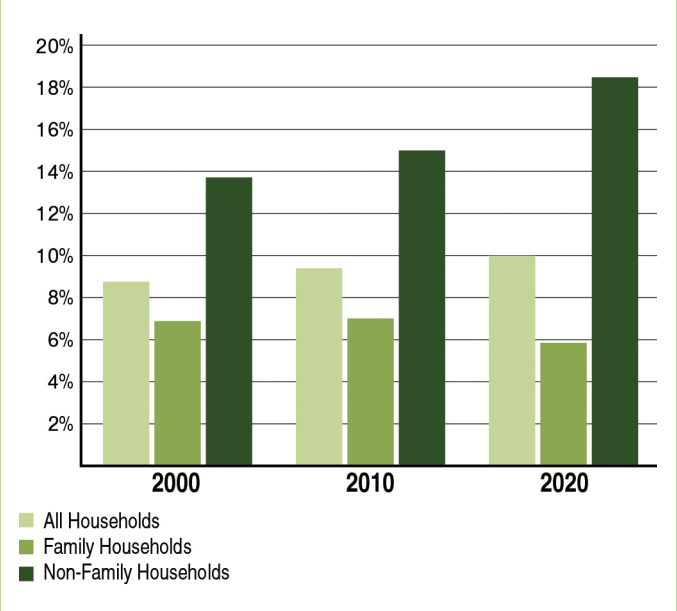
The increase in household income was not evenly distributed across households of different types and characteristics. Family households saw their median income grow significantly more than non-family households. The median income of single-person households in 2020 was less than 50% of the median for multi-person households. Households headed by someone nonwhite, younger, or older were disproportionately represented in the region's lower income groups.

The Vermont Department of Taxes reported income statistics for 2020 that were similar to the median household income estimated by the Census Bureau for the two counties. The tax data provides a more accurate representation of income level at the town level. It shows that the average adjusted gross income per return varies widely across the region—from a low of $42,769 in Richford to a high of $109,415 in South Hero.

The Census Bureau estimated that 10% of the region's households had an income below the poverty line in 2020. Both the total number of households below the poverty line and the poverty rate inched upwards between 2000 and 2020.

The increase in households below the poverty line is entirely attributable to nonfamily households (such as those with roommates). A nonfamily household in the two-county region is nearly three times as likely to have an income below the poverty line as a family household. Given that most of the region's household growth is in nonfamily households, the income and poverty disparity between family and nonfamily households is a worrying trend.

FIGURE 4: Households in Poverty



SOURCE: *U.S. Census Bureau*

NRPC has identified areas in the region that have less access to employment and education due to high transportation costs or high combined housing/transportation costs (Map 3). These areas have a higher concentration of households with lower incomes, a higher percentage of those living under the poverty line, and a measurable achievement gap between students of higher incomes and lower incomes.

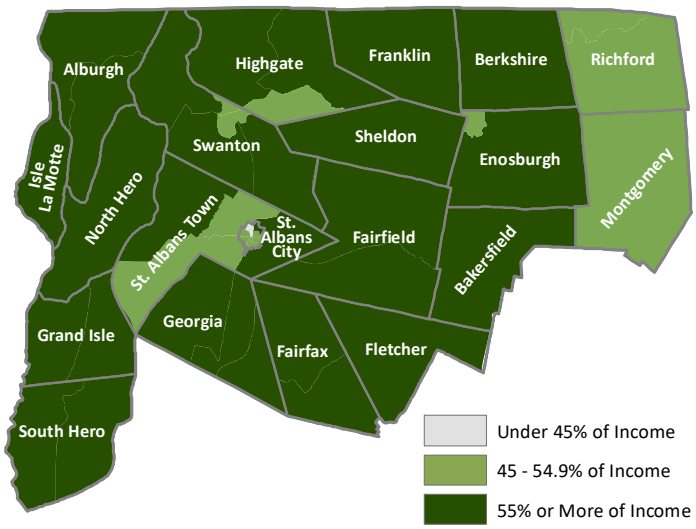
EQUITABLE PLANNING

NRPC has broadened its consideration of equity in its planning and implementation work. In 2021, NRPC contracted with a consultant to:

- Improve the ability to respond effectively and respectfully to complex social, economic, and political issues that impact the community;
- Improve the decision-making processes to ensure that decisions are fair and balanced; and
- Create and support the development of a more inclusive workspace and external community culture.

Early in 2022, the NRPC Board of Commissioners adopted a statement of inclusion to help guide our work. This statement was modified from the Municipal Declaration of Inclusion, which was first adopted in Vermont by the town of Franklin. The NRPC Board of Commissioners has identified ways to implement the statement of inclusion and tasked each of its committees to identify how to consider equity and inclusion in their work. A summary of those discussions is shown in Table 2. These themes and ideas have been incorporated into this plan and will be considered further in the implementation of this plan.

MAP 3: Housing and Transportation Costs



When considering the true costs of housing, the costs of transportation associated with living in a home must be considered. For example, consider a household of three people (with only one commuter) and a moderate household income of $49,282. There are few places in the region where the housing and transportation costs total less than 55% of income. In addition, there is only one census block in the region where housing and transportation costs are below the recommended rate of 45% of income. Therefore, when factoring in the true cost of house location, there is only one area of St. Albans City where combined housing and transportation costs total less than 45% of income in this example.

SOURCE: *The Housing and Transportation (H+T®) Affordability Index 2020 (https://htaindex.cnt.org/)*

The goals and policies in this plan for transportation, economic development, and education address issues of equity and provide policy guidance. NRPC will continue to partner with regional organizations to ensure regional projects and programs support improved access to opportunity for all people in the region.

Vulnerable and Disadvantaged Communities

It is important for NRPC to understand areas of vulnerability within the region so that planning efforts can keep overburdened areas from becoming even more so and can strategically prioritize efforts that positively affect some populations more. Several mapping and analytical tools have been developed by state and federal agencies that aim to identify areas of vulnerability and weakness in communities. Vulnerable communities are understood to be those that are less able to respond to the impacts of a certain hardship—this could be exposure to chemical contaminants, limited access to housing, health care or food, or responding to higher temperatures. As a result, they become disproportionately burdened when crises occur. NRPC has reviewed and aggregated information from the following tools:

TABLE 2: Statement of Inclusion - Action Steps

Board of Commissioners, Transportation Advisory Committee, Brownfields Steering Committee, Healthy Roots Advisory Committee, Basin Water Quality Councils

Considering inclusion and equity: How does the statement impact your work?

- Supports our work in general and provides overall guidance.
- Prioritization and project selection (water, transportation, brownfields) should include consideration of equity and environmental justice.
- Ensure equitable distribution of projects and identify ways to ensure benefits accrue to those who were negatively impacted.
- Aligns with the Working Communities Challenge Housing for All's mission.
- Advocate for more equitable funding besides local match for bike/ped infrastructure and public transportation.
- Each committee could create a program/committee specific Diversity, Equity and Inclusion statement or strategic goals.

Changing our approach: What could NRPC do differently to make progress toward this ideal?

- Expand representation and access by adding diverse voices to committees and marketing programs to areas/people not currently served.
- Improve outreach and ensure meetings are accessible to all people.
- Include Indigenous voices and participation.
- Educate partners about the NRPC goals and how they can help.
- Improve prioritizing projects and programs by giving priority weight to projects that further these goals.
- Elect women to chair/vice chair positions.
- Make efforts to recognize past injustices and give credence to them. Displacement of Native peoples and their voices is part of understanding the history of our landscape.
- Look to organizations who have done a lot of this work and learn about their failures and successes.

The result: What justice, equity, diversity and inclusion goals or objectives should be considered for the regional plan?

- Access and outreach for all.
- Promotion of fair and affordable housing.
- Environmental justice.
- Food justice, food sovereignty, land access, creating more community gardens.
- Transportation options for the low-income, those in poverty and elderly.
- All residents and visitors in the Basin have access to clean drinking water and safe water-based recreational activities.

- The Climate and Economic Justice Screening Tool
- The EPA's Environmental Justice Mapper
- The Vermont Department of Health's Social Vulnerability Index and Heat Illness Vulnerability Index

These mapping tools pull data from sources like the Census Bureau, the American Community Survey, and the National Emissions Inventory, among others. Each tool identifies vulnerable or disadvantaged communities based on different criteria, but common ones include low-income, limited English speaking, and BIPOC communities.

Incomplete census data can lead to high standard errors on any one indicator, but used together these tools can show a pattern of information that indicates areas in the region that may need specialized planning assistance and additional priority consideration for projects and programs.

Climate and Economic Justice Screening Tool: Two census tracts in the Northwest region have been highlighted as disadvantaged in this analysis, by meeting the associated socioeconomic thresholds.

- Richford and Montgomery have been identified as disadvantaged in areas of energy, health, and transportation. Specifically, energy costs, asthma rates, and transportation costs are all in the top 10% nationwide.
- The western half of St. Albans City has also been identified as disadvantaged in three areas: health,

housing, and water and wastewater. This part of the city ranks in the lowest 10% nationwide for low life expectancy, and leaking underground storage tanks within 1,500 feet of homes.

Social Vulnerability Index: In this tool, indicators that are over the 90th percentile statewide are flagged, indicating higher vulnerability when considering community health. It should be noted that some of the data from the Northwest region have high relative standard errors, meaning the results may not be as accurate as desired. The following communities were above the 90th percentile for the areas noted:

- *Highgate* – people with no high school diploma
- *Franklin, Sheldon, Fairfax, Fletcher, and Georgia* – population of children under 18
- *Berkshire and Enosburgh* – population under 18 and minority population
- *Fairfield and Bakersfield* – people with limited English proficiency
- *St. Albans Town* – people who are unemployed
- *St. Albans City* – percentage of single parents, and in the western part of the city, people with disabilities, people in poverty, and households with no vehicle available
- *Richford and Montgomery* – people who are unemployed, per capita income, and people with no high school diploma

Heat Illness Vulnerability Index: The Heat Illness Vulnerability Index is a composite of six indicators. In the Northwest region, the index identifies St. Albans Town and St. Albans City as more vulnerable overall to heat illness than the rest of the state.

EPA Environmental Justice (EJ) Screen: The EPA EJ Screen includes six environmental indicators that focus on air and air pollutants; four are areas of concern in the region. The particulate matter 2.5 and ozone indicators had the farthest ranging areas of concern for the region, with 11 census groups falling within the 90th to 100th percentile within the state. In Northwest Vermont, traffic proximity is only an issue in St. Albans, and similarly, the diesel particulate matter index indicated higher percentiles in St. Albans City and Swanton. Although there are no superfund sites in Northwest Vermont, the block groups surrounding St. Albans City, including ones in St. Albans Town and Swanton, are located near facilities that have highly toxic substances. St. Albans City is noted as an area with a high percentile for the environmental indicator of underground storage tanks (USTs) and leaking USTs.

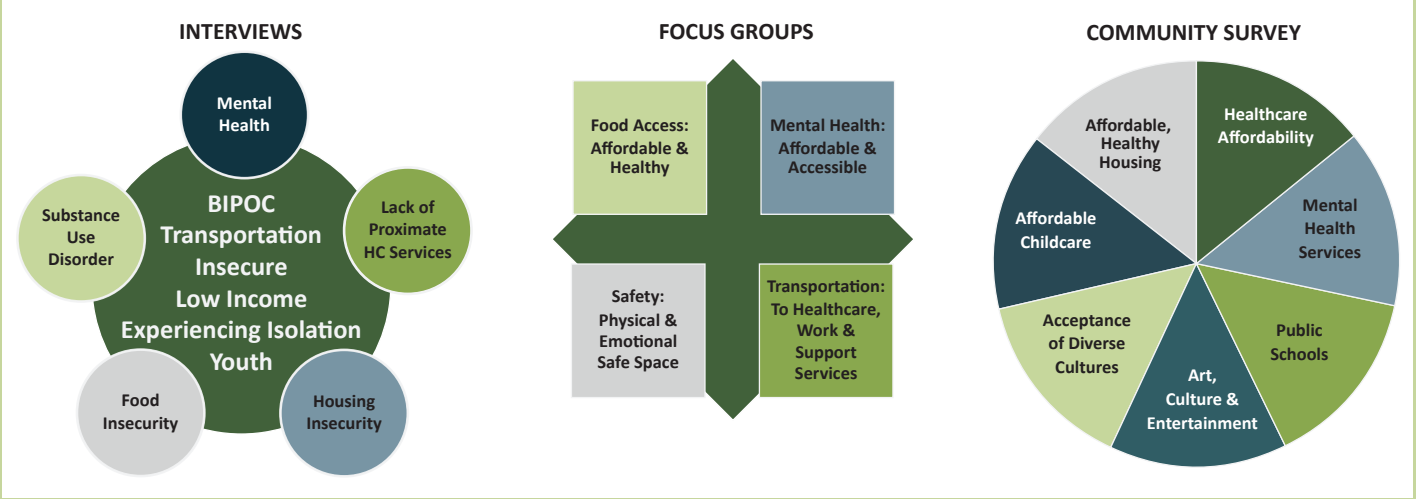
Community Engagement

NRPC considered community feedback during this plan development. As part of the Working Communities Challenge, NRPC completed an extensive community outreach effort centered around the "Formidable Four" barriers to economic success. The Formidable Four are transportation, housing, child care, and substance misuse. Reducing these barriers was the key focus of this community engagement. Through focus groups, a community survey, and public meetings, the Working Communities Challenge developed into the implementation project Housing for All, which supports the creation and improvement of housing for healthy, inclusive, and prosperous communities.

Housing For All
Working Communities Challenge

NRPC also actively participated in the Community Needs Assessment completed by the Northwestern Medical Center in 2022. That effort also included extensive public engagement, including focus groups, community surveys, tabling events, and interviews. Key priorities identified in that effort are incorporated into this plan.

Community Health Needs Assessment Key Priorities



SOURCE: *Northwestern Medical Center 2022 Community Health Needs Assessment*

PUTTING THE PLAN INTO ACTION

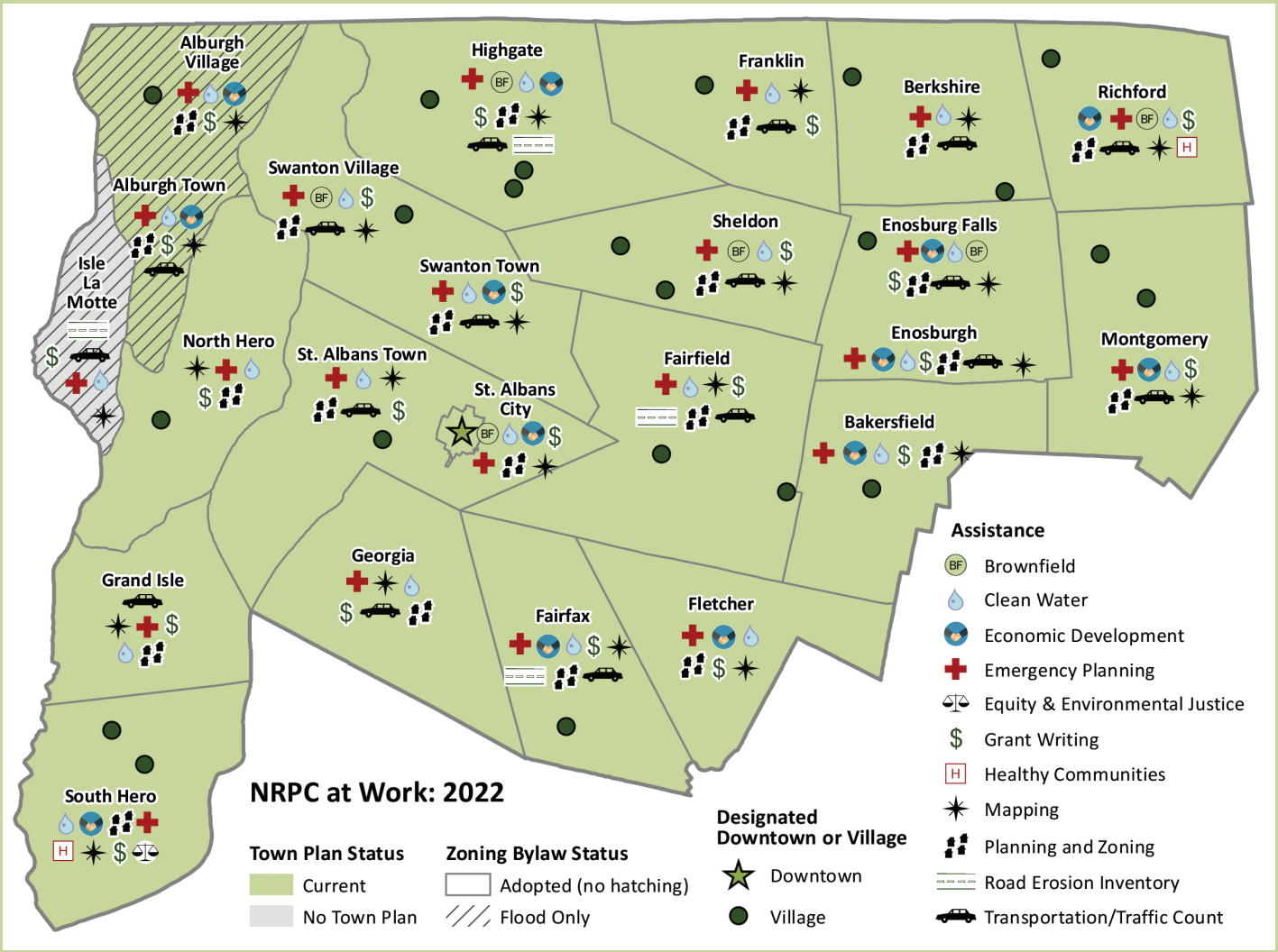
The goals and policies for the region's future outlined in this plan set a clear direction for public policy decisions that impact our region's municipalities. This plan is a dynamic document that will change over time. The state requires this plan to be updated every eight years, but the commission will review this document regularly to determine how it fits with the changing needs of the region and to evaluate implementation. In addition, different chapters will be updated and modified regularly to improve the quality of information.

Implementing this plan is one of many activities undertaken by the regional commission within its statutory requirements. Doing so requires a collective effort by the many local, state, and federal governments as well as individuals, organizations, and private interests that serve the region. Ultimately, its success hinges on a desire of all the region's interests to work together for the improvement of the region. Implementation will be completed in the following ways:

1. **Regional planning:** Through NRPC's annual work program and its ongoing activities, the commission will focus on projects and programs that implement this plan.
2. **Local planning:** Municipal plans, bylaws, capital budgets and programs, infrastructure development, and other implementation activities will support municipal plan goals and the goals of this plan. NRPC will support these efforts through technical assistance to our member municipalities.
3. **Coordination with regional and state entities:** The implementation of this plan will require coordination with regional organizations focusing on economic development, public health, education, solid waste, environmental quality, and public safety. State agencies and departments will also be key partners, including the Agency of Commerce and Community Development, Agency of Natural Resources, Department of Emergency Management and Homeland Security, and Department of Health.
4. **Public participation:** The commission recognizes that the citizens of the region have the most to gain from this plan. Input, ideas, opinions, concerns, and support from people in the region form the basis of this plan and will guide its implementation.
5. **Implementation priorities:** Upon adoption of this plan, NRPC will create a more specific strategic implementation plan. This will focus on actions in which NRPC can take the lead, can support others, or can be part of a collaborative effort.

6. **Annual work program:** In recent years, the range of activities conducted by NRPC has grown significantly. More requirements are being placed on municipal governments, and many programs require a regionally based approach to be both effective and efficient. In addition to its traditional regional and local land-use planning and coordination activities, NRPC now tackles projects related to watershed planning, energy conservation, housing, brownfields redevelopment, emergency planning, transportation planning, GIS mapping and analysis, and community and economic development, among others. NRPC's involvement in these myriad activities means that the commission's annual work program will be one of the most effective tools available for implementing this plan. The breadth of NRPC's work is demonstrated in Map 4.
7. **Measuring impact:** If the implementation program and the goals and policies in this plan are successful in realizing positive opportunities for the region, then we can expect that there will be measurable results. NRPC will develop key indicators for each of the areas of this plan. Based on our vision for the future, we will show whether the indicators should increase, decrease, or stay level in the future. The indicators will not be inclusive of all of the goals, policies, and actions in this plan; instead, the indicators will be representative measures of successful implementation. NRPC will seek public comment on the indicators and will report progress or changes at least annually.

MAP 4: NRPC at Work



SOURCE: *NRPC Collected Data*

Development Review

Project review is one component of NRPC's overall implementation strategy. Development review by NRPC has many purposes. Project review can:

- Enable implementation of the regional plan and support of the goals and policies;
- Help support a project through the regulatory process;
- Address concerns of a regional nature; and
- Consider issues not addressed through the local review process.

In completing any development review, NRPC shall proceed according to its adopted project review policies, which encourage cooperation and compromise and consider the needs of local communities and the region. During review of projects that fall under the requirements of Act 250 (the state's development control law) or Section 248 (30 V.S.A. §248, which regulates certificates of public good for new energy-related resources), NRPC will consider the goals and policies of this regional plan within the context of local guidelines. NRPC will report its opinion about whether the project conforms to the regional plan to permit officials. It is expected that in most instances the regional plan and local plan will be compatible. In cases where the plans are not compatible, the local plan will take precedence when the project benefits and/or negative impacts stay within the host municipality. However, when the project has the potential to benefit or negatively impact more than the host municipality, it is important to consider the regional context. To determine when a project may affect more than local interests, a threshold of substantial regional impact (see Appendix I: Definitions) and a framework for considering the cumulative impacts of development over time was developed as part of this plan.

If it is determined that a proposed development will have a substantial regional impact, NRPC will review the proposal according to regulatory guidelines, duly adopted municipal plans, and this regional plan. If a conflict exists between the regional plan and applicable municipal plans, NRPC shall proceed according to its adopted project review policies, which encourage cooperation and compromise, and consider the needs of local communities and the region.

Cumulative Impacts of Development

When determining whether a project has substantial regional impacts, the impacts caused by the project itself are considered. However, as the region experiences development of varying intensities and densities over time, impacts not evident on a project-to-project basis, but evident when considering the impacts of many projects in a limited geographic area together, can be revealed. Project review will consider cumulative impacts in all regional and subregional growth centers, transitional growth areas, and in any other area experiencing new development. Examples of undesirable cumulative impacts, which are currently noticeable in some areas of the region, include but are not limited to a failed intersection, a lack of pedestrian or public transit connections, a road of insufficient width for traffic, or a sewer and/or water system at capacity with no immediate plan for financing an expansion.

NRPC believes that new development should not be held solely responsible for such cumulative impacts, but that all contributors should share the cost of improvements. Project review will anticipate cumulative impacts in high growth areas, such as Regional Growth Areas, and make recommendations for cost-sharing methods to ensure negative impacts are mitigated or improved.

Proper implementation of planning goals, and in particular master planning, can mitigate undesirable cumulative impacts. NRPC strongly recommends that communities work with public and private interests to complete effective comprehensive municipal plans and master plans for subregional and regional growth centers and growth expansion areas.

THE PLAN IN CONTEXT

When implementing this plan, it is important to review how the region fits within the context of our communities, neighboring regions, and the state as a whole. Also, it is important to note how this plan meets the legal requirements outlined in the Vermont Municipal and Regional Planning and Development Act (Title 24, Chapter 117).

Compatibility with Plans of Member Municipalities

The Northwest Regional Plan was prepared in consultation with representatives of member towns. NRPC staff reviewed the goals and policies contained in the regionally approved plans, as well as other plans in the region, to ensure the regional goals and policies were not in conflict. NRPC staff and commissioners appointed to the Regional Plan and Policy Committee wrote this plan, which was reviewed and voted on by the full commission after the required public hearings.

This regional plan reflects the local plans of our member municipalities. This plan strongly supports concentrating growth in areas served by existing infrastructure and in locales that have or adjoin areas with population densities clearly higher than the surrounding region. These growth areas were based on town plan maps and high-density districts when designated. Approved municipal plans within the region also support the concept of targeting the majority of growth into compact areas and avoiding widespread growth in more rural areas. Regionally approved municipal plans support the conservation of farmland and wildlife habitat—goals that are consistent with the regional plan.

Compatibility with Title 24 V.S.A. Chapter 117

This regional plan is consistent and compatible with the requirements outlined in the state's land-use planning law, including 14 statutory goals related to growth, development, and conservation (Figure 5). These goals align with the principles described in the introduction to this plan. In addition to the goals discussed above, the Vermont Municipal and Regional Planning and Development Act requires regional planning commissions to follow certain guidelines in the construction of regional plans. The 11 elements that must be addressed in regional plans are included in this plan; community health and disaster resilience are not required elements in regional plans, but are included here because of their importance to the success of the region.

FIGURE 5: Vermont Planning Goals

SOURCE: *NRPC*

Compatibility with Plans of Adjoining Regions

The NRPC plan is considered compatible with other plans if it helps to make progress toward the goals and policies, or at least does not interfere with the goals and policies of that plan.

Chittenden County lies to the south of the Northwest region. The **Chittenden County Regional Planning Commission (CCRPC)** member towns of Colchester, Milton, and Westford are located on the southern border of the Northwest region. The CCRPC adopted its current Environment, Community, Opportunity, and Sustainability (ECOS) plan in 2018.

To the west, Lake Champlain acts as the border between the Grand Isle County towns of South Hero and Grand Isle and the Chittenden County towns of Colchester and Milton. The Colchester/South Hero Causeway, which is part of the Island Line Rail Trail, crosses the border of Colchester and South Hero and Route 2 (the primary access to Grand Isle County, known as the sandbar) and bisects the border of South Hero and Milton. Decisions regarding exit 17 in Colchester along Route 2 have a great impact on Grand Isle County, and NRPC will continue to participate in transportation planning and project development in this area.

Lands farther to the east in Milton and Westford have been designated by the CCRPC as Rural. Development is limited in this area, which is compatible with the NRPC's designation of Conservation Lands interspersed with Agricultural Resource Lands along the Lamoille River. The area in Milton located between Route 7/Arrowhead Lake and Route 104, where Husky Injection Molding Systems is located, is designated as an Enterprise Planning Area in the CCRPC future land-use plan. Although this area is not immediately adjacent to the town of Georgia, NRPC will continue to monitor it to ensure that future conflicts concerning growth in this area do not arise.

The CCRPC Regional Plan contains goals and policies pertaining to transportation, economic development, and public health. These goals and policies are compatible with those of the Northwest Regional Plan.

The **Lamoille County Planning Commission (LCPC)** adjoins the southeastern corner of the Northwest region along the town borders of Fairfax, Fletcher, Bakersfield, and Montgomery, with Cambridge, Waterville, and Belvidere in Lamoille County. Areas adjacent to the Northwest region are largely classified as Rural and Conservation. Areas of mutual interest with Lamoille County include the Route 104 corridor, the Route 108 corridor, the Lamoille River, Lamoille Valley Rail Trail, and forest habitat blocks. The LCPC's 2015 regional plan future land-use map, and its goals and policies are compatible with NRPC's regional future land-use plan.

The **Northeastern Vermont Development Association (NVDA)** adopted its current regional plan in 2015. The NVDA region adjoins the northeastern border of the NRPC region. The NRPC towns of Richford and Montgomery are adjacent to the NVDA member towns of Jay, Westfield, and Lowell. The NVDA identifies development areas on its future land-use map. Village Centers are identified within Westfield and Lowell, while a Service Center is identified in Jay. None of these three development areas are less than 10 miles from the Franklin County border. The NVDA plan encourages growth to concentrate in these areas, which is a strategy consistent with this plan. The NVDA also recommends little commercial or industrial development in rural agricultural and forest areas. Although it does not specifically discourage residential development in forest and agricultural areas, it suggests that development in these areas should be limited. As the adjoining area between the NRPC region and the NVDA region is primarily the wooded and steep Green Mountains, incompatible growth is not likely to be a significant problem. The NVDA plan is compatible with the NRPC regional plan. NRPC will continue to participate in planning and permitting for the master plan for Jay Peak Resort to ensure that its development will enhance the neighboring communities in the Northwest region and that any negative impacts on transportation, water quality, housing, or the local economy are mitigated.

ECONOMIC REGION

Economic Development

Infrastructure: Post-Secondary Education, Child Care, Workforce and Telecommunications

Energy

ECONOMIC DEVELOPMENT

GOALS

1. **Ensure that opportunities to experience, participate in, and benefit from the economy are available to everyone.**
2. **Improve the health of citizens and businesses by supporting the region's unique geography and landscape**
3. **Ensure that communities and businesses can rely on employees who are work ready; have strong work ethics and necessary skills in reading, writing, STEM (science, technology, engineering, math), and communication.**
4. **Ensure that businesses, employees, and communities have access to funding that is achievable and affordable, business costs that are reasonable and appropriate, and an infrastructure that is available and dependable.**
5. **Facilitate collaboration among Franklin and Grand Isle Counties to address issues that are similar throughout each county and secure the communities' economic future.**

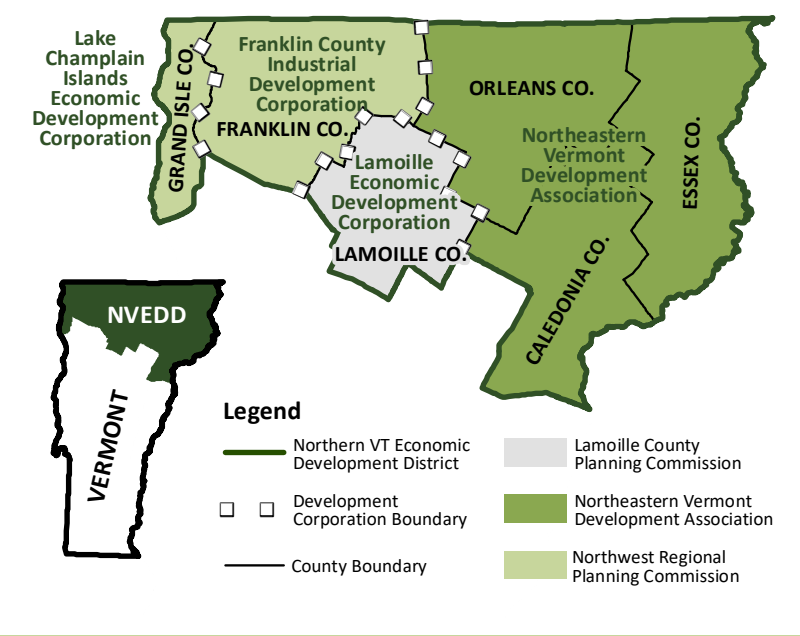
ECONOMIC OPPORTUNITIES AND CHALLENGES

Regional Assets

The Northern Vermont Economic Development District (Map 1) is a district recognized by the U.S. Economic Development Administration that allows access to federal economic development grants and technical support. The district is managed through a consortium of the regional planning commissions and regional development corporations. NRPC serves as the lead organization and fiscal agent.

The Comprehensive Economic Development Strategy for the district involves building a

MAP 1:
Northern Vermont Economic Development District



diverse economy, creating a competitive advantage for our businesses, and increasing the well-being of our communities. Supporting job growth and sustainability in existing industries and preparing our infrastructure and workforce for emerging industries is an overarching goal. Our success depends on identifying strategic industries for the region and making specific recommendations for the development of a highly skilled workforce to support those industries. Like all counties in Vermont, the health of businesses, employees, and communities in this region depends upon having access to funding that is achievable and affordable, business costs that are reasonable and appropriate, and an infrastructure that is available and predictable.

Businesses continue to struggle with low unemployment rates, the cost of health care, housing availability, and energy; these issues are common throughout the state and New England. Additionally, child care and transportation challenges impact employee availability. The regional assets of Franklin and Grand Isle Counties are strong counterpoints to these challenges and a key to the success of many businesses operating in the region. The following assets are critical to the regional economy:

- The Lake Champlain shoreline
- Tourism and recreational opportunities
- A working landscape and agricultural economy that supports regional food systems and keeps rural lands undeveloped
- Well-planned infrastructure, including industrial parks, a strong transportation network, and a growing broadband network
- Intact town and village centers that include public spaces and are designed to serve pedestrians and cyclists
- Proximity to Canada and major transportation routes
- A wealth of organizations and individuals committed to improving our residents' quality of life (e.g., through housing, transportation, energy, and the environment)
- A long history of state and local commitment to sustainable development as reflected in state law and regional and municipal plans

Two trends may impact the economy in the future–climate change and remote work. All sectors of Vermont's economy–from tourism to forestry, agriculture, maple sugaring, and recreation–will feel the impacts of climate change. "Vermont is expected to attract new residents through climate migration, and Vermont may see an increase in summer 'seasonal climate refugees' as the rise in temperatures nationwide draws visitors looking to escape extreme heat. By 2080, the Vermont ski season will be shortened by two weeks (under a low emissions scenario) or by a whole month (under a high emissions scenario), and some ski areas will remain viable." (Vermont Climate Office, Climate Action Plan 2021) The low emissions scenario is optimistic. The report notes that skiing in Vermont will remain largely viable through 2050 only with the aid of snowmaking. With remote work becoming increasingly common for certain sectors, Vermont is an attractive location due to quality of life. Data and projections on these trends are not readily available, but NRPC will monitor new data and support our communities in planning for potential increases in population.

Table 1 provides an overview of economic indicators in Franklin and Grand Isle Counties. The strong working relationships between private and public sectors–including communities, businesses, planning groups, and educational organizations–have been the catalyst for job creation and building a diversified economy. This growth has transformed Franklin County from a predominantly agriculture-based economy to today's diverse, dynamic industrial and economic base whose high-quality products are driven by leading-edge technologies. Several Canadian companies have located their U.S. operations within Franklin County industrial parks. To strengthen small and large businesses and promote the establishment of start-up businesses and entrepreneurial endeavors in Franklin and Grand Isle Counties, the region requires a strong and predictable infrastructure that encourages new owners and markets to support economic development.

Grand Isle County is the home of hundreds of small and micro businesses, as well as a fully permitted business park in Alburgh for light manufacturing and a privately owned industrial park in Grand Isle (Island Industrial Park), with lots available. According to U.S. census data, Grand Isle County currently exports more than 80% of its working-age population to employment outside the county. The economy is centered on tourism and agriculture, but a growing number of people are establishing home-based professional businesses or telecommuting thanks to the availability of high-speed Internet service.

Workforce

The COVID-19 pandemic resulted in immediate high unemployment rates, topping 14% statewide in the spring of 2020. Since then, Vermont has had a strong economic recovery. The region consistently has an unemployment rate at or lower than the statewide rate. In 2022, the unemployment rate has been under 3%, a sign of a tight labor market.

TABLE 1: The Regional Economy

County Wages (2021)	Average annual wages were less than those of Vermont as a whole: • Franklin County: $52,944 • Grand Isle County: $43,567 • Vermont: $56,263
Total Employment (April 2023)	• Franklin County: 27,302 • Grand Isle County: 4,053
Top Three Employment Sectors (2021)	• Franklin County: Admin/ Waste Services, Healthcare, Accommodation/Food Services • Grand Isle County: Retail, Accommodation/Food Services, Transportation
Place of Work: Franklin County Residents (2019)	• Franklin County: 45.8% • Chittenden County: 37.4%
Place of Work: Grand Isle County Residents (2019)	• Chittenden County: 54.2% • Franklin County: 14.6% • Grand Isle County: 14.0%
Unemployment (2022)	• Franklin County: 2.2% • Grand Isle County: 2.2% • Vermont: 2.1%

SOURCE: *Vermont Department of Labor, U.S. Census Bureau OnTheMap Journey To Work data*

Ensuring equality in economic success for all current and future residents is a cornerstone of successful economic development. Historically, there are disparities between income, unemployment, and business ownership depending on race, ethnicity, or gender. Because our region has a high percentage of people who identify as white, local data on economic disparities by race or ethnicity is not readily available. Using data for the state of Vermont as a whole demonstrates the current challenges in achieving equitable economic success. Statewide, the average unemployment rate was twice as high for Black and Hispanic Vermonters. The disparity is even greater among males who are Black (12.8 %) and Hispanic (10.8%). Black youth 16-19 had an average unemployment of 22.6%, compared to 4.7% for white youth. (ACS 2018-2022)

The Franklin Grand Isle Workforce Investment Board (FGIWIB) is no longer supported by the State of Vermont, leading to a diffuse approach to workforce development. The need continues to grow for instruction in basic skill sets and specific training and certifications. Industrial maintenance, industrial electricity, CNC setup, and shop print reading are in constant demand by local manufacturers. Adult education programs feature regularly scheduled classes in licensed nursing assistant (LNA), clinical medical assistant, phlebotomy, home health care, and emergency response training. Various small businesses and individuals consistently seek support in financial software, basic computer and office software, child-care provider, and supervisory training. With ever-changing needs and innovations, it is critical that these services remain available to incumbent workers, new employees, and individuals.

The Value of Manufacturing

The number of employers in the manufacturing sector within the region has remained steady during the past ten years, at or around 60.

Manufacturing wages in the past five years have increased by 33%. The Franklin County average manufacturing wage of $67,277 was well above the average for all employment (VT Department of Labor).

Industrial and Commercial Development

Industrial and commercial development in Franklin County has remained strong during the past two decades with the growth of Perrigo, Beta Technologies, and Northwestern Medical Center (NMC). In keeping with the regional land-use goals, industrial development has expanded almost entirely within previously permitted industrial parks that are in or adjacent to our downtowns and regional growth areas. The region continues to receive interest from businesses based in Quebec that seek a market in the United States. Grand Isle County still struggles to provide public transportation and municipal wastewater, which limits its commercial and industrial growth. The region's vibrant base of manufacturing and agriculture and its expanding base of sustainable agriculture and health-care services are all critical to the health of our communities. We st utilize the existing infrastructure, support targeted expansions, and understand the common threads throughout the region that are essential in supporting business and social communities.

Working Landscape

Supporting the unique geography and landscape of the region's counties and providing an environment that supports families and businesses in agricultural endeavors is essential to the health of our communities. Value-added agriculture (changing an agricultural product to a more valuable product) remains important in the region, although total value of agricultural products sold stayed steady or dropped slightly from 2012 to 2017. NRPC, the Franklin County Industrial Development Corporation (FCIDC), Lake Champlain Islands Economic Development Corporation (LCIEDC), Northwestern Medical Center, and others cooperated to form Healthy Roots Collaborative, a local food organization with a mission to provide marketing, business planning, and other support to local food growers and producers. Healthy Roots Collaborative joined NRPC in the fall of 2019, and NRPC provides organizational support for Healthy Roots employees and programs.

Franklin County (24%) and Grand Isle County (2%) represent 26% of state agriculture sales. In 2017, Franklin County farms averaged sales of $254,614; the figure was $150,720 in Grand Isle County. Those are a 2% growth and 4% decrease since 2012, respectively. There are areas of sales growth in vegetables, alternative dairy (sheep and goat), value-added products, and other farm income, like agritourism. Farmers markets continue to show community support of agriculture in Franklin and Grand Isle Counties. As of 2022, there are five regular summer markets in the region: Champlain Islands Farmers Market, Northwest Farmers Market, St. Albans Bay Market, Montgomery Farmers Market, and the Swanton Food Truck and Markets. Looking toward the future, of the 1,378 total producers in Franklin County, 328 are new and beginning farmers. In Grand Isle County, of the 196 producers, 62 are new and beginning farmers.

TABLE 2: The Working Landscape Economy

Value of Agricultural Products Sold	The dollar value increased 0.6% from 2012 to 2017 in Franklin County and decreased 5.9% in Grand Isle County over the same period.
Value of Dairy	Milk accounts for 60% to 70% of agricultural product value. Franklin County produced 25.6% of Vermont's total milk production in 2017, more than any other county.
Importance of Maple Syrup	Franklin County produced 39% of Vermont's maple products in 2017—the most in the state. Value of maple syrup produced in Franklin County nearly doubled from 2012 to 2017.
Agricultural Employment	Agricultural employment constituted 3.3% of total employment in Franklin County, and 2.7% of total employment in Grand Isle County in 2021.
Changes in Farm Acreage	From 2012 to 2017, the amount of farm acreage increased by 1.82% in Franklin County and decreased by 1.16% in Grand Isle County.

SOURCE: *U.S. Census of Agriculture 2017, VT Department of Labor*

The agricultural sector relies heavily on a migrant workforce. Some estimates are that the agricultural sector is supported by 1,000 to 1,500 migrant workers statewide, up to 90% of which are undocumented. We must ensure safety, food access, fair wages, educational opportunities, proper housing, and social supports as crucial components of supporting these workers. (Panikkar, B.; Barrett, M.-K. Precarious Essential Work, Immigrant Dairy Farmworkers, and Occupational Health Experiences in Vermont. *Int. J. Environ. Res. Public Health* 2021, 18, 3675.)

Tourism

Tourism in Vermont is a $3 billion industry that supports over 30,000 jobs in Vermont, or 10% of Vermont's workforce (VT Dept. of Tourism 2022). In Grand Isle County, the summer population is estimated to be three times the year-round population, and tourism in Franklin County is expected to continue to grow. Accommodations, food service, and retail account for more than 40% of Grand Isle County's private-sector employment. Increasing numbers of Canadian visitors account for a portion of the growth in tourism and bike tourism, and agritourism continues to grow in importance (VT Dept. of Tourism). Growth in bike tourism in the region is expected with increased marketing of the Missisquoi Valley Rail Trail and the completion of the Lamoille Valley Rail Trail.

The COVID-19 pandemic and associated stay-at-home orders, gathering limits, and testing/quarantine requirements had a tremendous impact on the tourism industry in 2020. In 2022, tourism within the region has rebounded and is growing again. Visitors at the Georgia Information Centers increased by nearly 100% from 2020 to 2021, and rooms and meals tax receipts continue to increase each year. In 2021, the rooms portion of the rooms and meals tax was $14.2 million in Franklin County and $3.2 million in Grand Isle County, equivalent to 2019 levels. Compared to the lows of 2020, this is a 300% increase for Franklin County and a 70% increase for Grand Isle County.

Arts, Culture, and the Creative Economy

The creative economy refers to efforts to foster economic growth and development through creativity, cultural heritage, and entrepreneurship, which reinforce the region's unique character and sense of place. The 2021 CreateVT Plan completed by the Vermont Arts Council estimated that 9% of the region's workforce was involved in the creative sector, either full or part-time. Specialty foods and design (graphic design, architecture, landscape architecture, interior/industrial design, printing, etc.) were the two largest creative industries in the region, each at 26% of the creative industry. Specialty foods and performing arts are the two sectors that grew the fastest from 2010 to 2018. (CreateVT Plan)

In 2017, 68.3% of Vermonters attended a visual or performing arts event, putting Vermont in the top ten in the nation. The Vermont Creative Network links creative economy practitioners and partners to supporting a thriving creative economy. NRPC supports these efforts and participates in the regional network.

GOALS AND POLICIES

1 GOAL

Ensure that opportunities to experience, participate in, and benefit from the economy are available to everyone.

a. Provide additional support to municipalities and partner organizations that do not have staff resources to access funding opportunities.
b. Support efforts to provide access to economic development funds to communities, businesses, and people who have been historically underserved.
c. Support efforts to modify grant match requirements to reflect ability to pay.

d. Encourage the tracking and reporting of data to measure the impact of economic and community development programs across income, race, ethnicity, disability status, and other measures.
e. Increase the organized regional marketing capacity for the region, with a focus on unique recreational and tourism opportunities and great places to live.

2 GOAL

Improve the health of citizens and businesses by supporting the region's unique geography and landscape.

a. Increase the production and marketing of local foods, beverages, and natural products as well as expanding access to those products at local and broad-based markets by supporting production and educating and engaging the public.
b. Promote county assets and quality of life for the citizens of Franklin and Grand Isle Counties, tourists, and recreationists by collaborating with regional brands and local food and beverage markets and capitalizing on the region's proximity to Canada, Chittenden County, and population centers in the northeastern United States.
c. Support efforts to ensure that the working landscape—including agriculture, forestry, and value-added production—remains a key sector in the region's economy.
d. Support economic diversity in tourism, transportation, recreation and agriculture to protect against negative economic impacts of climate change.

3 GOAL

Ensure that communities and businesses can rely on employees who are work ready; have strong work ethics and necessary skills in reading, writing, STEM (science, technology, engineering, math), and communication.

a. All levels of education—both K through 12 and post-secondary—must provide students with basic skills and solid work ethics for the workplace as well as post-high school education and training programs, and they must deliver skill sets that meet the changing needs of business and the rigors of collegiate programs.
b. All sectors of business, education, public protection, and the community must actively support economic sustainability by educating residents and employees on substance abuse, supporting drug rehabilitation and drug prevention programs, and addressing the crimes often related to drug addiction.
c. c. Support efforts to increase opportunities for students and adults to enjoy economic success by entering careers in the trades and licensed trades.

4 GOAL

Ensure that businesses, employees, and communities have access to funding that is achievable and affordable, business costs that are reasonable and appropriate, and an infrastructure that is available and dependable.

a. Ensure that the existing vibrant base of businesses—including manufacturing, agriculture and related businesses, health care, retail and service industries, home-based businesses, telecommuting, and seasonal and tourist-based businesses—have knowledge of and access to existing resources.
b. Support efforts to bring in additional public and private resources to expand and upgrade infrastructure, including water, wastewater, broadband Internet, cellular service and energy.
c. Forge strategic partnerships for creating a full range of housing options across the entire pricing spectrum to affordably house the regional workforce.

5 GOAL

Facilitate collaboration among Franklin and Grand Isle Counties to address issues that are similar throughout each county and secure the communities' economic future.

a. Encourage public and private investments in the arts and creative economy and facilitate locally designed creative economy projects that build upon the region's cultural heritage and creative assets.
b. Support collaboration between communities and artists for arts appreciation, arts learning, and arts promotion.
c. Establish goals for Grand Isle County to improve collaboration among the "islands" while distinguishing each unique community.
d. Support regional economic development services such as workforce training, public transportation, incubator development, and collaborative marketing.
e. Ensure that new economic development enhances and supports the region's land-use goals.
f. Work cooperatively with other regional partners to maintain and improve a quality of life that is necessary to attract and retain the type of talented workforce required for a high-performance regional economy.

INFRASTRUCTURE: POST-SECONDARY, CHILD CARE, WORKFORCE & TELECOMMUNICATIONS

GOALS

1. **Make workforce training and post-secondary education available to increase employment rates, job retention, earnings, and occupational skills.**
2. **Ensure the availability of safe and affordable child care and integrate child-care needs into the planning process.**
3. **Develop and maintain a high-quality, affordable telecommunications infrastructure that provides the most efficient and effective as well as the least obtrusive system possible.**
4. **Ensure the availability of broadband access in order to increase economic opportunity and support economic diversity.**

ASSETS AND VALUES

Education Levels

Students who never complete high school have a large impact on the region's long-term economic outlook. According to the U.S. Department of Education's National Center for Education Statistics, the median income of persons ages 25 through 34 who had not completed high school was roughly $26,000.

Grand Isle County residents have educational attainment levels similar to the state as a whole.

Compared to the state, Franklin County has a higher percentage of residents who have completed less than the ninth grade (though that percentage has dropped over the past decade) as well as a lower percentage of residents with a graduate/professional or bachelor's degree (Figure 1).

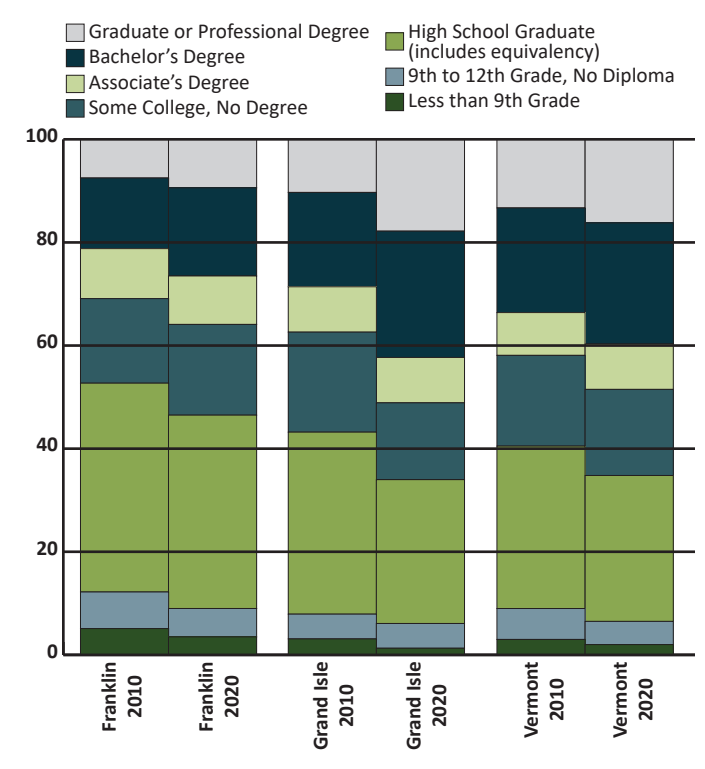
Educational attainment varies significantly by race and ethnicity. Accurate regionally specific data is not available, but statewide data shows a disparity in educational outcomes. Native Americans fall well below that of any other measured group, with only 5.2% having a bachelor's degree. Asian Vermonters have the highest levels of bachelor's degrees but also the highest percentage of people who did not finish high school. (ACS 2018-2022)

Post-Secondary Education and Workforce Development

The phrase "post-secondary education and workforce development" describes the knowledge, skills, and behaviors essential for high school graduates to be prepared to enter college and the workforce and to compete in the global economy. Post-secondary education and workforce development curriculum assumes that students are ready and able to demonstrate reading and math literacy without the need for remediation. Table 3 shows the educational attainment of the region's residents.

Workforce development is hard to measure, but it is extremely important to the continued prosperity of the region and for maintaining and attracting new business and industry. Incumbent employees who receive on- the-job training are, in general, promoted and receive higher wages. Newly trained employees who move into new positions create backfill openings for entry-level workers. The Vermont Training Program (VTP) provides comprehensive resources to prepare Vermont's workforce for new and enhanced positions. The VTP offers funds for the training of new hires and incumbent workers. Training can fall into categories such as on-the-job, classroom, or other specialized training. Grants can cover up to 50% of the training cost.

FIGURE 1: Educational Attainment - Residents Ages 25+ Franklin & Grand Isle Counties, VT



SOURCE: *U.S. Census Bureau 2010 Census & 2016 - 2020 American Community Surveys*

Vocational education is offered at the Cold Hollow Career Center in Enosburg Falls and at a number of high schools. Northwest Technical Center in St. Albans City also serves students in grades 10 through 12 who are interested in technically oriented careers, and it also offers classes for adults. Both serve as regional technical educational centers, accepting students from other school districts.

The Community College of Vermont offers educational services through a network of 12 sites around Vermont, including a campus in St. Albans City. Numerous degree programs and individual classes are also available online. The college is part of the Vermont State Colleges system, and it provides degree and non-degree programs to more than 9,000 students statewide.

TABLE 3: Educational Attainment by Race and Ethnicity

	White	Black	Asian	Other	Two or More Races	Hispanic
High School Graduate or Higher	94.8%	83.7%	83.5%	92.2%	95.5%	94.7%
Bachelor's Degree or Higher	44.5%	35.7%	52.0%	34.6%	45.2%	58.0%

SOURCE: *ACS 2018 - 2022*

Vermont Adult Learning (VAL) is a nonprofit organization that provides educational services for adults ages 16 and older who are not enrolled in high school. VAL provides General Educational Development (GED) preparation and testing as well as instruction in reading, writing, and STEM. VAL also helps students in a number of related areas, including driver's licenses, citizenship applications, and basic computer skills.

Many colleges and universities serve the region's residents in locations throughout the state, in neighboring states, and in Canada, including the University of Vermont and Champlain College in nearby Burlington, four Vermont State University campuses, and St. Michael's College in Colchester, along with nearby Canadian institutions such as McGill University in Montreal. In addition, numerous accredited online colleges and universities are available to the region's residents. Online educational opportunities provide an alternative for students who cannot attend classes in the traditional campus and classroom environments. Ensuring that the region's residents have access to such educational opportunities is essential to the economic health and prosperity of northwestern Vermont.

Child Care

Quality child-care services provide important benefits to a community and the region by contributing to early-childhood development, enhancing children's social skills, and resulting in more economically productive careers, as well as great personal and community civility (see Table 4 for data on overall need for services). Additionally, child-care services enable parents of young children to work, which reduces employers' recruiting and training costs for new employees following turnover due to parents' inability to obtain adequate child care.

According to the Vermont Department of Children and Families' 2019 market rate report, the average cost for full-time center-based care in the St. Albans district is $239.50 per week for infants and $227.00 per week for preschoolers, lower than the statewide averages. However, there is a significant gap between the current child-care subsidy rates and the market rates for care, especially for children younger than age three, and state subsidies vary widely depending on childcare facilities' ratings. This places an outsized burden on large families, who have to pay a higher copay, and those living far from a highly subsidized facility.

The number of child care providers in the region changes regularly, but there is a consistent gap between child care that is needed and child care that is available. In 2021, data from Let's Grow Kids estimated that an additional 1,000 children could be served if care was available. This need is especially true for infants and toddlers, since not all child care providers serve that age group (Table 4).

TABLE 4: Estimated Need and Supply of Child-Care Services in the Region

	Franklin County	Grand Isle County
Number of Children Birth to 12 Years	6,136	689
Number of Children Who Require Regulated Child-Care (estimated)	3,988	448
Number of Children Five Years Old or Younger	3,007	319
Proportion of Licensed Providers Serving Infants and Toddlers	64%	50%

SOURCE: *VT Agency of Human Services*

BROADBAND

Information technology is integral to fulfilling the economic needs of residents and businesses in the region. Telecommunications is the communication of information through various media. Information is transmitted in

numerous formats (e.g., voice, data, graphics, images, and video) over various media (e.g., copper wires, fiber-optic cable, air, and space). While this section focuses on broadband, it is important to note the region still has large geographic areas where cell phone service is unavailable or inadequate.

Broadband technology is a necessary component of the region's economic development. Broadband services can help increase residents' access to educational opportunities and resources, provide an interactive online marketplace for consumers, expand the customer base for businesses, facilitate access to higher-skilled employment opportunities for residents, enhance medical capabilities for health-care providers, provide access to health resources for the public, and contribute to increased productivity in the workplace. In addition, broadband services promote a sense of community through various online forums and encourage civic participation. Civic organizations can provide services to a greater portion of the communities they serve and create opportunities for new services.

The federal standard for broadband speed is 25/3 megabits per second (Mbps) of download/upload speeds, while the State Telecommunications Plan 2021 calls to increase the standard to 100/100 Mbps. The Vermont Department of Public Service has an estimate of the proportion of every town and city's buildings served by five tiers of internet service measured in Mbps of download/upload speeds. It should be noted that the actual speeds per premise are often below the advertised rate. Table 5 summarizes the five tiers of service and the number of premises served by each level within the region, as well as the underserved. (VT Department of Public Service, November 2022)

Existing types of broadband services in the region include cable, DSL, fiber-optic, satellite, mobile wireless, and fixed-point wireless. Broadband companies serving the region are Comcast Communications LLC, Consolidated Communications, DirectTV (600 MHz), FirstLight, Franklin Telephone, GlobalNet, Hughes Network Systems, Starlink, AT&T Mobility, Verizon Wireless, Sprint Nextel, T-Mobile, Mansfield Community Fiber, Viasat, and VTel Wireless. Coverage gaps can be found in nearly all municipalities. The most current view of broadband availability may be found at https://publicservice.vermont.gov/content/broadband-availability.

In August 2020, NRPC assisted Enosburgh Town, Fairfax, and Montgomery in the creation of the Northwest Communications Union District and then provided technical and administrative support to the organization during the first two years. The Northwest CUD (dba Northwest FiberWorx) now encompasses 21 municipalities in the region plus Milton in Chittenden County. Currently, utilizing state and federal broadband funding sources, they are active in planning and designing a community-based fiber-optic network that will provide universal access to all homes and businesses in the region (https://www.nwfiberworx.com). The focus is on unserved and underserved areas. The first construction phase is scheduled to begin in 2023.

TABLE 5: Five Tiers of Internet Service

Internet Connectivity 2022	Service Locations Franklin County	Percent Served or Better	Service Locations Grand Isle County	Percent Served or Better
100/100 Mbps or Greater	3,149	13.7%	5	0.1%
100/20 Mbps	17,897	77.7%	3,808	59.4%
25/3 Mbps	18,250	79.29%	4,421	69.0%
25/3 Mbps (includes wireless)	18,938	82.2%	4,676	72.9%
4/1 Mbps	22,740	98.7%	6,248	97.5%
Lacking 4/1 Mbps (underserved)	295	1.3%	163	2.5%

SOURCE: *VT Department of Public Service, November 2022*

GOALS AND POLICIES

1 GOAL

Make workforce training and post-secondary education available to increase employment rates, job retention, earnings, and occupational skills.

a. Support efforts by the regional technical centers and others to provide training that is based on employer-defined skill standards and essential academic learning requirements.
b. Promote efforts to provide individuals with the skills, knowledge, and abilities required to improve economic well-being and respond to changing workforce needs.

2 GOAL

Ensure the availability of safe and affordable child care, and integrate child-care needs into the planning process.

a. Municipal plans should include the future need for and supply of child-care services, assess whether local barriers exist for the provision of needed services, and develop action programs to reduce any local barriers.
b. Municipal land-use and development regulations should authorize child-care services in appropriate locations convenient to households and employers.
c. Employers, schools, and community organizations should collaborate to ensure that affordable, quality child-care services are available to meet the different needs of households.

3 GOAL

Develop and maintain a high-quality, affordable telecommunications infrastructure that provides the most efficient and effective as well as the least obtrusive system possible.

a. Support FiberWorx, the Northwest region's Communication Union District, in its effort to complete last mile build-out of broadband infrastructure in the region in unserved and underserved areas.
b. Promote Internet provider programs that offer reduced-cost broadband plans for families who qualify for the free or reduced-cost lunch program. Advocate for the expansion of these programs to more Internet providers.
c. Support state agency plans to strategically improve infrastructure that supports improved cellular service coverage in the region.
d. Ensure that the telecommunications system and related infrastructure fit within the character of the area as defined by the local and regional plans.
e. Consolidation of new telecommunications facilities on existing sites is preferred over the development of new sites. New telecommunications equipment and towers shall be sited in the least obtrusive and least ecologically sensitive areas possible.

4 GOAL

Ensure the availability of broadband access in order to increase economic opportunity and support economic diversity.

a. Support the development of a telecommunications infrastructure that enhances employment and business opportunities, high-quality education, lifelong learning opportunities and telehealth.
b. Promote affordable, universal access to high-speed broadband and emerging telecommunications technologies.
c. Identify and inventory specific technology infrastructure needs, such as telecommuting hubs and Wi-Fi hotspots.

ENERGY

GOALS

1. **Ensure all residents have equitable access to the benefits and an equitable share of the burdens of the energy transition.**
2. **Use demand-side management to handle the expected doubling of electric energy demand in the Northwest region by 2050.**
3. **Reduce annual regional fossil fuel needs and fuel costs for heating structures and foster the transition from nonrenewable fuel sources to renewable fuel sources.**
4. **Hold vehicle miles traveled per capita to 2011 levels through reducing the share of single-occupancy vehicle (SOV) commute trips, doubling the share of pedestrian and bicycle commute trips, increasing public transit ridership, and focusing regional development in or near existing growth centers and villages.**
5. **Significantly increase region-based passenger rail trips and double rail freight tonnage in the region by 2050.**
6. **Increase the share of renewable energy in transportation by increasing the use of renewable and less carbon-intensive fuels.**
7. **Increase the renewable energy generation capacity in the Northwest region with new solar, wind, and hydro generation capacity by 2050.**

REGIONAL ASSETS AND OPPORTUNITIES

In 2017, NRPC completed the Northwest Regional Energy Plan, a pilot project funded by the Vermont Department of Public Service. The intent of the project was to complete in-depth energy planning at the regional level while achieving state and regional energy goals (Figure 2)—most notably, the goal to have renewable energy sources meet 90% of the state's total energy needs by 2050 (known as the 90 x 50 goal). The energy element of this regional plan consists of this energy section and the full Northwest Regional Energy Plan, included by reference and available at www.nrpcvt.com. While the energy chapter is a high-level overview of NRPC's energy goals and policies, the energy plan takes a comprehensive and detailed look at the region's energy context. The regional energy plan meets the standards required for an enhanced energy plan and therefore gives NRPC increased deference in Act 248 proceedings. The requirements for enhanced energy plans can be found in Appendix I of the regional energy plan. The outline of the full regional energy plan can be seen in Table 6.

Since the development of NRPC's regional energy plan, there have been several statewide planning efforts that will inform NRPC's future energy planning. In 2020, the legislature passed the Global Warming Solutions Act,

which sets specific required emissions targets for the state. The Climate Action Plan (CAP), written in 2021 by Vermont's Climate Council, sets out pathways to achieve these emission targets, as well as addressing how to ensure an equitable transition and climate resilience. In 2022, the state updated its Comprehensive Energy Plan (CEP). The CEP included an increased focus on ensuring an equitable climate change transition and three updated sector goals for thermal, transportation, and electric sectors.

NRPC expects to adopt a new regional energy plan in 2023 that further addresses these new statewide planning efforts and new regional considerations. This chapter of the regional plan similarly includes a focus on equity and a just transition for all residents to the green future.

FIGURE 2: State and Greenhouse Gas Emission Goals

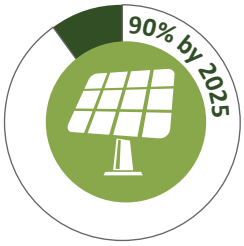
Global Warming Solutions Act: Requirements for Reducing Greenhouse Gases

Not less than 26% from 2005 greenhouse gas emissions by January 1, 2025, pursuant to the State's membership in the United States Climate Alliance and commitment to implement policies to achieve the objectives of the 2016 Paris Agreement

Not less than 40% from 1990 greenhouse gas emissions by January 1, 2030, pursuant to the State's 2016 Comprehensive Energy Plan

Not less than 80% from 1990 greenhouse gas emissions by January 1, 2050, pursuant to the State's 2016 Comprehensive Energy Plan

Increasing Renewable Energy



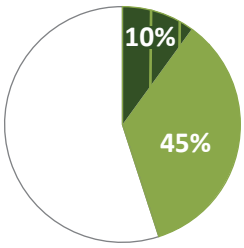
Meet 90% of Vermont's overall energy needs from renewable sources by 2050

CURRENT ENERGY USE AND GENERATION

NRPC has been tracking and analyzing energy generation and consumption data since the creation of the region's enhanced energy plan in 2017. The COVID-19 pandemic has made accurate data collection in recent years difficult, so trends around energy usage and other important data points might be distorted.

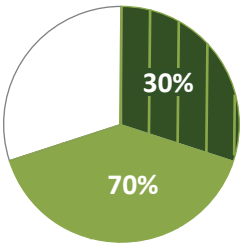
FIGURE 3: State Comprehensive Energy Plan Goals

Transportation Sector



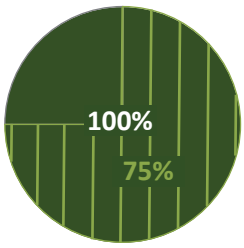
Meet 10% of energy needs from renewable energy by 2025, and 45% by 2040

Thermal Sector



Meet 30% of energy needs from renewable energy by 2025, and 70% by 2042

Electric Sector



Meet 100% of energy needs from carbon-free resources by 2032, with at least 75% from renewable energy

TABLE 6: Northwest Regional Energy Plan Outline (available at www.nrpcvt.com)

Section I	Executive Summary
Section II	Introduction
Section III	Regional Energy Supply and Consumption
Section IV	Targets for Energy Conservation, Energy Use and Electricity Generation
Section V	Strategies to Achieve Regional Targets
Section VI	Feasibility, Challenges and Conclusions
Appendix A	Regional Targets - Energy Conservation and Renewable Generation
Appendix B	Known and Possible Constraints - Used to Create Regional Energy Generation Maps
Appendix C	Regional Generation Maps
Appendix D	Planning Process
Appendix E	List of Acronyms and Phrases
Appendix F	Summary of Existing Renewable Generation Facilities in the Northwest Region
Appendix G	Summary of Municipal Energy - Analysis and Targets

SOURCE: *Northwest Regional Energy Plan*

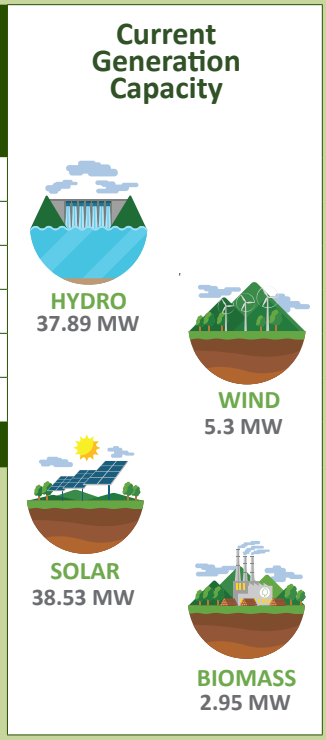
Despite the complications with data, a few trends have remained clear throughout the past several years. Residential electricity use has increased, a trend most likely caused by the increasing use of technology like electric heat pumps to heat and cool homes, electric cars, and other electrification technologies that allow residents to move away from fossil fuels and instead use electricity for more of their energy needs. In generation trends, solar installations have been increasing, both as commercial projects and smaller, home-based projects. Given environmental concerns with new hydro projects and the incompatibility of industrial wind with regional constraints, solar has been the primary form of new renewable energy generation in the region within the past five years.

FIGURE 4: Regional Generation Capacity

TYPE OF GENERATION	Generation Capacity (in MW) January 2017	Generation Capacity (in MW) January 2023
Hydro	41.4	37.89
Wind	5.3	5.3
Solar	9.5	38.53
Biomass	2.3	2.95
Fuel Oil/Biodiesel	40	48
Other	0	0
TOTAL	**98.4**	**132.67**

1. *Current Fuel Oil/Biodiesel Generation in only a peaking plant. It is only permitted for use a maximum of 600 hours per year.*
2. *Some proposed generation may have been constructed.*

SOURCE: *Community Energy Dashboard, Public Service Department and NRPC*



ENERGY USE AND GENERATION - FUTURE TARGETS

Energy Conservation

In 2017, the NRPC worked with the Vermont Energy Investment Corporation (VEIC) to create targets for energy conservation and renewable energy generation. The energy saved via conservation and improved efficiency was targeted to equal approximately 3.5 trillion BTUs by 2050. NRPC is currently working with VEIC to create updated targets and measure our progress

toward these goals. Conservation and improved efficiency are planned through a variety of means, including increased use of efficient materials during construction and weatherization of existing structures. Most prominently, improved efficiency is targeted through the use of electric vehicles for transportation and electric heat pumps for space heating. The resulting increase in regional electricity demand means that electricity generation in the region will also need to increase.

Energy Generation

NRPC plans to set new renewable energy generation targets as part of an upcoming update to the Northwest Regional Energy Plan.

A substantial part of the Northwest region's efforts to set renewable electricity generation goals involved the creation of regional energy generation guidelines and maps. The regional energy generation guidelines and maps, combined with the other sections of the NRPC regional plan, provide parameters for the development of new solar, wind, hydro, and biomass energy generation facilities in the Northwest region. The maps provide a macro-scale look at different factors that impact the siting of renewable generation facilities, including generation potential. NRPC will analyze the results of the maps and targets to ensure that NRPC has allowed for sufficient renewable electricity generation in the region while avoiding undue adverse impacts upon known and possible constraints. (These constraints are specifically identified in Appendix B of the regional energy plan.)

NRPC is committed to achieving its wind generation targets, but only through the construction of appropriately scaled wind generation facilities. Based upon the analysis in the regional energy plan (see Appendix II), the region generally does not have suitable locations for the construction of industrial or commercial wind facilities development, and therefore these types of facilities do not conform to this plan. For the purposes of this plan, NRPC will consider any wind facility with a tower height in excess of 100 feet (excluding blades) to be considered an industrial or commercial wind facility.

While the state goals focus specifically on solar, hydro, and wind, other renewable generation methods exist and may be appropriate for the region. The upcoming regional energy plan update will address these alternative generation methods in more detail.

CHALLENGES AND OPPORTUNITIES

Achieving energy conservation goals will require heavy reliance on the choices of individual consumers in the region. The region's thermal efficiency goals are similar. Incentives, education, and other programs that promote relevant changes can help encourage individuals to make these choices. Small-scale energy production goals and conservation goals require broad citizen participation in order to be achieved. Because citizen and consumer participation will be an important component of the success of this plan, NRPC will continue to work with our regional energy and climate committee to support the creation of municipal energy committees and support community engagement programs.

Achieving transportation-related energy goals is more straightforward. One of NRPC's core functions is coordinating transportation planning for the region. Therefore, NRPC is well suited to be a key player in achieving goals and implementing strategies for transportation. Given NRPC's role in transportation planning in the region, there is opportunity for NRPC to be a leader in transportation implementation actions.

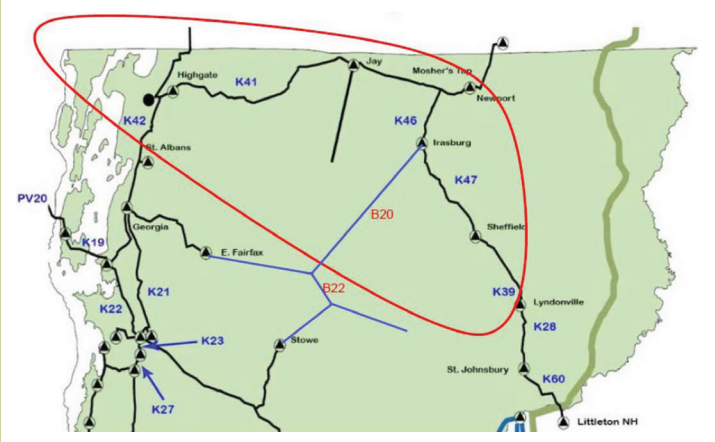
There are several challenges to successful plan implementation, including challenges pertaining to how the electric grid operates. The region's renewable generation goals are challenged by grid capacity constraints.

In a large portion of northern Vermont, known as the Sheffield-Highgate Export Interface (SHEI), the electric transmission grid was historically built to deliver energy from elsewhere to a relatively small population. As a result, there is limited transmission capacity for renewable generation in the SHEI. Currently, the SHEI contains much of the northern tier of our region. As more renewable generation is sited in the region, the constrained region may expand. To meet our regional renewable generation goals, this issue will need to be addressed through strategic improvements to the transmission system, non-transmission strategies such as battery storage, and increasing load (demand) for electricity within SHEI.

Other challenges include the need to balance "baseload" and "intermittent" electricity generation along with storage to ensure grid reliability, as well as inclement weather, which can threaten electricity service. Additional challenges include:

- Environmental concerns when developing new hydro generation
- Lack of solar generation during winter and night hours
- Lack of sufficient biofuel or ethanol technologies and research
- Lack of site-specific guidelines for solar and wind generation facilities
- Potential for large, out-of-region owned renewable energy generation facilities with limited benefit to the region
- Lack of residential building energy standards (RBES) and commercial building energy standards (CBES) outreach and enforcement
- The limits of regional planning commissions' jurisdiction

MAP 2: Sheffield-Highgate Export Interface (SHEI)



SOURCE: *https://www.vermontspc.com/library/document/download/5995/VELCO_SHEI_Study_FinalReport.pdf (page 4)*

NOTE: *The area in red is the Sheffield-Highgate Export Interface*

Equity and Affordability

Successfully reaching NRPC's energy goals and policies will require both economic and environmental costs. The equity issues related to who will bear those costs is of continuing concern to NRPC. Moving forward, NRPC is committed to proactively working to include equity in our energy and climate planning and ensuring representation of frontline communities who are most impacted by climate change. We recognize that the benefits and burdens of climate planning have not always been evenly distributed and that a just and sustainable transition requires that all residents have equitable access to the benefits and an equitable share of the burdens of the energy transition.

The transition to a more sustainable region will have both costs and benefits. The efficiency of green technologies offers savings for consumers as seen with electric vehicles, electric heat pumps, newer appliances, residential solar, etc. These technologies often have a higher upfront cost or require upfront investment, making them more difficult to access for residents with lower income. Low-income workers in Vermont also tend to work in industries that are more susceptible to the effects of climate change, such as tourism and agriculture, and are often disproportionately impacted by natural disasters like flooding. Integrating equity into every decision we make around energy and climate change will help to ensure NRPC's work benefits all residents and works to close the equity gap instead of increasing it. Vermont's Climate Council created Guiding Principles for a Just Transition, which will ensure consistent and integrated application of equity assessment to all of NRPC's work.

Guiding Policy Statements

NRPC readopts these overall statements of policy to affirm its commitment to meeting state and regional energy goals and to satisfy the determination standards established by the Vermont Department of Public Service:

1. Support conservation efforts and the efficient use of energy across all sectors.
2. Reduce in-region transportation energy demand, reduce single-occupancy vehicle use, and transition to renewable and lower-emission energy sources for transportation.
3. Increase the use of energy conservation practices in site planning and development and support patterns and densities of concentrated development that result in the conservation of energy.
4. Review the development and siting of renewable energy resources in the Northwest region that are in conformance with the goals, strategies, standards, and maps contained in this plan.

Additional goals, policies, and implementation steps will guide the Northwest region in achieving energy conservation and renewable energy generation targets. These have been specifically identified for the following categories: electricity conservation, thermal efficiency, and transportation. Goals and policies in other areas of the regional plan related to local food production and consumption, land-use patterns, natural resource protection, utilities, and other areas also support implementation of the energy goals. Implementation steps can be found in the introduction of this plan and the Northwest Regional Energy Plan in Appendix II.

GOALS AND POLICIES

1 GOAL — Ensure all residents have equitable access to the benefits and an equitable share of the burdens of the energy transition.

a. Use the Vermont Climate Council's Guiding Principles for a Just Transition (Appendix J of the regional energy plan) to proactively work toward equity in our energy and climate work.
b. Promote and support incentive programs for low-income and rural residents and other frontline communities to ensure equitable access to the economic benefits of energy-efficient technologies.
c. Ensure environmental justice as defined by the EPA when determining regional conformance of energy generation projects.
d. Promote widespread access to education on energy transition opportunities and advocate for equitable access to such opportunities.
e. Encourage policy makers to consider equity issues outside of Vermont when making decisions about our energy future.

2 GOAL — Use demand-side management to handle the expected doubling of electric energy demand in the Northwest region by 2050.

a. Encourage public utilities to move all customers to smart rates (i.e., charging higher rates during peak demand times), with mitigation of any differential effects of smart rates on low-income customers.
b. Encourage the legislature and/or public utilities to create programs that promote the use of energy storage systems for individuals and system-wide. Using electric storage systems may reduce peak demand and provide emergency backup power.
c. Support public utilities' efforts to increase customers' knowledge of their energy use. This may happen

through increased outreach to and education of customers, but it may also occur through the use of new technology, such as real-time monitoring of energy use.

d. Support the efforts of Efficiency Vermont to promote the selection and installation of devices, appliances, and equipment that will perform work using less energy (e.g., those with ENERGY STAR certification). This includes "load controllable equipment."
e. Encourage HVAC and weatherization providers to join the Building Performance Professionals Association of Vermont (BPPA-VT) to provide holistic energy advice to Vermonters.
f. Support and encourage school participation in Vermont Energy Education Program (VEEP) activities that foster an educational foundation geared toward energy savings.

3 GOAL

Reduce annual regional fuel needs and fuel bills for heating structures and foster the transition from nonrenewable fuel sources to renewable fuel sources.

a. Support efforts to transition residential and commercial sectors from nonrenewable sources such as heating oil and propane to biofuels, biomass, and electric heat pumps.
b. Support changes that create simplified financing for fuel switching that links bill payments, home equity, and public sector incentives.
c. Support the use of geothermal heating and cooling systems for new residential and commercial construction in the region.
d. Support programs that provide assistance to all households, including low-income households, to weatherize their homes.
e. Endorse the use of Downtown and Village Tax Credit programs to complete weatherization projects in the region's designated areas.
f. Support the creation of additional sustainable forest industries and biomass-related industries in the region to supply local biomass users.
g. Support greater state enforcement of existing state energy codes to ensure that all renovations of existing structures are energy efficient and meet current standards.

4 GOAL

Hold vehicle miles traveled (VMT) per capita to 2011 levels through reducing the share of single-occupancy vehicle (SOV) commuter trips, increasing the share of pedestrian and bicycle commute trips and public transit ridership, and focusing regional development in or near existing growth centers and villages.

a. New public and private transportation infrastructure shall be designed and built to interconnect with existing adjacent land development(s) and with adjacent lands that have the potential for future land development. This will ensure more efficient traffic patterns and bicycle and pedestrian movement within the region.
b. Support efforts to make regional transit authorities like Green Mountain Transit statutory parties to all Act 250 applications in the region.
c. Require a public transit stop for all residential and large commercial land developments subject to Act 250 if a stop is not currently available.
d. Support planning for municipal streetscape improvements and on-street parking in state-designated village areas. This may require some cooperation with the Vermont Agency of Transportation in some villages due to the existence of state roads.
e. Support municipal efforts to plan for future compact development that includes opportunities for

walking, use of public transportation, and other forms of transportation that are an alternative to the single-occupancy vehicle. Municipal efforts may include capital budgeting, streetscape plans, revitalization plans, or adoption of an "official map" (as outlined in 24 V.S.A. Chapter 117, to identify future municipal utility and facility improvements, such as road or recreational path rights-of-way, parkland, utility rights-of-way, and other public improvements) by the municipality.

f. Support changes to public transportation funding in the state that alters how public transit routes are funded. Support efforts for state funding of public transportation routes that serve stops on federal and state highways (in a similar manner to the existing highway funding system) and require municipal funding primarily for public transportation routes that serve local roads.
g. Work with regional employers to identify and encourage programs to reduce single-occupancy vehicle commuting by employees. Share best practices and encourage recognition of successful programs.
h. Support increased funding for expansion of public transit into Grand Isle County and the region's rural areas.

5 GOAL

Increase region-based passenger rail trips and rail freight tonnage in the region by 2050.

a. Support the extension of Vermonter service to Montreal.
b. Support increased rail freight service to the region.
c. Expand intermodal connection opportunities for passengers and freight.

6 GOAL

Increase the share of renewable energy in transportation by increasing the use of renewable and less carbon-intensive fuels.

a. Require all commercial, industrial, and multifamily developments subject to Act 250 to provide electric vehicle (EV) parking spots and at least one electric vehicle charger with associated infrastructure.
b. Continue to support Vermont Agency of Commerce and Community Development (ACCD) grant opportunities for municipalities to install EV charging stations, infrastructure, and supply in designated areas.
c. Support financial incentives for municipalities that develop direct current (DC) fast EV charging stations.
d. Support the development and creation of biofuels production and distribution infrastructure in the region.
e. Support the efforts of municipal fleet operators to replace inefficient vehicles with more efficient vehicles, including heavy-duty vehicles that operate on biofuels.

7 GOAL

Increase the renewable energy generation capacity in the Northwest region with new solar, wind, and hydro generation capacity by 2050.

a. Support the development of individual home and community-based renewable energy projects in the region through the following programs: Vermont Small Scale Renewable Energy Incentive Program, Vermont Clean Energy Development Fund, and tax and regulatory incentives, including net-metering.
b. Support changes to net-metering rules and other regulatory tools to provide financial incentives in order to encourage siting of renewable generation facilities on the built environment (such as parking

structures and rooftops) and other disturbed lands (such as former landfills, brownfields, or gravel pits). Support changes to net-metering rules that disincentivize development on land identified in this plan as a location with known and possible constraints. Encourage multiple uses in conjunction with the development of renewable generation facilities, such as grazing of livestock, recreation, or parking. Support efforts to make net-metering more accessible to low-income residents.

c. Continue to support the Standard Offer Program to foster deployment of diverse and cost-effective renewable energy resources, and support the evaluation of this program to determine if the program should be extended or changed.
d. Support efforts by local utilities and private individuals to maintain and upgrade existing renewable electric generation facilities and necessary distribution and transmission infrastructure in the Northwest region and the state.
e. Support the development of additional methane digesters on farms in the Northwest region, especially those that utilize manure from multiple farms and/or food waste.
f. Support the creation of incentives for locating new renewable energy generation facilities within a half-mile of three-phase distribution line or electric transmission line infrastructure. Ensure new transmission lines and three-phase power lines associated with renewable energy projects do not create forest fragmentation or have an undue adverse impact on necessary wildlife habitats, ecological systems, and water and/or air quality.
g. Development and siting of energy generation facilities shall be in conformance with the goals, strategies, standards, mapping, and other information contained in the entire regional plan. Standards of review for known and possible constraints (see Appendix B of the regional energy plan) will be used in evaluation of conformance.
h. Wind facilities with a tower height in excess of 100 feet (excluding blades) shall not be considered to be in conformance with this plan.

SOCIAL REGION

Infrastructure: Education, Libraries & Recreation Facilities

Housing

Community Health

INFRASTRUCTURE: EDUCATION, LIBRARIES & RECREATION FACILITIES

GOALS

1. **Provide high-quality educational and vocational opportunities that meet the needs of our population, regardless of age or economic status.**
2. **Ensure the region has a network of high-quality, publicly accessible and free community libraries.**
3. **Offer high-quality, sustainable recreational land, facilities, and programs that meet the recreational needs of current and future generations.**

Strong educational and recreational facilities are key to ensuring our region's people are healthy and that its communities are vibrant. Franklin and Grand Isle Counties are fortunate to have successful schools, healthy and community-supported libraries, and a location between two of Vermont's greatest recreational assets: Lake Champlain and the Green Mountains. Still, efforts must be made to maintain existing assets and further grow the region's infrastructure to ensure that all citizens have access to educational (Table 1) and recreational opportunities.

ASSETS AND VALUES

Education

The region's schools strive to provide high-quality education to all students. They aim to prepare students for the workforce, raise test proficiency ratings, and reduce the economic achievement gap while operating under declining (or unpredictable) school enrollment levels, increased costs per pupil, and budgetary constraints.

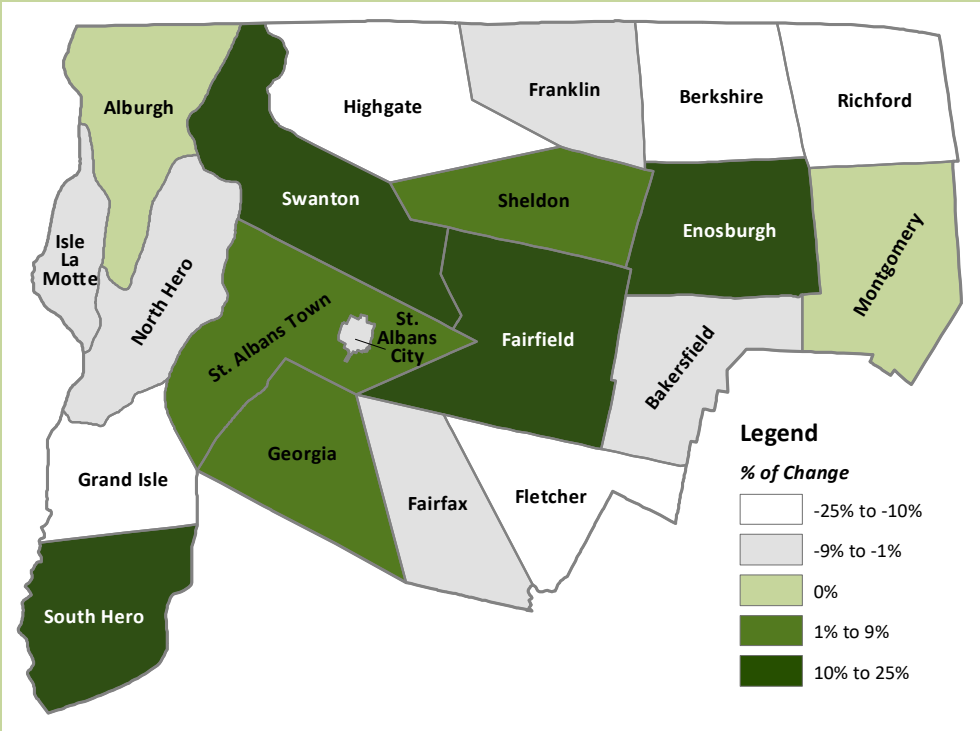
The State of Vermont uses standardized testing as a school accountability tool, mandated by the No Child Left Behind Act of 2001. These

TABLE 1: At a Glance - Education

- There are five supervisory unions in the region, which include:
  - 19 elementary schools
  - 4 junior high/middle schools
  - 5 high schools
  - 2 technical/career centers
- There were approximately 8,800 students enrolled in the region's schools for the 2021-2022 school year.
- 12 of the region's 23 municipalities provide tuition for grades 9–12 and 3 municipalities do so for grades 7–8 because there is neither a high school in the community nor a designated high school.

standardized tests help schools measure both individual student progress and how schools compare against each other. One of the key measures derived from these tests compares the results of students who qualify for free lunch or reduced-cost lunch with the results of students who do not. In the 2020–2021 eighth-grade math test, the average difference in percentage achieving at or above proficiency was 25.3%. Similarly, in eighth-grade language arts, the average difference in achieving at or above proficiency was 25.4% (Vermont Agency of Education, 2021). The overall percentage of students achieving proficiency or above was much lower in 2021 than in previous years, but this result is not directly comparable due to the many impacts of the COVID-19 pandemic on the education system, including the closure of schools for much of spring 2020.

MAP 1: Change in Elementary School Enrollment 2015-2022



SOURCE: *Vermont Agency of Education 2021*

Region-wide K–12 school enrollment has declined since the mid-2000s, and the majority of schools are facing declining enrollment. However, some schools, mainly in western and central Franklin County, are experiencing growth in enrollment compared to recent years. From the 2014–2015 school year to the 2021–2022 school year, Franklin County had a 1.8% increase and Grand Isle County had a 3.2% reduction in public school K-12 enrollment. Statewide there was a 5% reduction in enrollment during the same period. Enrollment numbers do not include high school students who attend school outside of the region or outside of the state.

Because of the size differences among regional schools and the way education funding is structured by Act 68, it is difficult to equitably compare per-pupil costs on a regional basis. Adjusting for inflation, some schools have seen increases in cost per equalized pupil since 2012, while others have not, but there does not appear to be a discernible trend explaining these changes.

Secondary, postsecondary, and adult technical education courses are provided through regional career centers, comprehensive high schools, and colleges. The Northwest region hosts two career and technical education centers: Cold Hollow Career Center at Enosburgh High School and Northwest Career and Technical Center at Bellows Free Academy high school in St. Albans.

Libraries

Library facilities are well distributed across the region. Only two towns in the region do not have a library: Berkshire and Fletcher. St. Albans Free Library serves both the City and the Town of St. Albans. Most public libraries are heavily dependent on local support. Municipal taxes provide the majority of funding for libraries, with almost two-thirds receiving at least 90% of their total income from this source. Volunteers contribute substantially to staffing many town libraries. For example, the library in Isle La Motte is operated entirely by volunteers.

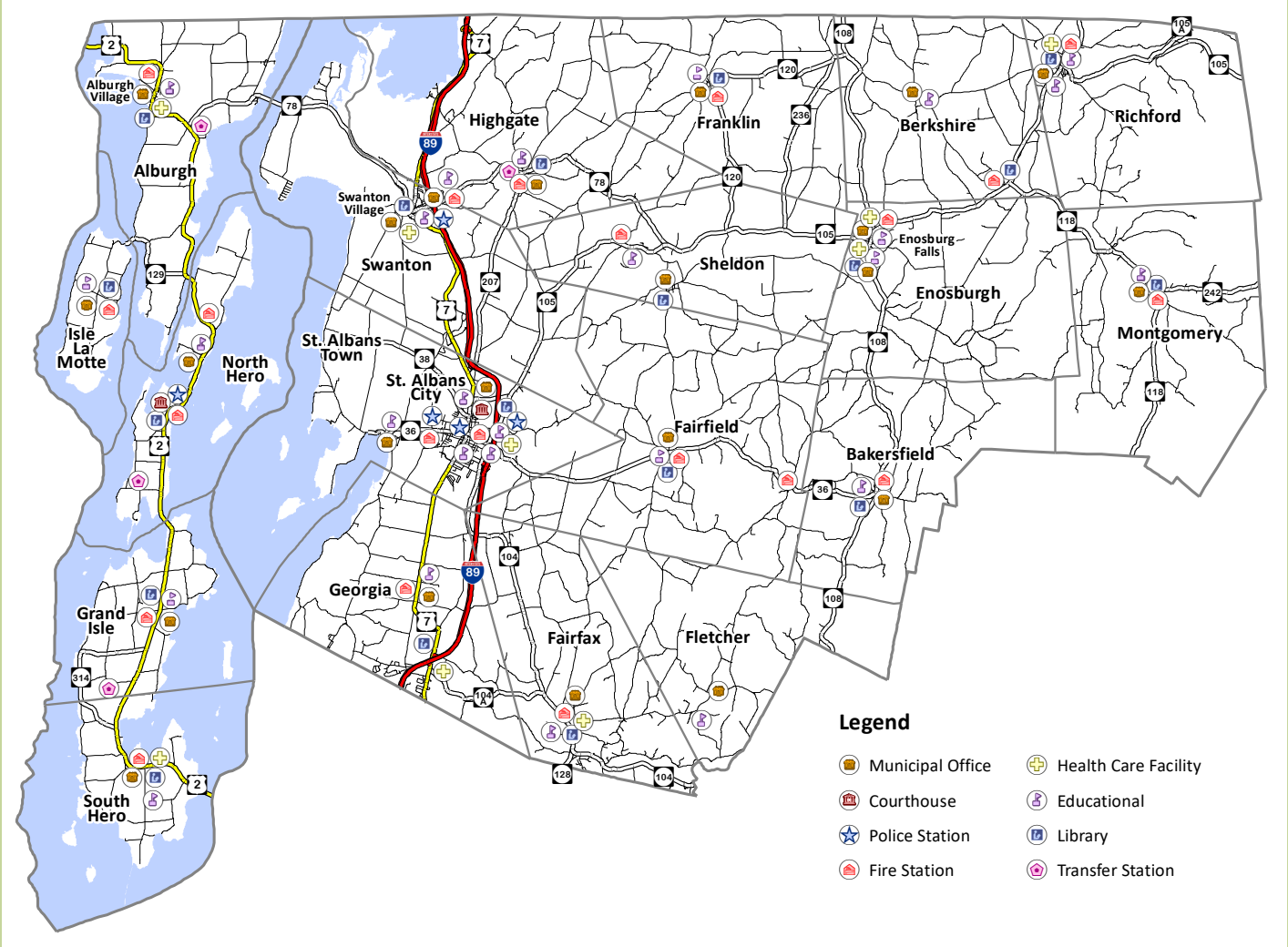
Internet access has vastly increased the resources available to rural libraries. All 17 libraries in the region have Internet access and 7 libraries have public Wi-Fi hotspots that allow for access outside of library hours (Vermont Department of Libraries, Vermont Public Library Statistics, FY 2021 Annual Report; Vermont Department of Public Service WiFi Hotspot Map). The interlibrary loan system is accessible to all libraries, enabling borrowers to obtain materials from all libraries in Vermont and, through the state's Department of Libraries, from most libraries across the country. The region is also uniquely served by the Franklin Grand Isle Bookmobile, a nonprofit local library that provides literacy activities, educational programming, and library services to children and adults.

Recreation

The Northwest region has a landscape ranging from the shores of Lake Champlain through expanses of the Champlain Valley's farmland to the western hills of the Green Mountains. For residents and visitors, this diverse topography offers a wide range of recreational opportunities.

Publicly owned lands cover more than 19,677 acres, 4.3% of the total land area in Franklin and Grand Isle Counties. The state owns more than half of this acreage, managing over 47 parcels ranging in size from the 1,766-acre Fairfield Swamp Wildlife Management Area to small, one-acre fishing access areas. The federally owned Missisquoi National Wildlife Refuge, which covers 6,470 acres, represents a very significant portion of the remaining public lands.

MAP 2: Northwest Region Facilities



SOURCE: *Vermont Enhanced 911 Board*

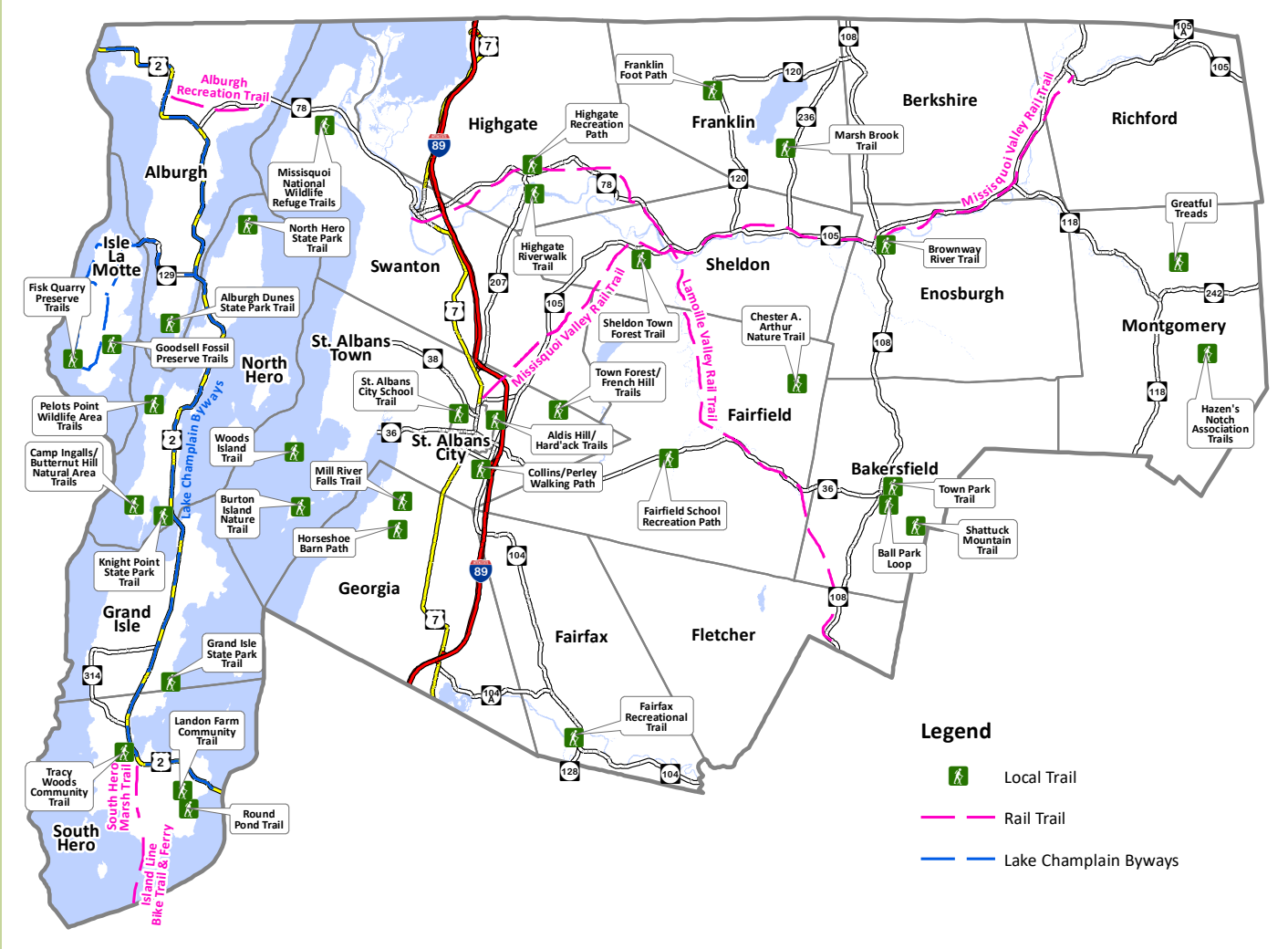
In addition to undeveloped forests, wetlands, and open lands, nearly every municipality in the region offers some recreational sites open to the public. Indoor recreation facilities serving the region include the Collins Perley Sports & Fitness Center in St. Albans Town and the Highgate Recreational Facility.

Hard'ack Recreation Area, owned by St. Albans City and located in St. Albans Town provides the only downhill skiing opportunity in the region, with a tow rope, snowmaking, and lighted trails. This recreation area was improved with a new lodge and, in 2022 a four-season community pool was added. Although not located within the region, Jay Peak Resort and Smugglers' Notch Resort are both located immediately adjacent to the region and are enjoyed by regional residents. These resorts provide a wide variety of winter recreational options (downhill skiing and snowboarding, cross-country skiing, ice skating, etc.).

The region could benefit from additional private gyms and fitness centers. The St. Albans-Swanton area is served by at least three private gyms. However, the remainder of Franklin County and Grand Isle County have no private gyms, although there are some private fitness class opportunities.

Franklin County is home to two significant outdoor recreation assets: the Missisquoi Valley Rail Trail (MVRT) and the Lamoille Valley Rail Trail (LVRT), two multi-use trails that span the region on more than 125 miles of decommissioned railroad beds. The MVRT spans from St. Albans Town to Richford. The LVRT spans from

MAP 3: Northwest Region Trails



SOURCE: *NRPC Collected Data*

Swanton south to Fletcher within the region, and then continues east to provide a connection to St. Johnsbury. Grand Isle County is a major bike recreation destination highlighted by the Island Line on road bike trails and a seasonal bike ferry connection to Colchester and the Burlington bike path. Communities throughout the region have sidewalks that provide additional opportunities for physical activity and for students to walk to school. See the transportation chapter for more details.

GOALS AND POLICIES

1 GOAL

Provide high-quality educational and vocational opportunities that meet the needs of our population, regardless of age or economic status.

a. Ensure that preschool, primary and secondary, and post-secondary educational services are provided in safe and accessible facilities with sufficient capacity, available at reasonable cost, and that meet or exceed state standards.
b. Ensure that new developments shall not place undue burden on the capacity of local school systems.
c. Support the location of schools and vocational training facilities within regional or sub-regional growth centers, or in city, village, or hamlet centers, rather than in non-growth areas.
d. Encourage the region's high schools and technical/career centers to offer specialized vocational training opportunities for both young adults and adults with varying backgrounds and educational levels.
e. Promote collaboration among local schools, technical/career centers, and businesses to support job growth and training needs and facilitate high-quality employment opportunities.

2 GOAL

Ensure the region has a network of high-quality, publicly accessible, and free community libraries.

a. Support the location of libraries within regional or sub-regional growth centers, or in city, village, or hamlet centers, rather than in non-growth areas.
b. Encourage libraries to provide educational and cultural programs for community members of all ages.
c. Support libraries as a place to learn about and use technology for people of all means and abilities and support installation/maintenance of Wi-Fi hot spots at libraries.

3 GOAL

Offer high-quality, sustainable recreational land, facilities, and programs that meet the recreational needs of current and future generations.

a. Support the establishment of a network of indoor and outdoor recreation land, facilities, and programs for people of various ages, physical abilities, incomes, races or ethnicities, and educational levels throughout the region.
b. Encourage the expanding network of high-quality, multi-use recreational trails in the region.
c. Promote the development of abundant opportunities for public access to the region's waters and shorelines.
d. Ensure all people feel welcome in our public and private recreation areas.
e. Support efforts to reduce financial barriers to access public lands.

HOUSING

GOALS

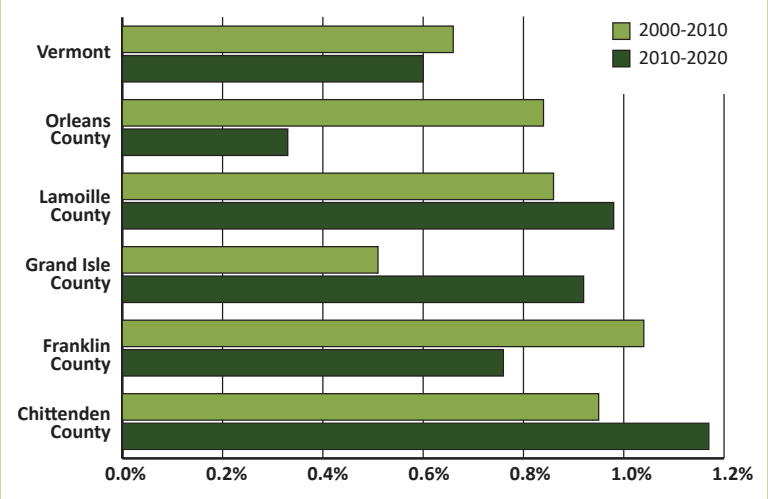
1. **Build and improve more homes so that high-quality, safe, and affordable housing options are equitably available to all current and future residents.**
2. **Ensure housing is easier to build in regional and sub-regional growth areas and village centers that are convenient and accessible to employment, services, retail, public transportation, recreation facilities, and schools.**
3. **Housing design and construction is energy efficient and minimizes adverse environmental impacts.**

Housing policy, planning, and regulation plays a major role in shaping the physical form, landscape, and demographics of the region. The policies set by regional and local plans result in regulations and other actions that impact the location, density, type, form, and amount of housing. These factors in turn inform the efficiency of utilities and services, the economic vitality of our region and its villages and downtowns, workforce availability, agricultural viability and forest fragmentation, and the overall character of our communities. Ultimately, regional planning decisions impact the housing options available to individuals and families, including accessibility to employment, health care, education, and grocery stores; affordability; and size.

Beyond physical implications, housing is a basic human need and foundational building block for individuals and families to be successful in life. It is well understood that once stable housing is achieved, individuals and families are more likely to sustain employment and achieve other life goals. While housing people is complicated by a wide range of social and economic policies and conditions, this region is committed to ensuring equitable access to safe, convenient, and affordable housing for current and future generations.

The region as a whole does not have enough affordable housing, driven in part by an overall housing shortage in the State of Vermont. The supply of housing has not kept pace with population growth, and more units are needed

FIGURE 1:
Rate of Growth in Number of Households



SOURCE: *Decennial Census, U.S. Census Bureau*

for a given population due to the growing number of smaller households. The shortage is complicated by an older, homogeneous housing stock, high construction costs, the pandemic, and other economic factors. The impacts of the housing crisis have rippled through every community; local and regional planners and officials throughout the state are faced with the immense challenge of taking action to better meet the housing needs of families and individuals.

NRPC completed a housing needs assessment in 2022 to provide an understanding of demographic and housing trends in the region and to quantify regional housing needs. (Northwest Vermont Housing Needs Assessment, Place Sense LLC, January 2023) This chapter includes important highlights and conclusions from the 2022 housing needs assessment.

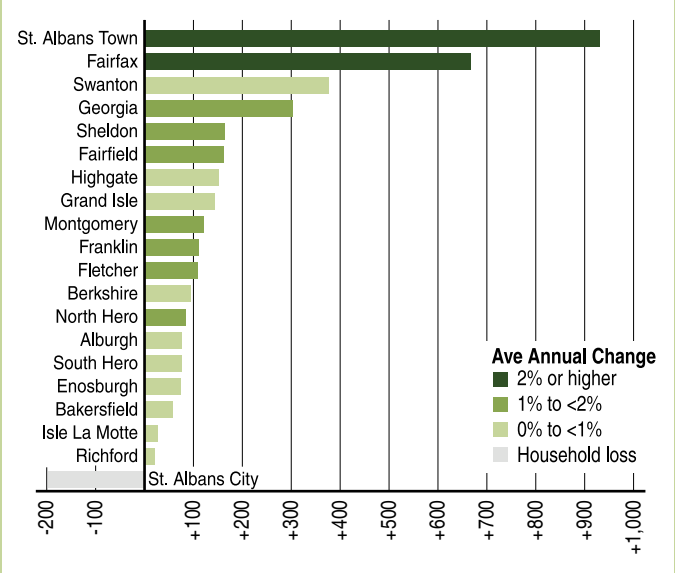
Current Housing Landscape and Trends

Household Count and Growth

23,088 households were living in the two-county region in 2020, an increase of 1,673 households from 2010. Household change has been increasing at slower rates since the 1970s, although Grand Isle County bucked this trend in the 2010s, growing faster than the previous decade. Overall, the region has been experiencing slow household growth—averaging 0.9% annually between 2000 and 2020. This growth is faster than the state, but slower than Chittenden County and Lamoille County.

Housing creation has largely been occurring in only a few communities in recent years. During the past 20 years, 45% of households moving into or forming in the region were in St. Albans Town and Fairfax. Only St. Albans City experienced a decline in the number of households between 2000 and 2020, although City permit data show a smaller decline of only 22 units.

FIGURE 2:
Change in Number of Households 2000 - 2020



SOURCE: *Decennial Census, U.S. Census Bureau*

Migration

Households that moved between 2000 and 2020 were largely going from one residence to another within the region, rather than migrating in from outside the region. Approximately 15% of residents who moved between 2015 and 2020 moved into the region from outside Vermont, while nearly 27% moved into the region from somewhere else in Vermont. In the coming decades, migration into Vermont by "climate refugees" is projected to increase. Some climate-related migration into Vermont is likely already happening and will continue to happen largely by households at higher median incomes with the flexibility to move to more desirable locations. As the climate continues to change, climate migration will likely become an unavoidable choice regardless of income in some parts of the country. This region should prepare to receive new climate refugees, since it is projected to be one of most habitable locations in the country as the climate warms (ProPublica, Climate Migration, 2020).

The COVID 19 pandemic may have influenced new migration into the region in 2020 and 2021 by households with the flexibility to work from home and the financial means to relocate to areas that appeal to their

lifestyle. These trends are so far only confirmed anecdotally; it is necessary to review the results of the pending 2021 American Community Survey data to confirm accuracy and also to explore the proportion of out-of-state migrants who already owned property in the state and changed it to their primary residence versus remote workers who decided to move to Vermont.

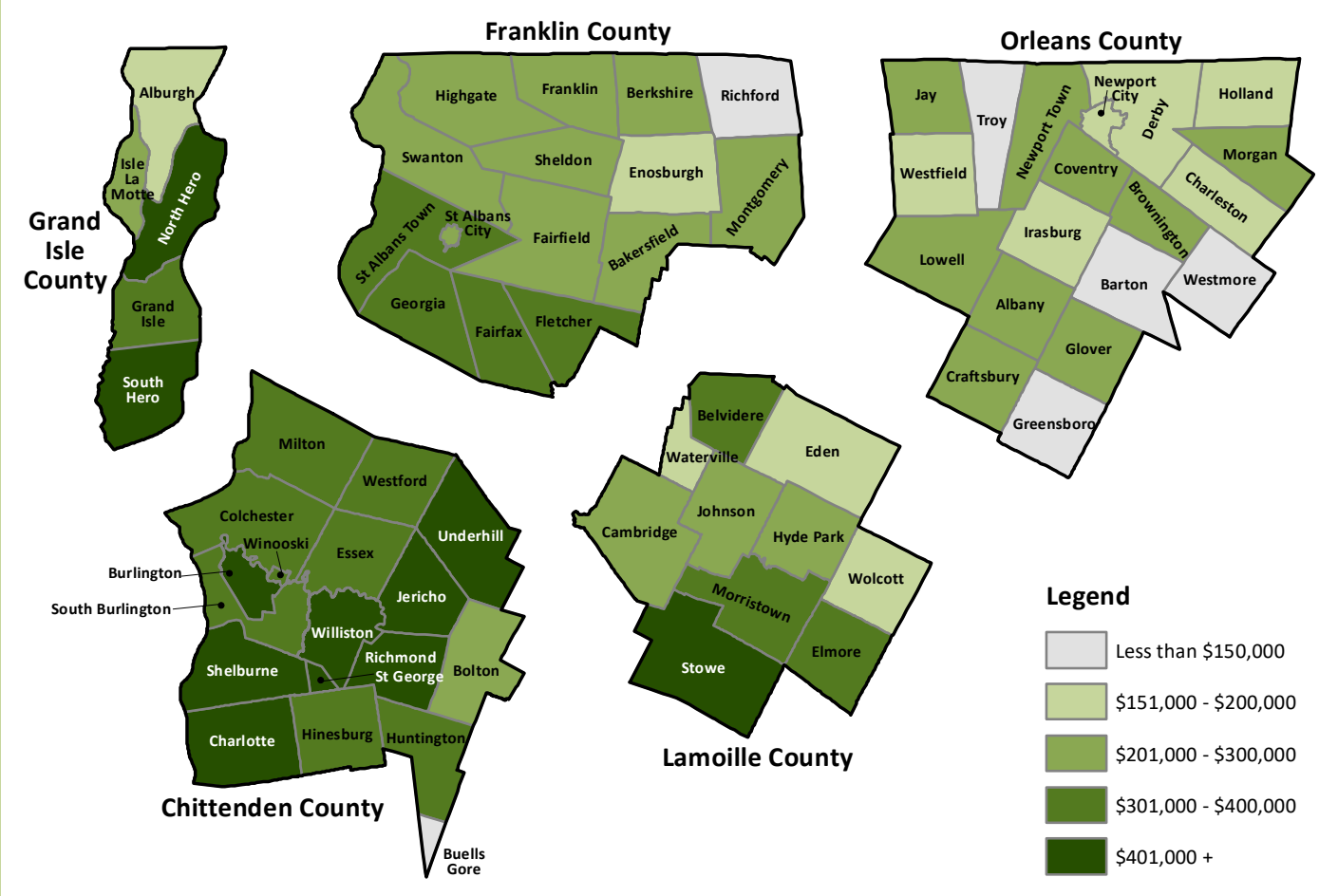
Travel to Work

While Franklin County is host to several regional job centers in St. Albans, Enosburgh, Swanton, and Georgia, it is also within commuting distance of Chittenden County's large regional employment center. As a result, just under half (48%) of the workforce stays within the county for employment. For the other half of the workforce that travels to Chittenden County for work, it is usually a tradeoff for more affordable housing options in Franklin County. In Grand Isle County, over 80% of the workforce travels off the islands due to limited employment options there and easy access to Chittenden County. (U.S. Census Bureau, LEHD Origin-Destination Employment Statistics (2019))

Sale Prices

The median sale price of a single-unit primary home in the two-county region increased to new highs in 2021: $275,000 in Franklin County and $330,050 in Grand Isle County.

MAP 4: Median Sale Prices of Primary Residences (2021)



SOURCE: *Housing Vermont - www.housingdata.org*

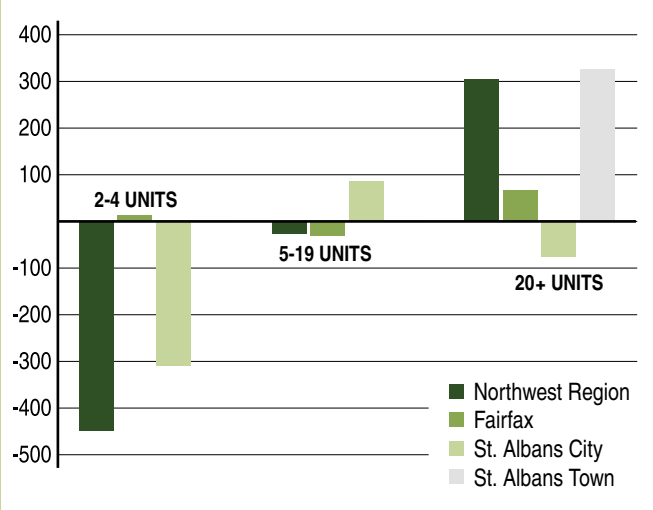
Home sale prices are strongly influenced by the market in Chittenden County, with those towns adjacent to or within easy commuting distance of Chittenden County having higher sale prices. In Franklin County, prices rose significantly at the beginning of the century but declined from 2006 to 2016. There was a sharp increase in 2019 to nearly $242,000, and price increases were sustained in 2020 and 2021. Grand Isle County experiences a high variability in median price from year to year due to the small number of sales, but the overall trend is similar to Franklin County at a higher price point. Overall, from 2018-2023 home prices in Vermont rose at more than three times the rate of inflation (Bureau of Labor Statistics).

Housing Types

The diversity of the housing stock declined between 2000 and 2020, with the region losing housing in two-, three-, and four-unit structures, along with mobile homes, which is a trend that is seen statewide. Single-unit detached homes comprised nearly 77% of the two-county region's housing stock in 2020.

On the other hand, the region has experienced an increase in units in large multi-unit buildings between 2000 and 2020. Affordable rental housing projects built in the region during this 20-year period created 325 units in buildings with 10 or more units, accounting for two-thirds of new units in buildings of that size. The remaining third is mostly accounted for by market-rate senior housing. New multi-unit housing was highly concentrated in a small number of communities: 52% in St. Albans Town and another 20% in Fairfax. Additional large-scale developments, such as the Cathedral Square senior housing facility in South Hero, have been constructed since 2020.

FIGURE 3: Multi-Unit Housing Change by Location



SOURCE: *American Community Survey*

Seasonal and Second Home Properties

The two-county region is a recreation destination and has historically had a substantial stock of camps and second homes. Census data suggests that nearly 13% of the region's housing units were seasonal in 2020. Seasonal housing is concentrated in Grand Isle County, where it accounted for nearly 35% of all units in 2020. Seasonal housing comprised more than 25% of the housing stock in six of the region's municipalities in 2020: Franklin, Montgomery, Alburgh, Isle La Motte, North Hero, and South Hero. Short-term rentals also make up a portion of seasonal dwellings, but the percentage varies by community and season.

Projections

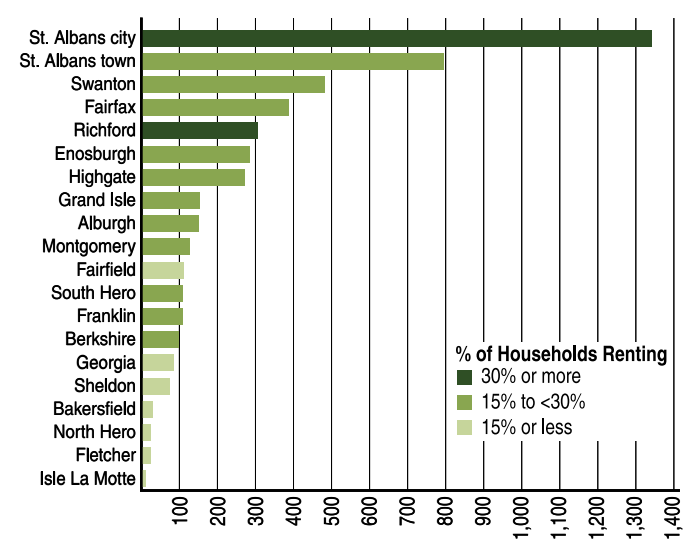
The two-county projection indicates that the regional population will continue to grow through 2040, but the pace of growth between 2020 and 2040 will be slower than between 2000 and 2020. It projects an increase of about 2,600 new residents in the region over the 20-year period—an average annual growth rate of 0.2% between 2020 and 2040. Future housing demand will be driven by the number and characteristics of households. It projects an increase of 1,630 new households in the region over the 20-year period—an average annual growth rate of 0.4% between 2020 and 2040. The projection indicates that the number of households in the two-county region headed by someone age 65 or older will increase by about 1,560, suggesting an aging in place of the region's boomer households and the need for long-term care facilities. It also shows a recovery in the number of households headed by someone age 35 to 44, which had declined significantly between 2000 and 2020, suggesting new millennial households moving into or forming in the region.

Household Characteristics

Age

The median age was estimated to be 40.5 years in Franklin County and 48.7 years in Grand Isle County in 2020. All municipalities in the region saw the median age of residents increase between 2000 and 2020. A person's age is highly predictive of their housing needs, preferences, and experience. Baby boomers have reached or will soon reach retirement age, with many planning to "age in place." The large generation of millennials have been facing issues of affordability and uncertainty since they entered the housing market.

FIGURE 4: Renting Households by Location



SOURCE: *American Community Survey, U.S. Census Bureau*

Household Size

Household size in the two-county region continues to decline, with the average falling below 2.5 people in 2020. Average household size ranged within the region from a low of 2.13 people in Isle La Motte to a high of 2.71 in Georgia. In both counties, the average household size was approximately 3 persons in 1980. As household size drops, more housing units are needed to house the same population.

Living Arrangements

Approximately 64% of the region's households are estimated to be families (defined as two or more people related by blood, marriage, or adoption and residing together) (ACS, 2020). While the two-county region continues to have more family than nonfamily households, we are seeing growth in nonfamily and single-person households. Between 2000 and 2020, 82% of new households created were nonfamily and 60% were single-person households. More than 2,100 new single-person households were created over the 20-year period. New family and nonfamily households account for net population growth in addition to the dynamic shifting of the same population between family and nonfamily living arrangements.

Tenure

Nearly 80% of households living in the two-county region in 2020 owned their home. More than 90% of new households created between 2000 and 2020 in the region were homeowners. Households who rent are concentrated in St. Albans City and St. Albans Town, which together account for more than 43% of all the renting households in the region. Households headed by the youngest and oldest residents in the region are the most likely to be renting. Single-person households in the region are also more likely to be renting.

Housing and Transportation Costs

Housing is generally considered affordable regardless of income when a household uses **no more than 30%** of their income to pay for it.

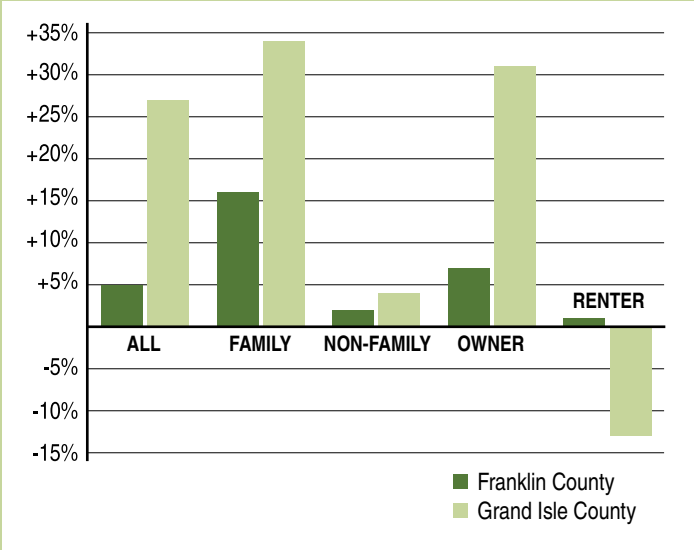
Given that travel to and from a household to destinations varies based on location **transportation costs** are considered affordable when they consume **15% or less** of the household income.

Combined housing and transportation costs that total **greater than 45%** of the household income are considered unaffordable.

Household Income, Housing Cost and Affordability

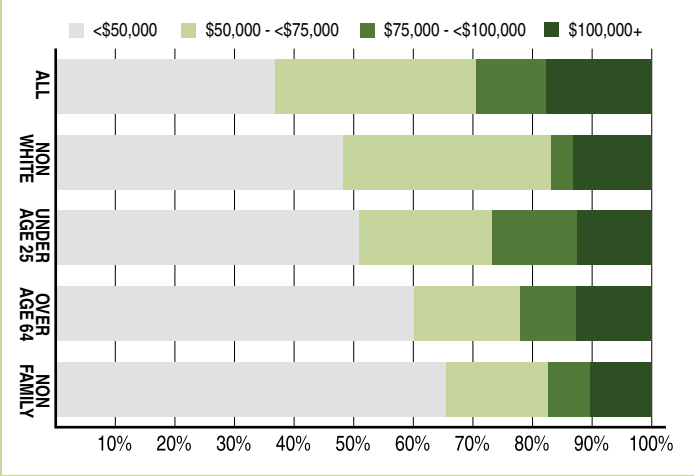
Housing affordability is primarily determined by two factors: household income and housing costs, although

FIGURE 5: Median Income Growth 2000 - 2020



SOURCE: *U.S. Census Bureau*

FIGURE 6: Income by Household Type 2020



SOURCE: *American Community Survey, U.S. Census Bureau*

other costs of living including transportation impact overall affordability. The Census Bureau estimated that median household income in Franklin County was $65,314 and in Grand Isle County was $81,667 in 2020. The Metropolitan Statistical Area Median (MSA) income, which includes the region and Chittenden County, is $73,447. Median household income in Franklin County increased 4.5% above the rate of inflation between 2000 and 2020. The data shows much larger gains in Grand Isle County with a jump of 26.5% over the 20-year period.

Household income growth is not evenly distributed across households of different types and characteristics. Family households saw their median income grow significantly more than non-family households. In 2020, the median income of owning households was approximately twice the median income of renting households in the two-county region. Households headed by someone identifying as non-white or white and another race/ethnicity, younger or older were disproportionately represented in the region's lower income groups.

The Census Bureau estimated that 10% of the region's households had an income below the poverty line in 2020. Despite gains in medium income, both the total number of households below the poverty line and the poverty rate inched upwards between 2000 and 2020. The increase in households below the poverty line is entirely attributable to nonfamily households. A nonfamily household in the two-county region is nearly three times as likely to have an income below the poverty line as a family household. Given that most of the region's new households are nonfamily households, the income and poverty disparity between family and nonfamily households is a worrying trend.

Households are considered to be cost-burdened by their housing costs when monthly housing costs consume more than 30% of their income for rent, mortgage, insurance, taxes and utilities. This metric is widely accepted as the maximum level considered affordable for the average household. For the Northwest Region, homeownership is affordable when ownership costs do not exceed 30% of gross annual income using a target incomes of 120% of the Burlington-South Burlington MSA median household income. And, rental housing is affordable when total rental costs do not exceed 30% of the gross annual income using a target income of 80% of the Burlington-South Burlington MSA median household income.

The Census Bureau estimated that nearly 1 in 3 households in the two-county region were cost burdened in 2020. The number of cost burdened households decreased from 2010 to 2020, however this decrease was

almost entirely made up of owning households. The steep rise in home sale prices has been cushioned by increases in median income for homeowners. Whether with a mortgage or without a mortgage, ownership costs remained well below the affordability limit of 30% of household income for the region's median household income. However, the region's renting households are significantly more cost burdened. Renting a home remains unaffordable for 43% of renting households at the region's median household income.

Many of the region's most vulnerable households are disproportionately burdened by housing costs. 6,620 or 64% of low-income households (with annual household income 80% of MSA or less) in the two-county region were cost burdened. Many of these households are single people – younger adults and seniors. Younger adults in this group are more likely to be renting, while older adults are more likely to be homeowners. These households are also more likely to be headed by someone with a disability or someone identifying as BIPOC or multi-racial. Households with children represent a smaller proportion of low-income households, but those with children are nearly all cost burdened.

FIGURE 7: Cost Burdened Households

NOTES: Cost burdened households are spending more than 30% of their income on housing. The percentage of cost burdened households in each category is shown in yellow in the pie charts. The pie charts are sized to represent the total estimated number of households in each category based on data from the U.S. Census Bureau, 2020 ACS PUMS.

Non White means that the head of the household responded to the US Census question on race and ethnicity by identifying as Native American, Black, Hispanic, another race or ethnicity other than White, or White in addition to another race and/or ethnicity, i.e mixed race and/or ethnicity.

Closing the Gap: Meeting Current and Future Housing Needs

Vermont Statute (24 V.S.A. § 4348a(a)(9)) tasks Regional Planning Commissions with identifying the housing needs for all communities and economic groups in the region. The 2022 Northwest Vermont Housing Needs Assessment has determined that a significant number of households in the region do not have adequate

housing, or have unmet housing needs. Housing needs are categorized by those households that are currently unhoused, underhoused and/or cost-burdened. Once factoring in overlap between the underhoused and cost-burdened, the assessment estimates that 7,600 households are currently living with an unmet need. The unhoused population consists of those individuals and families that are currently experiencing homelessness. The underhoused population includes individuals and families that do not have their needs met by their current housing, including young adults living with family members because adequate housing is not available, housing that is overcrowded or poor quality, and senior housing that is not ADA compliant. The cost-burdened population are individuals and families that pay more than 30% of their household income on housing costs.

The level of current unmet housing need is so significant that 'catching up' will require a sustained, long-term commitment. Meeting the housing needs of current households will take a combination of new affordable housing units, modifications to existing units and expansion of programs that address both housing costs and household income. To satisfy the current unmet need within a 20-year timeframe, it would necessitate addressing the unmet needs of an average of 380 households annually. This does not take into account new housing units needed to account for population growth.

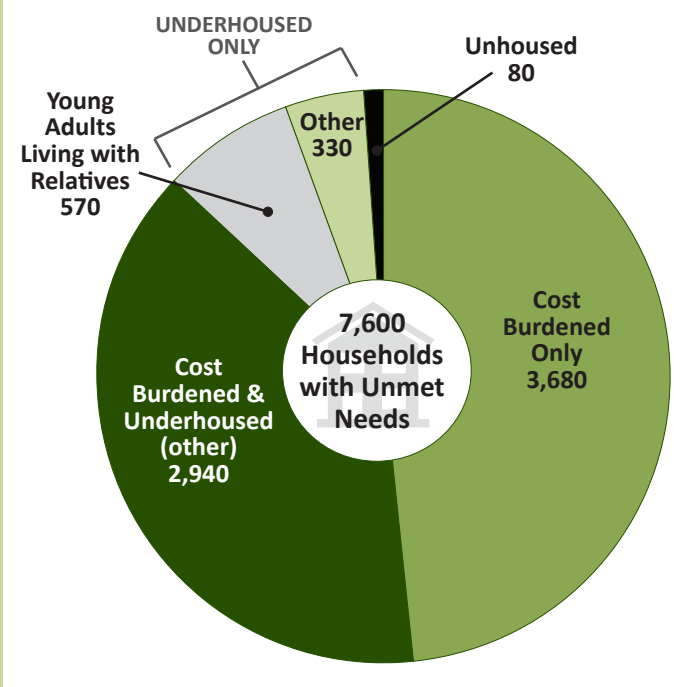
NRPC recommends the following strategies to address unmet housing needs:

1. new housing units in 2–5-unit buildings in regional and sub-regional growth areas and village centers,
2. flexibility and incentives for construction of Accessory Dwelling units
3. improvements to sub-standard housing units,
4. enrollment of existing units in guaranteed affordability programs,
5. new/expanded housing assistance programs that result in lower housing costs, and
6. new/expanded workforce development/job training programs that result in higher household income.

To address disproportional impacts on different types of households, strategies will need to focus on meeting the needs of:

1. severely cost-burdened households,
2. households currently living in substandard housing,
3. BIPOC households,
4. seniors facing difficulties with aging in place, and
5. young adults seeking to move into or form a household within the region.

FIGURE 8: Unmet Housing Needs



SOURCE: *2022 Northwest Vermont Housing Needs Assessment*

NRPC will work with municipalities and other regional and statewide partners on implementing housing strategies with the intention of addressing unmet housing needs and promoting the development of new units. Attention will focus on better meeting the needs of all communities across the region and the marginalized populations that have historically faced discrimination and disproportional impacts on housing security. While NRPC is not directly involved in constructing new housing units, the Commission will continue to work with communities on making it easier to build homes by reducing regulatory barriers and providing incentives for new housing development locally. The Commission also coordinates with partners to further a wide variety of

programming that supports homeowners and renters in managing the cost of housing, access to housing and sustaining and improving existing homes.

NRPC will continue to serve as the backbone organization for Housing For All, Working Communities Challenge. This partnership is funded through the state of Vermont and the Federal Reserve Bank of Boston and has a mission to support the creation and improvement of housing for healthy, inclusive, and prosperous communities.

This effort will also include education on regional housing needs, maintaining and updating data and tracking progress and outcomes. Unfortunately, the data needed to adequately track progress towards this goal is not easily collected or adequately tied to improvements in meeting housing needs, so part of this effort involves working to improve access to data.

GOALS AND POLICIES

1 GOAL

Build and improve more homes so that high-quality, safe and affordable housing options are equitably available to all current and future residents.

a. Promote the construction of new housing units through local and state permitting flexibility, bylaw modernization, employer assisted housing and education about the importance of housing.
b. Preserve the region's existing housing stock; improve substandard housing to comply with state recognized building codes.
c. Promote mixed-income Affordable Housing Developments with at least 20% or a minimum of 5 affordable units as defined by VT Statute for new housing developments in the region.
d. Support perpetual affordability protected by covenant or other legal restriction for new affordable housing developments.
e. Support a variety of programs that provide financial incentives for affordable housing, such as land trusts, cooperative housing, shared equity, Section 8 vouchers, alternative financing and others.
f. Promote zoning changes that integrate diverse housing types into existing neighborhoods, including accessory apartments, cottage courts and 2-5 multi-unit housing for residents of all incomes and ages.
g. Support the development of housing that meets the needs of the existing and future workforce of the region and assist employers who are interested in participating in employer supported housing.
h. Promote and facilitate life safety and accessibility improvements in housing units.
i. Support the development of housing units dedicated to those that are housing insecure or unhoused.
j. Target housing access programs to populations that have experienced housing insecurity at disproportionate rates, including BIPOC and mixed-race households.
k. Promote and facilitate housing dedicated to the region's senior residents.
l. Improve the financial security of low- and moderate-income households.
m. Ensure compliance with fair housing laws.

2 GOAL

Ensure housing is easier to build in concentrated, regional and sub-regional growth areas and village centers that are convenient and accessible to employment, services, retail, public transportation, recreation facilities and schools.

a. Promote the efficient design of new housing developments to conserve energy and minimize the financial impact of expanded municipal services on municipalities and taxpayers, including maximizing

density according to local context, utilizing a street network that connects to services and amenities and making use of public or shared wastewater, water supply and stormwater infrastructure.

b. Support the location of housing developments that have substantial regional impacts within locally and regionally designated growth centers with appropriate infrastructure, and outside of identified resource and conservation lands.
c. Ensure that multi-family, assisted living and group homes will be designed to meet the needs of the occupants and will be located in areas with convenient access to related services.

3 GOAL

Housing design and construction is energy efficient and minimizes adverse environmental impacts.

a. Support development of water and wastewater infrastructure in and around the region's growth areas to support additional high-density housing development in smart-growth locations.
b. Encourage the design of housing developments that fit into the cultural, aesthetic and natural landscape in which they are located.
c. Ensure new rural housing developments are sited to preserve the greatest amount of open space possible, avoid adverse impacts on significant natural areas and minimize the fragmentation and parcelization of agricultural land and habitat blocks. Open space shall be retained for agriculture, forestry, recreation or resource preservation.
d. Support the conversion of existing commercial and institutional space to new housing to meet the region's needs.

COMMUNITY HEALTH

GOALS

1. **Promote active, healthy living and a high quality of life among individuals and communities; encourage physical activity and access to healthy foods.**
2. **Reduce and prevent substance misuse across the region.**
3. **Support the mental and physical health of the region's residents of all ages.**

Good health not only increases life expectancy; it also contributes to personal happiness and success. A healthy lifestyle enables people to reduce their health-care expenses and save their earnings.

In recent years, there has been increased recognition of the major role social factors play in an individual's health outcomes. These "social determinants of health" include both direct factors, such as the impact of living next to a contaminated site, and indirect factors, such as a person's ability to access healthy food. According to the U.S. Center for Disease Control, these social determinants of health can be divided into five broad categories: economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community context. Healthy People 2030, a program of the U.S. Department of Health and Human Services, sets data-driven national objectives to improve health and well-being over the next decade using these determinants. This framework was used during the 2022 revision of the Northwestern Medical Center's Community Health Needs Assessment (CHNA), data from which is used throughout this chapter.

This chapter addresses these social determinants of health to provide strategic guidance for decisions related to regional community health in the short, medium, and long terms. Addressing the underlying social factors that can create poor health is important to eliminating health disparities and ensuring well-being for all regional residents.

The COVID-19 pandemic has affected all aspects of public health. It has also highlighted and exacerbated the existing disparities within Vermont around the social determinants of health. As the pandemic continued, it had a persistent and disproportionate impact on populations that are at higher risk and populations that

are underserved. For example, according to the VT Department of Health, "BIPOC Vermonters with COVID-19 have a significantly higher rate of pre-existing conditions compared to white non-Hispanic Vermonters with COVID-19; 19.4 versus 12.1 per 10,000 Vermonters, respectively. BIPOC Vermonters with COVID-19 have significantly higher rates of diabetes, lung, and cardiovascular disease than rates among white non-Hispanic Vermonters." (December 2020)

SOCIAL DETERMINANTS OF HEALTH IN THE NORTHWEST REGION

Economic Stability

Economic stability and access to a high-quality education are critical factors for a healthy community. A key takeaway from focus groups and informant interviews for the CHNA was that people with lower incomes are more likely to experience health challenges related to mental health, substance use disorder, and lack of access to health-care services in our region. More information regarding these factors can be found in the economic infrastructure chapter of this plan.

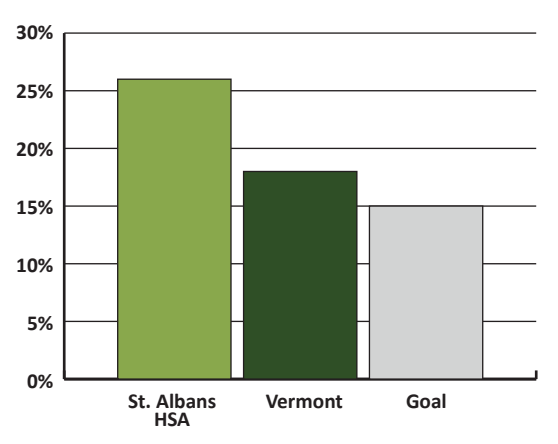
Education Access and Quality

Standardized tests are one measure of student progress and how schools compare against each other. These tests consistently show that students who qualify for free lunch or reduced-cost lunch score at least 25% lower on these tests than students who do not. More information regarding education can be found in the social infrastructure chapter of this plan.

Neighborhood and Built Environment

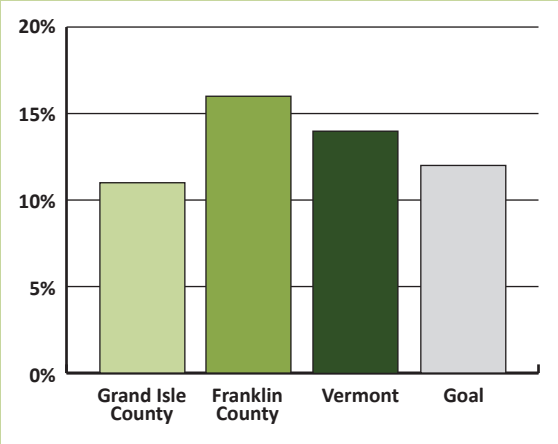
A person's neighborhood can have a major impact on a person's health. If someone is able to walk or bike to their destination, they will have exercised without needing to make a separate time to do so. Creating an environment that encourages walking and biking will therefore encourage healthy lifestyle choices and improve community-level health outcomes. However, many regional residents do not have this opportunity: 23% of residents stated that it was unsafe to walk in the region and 91% of residents commute via personal vehicle, though this number might be lower now with the increase in telecommuting. (Vermont Department of Health; U.S. Census American Community Survey 2020).

FIGURE 9: Percentage of Adults with No Leisure Time Physical Activity



SOURCE: *Behavioral Risk Factor Surveillance System*

FIGURE 10: Youth Grades 9-12 Who Did Not Participate in at Least 60 Minutes of Physical Activity on at Least One Day in the Past Week



SOURCE: *Behavioral Risk Factor Surveillance System*

Physical Activity: In many communities, schools and recreation areas can be challenging to access via walking or biking, or they are located on major truck routes or in communities where there are limited or no sidewalks or paths. Partially as a result of these conditions, more than a quarter of Franklin and Grand Isle County residents (26% in 2018) report that they do not use any leisure time for physical activity. That number has not improved since 2000–2002. Franklin County has a higher percentage of youth in grades 9-12 who did not participate in physical activity than the state as a whole, while Grand Isle's numbers are better than the state as

a whole (Figure 10). Lack of physical activity has been linked to a number of health conditions, including heart disease, high blood pressure, and type 2 diabetes (US CDC 2022).

The region has numerous opportunities to increase physical activity, including improving bike and pedestrian access to schools and recreation facilities and expanding bike path and sidewalk networks within the region's growth areas. Residents can be encouraged to take advantage of the region's vast natural resources for walking, hiking, snowshoeing, swimming, skating, etc.

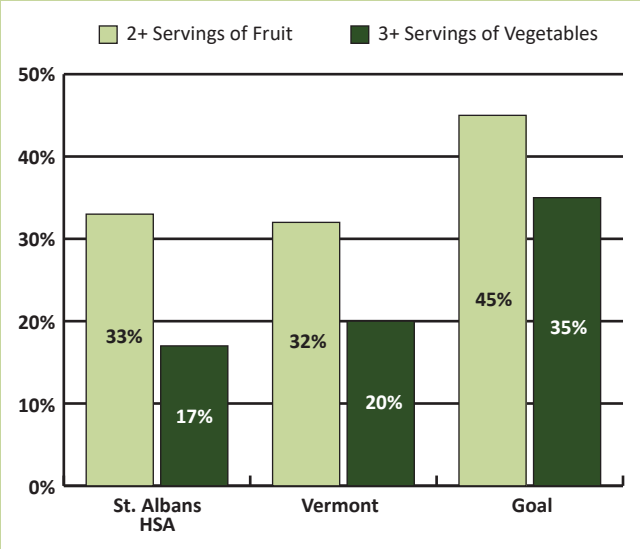
Safe Routes to School is a comprehensive program focused on children being able to safely walk and bike to school. At least 12 schools in northwest Vermont have worked with NRPC and the Vermont Agency of Transportation (VTrans) to develop Safe Routes to School programs.

Paths and trails in the region offer recreational and physical activity opportunities. The region is home to the Missisquoi Valley Rail Trail, a 26.4-mile multi-use pathway between St. Albans Town and Richford. The region is also home to a segment of the Lamoille Valley Rail Trail, which connects Swanton to St. Johnsbury. Additional efforts should be made to enhance bicycle connections, particularly to Canada, and to encourage recreation-oriented tourism. In Grand Isle County, paths like the South Hero Recreation path provide local opportunities. Wider shoulders on regional roads can encourage additional bicycle recreation as well, but can also lead to increased vehicle speeds.

Food Access: Access to nutritious, healthy food is a measure of neighborhood health and is a major issue in the region. Across the region, there are only six full-service grocery stores, and none of those are in Grand Isle County. Because of the importance of food access for community health, the NOTCH clinic purchased (and now operates) the grocery store in Richford when the previous owners announced its closure. While some areas may be served by smaller stores, not all of these stores provide access to a full range of produce and healthy options. Additionally, a survey conducted as part of the CHNA process found that 26% of respondents stated that the food available in the region does not meet the diverse needs of the community. Beyond access to stores selling healthy food, those with lower incomes may also be unable to afford such food. Statewide, 5% of residents reported not having enough to eat and an additional 22% reported not having the types of food they would like to eat available to them because of cost or availability (US Census Pulse Survey 2022). Because unhealthy food options are often cheaper than healthy options, it is likely that many regional residents find it challenging to access nutritious choices. The region's network of food shelfs fills the gap for area residents who cannot afford or access enough food. This charitable food system serves a crucial role in the region; in most cases, food shelfs are run by volunteers and supported by donations. Healthy Roots Collaborative, a program of NRPC, provides gleaned produce to the area's food shelfs and meal sites.

Statistics concerning eating habits are also available through the Vermont Department of Health Behavioral Risk Factor Surveillance System (BRFSS) survey 2019-2020. The data shows that adults throughout the region fall short of the goal of eating at least two fruits and three vegetables daily (Figure 11). Among youth, the total of the population eating at least two servings of fruit on a daily basis is approximately 30%.

FIGURE 11: Adult Healthy Eating

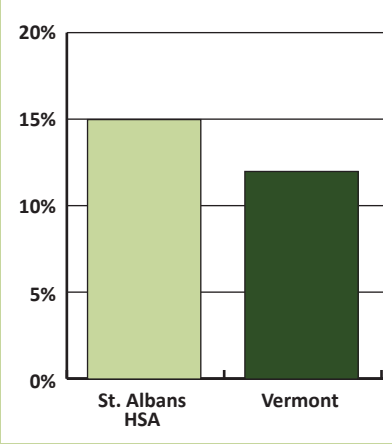


SOURCE: *Vermont Department of Health*

Social and Community Context

Positive community and social interactions are important for a person's physical and mental health. One of the key concerns of residents and service providers identified in the 2022 Community Health Needs Assessment is a lack of community connectedness. One in four respondents stated that people of all cultures, gender identities, and sexual orientations were not accepted. Over 80% stated that interpersonal violence is a problem in the community, and one-third stated that young people are not thriving.

FIGURE 12: Adults Reporting Poor Mental Health



SOURCE: *Vt. Department of Health*

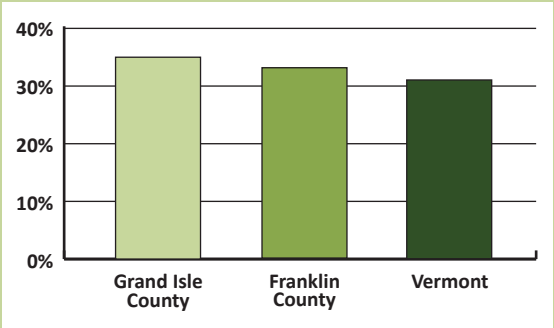
Isolation and social ostracization are major risk factors for mental health issues and substance use. Both youth and adults in the region are impacted by mental health challenges. Fifteen percent of regional adult residents reported poor mental health. Roughly one-third of high school age youth reported feeling sad or hopeless in the past year. LGBTQIA+ youth were significantly more likely to feel sad or hopeless, with almost 70% of Franklin County LGBTQIA+ youth stating they felt sad or hopeless (data for Grand Isle County LGBTQIA+ youth was not available). Research suggests the pandemic may have negatively impacted regional mental health, with a study of northern New England finding that nearly half of all respondents reported mental health challenges during the pandemic.

Substance use continues to be a major issue for the region's residents. The number of people being treated for opioid use disorder dramatically increased in the past two decades and is currently the most common substance use being treated in Franklin and Grand Isle Counties (Figure 14).

Alcohol use is the second most common reason that adults in Franklin and Grand Isle Counties seek treatment for substance use; however, treatment for alcohol use has decreased somewhat over the last decade. Alcohol and binge drinking rates for youth have continued to decrease from 2011 to 2019.

Smoking continues to be a public health concern in the region. Smoking is a major risk factor for asthma, which is the number-four chronic disease occurring in the region, at a rate of 11%. Roughly 13% of Grand Isle County adults and 18% of Franklin County adults smoke. However, 66% of adults made a quit attempt in the past year, showing a strong desire for treatment. Including both smoking and electronic vape products, 21% of Grand Isle youth and 30% of Franklin County youth smoke as reported in the 2019-2020 Behavioral Risk Factor Surveillance System data. These trends are extremely concerning, as they show that youth are now more likely to smoke than adults. A significant component of this trend is likely due to misconceptions about electronic vape products, with only 38% percent of Grand Isle County youth and 24% of Franklin County youth believing that electronic vapor products greatly risk harming themselves.

FIGURE 13: Youth Reporting Feeling Sad or Hopeless in the Past Year



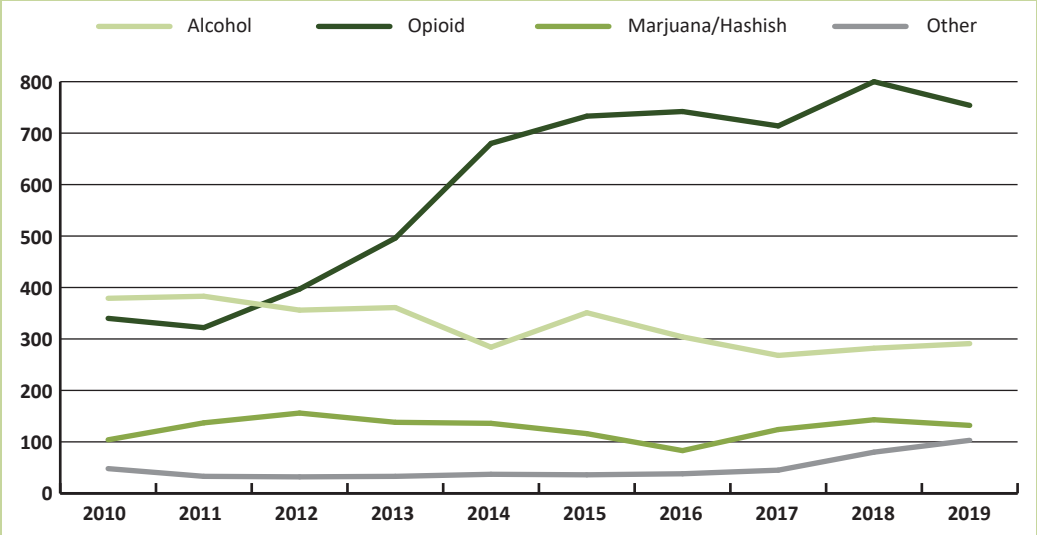
SOURCE: *Vermont Department of Health*

Marijuana/hashish use is the third most common reason adults in Franklin and Grand Isle Counties seek treatment for substance use. Roughly 18% of the region's adults currently use cannabis, while almost one-quarter of all high school youth in the region have used cannabis in the past 30 days. Similar to electronic vape products, many youth have misconceptions about the risks of cannabis, with just 22% of Franklin County high school students and 26% of Grand Isle County high school students believing that people greatly risk harming themselves if they

use marijuana regularly. Prevention organizations across the region have worked diligently to provide youth with accurate information about the risks of cannabis use. Legal sale of recreational cannabis began in 2022, with municipalities having the option to opt-in to allow recreational sales.

Addressing the underlying factors that impact mental health and substance use, including those discussed above, will be critical to combating these trends.

FIGURE 14: Number of People in Franklin and Grand Isle Counties Treated for Substance Use Disorders



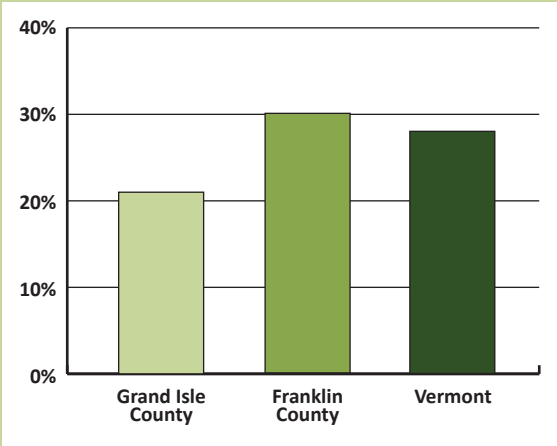
SOURCE: *Vermont Department of Health*

Health Access and Quality

Access to quality health-care services is critical for good health. The recent 2022 CHNA survey found that many residents had challenges accessing health-care services. Roughly 20% of survey respondents stated that services for substance use disorder are inaccessible due to lack of transportation. Many residents have encountered high wait times for health-care services: 36% of CHNA survey respondents stated that wait times for adult mental health care made it inaccessible, while 38% stated that the wait times for primary care and pediatric appointments make them inaccessible. These results point to a need for additional capacity in the region's health-care system.

While capacity of services is an issue, the region has many quality health-care assets. Most notable among the region's community health assets is Northwestern Medical Center (NMC), located in St. Albans City. The hospital is licensed for 70 beds and employs more than 75 medical staff members. It also has a walk-in clinic and urgent-care facilities located in St. Albans and Georgia.

FIGURE 15: Youth Grades 9-12 Who Used Tobacco Products or Electronic Vape Products in the Past 30 Days



SOURCE: *Vermont Department of Health*

NMC works closely with Northern Tier Center for Health (NOTCH), a primary-care practice with locations in Richford, Swanton, Enosburg Falls, St. Albans, Georgia, Fairfax, and Alburgh. NOTCH's mission is to provide high-quality care to traditionally underserved populations in Franklin and Grand Isle Counties. NOTCH provides a wide array of health-care services, including family medicine, behavioral health, pharmacy, and general dentistry. Because it is a federally funded health center, care is provided to those who do not have health insurance. Since 2012, Community Health Centers has operated a practice in South Hero—the Champlain Islands Community Health Center—which provides access to primary care and mental health services. Expansion to dental services is expected in 2024.

There are three nursing homes in Franklin County, which are all located in St. Albans City and St. Albans Town. Grand Isle County does not have any nursing homes. Nursing homes provide nursing care and related services for people who need medical, rehabilitative, or other special services. There are six Level III residential care homes serving Franklin County. Residential care homes are state-licensed group living arrangements designed to meet the needs of people who cannot live independently but usually do not require the type of care provided in a nursing home. In Grand Isle County Bayview Crossing senior housing recently opened, but there remains an unmet need in Grand Isle County for nursing and residential care homes. (Vermont Department of Disabilities, Aging and Independent Living).

Northwest Counseling and Support Services (NCSS) is a private, nonprofit service agency located in St. Albans that provides residents of the region with access to social services. NCSS focuses on providing mental and developmental health services. This includes providing support to those with substance use issues and to senior citizens through the Senior Team, and collaborating with the Champlain Valley Agency on Aging (which provides services to the region and to Chittenden and Addison Counties). NCSS also works with youth via several programs including the Youth in Transition Program and the Transitional Living Program Services. NCSS is one of three substance abuse treatment centers located in the region; the other two are the Howard Center and Turning Point of Franklin County, both of which are located in St. Albans City. Franklin County Caring Communities is a local nonprofit focused on youth development. The organization has been particularly involved in substance abuse prevention in Franklin County.

Franklin County Home Health Agency is a local nonprofit based in St. Albans that provides home health-care programs and related support services. The organization provides comprehensive health care within the home setting, often collaborating with other local organizations, such as NCSS.

Champlain Islanders Developing Essential Resources (CIDER) provides transportation, meals and community support services to seniors in Grand Isle County. United Way of Northwest Vermont is active in community health causes in the region. The organization has several different programs that focus on three key areas: access to health care, safe community and homes, and supporting healthy choices. Through these three programs, the United Way is combating substance use, domestic violence, mental health, and obesity issues in the region.

Samaritan House, a program of the Champlain Valley Office of Economic Development, is a nonprofit organization that provides emergency shelter and transitional housing to people without other options or resources within Franklin and Grand Isle Counties. Samaritan House is located in St. Albans City, and it is the only emergency shelter in Franklin and Grand Isle Counties. In 2020, Spectrum opened a drop-in center for youth in crisis that offers hot meals and showers during the day.

Health Equity

Health equity is the state in which everyone has a fair and just opportunity to attain their highest level of health (Center for Disease Control (CDC)). Achieving health equity and eliminating health disparities requires focused and ongoing efforts to address historical and social injustices (US CDC). Efforts to improve the social determinants of health must focus first on the most impacted marginalized communities and include the voices of those communities. The state's RPCs have collectively developed a Health Equity Toolkit to assist municipalities with incorporating health equity in their planning.

GOALS AND POLICIES

1 GOAL

Promote active, healthy living and a high quality of life among individuals and communities; encourage physical activity and access to healthy foods.

a. Incorporate healthy community design through land development patterns, transportation options, and site design that enable residents to lead physically active lives.
b. Include walking paths, sidewalks, biking paths, and/or recreation opportunities in larger projects that meet the definition of having significant regional impact.
c. Increase access to physical activity and healthy recreation spaces region-wide and support community-based recreation programs.
d. Increase access to healthy food in the region by supporting regional agriculture, farm-to-plate and farm-to-institution activities, and transportation programs to bring residents to shopping opportunities.
e. Promote worksite wellness in the Northwest region.
f. Create opportunities for aging residents to thrive through community-based events, social activities, and targeted assistance.
g. Support universal school meals to ensure all children have access to daily school meals.
h. Limit locations of land uses that can have negative health impacts, such as emissions and noise, to avoid additional burdens on historically disadvantaged communities.
i. Allocate resources to support new paths, sidewalks, parks, and recreational opportunities in communities and neighborhoods that have historically had lower public investment or experience negative impacts from existing land uses.

2 GOAL

Reduce and prevent substance misuse across the region.

a. Reduce the visibility of alcohol, cannabis, and tobacco products and advertisements.
b. Increase education about substance use prevention in order to change community norms.
c. Create restrictive licensure policies for alcohol, cigarettes and cannabis through local ordinances, including limiting location and hours of operation.
d. Increase the number of community and school personnel dedicated to providing screening, referral, and education.
e. Support the development of residential and non-residential treatment facilities within the region.

3 GOAL

Support the mental and physical health of the region's residents of all ages.

a. Reduce barriers to mental health treatment and support prevention efforts.
b. Ensure safe housing and transitional support for adolescents.
c. Create crisis safe space for adolescents, LGBTQiA, and BIPOC community members.
d. Provide safe spaces and support programs for individuals and families escaping domestic abuse.
e. Support the mental health of the region's aging residents.

PHYSICAL REGION

Transportation

Natural and Cultural Resources

Land Use

Disaster Resilience

Infrastructure:
Water, Wastewater & Solid Waste

TRANSPORTATION

GOALS

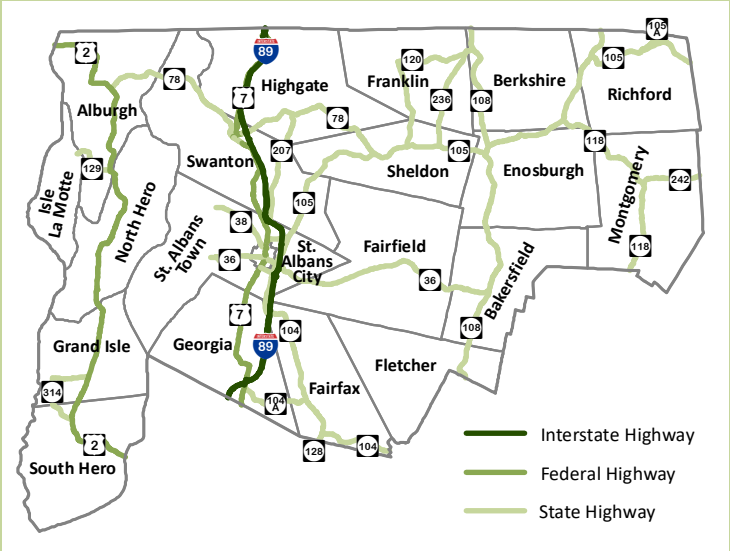
1. **Ensure all of the region's residents have access to safe and affordable transportation options regardless of age, physical ability, economic status, or other factors.**
2. **Use creative approaches to maintain, improve, and expand the region's transportation network, and ensure it is resilient to the impacts of climate change.**
3. **Ensure the transportation network enhances residents' overall quality of life, supports regional land use goals, and expands economic opportunities.**

TRANSPORTATION ASSETS AND TRENDS

Roadway

Of all the transportation modes in the region, the roadway is the most widely used means of transportation. There are approximately 1,300 miles of public roadway located in the Northwest region—ranging from town highways to state routes to components of the National Highway System and Interstate 89. The location of state, federal, and interstate highways is shown in Map 1. Privately maintained roads are not shown and there is no data on road conditions or cost of maintenance for private roads.

MAP 1: Northwest Region Highways

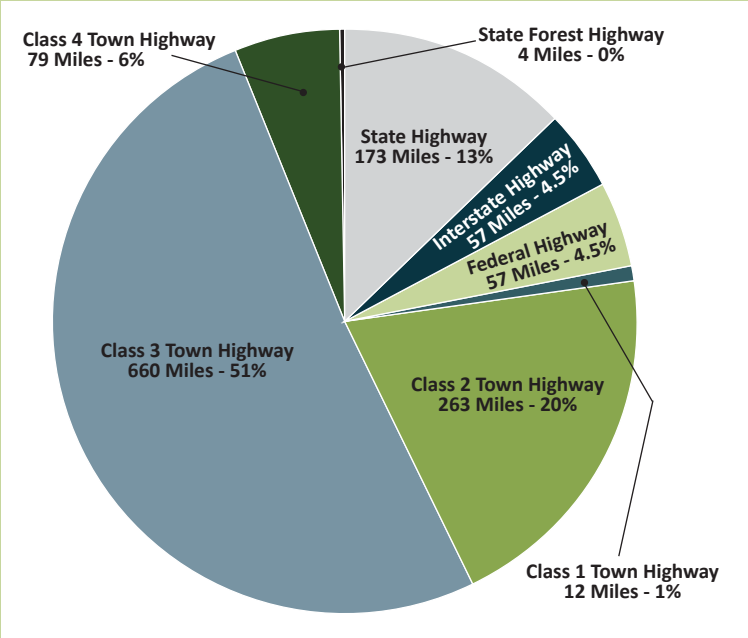


SOURCE: *Vermont Open Geodata Portal*

Interstate Highways: There are 57 miles of interstate highway (I-89) located in the region (just over 25 miles in each direction). This roadway provides limited access via exits 18 through 22. It allows travelers and goods to move at higher speed and capacity, and it is a vital link to Quebec at the Highgate Springs border crossing.

State Highways and Federal Highways: State highways and federal highways make up only 18% of the region's total public roadway mileage, but they are the backbone of the region's transportation system. U.S. 2 and U.S. 7 are the two segments of federal highway in the region. State highways include VT 36, VT 38, VT 78,

FIGURE 1: Northwest Region Public Road Miles



SOURCE: *VTrans Road Centerline Data*

At a Glance: Town Highways

- **Class 1:** Extension of a state highway, maintained by a town
- **Class 2:** Primary local roads
- **Class 3:** Minor local roads maintained year-round
- **Class 4:** Minor local roads not maintained year-round

TABLE 1: Pavement Condition Ratings of Interstate and State Highways in the Region

Category	Franklin & Grand Isle Counties % of Total Miles	Vermont % of Total Miles
Good	23%	30%
Fair	31%	31%
Poor	26%	22%
Very Poor	19%	16%
Invalid	1%	1%

SOURCE: *VTrans November 2022 Pavement Condition (0.1-mile segments). Road segments missing data for one or more pavement criteria are classified as "Invalid."*

VT 104, VT 104A, VT 105, VT 105A, VT 108, VT 118, VT 120, VT 128, VT 129, VT 207, VT 236, VT 242, and VT 314. Although these roadways are owned and maintained by the Vermont Agency of Transportation (VTrans), many portions of state highways go through our village centers and serve as our "Main Streets." The sections of state and federal highways in Enosburg Falls, Richford Village, Swanton Village, and St. Albans City are designated as class 1 town highways. This means the state and the municipalities have joint jurisdiction over the roadways. While VTrans will complete periodic paving, the communities are responsible for regular maintenance and generally have more control over the roadways.

National Highway System: The National Highway System (NHS) was designated in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The roads that make up the NHS are typically major roads that connect important regional destinations. In the Northwest region, VT 78 from Alburgh to Swanton and U.S. 2 from Alburgh to the New York line are part of the NHS, and these roads serve as a critical link between Interstate 87 in New York and Interstate 89 in Vermont.

Town Roads: The remaining public roads not classified previously are town roads that are owned by the municipalities. Of the 1,305 miles of public road in the Northwest region, 1,015 miles (78%) are local roads. Just over half of town roads are paved.

Regional Road Network Condition

Pavement Condition: VTrans evaluates pavement condition on state-maintained highways on a regular basis. Small segments of roadway (0.1 miles) are rated based on roughness, depth of wheelpath deformation/ruts, and the severity and extent of pavement cracking. An overall pavement condition is then derived from these factors. As seen in Table 1, the region's percentage of state roadway miles with an overall "Good" pavement is lower than the statewide average. and both the region's percentage of state roadway miles in the "Poor" and "Very Poor" category is higher than the statewide average.

The VTrans overall policy on roadway pavement condition is designed to ensure that good roads remain in good condition. This policy is based on the understanding that proactive

measures are more cost-effective than reactive measures when it comes to maintaining pavement conditions. While this approach makes fiscal sense, there are cases where poor and very poor pavement conditions create safety concerns. NRPC advocates to VTrans for new construction or paving projects to address these concerns.

At a Glance: Bridges in the Region

- There are 168 bridges (and culverts) with spans 20 feet or greater in the region:
  - 30 bridges on interstate
  - 57 bridges on state highways
  - 74 bridges on town highways
  - 6 railroad bridges
  - 3 pedestrian bridges
- In 2020, the average age of bridges in the region was 59 years old.

Bridge Conditions: VTrans inspects all state highway bridges and town highway bridges that are 20 feet in length or longer every two years unless the bridge condition warrants more frequent inspection. The bridge components of deck, superstructure, substructure, and channel conditions are evaluated and each bridge component is ranked on a scale of zero to nine, with nine indicating an excellent condition and zero a failed condition. A bridge with a rating of four or lower in any of the bridge components is reported as being structurally deficient. Of the 161 interstate, state highway, and town highway bridges in the region greater than 20 feet, 5.6% (9 bridges) were reported structurally deficient. This is slightly lower than the state's 2014 average of 8.3%, but it is still an issue of concern.

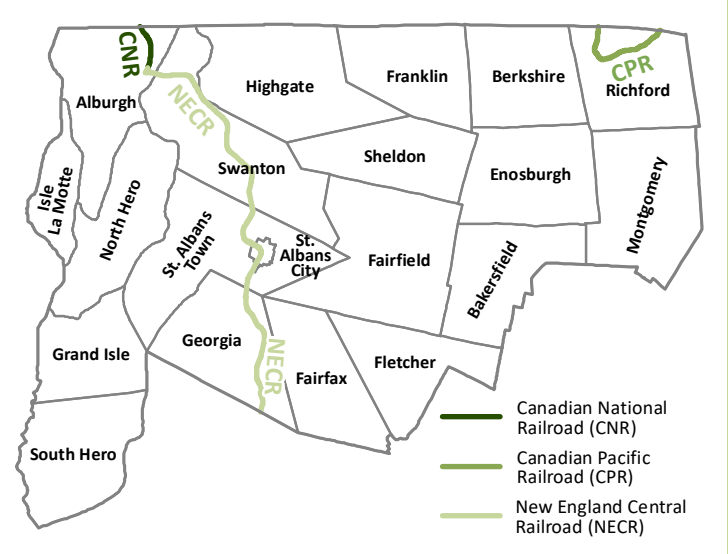
Rail

With three active rail lines, the Northwest region is home to a substantial amount of rail infrastructure (Map 2). This includes the state's largest private railroad owner/operator, New England Central Railroad (NECR).

The Canadian National Railway (CNR) operates freight traffic from Alburgh Springs to Canada. This three-mile segment is the only Class 1 railroad in Vermont. Class 1 railroads are the largest rail operators, and they are categorized by their annual operating revenue. There are eight Class 1 railroads currently operating in the United States.

The New England Central Railroad, a subsidiary of Genesee & Wyoming, operates 394 miles of railroad between the Vermont/Quebec border and New London, Connecticut. NECR has several interchanges with Class 1 railroads, including its connection with CNR in Alburgh Springs. NECR serves as a major shipper of goods from Canada to markets in southern New England because it is the only link between Montreal and Boston via rail. NECR's offices and headquarters are located in St. Albans City, as are the company's dispatch operations. NECR also operates the Italy Rail Yard in St. Albans Town, which is the busiest rail yard in Vermont. While the NECR rail in Vermont can accommodate 286,000-pound railcars, weight limits in Massachusetts and Connecticut effectively limit freight to 263,000-pound cars.

MAP 2: Northwest Region Railroads



SOURCE: *Vermont Open Geodata Portal*

Amtrak's Vermonter route—one of the two Amtrak passenger trains operating in Vermont—operates two trains per day on the NECR tracks: one from St. Albans south to Washington, DC, and one north to St. Albans from Washington, DC. The State of Vermont is committed to restoring passenger rail service to Montreal.

Current challenges to this effort include establishing international preclearance procedures, building a preclearance facility in the Montreal station, and restoring track in Quebec.

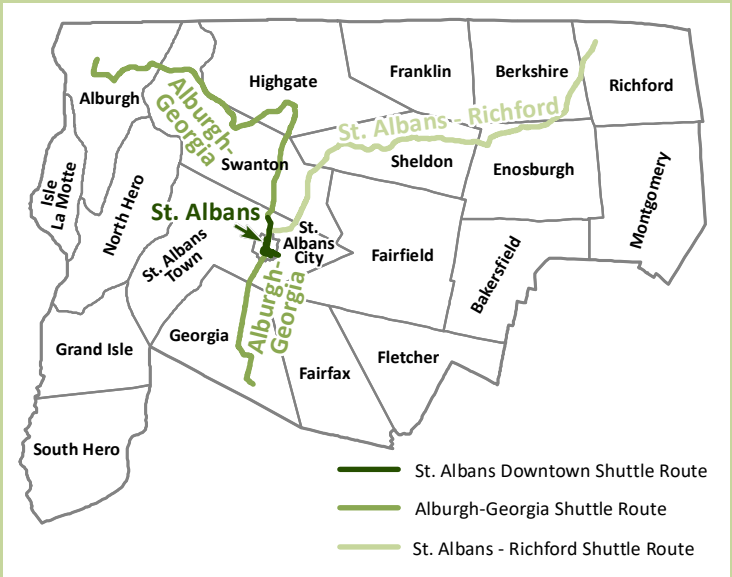
A 24-mile segment of line operated by Canadian Pacific enters Vermont in Richford to serve the Blue Seal Feeds, re-enters near Troy, VT, and terminates in Newport, VT, where it connects with the Connecticut River Subdivision.

Freight

In Franklin and Grand Isle Counties, as in all of Vermont, trucks are the primary means of freight transportation, but rail is also a critical component of the freight network. Approximately 46.7 million tons of freight moved into, out from, through, or within Vermont in 2018. Trucks carried approximately 84% of that freight and rail carried 15%. By 2045, the volume of freight (when measured by weight) is expected to increase 68% to 78.7 million tons. By 2045, rail is expected to move a larger share of freight (21%) in Vermont. (Vermont Freight Plan 2022). Freight rail transport is most competitive for long-distance hauls of bulky commodities such as coal, grain, paper, wood, and minerals. Freight- generating industries in the region include forest and logging (Franklin County), paper manufacturing (Franklin County), and animal production (Franklin and Grand Isle Counties).

The Interstate I-89 and VT Route 78 corridors in the region have the most freight truck traffic, representing 17% and 13% of total traffic respectively. I-89, VT 78 (from the I-89 intersection in Swanton to the U.S. 2 intersection in Alburgh) and U.S. 2 (from the VT 78 intersection in Alburgh to I-87 in New York State) are designated portions of the National Highway System. The high number of trucks traveling on VT Route 78 in Swanton Village has been of particular concern to the community. Many other communities in the region—such as Alburgh, St. Albans City, Georgia, Enosburg Falls, and Richford—are wrestling with how to accommodate trucks when their Main Streets are also major trucking routes. Periodic closures of VT 78, through Swanton, have proven to redirect significant traffic through the Champlain Island communities along U.S. 2, posing concerns of traffic, safety, and capacity.

MAP 3: GMT Shuttle Routes



SOURCE: *NRPC*

Public Transit

Green Mountain Transit (GMT) is the public transportation provider for Franklin and Grand Isle Counties (Map 3). GMT operates the following five main routes in the region; all are currently fare-free as a result of COVID-19 era policies:

- **St. Albans Downtown Shuttle:** This route provides service through St. Albans City and St. Albans Town from 5:45 a.m. to 6:34 p.m. on weekdays, and from 10:00 a.m. to 3:30 p.m. on Saturdays. Its route includes stops at the Highgate Commons, the State Office Building, the Champlain Valley Office of Economic Opportunity (CVOEO), Price Chopper, Walmart, Rite Aid, Community College of Vermont, and Northwestern Medical Center, and by request, the Franklin County Senior Center, Hawk's Nest Housing, and Northwestern Counseling & Support Services (NCSS).

- **Alburgh/Georgia Commuter:** This route provides one morning and one evening weekday commuter trip between Alburgh and the Georgia industrial parks. The Alburgh Commuter serves Swanton, Highgate, St. Albans, and Georgia.
- **Richford/St. Albans Commuter:** This route provides one morning and one evening commuter trip between Richford and the St. Albans Town Industrial Park, Monday through Friday. It travels through Berkshire, Enosburgh, and Sheldon.
- **St. Albans Link Express:** This commuter route to Chittenden County picks up passengers at Highgate Commons and the Collins Perley Sports & Fitness Center and takes them to Burlington. The LINK operates two morning and afternoon roundtrips Monday through Friday.
- **Price Chopper Shopping Shuttle:** This shuttle offers a free ride to the St. Albans Price Chopper for easy grocery shopping. This shuttle only operates on Tuesdays and only within the St. Albans and Swanton areas.

GMT currently operates numerous buses varying in size from 18 to 28 passengers. All buses are lift equipped. All regular routes operate on a fixed deviated schedule, which means that drivers may deviate up to three-quarters of a mile on the St. Albans Downtown Shuttle and up to one-quarter of a mile on the Richford and Alburgh Commuters with at least 24 hours' notice to pick up or drop off passengers.

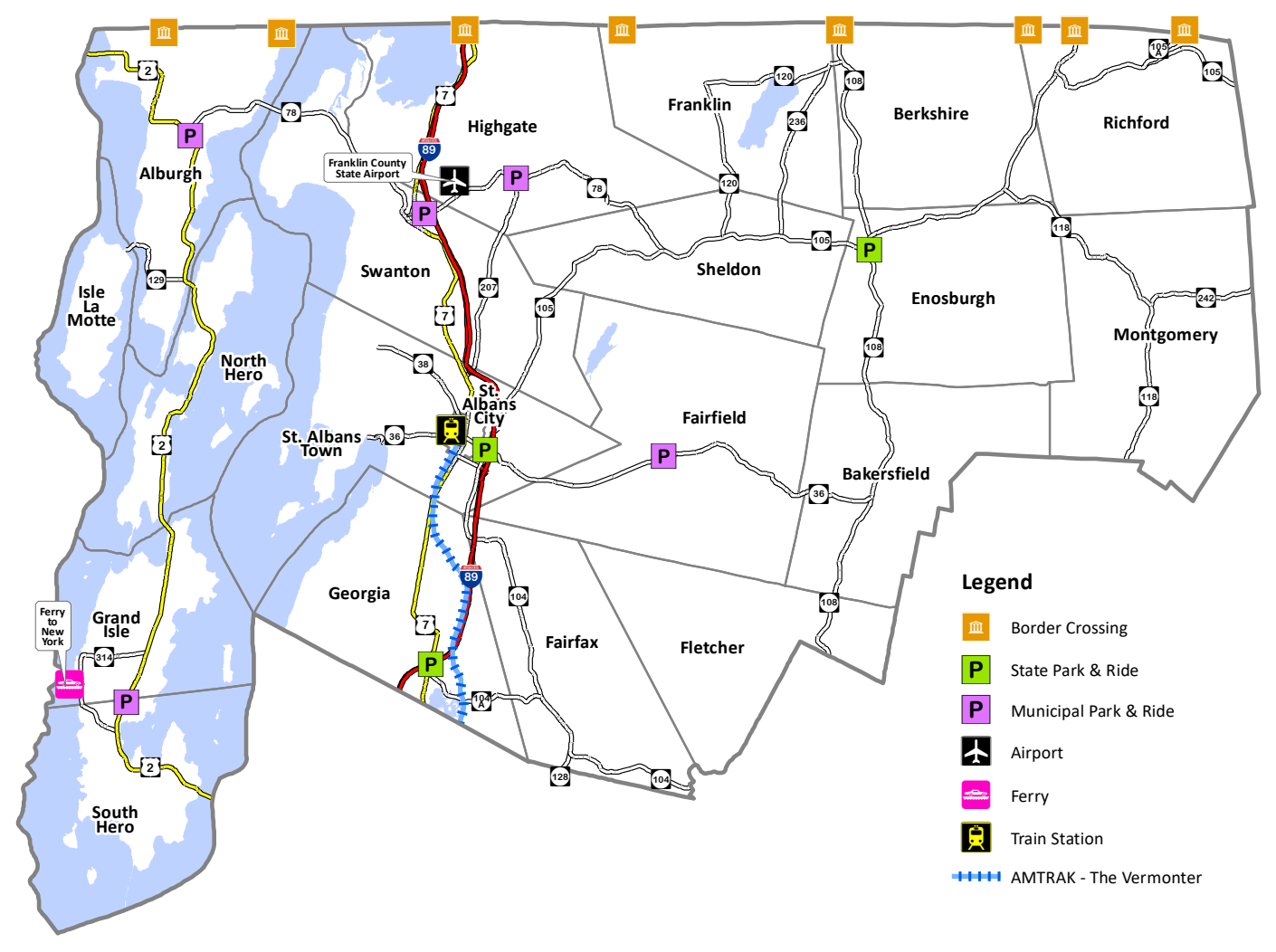
GMT provides special transportation services to the elderly, residents who are disabled, Medicaid recipients, and people undergoing radiation and chemotherapy treatments or kidney dialysis who do not have a car or cannot drive for medical reasons. GMT Elderly and Disabled services include transportation to senior meal sites, shopping, and medical services to permit elders to live independently. Services are provided through volunteer drivers, bus service, van service, or taxi cabs. GMT operates four shuttles per day to CarePartners Adult Day Center, providing respite time to caregivers and allowing them to work without concern for the safety of their loved ones. GMT also serves as the fiscal agent for its partner agency, CIDER (Champlain Islanders Developing Essential Resources). CIDER provides transportation to elderly and disabled residents of Grand Isle County.

Much of the region is currently unserved by regular transit routes. Barriers include cost and the low-density population of rural areas. Micro-transit, which is a nimbler on-demand system open to all users, is being investigated for Franklin and Grand Isle Counties and may hold promise for serving unserved or underserved areas. Current GMT funding formulas require municipalities to pay a non-federal match for new fixed routes based on mileage, without account for tax base or other factors. A more equitable approach to providing the non-federal match, or a source other than the local property tax, will help to ensure a more equitable approach to transit funding.

Air

The Franklin County State Airport is one of ten airports owned by the State of Vermont. The airport has one primary paved runway and two grass runways. The primary runway is equipped with medium-intensity runway lights (MIRLs). Recently, a precision approach path indicator (PAPI) was installed at the airport, and it is available for approaches to the primary runway. Runway end identifier lights (REILs) are available for all runways. The airport facilities include a weather reporting system, a communications relay device that allows the pilots to communicate directly with air-traffic controllers, a 3000' x 60' asphalt runway, hangers, and outdoor aircraft tie downs. The Franklin County State Airport is home base for about 65 aircraft and sees roughly 26,000 operations (takeoffs and landings) per year. Improvements are planned for the airport, with construction expected to begin in 2024. Plans are to rebuild the existing 3,000-foot-long runway and widen it from 60 to 75 feet, the size required under current federal guidelines. Additionally, a 1,001-foot runway extension will allow larger planes to use the airport, including single-engine cargo and passenger planes.

MAP 4: Transportation Facilities



SOURCE: *NRPC*

Commercial passenger air travel is available via the Burlington International Airport in Chittenden County, Vermont; the Plattsburgh International Airport in New York State; the Montréal-Pierre Elliott Trudeau International Airport in Quebec; and limited service from Rutland-Southern Vermont Regional Airport. The Montréal-Mirabel International Airport is also located in Quebec, but it primarily transports cargo.

Ferry

The Lake Champlain Transportation Company provides year-round ferry service between the town of Grand Isle and Plattsburgh, New York. The "Cumberland Head" ferry route runs 24 hours per day, seven days per week. The ferry dock is located on VT 314, which is an important link for the ferry traffic traveling to U.S. 2 and I-89. This ferry port is popular with cyclists, as it sits as a prime and convenient location on the popular Champlain Islands Bikeway, which follows portions of VT 314. A seasonal bike ferry also operates from the Colchester causeway to South Hero.

Border Crossings

The region has eight border crossings managed by the U.S. Border Patrol under the Highgate Springs Area and the Richford Area. The Highgate Springs Area contains four facilities located in Highgate Springs, Alburgh

Springs, Alburgh, and Morses Line. The Highgate Springs Port is one of three U.S. Customs high-volume centers for clearing cross-border commercial traffic in Vermont, with the other two located in Derby Line and Norton. U.S. Customs and Border Patrol has begun the early planning phases for an expansion and improvement project for this facility. The Highgate Springs complex oversees the Highgate and Richford Areas as well as the Burlington International Airport. The remaining three crossings in the Highgate Area are "permit" ports that primarily handle local traffic.

The Richford Area has four ports handling primarily local traffic at three crossings in Richford and one in West Berkshire. Distinct from the border crossings, the customs facility in St. Albans serves as a "service" port that processes information related to cargo classification and passenger information for the entire state (personal communication: Craig Jehle, area port director, U.S. Customs Service, Highgate Springs; Mike D'Ambrosio, U.S. Customs Service, St. Albans).

Intermodal Facilities

Intermodal facilities are locations where commuters, tourists, travelers, and/or freight are transferred from one mode of transportation to another. Consequently, the modal linkages provided by intermodal facilities are key components of effective multimodal transportation systems. Park and ride lots, train stations, bus stations, airports, and ferry stations are examples of intermodal facilities found in the Northwest region.

The automobile is by far the dominant mode of transportation in the region. Consequently, most intermodal facilities have automobile parking to accommodate people who drive to an intermodal facility and switch to another mode of transportation (carpool, vanpool, transit, bus, etc.). There are seven state and municipal park and ride lots in the region (Map 4).

Active Transportation

Active transportation facilities in the region include on-road shoulders, shared-use paths, and sidewalks. The major facilities are shown on Map 3 in the Social Region, Infrastructure section and include:

- **Missisquoi Valley Rail Trail:** This 26.4-mile crushed stone trail is situated on a railbanked corridor parallel to VT Route 105. The rail trail extends from St. Albans to Richford through the towns of Swanton, Sheldon, Enosburgh, and Berkshire, and it provides an alternative to VT Route 105.
- **Lamoille Valley Rail Trail:** This 96-mile railbanked corridor extends from Swanton to St. Johnsbury. The VT Agency of Transportation completed the majority of construction in summer of 2022 and will manage the trail with the support of local advisory councils. The trail passes through the towns of Swanton, Highgate, Sheldon, Fairfield, Bakersfield, and Fletcher in the region and intersects with the Missisquoi Valley Rail Trail.
- **Alburgh Recreational Rail Trail:** This 3.5-mile cinder and gravel trail is located on a railbed running east–west through Alburgh and is currently used for walking, mountain biking, and cross-country skiing. The rail trail crosses farmland and the Mud Creek Wildlife Management Area to Lake Champlain. It also serves as an alternative to U.S. Route 2 and VT Route 78 for non-motorized modes of transportation.
- **Local Trails:** Many municipalities within the region host a variety of local and recreational trails. Some well-known examples are the Swanton Fit & Healthy Recreation Path (1 mile), Fairfax Recreation Path (0.8 miles), and South Hero Recreation and Marsh Trails (4 miles out-and-back).
- **Sidewalks:** 14 of the 23 municipalities in the region have public sidewalks. A list of these is shown in Table 2. Several municipalities (notably, Enosburg Falls, Fairfax, Swanton, and St. Albans City) have added sidewalks since the last plan update through a combination of developer construction and municipal projects. Sidewalk projects are currently in planning phases in Montgomery, St. Albans Town, Fairfax, Highgate, Enosburg Falls, and Swanton Town.

TABLE 2: Sidewalk Locations in the Region

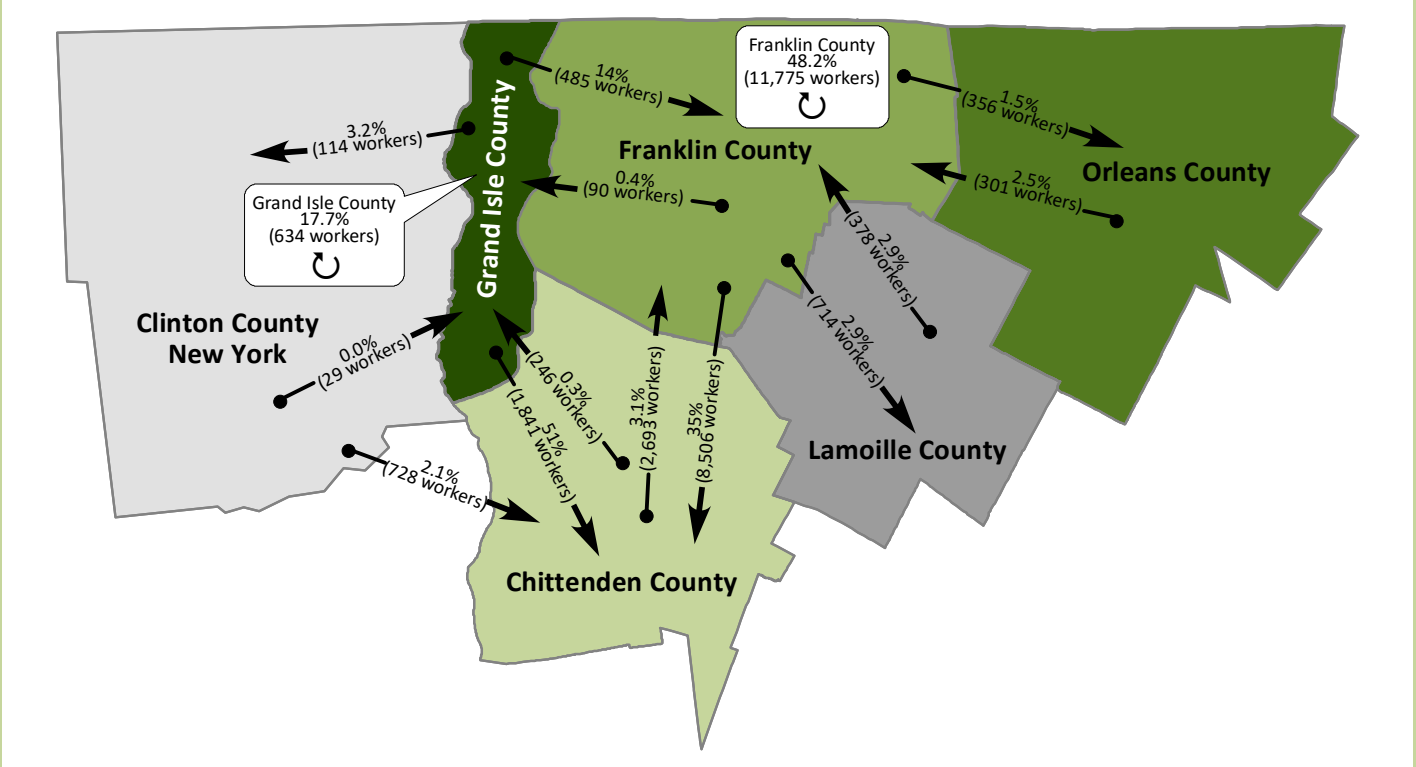
MUNICIPALITY	LINEAR FT.	DESCRIPTION
St. Albans City	144,006	Sidewalks are evenly distributed throughout most of the city on both sides of the streets. They are located along the major north–south (US Route 7) and east–west (VT Route 36) streets. 3,269 linear feet were added since 2017.
Swanton	48,009	Sidewalks are evenly distributed throughout Swanton Village, usually on both sides of the streets. 7,105 linear feet of were added since 2017.
Enosburg Falls	34,298	Sidewalks are concentrated in Enosburg Falls along major roads such as VT Route 108 and VT Route 105. They are also located on many minor roads that are perpendicular to those major roads. 10,622 linear feet were added since 2017.
Richford	27,424	Sidewalks are located along north–south streets in Richford Village, with a gap along VT Route 105 south of River Street.
Fairfax	8,472	Sidewalks are located along VT Route 104 between Tuttle and School Streets as well as along Hunt and School Streets. 3,741 linear feet were added since 2017.
Franklin	4,788	Sidewalks are located along Hanna Road near VT Route 120, along VT Route 120 between Lake and Hanna Roads, and along Square Road. These sidewalks were constructed in 2010. 63 linear feet were added since 2017.
South Hero	4,398	Sidewalks are located on the northern and southern sides of US Route 2 near South Street. 1,604 linear feet were added since 2017.
Montgomery	3,806	Sidewalks are located along VT Route 118 (Main Street) near the intersection of VT Route 242 and VT Route 118. 81 linear feet were added since 2017.
St. Albans Town	2,478	A segment of sidewalk is located south of the US Route 7/VT Route 207 intersection, extending into Price Chopper from US Route 7. There are also some sidewalks located on Fairfield Street around the hospital, that is in the Town. 2,178 linear feet were added since 2017.
Georgia	2,454	Sidewalks are located around the Georgia Elementary & Middle School. There are also small sections of sidewalks located at the Georgia Town Office, Georgia Fire Station, next to Maplefields on the northwestern side of US Route 7 and on Sumner Lane.
Alburgh	2,007	Sidewalks are located in Alburgh Village on the eastern side of US Route 2, from Champlain Street to Horican Avenue.
Fairfield	1,572	Sidewalks are located on one side of VT Route 36 in Fairfield Center. There is also a small section of sidewalk around the school library.
Bakersfield	1,101	Sidewalks are located along VT Route 108 (North end of Main Street) and were constructed in 2010. 237 linear feet were added since 2017.
Highgate	626	Sidewalks are located on VT Route 78 in Highgate Center.

SOURCE: *NRPC*

Commuting

As shown in Map 5, a large percentage of the region's residents work outside of their home communities. This creates a demand for transportation services and infrastructure to get residents to their places of work and home again. As this demand increases, efforts to combine infrastructure capacity improvements with increased public transportation services should be examined at every possible opportunity. Carshare, carpooling, and ridematch services can serve a useful role in rural areas where extensive public transit may not be feasible. The impacts of this daily mass commuter migration extend beyond the "wear and tear" to regional transportation infrastructure. It also impacts other facets of regional life, such as where commuters purchase goods and services. Although 48.2% of Franklin County residents who are employed work within the county, a significant portion (35%) commuted to Chittenden County for work in 2019. With the increase in telework, this number may be lower in 2023.

MAP 5: Northwest Region Workers



SOURCE: *Longitudinal Employer-Household Dynamics (2019)*

Complete Streets in Northwest Vermont

Complete Streets is an approach to planning, design, construction, and maintenance of our roadway network to consider all users, including pedestrians, bicyclists, and transit riders. Vermont's Complete Streets Law, Act 34, went into effect on July 1, 2011. The purpose of the law "is to ensure that the needs of all users of Vermont's transportation system—including motorists, bicyclists, public transportation users, and pedestrians of all ages and abilities—are considered in all . . . transportation projects and project phases, including planning, development, construction, and maintenance." There are many reasons to support Complete Streets techniques:

- Improve the safety of all users, including bicyclists, pedestrians, drivers, and passengers.
- Provide greater mobility and accessibility to individuals without cars.
- Offer less costly choices for transportation.
- Provide a physically active option for transportation.

The role of Complete Streets in this plan is to:

- Provide additional clarity to municipalities on how to implement Complete Streets.
- Guide NRPC Act 250 comments/project mitigation recommendations.
- Support regional projects seeking grant funding.
- Allow for stronger regional input in state transportation projects.

Table 3 outlines the implementation policies for Complete Streets for the different land-use categories included in the future land-use map in this plan.

TABLE 3: Implementation Policies for Complete Streets - Part 1
(*Part 2 is on the next page*)

	Downtowns	Village & Hamlet Areas (designated and undesignated)	Regional & Sub-Regional Growth Centers
Sidewalks	• Gaps in the sidewalk network shall have high priority for new sidewalk construction. • New sidewalks shall be constructed and existing sidewalks upgraded to comply with the Americans with Disabilities Act (ADA).	• Gaps in the sidewalk network shall have high priority for new sidewalk construction. • New sidewalks shall be constructed and existing sidewalks upgraded to comply with the Americans with Disabilities Act (ADA).	• Sidewalks shall be constructed in conjunction with new development or redevelopment projects. • The construction of sidewalks along existing roadways shall be required to mitigate traffic impacts from development or redevelopment projects.
Shoulders/Bike Lanes	• Bike lanes should be installed along streets with both high bicycle and vehicle traffic volumes.	• More narrow travel lanes and wider shoulders shall be encouraged, especially in areas without sidewalks.	• Bike lanes shall be recommended along streets with existing and anticipated future high bicycle and vehicle traffic volumes.
Shared-Use Paths/Rail Trails	• Shared-use paths/rail trails on the outskirts of downtowns should be extended into downtown areas.	• Shared-use paths/rail trails on the outskirts of downtowns should be extended into downtown areas.	• Shared-use paths/rail trails crossings within regional growth centers shall have crosswalks or pedestrian beacons when there is high vehicle volumes and high bike/pedestrian use.
Intersections and Crosswalks	• Curb extensions and pedestrian refuges shall be installed at very wide intersections.	• New crosswalks shall be supported when there is moderate pedestrian activity and moderate traffic, and when the crosswalk can be located in an area with proper sight and stopping distances.	• Intersection upgrades shall accommodate existing and future anticipated bicycle and pedestrian use.
Transit	• Transit stops shall be clearly marked and located in accessible areas for users.	• Transit stops shall be clearly marked and located in accessible areas for users.	• New development within regional growth centers shall work with local transit providers to increase routes within the area.
Maintenance	• Snow/ice shall be removed from sidewalks to allow for year-round pedestrian use. • Crosswalk and bike lane markings should be regularly maintained. • Recessed crosswalk striping should be considered in areas of high traffic to reduce annual maintenance.	• Snow/ice shall be removed from sidewalks to allow for year-round pedestrian use. • Crosswalk and bike lane markings should be regularly maintained.	• Snow/ice shall be removed from sidewalks to allow for year-round pedestrian use.
Other Considerations	• Amenities (e.g., pedestrian-scale lighting, bike racks, street furniture and trees) should be encouraged. • On-street parallel parking shall be encouraged.	• Amenities (e.g., pedestrian-scale lighting, bike racks, street furniture and trees) should be encouraged. • On-street parallel parking shall be encouraged.	• Accesses to the roadway shall be minimized. • Entrances to existing parking lots should be made narrower.

TABLE 3: Implementation Policies for Complete Streets - Part 2
(*Part 1 is on the previous page*)

	Transitional Areas	High Density Residential Clusters (Including Senior Housing) Located within Transitional & Rural Areas	Rural Areas
Sidewalks	• New sidewalks shall be encouraged in transitional areas and shall be recommended when the sidewalk can connect to services in a downtown or village area. • The right-of-way for future sidewalks shall be set aside as part of new development or redevelopment projects.	• Sidewalks or paths should be constructed within the development to allow for bike and pedestrian circulation within the development. • Sidewalks or paths should be constructed to connect the development to the adjacent public roadways.	• While not discouraged, sidewalks in rural areas shall not be encouraged unless the area is targeted for future growth.
Shoulders/Bike Lanes	• Wider shoulders should be constructed, especially in areas without sidewalks.	• Sidewalks or paths should be constructed within the development to allow for bike and pedestrian circulation within the development. • Sidewalks or paths should be constructed to connect the development to the adjacent public roadways and shall be constructed to adjacent public facilities or community amenities.	• Areas with higher bicycle and pedestrian usage shall be prioritized for shoulder widening as part of planned paving projects.
Shared-Use Paths/Rail Trails	• Crossings should have crosswalks or pedestrian beacons when there is higher vehicle use. • New roads crossing existing trails shall have stop sign–controlled accesses.	• New roads crossing existing trails shall have stop sign–controlled accesses.	• New roads crossing existing trails shall have stop sign–controlled accesses.
Intersections and Crosswalks	• Intersection upgrades shall accommodate existing and future bicycle and pedestrian use.	• Not applicable.	• Not applicable.
Transit	• Transit stops shall be clearly marked and located in accessible areas for users.	• Expanded transit services shall be encouraged for new developments. • Parking lots shall accommodate transit parking and the loading/ unloading of users.	• Not applicable.
Maintenance	• Municipalities should adopt a winter maintenance policy for existing bike and pedestrian facilities.	• Property managers should adopt a winter maintenance policy for existing bike and pedestrian facilities.	• Not applicable.
Other Considerations	• Entrances to existing parking lots should be made narrower.	• Not applicable.	• Not applicable.

Transportation Planning in Northwest Vermont

Transportation Planning Initiative: The Transportation Planning Initiative (TPI) provides the main framework and funding source for transportation planning in the region. It was created by the State of Vermont in 1991 in response to the federal Intermodal Surface Transportation Efficiency Act (ISTEA)—legislation with broad goals toward the development of a transportation system that is efficient, economical, respectful of local needs, and integrated with land-use planning.

The TPI intends to achieve the following goals:

- Improve linkages between transportation planning and planning for land use, economic development,
- emergency preparedness, and natural resources at the state, regional, and local levels.
- Increase participation by municipalities and members of the public in making transportation decisions.
- Facilitate implementation of transportation projects through greater understanding of transportation issues and opportunities.

Long-Range Transportation Plan: The TPI requires NRPC to develop and periodically update a Long-Range Transportation Plan that outlines a vision for the region's current and future transportation system, outlines specific action strategies, aids in the selection and prioritization of future transportation investments, and guides NRPC's comments throughout the Act 250 project review process. In past editions, the Long-Range Transportation Plan was a stand-alone document that was part of the regional plan by reference. It is now fully integrated into the regional plan, primarily in this transportation section.

Transportation Advisory Committee: The Northwest Transportation Advisory Committee (TAC) is critical in ensuring the public is engaged in the transportation planning process. TAC membership includes a representative from each municipality in Franklin and Grand Isle Counties and one representative from the following organizations or interests: air, rail, bike, pedestrian, and public transportation.

The TAC plays a vital role in identifying regionally important needs and projects through Vermont Project Selection and Prioritization (VPSP2). The team is also annually apprised of, and able to collaborate with, area-specific developments that are related to transportation: i.e., Green Mountain Transit plans, Road Safety Audit Reviews, Traffic Counts, etc.

In addition to ensuring legislative and regional compliance, TAC meetings support greater community growth, municipally focused development, and best practices. Regular meetings provide the working group a chance to learn from and with one another. The natural synergy fostered by TAC meetings provides advantages beyond planning and often encourages conversation around new or updated procedures, project management, and strategic initiatives.

Village Master Planning: NRPC supports village master planning efforts alongside municipalities. Many of these plans contain and incorporate transportation aspects, including pedestrian and bike facilities, streetscape design, and traffic calming. Recent master plans include:

Georgia South Village Transportation Master Plan (2019)
A collaborative effort between the Town of Georgia, NRPC, and VTrans to articulate and prioritize transportation and land-use strategies that will help foster the development of a dense, mixed-use, walkable village setting in Georgia's South Village district.

Alburgh Village Master Plan: Town and Village of Alburgh (2019)
An illustrative plan of the "public space" in Alburgh Village that identifies how that space can be improved to further the goals of the Alburgh Municipal Plan. This part of the plan contains proposals for traffic calming, sidewalks, bike lanes, street trees, and aesthetic improvements.

Enosburg Falls Vital Village Master Plan (2019)
A collaborative vision for a vibrant and healthy village center. Intended outcomes include improved and safer transportation alternatives, including wayfinding and Complete Streets improvements; improved pedestrian experience along Main Street through streetscape enhancements; and enhanced tourism and commerce in the village center through marketing and branding.

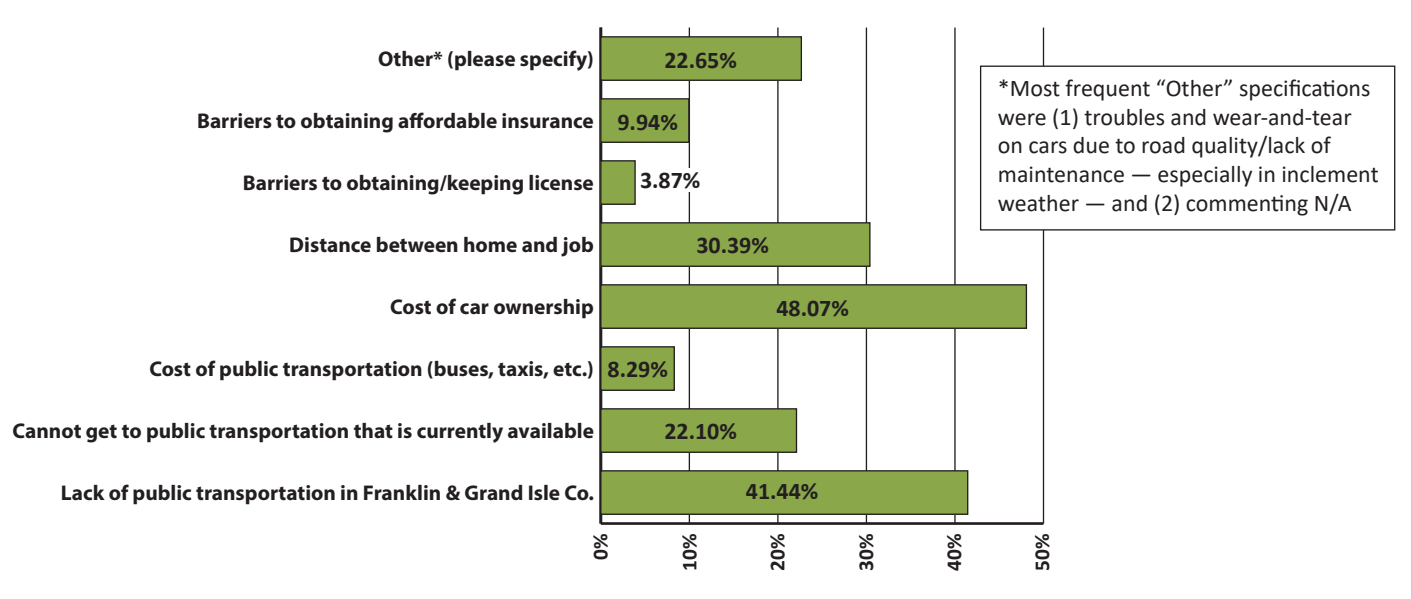
Connecting Sheldon: The Heart of Franklin County Strategic Bike and Pedestrian Plan (2020)
Identification of projects that would make walking and biking in village centers safer and to capitalize on the recreational and economic opportunities of the intersecting Lamoille and Missisquoi Valley Rail Trails.

FUTURE TRANSPORTATION NEEDS

Cost and Access

The Northwest Region has high transportation costs. Lack of transportation is frequently noted as an impediment to employment, education, and health care. The Working Community Challenge general public survey identified the most common impediments to accessing transportation (Figure 2). Three related factors topped the list: cost of car ownership, distance from home to work, and the lack of public transportation. As noted in the introduction, all but one small area of the region is considered cost-burdened for transportation. This data shows the importance of making progress on the regional plan goals—for example, increasing public transit routes and sidewalks and building more housing units near our employment centers will help to ease the transportation cost burden. Additionally, roadway access to Grand Isle County is limited, making improvement to Exit 17 in Chittenden County an important project for the region.

FIGURE 2: Working Communities Challenge Survey
What Aspects of Transportation Do You Find the Most Challenging in Franklin and/or Grand Isle Counties? (please pick 1 to 3 options)



SOURCE: *Working Community Challenge General Public Survey*

Climate Change: Greenhouse Gas Mitigation, Adaptation, and Resilience

Due to the rural nature of the state, transportation makes up 38% of the total energy consumed in Vermont and produces more greenhouse gas emissions—around 40% of the state's total—than any other sector. The 2022 State Comprehensive Energy Plan calls for 10% of energy needs in the transportation sector to come from renewable energy by 2025, and 70% by 2040. To achieve these goals and help mitigate the effects of climate change, NRPC supports efforts to adapt and become more resilient.

As one of the more rural areas in the state, the region's residents rely heavily on their personal vehicles for commuting and daily needs. Transportation infrastructure that increases the quality and types of

transportation choices available—like public transit, rideshares, bicycling, and walking—provides alternatives to single-occupancy vehicles. These choices make the transportation system more accessible and equitable while also helping to make communities more livable and vibrant and reducing energy use and emissions.

At a Glance: TAC Identified Roadway, Safety & Traffic, and Project Needs Not in the Capital Program

- VT 120- address drainage issues to mitigate on-going poor pavement conditions.
- VT 120/VT 236/Middle Road Intersection upgrades in Franklin.
- US RT 2/South St. Traffic and safety concerns at a busy intersection in South Hero.
- US RT 2/Hyde Rd. Traffic and safety concerns at a busy intersection in Grand Isle.

At a Glance: High Priority Paving, Safety & Traffic, Bridge and Roadway Projects in Capital Program

- VT Route 78 reconstruction from Swanton Village to the Missisquoi Bay Bridge- NH 036-1(9)
- I-89 Exit 19/VT 104/SASH intersection upgrade-ST. ALBANS 044-1(2)
- VT 104/VT 128 intersection upgrade-FAIRFAX STP 023-1 (8)- FAIRFAX STP 023-1 (8)
- I-89 Exit 21 address congestion on northbound exit ramp- SWANTON IM 089-3 (82)-
- US 7/VT 104A and I-89 Exit 18- Intersection and park and ride upgrades in Georgia South Village-GEORGIA STP 0285 (18)
- St Albans City Federal Street Corridor- ST. ALBANS CITY RAIZ(3)
- Swanton Village bridge B6 on VT 78 rehabilitation- SWANTON BF 036-1 (16)

Increasing transportation choices and promoting land-use patterns that support compact and mixed-use settlement are mutually reinforcing strategies that can drastically improve outcomes for the transportation system. Making roads that are suitable for multiple types of transportation can help create a foundation of more efficient and low-carbon infrastructure. Creating a smart transportation plan and foundation is key to having the infrastructure that can evolve and change with the needs of the community and environment in the future. To help reduce emissions, residents must continue to expand the market share of electric cars and trucks. This strategy can move the transportation sector toward energy and emissions goals faster than any other single measure. Although EVs are becoming more accessible, it is crucial to have a wide range of equitable options for transportation.

Climate offers a unique challenge to our transportation system. As severe weather becomes more common, it is important that the transportation system and infrastructure can handle these changes. NRPC's work in hazard mitigation and climate resiliency is explained more in the resilience chapter.

Project Priorities

The VTrans Capital Program outlines the state's capital transportation investments over the next five years. The program is updated annually and covers a range of transportation infrastructure projects, including highways, bridges, rail, aviation, and public transportation. The purpose of the program is to ensure that VTrans' capital investments align with the state's transportation goals and priorities, as well as meeting federal and state regulations. Many—but not all—of the region's priority transportation projects are in the Capital Program.

The TAC has a long-standing role helping prioritize projects for the Capital Program. In 2021, VTrans implemented a new methodology for identifying, selecting, and prioritizing projects for the Capital Program called Vermont Project Selection and Prioritization (VPSP2). The VPSP2 framework relies on data to maximize the "transportation value" delivered to Vermont taxpayers. This helps to maximize the way transportation funding is used in Vermont.

VPSP2 utilizes two main sources for understanding transportation needs: Vermont Agency of Transportation asset management systems and regional planning commissions' regionally driven transportation needs. In combination, these two sources evaluate each need across eight criteria: safety, asset condition, mobility

and connectivity, economic access, resiliency, environment, community, and health access. VPSP2 prioritizes projects on a two-year alternating cycle. Phase 1 includes addressing roadway, traffic and safety, and paving needs; phase 2 mainly includes bridges.

The TAC and the transportation planner are generally responsible for this planning activity. The transportation planner utilizes tools provided by VTrans to assign each project or area of concern with a score. The TAC then considers these scores and makes a final determination to be submitted to VTrans.

GOALS AND POLICIES

1 GOAL

Ensure all of the region's residents have equitable access to safe and affordable transportation options regardless of age, physical ability, or economic status or other factors.

a. Ensure that the region's transportation network will safely accommodate all users, including pedestrians, bicyclists, motorists, freight, and public transit users.
b. Seek out engineering, enforcement, and behavior change solutions to address safety issues on the transportation network.
c. Support new and expand existing public transportation services to serve both transit-dependent and transit-by-choice riders.
d. Support new revenue sources or equitable approaches to providing non-federal match for transit services.
e. Support changes to match requirements for multi-modal transportation grants to ensure a municipality's ability to pay is considered.
f. Prioritize transportation investment in communities or neighborhoods of historic underinvestment or disinvestment.

2 GOAL

Use creative approaches to maintain, improve, and expand the region's transportation network, and ensure it is resilient to the impacts of climate change.

a. Use innovative planning, design, construction, and contracting techniques to reduce cost and improve project delivery while still allowing for transparency and public oversight.
b. Facilitate public-private partnerships that implement the recommendations of local, regional, and state planning efforts.
c. Ensure that new commercial, multi-use, and multi-unit (4+) housing developments provide electric vehicle charging stations and provisions for public transit.
d. Ensure that new transportation facilities are designed with consideration for the people using the facilities and incorporate context-sensitive design features.
e. Incorporate climate resilience and greenhouse gas mitigation considerations in new and upgraded transportation facility designs and in project prioritization.
f. Implement the goals of the Vermont Climate Action Plan when developing new transportation projects and programs. This can include planning for appropriately sized culverts and stormwater mitigation, which better meet the challenges of current increased rainfall totals.
g. Use transportation as a tool to reduce greenhouse gas emissions, through planning for smart traveling (e.g., carpool, rideshare, public transit), EV charging infrastructure and walkable/bikeable infrastructure.

3 GOAL

Ensure the transportation network enhances residents' overall quality of life, supports regional land-use goals, and expands economic opportunities.

a. Ensure that construction and maintenance of the transportation network minimizes negative impactson natural, cultural, and scenic resources.
b. Use appropriate Complete Streets techniques depending on the land-use context, including as described in Table 4.
c. Develop and maintain rail, truck freight, and air facilities in a manner that supports efficient operation of the system, ensures compatibility with the host community, and increases economic opportunities for the region.
d. Implement the land-use and transportation recommendations from regionally endorsed (i.e., TAC or NRPC board) corridor plans.
e. Implement the goals of the Vermont Comprehensive Energy Plan when developing new transportation projects and programs.
f. Ensure that new land development does not negatively impact the safety of any mode within the transportation network.
g. New public and private transportation infrastructure shall be designed and built to interconnect with adjacent land development(s).

NATURAL AND CULTURAL RESOURCES

GOALS

1. **Protect significant natural resources, including air, wetlands, wildlife, lakes, ponds, woodlands, earth resources, open spaces, groundwater resources and wildlife habitat.**
2. **Protect and conserve historically significant buildings and locations, archaeological resources, and important scenic and aesthetic resources, starting with those identified in local and regional plans.**
3. **Maintain and wherever possible improve the quality of lakes, ponds, rivers, streams and groundwater.**

ASSETS AND VALUES

The region is a reflection of its people and its land. With a traditionally agrarian, working landscape framed by the Green Mountains and Lake Champlain, Franklin and Grand Isle Counties are still heavily dependent on the natural resource base. With a built environment largely defined by compact villages surrounded by open countryside, the region retains much of its rural character.

The region is home to an abundance of archaeological, historic, and cultural resources. The archaeological resources provide clear evidence of the region's extensive and longstanding indigenous habitation, while many of the historic resources are tangible reminders of the communities built following the arrival of Europeans in North America. Cultural value is attached to events and physical items from prehistory through to the present day.

Archaeological resources include the villages, hunting camps, trade networks and burial grounds associated with indigenous people. Significant indigenous archaeological resources are known to be located in the vicinity of Route 78 in Swanton and Monument Road in Highgate. The location of many other such sites in the region remain private to protect their integrity. The Vermont Division for Historic Preservation maintains a listing of the 522 known archaeological sites within the region, of which 410 have detailed data. This figure likely represents a small fraction of significant sites in the region given that indigenous peoples lived in many places and intensive investigation of pre-historic site locations has not been undertaken. The Abenaki of Missisquoi continue to maintain a deep connection to the area in many ways, including via their tribal headquarters in Swanton.

Similarly, several historic settlements, sites and structures in the region (most reflecting post-colonial settlement) have been identified and entered into the State Register of Historic Places. In addition, over 75 properties within the region are included in the National Register of Historic Places. These include historic

districts, as well as bridges, border stations, places of worship, and farmsteads. They also include two historic sites: the Hyde Log Cabin in Grand Isle (managed by the Grand Isle Historical Society) and the Chester A. Arthur Birthplace in Fairfield (managed by the Vermont Division for Historic Preservation). The region also hosts 10 museums, including St. Albans's Museum in St. Albans and the Hyde Log Cabin in Grand Isle, and a growing roster of art-focused venues, such as the Cold Hollow Sculpture Park. The region's 18 community-based historical societies work ever more diligently to document the diverse history of the region and its communities.

Long-standing cultural events such as the Vermont Dairy Festival in Enosburg Falls and Franklin County Field Days reflect the important role that agriculture continues to play in the region. For example, in St. Albans City, the Vermont Maple Festival typically draws more than 50,000 participants each year in honor of maple syrup, Vermont's "liquid gold." Newer and smaller cultural events, including those increasing awareness of the culture of the Region's indigenous people, are also noteworthy. These and other cultural events, from farmers' markets to concerts and parades too numerous to name, provide invaluable contributions to the local sense of place. Another event long considered symbolic of Vermont culture is Town Meeting Day. Indeed, residents in municipalities across the Region gather annually on or near the first the Tuesday in March to vote and make decisions that affect their local communities. Some municipalities have changed to Australian ballot voting combined with a public information session. Many municipalities temporarily halted in-person Town Meetings to respond to the COVID-19 pandemic, though by 2023 all communities in the region have returned to in-person Town Meetings or information sessions.

Beyond the historical richness of the region, Northwest Vermont boasts a robust mosaic of diverse landscapes, from the Adirondacks-backed agricultural viewsheds of the Lake Champlain islands to the heavily wooded western slopes of the Green Mountains. With sensitive siting and design, it's possible for scenic landscapes to be developed and still retain much of their intrinsic character. Aesthetic considerations are recognized as a legitimate public concern under Criterion 8 of Act 250. Conserving the region's aesthetic resources is crucial to maintaining its sense of place.

Our downtowns and historic village centers provide a gathering place for the community, a sense of identity and a unique heritage that is an important cultural and historic resource. State programs that "designate" downtowns and village centers provide a mechanism to access grants and tax credits to assist redevelopment projects and promote growth in these places. The Certified Local Government (CLG) program establishes a preservation partnership between a local historic preservation commission, the State Historic Preservation Office, and the National Park Service. St. Albans City achieved CLG designation in 2020. As such, the city can access CLG grant funding for locally-based preservation projects.

Natural Resources

Bedrock and the Physical Landscape: The Foothills of the Green Mountains are separated from the Champlain Lowlands by a series of thrust faults running north–south through Franklin County. The Hinesburg Thrust Fault and related erosional remnants—including Aldis Hill, Prospect Hill and Georgia Mountain—are among the most prominent landscape features in this part of the region. The Foothills are characterized by rolling hills and valleys ranging in elevation from 500 to around 1,000 feet above mean sea level. This area is differentiated from the Green Mountain chain more by elevation and topography than geology. Many of the region's more picturesque villages and hamlets are located there.

The Green Mountains—which are part of the Appalachian chain and once stood higher than the Rockies—now reach heights within the region of less than 4,000 feet. Nevertheless, these old mountains still present a formidable barrier along Franklin County's eastern border. Exposed bedrock, boulder surfaces, steep slopes and shallow soils are common. Because of its remoteness, elevation, steep slopes, shallow soils and poor

drainage, this area of the region has not been heavily developed. Farming historically has been confined to stream and river valleys. Forestry remains the predominant use of the land in this part of the region.

Climate: The climate of Northwestern Vermont is dominated by prevailing Westerlies—cold, dry air from Canada in winter; warmer, moist air from the Gulf of Mexico in summer; and occasionally damp, cold air moving in from the North Atlantic. The area enjoys the strong seasonal variations that are characteristic of northern New England. The diversity of elevation and proximity to Lake Champlain that define the region contribute to substantial differences in micro-climate between the Champlain Valley and the hill country of eastern Franklin County. Grand Isle County, which benefits from the moderating effects of Lake Champlain, tends to have milder weather, longer growing seasons and less snowfall than the more mountainous parts of the region.

Global climate change may have significant implications for our region. According to the U.S. Environmental Protection Agency (EPA), over the past century, Burlington, Vermont, has seen an average temperature increase of 0.4°F. By 2100, it predicts an additional increase of up to 4 or 5°F. This could significantly alter weather patterns and have implications for agriculture, forestry, maple production and tourist-related industries. Vermont's Global Warming Solutions Act required the adoption of a Climate Action Plan that will reduce greenhouse gas emissions and address climate resilience and adaptation. "As climate change continues to be observed in Vermont, the characteristics of these hazards are also changing and this sets up cultural, socioeconomic and policy implications for Vermonters as individuals, municipalities, communities, and indigenous peoples, as well as for the built and natural environments." (Vermont Climate Action Plan, 2021)

Soils: Soils are an important environmental factor influencing the use of land in rural areas. Within the context of land use planning, the characteristics that are of primary concern are bearing capacity, erodibility, drainage, septic suitability and resource value. Resource values may include productivity for growing crops or for sustaining specific species or communities.

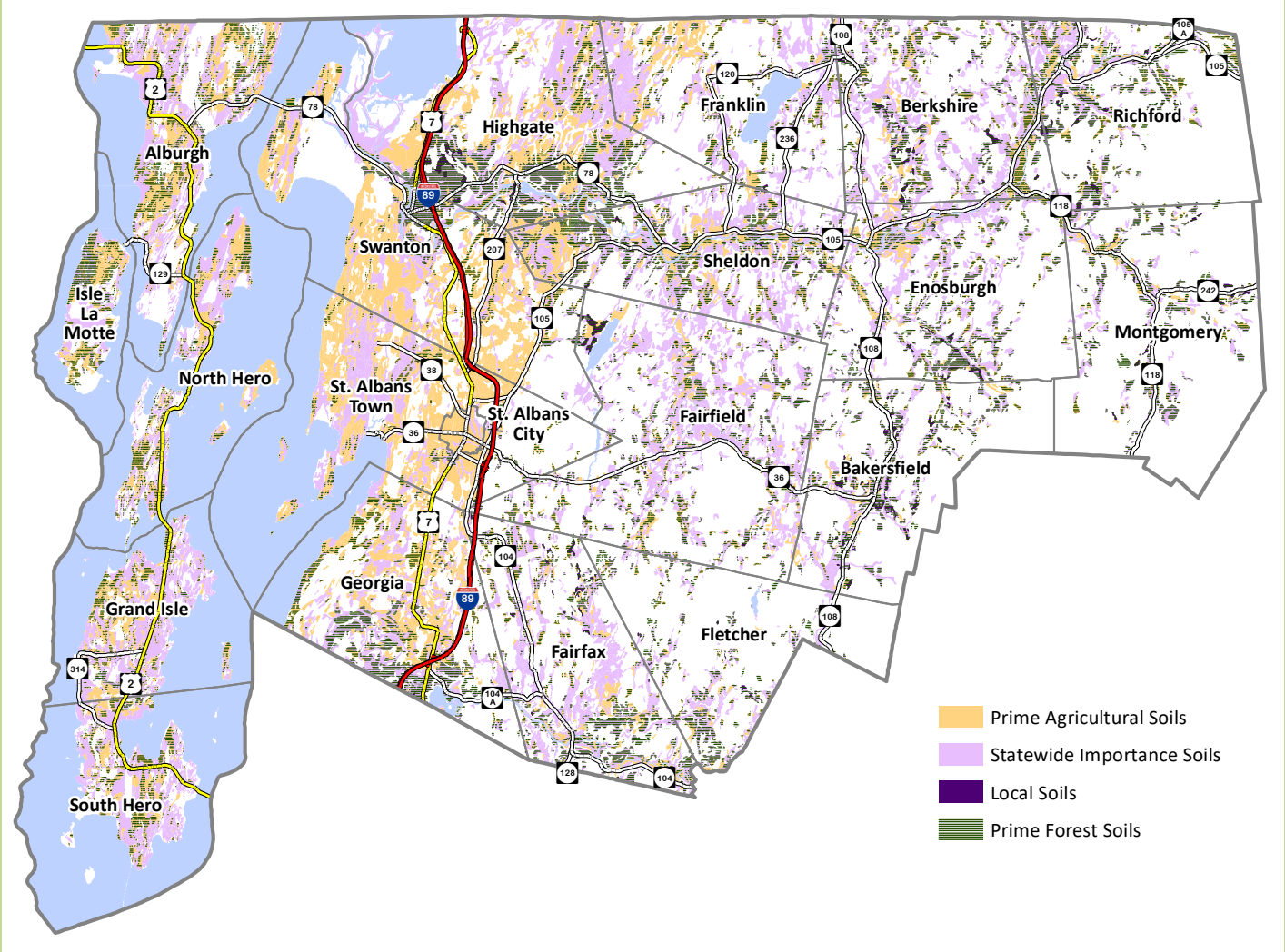
"Primary agricultural soils," as defined for use in Act 250 proceedings, are soils mapped as important farmland soils according to the Natural Resources Conservation Service (NRCS). NRCS classifies many soils as having prime, statewide or local importance for agriculture. Soils designated as having prime or statewide importance cover 41% of the region, the majority of which are in Franklin County (Map 6). Franklin County contains one category of local importance soils, defined as Missisquoi loamy sand, with 8% to 15% slopes.

Many of the region's agricultural enterprises depend upon the availability of high-quality soils in sufficiently large, contiguous parcels to allow for economical hay and field crop production. Because of their physical qualities, however, these soils are often also considered the best suited for land development and corresponding subdivision. Farmland conversion and fragmentation are a concern both regionally and statewide. The parcelization and development of good farmland effectively takes it out of production over the long term and reduces an already limited resource base.

The NRCS has also identified "prime forest soils," which are important to sustaining commercial forestry operations in the region. Prime forest soils can be classified according to their relative productivity (Map 6). These soils cover 12% of the region and in some cases overlap with important agricultural soils signifying areas of high soil quality. Similar concerns exist regarding the development and fragmentation of forest soils.

Other Earth Resources: A prominent geological site, the Chazy Reef—the oldest reef in the world—is visible and accessible in Isle la Motte. Other earth resources—including sand and gravel deposits and quarry stone—are of critical importance to road maintenance and construction and their use in products or industrial processes. An example of the latter is Isle La Motte's high quality black marble. Resource value asides,

MAP 6: Agricultural and Forestry Soils



SOURCE: *Natural Resources Conservation Service (NRCS)*

improper or excessive resource extraction is extremely damaging to the natural and scenic resources of the area, with far-reaching implications for surface and ground water quality as well as the archaeological and aesthetic resources of the region. Sand and gravel deposits often serve as important areas for aquifer recharge and filtration, so they are vital for high-quality sources of drinking water.

Rivers and Watersheds: Rivers and streams offer sustenance, scenic beauty and recreational opportunities, and they heavily influence the cultural, social and economic environment in Northwest Vermont. Within Franklin and Grand Isle Counties they form three major drainage basins, all of which empty into Lake Champlain (Map 7). Watersheds are a critical geographic unit when planning for natural resources. The Department of Environmental Conservation (DEC) has worked with NRPC and communities to complete Tactical Basin Plans for these watersheds. These basin plans are prepared to protect each basin's surface waters and ensure that they meet or exceed the Vermont Water Quality Standards.

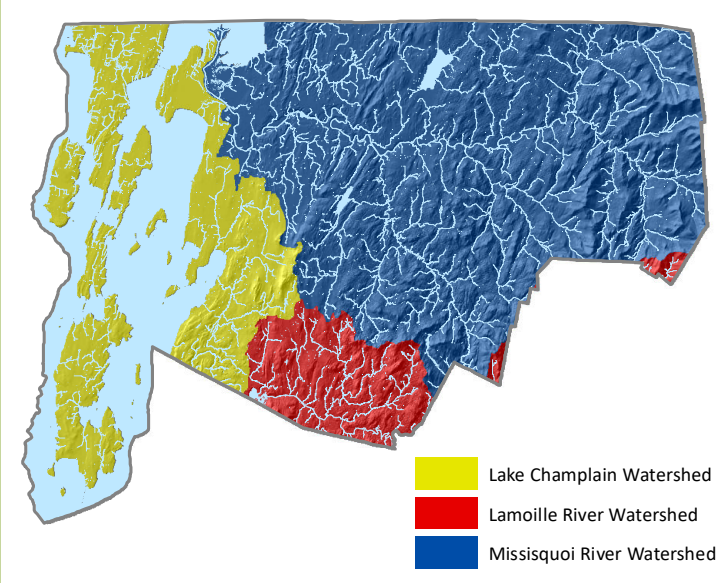
Development in and around the region's rivers can significantly affect the health of the river by reducing water quality, impacting the lives of stream biota, and increasing flood hazards. Of particular concern is development within a river's floodplain. During flood events, the floodplain provides an area for flood waters to spread out, slowing down their flow and depositing sediment. Development in the floodplain restricts the flood waters and

decreases the area available for flood storage. Channelization of streams, creeks and rivers also increases the severity of flooding and erosion by increasing the velocity of water and the amount of suspended sediment in the water. Much of the region's floodplain is currently used for agriculture, taking advantage of the rich soils.

The Federal Emergency Management Agency (FEMA) requires communities to adopt flood hazard regulations under the National Flood Insurance Program (NFIP) for property owners to be eligible for flood insurance and home mortgages. Floodplain delineations provided by FEMA have traditionally been inaccurate and/or difficult to interpret and did not serve as robust planning tools for floodplain management. All municipalities in the region are enrolled in the NFIP. Most NFIP maps in the region are over 40 years old and need updating. FEMA has begun work on new and improved flood maps for communities in the Northwest region which should be available in 2024. NRPC anticipates working with many communities on flood bylaw updates based on these maps.

Previously the NRPC has worked with local communities to complete studies known as stream geomorphic assessments. These assessments found that the lack of riparian buffers and past channel management practices—including channel straightening— are the two main stressors for the streams and rivers within the region. The absence of trees and other woody vegetation along stream banks can accelerate the rate of erosion and—since soil particles will bind with nutrients— increase the amount of phosphorus that is entering Lake Champlain in places like Missisquoi Bay. Due to these local conditions, and due to similar conditions in other watersheds, VANR has designated "river corridors" for streams and rivers across Vermont to ensure that new development does not further contribute to fluvial erosion and degradation of surface waters.

MAP 7: Northwest Region Watersheds



SOURCE: *Vermont Open Geodata Portal*

Vegetative stream buffers along rivers provide bank stability and shade the water, contributing to cooler water temperatures and lowering suspended sediment concentrations. Vegetation growing on the river banks also helps regulate flow, absorbing water to mediate the effects of flooding and releasing water during periods of low flow.

Many of Vermont's major wildlife species depend on riverine areas for various habitat needs. Several areas along the Missisquoi and Lamoille Rivers, including many tributaries, have been identified as optimum or critical habitat for deer, moose and water birds by the Vermont Department of Environmental Conservation (DEC). These sites are found mainly in eastern and southern Franklin County, and in many cases, they correspond to the location of deer wintering habitat.

The region's rivers also support a variety of game fish species, including wild populations of rainbow, brown and brook trout; northern pike; largemouth bass; smallmouth bass; and walleye. Muskellunge have also been periodically stocked in the Missisquoi River since 2008 to restore a self-sustaining population in the lower portion of the river. Many non-game fish species can also be found in the region including several rare (R), threatened (T), or endangered (E) fish species including lake sturgeon (E), Eastern sand darter (E), stonecat (E), American brook lamprey (T), greater redhorse (R), and silver redhorse (R).

Lakes and Ponds: Lake Champlain is without a doubt among the most treasured of Vermont's waters. At more than 400 square miles in size (158 square miles within Franklin and Grand Isle Counties), the lake—aside from the Great Lakes—is among the largest fresh waterbodies in the United States, and it is a dominant feature in the natural and cultural landscape of the region.

Other waters in the region—which are defined as lakes and ponds of state jurisdiction when 10 acres or larger in size— include Fairfield Pond, portions of Arrowhead Mountain Lake, Lake Carmi and Metcalf Pond. Across the region, particularly in Franklin County, these lakes and many smaller water bodies serve critical functions in the provision of wildlife habitat and migratory corridors, overland nutrient filtration, opportunities for recreation and public water supply. Shorelands along water bodies larger than 10 acres are subject to state regulations aimed at enhancing the vegetative and pervious cover along the shoreline to protect water quality and aquatic habitat.

Wetlands: Although wetlands often serve as transition areas between dry land and open water, they can also be isolated from any obvious connection to water. Franklin and Grand Isle Counties include approximately 46,200 acres of wetlands. Vermont's wetlands—including the extensive wetland complexes found in Franklin and Grand Isle Counties—serve numerous functions, including flood control, shoreline anchoring, water quality, habitat and contributing to socio-economic value. They account for 2.7% and 7.5% of the total land area for each, respectively. These counties rank among the top four in the state for the highest ratio of wetlands to total land area, with Grand Isle County being number one by a wide margin.

Wetlands are protected through local, state and federal regulations; the state wetland rules identify the types of wetlands that fall under state-level jurisdiction. The majority of wetlands in the Region are Class II wetlands. The wetland complex at the mouth of the Missisquoi—parts of which lie within the Missisquoi National Wildlife Refuge—is considered by some to be a candidate for class I wetland status. The Refuge was established in 1943 and now occupies an area of over 7,200 acres. The U.S. Army Corps of Engineers has jurisdiction over Class III wetlands. The Vermont Wetlands Program launched an effort to update Vermont's wetland maps in 2021. State official posted materials on their website and sought public comment on the draft documents through July of 2022, when associated Wetland Rule changes were filed. A final version of the revised wetland maps is expected to be published in 2023.

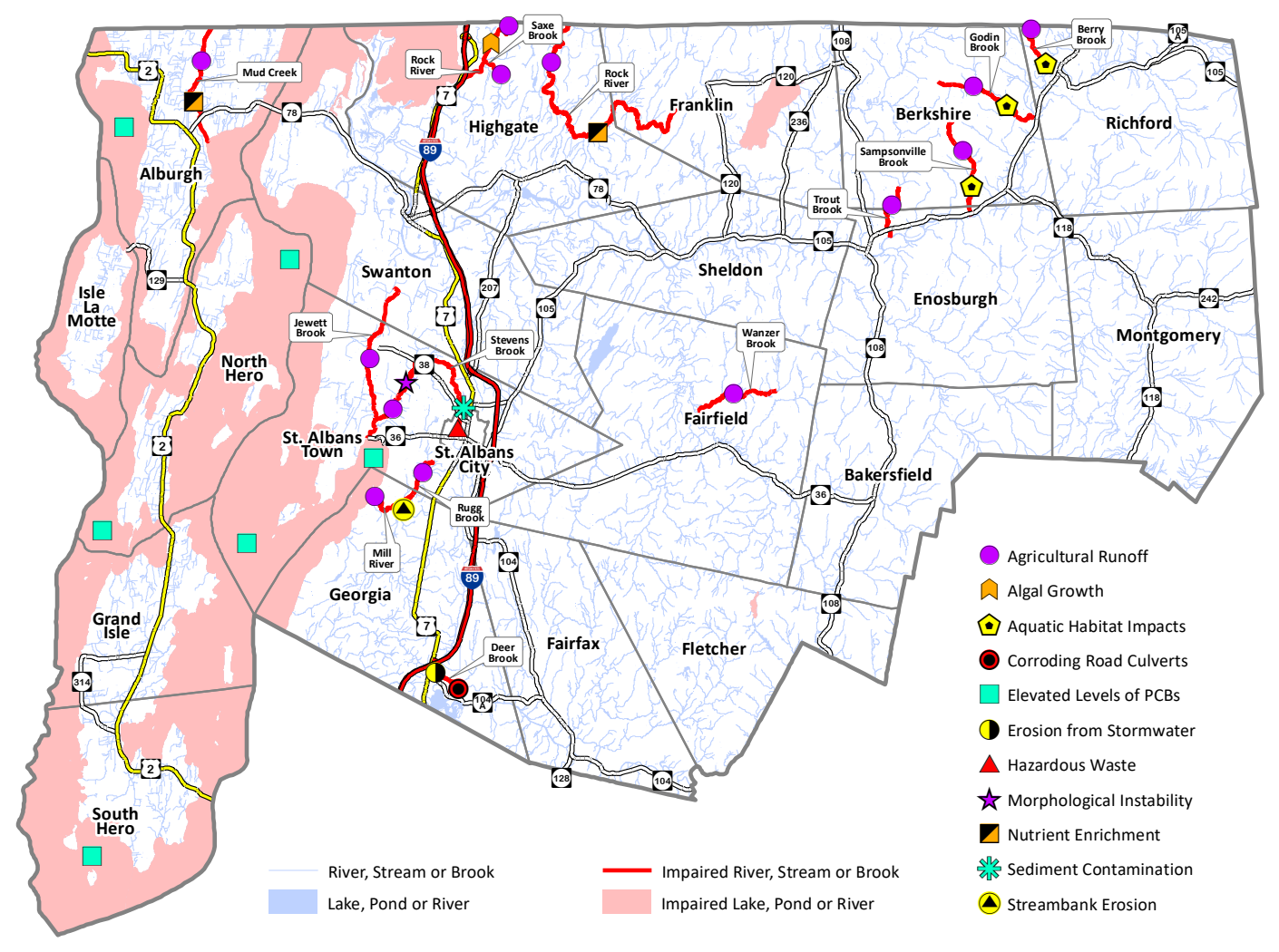
Groundwater: The region enjoys a general abundance of groundwater supplies, though yields and quality vary depending on local hydrology. Groundwater is a critical resource to the region for its obvious importance as a drinking water source. Approximately 66% of Vermont residents rely on groundwater as a source of drinking water. Although the quality is generally good, the resource is nonetheless fragile. Once supplies are contaminated, cleanup is difficult and comes at great public cost.

Water Quality: Many surface waters in the region, such as Lake Champlain, do not meet federal or state standards for water quality. These "impaired" areas have been identified across Vermont. Impaired waters located within the Northwest region are depicted in Map 8. Threats to water quality come from a variety of stressors. The underlying causes of these stresses include urban and agricultural runoff, invasive species, hazardous waste disposal and septic systems. See Table 4 for a list of stressors impacting the region.

When land is developed, there is a related increase in impervious surfaces, particularly pavement and roofs. As the area of impervious surface increases, the landscape's capacity to absorb and filter nutrients is reduced, resulting in higher levels of phosphorus and other nutrients running overland into water bodies and accelerating the process of eutrophication.

As noted in the basin plan for the Missisquoi Bay basin, agricultural runoff, if not properly managed, can negatively impact water quality. "Without proper management of fields and farmsteads, agricultural land use

MAP 8: Targeted Impaired Areas



SOURCE: *Vermont Agency of Natural Resources*

can be a source of nutrients, sediment, pathogens and toxins to surface waters." Improving the soil health of fields as well as managing application of nutrients through use of Agricultural Best Management Practices helps address water quality concerns and protect surface waters.

Toxic substances can be defined as chemicals capable of causing harm to plants and animals including humans. Vermont's Statewide Surface Water Management Strategy notes several classes of toxic substances have potential to affect surface waters in Vermont, including mercury, organic and inorganic contaminants, metals, and pesticides. Two significant threats of emerging concern being addressed statewide are chlorides and a class of chemicals knowns a PFAS. Inadequate or poorly maintained on-site septic systems also can impact water quality as noted in the Missisquoi Bay basin plan.

Management of shorelands, both developed and undeveloped, is also an important challenge for the region. Grand Isle County, which contains an overwhelmingly large ratio of lakeshore to land area, continues to experience development pressures due to second-home construction, the ever-expanding commuter shed of Chittenden County, and what some are calling "COVID migration." Franklin County's Lake Champlain shorelands face similar development pressures in part because of their close proximity to Interstate 89. Because of the variety of issues associated with these stressors, there is no "one size fits all" solution. Instead, several approaches are needed to deal with each problem effectively.

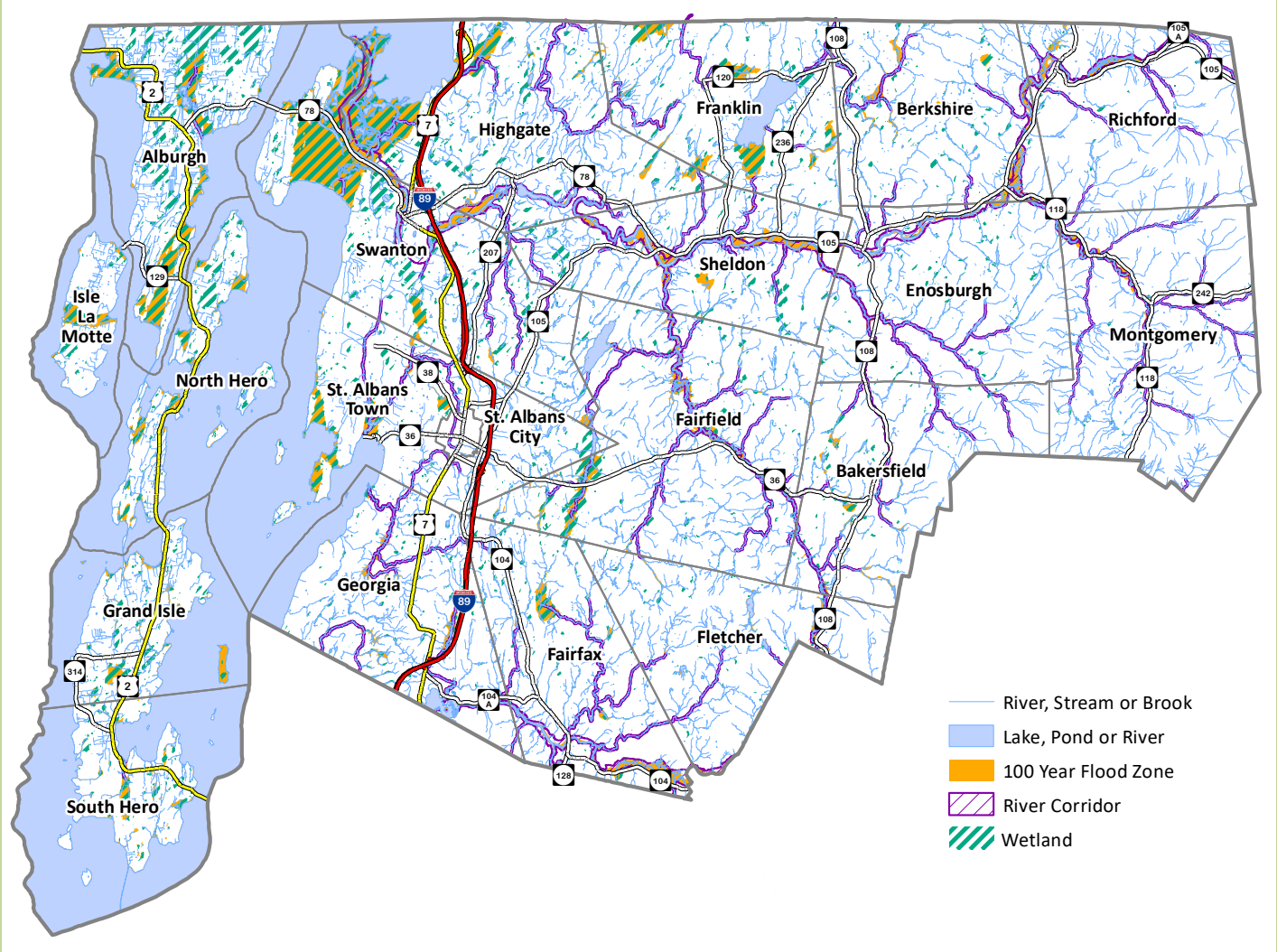
TABLE 4: Major Surface Water Stressors in the Region and Underlying Causes

STRESSOR	UNDERLYING CAUSE
ACIDITY from:	• atmospheric deposition • mine tailings runoff
ALTERED HYDROLOGY resulting in periodic dewatering or inundation of habitat (including extremely high velocities and rapidly changing flow) from:	• non-natural variation in flows due to withdrawals • decreased/altered flows from flood control and hydropower dams • lake or reservoir fluctuations • ditching of wetlands
AQUATIC INVASIVE SPECIES that cause loss of recreational opportunities and habitat/ecological integrity of aquatic or riparian habitats, due to:	• human dispersion (aquaria release, ballast release, boat/trailer transfer, fish tournaments) • natural spread (avian transfer)
CHANNEL EROSION causing increased sediment & nutrient loading due to mass wasting and stream disequilibrium (erosion/transport/deposition) from:	• increased flow peaks (watershed ditching/draining, impervious cover runoff, dams, and climate change) • sediment discontinuity (dams, diversions, and culverts) • channelization practices (channel dredging, straightening, berming, and armoring) • bed and bank disturbance
ENCROACHMENTS from loss of habitat, equilibrium, and ecological process due to encroachments within or adjacent to floodplains, wetlands, lakes, streams, and rivers from:	• earthen fills • roads • buildings • utilities • stream crossings • dams
LAND EROSION causing increased sediment & nutrient loading due to erosion of exposed soils and gully erosion from:	• ditching (conveyed surface flow) • cropland • forestland uses • construction sites • stormwater runoff
NUTRIENT LOADING (non erosion) to surface waters from:	• over-fertilization (urban, agriculture) • inadequately treated domestic waste • animal and milk house wastes
PATHOGENS from anthropogenic waste attributable to:	• poorly functioning septic systems • domestic animals • agricultural runoff • nuisance wildlife
TOXIC SUBSTANCES in surface water and groundwater from:	• atmospheric deposition • inorganic and organic contaminant releases • pesticides • contaminants of emerging concern • biologically derived toxins
THERMAL STRESS	• removal of woody and herbaceous riparian/shoreland vegetation • impoundment • climate change

SOURCE: *Vermont Surface Water Management Strategy*

Water Quality Initiatives: Several initiatives are underway in Vermont to reduce the amount of phosphorus entering Lake Champlain and other waterbodies. Phosphorus is naturally occurring, but excess phosphorus due in large part to human activity, has significant negative impacts on water quality. Efforts to control phosphorus focus on a range of land use sectors, including agricultural land, developed land, forestland and stream corridors. They include regulations as well as voluntary actions. To achieve targets agreed to by the

MAP 9: Water Resources



SOURCE: *Vermont Agency of Natural Resources and Flood Insurance Rate Maps*

State of Vermont and the Environmental Protection Agency, phosphorus loading within the region will need to be reduced as much as 66% in some basins. Lake Carmi is also a focus of efforts to reduce its high phosphorus levels. Both water bodies experience blue-green algae blooms and growth of invasive weeds fed by the elevated phosphorus levels. Lake Carmi has been designated a "Lake in Crisis" by the State of Vermont and as such has a specific management plan and dedicated resources to address ongoing water quality issues.

In 2019, the Vermont General Assembly approved the Clean Water Service Delivery Act, also known as Act 76. Act 76 provides a long-term funding source for water quality projects, prioritizes financial support for voluntary projects, and establishes a network of decentralized Clean Water Service Providers (CWSPs) and Basin Water Quality Councils (BWQCs) to identify and implement voluntary projects. CWSPs have multifaceted responsibilities. Their role includes establishing partnerships with non-profit groups and landowners, creating and supporting BWQCs, and identify and implementing projects to meet Phosphorus reduction targets established to clean up Lake Champlain. CWSPs are also responsible for verifying and inspecting projects over time and ensuring consistency with Tactical Basin Plans. NRPC has been selected to serve as the Clean Water Service Provider for the Missisquoi and Lamoille Basins and will also be an active participant in the BWQC representing interests in northern Lake Champlain. Improving water quality will require a long-term, sustained effort.

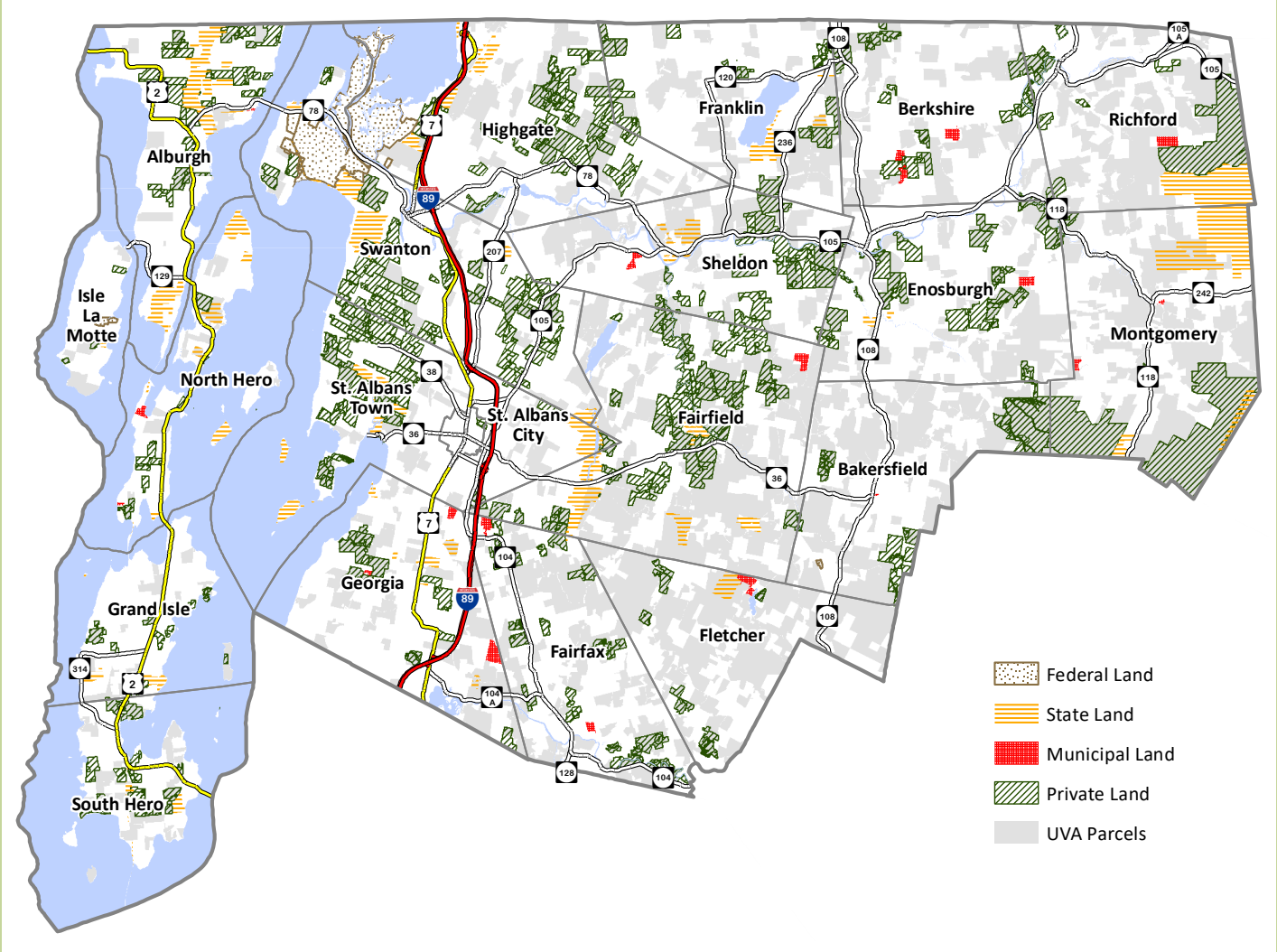
Forest Resources: The region's forests play an important role as a natural, cultural and economic asset to the local communities. Indeed, several communities in the region maintain town forests. These and other forests throughout the region are used for recreational and educational purposes and activities.

Northwestern Vermont is part of the Northern Forest, an area stretching across northern New York and New England and encompassing 26 million acres of forestland. The upland area of northwestern Vermont contains the largest tracks of contiguous woodland in the Northern Forest. This area is characterized by steeply sloping mature softwood and hardwood forests as well as streams that flow into the Missisquoi and Lamoille Rivers. The region's uplands strongly correlate with the preferred habitat for Vermont's black bear population, and these areas are generally the most undeveloped lands in Franklin County.

Forest products are a vital component of the local economy. According to the United States Department of Agriculture (USDA), Vermont produced 48.1% of the nation's maple syrup in 2014, with Franklin County a leading production area in the state. Timber is also an essential industry in the region, and more than 10,000 MBF (million board feet) and 7,614 cords of pulpwood were produced by Franklin County in 2010.

Fifty percent of the land in the region is enrolled in Vermont's Current Use or Use Value Appraisal (UVA) Program, which means the land is being actively managed for agriculture or forestry (Map 10). The amount of

MAP 10: Conserved Land



SOURCE: *Vermont Open Geodata Portal and Use Value Appraisal (UVA) Program*

forestland enrolled in the program has increased from 72,500 acres in 2000 to 166,860 acres in 2020. UVA is a temporary land conservation measure, unlike other more permanently conserved lands shown on the map.

The extensive, relatively undeveloped tracts of forested uplands in the region have the potential—with proper management—to serve as areas of core wildlife habitat substantial enough to support viable populations of large mammals, such as moose and black bear.

Additional information on the characteristics and values of the forest in the region along with measures that can be taken to ensure good forest stewardship can be found in the Northwest Regional Forest Stewardship Plan (2015).

Fragile Areas: In 1977, the Vermont Legislature established the Fragile Areas Registry (10 VSA Chapter 158). The goal of the Fragile Areas Registry is to protect significant natural areas through a process of site identification and documentation, resulting in heightened public awareness and serving as aids in state and local planning. Three areas in Franklin and Grand Isle Counties are currently listed in the Fragile Areas Registry:

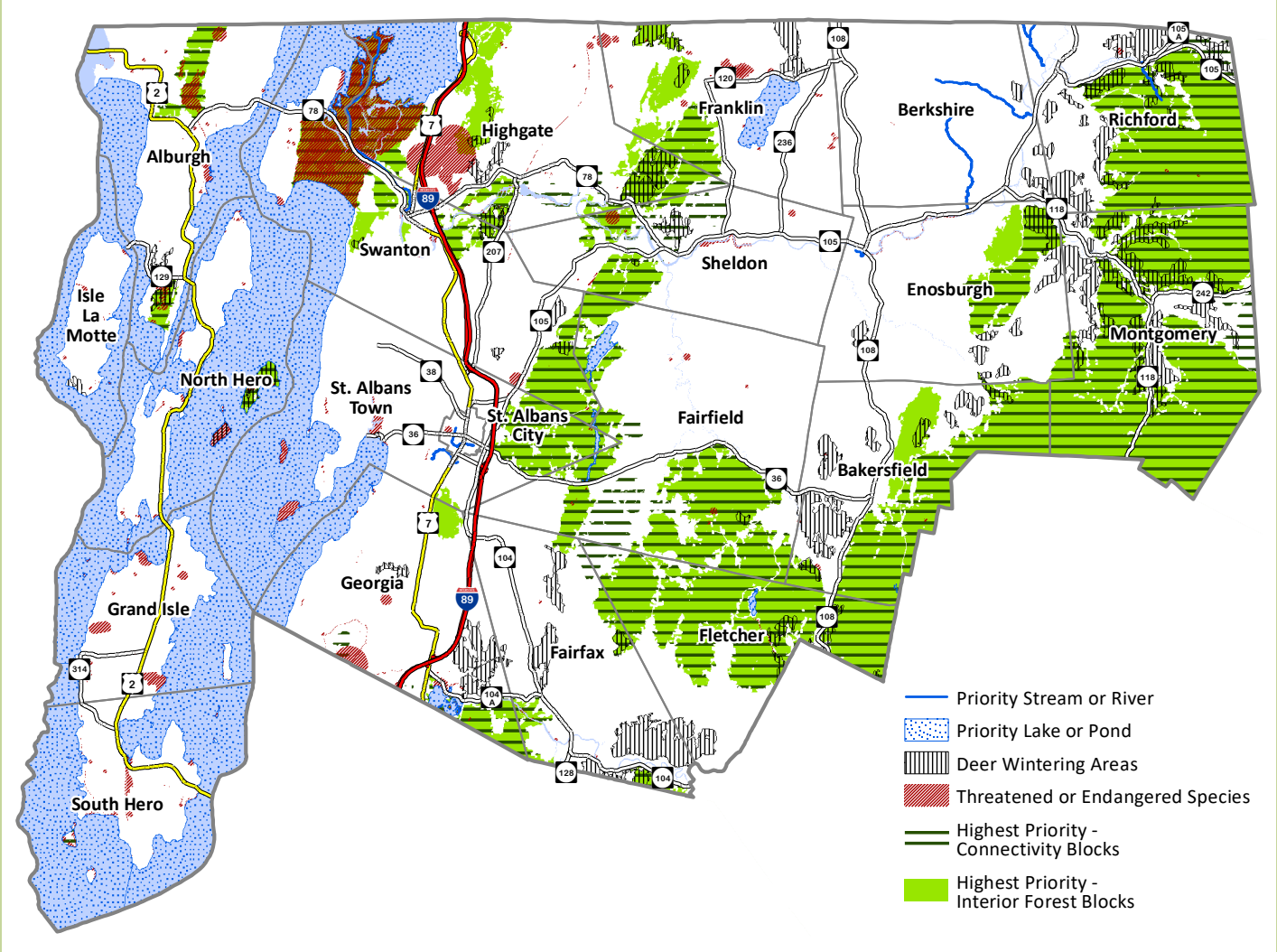
- **Missisquoi River Delta:** This 1,500-acre area of freshwater marsh and forest is recognized for its significance as a large, diverse, rich ecosystem supporting populations of several rare birds and game fish.
- **Chazian Coral Reef:** Found in numerous outcroppings in Isle La Motte, the Chazian Coral Reef is more than 480 million years old and is the oldest coral reef in the world. The reef represents a valuable resource for paleontological research.
- **Franklin Bog:** This 300-acre bog is located one-quarter of a mile north of Lake Carmi. Franklin Bog is exemplary for its size and its corresponding species and landscape richness, which includes several interpenetrating zones of conifer forest, open bog mat and streams with active beaver populations.

In the years since the creation of the Fragile Areas Registry, Vermont has created and expanded its Natural Heritage Inventory. The inventory includes data about both individual species and natural communities and supports conservation and monitoring at local, regional, and state levels.

Wildlife and Plant Habitat: The region provides critical habitat to a variety of wild animals as shown in Map 11. Development must be planned properly to ensure habitat conservation and to avoid fragmenting habitat and negatively impacting the local wildlife. Steps also must be taken whenever possible to prevent the degradation of habitats by invasive species. Map 11 shows some of the region's important habitat areas. Many habitat areas in the region are not depicted but nonetheless should be considered when planning for the future. Habitat for plant and animal species can occur within many landscapes present in the region such as wetlands, forestland, riverine and riparian environments. Indeed, wetlands serve as habitat for 95 species of threatened or endangered plants nationwide, and more than 43% of all federally recognized threatened or endangered plant species are found in Vermont wetlands (VT DEC).

Act 171 revised state law to encourage municipalities and regions to address protection of forest blocks and habitat connectors—which are vital to wildlife conservation—while also supporting forest industries. The highest priority forest blocks provide "core forest habitat," or interior forest not impacted by surrounding human uses. These more substantial undisturbed areas are particularly necessary for animals whose habitat requirements include large home ranges. Systems of core habitat—connected by smaller "connectivity blocks"—provide wildlife travel corridors between core areas and promote healthy animal populations by ensuring genetic mixing among animals from different core habitat areas. The highest priority connectivity blocks often feature water and may consist of surface water and riparian areas or riparian wildlife connectivity areas. Riverine areas support fish and wildlife species for various habitat needs, including winter shelter, food supply, breeding and use as travel corridors and migratory bird staging sites. Several areas along the Missisquoi and Lamoille Rivers, including many tributaries, have been identified as optimum or critical habitat for deer, moose and water birds.

MAP 11: Wildlife Habitat



SOURCE: *Vermont Open Geodata Portal*

Invasive species can be harmful to native wildlife and their habitats by "out competing" native species and displacing them. According to DEC, significant aquatic invasives found in Franklin and Grand Isle Counties include plants such as such as purple loosestrife, water chestnut, or Eurasian milfoil, and animals like zebra mussels, spiny water flea and white perch. Significant terrestrial invasive species include plants like garlic mustard, buckthorn and Japanese knotweed that can poison soils, cause streambank erosion, and crowd out native plants. Forest pest insects of concern include the Asian long-horned beetle, emerald ash borer, and hemlock wooly adelgid.

Numerous locations in the region support populations of designated rare, threatened or endangered plants and animals. The species identified have very particular habitat requirements, or they are at the edge of their natural range, are vulnerable to collection or disturbance, or have difficulty reproducing. The majority of identified sites are located in Grand Isle County and in western Franklin County. Many are found on the lesser islands of Grand Isle County and its shoreland areas.

Although not endangered, black bears are at risk. Black bears prefer mountainous and forested landscapes on the wooded slopes of the Green Mountains. Thus, a significant amount of regional bear habitat exists in eastern Franklin County. Because of its large home range, the black bear is vulnerable to habitat loss through the fragmentation of large forested areas into smaller units and isolated "forest islands."

Deer wintering areas, or "deer yards," provide critical habitat for white tail deer and other species of vertebrates. These areas of hemlock, spruce, fir, cedar and pine species provide shelter from deep snows and permit easier winter travel for deer, compared to deciduous forests. Deer yards also benefit 169 of Vermont's 386 vertebrate species (excluding fish). Of these, five species are threatened or endangered, and four are of special concern due to their limited population size. Numerous deer wintering areas have been identified throughout Franklin and Grand Isle Counties, the most extensive of which are located in the heavily forested areas of eastern Franklin County.

For habitat serving large mammal populations, the area along the Green Mountains on the eastern boundary of the region is critical. The Cold Hollow to Canada initiative is a partnership of community members in Franklin and Lamoille Counties. Its mission is to work together toward the common goal of land stewardship and wildlife habitat conservation across property and municipal boundaries through education, outreach and conservation of land and water resources. On a larger scale, several state and federal organizations have mapped large contiguous habitat blocks in the Green Mountains and vital corridors that connect them; these connectors are important for enabling the movement of large mammals (Map 11).

Scenic Resources: The region's scenic resources are plentiful and include both natural and human-influenced elements. Undeveloped ridgelines are among the region's highly valued natural scenic resources, serving both as vantage points (the areas we enjoy views from) and as terminal views (and create the scene we are enjoying through our observation). Because impacts on scenic resources are assessed as part of the Act 250 development review process, communities in the Region may wish to incorporate a scenic resource assessment as part of their planning processes.

Moose in a Highgate Wetland
PHOTO CREDIT: *Bill Ashton*

GOALS AND POLICIES

1 GOAL

Protect significant natural resources, including air, wetlands, wildlife, lakes, ponds, woodlands, earth resources, open spaces, groundwater resources and wildlife habitat.

a. Support efforts to reduce air pollutants generated in the region from the residential, commercial, industrial and transportation sectors.
b. Ensure that development will not present an undue risk of degrading the region's air quality.
c. Plan, construct and manage mineral and earth resource extraction and processing facilities to ensure that negative impacts are limited and rehabilitation is certain. Minimize noise and adverse impacts on existing or planned uses within the vicinity of the project, fish and wildlife habitat, water quality, prime agricultural soils and scenic resources. Ensure projects do not interfere with the function and safety of all modes within the transportation system.
d. Ensure that development in floodplain or river corridor areas does not impede the flow of flood waters or endanger public health, safety and welfare.
e. Locate and configure land development to avoid the fragmentation of and adverse impacts to natural areas, forest blocks, critical wildlife habitat and connectivity areas identified in the regional plan or local plans by the Vermont Agency of Natural Resources, or through site investigation.
f. Ensure that outdoor lighting is designed to minimize the amount of light leaving development sites, overly bright areas or hot spots, and the amount of light pollution illuminating the night sky.
g. Assist in efforts to combat the spread of invasive species.

2 GOAL

Protect and conserve historically significant buildings and locations, archaeological resources, and important scenic and aesthetic resources identified in local and regional plans.

a. Ensure that new land development minimizes impact on archaeological sites.
b. Ensure that land development along prominent ridgelines and hilltops is designed to fit within the landscape and avoid undue adverse visual impacts.
c. Encourage communication facilities to limit their impact on scenic resources by reducing their size or location so that exterior lighting is not required, by seeking opportunities for co-location, and by choosing sites, shapes and colors of structures that reduce visual impact.
d. Encourage energy generation and distribution facilities to minimize their visual impact on ridgelines, slopes and open areas.
e. Ensure that historically significant buildings and locations are conserved and/or made available for adaptive reuse whenever feasible considering their cost and condition.

3 GOAL

Maintain and wherever possible improve the quality of lakes, ponds, rivers, streams and groundwater.

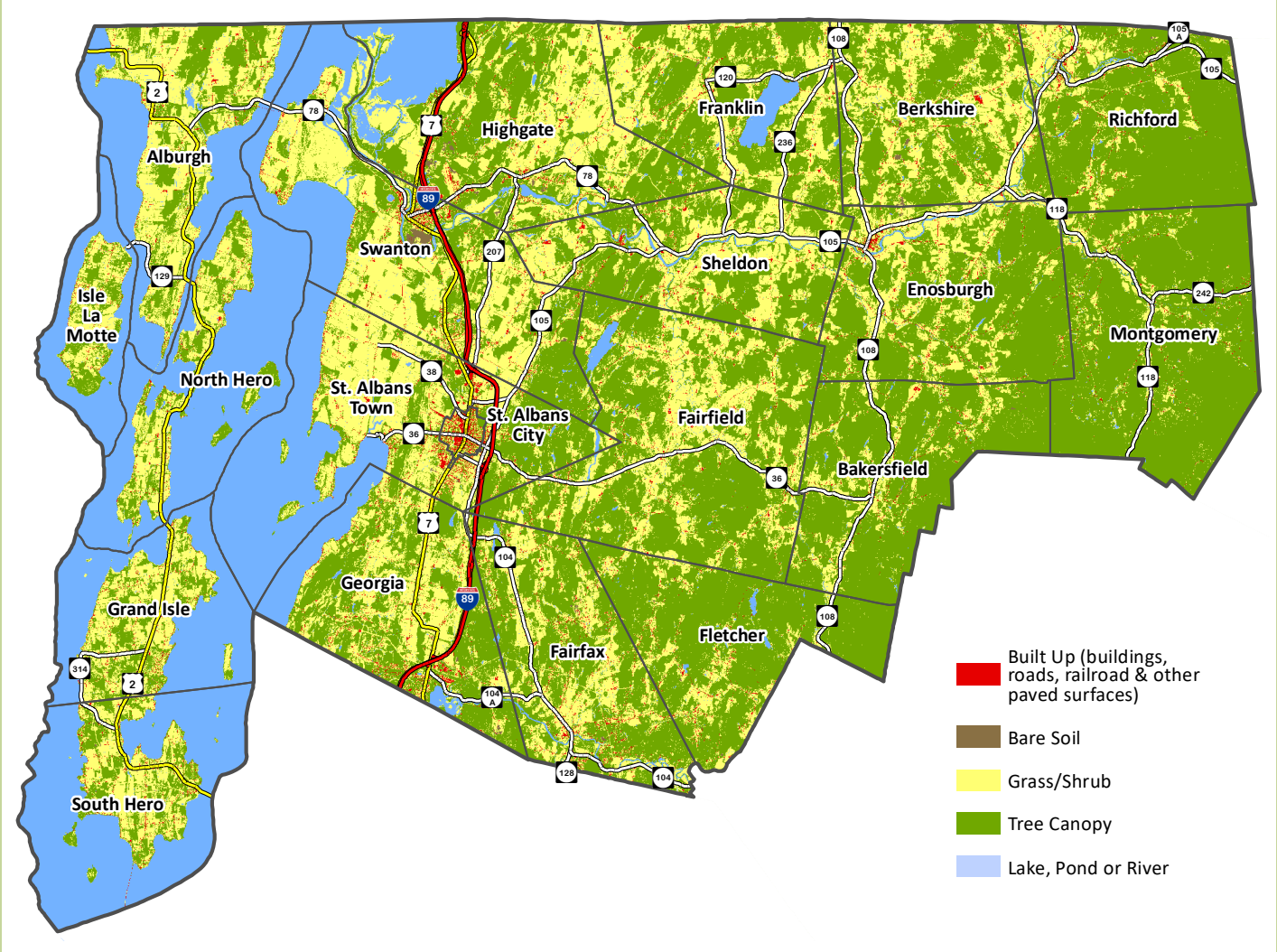
a. Forbid the use of persistent harmful and toxic pollutants in groundwater recharge areas or in areas where they could enter surface or sub-surface waters.
b. Ensure that development mitigates the anticipated effects on water quality through Low Impact Development techniques, such as limiting the amount of impervious surface on a site and incorporating adequate amounts of vegetation, trees and shrubs to aid in stormwater treatment.
c. Improve surface water quality and protect it from point and non-point nutrient loading.
d. Maintain and expand vegetative buffers along surface waters of sufficient width as a tool for improving water quality and protecting habitat.
e. Support efforts to remove as much of the Missisquoi and Carry Bay causeways as possible given permitting and funding constraints.

LAND USE

GOALS

1. The region is characterized by compact villages and growth centers separated by rural countryside and the working landscape.
2. Maintain healthy and diverse forest and conservation areas as well as a strong working landscape of agriculture and forestry.
3. Target future economic growth primarily in the region's existing and planned growth areas.

MAP 12: Current Land Use



SOURCE: *Vermont Open Geodata Portal*

CURRENT LAND USE PATTERNS

The region is composed of two counties with distinctly different land features that have influenced unique human settlement and use patterns over time (Map 12).

The topography of Grand Isle County consists of generally flat areas to rolling hills characterized by large farm fields, orchards and wetlands, and the county is surrounded on three sides by the small beaches and rocky shoreline of Lake Champlain. Predominantly clay soils and lack of public wastewater facilities limit development possibilities. As a popular summer destination, families have built camps and second-homes along the shoreline. With a population that more than doubles in the summer months and a continuing trend of converting seasonal homes to year-round use, the island's villages and amenities are growing, particularly in South Hero and Alburgh. US Route 2 (the region's first and only Scenic Byway) bisects the county from north to south and serves as the only access on and off the islands.

Franklin County's topography changes markedly from the Lake Champlain Valley in the west to the rising spine of the Green Mountains in the east. Farmland is highly concentrated in the Champlain Valley and extends east along the Missisquoi River Valley. East of the Champlain Valley, the topography gets hillier and more forested, particularly along the eastern border in Richford, Montgomery and Bakersfield. Franklin County has generally maintained the traditional pattern of densely settled villages surrounded by sparsely populated farm and forest land, although over the last several decades farmland conversion and a demand for affordable housing and has led to scattered homes throughout some of the rural areas of the county. In a few areas, commercial sprawl has become a concern. In the west of the county is St. Albans City, the region's only urban center, and the Interstate 89 Corridor, which provides quick access to Chittenden County and Montreal. These features orient the settlement pattern toward the west and the south for access to jobs, shopping and services in St. Albans City and via I-89.

ASSETS, OPPORTUNITIES AND CHALLENGES

Designated Centers

Vermont has established a framework of "designations" to offer incentives that encourage communities to maintain vibrant concentrated settlements separated by rural countryside. These programs provide a variety of incentives for development in the designated areas, but each program has a set of unique goals for making

TABLE 5: State Designations

DESIGNATION	INTENT/INCENTIVES
Village Center	Village Center Designation supports small town revitalization with a variety of tax credits and priority consideration for several state grants. Village Center planning also helps to build community connections and economic resilience.
Downtown	Downtown Designation provides communities with the help and resources they need to make downtown revitalization a community effort through a variety of incentives ranging from tax credits to tax increment financing to priority consideration for many state grants.
Growth Center	The Growth Center program designates areas that are planned for new development in keeping with historic development patterns and offers a variety of incentives ranging from tax increment financing to Act 250 master permit application to priority consideration for many state grants.
New Town Center	The New Town Center program provides the option for town that lack a historic downtown to designate a New Town Center. Benefits include being able to set up a special tax district to fund capital and operating costs of a project in the center, in addition to affording certain benefits during Act 250 Review and priority consideration for many state grants.
Neighborhood Development Area	The Neighborhood Development Area program designates areas that are within or adjacent to village centers, new town centers or growth centers for mixed income housing, providing special permit and tax incentives for communities and developers.

the region's centers vibrant places (Table 5). The region has one designated downtown and growth center (St. Albans City) and 23 designated village centers (Map 13). Of the remaining region's municipalities, several could benefit from seeking village center designation, such as Grand Isle, Fletcher and Georgia. Neighborhood Development Areas may be great options for many of the region's existing village centers to incentivize new housing opportunities that are walkable to amenities and services. New Town Center designation takes significant investment in planning but could be appropriate for Georgia's South Village.

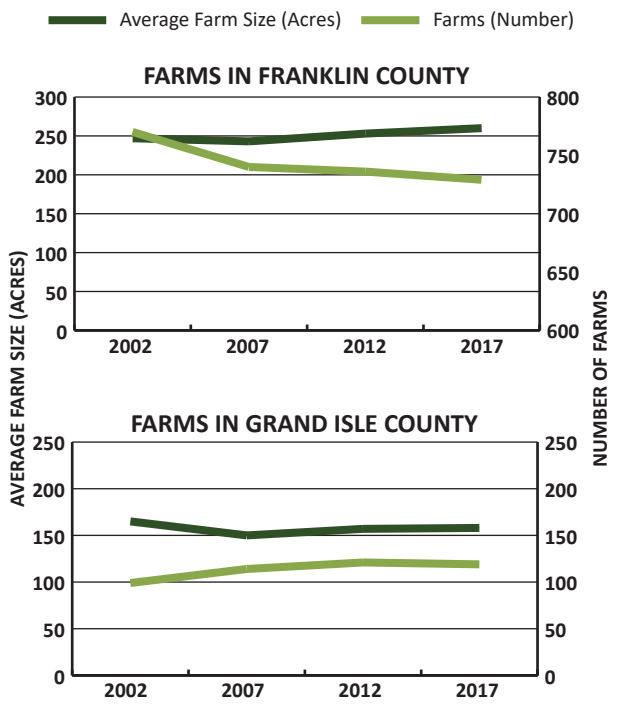
MAP 13: Regional Designated Growth Center, Downtown and Villages

SOURCE: *NRPC Collected Data*

Farms and Farmland

Franklin County remains one of the most productive agricultural counties in the state, generating 24% of Vermont's farm sales in 2017(the most recent year data is available). Although farms are a common land feature in both counties, the setting in each county is very different. On average, farms in Grand Isle County are significantly smaller in size and tend to be more diversified than farms in Franklin County. In Franklin County, the average size of farms and the amount of acreage in agricultural use is increasing (average of 260 acres in 2017) while the number of farms is decreasing (729 farms in 2017), which supports the trend of small and medium farms (primarily dairy) consolidating into fewer larger farms (Figure 3). In Grand Isle County, the number and size of farms has remained steady at around 120 farms at an average size hovering below 160 acres, along with a recent decrease in the amount of acreage in agricultural use. The trend of consolidating small and medium dairy farms has been consistent and is a major factor affecting the working landscape in the region. Competition is high and requires large scale production to be successful in shipping conventional fluid milk. In response, there is growth in diversified and value adding farming in both counties. For example, the amount of land used for harvesting vegetables increased from 126 acres to 266 acres from 2012 to 2017. Diversification and value-added production are key strategies for small and medium producers to stake out a place in the market. (Sources: Census of Agriculture).

FIGURE 3: Northwest Region Farms



SOURCE: *U.S. Census of Agriculture*

There are many strategies that municipalities can implement to strengthen agriculture and maintain the number of small and medium farms in the region. This includes incorporating pro-agriculture land use policies in town plans and bylaws, such as encouraging accessory on-farm businesses, encouraging the conservation of farmland through the purchase of development rights or other means, supporting programs that assist new farmers succeed, whether though land access, business planning or other training, and working with farmers and local groups to promote diversified agriculture, value added production and strengthening the regional food system.

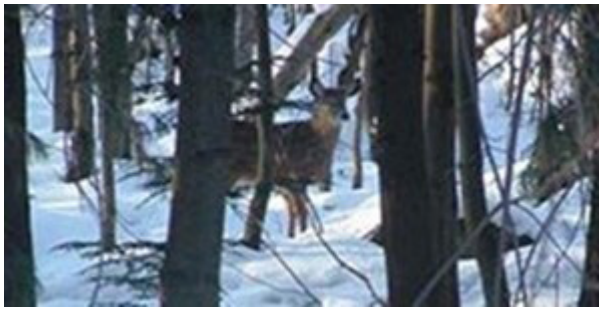
Strategies for Supporting Agriculture

- Support agriculture in municipal plans.
- Conduct an agricultural resource inventory.
- Establish agricultural districts.
- Adopt local right-to-farm laws.
- Clarify and streamline permitting for accessory on-farm businesses.
- Establish or support land trusts.
- Establish a transfer of development rights.
- Adopt local tax stabilization plans.
- Increase local awareness of agricultural issues.
- Encourage the production of value-added products and the purchase of locally produced products.

Forestland and Wildlife Habitat

The NRPC supports settlement patterns that maintain connecting patches of forestland and other habitat in order to sustain viable wildlife populations and biodiversity, which will lead to a healthier ecological system. State statute encourages municipalities and regions to address protection of forest blocks and habitat connectors—which are vital to wildlife conservation—while also supporting forest industries. This is discussed in more detail and mapped in the Natural and Cultural Resources chapter.

Tools for protecting wildlife habitat and other natural resources are shown in the text boxes on this page. The NRPC encourages all municipalities in the region to consider implementing one or more of these tools in order to manage growth and, ultimately, protect natural resources. By working to preserve corridors of wildlife habitat and large tracts of undisturbed forest, our communities can share the forest with a thriving wildlife population.



White Tail Deer in Highgate
PHOTO CREDIT: *Bill Ashton*

Population, Housing, and Commercial Growth

Franklin and Grand Isle Counties are consistently among the fastest-growing counties in Vermont in terms of population and housing units based on U.S. Census data. This high growth can largely be attributed to the region's proximity to Chittenden County. As land and housing prices in Chittenden County continue to increase, many people are trading a longer commute for more affordable land and housing and a more rural setting. In this region, it is critical to have the tools and resources in place to plan for and manage the impacts of growth.

Tools for Natural Resources Protection: Zoning Based Options

- Change allowed uses and/or minimum lot size requirements in zoning districts.
- Revise planned unit development (PUD) provisions for conservation.

  For lot size requirements:
  - ◊ Allow a smaller minimum lot size for PUDs than for subdivisions.
  - ◊ Establish a maximum lot size for subdivisions or PUDs.

  For review triggers:
  - ◊ Require that all subdivisions be reviewed as PUDs.
  - ◊ Require that all subdivisions of a certain size be reviewed as PUDs.

  For open spaces:
  - ◊ Provide a density bonus for "managed" open space or for other desired features or standards.
  - ◊ Require a percentage of open space.
  - ◊ Provide incentives for or require planned connections of open space between multiple parcels of land.
- Increase flexibility for Accessory Dwelling Units and two-unit dwellings.
- Develop road limitations and/or standards to reduce forest and habitat fragmentation.
- Limit development with regard to the availability of or access by municipal services.
- Restrict development within deer yards, bear habitat and/or other natural habitats.
- Exclude high value resources and undevelopable land from density calculations.
- Establish a transfer of development rights program.

Tools for Natural Resource Protection: Non-Zoning Based Options

- Create a conservation commission.
- Implement impact fees.
- Update town plans.
- Provide training for municipal officials and board members.
- Seek funding for municipal systems or expansion.
- Obtain Growth center designation and complete master plans.
- Establish road standards.
- Develop road limitations and/or standards to reduce forest and habitat fragmentation.
- Ensure adequate municipal infrastructure/facilities.
- Obtain Village/downtown designation.
- Create or update a capital budget.
- Complete a Town Forest Management Plan
- Support forest landowner cooperatives or land conservation

With sufficient planning, cumulative commercial and residential development can avoid creating problematic conditions over time, such as traffic congestion, lack of or insufficient infrastructure and services, lack of or poorly designed parking, pedestrian inaccessibility and sprawl. The beginning of these growth-related issues can be seen in some areas of the region. While recognizing the opportunities that residential and commercial expansion brings to the region in terms of economic growth, it is critical to strike a balance between embracing growth and managing it to preserve rural character and traditional settlement patterns. It is also crucial to ensure that municipal and regional infrastructure, facilities, utilities and services are adequate and functional. An important role of the NRPC is to work with local municipalities in developing plans and local regulations to effectively manage growth. Specific tools and resources are discussed in the next section.

PLANNING FOR GROWTH AND DEVELOPMENT

Most communities in Franklin and Grand Isle Counties have updated their plans and local regulations to keep pace with changing development pressures. However, ensuring local capacity to manage land use planning and development review continues to be a challenge. Faced with growth and development pressures, the workload and responsibilities of local governments will only expand in the coming years. Assistance and educational opportunities from the NRPC, the state, the Vermont League of Cities and Towns, and other organizations will help make land use planning and development review more manageable now and in the future. It will also be important to take advantage of opportunities to share resources among municipalities.

Regional Planning Area Mapping Criteria

Agricultural Resource Planning Area

- Farmed prime soils > 20 acres
- Farmed non-prime soils > 20 acres
- Negligible acreage of unfarmed prime soils

Forest and Conservation Planning Area

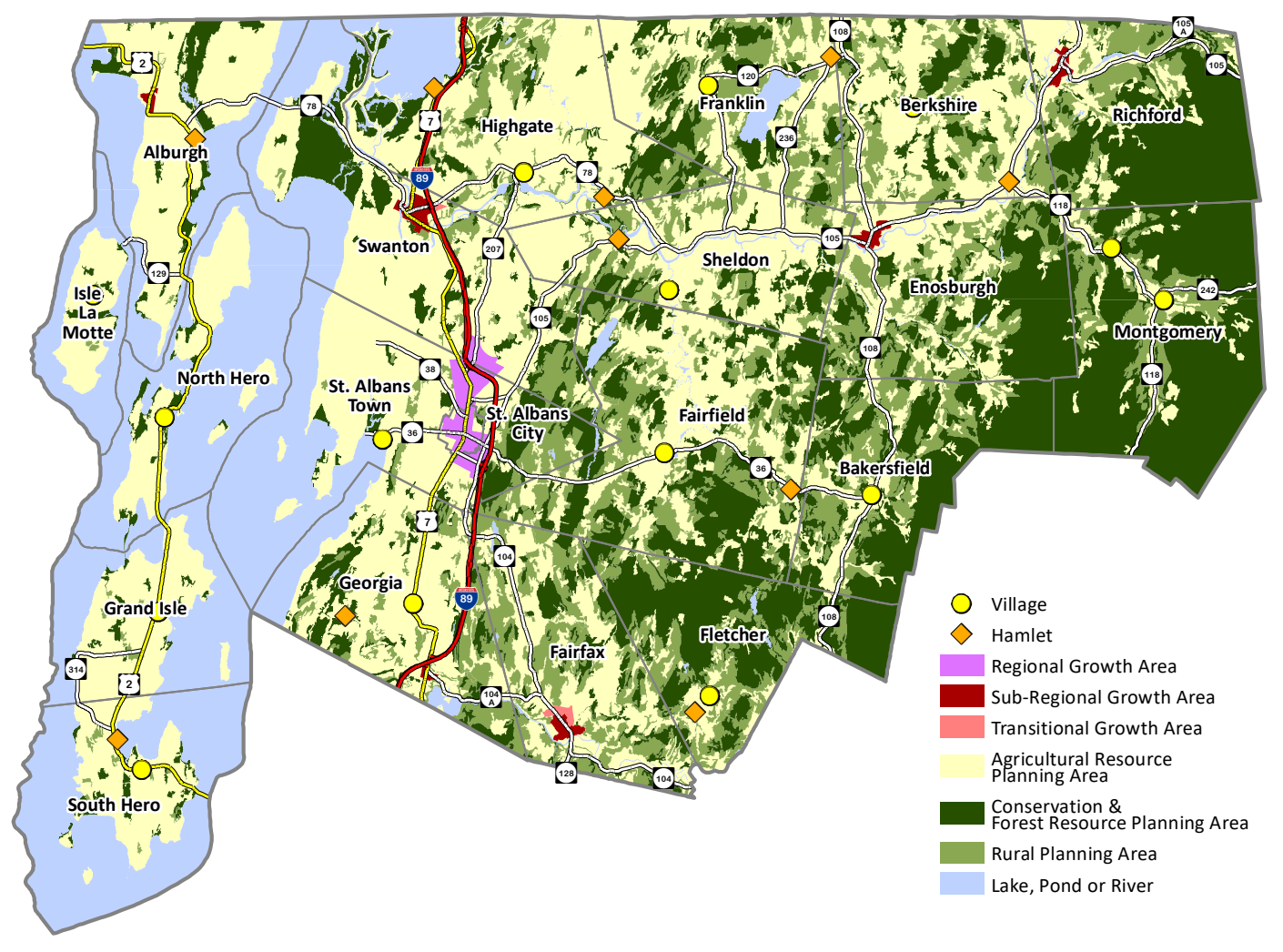
- Wetlands > 5 acres
- 100-year floodplain
- Uplands (> 1,000’ elevation)
- Public lands
- Shore land (< 500’ from waterline)
- Everything from “moderate to severe” on suitability map

To guide land use planning and development in this state, the Vermont Planning and Development Act outlines 13 planning goals and 9 smart growth principles. The smart growth principles are the core of the growth center designation program passed into law in 2006 and discussed later in this plan. If followed, these principles will prevent sprawl by focusing development in compact, pedestrian-friendly village, town, city or growth centers. The 13 state planning goals from 24 V.S.A. §4302 establish a policy framework for land use planning in Vermont. All municipalities are encouraged to adopt local plans that further these goals. The act enables communities to utilize numerous regulatory and non-regulatory tools to implement these goals, including but not limited to zoning bylaws and subdivision regulations.

PROPOSED LAND USE

The NRPC has divided the region into several proposed land use planning areas to encourage the conservation of valued resources and a development pattern that will maintain the character and quality of life that is important to this region. These planning areas are illustrated in Map 14 and include Agricultural Resource Planning Areas, Forest and Conservation Planning Areas, Rural Land Planning Areas, Growth Planning Areas and Sub-Regional Growth Planning Areas. In addition, the NRPC has identified villages, hamlets and transitional growth planning areas. It is important to note that planning areas designated in this plan are regional planning tools, not regulatory zoning districts. When reviewing land uses for conformance with this plan, emphasis will be placed not on whether the use is located entirely within or just outside a particular area, but on the impact the land use will have on underlying resources and how the use will affect the intent and function of the particular land use planning area.

MAP 14: Proposed Land Use



SOURCE: *Vermont Agency of Natural Resources and NRPC Collected Data*

Land Use Planning Areas

Agricultural Resource Planning Areas: Agricultural Resource Planning Areas represent the best farmland in the region and shall be given the highest level of support for their continued use as active agricultural lands. Nearly 39% of the region is included in this category, reflecting the significant acreage of prime agricultural soils, the large number of farms in the Northwest and the importance of agriculture in the region's economy. Strategies that support the long-term protection of these lands from conversion to non- agricultural use are supported by NRPC. Where development does occur, it shall be located to minimize impact to primary agricultural soils. Recognizing the importance of farming to the region's character and economy, and also recognizing that existing farms may occupy some good farming lands that would otherwise be categorized as Forest and Conservation Planning Area, Agricultural Resource Planning Areas were given precedence over the Forest and Conservation designation. For example, if a particular area has characteristics of both an Agricultural Resource Planning Area and a Forest and Conservation Planning Area, the area would be characterized as the former.

Forest and Conservation Planning Areas: Forest and Conservation Planning Areas, which constitute 25% of the region, include a variety of land types that are well suited for tree growth and habitat and generally not suitable for development. Land in this category usually should not be developed in order to protect the forest resource value of the lands. Development that does occur shall be limited due to natural resource constraints,

such as wetlands and floodplains, wildlife and scenic values in the case of uplands, or an overall low suitability for development based on soils, distance from roads and other factors.

Ridgelines and hilltops contribute significantly to the beauty of the region. Development in these areas can damage characteristic and picturesque viewsheds that contribute to the region's beauty. The use of these lands shall be limited to a mix of forest and conservation purposes including maple syrup production, logging, appropriate agricultural operations, wildlife habitat and recreation. These lands shall be protected from fragmentation and conversion.

Rural Land Planning Areas: A relatively small amount of the region's growth is anticipated in Rural Land Planning Areas, which occupy 16% of the region. Cluster development—such as planned unit developments and other methods that conserve open space, common land and/or farmland useful for its intended purpose—is encouraged in these areas, particularly in situations where developers plan to build numerous units. Methods of creating useful open space, common land or farmland include but are not limited to ensuring the land is appropriate and of value for the intended use, locating it adjacent to other open spaces in similar use, and requiring a management plan. Based upon historical development trends NRPC expects that much of the growth in rural areas will involve single-family homes. Areas included in this category require particularly careful planning to ensure that strip development and sprawl are minimized and the goals for the other land use areas are promoted.

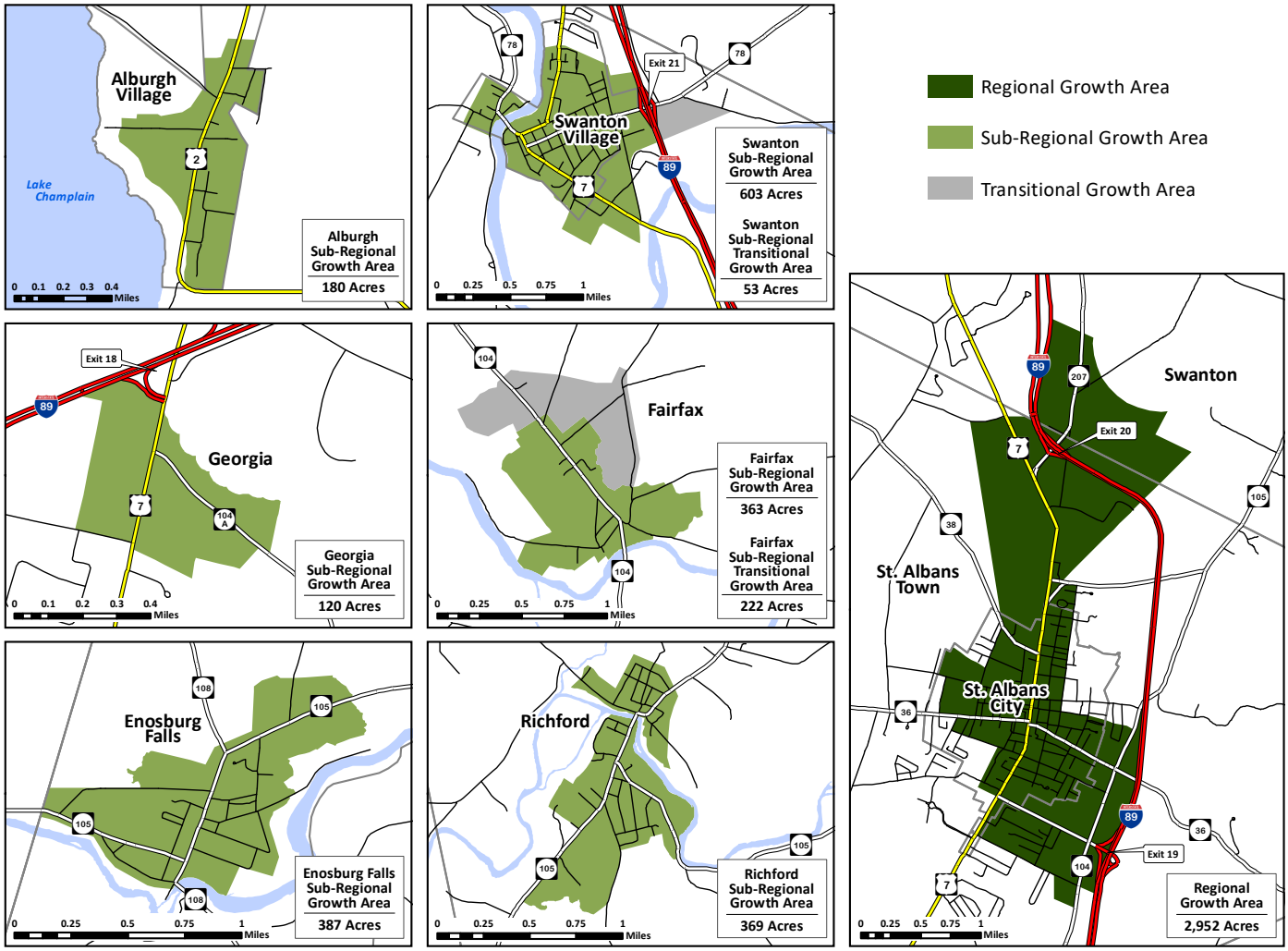
Smart Growth Principles

The term "smart growth principles" (as enacted into law under 24 V.S.A. § 2791) means growth that:

- Maintains the historic development pattern of compact village and urban centers separated by rural countryside
- Develops compact mixed-use centers at a scale appropriate for the community and the region
- Enables choices in modes of transportation
- Protects the state's important environmental, natural and historic features, including natural areas, water quality, scenic resources and historic sites and districts
- Serves to strengthen agricultural and forest industries and minimizes conflicts of development with these industries
- Balances growth with the availability of economic and efficient public utilities and services
- Supports a diversity of viable businesses in downtowns and villages
- Provides for housing that meets the needs of diverse social and income groups in each community
- Reflects a settlement pattern that, at full buildout, is not characterized by:
  - ◊ Scattered development located outside of compact urban and village centers that is excessively land consumptive
  - ◊ Development that limits transportation options, especially for pedestrians
  - ◊ The fragmentation of farmland and forestland
  - ◊ Development that is not serviced by municipal infrastructure or that requires the extension of municipal infrastructure across undeveloped lands in a manner that would extend service to lands located outside compact village and urban centers
  - ◊ Linear development along well-traveled roads and highways that lacks depth, as measured from the highway

Regional Growth Areas and Sub-Regional Growth Areas: This Regional Plan recognizes one regional growth area and six sub-regional growth areas in the Northwest region (Map 15). The six growth areas are located within municipalities that have expressed the desire and planned for managed, high-density, mixed-use development and the infrastructure to support it. St. Albans City and areas in St. Albans Town by exits 19 and 20 of Interstate 89 constitute the regional growth center. The five sub-regional growth centers include areas within the three incorporated villages (i.e., Swanton, Enosburg Falls and Alburgh), the village areas of Richford and Fairfax and a planned growth area in Georgia. Growth areas were chosen for their capacity to accommodate greater levels of economic and social activity than other areas in the region. Only the St. Albans growth area was found to have the scale and capacity to serve the entire region. The sub-regional growth areas are expected to serve as economic and cultural hubs for surrounding towns.

MAP 15: Designated Regional and Sub-Regional Growth Areas



SOURCE: *NRPC Collected Data*

In Focus - Northwest Regional Growth Area: The Northwest Regional Growth Area consists of the historic downtown area of St. Albans City at its center, along with a south wing, a north wing and a northeast wing—all with varied land uses and characteristics (Map 16).

St. Albans City, with its designated downtown and historic district, provides a traditional mixed-use "Main Street" setting of small storefronts with residential apartments above. In addition, Taylor Park, Welden Theater and City Hall are among the other municipal, cultural and service amenities. Surrounding the city center are networks of high-density residential neighborhoods and areas of industrial and commercial land uses. The city has a state-designated downtown and a state- designated growth center.

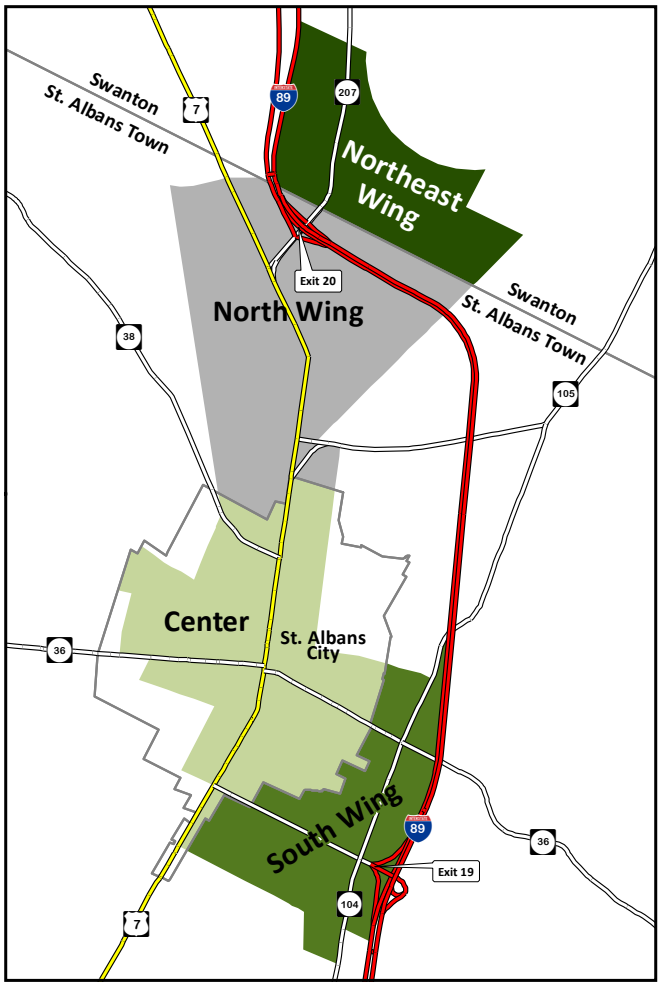
The **South Wing** consists of high-density residential neighborhoods south of the SASH Highway (connection from I-89 to Route 7) and commercial uses on either side of Interstate 89's exit 19. There is great

Shopfronts in St. Albans City
The heart of the Regional Growth Center

potential for further development in this wing of the growth center, but further development cannot continue any existing patterns of strip development. Although exit 19 creates demand for automobile-oriented development, it is important that future development link with both existing and future residential neighborhoods through pedestrian-accessible sidewalks or paths and that public transportation is provided.

The **North Wing** has experienced the bulk of recent development in the Northwest Regional Growth Area; however, most of it has been automobile-oriented commercial development in the form of strip malls, fast-food restaurants, car dealerships and banks. Like the south wing, the north wing is influenced by an interstate exit (i.e., exit 20). Future development in the north wing shall not continue the existing patterns of strip development and shall instead consist of infill development and/or projects that help promote the characteristics of growth centers noted earlier in this section. Pedestrian accessibility, public transportation, mixed uses (residential and commercial uses) and compact high-density design are necessary to further growth area goals.

MAP 16: Northwest Regional Growth Area



SOURCE: *NRPC Collected Data*

The **Northeast Wing** in Swanton is the newest addition to the Northwest Regional Growth Area, and it is largely undeveloped. The Town of Swanton is committed to planner-driven development, creating a foundation for this area to serve as an example of smart growth planning and development for the region. The NRPC is dedicated to working with Swanton in planning for a mix of pedestrian-oriented mixed- use development (including commercial, residential and civic uses), a network of high-density residential neighborhoods and green spaces for recreational uses. The NRPC strongly encourages Swanton to use a master plan to guide growth and to follow-through on strategies to secure sewer and water infrastructure. All new development shall connect to sewer and water infrastructure or otherwise provide infrastructure necessary to support development that meets smart growth principles and growth area characteristics described in this plan. In addition, due to the risk of strip development along Route 207 and Bushey Road, the NRPC strongly encourages development that adds depth through a network of interconnected public streets.

Other Planning Areas

Villages and Hamlets: There are many historic village centers and hamlets in the region where residential and modest commercial development is concentrated, but where infrastructure is generally limited (some, but not all, hamlets are shown on Map 13). The NRPC supports the continuation of historic village and hamlet centers through local planning and village center designation efforts that preserve their traditional character and if supported by local planning, to grow as concentrated settlements.

Transitional Growth Areas: Given the rate of growth in the region, some areas are certain to experience—due to geographic location or local planning—increased rates of local growth. To ensure well-planned and well-financed infrastructure and foster smart growth principles, it is of utmost importance for municipalities to plan for development in advance, rather than planning around established development after the fact. The NRPC will help municipalities with planning for these areas. Transitional growth areas have been identified north of the Fairfax sub- regional growth area and east of the Swanton sub-regional growth area.

Industrial Areas: The NRPC supports industrial parks, districts and areas that encourage economic expansion and high-wage businesses to locate in the region without adversely affecting neighboring land uses. Industrial parks and districts should be carefully planned to ensure access and connectivity. This can be achieved through public transportation service and walkability - both within the district in addition to making connections from the district to adjacent pedestrian and bicycle infrastructure. Thoughtful site planning can both ensure that off-site impacts, such as noise, are mitigated through buffers, landscaping and other design considerations while at the same time ensuring good quality of life and integration with the local community.

GOALS AND POLICIES

1 GOAL — Ensure the region continues to be characterized by compact villages and growth centers separated by rural countryside and the working landscape.

a. Support infill and redevelopment of designated growth centers or existing strip development areas over new commercial strip development.
b. Locate intensive residential development primarily in areas within or related to state or regionally designated growth areas and support redevelopment and infill opportunities.
c. Ensure that residential development outside of growth centers, downtowns, villages and hamlets is clustered or otherwise designed to work with the landscape in terms of energy efficiency, protection of ecologically sensitive areas and conservation of farmland and agricultural soils.
d. Ensure that public investments—including public facilities and the construction or expansion of infrastructure—will promote expansion in growth areas designated in this plan and will not encourage the development and/or fragmentation of farmlands or other resource areas.
e. Ensure that the scale, siting, design and management of new development respect the existing landscape and the character of the area's built environment.

2 GOAL — Maintain healthy and diverse forest and conservation areas as well as a strong working landscape, including agriculture and forestry.

a. Ensure that development respects the physical limitations of the site and avoids negative impacts on the natural and cultural features of the landscape.
b. Ensure that development in rural, forestry and conservation areas will not diminish the viability of agricultural or woodland operations, or fragment high-priority forest and connectivity blocks and other large contiguous tracts of woodland or wildlife habitat/ corridors.
c. Limit the loss of prime and primary agricultural soils and active farmland to the greatest degree possible, and mitigate it whenever the loss cannot be prevented.
d. Maintain all right-to-farm protections for agricultural operations that have acceptable agricultural practices.
e. Ensure that development in designated conservation areas on the proposed land use map will be small scale and will not diminish the environmental value of the lands. Only allow development farther than

1,000' from road centerlines in conservation areas if it advances conservation goals.

f. Encourage the development of local businesses that add value to agricultural and forest products grown in Vermont and site them in locations that minimize conflicts with neighboring land uses.
g. Support agricultural, forest and conservation land protection strategies including but not limited to transfer of development rights, purchase of development rights, fee-simple purchase of agricultural lands and use of value tax assessment; these protection strategies can allow for compatible uses that support other key policy goals.
h. Support initiatives that assist agricultural businesses with adapting to the impacts of climate change.

3 GOAL Target future economic growth primarily in the region's existing and planned growth areas.

a. Locate industrial development first in existing industrial areas. Ensure that industrial growth outside of existing industrial areas is located near or within growth areas designated in the municipal and regional plan, on property with sufficient infrastructure.
b. Ensure that mixed-use development occurs at significantly higher densities and on a larger scale in planned growth areas than in the surrounding region.
c. Scale retail and commercial developments to primarily serve the market of the regional, sub-regional or local growth center.

DISASTER RESILIENCE

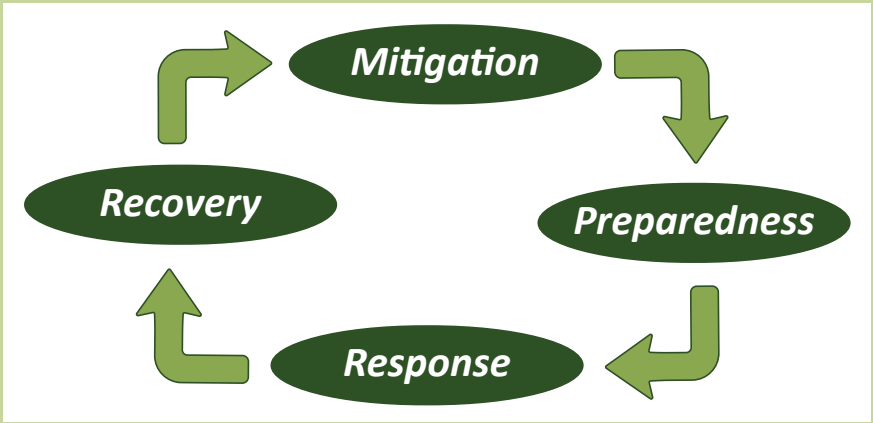
GOALS

1. **Reduce the loss of life, injury, and economic harm resulting from all-hazards events and climate change and focus efforts on those who are most vulnerable to impacts.**
2. **Reduce infrastructure damage and the financial losses incurred by municipal, residential, industrial, agricultural and commercial establishments due to disasters.**
3. **Ensure the region's communities are resilient to all-hazards events; include hazard mitigation planning, such as flood resiliency, in the municipal planning process.**

BACKGROUND

Resiliency is the ability of a community to respond and adapt to natural and human-caused disasters. Vermont Statutes require that regional plans include a flood resilience element. This plan incorporates a broader all-hazards resilience element instead of a flood resilience element due to the broad impact of disasters of all types on our region.

FIGURE 4:
Four Phases of Emergency Management



The impact of expected, but unpredictable, natural and human-caused disasters can be reduced through community planning. The purpose of this section is to provide communities in the Northwest region with all- hazards disaster resilience planning goals and policies that will help mitigate risks to public and private investments by protecting flood-prone and other vulnerable areas through municipal land use plans, municipal ordinances and capital improvement plans. The four phases of emergency management are mitigation, preparedness, response and recovery (Figure 4). In addition, economic resilience to disasters and to the impacts of Climate Change are important factors to incorporate into NRPC's future planning efforts.

The emergence of the Coronavirus disease (COVID-19) created a global pandemic which greatly impacted Vermont communities beginning in 2020. COVID-19 is an infectious disease caused by the SARS-CoV-2 virus. The pandemic affected all sectors of society including economic, public health and education systems. Federal, state and local governments responded with innovative solutions to limit disruptions and continue operations so that citizens could return to daily life. The efforts also sought to mitigate impacts to local economies by allowing essential services to continue to operate. There are now better systems in place to cope with

a future pandemic including public health surveillance, monitoring and response, improved food systems security, expanded broadband services in unserved and underserved areas and continuity of operations for governments.

Scientists are concerned that the changing climate could increase future events similar to the COVID-19 pandemic. Moreover, climate change is causing major shifts in weather patterns, sea levels, animal habitats, and temperatures. As these climate extremes continue to increase in severity and variability, many of the dangers discussed in the chapters are at risk of increasing.

Mitigation

Hazard mitigation is any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. Based on the results of previous mitigation efforts, federal and state agencies have come to recognize that it is less expensive to prevent disasters than to repair damage after a disaster has struck. Communities have opportunities to identify and implement disaster resiliency goals and policies through their municipal land use planning process, land use regulations and local hazard mitigation plans. Hazards cannot be eliminated, but it is possible to determine what the most likely hazards are, ascertain where their impacts would be most severe and then identify local actions that can be taken to reduce their severity.

Preparedness

This phase includes developing plans for what to do, where to go and who to call for help before an event occurs—actions that improve the chances of successfully dealing with an emergency either individually or as a community. Franklin and Grand Isle Counties annually update their Emergency Operations Plans and provide the adopted plans to the NRPC and the Vermont Division of Emergency Management. In addition, local and regional public safety officials regularly participate in simulated disaster exercises.

Response

Public safety and well-being during an emergency depend on how prepared communities and individuals are to respond to a crisis. By being able to act responsibly and safely, communities and individuals will be better protected.

The Franklin County International Firefighters Association, the Grand Isle County Mutual Aid Association and Local Emergency Planning Committee Districts 4 and 13 serve their member municipalities throughout the region by offering planning, training and exercising for all-hazards events.

Emergency service organizations and municipalities have mutual aid agreements in place to assist one another during emergency responses. There are two fire mutual aid associations in the region: the Franklin County International Firefighters Association and the Grand Isle County Mutual Aid Association. Each association is composed of municipal first response and rescue agencies within each county. There is a mutual aid agreement between the municipalities of each county and between each association to assist one another in times of crisis, and it offers agreed-upon rates of reimbursement for expended resources.

Recovery

After the immediate danger of an emergency is over, continued public safety and well-being will depend on the community's ability to cope with getting life back to normal. During the recovery period, communities must be able to manage disaster-related financial burdens. At this time, communities should also consider steps to take that would mitigate the effects of future similar disasters.

The 2019 Halloween Storm, 2018 Missisquoi River flood, 2011 Lake Champlain flood, Tropical Storm Irene, and ice storms in 1998 and 2013 have increased public recognition of the need to link regional and municipal

land use planning, mitigation planning and capital improvement planning. Communities can improve their resiliency by following a comprehensive planning process that considers impacts from natural and human-made disasters.

IDENTIFYING HAZARDS AND ASSESSING VULNERABILITY

The NRPC used a FEMA approved Hazard Identification Risk Assessment (HIRA) process to rank hazard types in the region (Table 6). Additionally, Vermont Agency of Transportation's Resilience Planning Tool is used to supplement the HIRA. Hazards that scored High in the ranking system are considered the worst threat in terms of their probability of occurrence and their impact on the community. The risk assessment produces a Relative Risk score using a qualitative process to compile estimates of the likely frequency of occurrence, the extent of the community impact and the likely consequences in terms of public safety, property damage, economic impacts and harm to environmental resources. The resulting analysis provides a Relative Risk score for each hazard as High, Moderate or Low. This information is summarized below and can be found in more detail within local hazard mitigation plans for communities as well as the Franklin & Grand Isle All Hazards Assessment prepared by the NRPC.

TABLE 6: Relative Risk

HAZARD	RELATIVE RISK
Flood, Fluvial Erosion	High
Severe Winter Storm, Extreme Cold, Ice Storm	High
Hazardous Materials	High
Structure Fire	High
Severe Wind, Tropical Storm, Hurricane	Moderate
Severe Thunderstorms (hail, high winds, lightning)	Moderate
Landslides	Moderate
Terrorism	Moderate
Ice Jam	Low
Tornado	Low
Drought	Low
Earthquake	Low
Major Fire -Wildland	Low
Pest Infestation	Low

SOURCE: *NRPC Hazard Identification Risk*

Because of limited roadway access points and the geography of the Islands, Grand Isle County has a unique vulnerability to being isolated as a result of natural or man-made disasters. Grand Isle Mutual Aid, with support from NRPC, meets regularly to coordinate among first responders in the county.

It should be noted that the region's overall risk rating is low (380 out of a possible high of 1,200 points in the Risk Assessment tool).

Flooding

The greatest risk to the region and the state is from flooding in the form of inundation and fluvial erosion. The region is most prone to flooding during the spring and summer months. During spring, partially frozen soils, melting snow and springtime rains produce an annual spring flood cycle. During summer, localized storm events produce flood conditions as soils become quickly saturated by high volumes of rain. Recent storms have caused significant damage to local transportation infrastructure, typically due to inappropriately sized culverts and other diversion systems. Erosion along stream banks from flooding often affects the roads, facilities, residences and utilities located nearby. Localized flash flooding is becoming more common as large rainstorms impact small areas during brief periods. Floods can be worsened by ice or debris dams and the failure of infrastructure (especially culverts), private dams and beaver dams.

In the region, there is a history of flooding and fluvial erosion along the Missisquoi River, Trout River, Tyler Branch, Black Creek, Rock River and Pike River, and along the shores of Lake Champlain as well as many brooks. Studies have shown that damaging floods are occurring in areas outside of mapped special flood hazard areas. The greatest threat to flooding is caused by changes in land use and increased development near riverbanks and in floodplain areas. Increased development encroachment on rivers and streams leads to greater volumes

of stormwater runoff and greater erosion of stream banks. Improperly built stormwater infrastructure also disrupt stormwater flow and can overload culverts with additional stormwater. Federal Major Disaster Declarations since 1995 due to flooding in the region are listed in Table 7.

The Vermont Agency of Natural Resources (ANR) has adopted river corridor protection, an avoidance strategy to restore and protect the natural stability of rivers and minimize flood damage. River corridor protection is recognized as a critical state wide goal in statute. Municipalities protecting River Corridors are eligible for incentives including increased post-disaster funding.

TABLE 7: Federal Disaster Declarations in the Region

	Franklin County	Grand Isle County
DR-1184 (July 15 – 17, 1997)	Severe Storms and Flooding	Not affected
DR-1201 (Jan. 6 – 16, 1998)	Severe Winter Storm / Ice Storm	Severe Winter Storm / Ice Storm
DR-1228 (June 17 – Aug. 17, 1998)	Severe Storms and Flooding	Not affected
DR-3157 (Mar. 5 – 7, 2001)	Not affected	Severe Winter Storm
DR-1428 (June 5 – June 13, 2002)	Not affected	Severe Storms, Tornado and Flooding
DR-1559 (Aug. 12 – Sept. 12, 2004)	Severe Storms and Flooding	Not affected
DR-1778 (June 14 – 17, 2008)	Severe Storms and Flooding	Severe Storms and Flood
DR-1784 (July 18, 2008)	Severe Storms and Flooding	Not affected
DR-1951 (Dec. 1 – 5, 2010)	Severe Winter Storms and Flooding	Not affected
DR-1995 (Apr. 23 – May 9, 2011) *Individual Assistance Declaration	Severe Storms and Flooding	Severe Storms and Flooding
DR-4043 (Apr. 23 – May 9, 2011)	Severe Storms and Flooding	Severe Storms and Flooding
DR-4022 (Aug. 27 – Sept. 2, 2011)	Severe Storms and Flooding	Severe Storms and Flooding
FEMA 338 EM (Aug. 29, 2011)	Tropical Storm Irene	Tropical Storm Irene
DR-4178 (Apr. 15 – 18, 2014)	Severe Storms and Flooding	Not affected
DR-4207 (Dec. 9 – 12, 2014)	Severe Winter Storm	Not affected
DR-4356 (Oct. 29 – 30, 2017)	Severe Storms and Flooding	Severe Storms and Flooding
DR-4380 (May 4 – 5, 2018)	Not affected	Severe Storms and Flooding
DR-4474 (Oct. 31 – Nov. 1, 2019)	Severe Storms and Flooding	Not affected
Anticipate (Dec. 23 – 25, 2022)	Severe Winds	Severe Winds

SOURCE: *FEMA*

TABLE 8: Structures Identified within Flood Zones 2023 (approximate)

COUNTY	Total Structures	Camp	Mobile Home	Multi Family	Other Residential	Single Family	Commercial	Government	House of Worship	Industrial	Public	Utility	Other/Unknown
Franklin County	1,128	441	59	35	5	413	64	2	2	2	11	10	84
Grand Isle County	536	262	39	1	4	177	13	0	1	0	1	2	36

SOURCE: *Flood Insurance Rate Maps & E911 Data*

Severe Winter Storms, Extreme Cold, Ice Storms

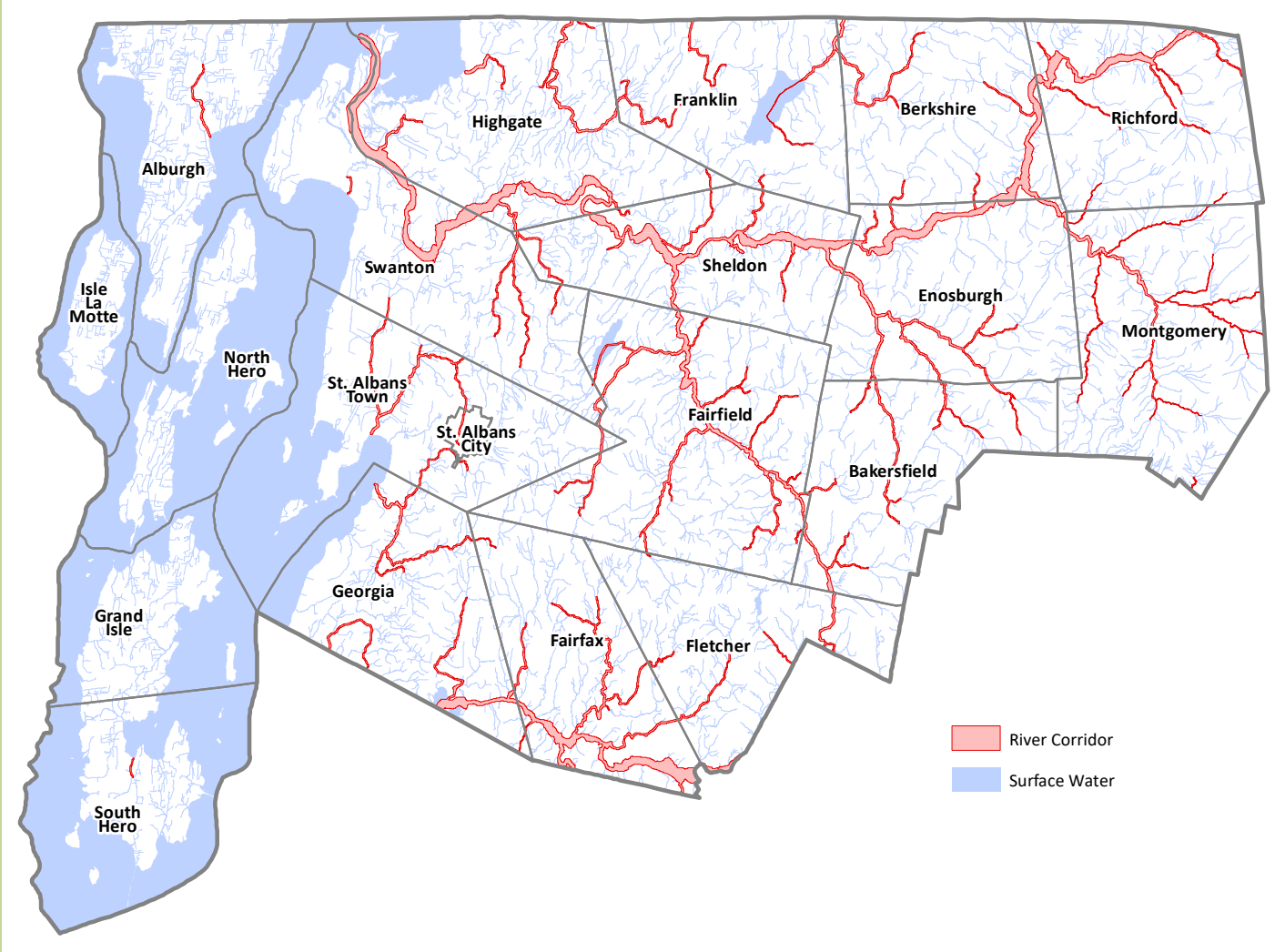
The second greatest risk to the region is from severe winter weather including winter storms, ice storms and extreme cold. In northwestern Vermont, a severe winter storm can last for several days and can be accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, substantial drifting

TABLE 9: Structures Identified within River Corridors 2023 (approximate)

COUNTY	Total Structures	Camp	Mobile Home	Multi Family	Other Residential	Single Family	Commercial	Government	House of Worship	Industrial	Public	Utility	Other/Unknown
Franklin County	645	21	63	59	3	363	48	5	1	6	6	17	53
Grand Isle County	1	0	0	0	1	0	0	0	0	0	0	0	0

SOURCE: *Vermont Agency of Natural Resources & E911 Data*

MAP 17: River Corridors



SOURCE: *Vermont Agency of Natural Resources*

and dangerous wind chill. Strong winds, accumulations of ice and heavy snow can knock down trees, utility poles, communication towers and power lines. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. People have been trapped at home for up to two weeks without utilities or other services. Some of the worst winter storms in the region have left ice accumulations of 2 to 4" (January 1998 and December 9, 2014) as well as wind speeds up to 50 mph (December 23, 2022). On the evening of December 22 through the evening of December 23, Vermont was hit by a winter storm "bomb cyclone", leaving nearly 100,000 without power and wind gusts approaching 75 mph.

Hazardous Materials (Fixed Site and Transport)

The third greatest risk to the region is from a hazardous materials incident. Local industry, natural gas and fuel oil distributors, and agricultural operations present the opportunity for a hazardous materials incident either at a fixed site or during transport anywhere within the region. Areas at risk for a stationary or on-site hazardous materials incident include the locations of hazardous materials manufacturing, processing or storage facilities, as well as all hazardous waste treatment, storage and disposal sites. Areas at risk for a hazardous materials transport incident include the region's transportation corridors and adjacent population centers. The Highgate Springs Border Station in Franklin County is a heavily traveled port of entry that is served by Interstate 89 (with connections from Routes 2, 78 and 105) and receives a high volume of freight trucks containing hazardous materials.

There are two active rail lines in the region that move freight: the New England Central Railroad (NECR) and the Northern Vermont Railroad (NVRR). The threat of a derailment and/or hazardous materials spill exists along every rail line in operation, although mandated rail yard speeds greatly reduce the probability of a derailment resulting in a spill.

Any incident that occurs within the region requires an initial response conducted by the local fire departments. The nearest hazardous materials (HazMat) response vehicle is located at the IBM facility in Essex, Vermont. HazMat decontamination trailers are stationed in Swanton Village, Essex Junction and South Hero.

Structure Fire

The Vermont Fire Marshall's Report notes that Vermont has a high per-capita death rate from fire compared to other states, and older adults have a greater risk of fire death than the overall population. Vermont experiences an average of 8 fire deaths a year. Fire safety officials, fire departments and other safety advocates have all contributed to the overall reduction in fire deaths over time. Although, the National and State fire death rates have decreased, the elderly and young children are still the most vulnerable populations. Older adults have a greater risk of fire death than the overall population. In the five-year period from 2017 to 2021, 31% of Vermont's fire deaths have been seniors over the age of 65. This is a drop from 48% during the five-year period (2012-2016). Although fire causes vary, there are several common contributing factors such as poverty, climate, education, code enforcement and demographics.

According to the State Fire Marshal in 2021, cooking fires and heating appliances continue to be the leading causes of structure fires in Vermont. Unattended cooking was the leading cause of cooking fires and casualties. Almost one third of the people killed by cooking fires were asleep when the fire started. More than half of the non-fatal injuries occurred when people tried to control the fire themselves. A lead contributing factor to home heating fires is failure to clean creosote from solid-fueled heating equipment chimneys. Vermont ranks first in the nation for its per-capita use of wood for heat, with at least one in six Vermont households use wood products as their primary heating source. The long cold Vermont winters put added stress on heating systems. Furthermore, fluctuating fuel prices can force people to use alternative heating sources that may not be safe. An improperly installed and maintained heating appliance is dangerous and can result in carbon monoxide poisoning or be the source of a fire.

Vermont's housing stock is dominated by older, owner-occupied homes. It is the second oldest in the nation behind Maine. About 44% of the housing stock is comprised of year- round, owner-occupied homes built before 1950. A third of all rental and owned homes in the state were built before 1950. (State Fire Marshal, 2021)

A fire in a downtown can be devastating. In 1997, a fire engulfed the City Feed and Lumber building and warehouse in St. Albans City. The fire also threatened the neighboring Century Arms building, a local weapons manufacturer, and the Fonda Container building. In 2005, a fire destroyed much of the historic downtown block in Enosburg Falls. For that fire, 11 fire departments responded through mutual aid plus one department from Sutton, Quebec. On December 2, 2022, a series of structure fires occurred in the St. Albans City that were pushed by high winds. One 18,000 sq ft warehouse, a vacant house and barn were destroyed with over $600,000 in damages.

Severe Thunderstorms (Lightning/High Winds/Hail)

Thunderstorms are the most frequent natural hazard event occurring in Vermont. Thunderstorms and their associated hazards can occur anywhere in the region at any time of the year; however, spring and summer are the most common times for severe thunderstorms. Supercell thunderstorms that produce tornadoes can be the most destructive and cause widespread damage to land, crops and property. Severe thunderstorms can produce hail that is damaging to crops, structures and vehicles as well as lightning that can damage infrastructure, plants and property, and can start forest fires. Flash floods are likely to occur after a severe thunderstorm that produces a large amount of precipitation over a short duration. Mountainous areas in the region are particularly prone to flash flooding due to the steep terrain. According to the EPA as well as The Center for Climate Sciences at NASA's Jet Propulsion Laboratory, it's a relatively well-accepted fact within the science community that as global temperatures increase, extreme precipitation and including more intense short duration storms will very likely increase as well.

Severe Winds, Tropical Storms, Hurricanes

Severe winds are a hazardous threat to the region and most commonly accompany other storm events. They typically occur as strong frontal systems move across the Adirondacks and southern Canada from the west. The region is far inland and unlikely to receive a direct hit from a hurricane; however, severe winds from tropical storms have occurred as weakened storms originating in the Atlantic Ocean track near the region (Table 10).

Power lines and trees are most vulnerable to wind. Power outages can result in significant loss of business, high repair costs and threats to public safety.

TABLE 10: Tropical Storm Impact

NAME	DATE
Unnamed	November 3, 1927
Andrew	August 1990
Floyd	September 1999
Hannah	September 14-15, 2007
Isidore	September 27, 2007
Katrina	August 30, 2005
Irene	August 28, 2011

Mobile home parks are uniquely vulnerable to flooding resulting from tropical storms. This increased risk is related to siting of park communities in flood hazard areas, and limitations of the structures themselves. Income, disability status and age can make park residents more vulnerable to the impacts of disasters with fewer resources for recovery. An assessment completed in 2012 by researchers at the University of Vermont found that one-fifth of Vermont's 247 mobile home parks have at least one lot that is located within a flood hazard area, and nearly 12% of all mobile home park lots are located in flood hazard areas.

Landslides

Vermont has a relatively high incidence of landslides partially due to soils. Clay "hard pan" soils reside underneath sand; water that infiltrates the sand rests on top of the clay, resulting in a sheering effect that

causes the sand and topsoil to slide off the clay. This type of disaster rarely results in injury, but it can destabilize roads and threaten structures. Landslides can be caused by seismic events, manmade or natural changes to groundwater flow, removal of vegetation, and manmade or natural undercutting of steep banks. In the region, slides along the Missisquoi River in Highgate have threatened residential properties, a cemetery, the Highgate Transfer Station, infrastructure and local roads.

Terrorism

Terrorist events are possible in the region but are considered rare. Two types of terrorism could occur: international and domestic. The region is situated along the northern border of the United States and contains several Ports of Entry into Canada. Border crossings in upstate New York at Champlain and Rouses Point connect New York to Vermont via Route 78. Lake Champlain is an open waterway between New York and Vermont that flows north into Canada as well. Interstate 89 provides easy transportation to population centers located in New York City, Boston and Washington, DC.

Domestic acts of terrorism such as a school shooting incident, bomb threats and citizen confrontations at government offices are a regional concern. Schools have prepared by implementing school crisis plans, adding security features to school buildings, and conducting drills with local law enforcement and first response agencies.

Low Risk Hazards

Ice Jams: Ice jams occur in streams and rivers when warm temperatures and heavy rain cause snow to melt rapidly, and they typically take place in sharp river bends, decreases in slope and constrictions within the stream channel as well as at confluences. The five most notable locations where ice jams occur in the region are the Lamoille River along VT 104A between Georgia and Fairfax near the Georgia High Bridge; the Missisquoi River along VT 78 west of Swanton Village; the Missisquoi River in East Highgate; the Missisquoi River along VT 105 between Enosburgh and Berkshire; and West Hill Brook at the intersection with VT 118 in Montgomery.

From 1867 to 1999, there were 753 ice jams on 74 rivers and in 127 towns in Vermont. The Lamoille and Missisquoi Rivers (both of which flow through the region) each account for nearly 10% of all statewide ice jams. These ice jams occur most often in March (44%), January (24%) and February (18%). There are 99 records of ice jams along the Missisquoi River alone. (U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL).

Most recently, mid-winter ice jam break ups have occurred in Swanton and Highgate in January 2020 and January 2018. These ice jams caused flooding related damages to roads and residential properties, along with evacuations. The impacts occurred mainly along N River St (VT78) and Monument Rd. In 2020, a Missisquoi River Ice Jam report issued for this stretch of river was developed by the Army Corps of Engineers and reviewed by state and local officials. The report noted that an advance mitigation measure that should be investigated further is an early warning system. This system would require engineering to include a variety of elements including but not limited to stream gages, weather forecast stations, web cameras, ice motion detectors, first hand observers, etc. The main objective of such a system would be to allow for the collection of data and information to assist emergency managers with staging a response to a probable or imminent ice jam event. As these events are becoming more frequent, residences, buildings and other infrastructure built within the floodplain will be susceptible to all flood types, including those caused by ice jams.

Wildfire: Wildfire in the region typically comes in the form of grass fires. Forest fires in the NRPC region are currently rare; however, the fuel potential for large fires exists. Grass fires occur in spring and early summer as fields are cleared of fall and winter debris. Wildfire suppression comes from the local fire department and

mutual aid organizations. Throughout the region, large tracts of forested land could be at risk during sustained dry periods. With changing weather patterns associated with climate change, wildfire risks are increasing in Vermont. The NRPC region can expect and should plan for increasing wildfire danger in the coming decades, as well as air quality impacts from fires in adjacent regions, states and Canada. Education and outreach to increase community awareness will be important.

Tornado: Tornadoes may form when strong thunderstorms track through the area. These phenomena are rare in Vermont. Environmental impacts would include felled trees, while business impacts would take the form of destroyed crops. Building damages may include destroyed windows, torn roofs and destroyed barns. Tornadoes occurred in Franklin County on June 18, 1957; June 13, 1961; August 3, 1970; and July 19, 1972.

Drought: Severe droughts are rare in occurrence and relatively brief in duration. They have affected residential and commercial water supplies and can pose a serious threat to the region—especially to agriculture-based businesses, such as commercial farms and horse boarding stables. Droughts can be a problem in late summer, when local springs and wells are reduced to minimal flows. Water tables reached an all-time low during the drought of 1988; however, recovery was fairly rapid. Weather shifts have lowered drought risks in the near future compared to historical values, but the risk of drought related to climate change will increase with the upward moving temperature trends. Warmer air temperatures will cause higher evaporation levels from water bodies, soil and vegetation. Warmer and shorter winters will result in higher precipitation as rain rather than snow, causing snow to melt earlier in the season. This result in lower snowpack that would supply water to bodies in the spring when water is needed more. As storms continue to more intense, heavy levels of rain runoff directly into surface waters. This prevents the water from having time to absorb into the ground and refill aquifers.

Earthquake: Earthquakes have been felt in the region and remain a geologic possibility. The region is situated in a moderate earthquake zone. Although earthquakes are not a frequent event, they have the potential to cause extensive damage to masonry (i.e., brick) buildings that are not reinforced as well as older bridges. FEMA used its Hazus earthquake risk analysis and loss model to conduct an analysis at the regional level in 2004. There is moderate potential for serious damage to buildings and infrastructure where losses would easily be in the millions if a high- magnitude earthquake occurred.

Pests and Invasive Species: Infestations of pests and invasive species threaten the diversity and survival of native species and can affect commercial, agricultural or recreational activities that depend upon the native species. They negatively impact the quality of wildlife habitat, create financial burdens for landowners and reduce the economic value of working forests. Sugarmakers, foresters, conservation groups, landowners and water facility operators are increasingly concerned about the economic toll of managing invasive species. In Vermont, a landowner could spend $200 to $800 per acre or more to manage invasives (Vermont Chapter of The Nature Conservancy). The maple, elm, horse chestnut, willow, ash, poplar, European mountain ash, hackberry, and hemlock have all seen population impacts from invasives. A caterpillar infestation caused more than $8 million in damage to the 2001 hay crop in Vermont, with some farmers losing up to 90% of their crop that year. Invasive plants and pests—such as Eurasian Watermilfoil and zebra mussels in Lake Champlain and the Asian Longhorned Beetle and hemlock wooly adelgid (HWA), —cause millions more in damage in Vermont annually. The arrival of the Emerald ash borer (EAB) in the region has the potential to devastate ash trees in forests and communities, the state, municipalities; foresters and conservation groups have begun mitigation efforts to prevent their spread.

Emerald Ash Borer
PHOTO CREDIT: *VT ANR*

High Heat: Over the past 50 years alone, air temperatures in Vermont have increased more than 4°F in winter and more than 2°F in summer. The risk of heat related events including heat waves will increase in Vermont, with the number of days reaching 87°F per year are expected to increase from 6 to 20 (CDC). To help prevent heat related events, municipalities in the region have begun local emergency planning efforts to reduce their vulnerability to heat, both in response to an extreme heat event and as part of longer-term planning to lessen future risk. Examples include developing shelter annexes within their local emergency management plans which includes identifying local cooling spaces and cooling shelters and resources support lists. To safeguard people's health in the short term, local municipalities can establish early warning systems, cooling areas, and raise awareness about heat related illness. Municipalities can modify roads, train tracks, and other infrastructure to use more heat-resilient materials and reduce heat absorption. Heat-waves are capable of placing high stress on electricity systems and cause possible disruptions. It is crucial that the Northwest Region continues its commitment to implement energy efficient measures throughout the network to lower the risk of these events.

CLIMATE CHANGE

Climate change refers to any significant change in the measures of climate lasting for an extended period of time. Increasing concentrations of greenhouse gases in the atmosphere are causing climate patterns to change. Predicted impacts of climate change include more variable temperatures and rainfall, extreme weather events and rising lake levels.

Vermont is often considered a "climate haven," and one of the best protected states from natural hazards and the effects of climate change. However, many of the state's greatest hazards are climate driven. Extreme weather events such as the more frequent and severe precipitation events experienced in the past decade will likely cause a greater frequency of current "100-year flood" levels (severe flood levels with a one- in-100 likelihood of occurring in any given year). Higher temperatures could lead to greater risk of wildfire or drought conditions.

Impacts to the regional economy from climate change could be significant, especially where deciduous forests (e.g., maple, beech and birch forests) are concerned. Warmer fall temperatures would mean decreased colors and decreased tourist revenues during the foliage season. Warmer temperatures and a shorter spring season could affect the quality and quantity of sap produced, impacting the maple sugaring industry.

Water quality could be diminished as well, with more frequent algae blooms in Lake Champlain, Fairfield Pond, Lake Carmi, Arrowhead Mountain Lake and Metcalf Pond. This would drive down property values for lake shore properties, decreasing the tax base of municipalities.

One of the largest impacts from Climate Change will be seen in the agricultural sector. Some of the heating effects of climate change have lengthened the grow season, created milder average temperatures, and therefore have allowed for the expansion of new species into Vermont. The changing climate is also bringing agriculture setbacks, with fruit-bearing species like apples struggling with shorter winters, and the maple syrup industry in danger due to higher temperature variations impacting the length and quality of the sugaring season. Climate models predict overall tougher growing conditions caused by higher variability in temperature and precipitation, including floods and droughts leading to potential crop damage. According to the EPA, increases in temperature will likely reduce milk yields and slow weight gain in dairy cows. The projected increases in temperature will negatively affect operations, because production costs will increase with reductions in milk and meat production.

Vermont's hunting and fishing industry will also be affected by climate change. Warmer summers and shorter winters will result in an increased growing season and create changes in the makeup of natural communities. As ecological conditions change, habitats may become less suitable for some species and more suitable for others. For example, certain climate-sensitive habitats such as the high-elevation spruce fir forest may shrink or vanish, with implications for specialized species. Some species of fish and wildlife may shift their distribution on the landscape to follow the presence of preferred or essential habitats. Species formerly uncommon in Vermont, or only present during warmer seasons, may become more commonplace. Vermont's Fish and Wildlife Department states that habitat and species management will be critical in adapting to climate change, as will the protection of conservation lands.

Residents of the region rely on Vermont's downhill ski industry for recreation and employment. A shortened ski season due to briefer winters will mean decreased earnings for seasonal ski industry workers and related tourism businesses. Many ski areas have begun to expand upon recreation opportunities, such as offering summer recreation camps, to make the resorts economically viable year-round.

DISASTER RESILIENCY

Front Line Communities

Frontline communities are those that experience the "first and worst" consequences of climate change. These communities include smaller, less resourced municipalities, low-income homeowners, renters, individuals without homes, and those who have high transportation burdens. Traditionally underserved and impacted communities must be identified, and their input solicited on the expansion and creation resiliency efforts.

Historically, the effects of climate change and local disasters ha ve not been equally distributed, and this is no different in Vermont. Hurricane Irene was a terrible disaster, and left millions of dollars of damage throughout the state. Although this was an extreme weather event, it is not isolated. The University of Vermont projects approximately 5.29 billion dollars in flood damages in the next century. (Inequities in the distribution of flood risk under floodplain restoration and climate change scenarios, Jesse D. Gourevitch, Rebecca M. Diehl, Beverley C. Wemple, Taylor H. Ricketts, January 2022).

This dollar value is more than double the expectations under current weather conditions, but the projected increased severity of storms due to climate change causes a 148% increase. The study found that low-income homeowners and mobile home owners are expected to face the largest burden from flooding, with mobile homes facing much higher risk compared to higher-value properties. 5.8% of all mobile homes are exposed to inundation during a 500-year flood event (Figure 6b). By comparison, approximately 1.9% of all multi-family and commercial properties are exposed to flooding. Although the study presents that 20% of these hazards can be alleviated by floodplain restoration, higher-value properties are expected to benefit more from this investment. If these disparities go unnoticed, flood risk could continue to be a factor to inequality in society.

A strategy to help remove some of these unequal effects is using metrics of social vulnerability, which ranks flood projects with consideration for their social vulnerability. In Vermont, the socioeconomic and demographic variables needed to create the variable are not paired with property data sets, and therefore makes it much harder to measure. It is important that social measures are taken into consideration in planning to ensure the most equitable outcome. Vermont's Municipal Vulnerability Tool, currently under development by the Vermont Climate Council, should help identify more vulnerable communities.

Infrastructure

Disaster resilience efforts seek to alter hazards by eliminating or reducing the frequency of occurrence; avert hazards by redirecting their impact by means of a structure or land treatment; adapt to hazards by modifying

structures or standards; or avoid hazards by stopping or limiting development. Disaster-resilient projects include:

- Implementing proactive land use planning that encourages development or redevelopment outside of floodplains and other flood-prone areas
- Ensuring critical facilities are safely located
- Establishing and enforcing appropriate building codes to promote safer development
- Identifying and upgrading undersized culverts
- Properly building and maintaining roads
- Flood-proofing structures
- Tying down propane/fuel tanks in flood-prone areas
- Elevating furnaces and water heaters
- Identifying and modifying high-traffic incident locations and routes
- Ensuring an adequate water supply
- Elevating structures or utilities above flood levels
- Buying out and relocating structures to less vulnerable areas
- Providing information to the public

The Local Hazard Mitigation Plan (LHMP), helps communities identify important local hazards, prioritize steps, and find access to funding. There are a wide variety of ways that communities can invest into mitigation. To help address issues, the State of Vermont has developed the Transportation Resilience Planning Tool to identify at-risk areas of Vermont infrastructure. They have set forward four groups of mitigation strategies to support broad planning and to begin an alternative analysis to reduce vulnerability. Mitigation recommendations were established based on the characteristics that contribute to vulnerability and criticality for each location. The strategies include River and Road Stabilization (fortify road embankments, bridges, or culverts to resist erosion), Conveyance of Flood Flows (Increase space for passing water, sediment, and other flood debris), Floodplain Protection and Road Relocation (Protect floodplains and river corridors from permanent infrastructure), and Improve Vegetation (Naturalize the riverbanks, and riparian buffers to provide filtration, and natural habitat). Making these changes to communities is key to mitigation, and ensuring peoples safety and health.

Economic Resiliency

Resilience pertains to how a community sustains itself through change via adaptation and occasional transformation. One aspect of economic resilience is the way a community reduces economic losses due to disasters. Investing in infrastructure to lessen the impacts of flooding and other disasters is one way communities and businesses can limit rebuilding and recovery costs. Protecting functioning river corridors and floodplains can lessen the impacts of flooding. Maintaining the local economy during times of disaster—including saving jobs and keeping businesses open—is an indicator of a healthy, strong community. The Economic Chapter provides additional information about Climate Resilience.

GOALS AND POLICIES

1 GOAL **Reduce the loss of life, injury, and economic harm resulting from all-hazards events and climate change and focus efforts on those who are most vulnerable to impacts.**

a. Leverage existing public health infrastructure to build climate resilience and engage and serve front line communities that are most vulnerable.
b. Ensure that municipalities identify emergency management directors and emergency management coordinators who are qualified to fulfill the duties as required under Title 20 V.S.A. § 6.

c. Ensure that municipal and regional response plans are in place for large events including community events such as fairs, festivals and sporting events.
d. Ensure that all municipalities and major employers have flood emergency preparedness, all-hazards preparedness and response plans in place that include a focus on those who are most vulnerable to impacts.
e. Except in growth areas designated in local and regional plans, discourage new development in identified flood hazard, fluvial erosion and river corridor protection areas. If new development is to be built, it must not exacerbate flooding and fluvial erosion.
f. Support local volunteer efforts and mutual aid agreements during response and recovery efforts.
g. Utilize Vermont's new Municipal Vulnerability Tool to identify key communities or parts of communities that need additional support to plan for the impacts of climate change.

2 GOAL

Reduce infrastructure damage and the financial losses incurred by municipal, residential, industrial, agricultural and commercial establishments due to disasters.

a. Support community projects and grant applications that seek to reduce losses from all-hazards events through programs to elevate, relocate or retrofit buildings and infrastructure within flood-prone areas, prioritizing people or communities at greatest risk.
b. Consider conservation of open space by acquisition of repetitive loss structures.
c. Identify sites that have limited to zero risk of natural hazards for potential future residential, commercial and industrial development activities.
d. Promote good construction practices and enforce effective building codes and local ordinances to eliminate structural problems during hazard events.
e. Ensure facilities such as schools, daycare providers, government, public utilities and public safety facilities are not located in areas identified as being at high risk for natural or manmade disasters.

3 GOAL

Ensure the region's communities are resilient to all-hazards events; include hazard mitigation planning, and climate resiliency, in the municipal planning process.

a. Recognize the connections between land use, stormwater, road design and maintenance as well as how they might be affected by disasters and climate change, and incorporate mitigation into site design and infrastructure planning.
b. Ensure that resiliency measures are compatible with natural features, including floodplains, river corridors, land adjacent to streams, wetlands, and upland forests; historic resources; the character of neighborhoods; and the capacity of the community to implement them.
c. Encourage communities to identify vulnerable areas with known hazards and consider impacts of climate change when planning for future land development.
d. Support the municipal adoption of all-hazards resilience plans (24 V.S.A. Section 4382) and river corridor, flood plain and buffer bylaws.
e. Evaluate land use restrictions within designated flood zones such as no-build zones and prohibition or tie down of buoyant hazardous materials storage tanks.
f. Ensure communities remain in good standing with the National Flood Insurance Program.
g. Protect and restore floodplains and upland forested areas that attenuate and moderate flooding and fluvial erosion.

INFRASTRUCTURE: WATER SUPPLY, WASTEWATER, STORMWATER AND SOLID WASTE

GOALS

1. **The water supply for the region will not be contaminated, depleted or degraded, and there will be sufficient quantity to support existing and future residential, commercial and industrial needs.**
2. **Residents, communities and businesses will have access to solid waste disposal, wastewater treatment systems and stormwater treatment methods that are cost-effective and environmentally sound.**

WATER SUPPLY

Residents of and businesses in Franklin and Grand Isle Counties access drinking water from a variety of sources. Some of the sources are referred to as public even if they are not public in the traditional sense[1], while the majority are private and small. Map 18 illustrates the service areas of larger public water and sewer systems in Franklin and Grand Isle counties. There are 30 public water systems in the region drawing water from 45 different source points. Lake Champlain is the source for all public water systems in Grand Isle County, and supplies the major portion of water to the St. Albans City system, the largest public water system in the region. Other systems in the region draw from groundwater or in some cases from specific streams. Most if not all the public water systems in the region are operating below 90% capacity, the threshold at which communities would need to begin planning for expansion. (Occasional shortages are experienced in some smaller systems reliant on groundwater.)

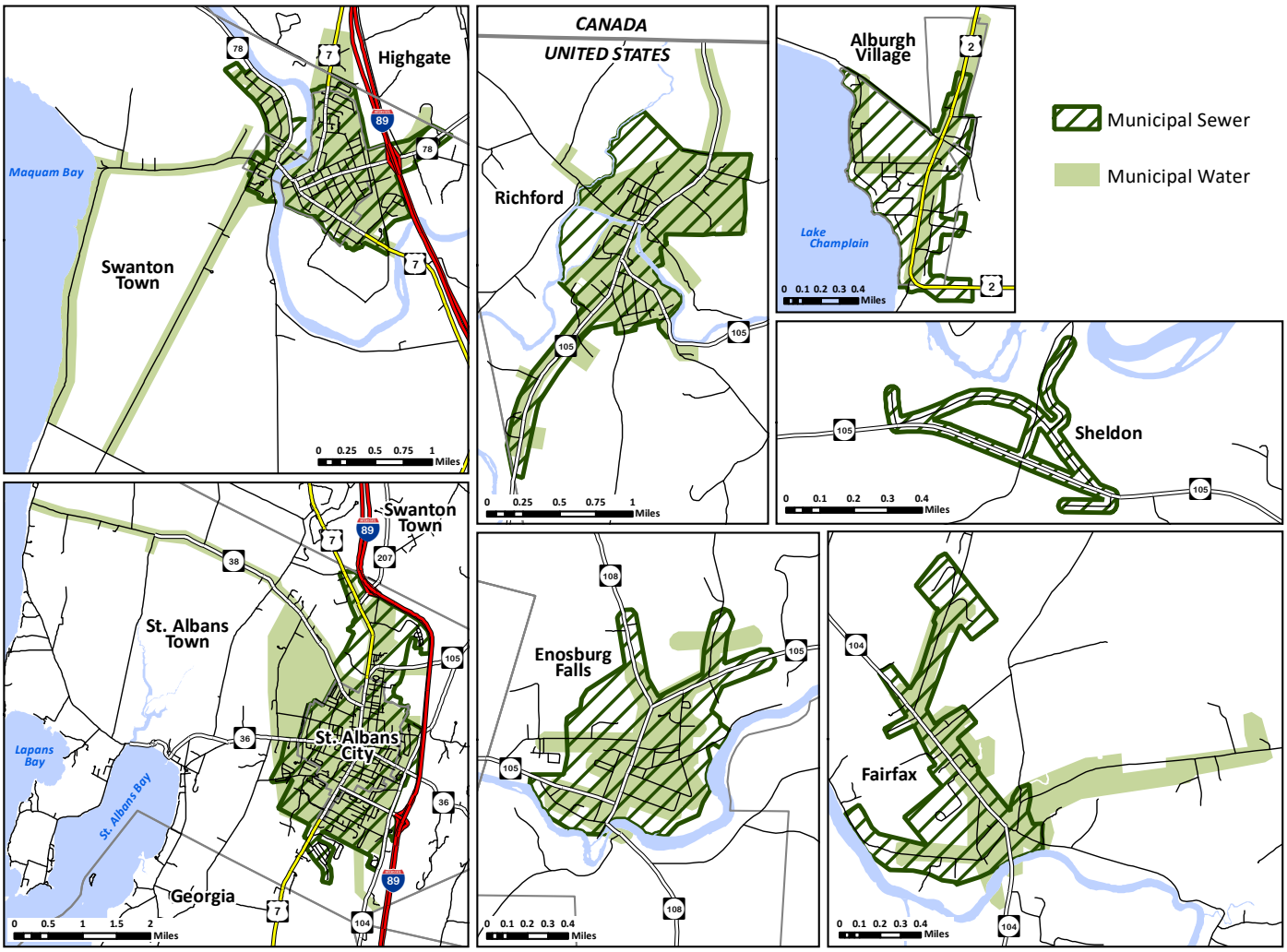
Public water supplies, whether from ground or surface waters, are challenging resources to manage and protect. Take groundwater, for example. It is important that groundwater aquifers are protected from pollutants because restoring an aquifer after it has been contaminated can be extremely expensive and take a very long time. One tool for protecting public water supplies is to map and develop plans for Source Protection Areas (SPA). SPAs delineate zones around a ground or surface water supply. Any contaminants reaching the

[1] *In the context of water supply systems in Vermont, a "public" water supply system is one serving 25 or more year-round residents or having 15 or more year-round connections. The term also includes systems serving 25 or more people for shorter periods of time, ranging from 60 days to six months per year.*

SPA are reasonably likely to move toward the system's intake point. While operators of a water system do not have authority to control land uses on any land within the SPA unless they own the land or have specific legal agreements with the landowner, towns can adopt local ordinances or bylaws that restrict uses that are not compatible within a SPA. State regulations do not currently limit land uses within and buffering SPAs, although these areas may have bearing under Act 250, Vermont's Land Use and Development Law.

The water quality of Lake Champlain is particularly important to those communities for whom the lake is their drinking water source. This includes all towns in Grand Isle County as well as the St. Albans City and Swanton Village systems. Invasive plant and animal species are also a growing problem facing systems drawing water from the lake. Barring a breakthrough in control methods the cost of preventing infestation will rise substantially in coming years. As noted in the Natural and Cultural Resources section of the plan, other stressors to water supplies include nutrient loading from over fertilization, pathogens from animals and poorly functioning septic systems, toxic substances from contaminant release and pesticides, and acidity from atmospheric deposition. Threats associated with climate change include impacts from large storms (e.g., flooding) as well as drought.

MAP 18: Municipal Sewer and Water Systems



SOURCE: *NRPC Collected Data*

WASTEWATER

There are seven municipal wastewater treatment plants serving the northwest region with a range of treatment systems including chemical treatment, aerated lagoons and activated sludge. The majority of these systems have adequate capacity to serve future growth. Insufficient uncommitted capacity is a concern for growth in at least one village in the region. Some communities maintain combined wastewater and stormwater systems where both outputs are transported to a treatment plant by way of a network of sewer pipes and storm drains. Such combined networks increase demands on wastewater treatment facilities and during periods of highest stormwater flow may overwhelm treatment processes. The village of Fairfax has limited capacity for additional service connections thereby creating a potential barrier for future development in the village and growth area. In addition to hydraulic capacity, wastewater systems are limited by the composition of the wastewater that must be treated. Particular problems to be monitored include phosphorus, organic compounds, industrial wastes, sludge production and disposal, and storm water runoff.

Most communities in the region do not have a municipal wastewater system and utilize private septic systems. This lack of infrastructure can limit the way in which a community can grow and attract economic development opportunities. In addition to striking agreements with neighboring communities (as was recently done between Swanton Village and the Town of Highgate), communities could explore the development of small-scale wastewater treatment systems or facilitate the building of multi-user systems to aid development in and around the community's growth areas. These community-scale wastewater treatment systems may also be appropriate for clusters of shoreland development where wastewater disposal is particularly challenging because of small lot sizes and close proximity to surface waters.

Several state and federal programs are available to provide grants and low or no-interest loans for infrastructure planning and construction. Examples include the Vermont Clean Water Revolving Fund and USDA Rural Development facilities programs. As a result of the COVID-19 pandemic and recently passed federal spending and infrastructure bills, more funding than normal is available for water, wastewater and stormwater infrastructure.

STORMWATER

For the majority of communities in the region, stormwater infrastructure consists of a system of culverts and ditches that moves stormwater from one place to another. Typically, these systems drain directly or indirectly into nearby waterbodies. In many cases, these waters move through the system without any retention or treatment. The result is whatever pollutants the stormwater carries are discharged. Because stormwater lines concentrate flows, they also increase erosion risk from the additional volume of water funneled into stream. Impervious surfaces such as paved or gravel driveways, sidewalks and roofs typically result in creating stormwater runoff as the water that hits these surfaces cannot be absorbed into the ground and drains off the site.

As development occurs in communities the ability to handle the volume of stormwater should be monitored. If stormwater runoff is not managed properly, it can impair water quality in local watersheds by carrying more sediment and pollutants into streams, rivers and lakes. In recent years, the reduced water quality seen in Lake Champlain and its bays has brought greater awareness to the role of stormwater on water quality. As of 2013 both the City and Town of St. Albans were required to obtain a federal stormwater management permit for its Municipal Separate Storm Sewer System (MS4) and are implementing stormwater management programs to reduce the contamination of stormwater runoff and prohibit illicit discharges. In 2015, Vermont adopted Act

64 requiring municipalities to obtain coverage under a permit aimed at reducing stormwater-related erosion from municipal roads. The legislation also required development of new stormwater rules aimed at addressing stormwater on already-developed properties with more than 3 acres of impervious surface and no prior permit.

Communities benefit from encouraging sponsors of new and existing development to reduce the amount of stormwater runoff leaving their sites. Communities benefit still more by ensuring that storm water systems are maintained properly. This could be achieved in several ways; one of them is through implementing Low Impact Development (LID) Best Management Practices (BMPs) to effectively manage stormwater onsite. LID systems infiltrate, filter, store, evaporate and detain runoff to minimize stormwater runoff and pollution. Examples of these BMP methods include rain gardens, rain barrels, cisterns, vegetated swales, roof-top disconnection, infiltration trenches, green roofs, and pervious pavement. These systems are meant to be used in conjunction with traditional stormwater systems to treat the maximum amount of stormwater possible on site and reduce the burden on municipal infrastructure and impacts to water quality.

The State of Vermont regulates stormwater runoff on construction sites and on substantial development and redevelopment projects. Given the cumulative impact many small developments can have, communities should explore incorporating stormwater standards into their development regulations to address the stormwater created from all land development. The Agency of Natural Resources is currently updating their stormwater manual which may bring changes to the Agency's rulemaking and incentives for incorporating new measures.

The Franklin County Stormwater Collaborative was launched in 2014 to encourage residents and business owners to get involved in reducing stormwater pollution. The Collaborative is a partnership between the City and Town of St. Albans with the Northwest Regional Planning Commission. The City and Town of St. Albans are working together to encourage area residents to get personally involved in reducing stormwater pollution in Lake Champlain. This effort is being conducted as a part of a public education requirement of a federal Environmental Protection Agency stormwater system permit, called Municipal Separate Storm Sewer System (MS4). The Stormwater Collaborative was designed to allow other municipalities to participate in the future.

Three communities, the City of St. Albans and the Villages of Swanton and Enosburg Falls, have combined stormwater and wastewater systems. In the City of St Albans, approximately 11% of the stormwater drainage area—or 160 acres with a total of 149 connected catch basins—goes into the combined sewer system The City is planning for projects to create offline combined sewer storage as well as separate portions of the combined system where feasible. These will reduce the number and magnitude of overflows during rain events.

SOLID WASTE

All Vermont municipalities are required to adopt a Solid Waste Implementation Plan (SWIP; 10 V.S.A. § 6604) that details a comprehensive waste management strategy such as identifying services and how waste will be disposed. This plan must comply with the statewide Materials Management Plan. For the collection of waste and recycling in the region, all communities except Fairfax are members of the Northwest Vermont Solid Waste Management District. The Town of Fairfax has a separate SWIP and therefore coordinates the services for its community members.

The Northwest Vermont Solid Waste Management District's (NWSWD) current SWIP was adopted in 2020 and is renewed at least once every five years. Based on hauler reports in 2021, NWSWD estimates that the per capita waste generated in the region was 4.0 pounds/person/day, which is below the national average of 4.4

pounds/person/day. NWSWD estimates that 30% of this waste is recycled thereby reducing the amount of waste headed to landfills to 2.8 pounds/person/day.

In 2000, the NWSWD implemented a mandatory recycling ordinance in member towns. Recyclable material collected at NWSWD waste facilities is transported to its Georgia Recycling Center to be processed and sent to be recycled into further products. Overall, removing and recycling materials from the waste stream cuts disposal costs, reduces environmental impact of both waste disposal and goods production, and lowers energy consumption overall.

NWSWD has a list of 31 private haulers that operate within the district, and the Town of Fairfax has a contract with a private hauler for curbside pick-up. Six of the nine transfer stations are operated by NWSWD, the Highgate Transfer Station is operated by Casella Waste Management, and the municipalities of Grand Isle and Alburgh each operate a transfer station. In March 2023, voters in the NWSWD approved a bond of up to $1.5 million to finance the cost of renovating the NWSWD Georgia Recycling Facility to increase capacity and improve safety.

The District offers collection of household unregulated hazardous waste--such as used motor oil, paint, and batteries--at the Georgia Transfer Station year-round and at special collection events throughout the year. In a typical year, 1500 households take advantage of these services. NWSWD contracts with a hazardous waste transporter to transfer and manage this waste efficiently; the material is typically shipped out of the Region and is often incinerated for fuel.

The majority of the landfill-bound waste collected in the area is shipped to the Highgate Transfer Station or the Williston Transfer Station. From there the waste is shipped in bulk to the Coventry Landfill. The NWSWD owns a 154 acre property in Sheldon intended to be used as a landfill site when existing landfill capacity is exhausted or export becomes less cost effective. The NWSWD received a permit from the ANR in 1997 to construct and operate a lined landfill on 7 acres of the site; this permit was recertified in 2011. The facility still needs to obtain Act 250 and local permits before commencing operation.

Legislation known as Act 148 (AKA the Universal Recycling law) was passed in 2012 to reduce the amount of waste going to landfills by banning recyclables, food scraps and yard or leaf debris from landfills. Amendments to the law in 2018 established a new framework for waste fees, leaf and yard waste and food waste. Changes to the law in 2019 prohibited retailers and food establishments from providing customers with single-use plastic bags, straws, stirrers, or polystyrene containers.

FUTURE NEEDS

The Vermont Agency of Natural Resources estimates “across Vermont there is more than $2 billion of investment needed in drinking water, wastewater and stormwater systems over the next 10 years, to both refurbish existing systems and to prepare this essential infrastructure for increasingly disruptive and potentially devastating effects of climate change.“ According to a 2019 “report card” issued by the Vermont section of the American Society of Civil Engineers, these system are among the lowest scoring infrastructure categories in the state. This cost estimate does not include any additional capacity that might be needed to support increased housing growth called for elsewhere in this plan. Examples of water and wastewater-related investment priorities for the Northwest Region include development of systems in Highgate (in Highgate Center village as well as near the State airport), South Hero and Keeler Bay villages, Georgia and St. Albans Town. They also include the updating of systems in Swanton Village (including water line upgrades and significant wastewater plant upgrades to reduce phosphorus) and St. Albans City.

ANR's stormwater-related investment priorities for the Northwest Region will be pursued in the context of a law known as Act 76. In addition to providing a long-term funding source for water quality projects, Act 76 establishes a network of Clean Water Service Providers (CWSPs) and Basin Water Quality Councils (BWQCs) to identify and implement voluntary projects. NRPC has been selected to serve as the Clean Water Service Provider for the Missisquoi and Lamoille Basins and will also be an active participant in the BWQC representing interests in northern Lake Champlain.

Climate change will have an impact all forms of water infrastructure, particularly from flooding and also drought. More frequent and more intense rain events can strain stormwater systems and impact drainage patterns. New and updated public drinking water and wastewater system design should consider climate change impacts, such as more droughts and more wet periods. Wellhead protection areas should take climate change impacts into account and can be integrated into land conservation and recreation objectives. Stormwater systems must account for changes in expected weather patterns. (Vermont Climate Action Plan, 2021)

With respect to solid waste needs, in Highgate, a significant solid waste related priority involves the site of the Highgate transfer station and previously capped landfill. Slope stabilization has been proposed at the transfer station to protect human health, the natural environment, and a town owned infrastructure.

GOALS AND POLICIES

1 GOAL

The water supply for the region will not be contaminated, depleted or degraded and there will sufficient quantity to support existing and future residential, commercial and industrial needs.

a. Land development shall not threaten to pollute or deplete groundwater resources or exceed existing or planned public water supply capacity.
b. Development that could negatively impact ground and surface water must not be located in identified water protection areas and groundwater recharge areas or where such development is likely to adversely impact water supplies.
c. Withdrawal of groundwater must not exceed the recharge rate over a reasonable period of time and must not interfere with the reasonable withdrawal of groundwater by other users.

2 GOAL

Residents, communities and businesses will have solid waste disposal, wastewater treatment systems and stormwater treatment methods that are cost-effective and environmentally sound.

a. New or upgraded wastewater management systems will reinforce the desired settlement patterns of compact villages and growth centers separated by rural countryside.
b. Creative inter-municipal and public/private partnerships that promote cost-savings for providing wastewater and stormwater treatment are encouraged.
c. Long-range community facility plans and capital budgets will guide the creation, upgrade or expansion of wastewater and stormwater treatment systems and will consider impacts from climate change.
d. New development that creates an undue adverse impact on solid waste disposal, wastewater treatment and/or stormwater treatment will contribute funds to increase the capacity of these systems.

e. The cumulative impact of development on stormwater facilities must be addressed in considering stormwater treatment options.
f. Stormwater management and facility design must incorporate: consideration of cumulative impact, low impact development techniques, green stormwater infrastructure and long-term maintenance plans.
g. Solid waste will be recycled, reused and composted to the greatest extent possible prior to disposal.

APPENDICES

Appendix I - Definitions

Appendix II - Northwest Regional Energy Plan

APPENDIX I - DEFINITIONS

Act 200 - the 1988 amendments to 24 V.S.A. Chapter 117; the Vermont Municipal and Regional Planning and Development Act.

Act 250 - (10 V.S.A. §6001); Vermont Land Use and Development Law; the state environmental review process conducted by a District Environmental Commission to consider a proposed development's impact using 10 established criteria.

Affordable Housing - Housing is affordable when households with an income below the county median income pay no more than 30% of their income on housing costs. Housing costs for renters include rent and utilities. Housing costs for homeowners include principle and interest, property insurance, and property taxes.

Agricultural Land - real estate capable of supporting commercial farming (10 V.S.A. §331 [2]).

Area-Based Zoning - a type of zoning ordinance that establishes a formula for the number of non-farm dwellings permitted per acre, with houses typically built on small lots.

Bylaw - zoning regulations, subdivision regulations, shore land and flood hazard by-laws, an official map and capital budget/program adopted under 24 V.S.A. Chapter 117 § 4401.

Demand Side Management - Planning, implementing, and monitoring activities of electric utilities which are designed to encourage consumers to modify their level and pattern of electricity usage (US Dept. of Energy).

Development - the division of a parcel into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or other structure, or of any mining, excavation or landfill, and any change in the use of any building or other structure, or land, or extension of use of land.

Family - a family consists of a householder and one or more other persons living in the same household who are related to the householder by birth, marriage, or adoption.

Floodplain - the land in the community subject to a one percent or greater chance of flooding in any given year. The area may be designated as Zone A on the National Flood Insurance Program maps.

Groundwater - means water below the land surface in a zone of saturation but does not include surface waters within the meaning of 10 V.S.A. §1251 (13).

Household - A household includes all the people who occupy a housing unit. Occupants in this category include a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements.

kiloWatthour (kWh) - a unit of energy equivalent to using one kiloWatt of electricity for one hour, equal to 3,412 BTU's.

Legislative Body - the selectmen in the case of a town, the trustees in the case of an incorporated village, and the mayor and City Council Members in the case of a city, and the supervisor in the case of an unorganized town.

Level of Service (LOS) - A qualitative measure describing operational conditions within a traffic stream; generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Level of service is reported as being in the range of A to F, with A the best and F the worst. For example,

- LOS A describes operations with very low delay.
- LOS F describes operations with considerable delay and congestion. Roadways with LOS of E or F are generally considered unacceptable.

Municipality - a town, a city, or an incorporated village.

Public Water System - a water supply system with 10 or more connections or that serves an average of at least 25 individuals for at least 60 days per year. Consult the Vermont Water Supply Rule, Agency of Natural Resources for more detailed information.

Section 248 - Vermont law contained in 30 V.S.A. granting judicial power to the Public Service Board to hold proceedings and to determine facts upon which to issue a Certificate of Public Good for new electrical or gas transmission lines, or generation facilities in the state. Prior to granting a Certificate the Board must find that the project meets with specific criteria, including that the facility must not interfere with the "orderly development of the region". The criteria also requires that the Board give due consideration to the recommendations of both municipal and regional planning commissions and related plans.

Source Protection Area (formerly referred to as **Wellhead Protection Areas** in the Vermont Water Supply Rule, ANR) - a surface or subsurface area through which contaminants are reasonably likely to reach a public water system source including both surface and ground water supplies.

Substantial Regional Impact - See below.

Undue Adverse Effect (or Impact) - an unnecessary or excessive net effect or impact that (1) violates a clearly stated community standard including policies of the regional plan and (2) which cannot be avoided through site or design modifications, on or off-site mitigation, or other conditions of approval.

Wetlands - those areas of the state that are inundated by surface or groundwater with a frequency sufficient to support significant vegetation or aquatic life that depend on saturated or seasonally saturated soil conditions for growth and reproduction. Such areas include but are not limited to marshes, swamps, sloughs, potholes, fens, river and lake overflows, mud flats, bogs and ponds, but excluding such areas that grow food or crops in connection with farming activities (10 V.S.A. §902 [5]).

Substantial Regional Impact

If a development proposal meets any of the criteria listed below- and therefore may have benefits or negative impacts beyond the borders of the host municipality-- and a conflict exists between the local and regional plan, the regional plan will take effect.

A project with substantial regional impact can have positive, as well as negative impacts. It is important to note that for development proposals compatible with this plan, this document will add credibility and support for the proposal.

A substantial regional impact in Franklin and Grand Isle Counties involves development which may:

1. Change the existing settlement pattern in the region by:
    - shifting activity from an existing area of development to a major new area of development;
    - locating in a new part of the region which does not presently contain development of that type or scale.
2. Significantly enhance or negatively affect the region's economy, or a major sector thereof, by:
    - generating a new sector of economic activity in the region;
    - providing employment and/or training opportunities in a new occupation or industry;
    - impacting the cost or availability of affordable housing in the municipalities affected by the project.
3. Significantly enhance or negatively impact regionally significant natural and cultural features as identified in this plan.
4. Significantly enhance or impact (beyond anticipated growth rates) important regional services or service areas by completing or necessitating their expansion, extension or relocation. Important regional services or service areas include, but are not limited to: public safety, transportation services, central business districts and village centers, education, health care, and recreation.
    - The development is located outside of a State designated Downtown, Village, Growth Center and meets the following criteria: a residential development, requiring an Act 250 permit, located in a regional plan growth area where the proposed number of housing units increases a municipality's total housing units according to the schedule in Table 1;
    - a residential development, requiring an Act 250 permit, located outside a regional plan growth area and where the proposed number of housing units increases a municipality's total housing units according to the schedule in Table 2;
    - commercial, retail, or industrial development involving employment opportunities for 40 or more individuals or 30,000 square feet or more of gross floor area located in a growth area;
    - industrial, office, hotel/motel, retail, wholesale, or service development with 10 or more employees located outside a growth area;
    - construction of facilities or utilities servicing two or more municipalities within one mile of a municipal boundary.
5. A new or expanded power generating or transmission facility that requires Public Utility Commission approval under 30 V.S.A. § 248 and at least one of the following applies:
    - it is visible from more than one municipality, or
    - it has impacts to two or more known or possible constraints identified in the regional energy plan, or
    - it is a solar installation located outside of a preferred area identified in the regional energy plan, or
    - it is a generation facility that requires upgrades to the transmission grid beyond the host municipality.
6. A project that will materially affect the existing or potential capacity to provide essential or required public services by one or more municipalities adjacent to the municipality where the proposed development is located. In considering such development, the Commission will consider secondary land use impacts that are attributable to the development.

TABLE 1: Substantial Regional Impact Threshold Within Regional, Sub-Regional and Transitional Growth Areas: Housing Units

Growth Center	Number of Units Required to Meet Threshold
Alburgh Village	50
Enosburg Falls	50
Fairfax	50
Georgia	50
Richford	50
St. Albans City	75
St. Albans Town	75
Swanton Village	75

TABLE 2: Substantial Regional Impact Outside Regional, Sub-Regional, and Transitional Growth Areas and State Designation Areas: Housing Units

Municipality	Number of Units to Meet Threshold
Alburgh	25
Bakersfield	15
Berkshire	15
Enosburgh	25
Fairfax	25
Fairfield	15
Fletcher	15
Franklin	15
Georgia	25
Grand Isle	25
Highgate	25
Isle La Motte	15
Montgomery	15
North Hero	15
Richford	25
St. Albans Town	25
Sheldon	15
South Hero	25
Swanton	25

7. A new or expanded telecommunications facility that requires Public Utility Commission approval under 30 V.S.A. § 248a and at least one of the following applies:

- it is visible from more than one municipality, or
- it provides service to two or more municipalities within one mile of a municipal boundary.

Any one or combination of the above criteria may characterize a development proposal having substantial regional impact. These criteria are not exclusive, but should be considered as the principal indicators of regional impact.

APPENDIX II - NORTHWEST REGIONAL ENERGY PLAN

The full text of the plan can be found at www.nrpcvt.com or call NRPC for a copy.