



NORTHWEST REGIONAL PLAN

2023 - 2031

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Photo: David Juaire

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ENERGY

GOALS

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

REGIONAL ASSETS AND OPPORTUNITIES

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

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

Guiding Policy Statements

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

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

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

GOALS AND POLICIES



GOAL

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

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



GOAL

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

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

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

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

5 GOAL

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

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

6 GOAL

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

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

7 GOAL

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

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

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

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

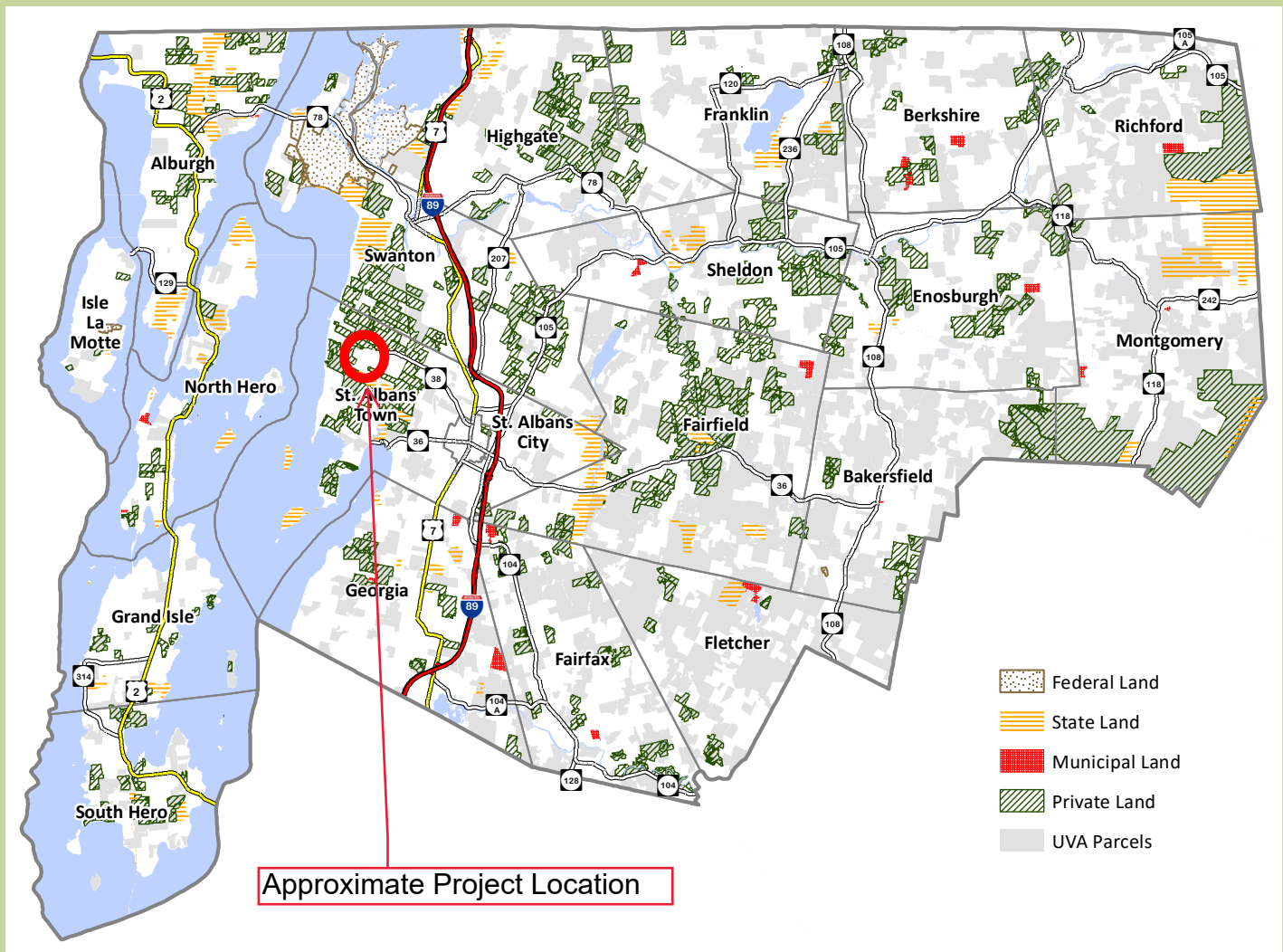
Forest Resources: The region's forests play an important role as a natural, cultural and economic asset to the local communities. Indeed, several communities in the region maintain town forests. These and other forests throughout the region are used for recreational and educational purposes and activities.

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

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

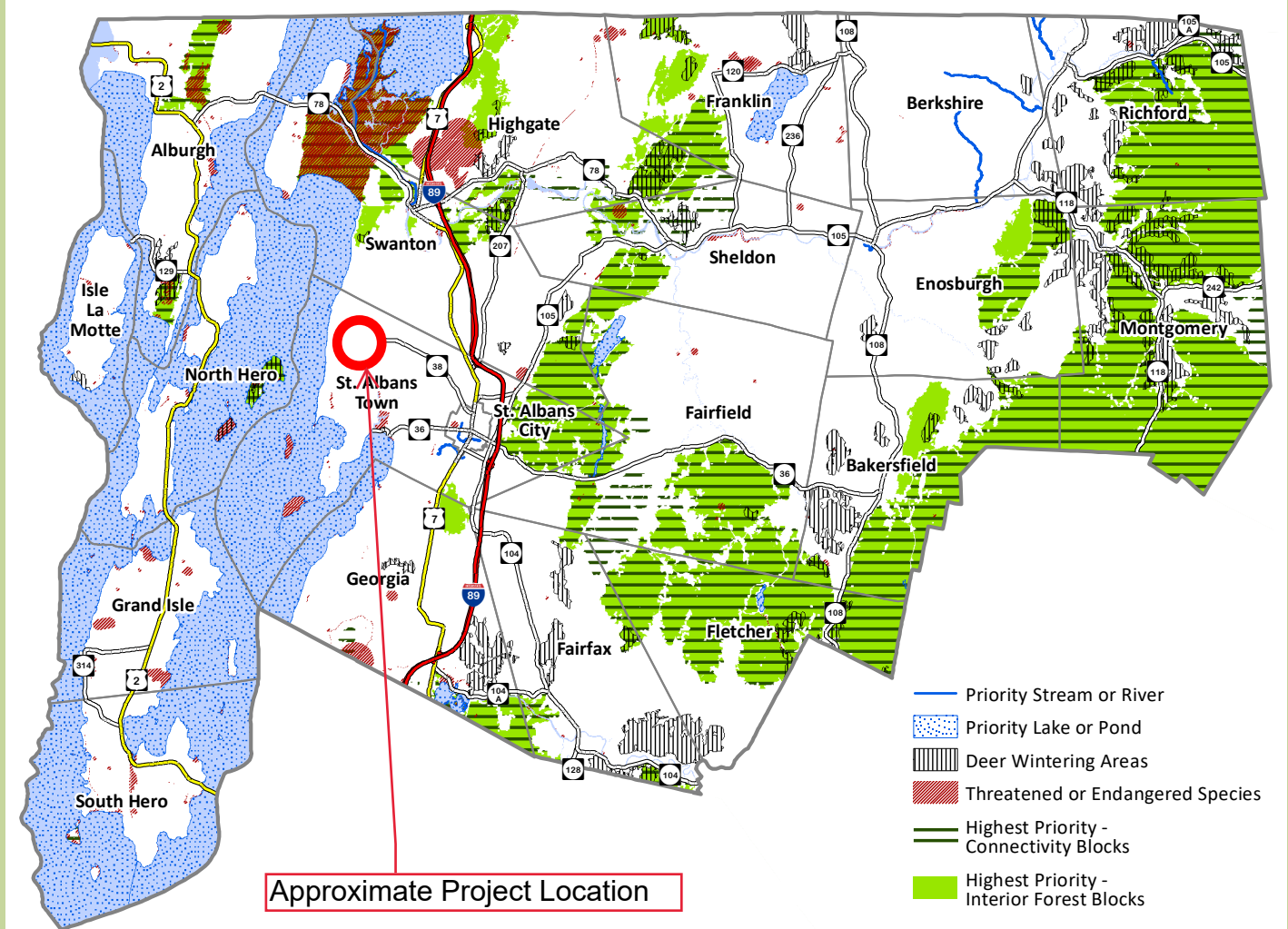
Fifty percent of the land in the region is enrolled in Vermont's Current Use or Use Value Appraisal (UVA) Program, which means the land is being actively managed for agriculture or forestry (Map 10). The amount of

MAP 10: Conserved Land



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

MAP 11: Wildlife Habitat



SOURCE: Vermont Open Geodata Portal

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

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

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

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

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

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



Moose in a Highgate Wetland
PHOTO CREDIT: Bill Ashton

GOALS AND POLICIES

1 GOAL

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

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

② GOAL

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

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

③ GOAL

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

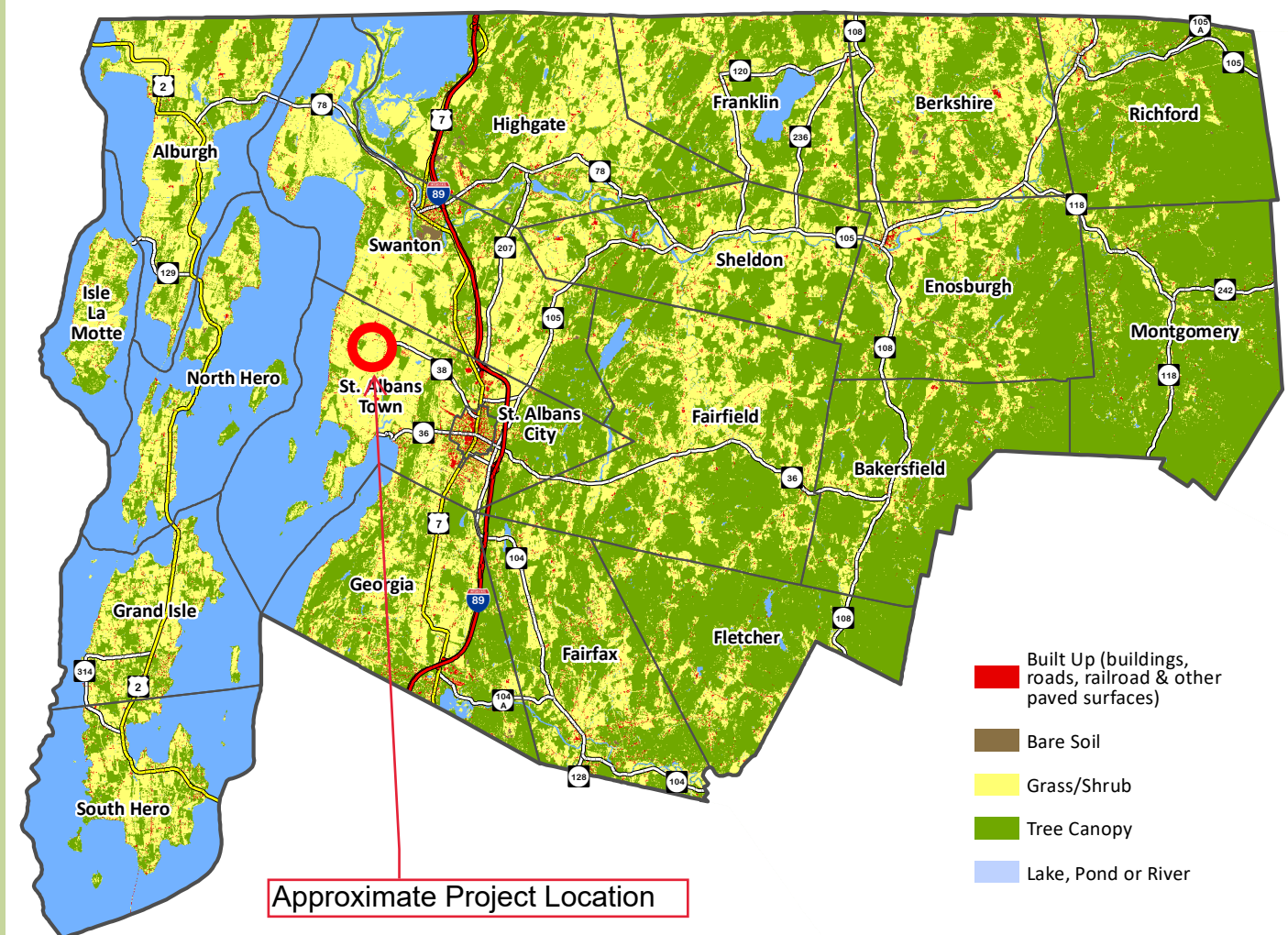
- a. Forbid the use of persistent harmful and toxic pollutants in groundwater recharge areas or in areas where they could enter surface or sub-surface waters.
- b. Ensure that development mitigates the anticipated effects on water quality through Low Impact Development techniques, such as limiting the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

LAND USE

GOALS

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

MAP 12: Current Land Use



SOURCE: Vermont Open Geodata Portal

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.

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

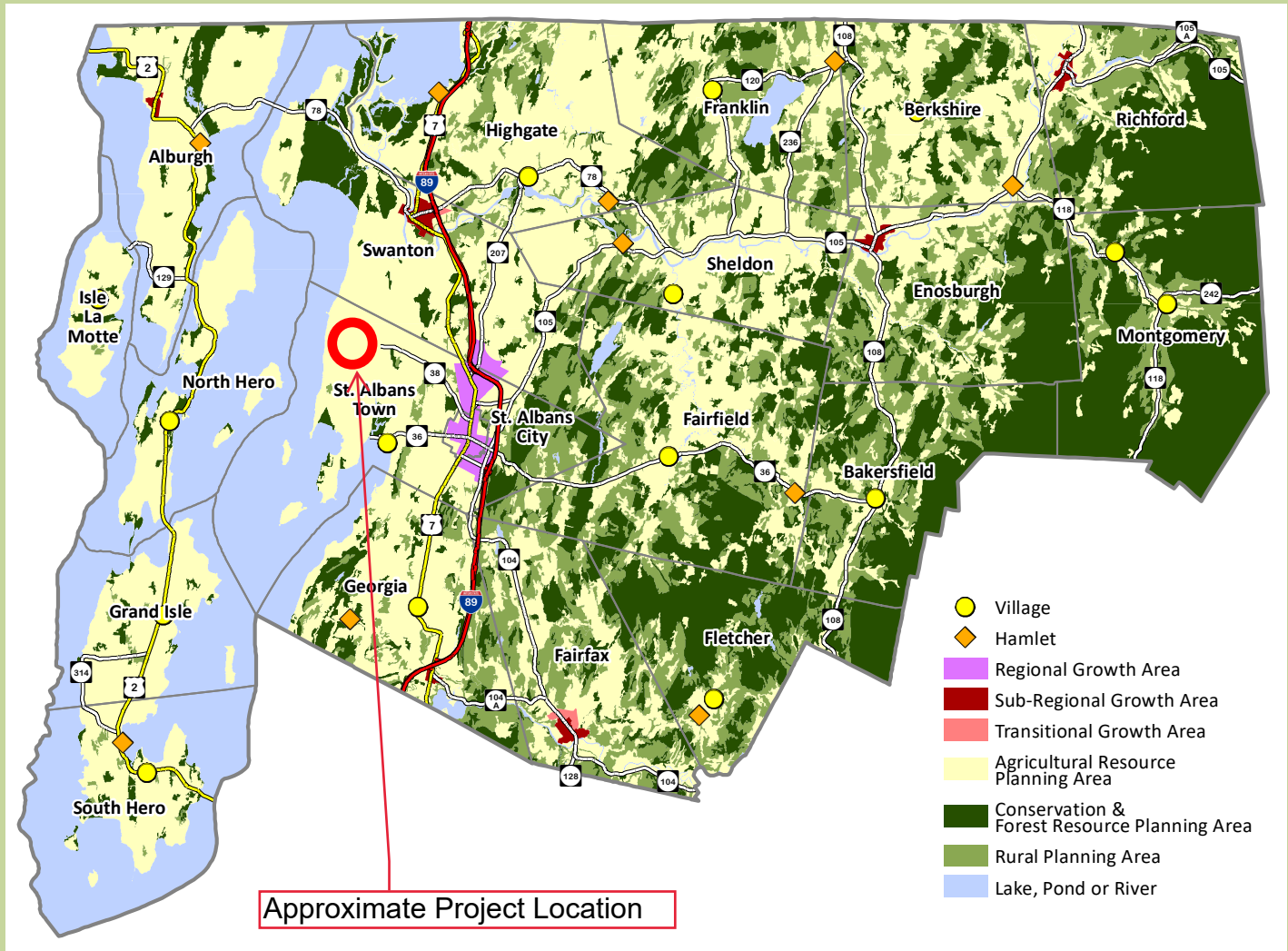
Forest and Conservation Planning Area

- 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

PROPOSED LAND USE

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

MAP 14: Proposed Land Use



SOURCE: Vermont Agency of Natural Resources and NRPC Collected Data

Land Use Planning Areas

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

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

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

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

GOALS AND POLICIES

① GOAL

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

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

② GOAL

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

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

- 1,000' from road centerlines in conservation areas if it advances conservation goals.
- f. Encourage the development of local businesses that add value to agricultural and forest products grown in Vermont and site them in locations that minimize conflicts with neighboring land uses.
- g. Support agricultural, forest and conservation land protection strategies including but not limited to transfer of development rights, purchase of development rights, fee-simple purchase of agricultural lands and use of value tax assessment; these protection strategies can allow for compatible uses that support other key policy goals.
- h. Support initiatives that assist agricultural businesses with adapting to the impacts of climate change.



GOAL

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

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



NORTHWEST REGIONAL PLANNING COMMISSION

REGIONAL ENERGY PLAN

Adopted June 28, 2017

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I. EXECUTIVE SUMMARY

The Northwest Regional Energy Plan is a pilot project funded by the Vermont Department of Public Service. The intent of the project is to complete in-depth energy planning at the regional level while achieving state and regional energy goals—most notably, the goal to have renewable energy sources meet 90% of the state’s total energy needs by 2050 (90 x 50 goal). In-depth regional energy planning is needed to address three key issues: energy security, environmental protection, and economic needs and opportunities. The Northwest Regional Energy Plan consists of the plan and all plan appendices.

Specific goals to be achieved by this plan include the following:

- Collaboration with Vermont Energy Investment Corporation (VEIC) to create a regional energy model that identifies targets for energy conservation and renewable energy generation
- Creation of specific strategies to help the region achieve state energy goals
- Creation of regional maps prioritizing locations for the development of future renewable generation facilities in the region

The region’s energy supply and consumption are analyzed in Section III to establish baseline energy use. The use of space heating energy, transportation energy, and electricity in the region is specifically examined. Based on the NRPC’s estimates, the region currently uses approximately 2.243 trillion BTUs to space heat residential units each year and about 2.7 trillion BTUs to space heat commercial, industrial, and institutional structures. Regional electricity use totals approximately 1.647 trillion BTUs per year based on 2013 data available from Efficiency Vermont. Regional transportation energy use is greater than 3.1 trillion BTUs per year based on approximate passenger vehicle fuel use in the region. Actual regional transportation energy use is likely greater due to the use of commercial vehicles in the region.

As of January 2017, the Northwest region had the capacity to generate 58.4 MW of electricity through hydro, wind, solar, and biomass technologies, and it had 98.4 MW of total generation capacity from all sources, according to data available from the Community Energy Dashboard.³ The 58.4MW of renewable generation in the region is a “raw” number that does not take “capacity factors, renewable energy credits sold, or ownership of the systems” into consideration. The NRPC has estimated renewable generation in the region to be about 182,190.79 MWh per year when factoring capacity factors for solar, wind, and hydro.

Regional electricity generation is also investigated and catalogued in Section III. Currently, the region has the capacity to generate approximately 98.4 MW of electricity. About 58.4 MW of this electricity comes from hydro, wind, solar, and biomass sources. Approximately 75.211 MW of additional renewable generation has been proposed to be sited in the region.

The NRPC cooperated with VEIC to create targets for energy conservation and renewable energy generation. The energy saved via conservation and improved efficiency is targeted to equal approximately 3.5 trillion BTUs by 2050. Conservation and improved efficiency are planned through a variety of means including increased use of efficient materials during construction and weatherization of existing structures. Most prominently, improved efficiency is targeted through the use of electric vehicles for transportation and electric heat pumps for space heating. The resulting increase in regional electricity demand means that electricity generation in the region will also need to increase. Specific targets for new in-region electricity generation by 2050 include the following: 208.5 MW (711.4 billion BTU/hour) of solar generation, 19 MW (64.8 billion BTU/hour) of wind generation, and 10 MW (34.1 billion BTU/hour) of hydro generation.

Goals, strategies, and implementation steps are established in Section V to guide the Northwest region to achieve the energy conservation and renewable energy generation targets created in Section IV. Goals,

Additional energy goals have also been set for Vermont's public utilities for renewable energy generation, distributed generation, and fossil fuel use through Act 56 (the Vermont Renewable Energy Standard).¹ It is important that these goals be kept in mind while reading and using this document. The goals and strategies in this plan will provide a path to achieving regional and state energy goals.

B. PURPOSE OF THE PLAN

The NRPC has identified regional goals and strategies for energy conservation and renewable energy generation that will support the attainment of Vermont's energy goals. The NRPC has also identified specific implementable strategies appropriate to the region to accomplish these goals.

The NRPC collaborated with Vermont Energy Investment Corporation (VEIC) to create a regional energy model to identify targets for energy conservation and renewable energy generation. VEIC used the Long-range Energy Alternatives Planning (LEAP) modeling system to create a statewide model as well as regional models for the regional planning commissions (RPCs) participating in the pilot project. The models provide one possible scenario of accomplishing the state's goal of meeting 90% of total energy demand through renewable energy resources by 2050 and analyze the potential energy demand within the region. They also look at regional energy generation needs. Specific information about the models and their results can be found in Section IV.

The modeling work completed by VEIC provided a framework for two other tasks completed by the NRPC:

- Creation of specific strategies to help the region achieve state energy goals
- Creation of regional maps prioritizing locations for the development of future renewable generation facilities in the region

Regional strategies are outlined in Section V. The regional energy maps as well as information regarding the process by which the maps were developed are located in Section V, Appendix B, and Appendix C.

While reading this document, it is also important to keep in mind what the Regional Energy Plan will not do. Much like the Vermont Comprehensive Energy Plan, the Regional Energy Plan does not intend to directly address every specific energy-related issue within the region, and it does not discuss or provide recommendations regarding specific renewable energy generation projects that have been proposed in the region. Although it provides a prospective vision of the mix of renewables that may be developed in the region to attain state goals, the Regional Energy Plan does not specify the mix of renewable energy generation facilities that will actually be built or contracted by utilities serving the Northwest region. In addition, the plan does not provide direct information about the costs of implementing the plan or the costs of failing to implement the plan.

The energy landscape in Vermont has rapidly changed over the past 10 years. This has been driven by climate change, policy changes, materials cost reductions, and quickly evolving technologies. The NRPC anticipates that methods of generating, distributing, and conserving energy will continue to evolve over the next 30 to 40 years. This plan should be revisited and revised—perhaps more frequently than other regional plans adopted by the NRPC—to account for changes in federal and state policy as well as regulatory framework, and for changes in environmental conditions due to climate change.

The NRPC will work to incorporate the strategies identified in this plan into the Northwest Regional Plan during 2017.

C. KEY ISSUES

While it is important to understand the energy goals established by the legislature, it is more important to understand the reasons why the goals were established. The “why” behind this plan can be explained by looking at three different motivations that are important both regionally and statewide: energy security, environmental protection, and economic needs and opportunities.

¹Act 56: Vermont Renewable Energy Standard (<http://legislature.vermont.gov/bill/status/2016/h.40>)

ENERGY SECURITY

Vermont and the Northwest region are reliant upon other states and countries for a large portion of their energy needs. To address this issue, a state statute (10 V.S.A. 580(a)) has set a goal that by 2025, 25% of the energy consumed within the state will also be produced in the state by renewable generation.

Transportation energy is a clear example of the threats to both state and regional energy security. Vermont imports all of the gasoline and diesel fuels that are required to operate passenger and heavy vehicles in the state. And while there are varying opinions about “peak oil,” there is no debate that fossil fuels are a finite resource. The continuing reliance on a finite resource combined with the volatility of the fossil fuel market will result in higher transportation costs with potentially far-reaching implications.

Transportation energy isn’t the only example of a threat to energy security. The source of electrical energy is also a concern. Vermont currently obtains much of its electricity from hydroelectric facilities located out of state, primarily Quebec. Although these sources of electricity currently provide the region with low-cost, renewable generation, the prospective construction of high-capacity transmission lines from Quebec to southern New England may create increased competition for electricity between Vermont and other, faster-growing states that are seeking electricity from renewable sources. With increased competition, costs typically increase. Maintaining or decreasing reliance on electricity from sources located outside Vermont will certainly make both the state and the region more energy secure, especially in a future where electricity demand is anticipated to almost double by 2050 (see Section IV).

It is possible to have a state and a region that are less reliant on others for their energy needs. By utilizing the resources that exist inside both the state and the region, long-term security concerns about energy supply and energy costs can be alleviated.

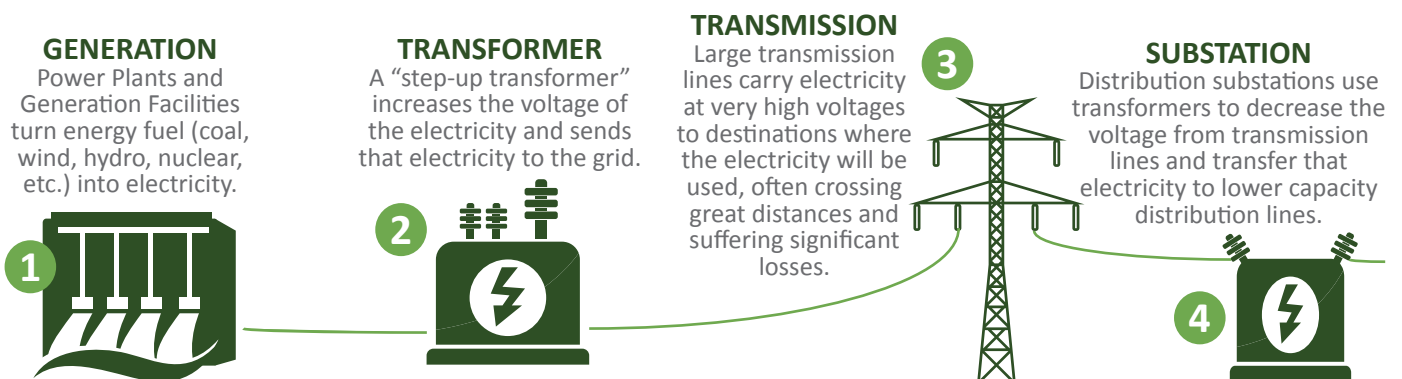
ENVIRONMENTAL PROTECTION

Human energy needs over the past few centuries have had confirmed negative impacts upon environmental quality worldwide—primarily due to fossil fuel use. And while these effects have often seemed intangible in the past, Vermonters are becoming well acquainted with the influence of climate change.

The changing composition of the state and region’s forest may have a real impact on the future of the sugaring industry. This is an issue of immense importance in the Northwest region, the highest-producing maple

FIGURE 2.2 UNDERSTANDING THE GRID

The major components in the US electrical generation and distribution grid are enumerated and described in the diagram below (continued on the following page)



V. STRATEGIES TO ACHIEVE REGIONAL TARGETS

The results of the LEAP model provide one scenario of future energy use in the Northwest region that ensures that state and regional energy goals are met. However, the LEAP model only provides targets for energy conservation and generation. It does not provide details about how the region may attain the targets set by the model.

Section V addresses how the LEAP targets will be attained by examining specific goals, strategies, and implementation steps that the region may use to progress toward the 90 x 50 goal and a more sustainable future.

This section is guided by the following statements of policy. The NRPC adopts these statements of policy to affirm its commitment to meeting state and regional energy goals and to satisfy the determination standards established by the Vermont Department of Public Service:

STATEMENTS OF POLICY

- NRPC supports conservation efforts and the efficient use of energy across all sectors.
- NRPC supports the reduction of in-region transportation energy demand, reduction of single-occupancy vehicle use, and the transition to renewable and lower-emission energy sources for transportation.
- NRPC supports patterns and densities of concentrated development that result in the conservation of energy.
- NRPC supports the development and siting of renewable energy resources in the Northwest region that are in conformance with the goals, strategies, and standards outlined in this plan.

Section V is separated into conservation and generation strategies. The conservation strategies look specifically at the topics of electricity conservation, weatherization, and transportation, while the generation strategies explore how and where generation may be developed in the region.

Only strategies and implementation steps that can be completed by the NRPC are included in this plan. Many other strategies and implementation steps could help the region attain its energy goals, but these strategies cannot be achieved by the NRPC and require the action of the state agencies, municipalities, public utilities, and private individuals. The goals, strategies, and implementation steps outlined in this section are meant to evolve over time to reflect continuing changes in the Northwest region.

A. CONSERVATION

ELECTRICITY CONSERVATION

Additional electric generation and conservation are both required to ensure that the region can attain the targets set in the LEAP model and in state statutes. The following goals focus on electricity conservation. Policy makers must find ways to further electricity conservation efforts while also increasing the overall use of electricity compared to other energy sources (especially for space heating and transportation). The failure of conservation efforts could severely hinder the region's ability to achieve the 90 x 50 goal.

FIGURE 5.1 RECAP: LEAP ELECTRICITY CONSERVATION TARGETS

To meet the 90 x 50 goal, LEAP establishes the following targets:

- Total regional electricity demand projected to increase by 100% by 2050.
- Regional electricity use for transportation projected to increase .05% in 2010 to 33% in 2050.
- Use of electric heat pumps projected to account for 52% of single family home energy thermal energy demand by 2050.

Strategies used to address electric demand focus on supporting further development of energy storage systems (i.e., batteries), which can help address peak-demand issues associated with renewable generation,

and on supporting existing programs that address the efficiency of appliances and lighting in Vermont. Smart rates, which use a rate structure that charges more for energy use during peak hours, can be used to reduce peak-hour electricity use.

1 GOAL

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

STRATEGIES

1. Encourage public utilities to move all customers to smart rates (i.e., charging higher rates during peak demand times), and encourage public utilities to mitigate any differential effects of smart rates on low-income customers.
2. Encourage legislature and/or public utilities to create programs that promote the use of energy storage systems. Using electric storage systems may reduce peak demand and provide emergency back-up power.
3. Support public utilities' efforts to increase customers' knowledge of their energy use. This may happen through increased outreach to and education of customers, but it may also occur through the use of new technology such as real-time monitoring of energy use.
4. Support the efforts of Efficiency Vermont to promote the selection and installation of devices, appliances, and equipment that will perform work using less energy (e.g., ENERGY STAR). This includes "load controllable equipment."
5. Encourage HVAC and weatherization providers to join the Building Performance Professionals Association of Vermont (BPPA-VT) to provide holistic energy advice to Vermonters.
6. Support and encourage school participation in Vermont Energy Education Program (VEEP) activities that foster an educational foundation geared toward energy savings.

IMPLEMENTATION

1. Work with GMP and regional partners to better promote the use of electricity conservation programs like the GMP eHome program and the Zero Energy Now program (in conjunction with GMP and BPPA-VT).
2. Support and provide outreach for EVT's customer engagement web portal and home energy reports.

THERMAL EFFICIENCY

Weatherizing structures to increase thermal efficiency is a very important part of reducing the region's energy demand by 2050. Outreach is one challenge that has limited building weatherization and the adoption of alternative heating systems in the region. An organization that can deliver both the message and the services doesn't exist. Businesses that deliver home heating oil, propane, and natural gas might be ideal for advocating weatherization efforts due to their connections to and frequent contact with business owners, homeowners, and landlords.

The amount of oil and gas being sold by most fuel dealers has declined in recent years, and further declines are expected. It may be in the interest of these companies—as well as the region—to begin transitioning their business

FIGURE 5.2 RECAP: LEAP THERMAL EFFICIENCY TARGETS

To meet the 90 x 50 goal, LEAP establishes the following targets:

- Total regional thermal energy needs for single family homes projected to drop by 9% by 2050.
- Use of cord wood to heat single family homes projected to decrease by only 20% by 2050.
- Use of electric heat pumps to projected to account for 52% of single family home energy thermal energy demand by 2050.
- Use of natural gas for single family home thermal energy expected to decrease by 68% by 2050.

IMPLEMENTATION

1. Implement the existing language in the Northwest Regional Plan that calls for limiting the loss of primary agricultural soils and active farmland. In addition, implement the existing language in the Northwest Regional Plan that calls for mitigating the impacts to primary agricultural soils and active farmland when these areas are to be developed, including the construction of renewable energy generation facilities.
2. Work with regional municipalities to institute local zoning changes that provide additional protections to productive agricultural land and primary agricultural soils.

B. GENERATION

As seen in the results of the LEAP model, achieving the state's energy goals will take more than improvements to energy efficiency and reductions in energy use. It will also require additional energy generation, particularly of electricity.

ELECTRICITY GENERATION

Electricity generation strategies focus on continued support of existing state programs that encourage renewable generation development such as net-metering programs and the Standard Offer Program. Strategies also focus on the creation of more accessible, internet-based information for electricity generation developers and for the general public regarding grid limitations and the Certificate of Public Good process. Implementation will primarily focus on the NRPC aiding municipal energy planning efforts, which includes working with municipalities to identify preferred locations for future generation development in municipal plans. It also includes working with municipalities to identify and develop effective policies to protect significant cultural, historical, scenic, or natural resources. The development of these policies can address many of the concerns that communities and citizens in the region have expressed with regard to solar and wind generation facilities. The NRPC will work with municipalities to ensure that municipal plans receive an affirmative "determination" from the Northwest Regional Planning Commission.

The NRPC would like to further investigate the public benefits provided to municipalities either directly from renewable energy generation developers or as a condition of a Certificate of Public Good. The NRPC is interested in determining whether the current system creates equitable outcomes or if it can be improved to provide greater equity to all municipalities impacted by a renewable energy generation facility, even if the facility is only located in one municipality. This is particularly relevant when discussing "industrial" or "commercial" wind generation facilities.

Lastly, the NRPC finds it to be essential that all decisions regarding new renewable energy generation facilities take into consideration concerns about health and safety. The noise, vibration, glare, or other impacts from generation facilities shall be mitigated by developers to ensure that such impacts do not have an undue adverse impact upon neighboring properties. This includes any impacts that pertain from electric or magnetic fields, or from construction activities associated with the facility.

FIGURE 5.5 **RECAP: LEAP ELECTRIC GENERATION ENERGY TARGETS**

To meet the 90 x 50 goal, LEAP establishes the following targets:

- Total regional electricity consumption expected to double between 2010 and 2050.
- Regional generation needs project to be met by development of 208.5 MW of new solar generation, 19 MW of new wind generation, and 10 MW of a new hydro generation.

8 GOAL

Increase the renewable energy generation capacity in the Northwest region to include an additional 208.5 MW of new solar generation capacity, 19 MW of new wind generation capacity, and 10 MW of new hydro generation capacity by 2050.

STRATEGIES

1. Support the development of individual home and community-based renewable energy projects in the region through the following programs: Vermont Small Scale Renewable Energy Incentive Program, Clean Energy Development Fund, and tax and regulatory incentives including net-metering.
2. Support changes to net-metering rules and other regulatory tools to provide financial incentives in order to encourage siting of renewable generation facilities on the built environment (such as parking structures and rooftops) and other disturbed lands (such as former landfills, brownfields, or gravel pits). Support changes to net-metering rules that disincentivize development on land identified in this plan as a location with known and possible constraints. Encourage multiple uses in conjunction with the development of renewable generation facilities, such as grazing of livestock, recreation, or parking.
3. Continue to support the Standard Offer Program (Figure 5.6) to foster deployment of diverse and cost-effective renewable energy resources, and support the evaluation of this program after 2022 to determine if the program should be extended or changed.
4. Support the creation of “solar maps,” like the maps developed by Green Mountain Power, to make interconnection information available to the general public and accessible online. Local electric utilities could partner with the NRPC to create these maps.
5. Support efforts by local utilities and private individuals to maintain and upgrade existing renewable electric generation facilities in the Northwest region and the state.
6. Support the development of additional methane digesters on farms in the Northwest region, especially those that utilize manure from multiple farms and/or food waste.
7. Support the creation of incentives for locating new renewable energy generation facilities within a half-mile of three-phase distribution line or electric transmission line infrastructure. Ensure new transmission lines and three-phase power lines associated with renewable energy projects do not create forest fragmentation or have an undue adverse impact on necessary wildlife habitats, ecological systems, and water and/or air quality.

FIGURE 5.6 STANDARD OFFER PROGRAM

In 2009, the Vermont legislature created the Standard Offer Program, which is designed to encourage the development of renewable energy generation facilities by establishing prices for new renewable energy generation facilities based on the cost of developing a project plus a reasonable rate of return. Through the program, renewable energy developers can receive a long-term, fixed-price contract for renewables facilities up to 2.2 MW in size. The original program cap was 50 MW, which was amended to 127.5 MW in Act 170 of the 2011–2012 legislative session. Facilities to meet the program cap will be built over time through 2022. All facilities to be built through the program are required to receive a Certificate of Public Good from the Public Service Board.

IMPLEMENTATION

1. Apply to the Public Service Department to have the Northwest Regional Energy Plan receive an affirmative determination of energy compliance in order to ensure that the plan is given greater weight in the Certificate of Public Good process.
2. Provide assistance to municipalities to identify potential areas for development and siting of renewable energy generation facilities. Work with municipalities to identify areas, if any, that are unsuitable for siting renewable energy generation facilities or particular categories of renewable energy generation

facilities. Ensure that municipalities include this information in their municipal plans and work to ensure that municipal plans are given an affirmative regional determination of energy compliance by the NRPC so that municipalities may receive “substantial deference” in the Certificate of Public Good process.

3. Work with municipalities to specifically identify significant cultural, historical, or scenic resources in their communities. Work with municipalities to protect these resources through the development of a statement of policies on the preservation of rare and irreplaceable natural areas and resources as well as scenic and historic features and resources, as required by 24 V.S.A. 4382, and include such policies in municipal plans.
4. Identify, catalog, and map potential brownfield sites and other previously disturbed sites in the region that may be appropriate for future solar generation facilities.
5. Investigate public benefits provided to municipalities either directly from renewable energy generation developers or as a condition of a Certificate of Public Good. Assess if the current system is equitable to all municipalities impacted by a renewable generation facility, or if the current system can be improved to provide greater equity to all municipalities impacted by a renewable energy generation facility.

ENERGY RESOURCE MAPS AND THE PUBLIC SERVICE BOARD

The Vermont Public Service Board has jurisdiction over all energy generation facilities that are a part of the public electrical grid. The board provides its approval to an energy generation facility by issuing a Certificate of Public Good to that facility. A proposed energy generation facility must meet the criteria found in 30 V.S.A. §248 in order to receive a Certificate of Public Good. The role of regional planning commissions in the Certificate of Public Good process is outlined in 30 V.S.A. §248(b)(1), commonly referred to as Section 248:

With respect to an in-state facility, will not unduly interfere with the orderly development of the region with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations of the municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality.

In addition, regions and municipalities may receive “substantial deference” instead of “due consideration” during a Certificate of Public Good proceeding if the region or municipality has received an affirmative determination of energy compliance. This potentially provides regional and municipal plans with greater weight before the Public Service Board.

In recent Certificate of Public Good proceedings, the Public Service Board has frequently found that municipalities and regional planning commissions have not had language, or maps, that have provided for “land conservation measures” that are specific and/or well-reasoned enough to have a real impact on the siting of renewable generation facilities through the Certificate of Public Good process. Through the creation of the following regional energy generation maps, the NRPC is planning for the development of additional renewable generation facilities in the region (using the LEAP model targets as a basis of conversation) and providing for clarity regarding regional land conservation measures and specific policies.

The NRPC has developed renewable energy generation maps for four renewable energy resources: solar, wind, hydro, and biomass. The following subsection provides a basic explanation of how the maps were created and how they are intended to be used and/or integrated into the Northwest Regional Plan. This is followed by subsections explaining the intent behind the maps of each renewable energy resource. Maps created while developing this project are provided in Appendix C.

ENERGY GENERATION MAPS METHODOLOGY

NRPC staff worked with other regional planning commissions, the Department of Public Service and other project partners in the state to develop criteria that would inform and guide the siting of renewable energy

generation facilities. The NRPC and the other RPCs each created maps that provide a macro-scale look at different factors that impact the siting of facilities.

Spatial data showing generation potential, which was originally compiled by the Vermont Sustainable Jobs Fund, formed the basis of the NRPC's mapping exercise. The NRPC then identified conservation resources in the region that were considered worthy of protection from development. These resources were selected through conversations with project partners, analysis of the current Northwest Regional Plan, and public input. Known and possible constraints were subsequently identified.

Known constraints are conservation resources that shall be protected from all future development of renewable generation facilities. Possible constraints are conservation resources that the NRPC intends to protect, to some extent, from the development of renewable generation facilities. The presence of possible constraints on a parcel does not necessarily preclude the siting of renewable generation facilities on a site. Siting in these locations could occur if impacts to the affected possible constraints are mitigated, preferably on-site.

When considering locations for future renewable energy generation facilities, the NRPC would like developers to target regional locations with generation potential that do not contain any known or possible constraints. These areas are shown as "prime" on the renewable energy generation maps in Appendix C. Further, if prime areas are located within a half-mile of existing transmission or three-phase distribution infrastructure, the NRPC finds that these areas should be given further preference by the Public Service Board. Areas with high generation potential but that also contain possible constraints are identified on the regional energy generation maps as "base" areas. These areas may be appropriate for the development of renewable energy generation facilities, but they should be given less preference than prime areas.

A full list of the known constraints and possible constraints identified by the NRPC for each type of generation (solar, wind, biomass, hydro), along with information about data sources, may be found in Appendix B.

It should be noted that the energy generation maps are based on the best available geographic data. They are macro-scale maps meant to guide the development of renewable generation facilities. The NRPC expects that some applicants or parties will be able to provide on-site information that is more accurate regarding the presence of known and/or possible constraints. This information will need to be taken into account by the NRPC and the Public Service Board when reviewing applications for renewable generation facilities to ensure that known constraints are not impacted and to ensure that impacts to possible constraint areas are mitigated. The energy generation maps are not intended to be used without the accompanying goals and policies of the NRPC contained in this plan.

FIGURE 5.7 ROOFTOP SOLAR – POTENTIAL CAPACITY

NRPC has approximated potential solar generation from both commercial/industrial and residential rooftops in region. The analysis estimates that 25% of all residential, commercial and industrial structures may be correctly side for solar generation and have actually installed solar panels. NRPC then estimated that a typical residential system would generate 4 kW of electricity and that a typical commercial or industrial system would generate 20 kW of electricity.

Based on these assumptions, the Northwest region could potentially generate 28.8 MW of electricity from rooftop solar generation. About 21.6 MW would come from residential rooftops and 7.2 MW would come from commercial and industrial rooftops.

Additional development of structures in the region would provide additional generation capacity. While these assumptions allow for only rough approximations, they do provide a sense that rooftop solar may be a viable way to meet at least a portion of the regional generation targets.

can't be considered baseload power because the dams are required to operate as "run-of-river" and therefore aren't always a reliable source of generation in the summertime). Hydro generation is a more consistent and reliable source of renewable generation than both wind and solar generation. Investment in existing and new hydro sites should meet environmental standards established by the State of Vermont Agency of Natural Resources.

The NRPC supports continued import of hydro-generated electricity from the New York Power Authority projects in the St. Lawrence River Valley and from Hydro-Québec. However, the commission is concerned about the long-term price of electricity from these projects. In recent years, several projects have been proposed in Vermont and New York to construct privately owned DC transmission lines from the Canadian border to various points on the New England grid, including several locations in Vermont. These transmission lines will allow additional electricity to be transmitted to the United States from Canada, primarily from Hydro-Québec, which will subsequently be sold on the ISO New England grid. This potentially will mean that Vermont public utilities will be competing with public utilities from southern New England for electricity generated by Hydro-Québec. The NRPC is concerned that this increased competition with public utilities from outside the state may lead to higher wholesale electricity costs and higher electricity rates for Vermonters. Although the region and state may need to continue to rely on Hydro-Québec for some hydro generated electricity to ensure that the 90 x 50 goal is met, the NRPC finds additional in-state renewable generation to be preferable.

The NRPC generally supports hydro generation in the region—but due to the regulatory complexity of permitting dams, the cost of refurbishing existing dams, and the potential effects that dams may have on wildlife, it finds that meeting the LEAP target of 10 MW of new generation capacity by 2050 would be tremendously difficult. The NRPC is committed to planning for and exploring hydro generation at existing sites, but the commission believes that planning for additional generation from other renewable sources and advances in electricity storage may be needed to ensure that the 90 x 50 goal can be attained.

Biomass Generation Facilities

Biomass, in various forms, can be used to produce heat and electricity. For several reasons, the LEAP model does not provide a target for biomass electric generation or thermal generation (or at least for thermal generation from a "district heating facility"—a central facility that would provide heat to several structures).

Electrical generation from biomass is specifically not addressed by LEAP due to concerns about how additional large-scale biomass electric generation, from both wood and methane sources, may impact climate change and air quality in the region. There are also concerns about the efficiency of using biomass to generate electricity. However, in the event that a biomass heating facility is proposed in the region, it would certainly make sense to have the proposed facility operator assess whether the facility could also cost effectively provide electrical generation (i.e., a Combined Heat and Power [CHP] facility).

Some farms in the Northwest region currently use "cow power" biomass to generate electricity. "Cow power" utilizes methane released from cow manure to fuel an engine. The engine, in turn, creates electricity. There are five "cow power" facilities located on farms in Franklin County. A currently proposed facility in St. Albans Town is slated to use manure and food scraps from the solid waste district to generate electricity. Food scraps are another fuel source that may open up possibilities for additional generation. The NRPC supports using cow power to the greatest extent possible in the region given its renewable nature, the financial support it can provide to regional farmers, and additional water quality benefits.

Thermal generation is the more probable route for utilizing biomass, especially from forests (i.e., "woody biomass") in the region. The LEAP model also does not provide a target for thermal generation from a central biomass facility (i.e., district heating), but instead it provides some targets for distributed thermal generation

VI. FEASIBILITY, CHALLENGES AND CONCLUSIONS

A. FEASIBILITY

Combined with the LEAP model results, the analysis of existing energy demand and supply provides a framework for discussing the region's energy present and future. From that framework, the NRPC has developed goals, strategies, and implementation actions for both conservation and generation that will help the region achieve the 90 x 50 goal. Generally, the generation goals and strategies, guided by the LEAP generation targets, are feasible for the region to achieve in terms of both the amount of electricity needed to reach projected demand and the amount of land required to generate the electricity.

In the Northwest region, solar generation is the preferred method of renewable generation. Solar will have to meet generation levels higher than the targets set by the LEAP model to make up for the difficulty of developing hydro and wind generation facilities in the region. However, the generation targets remain feasible despite challenges posed by grid limitations and by site-specific siting issues that the NRPC is confident can be addressed at least partially and overcome through the implementation of this plan. The development of other types of renewable generation (e.g., wind, hydro, biomass) is also possible in the region, and the regional generation maps in Appendix C provide guidance on how those types of renewable energy generation facilities should be deployed in the region.

The identified conservation goals and strategies may be more difficult for the NRPC to implement. Electricity conservation goals will require changes by individual consumers in the region. The NRPC can facilitate and help organize the efforts of other organizations in the region (e.g., public utilities, Efficiency Vermont) but has little expertise or influence in this area. Thermal efficiency is similar. The NRPC can aid the efforts of other organizations to increase thermal efficiency in the region, but it cannot accomplish the plan's goals and strategies alone.

The third area of conservation—transportation—is different. One of the NRPC's core functions is to coordinate transportation planning for the region. Combined with the NRPC's experience in land use planning—a discipline inextricably linked to transportation planning—the commission is well suited to implement transportation goals and strategies. Progress on transportation implementation actions will be prioritized.

B. IMPLEMENTATION CHALLENGES

The NRPC faces several challenges in achieving the 90 x 50 goal. Many cannot be resolved by the NRPC alone and will require the cooperation and coordination of the federal government, state government, and private sector. Other challenges, such as those posed by Chittenden County's future electricity demand, will require the NRPC to make policy decisions that will have an impact on the achievement of state energy goals. Key implementation challenges include the following:

- **Baseload vs. intermittent electricity** – Solar and wind generation technologies create electricity intermittently: when the sun is shining and when the wind is blowing, respectively. Unfortunately, the times when these generation sources are operating do not always correspond to the times when electric demand is at its peak. “Baseload” electricity, or electricity that is available on demand, is needed to ensure that peak demand can be met at any time. At present, baseload electricity is typically generated by fossil fuel, nuclear, or hydro generation sources; this may change in the future. Research indicates that solar and wind generation often complement each other, and increased solar generation in the region has helped the region address peak loads. Still, reaching the 90 x 50 goal will require the development of alternative technologies—most likely, more efficient and large-scale batteries, which will enable renewable technologies to supply baseload electricity (and fossil fuel generation facilities transitioning to “peaking” plants).

gas. The economic viability of renewable natural gas, its impacts on climate change, and its classification as a “renewable” resource should be analyzed in future updates to this plan.

The LEAP analysis only factors in the energy use of heat pumps for heating. It does not factor in the use of heat pumps for cooling. Use of heat pumps for cooling may have a substantial effect on electricity demand in the summer, especially given the potential effects of climate change on the region. This issue should be addressed in future revisions to the LEAP analysis.

- **Proximity to Chittenden County** – Although the LEAP generation targets appear to be achievable in the Northwest region and for most of the state, it may be much more difficult for neighboring Chittenden County to attain its LEAP generation targets. Chittenden County’s existing electricity demand is larger than that of the Northwest region, and the electric demand in Chittenden County is growing at a faster rate than in the rest of the state. There will likely be pressure on the regions surrounding Chittenden County to “help” it meet its generation targets. The NRPC specifically expects there to be pressure to develop additional solar in southern and western parts of the region due to these areas being adjacent to Chittenden County. This is especially true given grid limitations that exist in Addison County and Washington County. The NRPC will need to decide whether or not it is appropriate for the region to be an energy “exporter” to Chittenden County. The effects of additional generation in the region will need to be weighed against the potential monetary benefits that additional generation may have for some of the region’s landowners, as well as the positive impacts that it may have both in helping the state achieve the 90 x 50 goal and on the overall state economy. Many regional residents rely on Chittenden County for employment.
- **Reliance on cord wood and biomass** – The LEAP model depends very heavily on cord wood use as a single-family home heating source (and for commercial and industrial heating, too). The NRPC has some questions about how this increased demand will be met regionally and about the potential environmental impacts of increased reliance on wood—particularly with regard to climate change. Although wood is a renewable resource that is currently available in the region, its use in the region should be monitored as this plan evolves to ensure that it continues to be harvested in a sustainable manner. The continued reliance on cord wood for heating and its impacts on greenhouse gas emissions in the region should be monitored. As the impacts of climate change on the Northwest region become clearer, the widespread use of cord wood should be reassessed to ensure that its use continues to be in the best interest of the region and the state. In addition, information from BERC indicates that the region has less low-grade wood that can be used for biomass heating than other regions of Vermont. This may limit efforts in the region to greatly expand the use of biomass for heat and electricity generation.
- **Lack of site-specific guidelines for solar and wind generation facilities** – The energy generation maps in the plan address which conservation resources should be protected from development of renewables and which conservation resources should be subject to mitigation if impacted by development of renewables. This plan does not provide site-specific guidelines for how solar or wind should be placed on a site if it is deemed appropriate for development. The issues of screening, stormwater management, fall distance, sound levels, and aesthetics have not been addressed in this plan. The NRPC did not address these issues directly in this plan primarily due to the unique challenges that each particular site poses to renewable development.

The legislature has developed setback requirements for solar facilities and has enabled municipalities to develop solar facility screening ordinances, but concerns persist about whether enough has been done to protect the state’s working landscape. Sentiment is even stronger in the state regarding the need for siting standards for wind generation facilities. Of particular concern to the NRPC are the possible economic inequities that can result through the siting of a wind generation facility in the region. The NRPC advocates for changes to the Section 248 process ensuring that the economic benefits provided by a developer are distributed equally to all municipalities that are impacted by a proposed facility.

- **State Significant Natural Communities and Rare, Threatened, and Endangered Species:** Rankings S1 through S3 were used as constraints. These include all of the rare and uncommon rankings within the file. For more information on the specific rankings, explore the methodology for the shapefile. (*Source: VCGI*)

OTHER MAP FEATURES

- **Three-Phase Distribution Lines:** All available utilities with service in any of the three regions (*Source: Green Mountain Power, Swanton Village Electric Department, Vermont Electric Coop, and Village of Enosburg Falls*) were mapped.
- **Transportation Infrastructure:** These were removed in the initial analysis performed by VCGI. Parking lots are not included. (*Source: VCGI*)
- **VELCO Transmission Lines and Substations:** (*Source: VCGI*)
- **Water Bodies:** Major water bodies (i.e., >1 square kilometer in surface area) are shown on maps as “Lakes/Ponds.” (*Source: VCGI*)

F. EXPLANATION OF MUNICIPAL CONSERVATION LAND USE AREAS

The NRPC conducted an analysis of municipal conservation land use area. The analysis reviewed the written descriptions of conservation land use areas from each municipal plan in the region. The intent of the analysis was to see if the conservation land use areas contained language that restricted future development (including the development of renewables). After review, the conservation land use areas from each municipal plan were divided into the following categories:

STRONGLY DETERS

These conservation land uses areas use language that prohibits development or only permits limited, low-density residential development. These areas are included as Regional Known Constraints on the Regional Energy Generation maps. Municipal conservation land use areas that meet this description include:

- Alburgh Town & Village – Conservation Land A
- Enosburgh – Conservation District
- Enosburgh Falls – Conservation District
- Fletcher – Forest District
- Grand Isle – Conservation District
- Montgomery – Conservation District II
- North Hero – Conservation District
- Richford – Recreation/Conservation District and Water Supply District
- St. Albans Town – Conservation District

DETERS

Several conservation land use areas in the region are described in municipal plans as areas where land use shall be restricted to conservation, forestry, and agricultural uses and/or are described as land that is geographically unsuitable for development. These areas are included as Regional Possible Constraints on the Regional Energy Generation maps. Municipal conservation land use areas that meet this description include:

- Alburgh Town and Village – Conservation Land B
- Bakersfield – Conservation District
- Fairfax – Conservation District
- Fairfield – Conservation District
- Fletcher – Conservation District
- Highgate – Forest Reserve District

- Highgate – Protected District
- Montgomery – Conservation District I
- Richford - Forest/Conservation District
- Sheldon – Rural Lands II
- Swanton Town and Village – Conservation District

NEUTRAL

These conservation land use areas may be identified in municipal plans as being geographically or topologically unsuitable for development, yet contain language that allows for some types of development. These areas have not been included on the Regional Energy Generation maps. Municipal conservation land use areas that meet this description include:

- Berkshire – Conservation District
- Georgia – Natural Areas District
- Georgia – Recreation District
- South Hero – Conservation District

DEVELOPMENT MAY OCCUR

These conservation land use areas do not contain language that restricts development. These areas have not been included on the Regional Energy Generation maps. Municipal conservation land use areas that meet this description include:

- Franklin – Conservation District

Approximate
Project Location

Solar

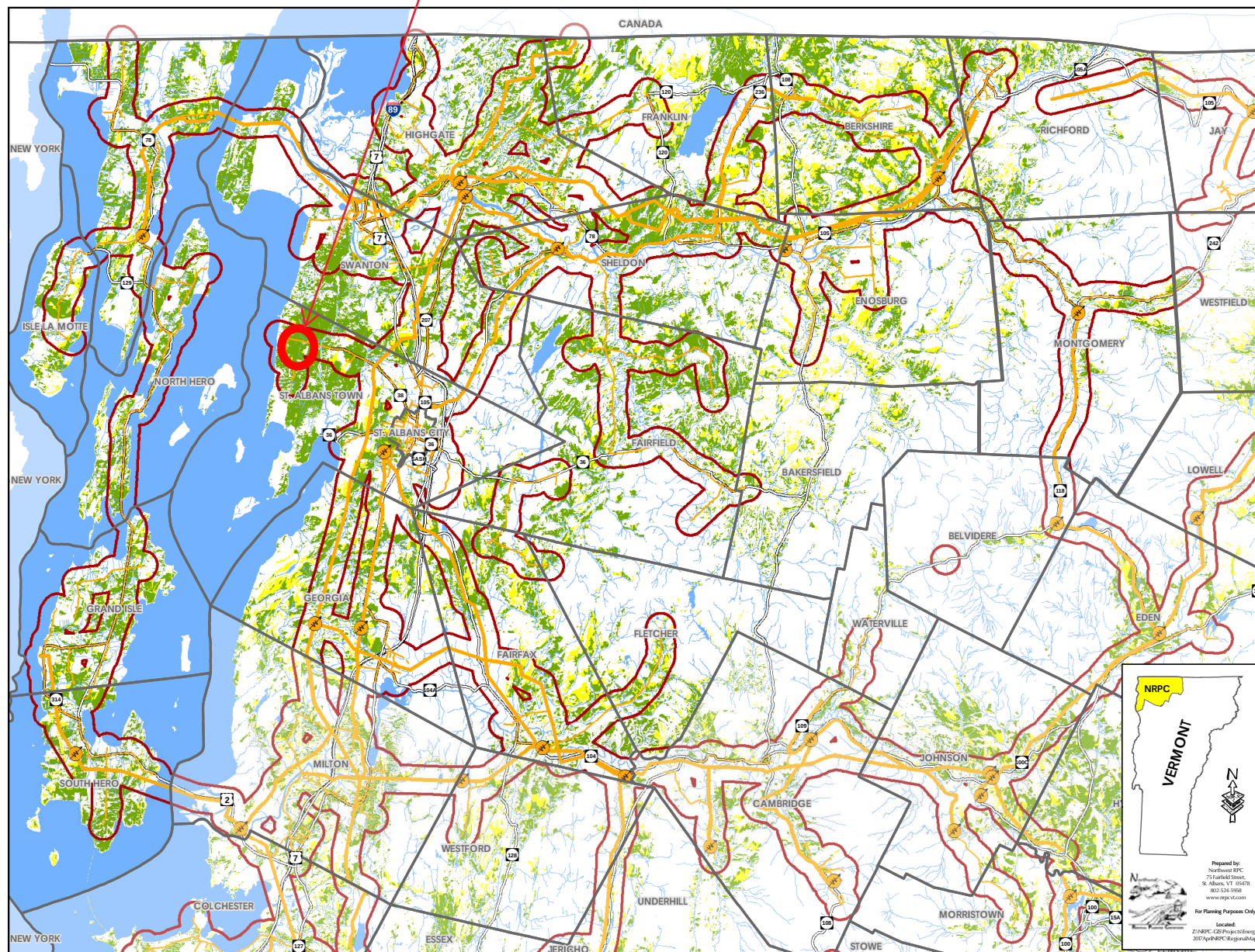
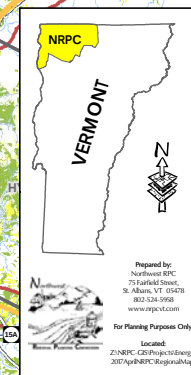
Northwest Region, VT Act 174 Energy Development Improvement Act of 2016

This map and the corresponding data is intended to be used to inform energy planning efforts by municipalities and regions. This may also be used for conceptual planning or initial site identification by those interested in developing renewable energy infrastructure. The maps do NOT take the place of site-specific investigation for a proposed facility and cannot be used as "being maps."

Legend

-  Substation
-  3 Phase Power Line
-  Transmission Line
-  1/2 Mile Buffer (3 Phase Power Line & Transmission Line)
-  Prime Solar/No Known Constraints
-  Base Solar/Possible Constraints

Sources: VCGI
Disclaimer: The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Northwest RPC is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.



**TOWN OF ST. ALBANS
Franklin County, Vermont**

Town Plan

Selectboard Approved on Monday June 15, 2020

Prepared By:
Town of St. Albans
579 Lake Road
St. Albans, VT 05478

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INTRODUCTION

1.1. Vision Statement

The following are a broad vision for our future community and describes the prospective civic aspirations of our citizens.

The Town of St. Albans is and will continue to be a community where there is:

- **a balance between residential, commercial, and industrial development;**
- **a robust, sustainable, and equitable economy;**
- **a common value in local agricultural businesses; and,**
- **an appreciation of our natural, cultural, scenic, and historical resources.**

This Town Plan includes goals, policies, and actions that result in the future described by the vision statement.

1.2. Town Planning

In 1968, the Vermont General Assembly enacted the Vermont Municipal and Regional Planning and Development Act (24 V.S.A. Chapter 117). The Vermont Municipal and Regional Planning and Development Act give all State of Vermont municipalities the authority to prepare, implement and maintain a town plan.

The Town Plan includes policies that can be used as a strategic plan of action. The Town Plan also includes policies for Land Use Regulations and further planning efforts. Projects that come under Vermont's Land Use and Development Act (Act 250) must conform to the Town of St. Albans Town Plan.

1.3. Foundational Goals for the Town Plan

Goal - Provide a means for St. Albans to reach its desired future: The overriding intention of this Town Plan is to provide a means for shaping policies and land use decisions in a manner that enables the community to reach the future described by the citizens in the Vision Statement.

Goal - Manage growth in a logical and sustainable manner: This Town Plan provides for the growth of the community in a manner that allows the maintenance of economic well-being, healthy, functioning environmental systems, and a sustainable high quality of life. The intent of the Town Plan is to meet and exceed the goals for planning established by the Northwest Regional Planning Commission (NRPC) and all related legislation.

Goal - Provide for constant citizen involvement: Continuous public involvement in the planning process is critical within the formal process for reviews and updates of the Town Plan. The development of St. Albans is continuously monitored to ensure that growth is occurring in an orderly fashion that is not and will not adversely affect the Town's ability to provide adequate services, facilities, and infrastructure.

3. LAND USE

Land use is the traditional foundation of a Town Plan. A detailed land use plan and strategies for implementation are essential for St. Albans to achieve its vision of the future. They give expression to the community's desires regarding where expected growth will go and in what densities, forms, and quantities.

This Land Use Chapter establishes goals and policies for St. Albans as it continues to develop and describes how the community will implement its vision of future distribution of land uses through land use policies and regulations. It also serves as the basis for revisions and creation of new land use and development regulations to implement its policies.

3.1. Goal - Encourage development in a manner that will promote the public health, safety, prosperity, convenience, efficiency, and the economy of St. Albans.

St. Albans is continuing to evolve from primarily an agricultural community to one that supports a mix of agricultural, residential, commercial, and industrial development.

Policy: Encourage commercial development, especially around I-89 exit 19 and exit 20, which are our designated Growth Centers. The Current Land Use Map (**Map 3.1**) is a good broad vision for development in the future with allowances made for in-fill and expansion on existing sites.

Policy: Explore ways for developers and private landowners to either donate or sell easements to create bike paths, recreational trails, and walking paths between parks, schools, neighborhoods, high traffic sites, and other areas to lower the dependence on vehicles for travel between these sites.

3.2. Goal - Ensure that the Unified Development Bylaws incorporate smart growth principles.

In 1970, St. Albans began to regulate land use. Land use regulations are implemented through the Unified

Land Use – Statutory Goals

Planning Goals – 24 V.S.A. 4302

(1) To plan development so as to maintain the historic settlement pattern of compact village and urban centers separated by rural countryside.

(A) Intensive residential development should be encouraged primarily in areas related to community centers, and strip development along highways should be discouraged.

(B) Economic growth should be encouraged in locally designated growth areas, employed to revitalize existing village and urban centers, or both, and should be encouraged in growth centers designated under chapter 76A of this title.

(C) Public investments, including the construction or expansion of infrastructure, should reinforce the general character and planned growth patterns of the area.

(D) Development should be undertaken in accordance with smart growth principles as defined in subdivision 2791(13) of this title.

(6) To maintain and improve the quality of air, water, wildlife, forests, and other land resources.

(A) Vermont's air, water, wildlife, mineral, and land resources should be planned for use and development according to the principles set forth in 10 V.S.A. § 6086(a).

(C) Vermont's forestlands should be managed so as to maintain and improve forest blocks and habitat connectors.

(9) To encourage and strengthen agricultural and forest industries.

(A) Strategies to protect long-term viability of agricultural and forestlands should be encouraged and should include maintaining low overall density.

(D) Sound forest and agricultural management practices should be encouraged.

Development Bylaws. It is important to have land use regulations to ensure that land is developed according to the vision of the Town.

Policy: Periodically review, update, and adopt revised Unified Development Bylaws to account for new State regulations and account for any other necessary changes.

Policy: Periodically review that the Unified Development Bylaws encourages and permits logical and reasonable Smart Growth principles. Smart Growth is a planning term and theory that recommends concentrating new development in compact neighborhoods and or walkable retail centers to avoid new construction sprawling over prime agricultural soils and fields.

3.3. Goal - Ensure that new development maintains and complements the character of its surrounding neighborhoods and existing improvements through the permitted and conditional uses in our Unified Development Bylaws.

The Zoning Districts within the Unified Development Bylaws define how land should be developed in a given area, what kind of uses will be allowed in a defined area, and what St. Albans requires for certain uses. Zoning Districts serve to give notice to landowners about what they can expect will be allowed both on their land and on their neighbor's land.

Policy: Regularly review the permitted and conditional uses for each zoning district and overlay area within the Unified Development Bylaws to evaluate if each use conforms with the purpose of the district.

Policy: Balance a landowner's inherent property rights to develop land with the public's interest in protecting the environment and character of the surrounding neighborhood.

3.4. Goal - Permit increased densities on lots served by both public water and sewer systems through smaller lot sizes and lesser dimensional requirements in our Unified Development Bylaws.

St. Albans uses incentives and tools that increase development density to aid landowners in keeping their land functional for present and future agricultural activities. A tool to keep land productive is to encourage clustering in Planned Unit Developments (PUD's) in all zoning districts and categories.

Policy: Periodically review that new PUD's in the Residential District have an accompanying Home Owner's Association bylaws or other mutual maintenance agreement and that the Home Owner's Association is regularly meeting. No commercial or industrial or mixed use PUD's have ever been proposed in St. Albans as of March 2018.

**Land Use – Statutory Goals
(Continued)**

Planning Goals – 24 V.S.A. 4302

(11) To ensure the availability of safe and affordable housing for all Vermonters.

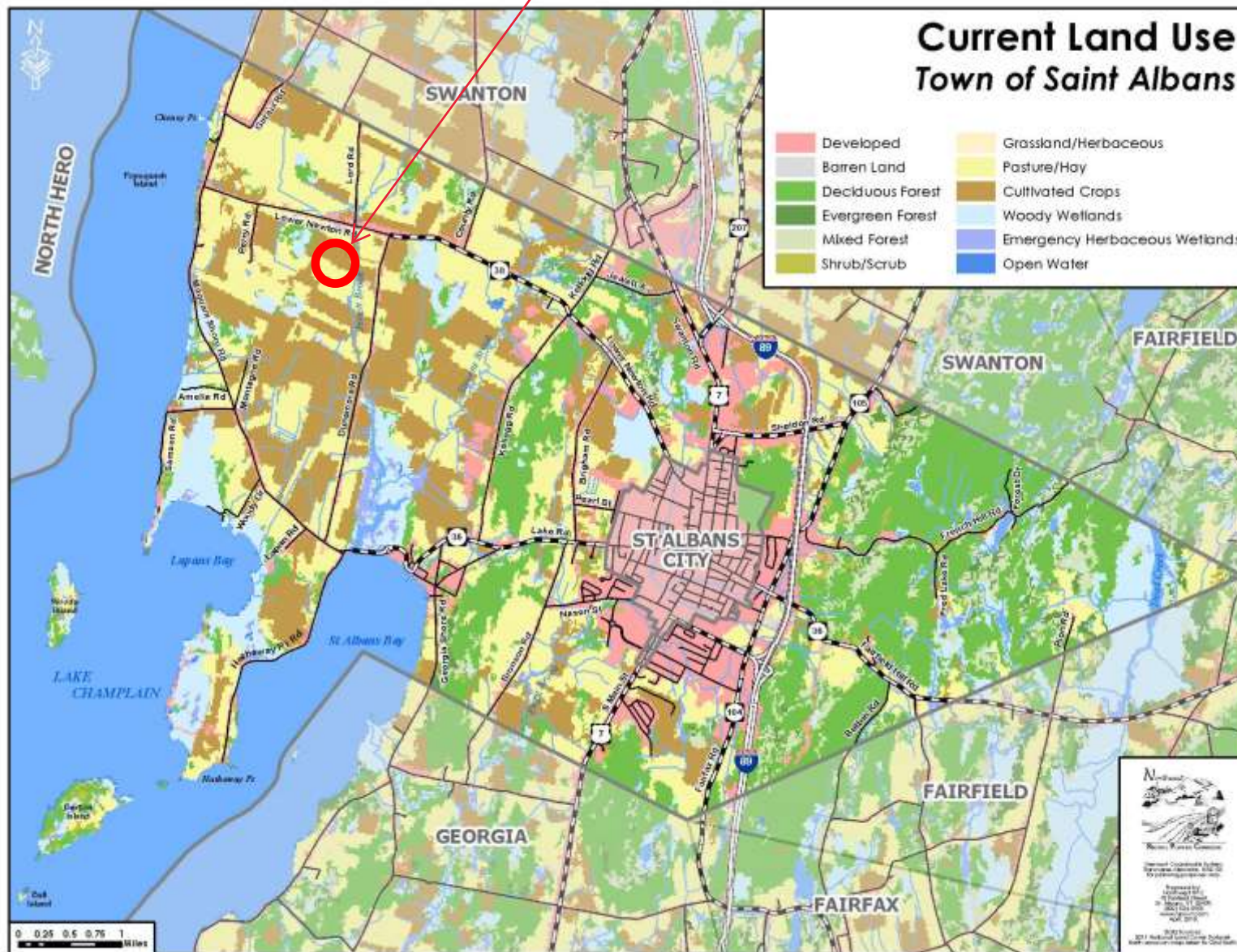
(B) New and rehabilitated housing should be safe, sanitary, located conveniently to employment and commercial centers, and coordinated with the provision of necessary public facilities and utilities.

(C) Sites for multi-family and manufactured housing should be readily available in locations similar to those generally used for single-family conventional dwellings.

(D) Accessory apartments within or attached to single-family residences which provide affordable housing in close proximity to cost-effective care and supervision for relatives, elders, or persons who have a disability should be allowed.

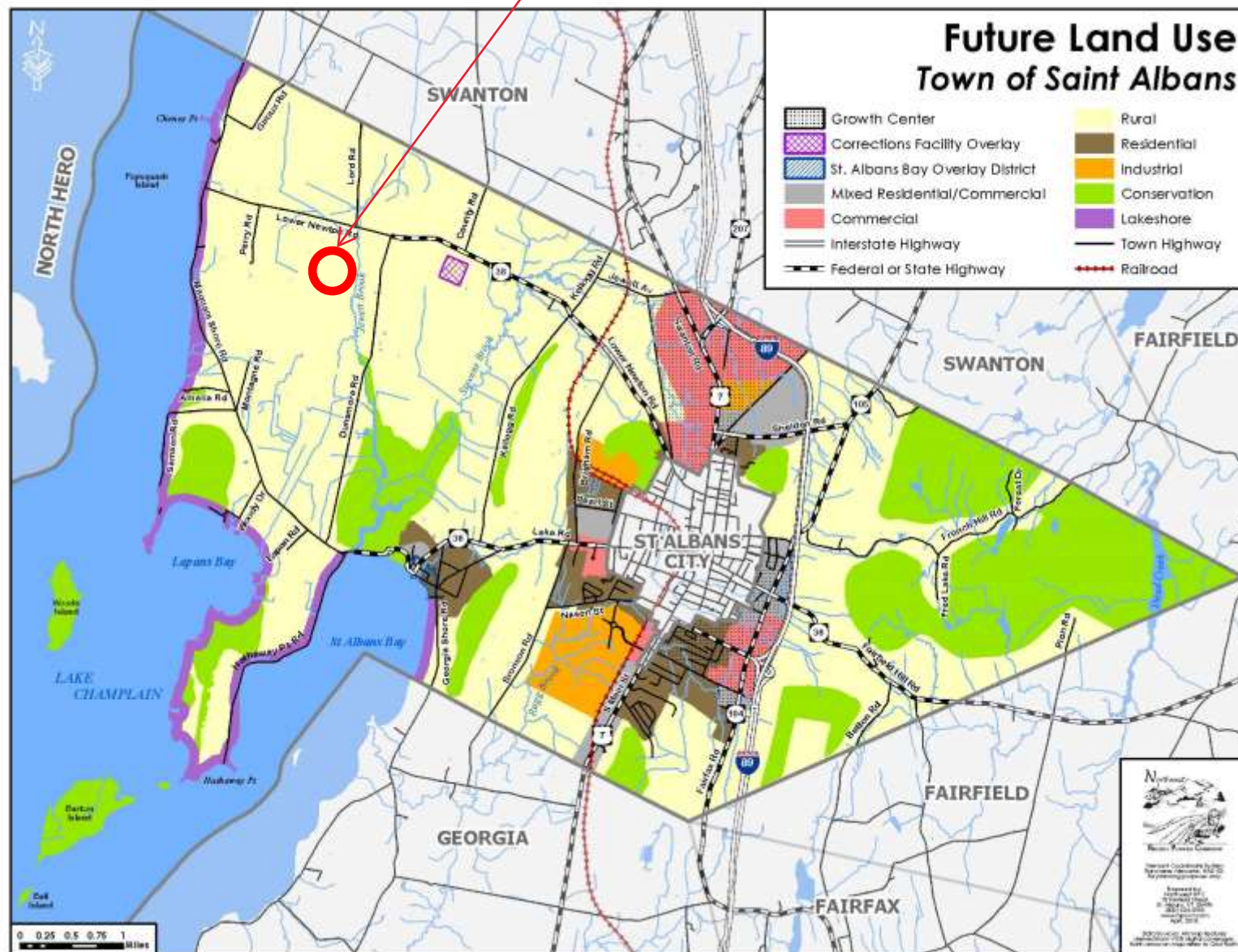
Map 3.1 – Town of St. Albans Current Land Use

Approximate
Project Location



Map 3.2 – Town of St. Albans Future Land Use

Approximate
Project Location



5. SCENIC AND NATURAL RESOURCES

The purpose of this chapter is to describe the community's commitment to stewardship of the natural environment and to provide a basis for policies that guide the Town's decisions that will affect the natural environment. The environment is a complex system of interrelated components upon which the Town depends including air, water, soils, plants, and animals. Finding a balance between the preservation, protection, and transformation of natural resources with other community needs is vitally important to ensuring the continued viability of natural systems and the continued high quality of life for St. Albans.

5.1. Goal - Identify, protect, preserve, and transform important natural and scenic features of St. Albans' landscape.

Policy: Protect and preserve natural resources including surface waters, groundwater, floodplains, river corridors, agricultural soils, wetlands, steep slopes, forest blocks, habitat connectors, and endangered wildlife habitats.

Surface Water, Groundwater, and Floodplain.

Water quality and the condition of surface waters in St. Albans has been an important issue for many years, particularly in regards to Lake Champlain and St. Albans Bay. Water quality and issues related to surface water quality are discussed in more depth in Chapter 10 – Stormwater and Flood Resilience. Issues surrounding the regulation of floodplain and state-designated river corridors are also discussed in Chapter 10.

Public water service is currently supplied by the City of St. Albans Water and Sewer Department to some Town residents and businesses. This water comes from Lake Champlain through a pumping station on Maquam Shore and from the St. Albans Reservoirs North and South in the Town of Fairfax. A Surface Water Source Protection Area surrounds the Maquam Shore location; Ground Water and Surface Water Source Protection Areas for the St. Albans Reservoirs are located in the Town of Fairfax, the Town of Fairfield and in a small southeastern portion of the Town. These recharge areas are to be protected from any activities and or

Natural Resources – Statutory Goals

Planning Goals – 24 V.S.A. 4302

(5) To identify, protect, and preserve important natural and historic features of the Vermont landscape, including:

(A) significant natural and fragile areas;

(B) outstanding water resources, including lakes, rivers, aquifers, shorelands, and wetlands;

(C) significant scenic roads, waterways, and views;

(6) To maintain and improve the quality of air, water, wildlife, forests, and other land resources.

(A) Vermont's air, water, wildlife, mineral, and land resources should be planned for use and development according to the principles set forth in 10 V.S.A. § 6086(a).

(B) Vermont's water quality should be maintained and improved according to the policies and actions developed in the basin plans established by the Secretary of Natural Resources under 10 V.S.A. § 1253.

(C) Vermont's forestlands should be managed so as to maintain and improve forest blocks and habitat connectors.

(10) To provide for the wise and efficient use of Vermont's natural resources and to facilitate the appropriate extraction of earth resources and the proper restoration and preservation of the aesthetic qualities of the area.

businesses that would harm the potability of existing water supplies.

Protecting groundwater is also of interest to St. Albans, because groundwater is the primary source of drinking water for the majority of St. Albans households. A majority of St. Albans is underlain by deposits of unstratified glacial drift and bedrock. Drilled wells in these materials generally yield enough water for domestic or light commercial use.

Agricultural Soils. The latest soil survey in Franklin County was completed by the Natural Resource Conservation Service in 1998. The survey classifies soils on the basis of their structure, form, composition, and suitability for various types of development. The majority of soils in Town are members of Covington, Farmington, Kinsbury, Georgia, and Massena classes, which are all either clays or stony loams which generally do not drain well. The hillside slopes in the eastern section of Town is typically Woodstock class which tend to be excessively drained and predominantly exist on hillside slopes.

Agricultural soils are specifically classified by the Natural Resources Conservation Service as being “prime,” of “statewide importance,” or of “local importance.” Prime soils have very high agricultural potential and few limitations for farming. Soils of statewide importance have good agricultural potential but one or more limitations requiring more careful management.

St. Albans encourages the responsible management of all agricultural soils in an effort to protect and preserve these soils for continued agricultural use, particularly in land use districts that are intended to retain a rural and agriculture-based character.

Natural Resources – Statutory Elements

Plan Elements – 24 V.S.A. 4382

(2) A land use plan, which shall consist of a map and statement of present and prospective land uses, that:

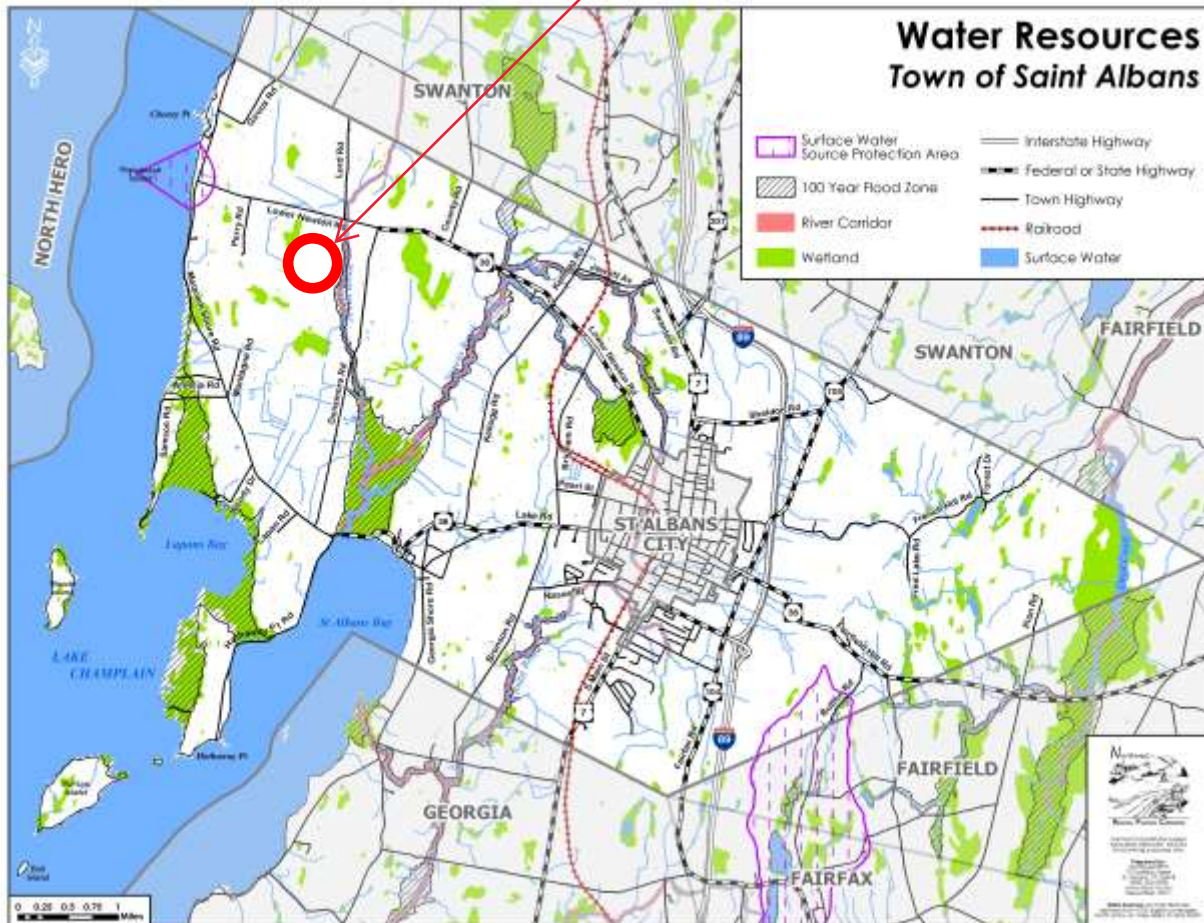
(A) Indicates those areas proposed for forests, recreation, agriculture (using the agricultural lands identification process established in 6 V.S.A. § 8), residence, commerce, industry, public, and semi-public uses, and open spaces, areas reserved for flood plain, and areas identified by the State, the regional planning commission, or the municipality that require special consideration for aquifer protection; for wetland protection; for the maintenance of forest blocks, wildlife habitat, and habitat connectors; or for other conservation purposes.

(D) Indicates those areas that are important as forest blocks and habitat connectors and plans for land development in those areas to minimize forest fragmentation and promote the health, viability, and ecological function of forests. A plan may include specific policies to encourage the active management of those areas for wildlife habitat, water quality, timber production, recreation, or other values or functions identified by the municipality (5) A statement of policies on the preservation of rare and irreplaceable natural areas, scenic and historic features and resources.

(5) A statement of policies on the preservation of rare and irreplaceable natural areas, scenic and historic features and resources.

Map 5.1 - St. Albans Town Water Resources

Approximate
Project Location



Wetlands. There are numerous wetlands within St. Albans. Wetlands are an integral component to the health of a watershed. Wetlands provide a number of critical functions including filtering out nutrients and pollutants, storing flood waters, dissipating wave energy at the shoreline, and serving as important habitat for a variety of species.

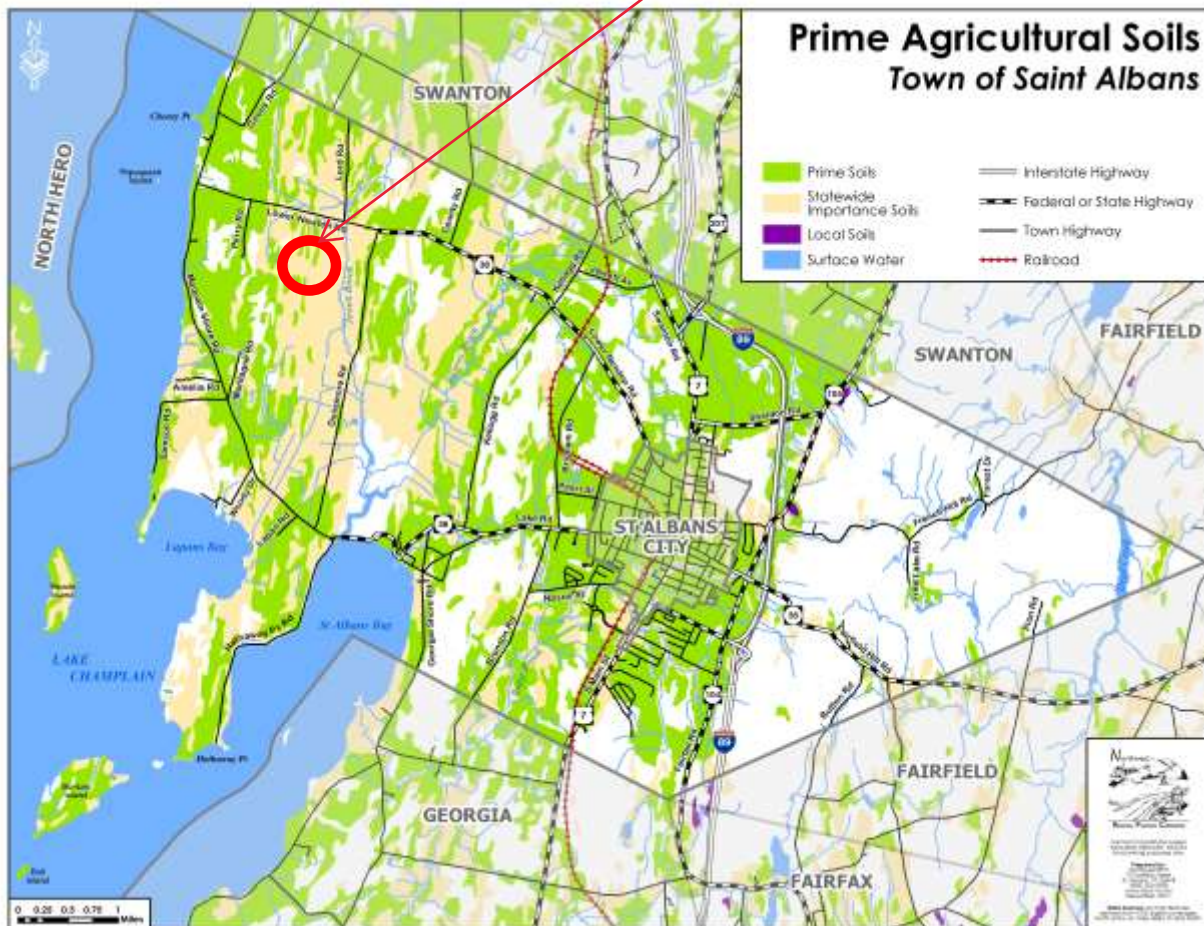
Development located within wetlands and in proximity to wetlands is regulated by Federal and State governments. Local governments are enabled to regulate wetlands, but St. Albans does not have additional local wetland regulations.

In 2007, the Agency of Natural Resources published “The Lake Champlain Basin Wetlands Restoration Plan.” This plan identified 149 potential wetland restoration projects in the St. Albans, totaling approximately 1,745 acres. Generally, St. Albans works with state agencies involved in implementing this plan to ensure that progress is made to complete these projects.

Steep Slopes. Steep slopes are evidence of the past geological epochs that form this area and are characteristically covered by shallow soils that can present challenges to most types of development. Development on steep slopes may upset the natural slope repose angle and the removal of vegetation and the injection of effluent by onsite sewage disposal may increase runoff, erosion, and the possibility of landslides unless properly designed. Development on steep slopes in St. Albans is regulated to address these impacts for areas with slope of equal to or greater than 15%. However, this regulation of steep slopes does not totally prevent any properly-designed development on steep slopes.

Map 5.2- Town of St. Albans Agricultural Soils

Approximate
Project Location



Forest Blocks, Habitat Connectors, and Endangered Wildlife Habitat.

As of January 1, 2018, all municipal plans must address how “Vermont's forest lands should be managed, so as to maintain and improve forest blocks and habitat connectors.” St. Albans contains two large, significant forest blocks located on French Hill. These three forest blocks are over in 1,000 acres in size and extend into the surrounding towns of Fairfield and Swanton. They are the three largest forest blocks in eastern Franklin County with the exception of Missisquoi Wildlife

Refuge in Swanton and provide habitat connection between habitat blocks located in the Green Mountains and the northern portions of the Champlain Valley. There are additional forest blocks located in other areas of town, but these forest blocks tend to be much smaller and fragmented by roads, development, and agriculture.

According to the Agency of Natural Resources Atlas, St. Albans contains several areas likely to contain rare, threatened, or endangered species. These areas include surface water and shorelines around St. Albans Bay, Lapans Bay, Woods Island, and Burton Island. It also includes an area near the VT Route 104 / VT Route 105 intersection near the border with Swanton and portions of Fairfield Swamp.

St. Albans also contains two “Significant Natural Communities.” These are areas with rare and high quality “interacting assemblage of plants and animals, their physical environment, and the natural processes that affect them.” These areas include a rare Buttonbush Swamp north of Lapans Bay and a Red Maple-Northern White Cedar Swamp community located in Fairfield Swamp.

The Town Forest is located on French Hill and is 162 acres. It is a recreational area and wildlife habitat area. St. Albans adopted a Town Forest Management Plan and is actively managing the forest. In the past, St. Albans logged the forest using low impact sustainable harvesting techniques. Marketable timber was sold by the Town and remaining unsold wood was given to residents for fuel assistance.

Policy: Proactively work to understand the impacts of increasingly severe weather on St. Albans and support efforts to combat and or adapt to the new climate realities.

Meteorological data shows that Vermont is experiencing warmer and short winters combined with experiencing warmer summer days and more severe or significant weather events. These are current realities in Vermont and many scientists believe that these trends may become more noticeable in the near future.

It is important that St. Albans continue to discuss how increasingly severe weather impacts the function of municipal government and the lives of residents regardless of the reasons for these changes. This may include discussing topics as diverse as agriculture, tourism, solar electricity generation, and stormwater infrastructure. The Implementation section contains several actions that the Town can take to combat the impacts from severe weather. These actions pertain to how land and natural resources are used, transportation choices citizens make, and how energy is created and used. All these actions reduce greenhouse gas emissions. St. Albans should continue to monitor climate in Vermont and refine the municipality’s role in dealing with severe weather through 2025.

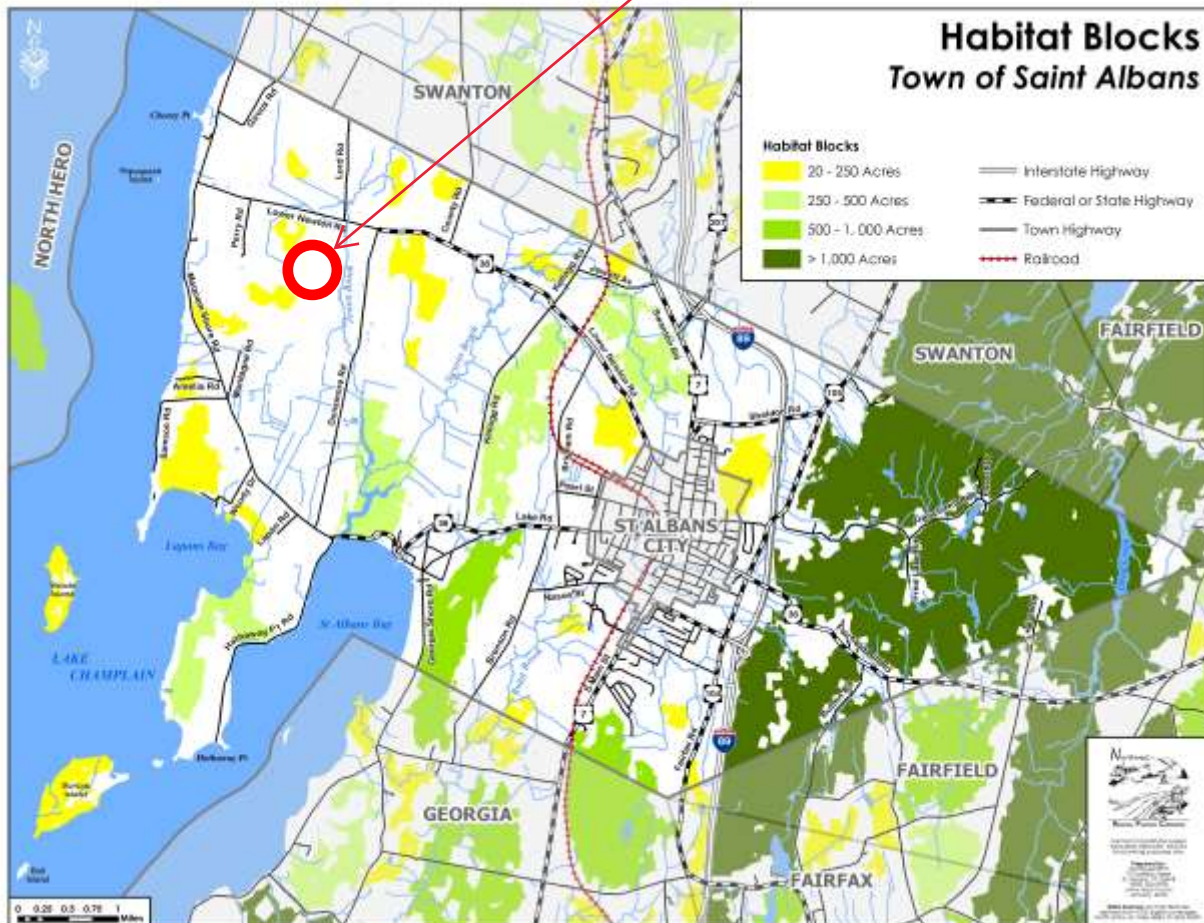
Policy: Protect and preserve scenic locations and scenic roads.

St. Albans is a scenic place. The Town’s working landscape and agricultural heritage with rolling fields, tree lines, and farm buildings are a critical component of this beauty. Lake Champlain figures prominently in the sweeping views from the hills on the east of Town, to the views along the lakeshore and the beauty of islands. St. Albans Bay’s natural beauty and historic village area also contribute to St. Albans Town’s sense of place.

The Town should work to specifically identify scenic locations and scenic roads in St. Albans in the future. The Town should then decide if there should be regulatory protection of the identified scenic locations and scenic roads.

Map 5.3 – Town of St. Albans Habitat Blocks

Approximate
Project Location



Policy: Regulate natural resource extraction to ensure extraction does not have an undue adverse effect upon the environment or upon the surrounding homes and neighborhoods.

There are little to no known underground natural resources in St. Albans that have commercial value. Any future natural resource extraction or processing shall be regulated to meet this policy. In addition, any proposal shall include a plan for the rehabilitation of the site at the conclusion of extraction or processing activities.

8. ENERGY

Energy is needed to heat homes, operate transportation systems, and utilize the appliances and electronic devices that we rely on daily. Vermont has established ambitious energy goals that focus not only on the development of new, local energy resources, but also on conservation of energy and the transition away from traditional fossil fuel use. St. Albans supports these goals and the transition to a self-reliant, efficient, and affordable energy future.

Figure 9.1 - Energy vs. Electricity

Energy is a term used in this chapter to encompass all types of power used to conduct work.

Electricity is a form of **energy** resulting from the existence of charged particles either statically as an accumulation of charge or dynamically as a current.

8.1 Goal - Aid the State of Vermont in achieving the goals of the Vermont Comprehensive Energy Plan to have 90% of total energy needs in Vermont supplied by sustainable energy sources by 2050.

The Vermont Department of Public Service created the Vermont Comprehensive Energy Plan in 2016. This plan discusses all aspects of energy use in the state and provides strategies for reducing energy demand, transitioning alternative, sustainable fuels, and ensuring affordable energy costs. St. Albans supports the general goals of this plan.

Policy: St. Albans supports the development and siting of sustainable energy resources in our community that are in conformance with this plan. Development of generation in identified preferred locations shall be favored over the development of other sites.

Development of new sustainable energy sources, most notably renewable electricity sources will be essential to meeting the goals of the Comprehensive Energy Plan. St. Albans is home to 4.8 MW of sustainable electricity generation capacity as of November 2017 (Table 8.1).

Energy – Statutory Goals and Elements

Planning Goals – 24 V.S.A. 4302

(4) To provide for safe, convenient, economic and energy efficient transportation systems that respect the integrity of the natural environment, including public transit options and paths for pedestrians and bicyclers.

(7) To make efficient use of energy, provide for the development of renewable energy resources, and reduce emissions of greenhouse gases.

(A) General strategies for achieving these goals include increasing the energy efficiency of new and existing buildings; identifying areas suitable for renewable energy generation; encouraging the use and development of renewable or lower emission energy sources for electricity, heat, and transportation; and reducing transportation energy demand and single occupancy vehicle use.

(B) Specific strategies and recommendations for achieving these goals are identified in the State energy plans prepared under 30 V.S.A. §§ 202 and 202b.

Plan Elements – 24 V.S.A. 4382

(9) An energy plan, including an analysis of energy resources, needs, scarcities, costs and problems within the municipality, a statement of policy on the conservation of energy, including programs, such as thermal integrity standards for buildings, to implement that policy, a statement of policy on the development of renewable energy resources, a statement of policy on patterns and densities of land use likely to result in conservation of energy.

St. Albans generally supports the development of new sustainable energy sources. The Town intends to develop a municipal “enhanced energy plan,” as enabled in 24 V.S.A. 4352 in the near future to clearly explain community preferences regarding the type, location, and scale of sustainable energy generation facilities. The Town does support net-metering projects for local citizens and businesses, especially rooftop solar net-metering. In the near future, the Town intends to develop a screening ordinance for ground-mounted solar facilities as enabled by 24 V.S.A. 4414. The ordinance will ensure that future solar facilities are located and properly screened from roads and adjacent land.

Table 8.1 - Existing Sustainable Electricity Generation Facilities within St. Albans (Nov 2017)

Resource	MW	MWh (approximate)
Solar	4.49	1,226.40
Wind	0.01	3,066.00
Hydro	0.00	0.00
Biomass	0.30	3,504.00
Other	0.00	0.00
Total Existing Generation	4.80	5,353.24
Source: Vermont Department of Public Service and Energy Information Administration		

It is difficult to accurately estimate future sustainable electricity needs on a municipal level. The most straightforward method is to use data from the Vermont Comprehensive Energy Plan and disaggregate data to a municipal level. NRPC used this method and provided a rough estimate for future sustainable electricity needs for town in the 2017 Regional Energy Plan. Future electricity needs for St. Albans were estimated to be approximately 23,000 MWh in 2050. This is about 5 times the amount of current sustainable electricity generation in St. Albans.

Table 8.2 - New Sustainable Electricity Generation Target

	2025	2035	2050
Total Sustainable Generation Target (in MWh)	7,524.9 3	15,049.8 6	22,802.8 2
Source: Northwest Regional Planning Commission			

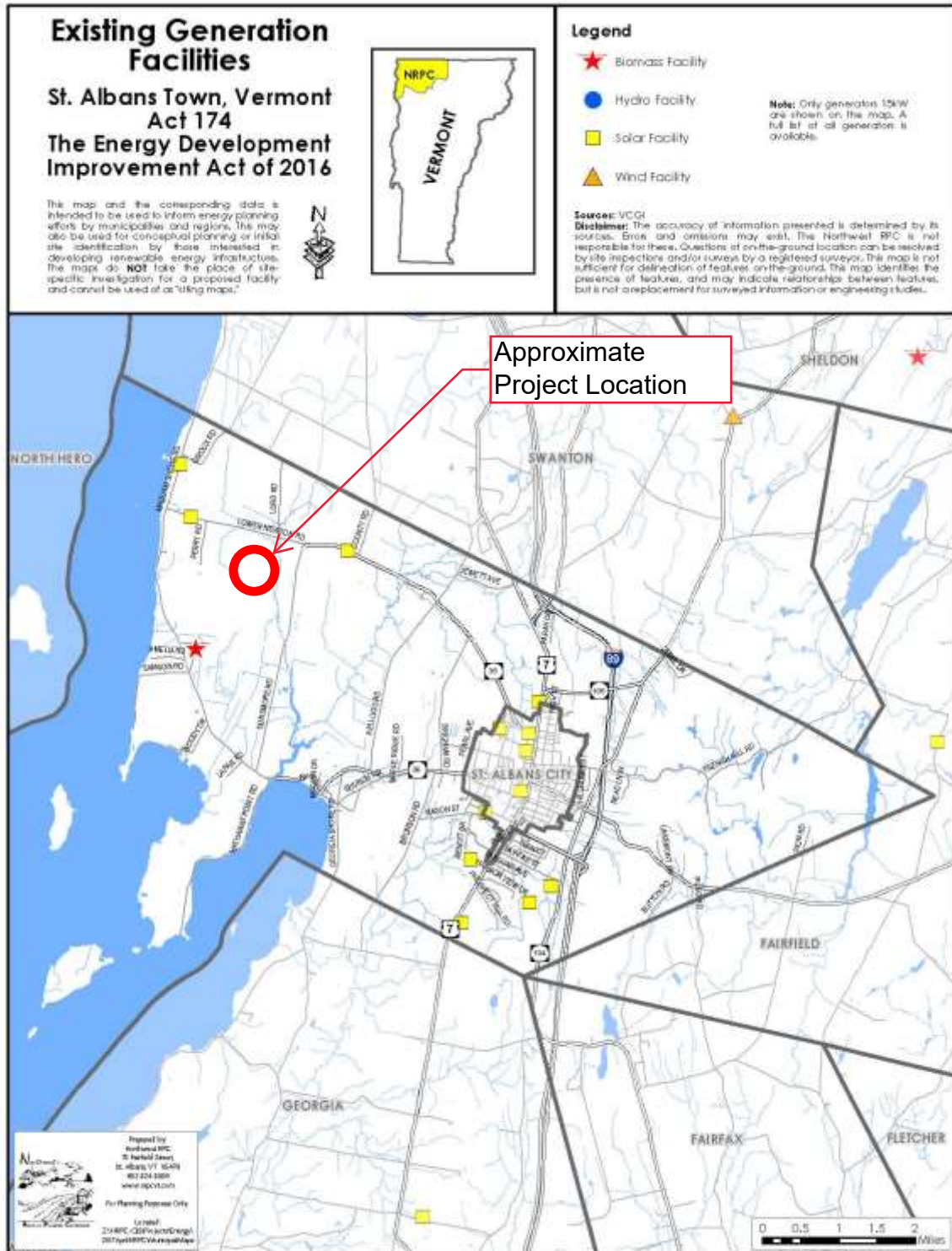
8.2 Goal - Make efficient use of energy, provide for the development of sustainable energy sources, and reduce emissions of greenhouse gases.

Policy: St. Albans supports energy conservation efforts and the efficient use of energy across all sectors.

Energy conservation efforts reduce energy costs and the volume of use. This in turn will reduce reliance on external energy sources from abroad and keep money spent on energy cost local. Tables 8.3, 8.4, and 8.5 estimate the current thermal, transportation, and electricity energy use and costs in St. Albans. This serves as baseline by which to measure future energy use, costs, and savings.

Source: American Community Survey 2011-2015, VT Agency of Transportation, and Northwest Regional Planning Commission

Map 8.2 - Existing Sustainable Electricity Generation Facilities



10.5 Goal – Verify results and implementation the St. Albans Stormwater Management Plan.

Policy: Stewardship – St. Albans will with State and Federal government entities, whom are ultimately responsible for protecting our local waterways, strive to keep local waterways free and clear of contamination.

Quality of life and our local economy are linked to water quality in Lake Champlain. In recognizing this, the Town will strive to become a sustainable community of citizens and businesses motivated to conserve and enhance natural resources through policies, programs, and outreach activities. The Town's stewardship objective is intended to create long-term environmental benefits, to conserve natural resources, and aid the local economy.

Policy: St. Albans will develop and adopt a protocol for addressing potentially hazardous land use activities in the MS4 areas. The goal of this policy is to address potentially hazardous land use activities could contribute to watershed contamination and pose a potential risk or potential of becoming a public nuisance. The Town's strategy will identify risks and encourage the landowner or operator to develop, implement, and monitor best management practices to assure good stewardship and reduce risk of contamination.

Policy: St. Albans will develop and adopt protocols for addressing potentially adverse stormwater activities in the MS4 areas.

Policy: St. Albans will continue to omit wetlands, hydric soils, and flood prone areas from consideration as locations for stormwater retention and mitigation facilities.

Policy: St. Albans will encourage smart use of phosphorous fertilizer with soil testing prior to application. Phosphorous loading is the number one threat to the health and stability of Lake Champlain. The primary sources of phosphorous are from fecal matter, fertilizers, and erosion of previously contaminated soil. For many years the Town has committed to using phosphorous-free fertilizers on Town-owned land in an effort to minimize the amount of phosphorous that enters our waterways. In 2012, Vermont banned the use of phosphorus fertilizer on lawns.

10.6 Goal – Maintain the current level of protection within the Unified Development Bylaws for areas within the 100-year floodplains and within the state's defined River Corridors.

Our Unified Development Bylaws contain a Flood Hazard Overlay district. The purpose of the Flood Hazard Overlay is to assure compliance with the minimum National Flood Insurance Program standards, which limits increases in flood damage caused by development in the flood hazard areas, to minimize future public and private losses due to floods, and promotes the public health, safety, and general. The flood hazard Overlay overlaps other zoning districts and requires specific development and construction criteria designed to maintain and improve flood resiliency and further protect state designated River Corridors.

Policy: Encourage a flood resilient community by avoiding new development in the flood hazard and river corridor protection areas combined with protection and restoration of flood attenuation areas and engaging in flood emergency preparedness and response measures.

Policy: Engage in planning efforts to implement flood resiliency along with annually readopting our Local Emergency Operations Plan to address and meet the requirements of state law.

Policy: Maintain the Conservation District with our Unified Development Bylaws as an area that helps protect and restore floodplains, upland forestland, and to meet the requirements of state law.

13. IMPLEMENTATION OF THE PLAN

The St. Albans Town Plan is a living document. St. Albans should be actively using this plan to guide the planning process and enhance decision making. Each chapter has at least one goal and several policy recommendations to fulfill the goal. Some of these will require updating of our ordinances; some are through capital improvements, and some can be accomplished as part of the annual Town budget. All require communication amongst the various constituents and by doing so we will raise public awareness and advance these ideas so they will help St. Albans flourish.

St. Albans is fortunate to have a large number of actively engaged citizens that are eager to make St. Albans an even better place to live. To that end, the Planning Commission will take on the task of evaluating and prioritizing Town Plan goals and policy recommendations. In some cases the Selectboard may create new committees, if one does not already exist, to further reach to goals and policy recommendations in the Town Plan. All meetings will adhere to the open meeting law and minutes will be kept and made public.

13.1 Priority Goals

A goal has been selected from each chapter in the Town Plan, which is listed below to be targeted as a priority. The intent is to draw upon community members that are already in place to help prioritize and implement this plan. The Planning Commission will be charged with overseeing and coordinating this effort. The Chair of the Planning Commission will meet with the Chair of the Selectboard each year in April to determine if the Selectboard would like periodic updates of specific activities of the Planning Commission and to establish a schedule. This is an 8-year plan, so there will be updates several times each year delineating progress and allowing for discussion about the management of planning and implementation process. At those meetings, discussions will be held on this Plan's conformity, address subsequent questions, permit citizens to express concerns about the Plan's implementation, and suggest changes with implementation.

Land Use: Continue to encourage new development in a manner that will promote the public health, safety, prosperity, convenience, efficiency, and the economy of St. Albans.

Transportation: Develop a comprehensive approach to our transportation system that emphasizes the safe and efficient movement of people and goods utilizing a variety of transportation modes that includes public transit, sidewalks, bikeways, multi-use paths, in addition to the movement of cars and trucks along our roads and highways.

Scenic and Natural Resources: Identify, protect, preserve, and transform important natural and scenic features of St. Albans' landscape.

Housing: Facilitate a diverse range of residential dwellings that provide safe and affordable housing for all residents with ownership opportunities for low and moderate income people.

Facilities, Utilities, and Services: Plan for, finance, and provide an efficient system of public facilities and services to meet future needs use.

Energy: Make efficient use of energy, provide for the development of sustainable energy sources, and reduce emissions of greenhouse gases.

Education: Provide a high quality education for students of all ages that creates productive and responsible citizens in cooperation with the Maple Run Unified School District and other local education stakeholders.

Stormwater Management and Flood Resiliency: Operate as an MS4 within the framework established by the Clean Water Act, under the General Permit 3-9014 issued by the State of Vermont.

Recreation: Continue to provide access to high quality recreational facilities, parks, and beaches.

13.2 Coordination and Staffing

The process of good local planning with public involvement is the most important thing and we hope to achieve this through this implementation of this Town Plan. The Planning Commission will periodically review the Implementation actions of the Town Plan and make recommendations to the Selectboard and Town Manager on programs and projects necessary for effective plan implementation.

13.3 Policy Recommendations

The Town of St. Albans should implement goals and policy recommendations found in the 2020 Town Plan to achieve the vision of the community.