PHYSICAL REGION

GUIDING THEMES

Coordinate Policies and Leverage Investment

Policies on housing, land use, transportation, energy, natural and cultural resources, and infrastructure are coordinated to support growth and development that make the most efficient use of our existing infrastructure. This plan is consistent with Vermont's planning goals, and statewide priorities in transportation, disaster resilience and infrastructure will be influenced by the policies contained in this plan. This plan implements local priorities through the ongoing participation of the region's Transportation Advisory Committee (TAC) and Local Emergency Planning Committees (LEPCs).

Provide More Transportation Choices

The transportation section includes policies on roadways, transit, pedestrian facilities and bicycle access. This plan contains policy guidelines to implement the Complete Streets law, which requires that transportation projects take into account the needs of motorists, bicyclists, public transportation users and pedestrians of all ages and abilities. When implemented, this plan will enhance the community's transportation options by providing more employment opportunities closer to where people live so that walking and biking to work could become viable options. Finally, as part of implementation, grants will be available to local municipalities to adopt local plan and zoning code revisions to enhance streetscapes with pedestrian- and bicycle-friendly facilities.

As part of the Healthy People, Strong Communities project, the Northwest Regional Planning Commission (NRPC) held 20 community meetings to hear the community's ideas about economic development, disaster resiliency, Complete Streets and public health. The key themes from the land use, transportation and public safety discussions are summarized in Table 1.

TABLE 1: COMMUNITY MEETINGS – PHYSICAL REGION KEY THEMES	
Opportunities To Be Healthy	Better information about recreation opportunities and locations; safer places to walk and bike (e.g., wider shoulders, rail trails and other trails, indoor places, town forests); access to the lake; youth recreation (organized and lifelong activities—kids' lives can be isolated); nutrition should be taught in school; local foods
Changing Demographics	Senior housing, nursing facilities, aging in place, senior recreation programs; intergenerational connections to support mental health; an aging community necessitates more transit options to ensure safety
Public Safety	Happy with disaster response; good collaboration with surrounding towns; better outreach for the emergency plans; communicate what the emergency plans are and what their key points of information; hold classes/drills for public safety; promote community resources
Barriers To Accessing Health Services	Health care is especially fragmented in Grand Isle County; dental care is not widely available; difficult to use services if transportation is lacking (this is also a safety issue)

TRANSPORTATION

GOALS

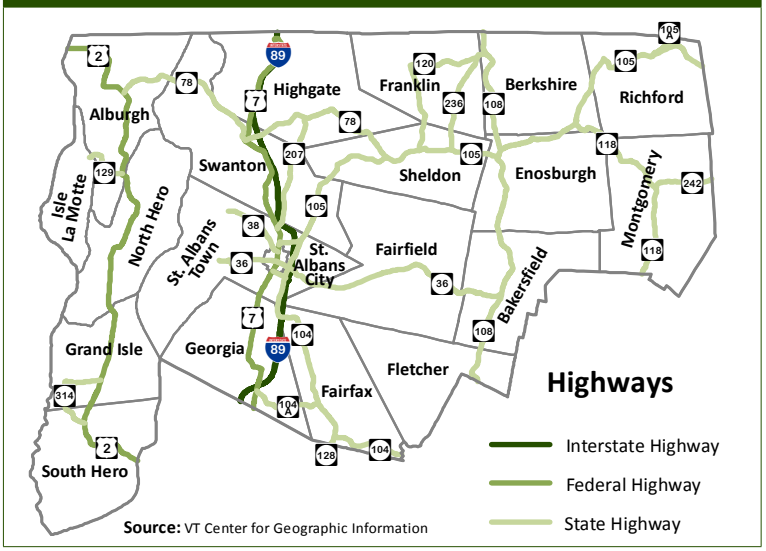
1. **Ensure all of the region's residents have access to safe and affordable transportation options regardless of age, physical ability or economic status.**
2. **Use creative approaches to maintain, improve and expand the region's transportation network.**
3. **Ensure the transportation network enhances 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 Figure 1.

FIGURE 1: NORTHWEST REGION HIGHWAYS



Interstate Highways: There are approximately 50 miles of interstate highway (I-89) located in the region (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: The state highways and federal highways only make up 18% of the region's total public roadway mileage, but they are the backbone of the region's transportation system. US 2 and US 7 are the two segments of federal highway in the region. The state highways include VT 36, VT 38, VT 78, 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 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 US 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.

All remaining roads not classified previously are town highways that are owned by the municipalities. Of the 1,134 miles of road in the Northwest region, over 1,000 miles or more than 78% are local roads. Just under half of town highways are paved.

Regional Road Network Condition

Highway Sufficiency Ratings: VTrans rates state highways for their adequacy in terms of structural condition, safety, and service. A section of road that meets all minimum design standards and is completely adequate in all other respects, rates a 100. The score decreases based on actual deficiencies in each of these areas. Sufficiency ratings are useful in identifying road sections which may have various types of deficiencies. Table 2 provides an overview of sufficiency ratings for the region's highway network. Of the 30.7 miles of state highway in the region rated as "bad" for highway sufficiency, VT 105 had the most mileage (12.75 miles) in this category followed by VT 36 (11.04 miles).

TABLE 2: HIGHWAY SUFFICIENCY RATINGS OF INTERSTATE AND STATE HIGHWAYS IN THE REGION

		Franklin and Grand Isle Counties		Vermont	
Sufficiency Rating	Category	Total Miles	% Total Miles	Total Miles	% Total Miles
0-39	Bad	30.7	13.5	177	6.7
40-59	Poor	67.9	30.0	88.9	33.8
60-79	Fair	91.4	40.4	930	35.4
80-100	Good	34.0	15.0	633	24.1

Bridge Conditions: VTrans inspects all state highway bridges and town highway bridges 20 ft. in length or longer every two years unless the bridge condition warrant 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 ft., 5.6% (9 bridges) were reported structurally deficient. This is slightly lower than the state's 2014 average of 8.3%.

Rail

With three active rail lines, the Northwest region is home to a substantial amount of rail infrastructure (Figure 2). The region is also home to the state's largest privately owned 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.

At a Glance: Bridges in the Region

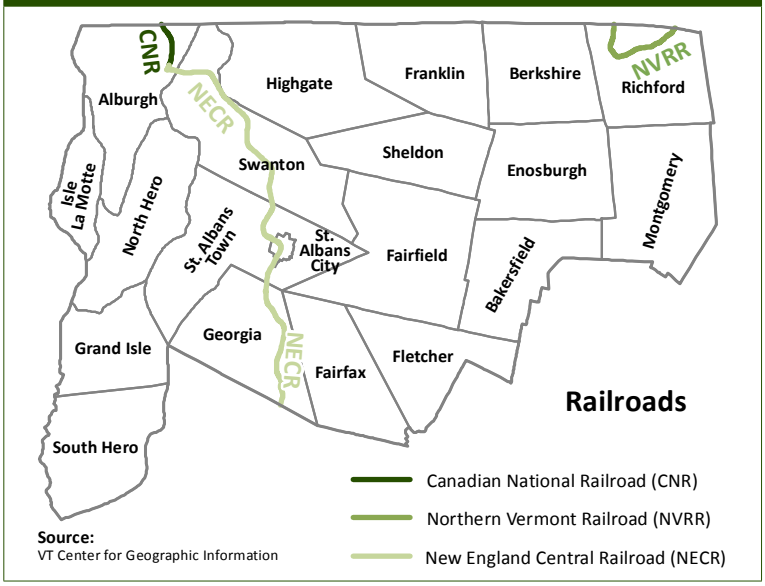
- There are 168 bridges (and culverts) with spans 20 feet or greater in the region.
  - 30 bridges on interstate
  - 57 bridges on state highways
  - 74 bridges on town highways
  - 6 railroad bridges
  - 1 pedestrian bridge
- In 2014, the average age of bridges in the region was 58 years old.

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. Within the state, this line received two significant federal grants (2010 High-Speed Intercity Passenger Rail funding and a 2012 TIGER IV grant) to upgrade bridges so they can accommodate 286,000-pound railcars and to install continuously welded rail that allows trains to travel at higher speeds.

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 recent upgrade of the NECR line in Vermont, along with upgrades in Connecticut and Massachusetts, will reduce the trip time from St. Albans to Washington, DC, by one hour and 15 minutes. 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.

FIGURE 2: NORTHWEST REGION RAILROADS



The Northern Vermont Railroad (NVRR) operates freight service on the tracks that provide a link from Canada through St. Johnsbury to Wells River, Vermont. Although NVRR only operates on a small loop of track in Richford, the largest customer on the line—Blue Seal Feeds—is located there.

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. Statewide, trucks move approximately 83% of goods by weight and 88% of goods by value, according to the Vermont Freight Plan (2015). Rail movements account for approximately 17% of goods by weight and 11% of goods by value. Freight rail transport is most competitive for long-distance hauls of bulky, low-value 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. 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.

Public Transit

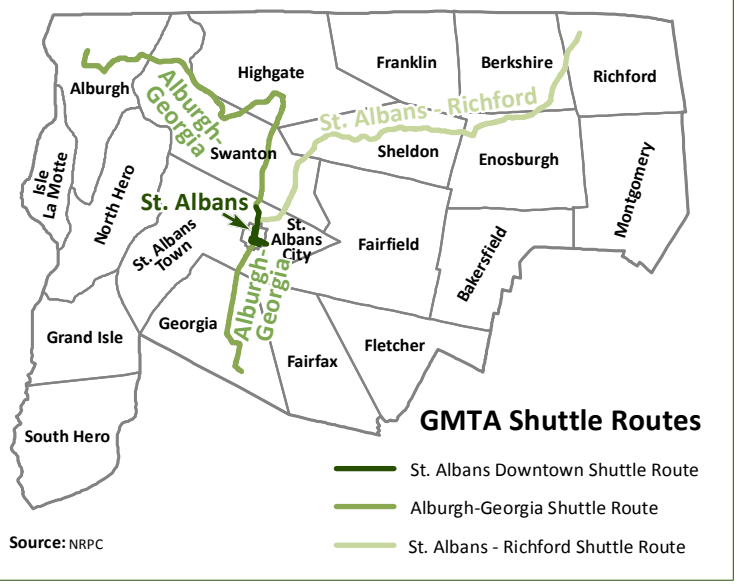
The Green Mountain Transit Agency (GMTA) is the public transportation provider for Franklin and Grand Isle Counties (Figure 3). GMTA operates the following three main routes in the region:

- **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 Saturday. 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 for 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.

FIGURE 3: GMTA SHUTTLE ROUTES



GMTA 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.

GMTA's parent agency, the Chittenden County Transportation Authority (CCTA), operates the St. Albans LINK Express, which 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.

GMTA provides special transportation services to the elderly, the 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. GMTA 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. GMTA 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. GMTA also serves as the fiscal agent for its partner agency, C.I.D.E.R. (Champlain Islanders Developing Essential Resources). C.I.D.E.R. provides transportation to elderly and disabled residents of Grand Isle County.

Air

The Franklin County State Airport is one of 10 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.

In addition to the Franklin County State Airport, there are two privately owned airports in the region: Northern Lights Airport in Alburgh and Allenholm Airport in South Hero. Commercial passenger air travel is available via the Burlington International Airport in Chittenden County, Vermont; the Plattsburgh International Airport in New York State; and the Montréal-Pierre Elliott Trudeau International Airport in Quebec. The Montréal-Mirabel International Airport is also located in Quebec, but it primarily transports cargo.

Bicycle and Pedestrian

Bicycle and pedestrian facilities in the region include on-road shoulders, shared-use paths and sidewalks. The major facilities 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 Vermont Association of Snow Travelers (VAST) holds the lease on the corridor and is working to convert it to a year-round, multi-use trail. The trail is not constructed in our region; but once completed, it will pass through the towns of Swanton, Highgate, Sheldon, Fairfield and Fletcher and will intersect 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 US Route 2 and VT Route 78 for non-motorized modes of transportation.
- **Swanton Fit & Healthy Recreation Path:** This one-mile, all-season crushed stone trail is situated on a railbanked rail corridor that extends from Robin Hood Drive to South River Street in Swanton.
- **Sidewalks:** 14 of the 23 municipalities in the region have public sidewalks. A list of these is shown in Table 3.

TABLE 3: SIDEWALK LOCATIONS IN THE REGION

Town	Feet	Description
St. Albans City	140,737	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.
Swanton	40,904	Sidewalks are evenly distributed throughout Swanton Village, usually on both sides of the streets.
Richford	27,417	Sidewalks are located along north–south streets in Richford Village, with a gap along VT Route 105 south of River Street.
Enosburg Falls	23,676	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.
Fairfax	4,731	Sidewalks are located along VT Route 104 between Tuttle and School Streets as well as along Hunt and School Streets.
Franklin	4,725	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.
Montgomery	3,719	Sidewalks are located along VT Route 118 (Main Street) near the intersection of VT Route 242 and VT Route 118.
South Hero	2,794	Sidewalks are located on the northern and southern sides of US Route 2 near South Street.
Sheldon	2,029	Sidewalks are located along Main Street between Pond Road and Bridge Street.

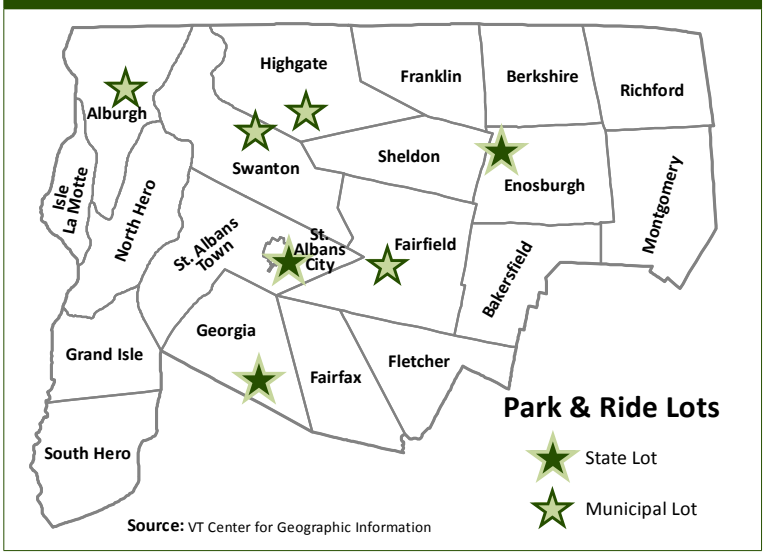
Alburgh	2,006	Sidewalks are located in Alburgh Village on the eastern side of US Route 2, from Champlain Street to Horican Avenue.
Highgate	912	Sidewalks are located on the eastern side of VT Route 78 near Machia and Durkee Roads.
Bakersfield	864	Sidewalks are located along VT Route 108 (Main Street) and were constructed in 2010.
Georgia	417	Sidewalks are located on the northwestern side of US Route 7 at the intersection of US Route 7 and VT Route 104A.
St. Albans Town	300	A segment of sidewalk is located south of the US Route 7/VT Route 207 intersection, extending into Price Chopper from US Route 7.

Source: *NRPC*

Ferry

The Lake Champlain Transportation Company provides year-round ferry service between the town of Grand Isle and Plattsburgh, New York. The ferry dock is located on VT 314, which is an important link for the ferry traffic traveling to US 2 and I-89.

FIGURE 4: NORTHWEST REGION PARK & RIDE LOTS



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. 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

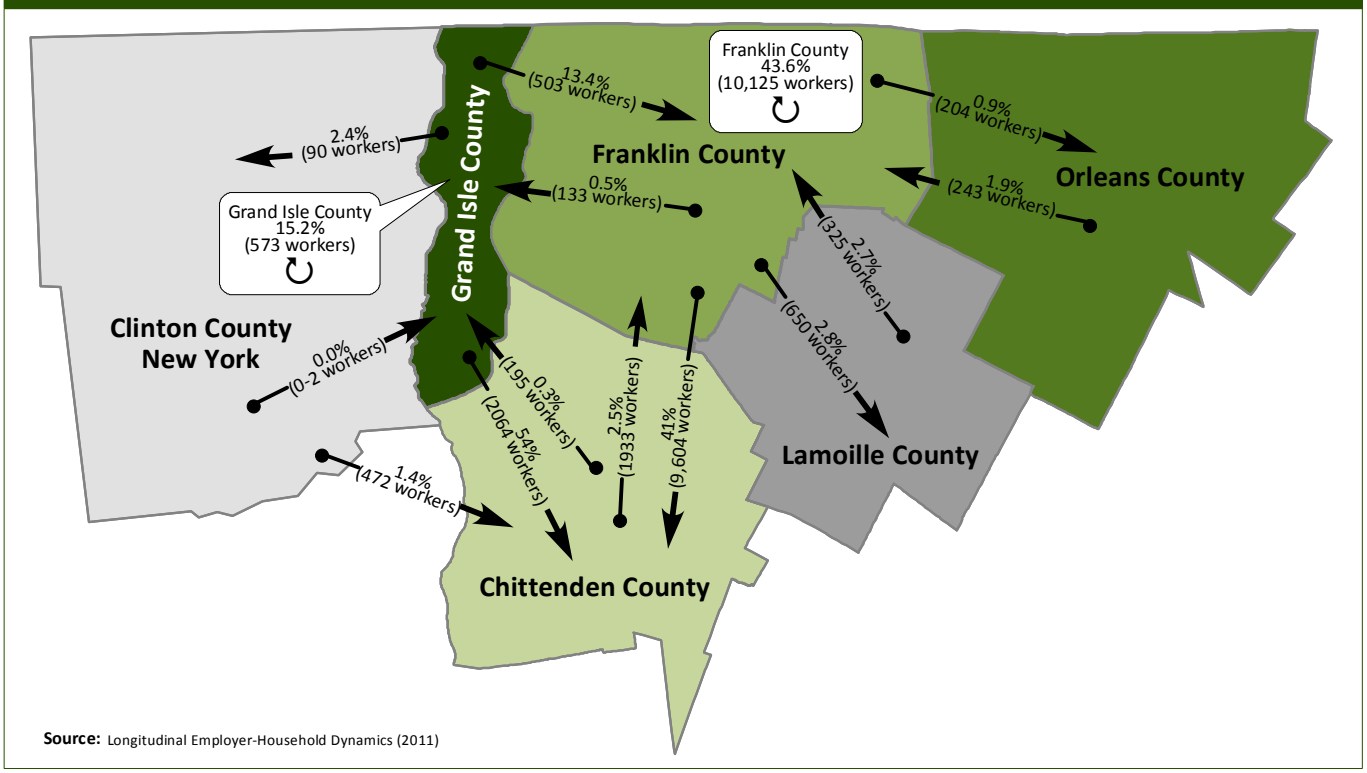
Intermodal facilities are locations where commuters, tourists, travelers and/or freight are transferred from one mode of transportation to another. Consequently, the modal linkages provided by intermodal facilities are key components of effective multimodal transportation systems. Park and ride lots, 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 (Figure 4).

Commuting

As shown in Figure 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 43.6% of Franklin County residents who are employed work within the county, a significant portion (41.4 %) commute to Chittenden County for work.

FIGURE 5: NORTHWEST REGION WORKERS



Source: Longitudinal Employer-Household Dynamics (2011)

The 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 4 outlines the implementation policies for complete streets for the different land use categories included in the future land use map in this plan.

TABLE 4: IMPLEMENTATION POLICIES FOR COMPLETE STREETS

	Downtowns	Village Areas	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.
	Transitional Areas	**High Density Residential Clusters (Including Senior Housing)**	**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.	• 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 the 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/prioritization of future transportation investments and guides the 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/interests: air, rail, bike, pedestrian and public transportation.

Each year, the NRPC TAC prioritizes projects for the Agency of Transportation Capital Program. The TAC's ranking accounts for 15% to 20% of a project's total score. The remainder of the score is based upon technical criteria evaluated by the Agency of Transportation.

The TAC evaluates projects on the following criteria:

- The impact of the project on congestion and mobility conditions in the region
- The availability, accessibility and usability of alternative routes
- The functional importance of the highway or bridge as a link in the local, regional or state economy
- The functional importance of the highway or bridge in the social and cultural life of the surrounding communities
- Conformance to the local and regional plans
- Local support for the project

Recent Planning Efforts

The NRPC has initiated several corridor or intersection feasibility studies for priority areas in the region. These plans serve as an extension of the regional plan and provide specific recommendations and identify next steps to improve these transportation assets. These studies can be found at www.nrpcvt.com.

I-89 Exit 19, St. Albans South State Highway (SASH) and VT Route 104 Intersection Feasibility Study Update (2009)

Summary of Study and Recommendations:

- Congestion during peak commuting times.
- No accommodation for pedestrians or bicycles.
- Identified by VTrans as a High Crash Location (HCL) intersection (based on 2008-2012 data).
- The intersection is located in the regionally and locally designated growth center but new development is limited because of improvements needed at intersection.
- The engineering preferred alternative is a 180 ft. diameter multi-lane roundabout with landscaped center island and 14 ft. truck apron.

US 7 Corridor Study Update (2007)

Summary of Study and Recommendations:

- Study area includes 1.7 miles of US 7 from intersection with VT 105 north to the intersection with Jewett Avenue (including 0.8 miles of VT 207 from intersection with US 7 to intersection with Bushey Road).
- The corridor includes many commercial and residential drives and carries significant truck and vehicular traffic. The corridor does not accommodate bicyclists or pedestrians well.
- Improvements are needed to accommodate the future traffic projected for the corridor and to provide facilities for bicyclists and pedestrians.
- Some of the recommended improvements include (but are not limited to) signalizing/realigning the intersection of VT 105 with US 7 and establishing a parallel road to US 7, referred to as the "federal street extension."

US Route 7 / VT 104A Intersection and VT104A Bridge No. B1 over Arrowhead Mountain Lake (2013)

Summary of Study and Recommendations:

- There is significant congestion at intersection during peak commuting times.

- Levels of Service (LOS) at intersection are projected to be failing in the coming years (2016= LOS E and 2036=LOS F).
- Intersection improvements should be compatible with the Town of Georgia's plan for the South Village.
- The engineering preferred alternative is a single-lane roundabout with paved truck apron and upgrades to neighboring commercial drives.

GOALS AND POLICIES

1. **Ensure all of the region's residents have access to safe and affordable transportation options regardless of age, physical ability or economic status.**
   a. Ensure that the region's transportation network will 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.

2. **Use creative approaches to maintain, improve and expand the region's transportation network.**
   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.

3. **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 impacts on natural, cultural and scenic resources.
   b. Use appropriate Complete Streets techniques depending on the land use context.
   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. When possible, 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 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 & CULTURAL RESOURCES

GOALS

The region is the product of its history, 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 of compact villages surrounded by open countryside, the region retains much of its rural character.

The following three goals were devised to ensure the continued protection and cultivation of the region's natural and cultural resources:

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 identified in local and regional plans.**
3. **Maintain or improve the quality of lakes, ponds, rivers, streams and groundwater.**

ASSETS AND VALUES

Cultural and Historic Resources

The region is home to an abundance of cultural resources, the most historical of which are its archaeological resources. A number of important archaeological sites have been found in the Northwest region, including evidence of several types of habitation such as villages, hunting camps, trade networks and burial grounds. Extensive archaeological resources are known to be located in the vicinity of Route 78 in Swanton; however, the locations of many other such sites in the region remain private in order to protect their integrity. The Vermont Division for Historic Preservation maintains a full listing of the 340 known archaeological sites within the region. This figure may likely represent only a small fraction of all significant sites in the region because intensive investigation of site locations has not been undertaken. A prominent geological site, the Chazy Reef—the oldest reef in the world—is visible and accessible in Isle la Motte.

Several historic settlements, sites and structures in the region that reflect post-colonial settlements have been identified and entered into the State Register of Historic Places. In addition, several sites within the region are included in the National Register of Historic Places. These include downtown historic districts in St. Albans and Richford as well as two historic sites: the Hyde Log Cabin in Grand Isle and the Chester A. Arthur Birthplace in Fairfield. The region also hosts 10 museums including St. Anne's Shrine in Isle La Motte. The region's many historical societies work to document the history of the region and its communities.

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. In St. Albans City, 2016 will mark the 50th anniversary of the Vermont Maple Festival, an event that draws more than 50,000 participants each year in honor of Vermont's "liquid gold." Cultural events throughout the region, from farmers' markets to concerts and parades too numerous to name, provide invaluable contributions to the local sense of place. Perhaps the event most

symbolic of Vermont culture is Town Meeting Day. Each year, on the first Tuesday in March, residents across Vermont gather to vote and make decisions that affect their local communities.

Beyond the historical richness of the region, Northwest Vermont boasts an extremely robust mosaic of diverse landscapes, from the agricultural viewsheds of the Lake Champlain islands to the heavily wooded western slopes of the Green Mountains. With sensitive siting and design, scenic landscapes may 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.

Natural Resources

The Physical Landscape: The Foothills of the Green Mountains are separated from the Champlain Lowlands by the Hinesburg Thrust, a thrust fault running north–south through western Franklin County. The Hinesburg Thrust and related erosional remnants—including Aldis Hill, Prospect Hill and Georgia Mountain—are 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 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.

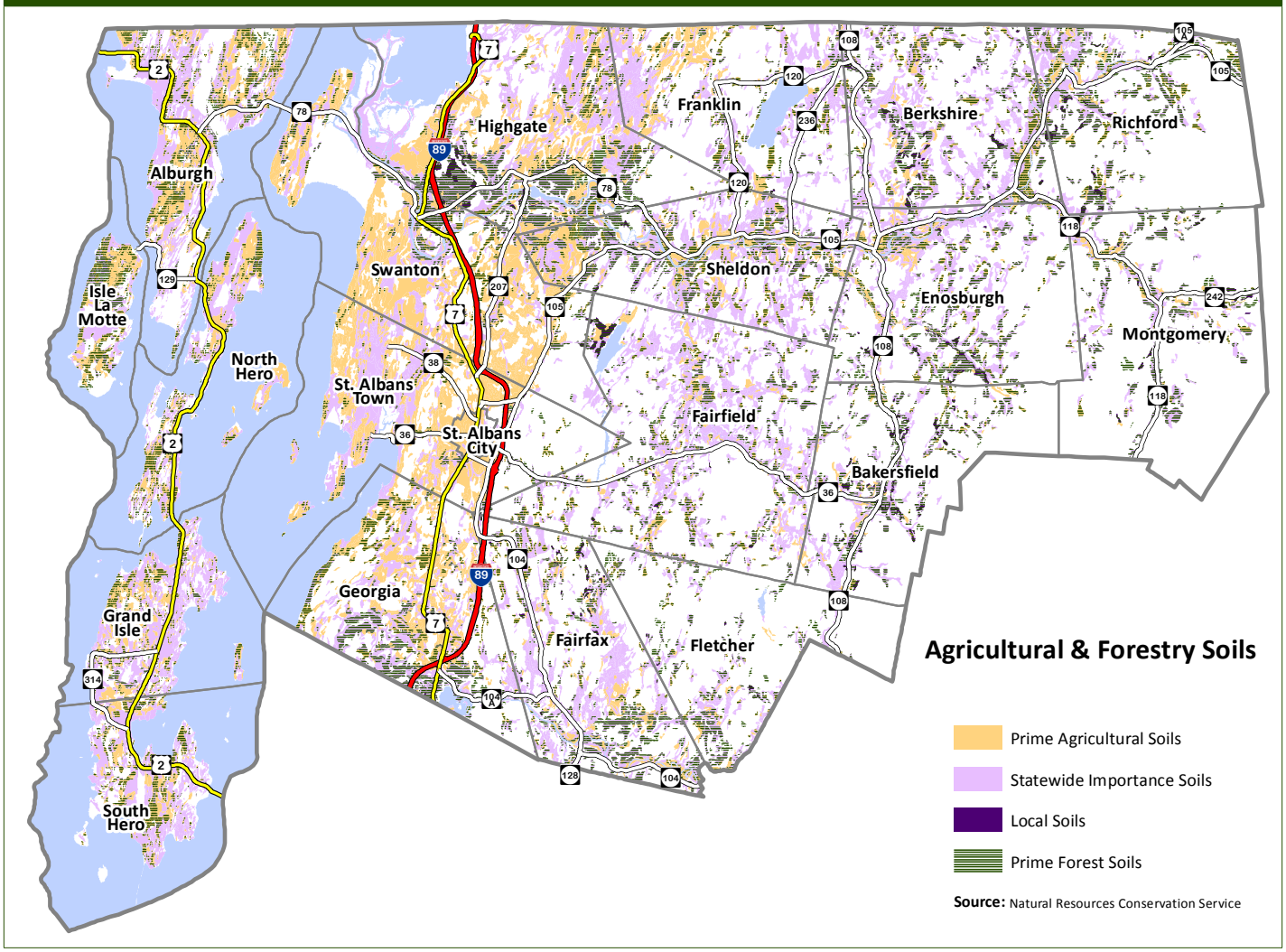
Climate: The climate of Northwestern Vermont is dominated by prevailing Westerlies—cold, dry air from Canada in winter; warmer, moist air from the Gulf of Mexico in summer; and occasionally damp, cold air moving in from the North Atlantic. The area enjoys the strong seasonal variations that are characteristic 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. Although such an increase may seem small, it could significantly alter weather patterns and have implications for agriculture, forestry, maple production and tourist-related industries.

Soils: Soils are an important environmental factor governing the use of land in rural areas. Within the context of land use planning, the characteristics that are of primary concern are bearing capacity, erodability, drainage, septic suitability and resource value.

"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) rating determinations of prime, statewide or local importance soils. Soils in these two categories cover 41% of the region, the majority of which are in Franklin County (Map 1). Franklin County contains one category of local importance soils, defined as Missisquoi loamy sand, with 8% to 15% slopes.

MAP 1: AGRICULTURAL AND FORESTRY SOILS

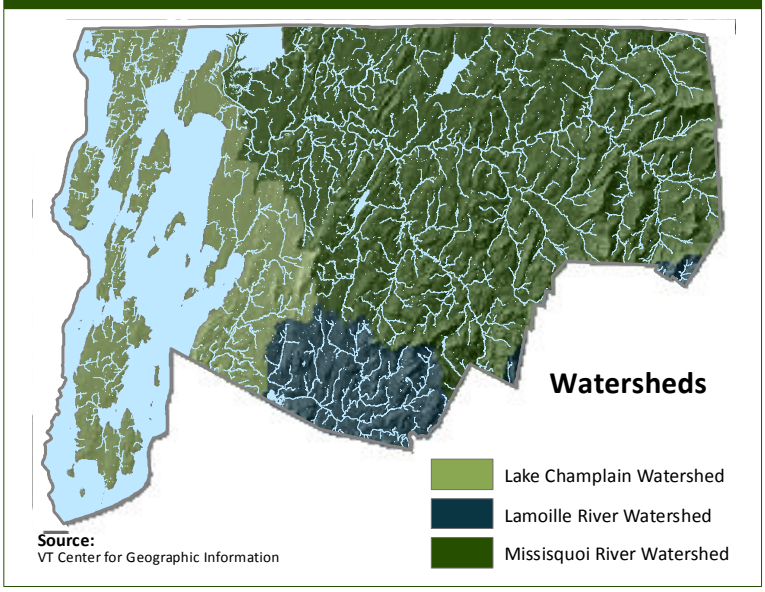


The region's agriculture depends upon the availability of high-quality soils, in sufficiently large, contiguous parcels to allow for economical hay and field crop production. Because of their physical qualities, however, these soils are often also considered the best suited for subdivision and development. Farmland conversion and fragmentation are a concern both regionally and statewide. The conversion 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 sustain commercial forestry operations in the region, according to their relative productivity (Figure 7). These soils cover 12% of the region; in some cases these soils overlap with soils of agricultural. Similar concerns exist regarding the development and fragmentation of these soils.

Earth Resources: Earth resources—including sand and gravel deposits and quarry stone—are critical regional resources for both their importance to road maintenance and construction, and their use for the extraction of high-quality quarry stone such as Isle La Motte's black marble. 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.

FIGURE 6: NORTHWEST REGION WATERSHEDS



Rivers and Watersheds: Lakes, rivers and streams offer sustenance, scenic beauty and recreational opportunities, and they heavily influence the cultural, social, economic and environmental landscape of Northwest Vermont.

Waters in Franklin and Grand Isle Counties are encompassed by three major drainage basins, which empty into Lake Champlain (Figure 6).

Development in and around the region's rivers can significantly affect the health of the river by reducing water quality, impacting fish and plants, 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 storage. This 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.

The Federal Emergency Management Agency (FEMA) requires communities to adopt flood hazard regulations under the National Flood Insurance Program (NFIP) in order for property owners to become eligible for flood insurance and home mortgages. Floodplain delineations provided by FEMA have traditionally been inaccurate and/or difficult to interpret, and they do 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 35 years old and need updating. Digital topography data is now available (a critical need for updated mapping) however federal funding for Flood Insurance Rate Maps has nearly dried up and no updates to FIRMs have been scheduled in the region. Communities should continue to request updates.

The NRPC has worked with the state's River Management Program and local communities to complete geomorphic assessments in the Missisquoi River Basin to analyze river conditions for erosion. Results of assessments have noted 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 Missisquoi Bay watershed. The absence of trees and other woody vegetation along stream banks can accelerate the rate of erosion and therefore increase the amount of phosphorus that is entering Missisquoi Bay. Due to these local conditions, and due to similar conditions in other watersheds, the state is now creating "river corridors" for all streams and rivers in Vermont to ensure that new development does not further contribute to fluvial erosion and degradation of surface waters.

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 native populations of rainbow, brown and brook trout; northern pike; largemouth bass; muskellunge; and walleye (Vermont Rivers Study, 1986). 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.

Lakes and Ponds: The crown jewel of regional and state waters is Lake Champlain. 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 the largest freshwater body in the United States, and it is a dominant feature in the natural and cultural landscape of the region.

TABLE 5: SURFACE WATER THREATS

Point Sources	• industrial discharges • combined sewer overflow
Non-Point Sources	• crop production • pasture land • animal holding and management areas
Silviculture	• harvesting and restoration • road construction and maintenance
Construction and Extraction	• highway, road and bridges • land development • urban runoff • surface mining
Land Disposal	• industrial land treatment • onsite septic systems • septage disposal
Hydromodification	• flow regulation • removal of riparian vegetation • streambank destabilization • atmospheric deposition • waste storage • contaminated sediments • recreational activities
Other	• landfills • dam construction

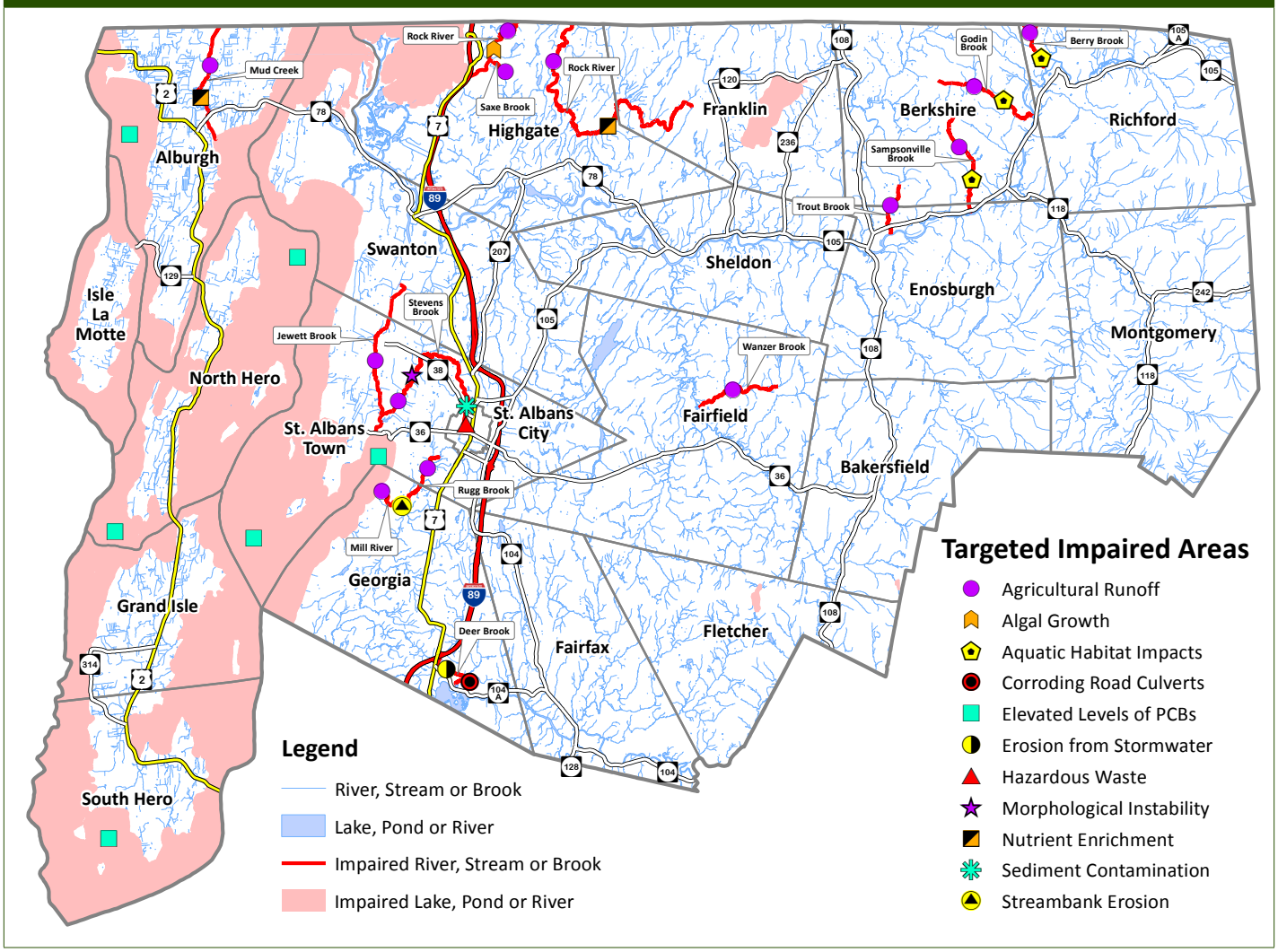
Source: *Vermont Surface Water Management Strategy*

Other state waters in the region—which are defined as major lakes and ponds larger than 10 acres 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. All of the shorelines 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.

Water Quality: Many surface waters in the region, such as Lake Champlain, do not meet all of the state management goals for water quality. These "impaired" areas have been identified statewide, and the regional portion of these areas is included in Map 2. The threats come from a variety of sources, including urban and agricultural runoff, invasive species, hazardous waste disposal and septic systems. Because of the variety of issues present in these waterways, there is no "one size fits all" solution. Instead, several approaches are needed to deal with each problem effectively.

A major effort is under way in Vermont to reduce the inputs of phosphorus into Lake Champlain. A particular focus exists on non-point sources of phosphorus pollution. This is due in part to past efforts aimed at reducing point source loads, which have resulted in a significant drop in point source phosphorus pollution—including a 66% decrease between 1991 and 2000. Non-point sources now account for 97% of the total phosphorous load (Vermont DEC).

MAP 2: TARGETED IMPAIRED AREAS

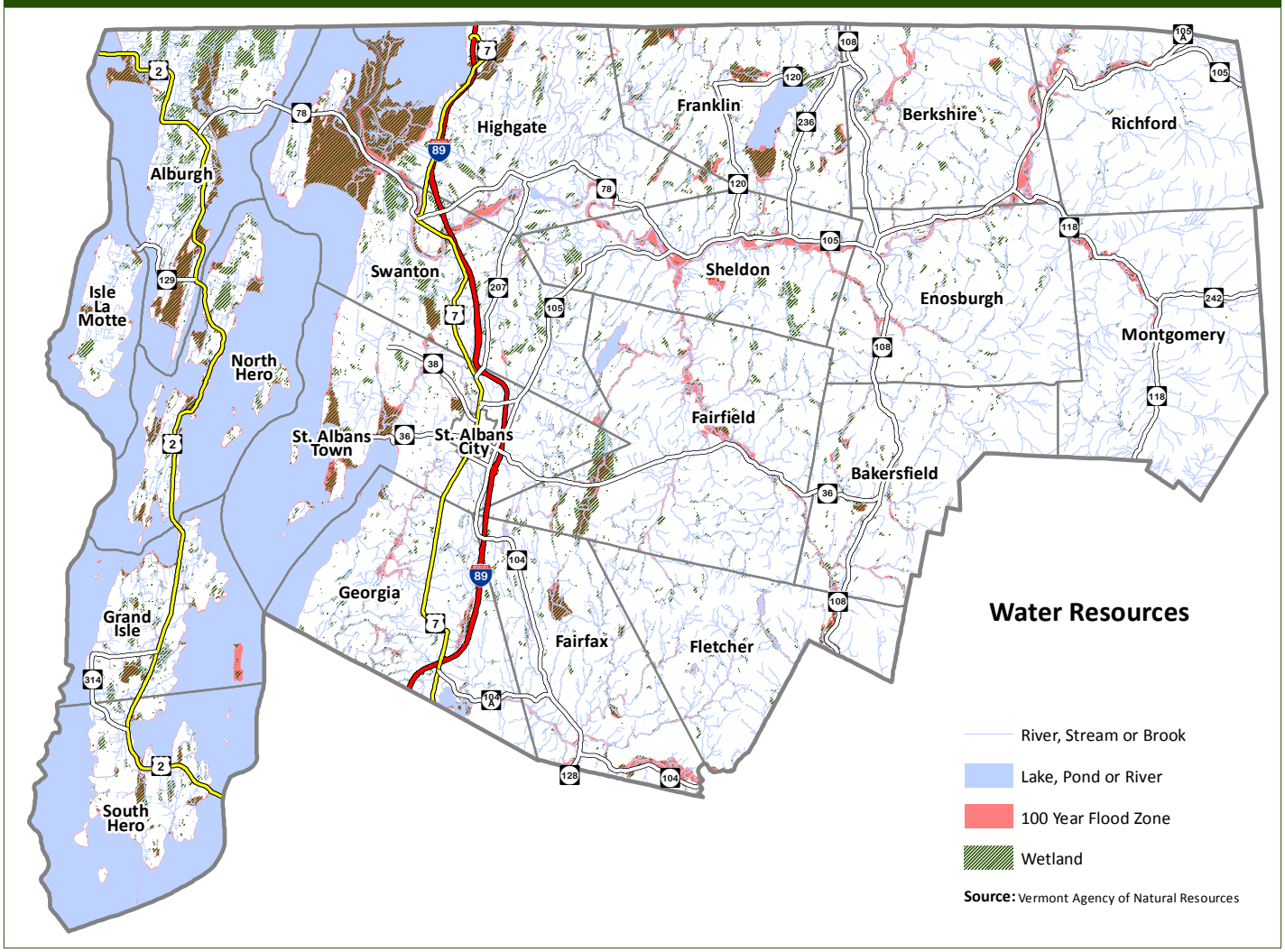


Stormwater runoff is one non-point source that poses a significant threat to water quality in the region. As more land is developed, there is a related increase in the amount of impervious surfaces, particularly pavement and roofs. As the area of impervious surface increases, the landscape's capacity 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.

Phosphorus pollution from stormwater and agricultural runoff poses perhaps the most significant threat to water quality in Lake Champlain. Phosphorus levels in Lake Champlain continue to increase despite efforts to combat point and non-point pollution sources through strategies such as Total Maximum Daily Load (TMDL), which is a plan for reducing phosphorus in the basin. Lake Carmi is also battling efforts to reduce its phosphorus levels. Both water bodies experience blue-green algae blooms and growth of invasive weeds fed by the elevated phosphorus levels. A revised TMDL implementation plan for Lake Champlain currently under development will require significant changes to management practices for infrastructure and to farming practices.

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, is experiencing development pressures due to second-home construction and the ever-expanding commuter shed of Chittenden County. Franklin County's Lake Champlain shorelands face similar development pressures in part because of their close proximity to Interstate 89.

MAP 3: WATER RESOURCES



In 2015 Vermont adopted Act 64, new legislation that implemented changes to local roads, agriculture, stormwater permitting and other areas with the goal of improving water quality. NRPC will work with local and state officials to assist with implementation of new requirements within the law.

Wetlands: Franklin and Grand Isle Counties include approximately 46,209 acres of wetlands, accounting 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.

Although wetlands often serve as transition areas between dry land and open water, they can also be isolated from any obvious connection to water. 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 socio-economic value.

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 U.S. Army Corps of Engineers has jurisdiction over Class III wetlands.

Groundwater: The region enjoys a general abundance of groundwater supplies (Map 3), 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.

Forest Resources: Northwestern Vermont is considered part of the Northern Forest, an area stretching across northern New York and New England encompassing 26 million acres of forestland. The upland area of northwestern Vermont contains the largest tracks of contiguous forest. This area is characterized by steeply sloping mature softwood and hardwood forests as well as second- and third-order 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.

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

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 4). The amount of forestland enrolled in the program has increased from 72,500 acres in 2000 to 109,288 acres in 2013, or half of the land enrolled.

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.

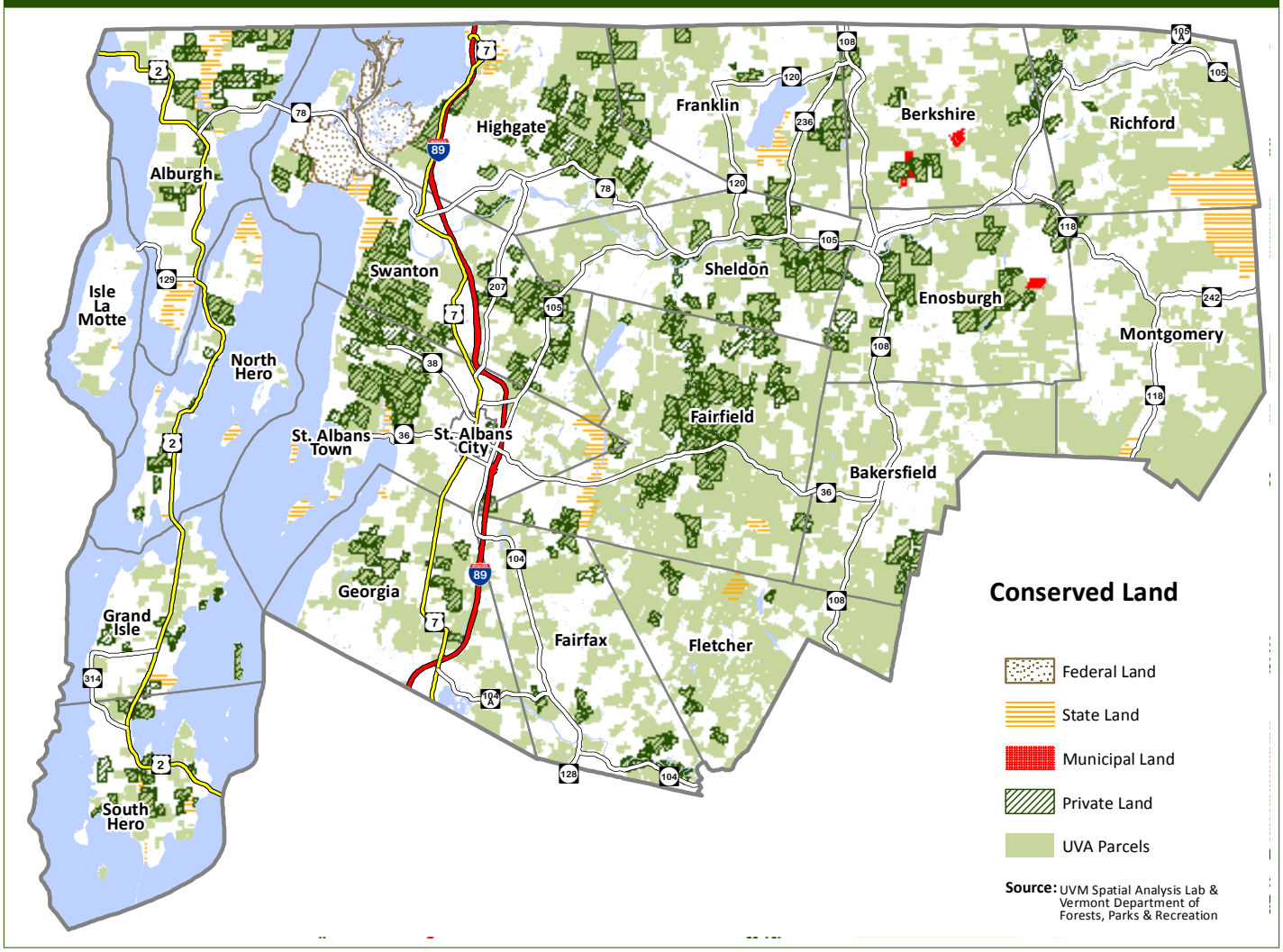
Additional information on the characteristics and values of the forest in the region along with measures that can be taken to ensure good forest stewardship can be found in the Northwest Regional Forest Stewardship Plan (2015).

Fragile Areas: In 1977, the Vermont Legislature established the Fragile Areas Registry (10 VSA Chapter 158) "as a means of protecting significant natural areas through documentation and education." 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.

Wildlife and Plant Habitat: The region provides critical habitat to a variety of wild animals. Map 5 shows the habitat areas; however, many habitat areas in the region are not mapped. Habitat for plant and animal species

MAP 4: CONSERVED LAND



can occur within many landscapes present in the region such as wetlands, forestland, riverine and riparian environments. Development must be planned properly to ensure habitat conservation and to avoid fragmenting habitat and negatively impacting the local wildlife.

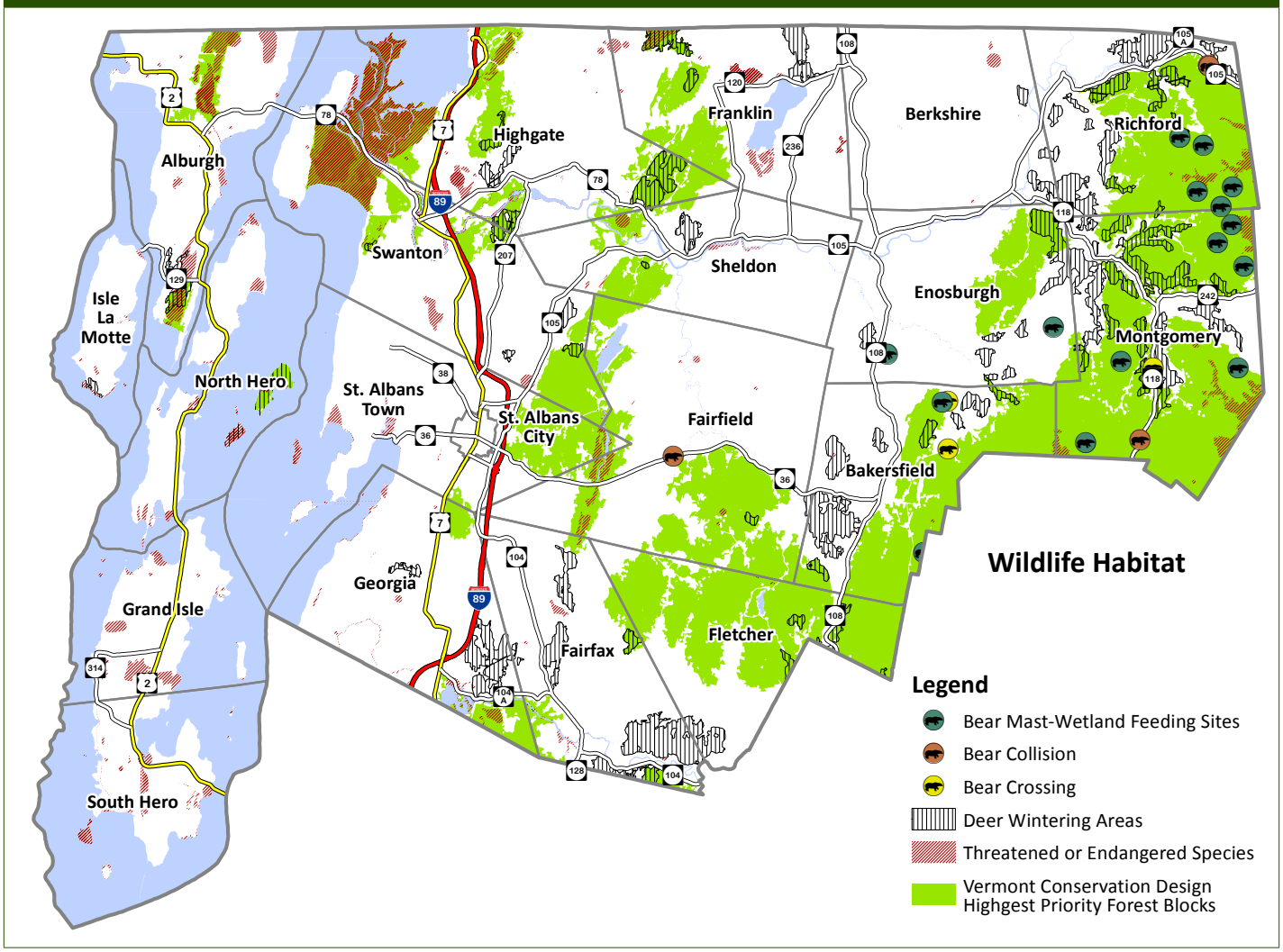
Wetlands serve as habitat for 95 species of threatened or endangered plants nationwide, and more than 43% of all federally recognized threatened or endangered plant species are found in Vermont wetlands (Vermont DEC).

The term "core forest habitat" refers to large areas of interior forest that are 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, more linear forested tracts—provide wildlife travel corridors between core areas and promote healthy animal populations by ensuring genetic mixing among animals from different core habitat 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.

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

MAP 5: WILDLIFE HABITAT



range, are vulnerable to collection or disturbance, or have difficulty reproducing. The majority of identified sites are found in Grand Isle County and in western Franklin County, particularly 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 (Vermont Agency of Natural Resources, 1993). 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 5).

Moose in a Highgate Wetland
Image Credit: *Bill Ashton*

GOALS AND POLICIES

1. **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 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, 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 lighting is designed to minimize the amount of light leaving the development site, overly bright areas or hot spots, and the amount of light pollution illuminating the night sky.

2. **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. **Maintain or 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 the removal of the Missisquoi and Carry Bay causeways.

LAND USE

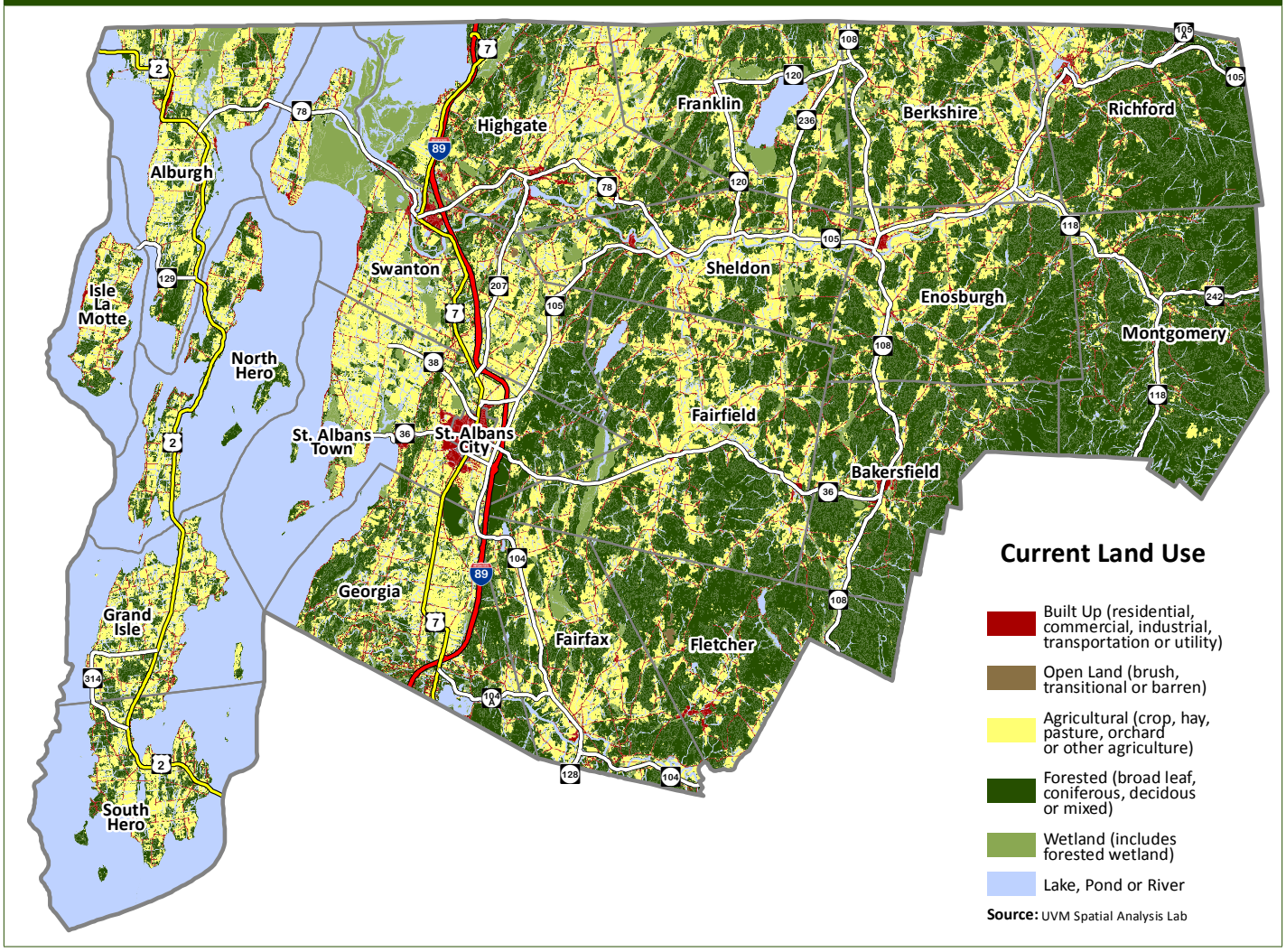
GOALS

1. **Ensure the region continues to be 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, including agriculture and forestry.**
3. **Target future economic growth primarily in the region's existing and planned growth areas.**

CURRENT LAND USE PATTERNS

The region is composed of two counties with distinctly different land features and settlement patterns (Map 6). The topography of Grand Isle County consists of generally flat to rolling hills characterized by large farm fields,

MAP 6: CURRENT LAND USE



orchards and wetlands, and the county is surrounded on three sides by the small beaches and rocky shoreline of Lake Champlain. As a popular summer destination, the shoreline is scattered with dense pockets of seasonal and second-home developments. 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 island.

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 recent growth has led to scattered residential and commercial development in some areas. The county is flanked to the west by St. Albans City, the region's only urban center, and the Interstate 89 Corridor, which provides quick access to Chittenden County. 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.

MAP 7: STATE DESIGNATED GROWTH CENTER, DOWNTOWN & VILLAGES

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 the region's centers vibrant places (Table 6). The region has one designated downtown and growth center (St. Albans City) and 15 designated village centers (Figure 7). Of the remaining half of the region's municipalities, several could benefit from seeking village center designation, such as Berkshire, Alburgh Village, and Sheldon.

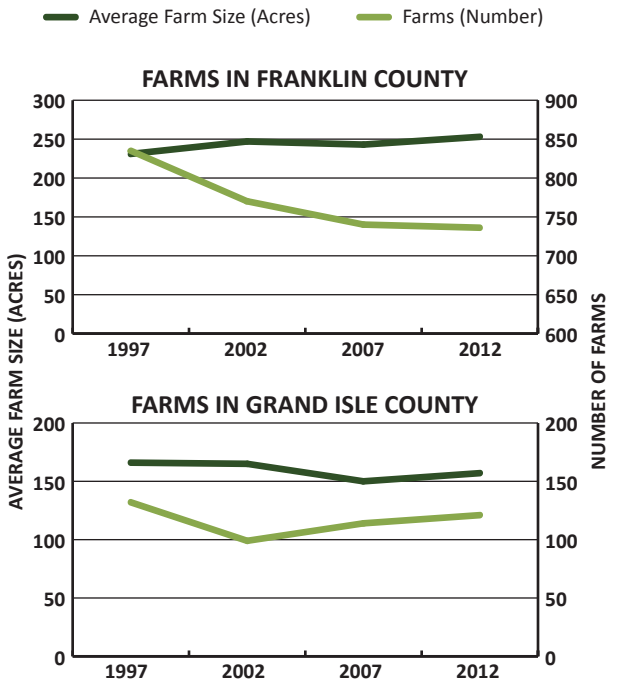
TABLE 6: STATE DESIGNATIONS

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.
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.

Farms and Farmland

Franklin County remains one of the most productive agricultural counties in the state, generating 24% of Vermont's farm sales in 2012. 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 while the number of farms is decreasing, which supports the trend of small and medium farms (primarily dairy) consolidating into fewer larger farms (Figure 7). In Grand Isle County, the number of farms is increasing, along with a recent increase in the size of farms and the amount of acreage in agricultural use. Although the trend of consolidating small and medium dairy farms has been consistent and is a major factor affecting the working landscape in the region, the data also supports the recent influx of smaller diversified farms in both counties. Diversified farms have found increasing market opportunities with a more than 30% increase in direct sales in both counties from 2007 to 2012. (Sources: Census of Agriculture, Vermont Economic Demographic Profiles)

FIGURE 7: NORTHWEST REGION FARMS

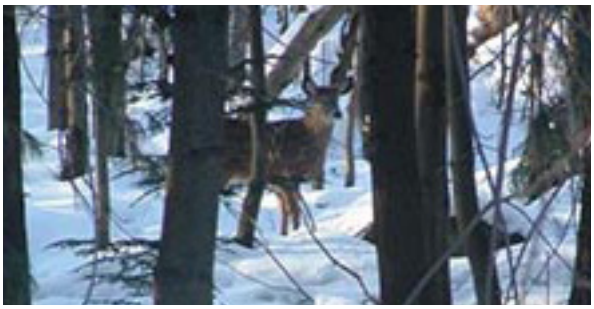


Source: *Census of Agriculture*

There are many strategies that municipalities can implement to strengthen agriculture and maintain the number of small and medium farms in the region, including incorporating pro-agriculture land use policies in their town plan and bylaws, encouraging the conservation of farmland through the purchase of development rights or other means,

Strategies for Supporting Agriculture

- Support agriculture in municipal plans.
- Conduct an agricultural resource inventory.
- Establish agricultural districts.
- Adopt local right-to-farm laws.
- 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.



White Tail Deer in Highgate
Image Credit: *Bill Ashton*

assisting farmers in educating newcomers about farming and farm practices, and working with farmers and local groups to implement an increasing number of strategies that support agriculture, such as encouraging the production of value-added products and purchasing locally produced products.

Forestland and Wildlife Habitat

The NRPC supports settlement patterns that maintain connecting patches of forestland and other habitat in order to mitigate negative impacts on wildlife populations and biodiversity, which will lead to a healthier ecological system. The Vermont Department of Fish and Wildlife has completed mapping of the habitat blocks and wildlife travel corridors that are useful in local and regional planning.

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. See the Natural and Cultural Resources section for a more detailed discussion of forestland and wildlife habitat.

Tools for Natural Resource Protection: Zoning Based Option

- Change allowed uses and/or minimum lot size requirements in zoning districts.
- Revise planned unit development (PUD) provisions.
  - 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.
- Develop road limitations and/or standards.
- 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 certain features from density calculations.
- Establish a transfer of development rights program.
- Establish stream buffers within zoning bylaws.
- Require additional studies (e.g., traffic, municipal facilities, environmental).

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.
- Ensure adequate municipal infrastructure/facilities.
- Obtain Village/downtown designation.
- Create or update a capital budget.
- Complete a Town Forest Management Plan
- Forest landowner cooperatives or land conservation

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 (U.S. Census). 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.

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

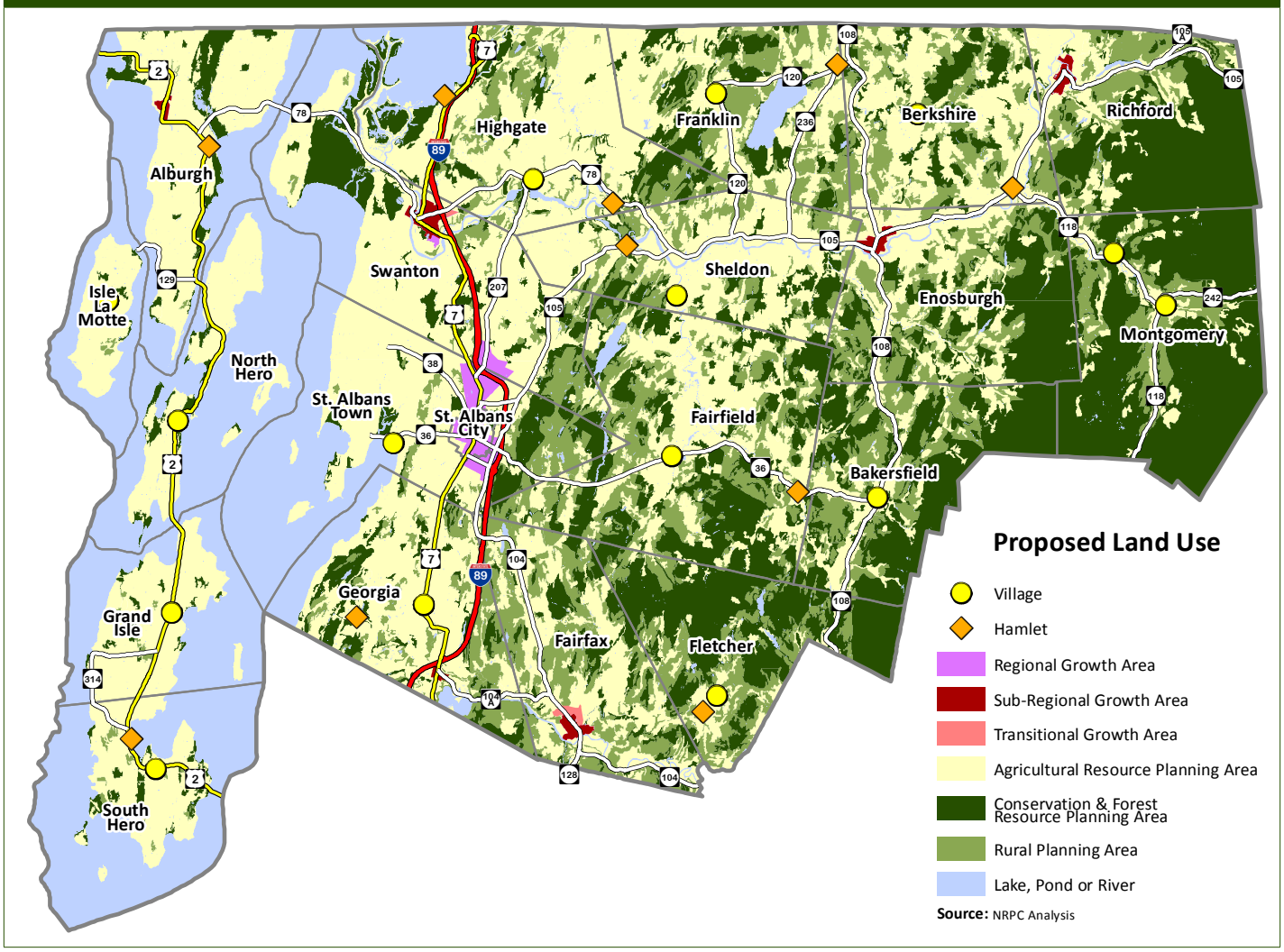
Most communities in Franklin and Grand Isle Counties have updated their plans and local regulations to keep pace with changing development pressures. However, ensuring local capacity to manage land use planning and development review continues to be a challenge. Faced with growth and development pressures, 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.

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 8 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 8: PROPOSED LAND USE



Land Use Planning Areas

Agricultural Resource Planning Areas: Agricultural Resource Planning Areas represent the best farmland in the region and should be given the highest level of support for their continued use as agricultural lands. Nearly 39% of the region is included in this category, reflecting the significant acreage of prime agricultural soils and the large number of farms in the Northwest. Strategies that support the long-term protection of these lands from conversion to non-agricultural use will be supported by NRPC. 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.

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
- Prime forest soils with forest cover > 20 acres

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

Characteristics of Growth Areas

- Incorporate a mix of uses
- Provide public spaces
- Are organized around a focal point
- Promote development that is more dense than that outside a growth center
- Are supported by existing or planned infrastructure
- Result in concentrated development surrounded by rural countryside
- Are planned in accordance with Chapter 117 planning goals and with smart growth principles

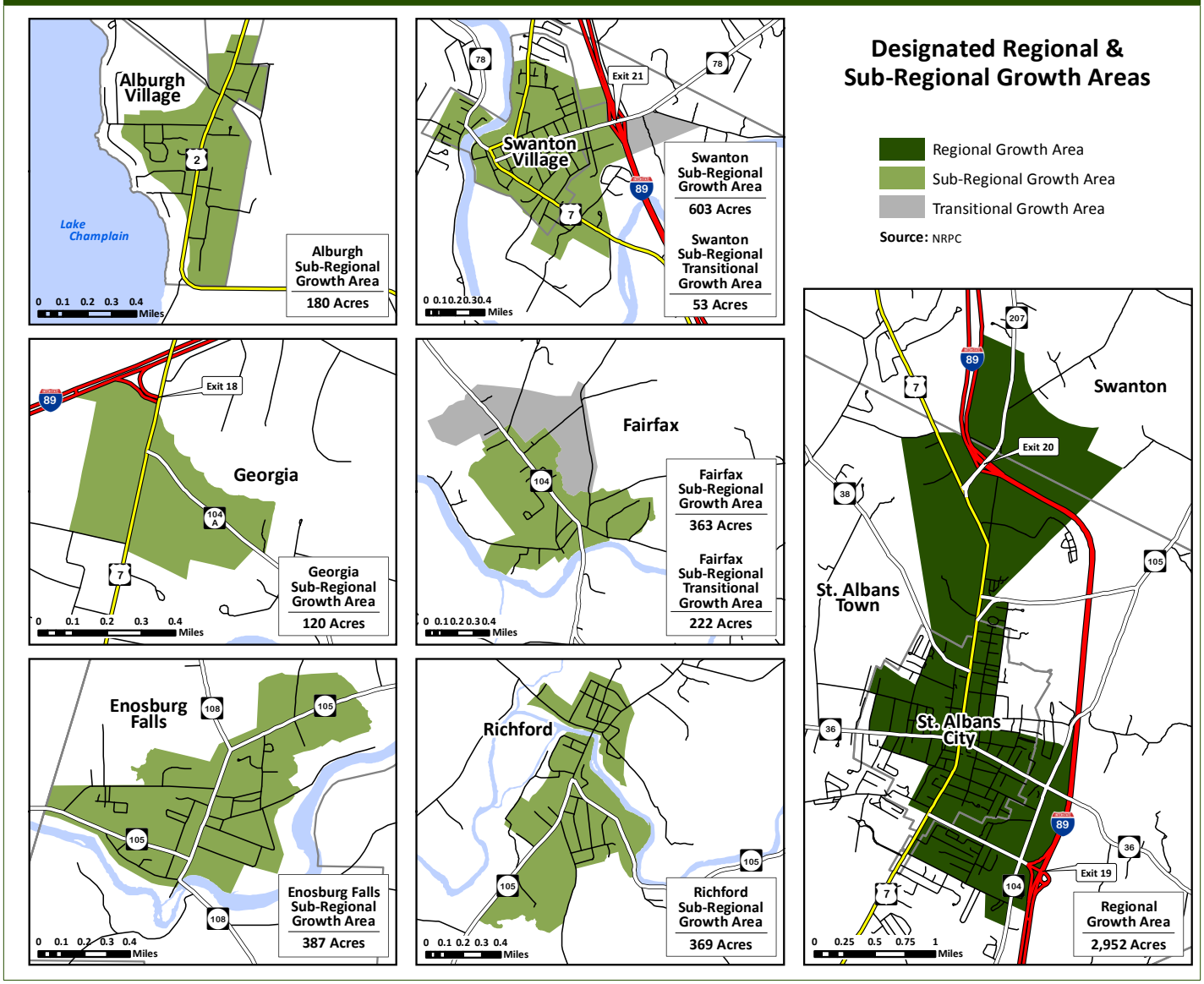
Forest and Conservation Planning Areas: Forest and Conservation Planning Areas, which constitute 25% of the region, include a variety of land types that are generally not suitable for development as well as lands that are particularly well suited for tree growth. Land in this category usually should not be developed. Development may 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.

In addition, development may be inappropriate due to the forest resource value of the lands. Ridgelines and hilltops contribute significantly to the beauty of the region, and development in these areas can have widespread significant negative effects. The use of these lands should include a mix of forest and conservation purposes including maple syrup production, logging, appropriate agricultural operations, wildlife habitat and recreation. These lands should 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.

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 9). St. Albans City and areas in

MAP 9: NORTHWEST REGION DESIGNATED REGIONAL & SUB-REGIONAL GROWTH AREAS



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. The six growth areas are located within municipalities that have expressed the desire and planned for for managed, high-density, mixed-use development.

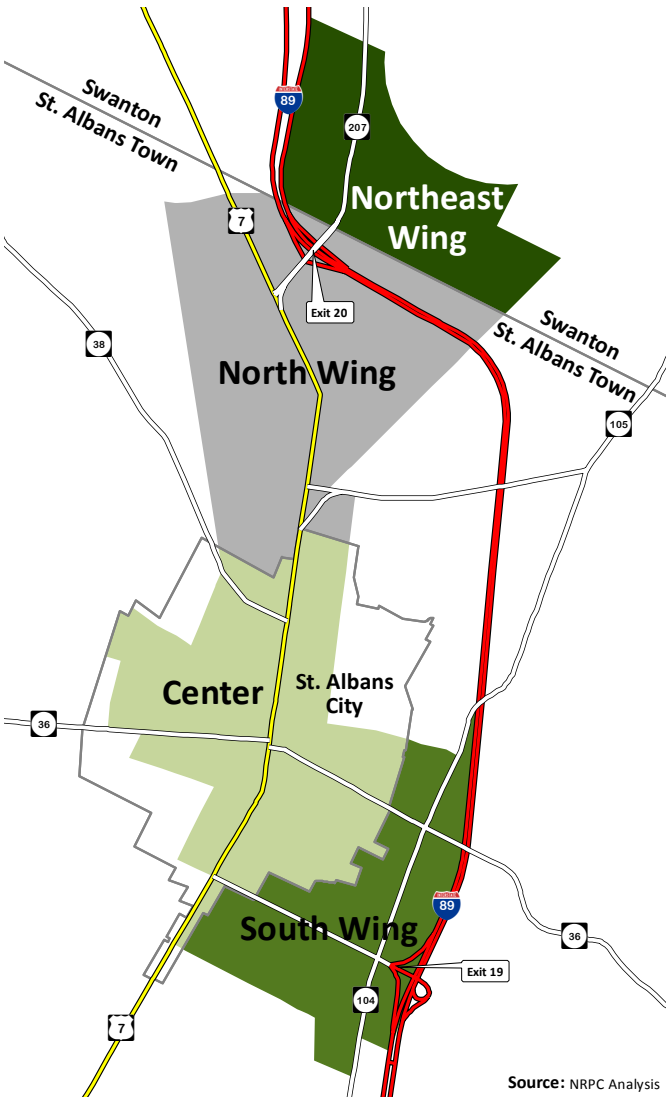
In Focus - Northwest Regional Growth Area: The Northwest Regional Growth Area consists of the historic downtown area of St. Albans City at its center, along with a south wing, a north wing and a northeast wing—all with varied land uses and characteristics (Figure 8).

- 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 and commercial uses on either side of Interstate 89's exit 19. There is great 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 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 must not continue the existing patterns of strip development and should 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 will be necessary to further growth area goals.
- 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 must 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 public streets.

FIGURE 8: NORTHWEST REGIONAL GROWTH AREA



Source: NRPC Analysis

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 8). The NRPC supports the continuation of historic village and hamlet centers through local planning and village center designation efforts that preserve their traditional character.

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 the development of industrial parks and districts that encourage economic expansion and high-wage businesses to locate in the region without adversely affecting neighboring land uses. Industrial uses frequently produce off-site impacts, such as noise, that can often be mitigated if these businesses are located in areas designated specifically for industrial development and job growth. The specific use of these areas differentiates them from the mixed-use growth centers discussed in the previous section. Industrial areas are not mapped in the Regional Plan, but they are supported as locally designated areas.

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

GOALS AND POLICIES

1. **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.
   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. **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 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.

3. 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.

ALL-HAZARDS DISASTER RESILIENCE

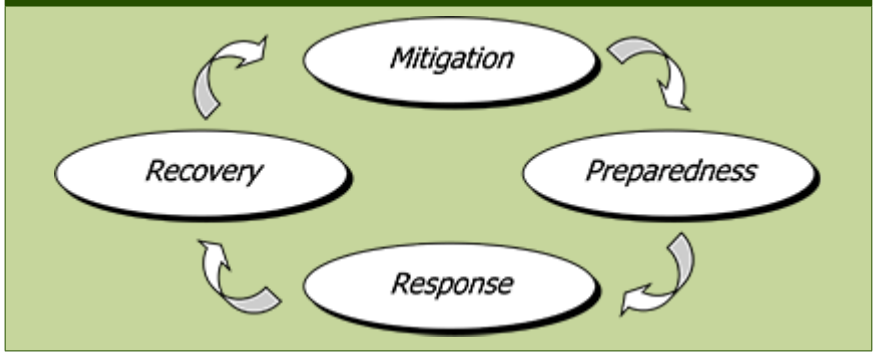
GOALS

1. **Reduce the loss of life and injury resulting from all-hazards events.**
2. **Reduce the financial losses and infrastructure damage 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. This plan incorporates an all-hazards resilience element rather than just a flood resilience element.

FIGURE 9: THE FOUR PHASES OF EMERGENCY MANAGEMENT



The Vermont Statutes require that as of July 1, 2014, regional plans include a flood resilience element that identifies flood hazard and fluvial erosion hazard areas based on river corridor maps provided by the Secretary of Natural Resources; designates those areas to be protected—including floodplains, river corridors, land adjacent to streams, wetlands and upland forests—to reduce the risk of flood damage to infrastructure and improved property; and recommends policies and strategies to protect them. Although this plan recognizes the need to more fully address flood resiliency, the maps and data were not available at the time of plan adoption to adequately address this issue.

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 9).

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 hazards are, ascertain where they are 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 and Homeland Security. 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 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 Hazard Identification Risk Assessment process to rank hazard types in the region (Table 7). 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 derives a Relative Risk score using a qualitative process to compile estimates of the likely frequency of occurrence, the extent of the community that would be impacted 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.

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).

TABLE 7: 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 Assesssment*	

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 8.

TABLE 8: FEDERAL DISASTER DECLARATIONS IN THE REGION		
	Franklin County	**Grand Isle County**
DR-1184 (July 15-17, 1997)	Severe Storm and Flooding	Not affected
DR-1201 (Jan. 6 – 16, 1998)	Severe Storms and Flooding	Not affected
DR-1228(June 17 – Aug. 17, 1998)	Severe Storms and Flooding	Not affected
DR-1428 (June 5 – June 13, 2002)	Not affected	Severe Storms, Tornado and Flooding
DR-1559 (Aug. 12 – Sept. 12, 2004)	Severe Storm	Not affected
DR-1778 (June 14 -17, 2008)	Severe Storms and Flooding	Severe Storms and Flood
DR-1784 (July 18, 2008)	Tropical Storm Irene	Not affected

DR-1951 (Dec. 1-5, 2010)	Severe Storms and Flooding	Not affected
DR – 1995 (Apr. 23 – May 9, 2011)	Severe Storms and Flooding	Severe Storms and Flooding
DR-4022 (Aug. 27 – Sept. 2, 2011)	Severe Storms and Flooding	Not affected
Source: *VTDEMHS*		

Analysis of stream geomorphic assessment data collected over the last 10 years is providing important insights regarding the condition of Vermont's streams and rivers. Of the nearly 1,700 assessed river miles in Vermont, nearly three-quarters (74%) have become confined to deeper, straighter channels and no longer have access to historic floodplains (Vermont Agency of Natural Resources). In response, the Vermont Agency of Natural Resources (ANR) has adopted an avoidance strategy to restore and protect the natural stability of rivers and minimize flood damage. River corridor protection is now recognized as a critical state wide goal in statute. Municipalities protecting River Corridors are eligible for incentives including increased post-disaster funding. The Vermont Rivers Program has developed a work plan to create a statewide river corridor digital map layer that will allow the state to further identify potential conflicts between human investments and river dynamics. A statewide river corridor layer will facilitate mitigation, river corridor protection planning and project prioritization. Limiting or prohibiting new development in flood zones and river corridors will be an important method of reducing the future dangers associated with flooding (See Table 8 for current levels of development).

TABLE 9: STRUCTURES IDENTIFIED WITHIN FLOOD ZONES (APPROXIMATE)

COUNTY	Total Structures	Camp	Mobile Home	Single Family Dwelling	Multi Family Dwelling	Commercial	Industrial	Utility	Government	Educational	Public Gathering	House of Worship
Franklin County	990	409	63	405	22	53	8	4	10	1	13	2
Grand Isle County	486	248	40	179	1	15	0	0	0	0	2	1

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 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 2013) as well as wind speeds up to 40 mph (January 1998).

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 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 locatedat 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. During the last four years, 68% of Vermont's fire deaths have involved seniors over the age of 60. Although fire causes vary, there are several common contributing factors such as poverty, climate, education, code enforcement and demographics. According to the Federal Emergency Management Agency (FEMA), the three leading causes of structure fires in rural areas are heating (29%), arson (12%) and electrical distribution (12%).

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.

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.

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, socioeconomic characteristics of park residents and limitations of the structures themselves. 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.

Low Risk Hazards

Ice Jams: Ice jams occur 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. From 1867 to 1999, there were 753 ice jams on 74 rivers and in 127 towns. 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%) (U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire). These events are becoming more frequent as humans change the landscape. Residences, buildings and other infrastructure built within the floodplain will be susceptible to all flood types, including ice jams.

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.

Wildfire: Wildfire in the region typically comes in the form of grass fires. Forest fires are 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.

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: 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.

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. A Hazus earthquake risk analysis and loss estimate was conducted 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.

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 local 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.

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). 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—cause millions more in damage in Vermont annually.

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.

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.

According to the EPA, increases in temperature will likely reduce milk yields and slow weight gain in dairy cows. The projected increases in temperature would negatively affect operations, because production costs would increase with reductions in milk and meat production.

Vermont's hunting and fishing industry would also be affected by climate change. Warmer summers and shorter winters would result in an increased growing season and create changes in the makeup of natural communities. As ecological conditions change, they 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 would 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

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

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 Vermont Department of Housing and Community Development began the Vermont Economic Resiliency Initiative (VERI) along with the Agency of Natural Resources, the Agency of Transportation and regional planning commissions in 2014. VERI was designed to help maintain local economies following floods. The VERI process included a detailed risk analysis that examined economic activities and associated infrastructure to ensure local economies and communities remain intact following disasters. After completing their analysis, the VERI team developed community-tailored action plans to reduce the loss of jobs, inventory and revenue, as well as the cost to repair roads, bridges and other key infrastructure. The Town of Enosburgh and the Village of Enosburg Falls were selected to participate in VERI. The local action plans will provide templates to help other communities better understand the risks and consequences of flooding and take steps to reduce future damages and disruptions to local businesses. Thanks to VERI, communities that are developing new or updated local hazard mitigation plans will have new tools to incorporate economic resilience planning into the process. Municipalities are also encouraged to incorporate economic resilience into their municipal plans.

GOALS AND POLICIES

1. **Reduce the loss of life and injury resulting from all-hazards events.**
   a. 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.
   b. Ensure that municipal and regional response plans are in place for all-hazards events including community events such as fairs, festivals and sporting events.
   c. Ensure that all municipalities and major employers have flood emergency preparedness, all-hazards preparedness and response plans in place.
   d. 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.
   e. Support local volunteer efforts and mutual aid agreements during response and recovery efforts.

2. **Reduce the financial losses and infrastructure damage 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.
   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. **Ensure the region's communities are resilient to all-hazards events; include hazard mitigation planning, such as flood resiliency, in the municipal planning process.**
   a. Recognize the connections between land use, stormwater, road design and maintenance as well as their effects from disasters, 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 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.