starksboro town plan

2018 - 2026

As Adopted by the Starksboro Selectboard
[date]

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1. introduction

1.1. TOWN OVERVIEW

Starksboro, Vermont is a town of 45 square miles and around 1,800 residents located in the northeastern corner of Addison County. It adjoins the towns of Bristol, Lincoln and Monkton in Addison County, as well as Hinesburg and Huntington in Chittenden County.

Starksboro is located in the western foothills of the Green Mountains and is characterized by its terrain, which ranges from 372 to 2,500 feet above sea level. Hogback Mountain, a north-south ridge that defines the town's western border, slopes sharply into the Lewis Creek Valley. The valley is recognized for its high quality agricultural soils and the scenic views of the surrounding hills and ridges visible beyond the fields and pastures. From the valley eastward, the land rises by a series of gradually ascending hills to another significant ridgeline, East Mountain. That north-south ridgeline extends in a broken, irregular manner nearly the whole length of the town, sloping steeply on the east towards the Huntington River, which flows for a short distance in Starksboro. Most of the town drains to the Lewis Creek, which has its source in the Hillsboro Mountain and Ireland Road area and flows north through the western parts of Starksboro ultimately emptying into Lake Champlain. Numerous small streams, tributaries of Lewis Creek, flow out of Starksboro's hillsides.

Those streams and the rugged terrain have shaped the town's settlement pattern and transportation system. Starksboro Village, the traditional town center, is located in the Lewis Creek Valley, along the town's main north-south highway, now Vermont Route 116. High above the valley in the southeastern part of town, known as South Starksboro, the historic hamlet of Jerusalem developed along one of the few east-west crossings over the Green Mountains, now Vermont Route 17. Several town roads wind their way eastward from the valley up into the town's higher elevations following the narrow stream valleys. The hill farms once scattered along these roads have largely disappeared, replaced in recent decades by rural residences. Large areas of the town's uplands remain inaccessible by vehicle, creating large tracts of undisturbed forestland.

We envision our town remaining largely as it is today. It is our hope that the future Starksboro will remain recognizable to current residents and that the best parts will be preserved.

1.2. VISION STATEMENT

Starksboro's collective vision is to maintain our town's environmental quality, scenic beauty, diverse working landscapes, rural character, sense of community and quality of life. It is our hope that the future Starksboro will remain recognizable to current residents – that the best parts will be preserved. While most residents want to maintain our town largely as it exists today, we recognize that change is an ongoing and necessary process. We should strive to properly manage that change, so that it will be beneficial to individual residents and the community as a whole.

In future decades, we hope agriculture becomes an increasingly vital and economically viable enterprise, which can support farmers and their families. We want our town to move

towards greater sustainability – producing food and energy locally. We would like our economy to expand – providing more jobs in town in a diversity of small businesses, which are built on our natural and human assets.

To maintain productive working lands, we will need to find ways to live in carefully planned, compact neighborhoods that are compatible with their surroundings. We want Starksboro to continue to be a place where someone can live and be an active citizen for their entire life. We will need homes and services that meet the needs of residents of all ages. We should build upon our strong tradition of volunteerism and looking out for our neighbors to ensure that Starksboro will become an even more close-knit community than it is today, and one that encourages respectful civic participation and pride.

Finally, Starksboro residents will continue to place a high value on the town's natural resources. We want future generations to enjoy the healthy environment, connection to nature, and scenic beauty we often take for granted. We should increase understanding and appreciation of our wildlife populations and their habitat needs. We want there to be clean air and water, productive fields and forests, and abundant wildlife, so we need to carefully consider our choices and their effects on the natural systems around us. We envision water, air, soil, forest and wildlife resources being used wisely and residents acting in ways that will sustain these resources for the use and enjoyment of current and future generations.

1.3. GENERAL GOALS

G1 Maintain the land base needed to support environmentally sustainable and economically viable farming and forestry in town, thus preserving our rural way of life.

G2 Preserve the interrelated values of community, neighborliness, independence, and privacy essential to Starksboro's small-town character.

G3 Guide the land use and development of the town to protect the health of the natural environment and the scenic landscape around us.

G4 Guide the land use and development of the town to help protect the long-term interests of the community, while minimizing infringements on individual rights.

G5 Restrain rapid, large-scale or otherwise inappropriate growth that would negatively affect Starksboro's fiscal condition, environmental quality, and/or rural character.

G6 Protect and enhance the natural resources of the town for the health, safety, and enjoyment of all residents, current and future.

G7 Protect the health of residents through the maintenance of a clean environment, and safe and adequate water supply.

G8 Mitigate, the impacts of development on clean water, clean air, soils, forests and wildlife to the extent possible.

G9 Support our working landscapes – farms, forests and sugar bushes – and the livelihoods of residents who make their living off the land.

G10 Support the stewardship of natural resources in ways that do not degrade the resource.

2. about the plan

2.1. PLANNING IN STARKSBORO

2.1.01 Authority

Starksboro has the authority under the Vermont Planning and Development Act, Title 24 V.S.A., Chapter 117, to adopt a town plan. The town plan must be consistent with the 13 state planning goals and include the 12 required elements enumerated in statute. State law requires the town to review, update, and readopt our town plan at least every eight years. The Starksboro Planning Commission has reviewed the town's conditions and facilities, and has stated its public goals and objectives in the following 2018 Town Plan.

This plan presents a vision for the town's future, and a series of recommendations for achieving that vision. It is intended that this plan guide the town's efforts in land use planning, the provision of public facilities and services, environmental protection, economic development and land conservation. This plan will be implemented through town ordinances and regulations, town participation in state and federal regulatory processes, and the town's approach to raising and spending public funds.

2.1.02 Purpose of the Plan

This Town Plan is the Town of Starksboro's principal policy statement. A town plan should state the town's aims in terms broad enough to allow application to a wide range of situations, yet with sufficient detail to serve as a strong foundation for land use regulations and other implementation tools. The plan should allow for flexibility and creativity in its application in order to achieve an appropriate balance between competing objectives. The plan is not regulatory in nature, but it serves a number of important purposes in various regulatory and judicial processes.

To be valid, the town's land use regulations require the policy and data foundation of a town plan. Land use regulations must be in conformance with the town plan, which is defined in statute as:

- Making progress toward attaining, or at least not interfering with, the goals and policies contained in the town plan.
- Providing for proposed future land uses, densities, and intensities of development contained in the town plan.
- Carrying out, as applicable, any specific proposals for community facilities, or other proposed actions contained in the town plan.

The courts will look to the town plan if any provisions of the regulations or other related municipal action is legally challenged. The plan is also the foundation for other implementation tools such as a capital budget, permit phasing or impact fees. Indeed, such mechanisms cannot be adopted without a current plan and they must be consistent with the provisions of the plan. The plan will also be considered by the Addison County Regional Planning Commission and the District Environmental Commission in the course of regional and state planning activities: including regional plans, public good determinations, state subdivision permits and Act 250 permits.

2.1.03 How to Read the Plan

Residents of Starksboro are urged to read and consider this plan carefully, giving thought to goals, objectives and policies that contribute to protecting and preserving Starksboro's valuable resources while guiding a gradual and diversified growth pattern. Without a comprehensive Town Plan and effective land use regulations, uncontrolled development may overwhelm the town.

2.1.04 History of the Plan

Starksboro's long-term planning efforts, initiated in the late 1980s, have been effective in guiding growth and development in such a way as to preserve valuable natural and economic resources while balancing the rights of individuals. In accordance with state law, town plans must be reviewed, revised as needed, and readopted every eight (formerly five) years. Thus, Starksboro's plan has been updated multiple times since it was initially adopted.

2.1.05 Public Participation

Planning is a continuous activity and the Town Plan is an evolving document that should reflect the goals and vision of Starksboro's residents as that vision changes over time. The Planning Commission, Selectboard and numerous citizens who have participated in town planning activities over the years have contributed time and energy to the goal of creating a document that clearly expresses the wishes of the community. This most recent town plan update included public participation including a public opinion survey and a community planning workshop.

The Planning Commission encourages all residents who value the unique characteristics of our town to participate in planning activities to help effectively guide future change and ensure that the rural beauty and diversity of our town is preserved for the enjoyment of future generations.

2.2. COMPATIBILITY AND CONSISTENCY

2.2.01 Strategies

S1 Improve communication and coordination with adjoining municipalities regarding land use and planning for future growth.

S2 Work with adjoining towns to develop transportation strategies that minimize traffic, air, water and noise pollution, which are energy efficient, appealing and serviceable for the region's people.

S3 Work with adjoining towns to develop wildlife corridors that maintain and enhance wildlife habitat and which preserve wildlife migration routes.

S4 Work with adjoining towns to develop recreational corridors for enjoyment of the regions agricultural and forested landscape.

S5 Collaborate with the neighboring towns to expand recreational opportunities for Starksboro's residents.

S6 Work with neighboring towns, organizations and state agencies to develop sustainable energy resources in the region and coordinate energy planning initiatives.

2.2.02 Discussion

There are five towns (Hinesburg, Huntington, Lincoln, Bristol, and Monkton) and one gore (Buels Gore) adjoining the Town of Starksboro.

At this time, it appears the Monkton, Huntington, and a portion of Hinesburg's land use plans and zoning have similar intent as Starksboro's in that they propose to direct development toward existing higher density areas in their existing villages. Their minimum lot sizes once away from the roads, however, are smaller than Starksboro's 25-acre minimum lot size. The portion of Hinesburg west of Route 116 is zoned as 10-acre residential, and the portion immediately east of Route 116 (within 4,300 feet) is zoned industrial. Bristol and Lincoln currently see mostly residential use on their boundaries with Starksboro, though, both allow at least some form of commercial as conditional uses.

The Addison County Regional Plan adopts municipality's land use designations as its own, thus it would be difficult to be in conflict with the region in this area. Additionally, the regional plan supports preservation of the working landscape and continuation of historic settlement patterns. There are no conflicts with the goals of the Regional Plan.

3. about starksboro

3.1. NATURAL SETTING

Natural systems are the basis for life. Starksboro's natural environment is composed of a rich and diverse mix of resources. Our use of these resources sustains us; we, in turn, must ensure that we use these resources in a manner that preserves their value both to us and to future generations. The continued viability of the town's natural resources and working landscape is dependent upon our individual and collective acts of responsible stewardship.

Some of the impacts to these resources are beyond our local control. We can do little to stop acid rain or climate change, prevent damaging insect infestations or invasive species, or improve air quality. We can, however, take prudent steps to control the impacts that are directly related to our living here. Many of these steps involve personal choice – driving fewer miles, insulating our houses, supporting local farms and farmers, promoting wise use of our resources. Individually, we must be good stewards. It is our responsibility to use resources wisely and town actions can help to inform that use by encouraging good behavior.

3.1.01 Climate

Starksboro has a climate that is highly variable with wide-ranging temperatures (both daily and annually) and great differences between the same seasons from year to year. A large number of low-pressure storm systems and fronts pass over or near Vermont and the Green Mountains have a strong effect on precipitation.

July is usually the warmest month in Starksboro with an average high temperature around 77°F and January is usually the coldest with an average low temperature of 6°F. High and low temperatures around town vary noticeably based on elevation. We receive approximately 42 inches of precipitation annually with an average of 2 to 5 inches of precipitation per month. The growing season has historically been around 120 days long with the last frost likely during the last two weeks of May. The first frost usually occurs during the last two weeks of September – again with variation based on elevation.

Globally, 16 out of the 17 warmest years in the modern meteorological record have occurred since 2001. Since 1970, the average annual temperature in the Northeast has increased by 2°F, with winter average temperatures rising by 4°F. The average annual temperature in Vermont is projected to increase another 3-4°F by 2050 and anywhere from 5-10°F by the end of this century. Warming is resulting in many climate-related changes including:

- More days each year with temperatures above 90°F.
- A longer growing season.
- More storms with heavy precipitation.
- Less snow and more rain in the winter.
- Reduced snow pack and ice on lakes and rivers some winters.
- Earlier spring snow melt and break-up of ice.

Changes in average temperatures are of particular concern in Starksboro, where maple production is a major component of the local economy. Climate change is affecting the timing and duration of sugar season. According to the Proctor Maple Research Center, the Vermont maple sugaring season on average starts 8 days earlier and ends 11 days earlier than it did 50 years ago.

3.1.02 Air Quality

Generally, air quality throughout Vermont is very good. Given the relative lack of heavy industry in Vermont, the transportation sector is responsible for most of our air quality issues, and locations with heavy traffic and congestion are the most likely to have reduced air quality. Overall air quality in Starksboro is excellent and unlikely to degrade significantly in the foreseeable future. There is the potential for localized air quality concerns such as:

- Emissions from vehicles idling or waiting in traffic, which can be addressed through 'no idling' policies in high traffic areas like the school. State law prohibits idling for more than five minutes in a 60-minute period (with exceptions).
- Emissions from heating systems, which can be addressed by operating heating systems properly, burning only the fuels the system is designed for, maintaining the system as recommended, and replacing old, inefficient models.
- Dust generated from dirt roads, agricultural activities, construction sites or extraction operations, which can be addressed through simple measures like good road maintenance, covering loads, watering or using dust inhibitors on haul roads and at construction sites, and following required agricultural practices.

3.1.03 Terrain

The open fields of the Champlain Valley and the forested slopes of the Green Mountains meet abruptly in Starksboro. The terrain has directly shaped our town's history and development pattern. Steep slopes and substantial changes in elevation are a common feature in Starksboro. The highest point in town is more than 2,000 feet above the lowest point in town.

Rugged terrain and steep slopes significantly affect our ability to travel from one area of town to another and affect where development is feasible or desirable. High elevations and steep slopes are fragile environments that are easily damaged by human activities. Clearing natural vegetation, disturbing soil or altering natural grades can result in erosion and run-off that can reduce water quality and damage property downslope.

The USDA Natural Resource Conservation Service has established slope categories and described the constraints and management requirements associated with each as summarized below:

- Slopes in excess of 25% are generally not suitable for development or widespread clearing for farming and forestry. Any disturbance of these severely steep slopes is discouraged and will require careful attention to erosion control and stormwater management.
- Slopes from 15-25% are generally poorly suited for development. Use of these lands for farming or forestry will require special consideration and best management

practices to conserve soil and minimize erosion. Any disturbance of these moderately steep slopes will require specific measures to control erosion and manage stormwater.

- Slopes from 8-15% can generally accommodate development. Disturbance of these slight slopes may still require measures to control erosion and manage stormwater.
- Slopes of less than 8% generally do not pose any particular development constraints due to the slope itself, although level land (<3% slope) may be poorly drained and prone to ponding.

The steeper the slope, the larger the area of disturbance has to be to accommodate the development footprint. The cost of development generally increases as slope and elevation increases, as does the ongoing cost of providing services to what are often remote areas. It is challenging to provide adequate access for emergency and service vehicles to development on steep slopes or at high elevations. Additionally, development on higher elevations is typically more visible than downslope development as high elevations and ridgelines are frequently visible from many locations.

While land above 2,500 feet receives a higher level of protection under state law, Starksboro's highest areas are just below that elevation. Much more of our land is located on steep slopes than is located at high elevation.

3.1.04 Geology

Bedrock is the most basic component of our environment. The bedrock underlying Starksboro consists primarily of metamorphic rocks such as schist, phyllite, gneiss and quartzite. Fragments of calcareous materials that formed under an ancient ocean are common.

The Green Mountains formed millions of years ago and have eroded to a fraction of their original height. The landscape we know today was significantly shaped by the advance and retreat of glaciers during the last Ice Age. The ice scraped and rounded the Green Mountains, widening the valleys and carving gaps through the mountains. The melting glacier left rocks and gravel covering the ground. This layer of glacial till covers our landscape, except for areas of exposed bedrock. The valley floors contain sediments, including sand and gravel, deposited under glacial lakes 10,000 or more years ago.

3.1.05 Soils

Because of their importance to our ability to grow crops, develop land, and obtain raw materials, soils are better understood and documented than many other components of our natural environment. The USDA Natural Resource Conservation Service (NRCS) maintains county soil surveys that map and inventory soils. The NRCS reports describe the characteristics of each soil type and its suitability for various uses. Section 3.4.01 includes further discussion of soil productivity for farming and forestry, and Section 3.4.02 includes a further discussion of mineral resources.

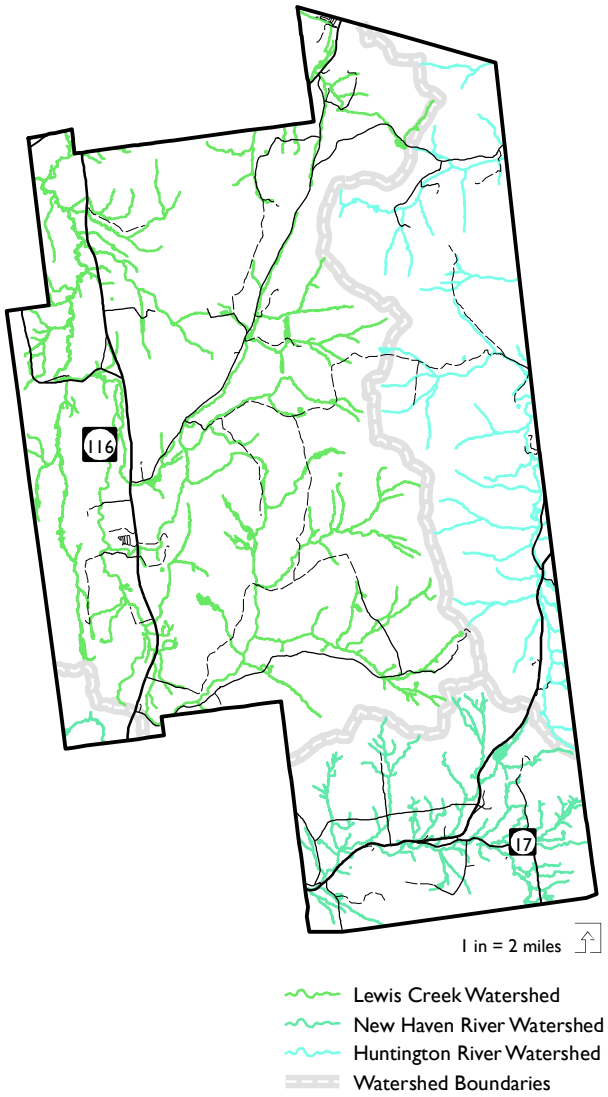
Soil conditions play a critical role in determining the location and intensity of development in Starksboro. In addition to their suitability for supporting roads and structures, soils must be suitable for septic systems. There is no municipal sewer service in Starksboro and

all development relies upon on-site septic systems for waste disposal. Approximately 12% of soils in town are moderately suited to treat wastewater and 60% are marginally suited, which means that most landowners will need to build septic systems that may be more technologically advanced, more expensive, and require more land than a basic conventional in-ground system.

Since 2007, a state wastewater system and potable water supply permit has been required for every new lot and most new construction. The state wastewater rules assert a strong influence over development. Changes to the rules in the 2000s created more opportunity to develop marginal land and eliminated the incentive for new house lots to be more than 10 acres in size. With evolving technology and other regulatory changes, we can no longer rely upon the state wastewater rules as a default means of managing land use and growth in Starksboro.

The state regulations also create incentives for community wastewater systems – private, in-ground septic systems that would serve two or more properties. Community systems can promote more compact development patterns with buildings being clustered in order to share common infrastructure. They also allow owners to more efficiently use smaller pockets of good soils to provide wastewater treatment for multiple properties.

Figure. 1 Surface Water Map



3.1.06 Water Resources

Surface Water. The term "surface water" refers to moving or standing water that is above ground. Surface water and groundwater are linked, each flowing to the other. Watersheds are the catchment areas through which water flows into streams of increasing size. Starksboro is part of three watersheds, the primary one being the Lewis Creek Watershed. Portions of southern Starksboro are in the New Haven River Watershed and parts of eastern Starksboro are in the Huntington River Watershed.

When the lands within watersheds are managed to reduce erosion and pollution—and to maintain tree cover — surface waters generally stay healthier for wildlife, swimming, and fishing. The forested land in town lies high above the valley floor with steep slopes and limited road access. The stewardship of these forests has important implications for the water quality of the Lewis Creek Watershed and beyond.

The Great Falls of Lewis Creek and the Seven Falls of the Huntington River are designated as important natural scenic areas in Starksboro. The Seven Falls of the Huntington River are a series of waterfalls cutting through rocks where potholes are forming. They are located in Starksboro near the Huntington Town line. Starksboro is also home to a variety of wetlands and ponds.

Partners in Water Quality. There are several organizations that partner to help preserve and improve surface water quality in Starksboro. The Lewis Creek Association monitors stations on the river, including several in Starksboro, in order to understand water quality fluctuations. The organization also educates students and regularly produces reports on water quality in the creek including:

- E. coli, one measure of potentially harmful pathogens in the water;
- Phosphorous, an indicator of nutrient imbalance in water;
- Nitrogen, a nutrient which can damage ecological integrity even with small increases; and
- Turbidity.

Excessive nutrients and turbidity in surface water can create algal blooms that disrupt healthy aquatic ecosystems by diminishing oxygen levels, lowering diversity of macro-invertebrate life, thereby having negative impacts on fisheries and other aquatic species.

The Lewis Creek Association is part of the Addison County Riverwatch Collaborative, which pools resources among different watersheds in the county in order to carry out river water quality monitoring and reporting. Other organizations including the U.S. Fish and Wildlife Service and the Natural Resources Conservation Service (also a federal agency) have collaborated with Starksboro farmers, the town and the river monitoring groups to implement river buffer tree plantings and fence improvements to keep cows out of streams.

Lewis Creek Monitoring. Years of monitoring data at four different monitoring points on Lewis Creek within Starksboro have revealed some discernible patterns. The data shows that in Starksboro's hilly terrain Lewis Creek is a "flashy stream," meaning it is prone to rapid fluctuations in water level due to the steep topography of our uplands. Small tributaries such as Hogback Brook, High Knob Brook, and other upland tributaries running down from the hills gain speed. When these swift waters meet the agricultural soils of the Lewis Creek Valley erosion and bank failure can occur. In addition to the loss of valuable land and threats to property, this causes nutrient loading in the water column – a major threat to Lake Champlain.

Flood and Erosion Hazards. Of all the hazards in Vermont, flooding is the most frequent, damaging, and costly. Starksboro has adopted Flood Hazard Area regulations and works to limit development within floodplains as identified by the Federal Emergency Management Agency. The Flood Hazard Area is the 100-year floodplain, which includes all areas determined to have a one percent chance of being flooded in any given year.

In addition to the danger from inundation, a river causes erosion, deposition, and sediment transport. Flowing water is always moving the land that it flows over, through, and around. Rivers and streams flow in channels that change over the seasons and years. Rivers continuously adjust their position in the landscape, both vertically and laterally, in an attempt to optimize their slope and channel dimensions to efficiently carry the water

and sediment loads supplied from the upstream watershed. The science of the interaction between rivers and landform is known as fluvial geomorphology.

State and federal agencies over the past decades have become increasingly concerned and aware of fluvial geomorphology and how it affects river health, humans, and the built environment. There has been an effort in Vermont, including some projects in Starksboro, to understand and restore some of the natural and beneficial fluvial characteristics of our streams and rivers. There has also been a recognition that fluvial erosion (stream bank erosion and moving stream channels) is causing more damage and is more of a hazard than inundation flooding in most Vermont communities.

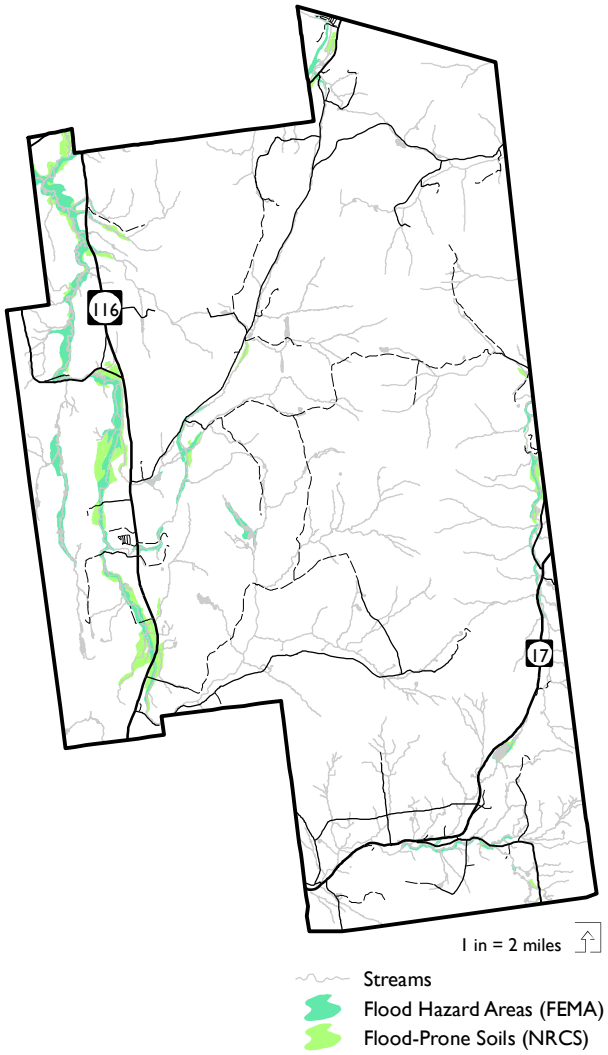
Fortunately, the present degree of residential/commercial development along the Lewis Creek corridor is relatively minor and much of Starksboro's riparian areas remain forested. As of 1995, 72 percent of the town's riparian buffer was forested. Woody vegetation along streams provides many environmental services including root systems that stabilize soil and tree canopies that intercept rainfall. Starksboro implements a 50-foot setback from streams for most development, which was established largely to protect water quality. It is likely that this setback has also worked to prevent development within fluvial erosion hazard areas.

A proactive planning process can support the river's ability to move toward an equilibrium condition and reduce losses and expensive repairs in future flood events. Planning efforts can include "avoidance" strategies to ensure that new development does not:

- Further encroach on the river corridor.
- Reduce the sediment and flow attenuation functions of the floodplain area.
- Place infrastructure at risk.

A river corridor management area that acknowledges the dynamic nature of rivers and which is based on the geomorphic condition of the channel has advantages over a no-build setback from the river. Fluvial Erosion Hazard (FEH) zones are contained in the recently completed corridor plans for Lewis Creek and can inform the creation of appropriate setback zones. River channels vary in width along their length, depending on the size and nature of the upstream watershed draining to a given location, and the valley setting of the channel. A default setback is often inadequate and difficult to administer where a river is adjusting laterally at a rate of several feet per year.

Figure. 2 Flood Hazard & Flood-Prone Areas Map

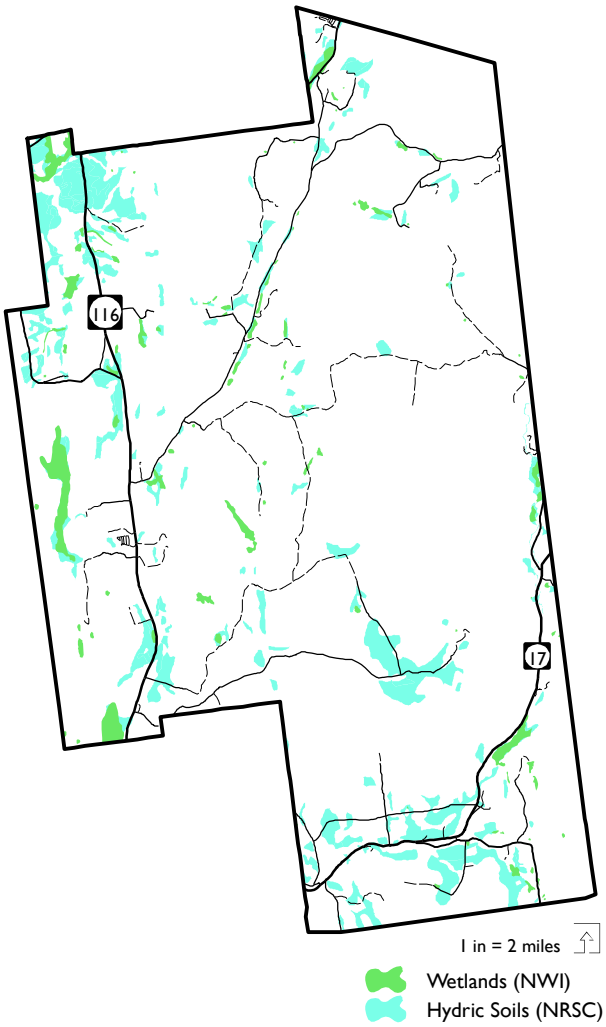


Stormwater Runoff. Stormwater runoff is the surge of energy that comes with a large amount of water running off the land's surface and potentially causing erosion in unvegetated and/or steep areas. Some studies show that in hilly and mountainous terrain, like Starksboro, management of stormwater runoff from roads is the most critical factor in reducing the impact of rain storms and spring melt-off. Some "Best Management Practices" for reducing stormwater runoff from roads include building settling ponds near culverts, and well-placed stone check dams and silt fences.

The Low Impact Development (LID) approach aims to retain the natural ability of any pre-development site to absorb water by capturing, detaining, and infiltrating precipitation. LID often uses a series of small-scale non-structural and structural practices linked together on the development site. For example, the development site can maintain native vegetation, incorporate rain gardens, and divert water from downspouts into planting beds.

As of 2018, Starksboro (and all other Vermont municipalities) will need to obtain a Municipal Roads General Permit from the state, which is intended to achieve significant reductions in stormwater-related erosion from town roads. This will require that our road drainage systems meet basic maintenance standards and that improvements are made to reduce erosion as necessary. Employing best practices to manage stormwater from private development and public roads will be essential to meet the requirements of our permit.

Figure. 3 Wetlands and Hydric Soils Map



Wetlands. Starksboro's numerous wetlands are a critical piece of the natural environment. Wetlands serve as storage areas for floodwater. They help cleanse water before it reaches groundwater or surface water bodies. Wetlands are prime habitat for a variety of plant and animal species. Wetlands often serve as groundwater recharge zones.

The Gazetteer and Business Directory of Addison County, Vermont for 1881-82 makes particular note of the large wetland called Big Beaver Meadows along what is now Route 17. This wetland remains a significant natural area. Today, moose, bear, otter, heron, geese, wood ducks and numerous other creatures are regular visitors to the Big Beaver Meadows. The area is unique in its proximity to the state highway, which provides travelers the opportunity to view numerous large and small birds and animals. The wetland is also a significant groundwater recharge area and watershed for streams flowing down from the mountains on either side of Route 17. A large wetland west of Lewis Creek is an occasional blue heron rookery and home to rare plant and animal communities.

3.1.07 Wildlife and Fisheries

Residents of Starksboro have expressed a strong desire to preserve the town's rich and varied wildlife populations. Black bear, whitetail deer, bobcat, moose, fisher, mink, fox, otter, snowshoe hare, great blue heron, wood turtle, and rainbow trout are just some of the species found in Starksboro. It is natural to think that what is here, will always remain. However, without a better understanding of the habitat needs of wildlife species, town residents could easily lose some of these neighbors that we assume will always be around.

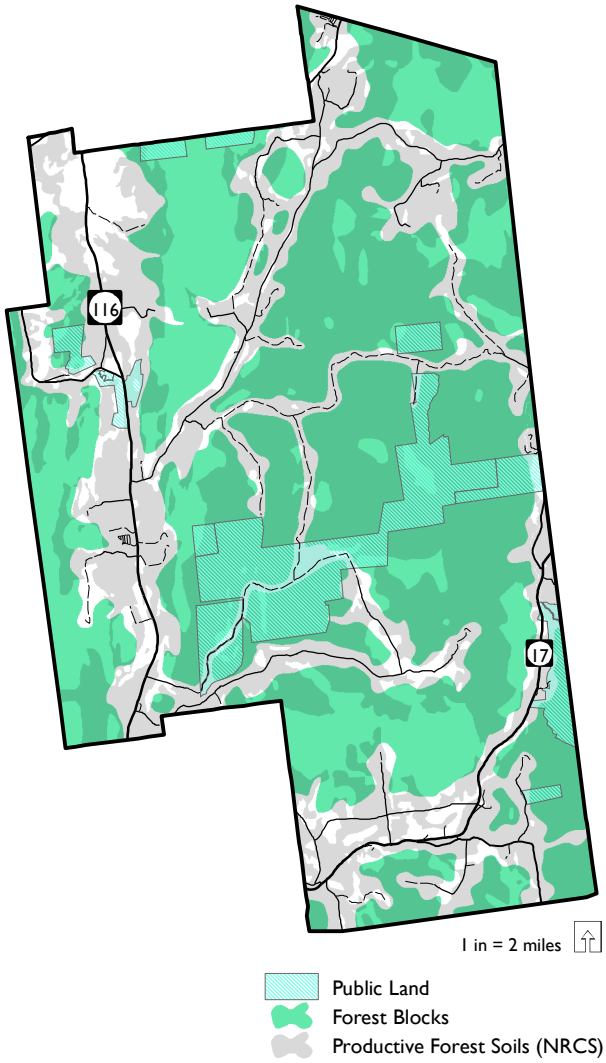
Starksboro's significant areas of largely unbroken forest provide habitat for many wildlife species vulnerable to development pressures. Two important reasons that wildlife is relatively abundant in Starksboro are:

- A diversity of habitats that are available to support a diversity of species and functions, and
- The town occupies a rich position in the landscape – an ecotone between the more open habitat in the Champlain Valley and the more remote habitat of the Green Mountains.

Wildlife habitat can be thought of as having landscape and "local" components. Landscape components include core and linkage habitat; while local components describe smaller, parcel-level features such as deer wintering areas or wetland—features with very specific functions. One important component of good wildlife planning is understanding the relationship between these elements.

Core Habitat. Core habitat can be described as large areas of contiguous forested land unbroken by human disturbances such as roads or development. Core forests mapped by the state have boundary buffers of at least 330 feet. Large areas of contiguous forest land are essential to the health and vitality of wildlife species. Many plant and animal species require a large and varied landscape to provide for feeding habitat, reproductive needs and genetic exchange. Deer wintering areas, often south-facing locations of mixed conifers, provide important shelter and feeding areas during times of deep snow. Deer wintering maps tend to be areas likely to be utilized by deer. However, these maps

Figure. 4 Forest Resources Map



have not been checked in many years. Mast stands of mature beech trees, ideally including some cherry or oak, are of primary importance to the black bear population, providing the necessary calories to prepare bears for the long Vermont winters. Equally as important to bear are the tubers and plants found in wetlands, especially in spring when little else is available and their reserves are severely depleted.

Core forest values are completely compatible with sustainable forest management practices, allowing for the need of an income producing, working landscape while ensuring that there will be healthy and productive forest land for future generations to enjoy.

Connecting Habitat. Travel "corridors" or connecting habitat is the land that links large or specialized habitat areas to one another, thereby facilitating the movement of wildlife to a variety of landscape features necessary for seasonal feeding, denning, and mating. Typically, travel corridors are found where dense forest, heavy shrub cover, or streams approach a road or other developed area from both sides, allowing for some sense of protection for the traveling species. By studying the movement patterns of wildlife species, we can identify key crossing points essential to the continued survival of our most valued species, and take steps to ensure that these critical corridors remain intact.

As we collect data and evidence from local residents and scientists pertaining to the basic needs and habits of our wild neighbors, we will be better equipped to make informed and well planned decisions regarding best practices for development. Public interest, input and awareness combined with scientific data collection, monitoring and study can help ensure that Starksboro maintains a rich and healthy balance of human and wildlife cohabitation.

Wildlife Management Areas. Lewis Creek Wildlife Management Area (WMA) is completely forested with aspen, paper and yellow birch, red and sugar maple, beech and hemlock. There are small acreages of old field and apple orchards. There are also several small streams and some limited area of wetland.

The Fred Johnson WMA is located partially in Starksboro. It is forested with a mix of hemlock, white pine, planted red pine, yellow, paper, black and grey birch, red and sugar maple, beech, white ash, red oak, and aspen.

3.2. HISTORIC CONTEXT

3.2.01 Formation and Early Settlement

Starksboro, chartered November 9, 1780 by the Republic of Vermont, was named in honor of Brigadier General John Stark. The first permanent settler, George Bidwell, along with Horace Kellogg received a deed of land in Starksboro on September 12, 1787. When the first United States Census was taken in 1791, the town as chartered, had nine families living within its bounds, for a total of 40 people. All settlement was in the Lewis Creek Valley.

3.2.02 Population Centers

Although Starksboro village on Route 116 is now commonly recognized as the town's primary center, in earlier times there were many other villages and hamlets:

- Brownsboro, named for the Brown family;

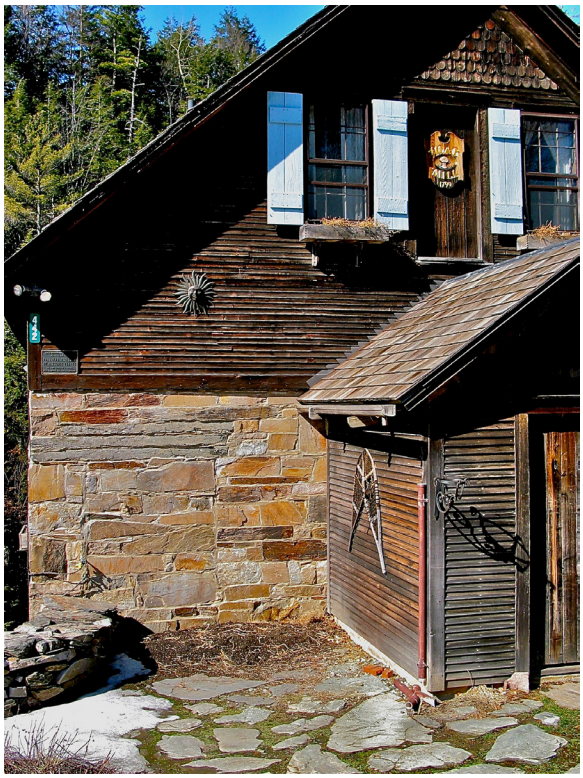
- Little Boston, a small industrial center located in the southern part of town where Route 116 now crosses Lewis Creek;
- Hillsboro, named for Samuel Hill who settled there from New Hampshire in 1805; and
- Jerusalem, the factories and hotel that used to be there are long gone. Located on a mountain road in the extreme southeastern part of town, it retains some of its individuality, with a small school, that closed in 1968, a cemetery, and cluster of houses.

Abundant water power was available in every section of town. As settlers continued to arrive, small industrial centers grew up in several areas. As early as 1797, mills were operated along Baldwin Brook in Starksboro village. By the early 1800s, the town was home to a variety of mills and manufacturers.

By 1860, the town had a record population of 1,437, the second-largest population of any town in Addison County. Though the population had declined somewhat by 1886, the village then boasted a foundry, two stores, a carriage shop, a hotel, a gristmill, a sawmill, and a butter tub factory. A grist mill and saw mill operated at the Great Falls of Lewis Creek. South Starksboro had a post office, gristmill, a stave mill, a rake factory, and butter tub factory.

3.2.03 Community Facilities

Schools were among the first concerns of the settlers. The earliest school record in Starksboro, dated 1805, states, "the scholars numbered and found to be one-hundred-eighty-nine." In 1892, Starksboro Village School was constructed as a one-room building and then in 1941 was enlarged into the two-room Robinson School. In succeeding years, schools were closed in various parts of town and the students transported to the village or to Jerusalem School. When Mt. Abraham Union High School opened in the fall of 1968 with accommodations for grades seven through 12, Jerusalem School, the last one-room school in town, was closed and all elementary students were transported to Robinson School.



The first house of worship in town was the Quaker Meeting House built in 1812 in the north part of Green Mount Cemetery. The South Starksboro Friends built the present South Starksboro Friends Meeting House in 1826, making it the oldest operating Friends Meeting House in the state. The Starksboro Village Meeting House was completed in 1840 and served three denominations, as well as providing accommodations for a Town Hall in the basement.

3.2.04 Agricultural Heritage

Starksboro has always been primarily an agricultural town. In the early 1800s, the small local iron industry and the Monkton Iron Works in Vergennes provided a ready market for charcoal so settlers clearing land for farming were able to convert unwanted trees into cash.

With the coming of railroads in the mid-1800s, dairying began to be an important source of income. Many farmhouses boasted a "cheese room" where the farmer's wife made large wheels of cheese. Butter was also made on the farm. Buyers went from farm to farm purchasing these products for city markets. Toward the end of the century, butter and cheese factories were established. Green Mountain Cold Spring Creamery in Starksboro village was incorporated in 1898 for the purpose of manufacturing butter, buying, selling and dealing generally in milk and milk products.

In the 1920s, truck transportation opened the markets for fluid milk in the large industrial centers of southern New England and became accessible to farmers in northern Vermont. In 1929, Silverman Brothers owned the creamery and began to process whole milk. By 1935, the plant, then known as Mountain View Creamery, had become a very successful business enterprise and it continued to be the most important industry in town until the 1960s. Changing economic conditions resulted in the plant closing in the early 1970s. When the first Town Plan was adopted in 1973, there were 19 operating dairy farms in Starksboro. Presently, there are two. It is interesting to note that one farm in town has remained in the same family, generation after generation. In 1807 James Kinsley, Sr., a native of Scotland, purchased 100 acres of land in Starksboro. That land is now part of the farm owned and operated by his eighth generation descendant, Eric Clifford.

Maple sugaring has always been a part of the town's agricultural economy and way of life. Individual farmers usually built up a market for their product both in and out of the state. For many years, maple syrup that was not sold in cans or made into maple sugar was put into large casks and hauled by wagon to the railroad in Bristol.

3.2.05 Population Change

Between 1860 and 1960, westward migration and changing economic conditions causing the abandonment of hill farms and the loss of small business resulted in a steady decline in the town's population.

In 1960, there were only 502 people living in Starksboro. By 1973, when the first Town Plan was adopted, Starksboro was already rapidly changing from an agricultural community with a few small businesses to a quasi-suburban environment. Proximity to the greater Burlington area resulted in a new period of growth between 1970 and 2000. The 2000 census listed our population at an all time high of 1,898 residents.

Beers' Atlas, originally published in 1871, provides a unique point of reference for considering how Starksboro has changed over the last century. Starksboro village and South Starksboro were still the more densely developed hubs of economic activity, but development is now less dense on what had served as connecting roads in earlier days. These areas of town are now predominantly forested and dotted with seasonal camps.

A significant percentage of the houses listed in Beers' Atlas are still here and provide some of the most attractive housing in town. This is particularly true of Starksboro village where almost every building shown in the atlas is still standing.

3.3. COMMUNITY PROFILE

3.3.01 Population

Population Growth. According to the U.S. Census Bureau in 2010, Starksboro's population was 1,777 people. From 1960 until 2000, Starksboro experienced sustained population growth. This period of population growth ended during the 2000s with the town population declining by 121 residents between 2000 and 2010.

Starksboro's current population remains significantly greater than its peak in the mid-1880s. The town's proximity to Burlington and the relatively easy commute to job centers in Chittenden County, Middlebury, and Vergennes made Starksboro a desirable place to live for people settling in the region in previous decades.

Figure. 5 Starksboro Population, 1791-2010

Source: US Census Bureau

With changing demographics and lifestyle preferences, Starksboro is attracting fewer new residents. Without significant growth in the regional economy that would attract new residents, it seems unlikely that the town will return to the growth levels seen in earlier decades.

Birth Rates and Age of the Population. In addition to new people moving into town, Starksboro had one of the highest birth rates in the county for more than 20 years. During the 1980s and 1990s, Starksboro's population increase was largely due to natural increase (births minus deaths). In recent years, however, Starksboro's birth rate has declined noticeably and is now closer to state and county averages than in past decades.

Figure. 6 Average Annual Growth in Population, 1960-2010

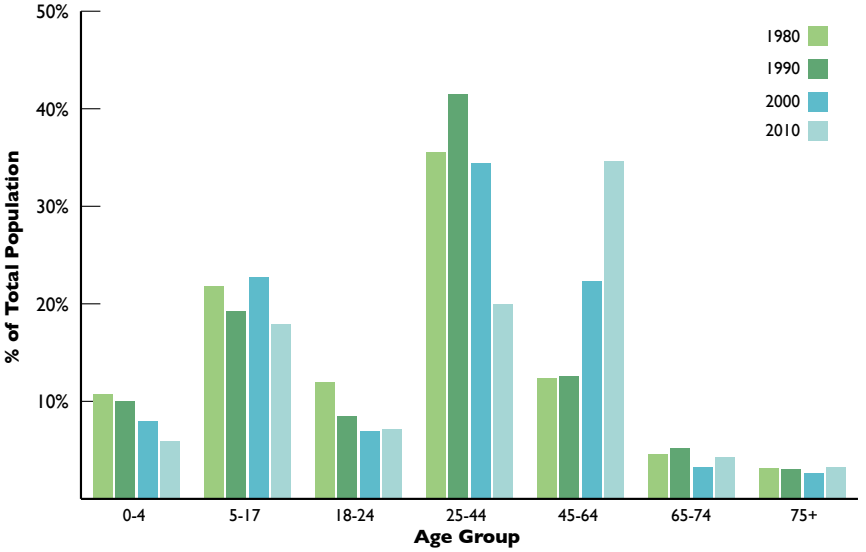
Source: US Census Bureau

	Total Population						Ave. Annual Growth Rate				
	1960	1970	1980	1990	2000	2010	'60s	'70s	'80s	'90s	'00s
Starksboro	502	668	1,336	1,511	1,898	1,777	2.9%	7.2%	1.2%	2.3%	-0.7%
Hinesburg	1,180	1,775	2,690	3,780	4,340	4,396	4.2%	4.2%	3.5%	1.4%	0.1%
Huntington	518	748	1,161	1,609	1,861	1,938	3.7%	4.5%	3.3%	1.5%	0.4%
Monkton	551	765	1,201	1,482	1,759	1,980	3.3%	4.6%	2.1%	1.7%	1.2%
Lincoln	481	599	870	974	1,214	1,271	2.2%	3.8%	1.1%	2.2%	0.5%
Bristol	2,159	2,744	3,293	3,762	3,788	3,894	2.4%	1.8%	1.3%	0.1%	0.3%
Addison Co.	20,076	24,266	29,406	32,953	35,974	36,821	1.9%	1.9%	1.1%	0.9%	0.2%
Chittenden Co.	74,425	99,131	115,534	131,761	146,571	156,545	2.9%	1.5%	1.3%	1.1%	0.7%

The proportion of the population under age 18 did not change significantly from 1980 through 2000 but has declined somewhat during the past decade. Starksboro's population remains younger than state and

Figure. 7 Starksboro's Population by Age Group, 1980-2010

Source: US Census Bureau



regional averages, but the gap is narrowing. In the year 2010, the median age in Starksboro was 40.2 compared to 41.3 for Addison County and 41.5 statewide.

The largest percentage of Starksboro's population is in the 45 to 64 age group. Over the next two decades, this group will be retiring with changing lifestyles and needs. Starksboro will likely need to consider the needs of older residents and provide housing types and services appropriate to this population.

Household and Family Composition. Starksboro had 698 households in 2010 with an average size of 2.54 people, according to the census. The number of households increased in the 2000s, despite the fact the population declined due to declining household size. Of Starksboro's households in 2010, 376 (54%) were married-couple families, 172 of which had children under age 18. Another 71 non-married households also included children under age 18. There were 152 people living alone.

Population Density. Starksboro's overall population density was more than 39 people per square mile in 2010, an increase of nearly 25 people per square mile since 1970. However, there are several settlement areas in Starksboro with much higher population densities.

3.3.02 Housing

A housing plan should allow people from a range of ages and income levels to live and own homes in Starksboro. While there are still working farms in town, Starksboro has evolved from a predominantly agricultural-based community to one that is mainly residential and serves as a bedroom community for larger economic areas in the region.

Changes in Starksboro's population and housing needs are likely to reflect changes in the economic pressures of northwestern Vermont. Employment changes at large employers such as Middlebury College, Global Foundries, UVM, University of Vermont Medical Center, and others now influence the pattern of development in bedroom communities like Starksboro.

In trying to establish housing goals for Starksboro, several diverse factors must be considered including:

- The town's rural character and lack of public transportation, which leads to heavy reliance on personal transportation;
- Economic variables tied to growth or constriction of large employers in the region; and

- The stated goals of this plan related to preservation of rural, small-town character, agriculture, and forested landscape.

Further, availability of land parcels, sales and turnover of homes and land, income of residents, and property taxes each contribute to availability of housing for those wishing to move to Starksboro.

It is in the interest of the town to plan for housing development that creates an environment that is socially and environmentally healthy. The town's unified bylaws are intended to do that.

Growth in Housing. The type of housing found in Starksboro is overwhelmingly single-family homes, either as "stick built" or as sited mobile homes. Between 1960 and 2000, Starksboro's housing stock, like its population, grew rapidly. Since 2000, that growth rate has slowed with fewer than five new homes being built in town each year.

Some of the increase in year-round housing in recent decades has come from the conversion of seasonal camps to year-round use. This type of conversion has been particularly prevalent in South Starksboro and along Ireland Road. Both these areas are heavily forested with steep slopes and shallow soils. Such conversions also have direct impacts on the community's tax base demands, which are largely tied to education costs and, to a lesser extent, expenses such as road maintenance and emergency response.

Figure. 8 Starksboro's Housing Units by Tenure, 1970-2010

Source: US Census Bureau

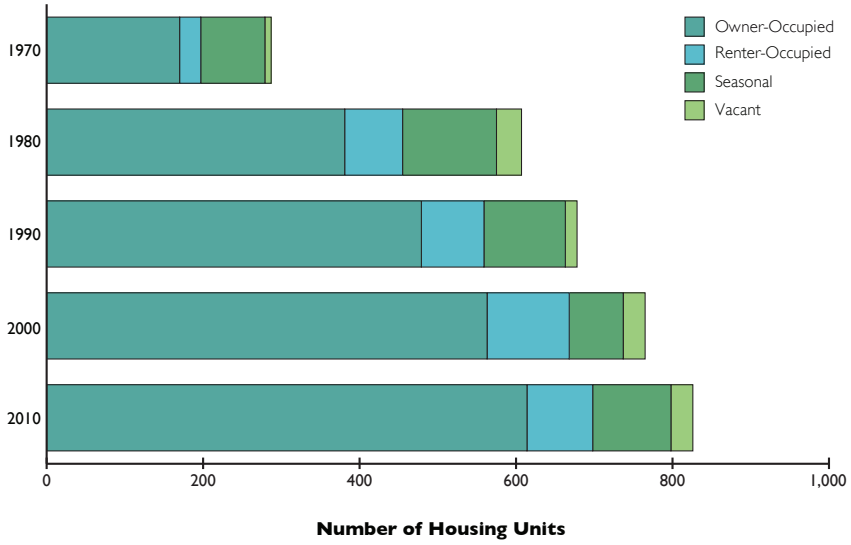


Figure. 9 Development Trends in Starksboro, 1993-2016

	1993	1994	1995	1996	1997	1998	1999	2000
New Homes	9	13	15	7	11	6	19	10
Subdivision Applications	5	7	8	5	5	8	6	6
New Lots	8	15	14	13	6	16	15	11

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
New Homes	4	9	4	6	14	6	5	9	2	7
Subdivision Applications	3	5	5	4	6	9	8	8	8	2
New Lots	6	10	11	12	15	25	21	14	8	2

	2011	2012	2013	2014	2015	2016
New Homes			4	5	7	5
Subdivision Applications			1	3	3	0
New Lots			1	3	5	0

Mobile Homes. A substantial share of Starksboro's housing stock is composed of mobile homes, most of which are located in one of three mobile home parks. Addison County Community Trust owns the three mobile home parks – Brookside, Lazy Brook and Hillside –

Figure. 10 Starksboro's Mobile Home Parks

Note: Population estimates by Sarah Weintraub, CDAE UVM based on census data.

	First Opened	Purchased by ACCT	Number of Lots	Estimated Population (2007)
Brookside	1969	2001	48	116
Lazy Brook	c. 1960	1992	51	153
Hillside Manor	c. 1968	1993	29	78
Total			128	347

in which the residents own the mobile homes and lease a site. Starksboro's mobile home parks provide a stable source of affordable housing in the town.

Starksboro is among a small group of towns statewide with a high concentration of residents living in mobile home parks. In 2007, the population of the three parks was estimated by students at the University of Vermont to be at least 347 residents, amounting to nearly 20 percent of the town's total population.

Seasonal Camps. Starksboro's upland forest provides many of the values critical to the town's identity, character and quality of life. Starksboro's extensive and largely contiguous forest provides wildlife habitat, cleans the water, provides fresh air and the opportunity to "get away from it all" for a while. There are approximately 75 seasonal camps located in the forest. Conversion of these existing camps to year-round homes or construction of new year-round homes in difficult to access and environmentally sensitive areas is an ongoing issue for the town.

Much of the upland forest includes lands that are particularly susceptible to damage from development, either due to poor soils, occupation by species that are easily displaced by human activities, or because the area is in the upper reaches of the watershed where small quantities of pollutants can have a cumulative impact on water quality. Much remains to be learned about how people can live in sensitive areas without causing undue disturbance. Increasing our understanding in this area is critically important to improved planning for the town's forested uplands.

In addition to the extremely important ecological functions provided by remote and contiguous forest habitat, the area also provides several additional amenities to visitors and residents. These include the opportunity for remote outdoor recreation, solitude and a variety of sustainable economic activities including forestry and maple sugaring.

Furthermore, development in this area would be costly to the town due to the difficulty of providing services to these remote areas. Although no local studies have been conducted, nationally studies examining the cost of serving spread-out development versus compact development have been carried out by academics, groups representing developers and government agencies. Each concludes that spread-out development is more expensive. Municipal and education costs rise because the per unit cost of activities such as maintaining roads, snow plowing and busing school children is higher as longer distances have to be traveled. Studies indicate that these increased costs are paid for either in higher costs of housing or higher property taxes.

In response to these concerns, when Starksboro adopted its first zoning ordinance in 1993, much of its upland forestland was placed into a zoning district where year-round homes are a conditional use. Public comments heard during this most recent plan revision suggests that public sentiment remains essentially the same – seasonal homes should not be converted and few to no year-round homes should be constructed in areas characterized by difficult access and sensitive resources. Now, the town regulates a seasonal use based

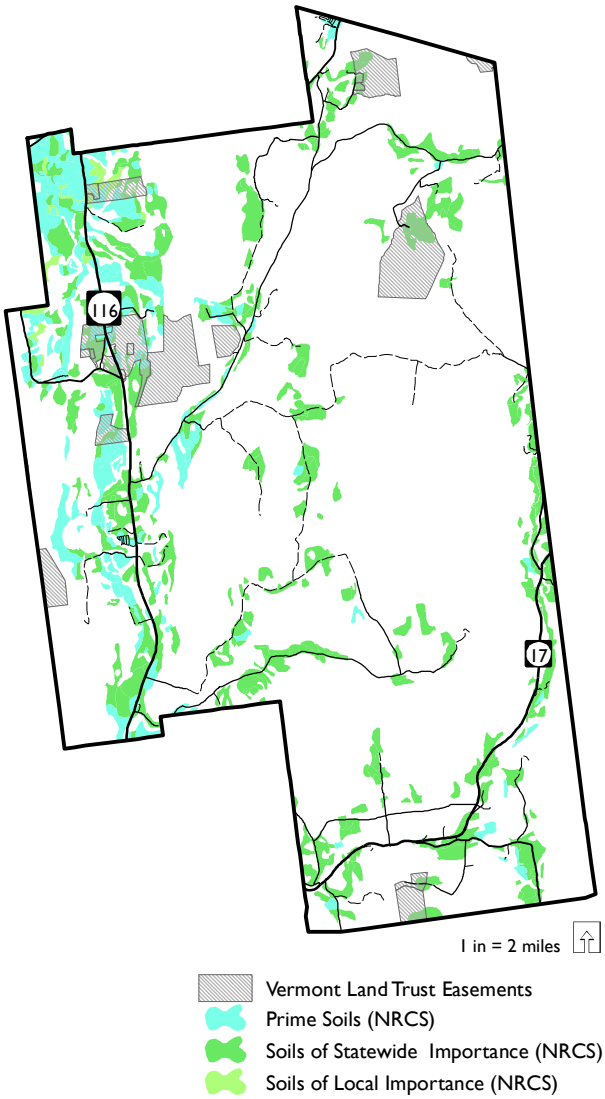
on a standard that includes ownership of a primary, year-round residence elsewhere (per interim bylaws).

Farm Worker Housing. Working farms have traditionally offered farm employee housing as part of the labor arrangement. Today farms in Starksboro face many challenges attracting and keeping employees. The town's farming community wants to retain the option of offering housing as a part of the employment package.

Multi-Unit Housing. As family size continues to decline and Starksboro's elderly population increases, there may be an increased demand for alternatives to detached single-family homes such as smaller, attached, rental, condominium or congregate housing. Additionally, there are larger, older homes and outbuildings in Starksboro that could be converted to income-producing, multi-family housing.

Starksboro's zoning regulations currently allow for duplexes and three-unit structures as a conditional use in the HDRC and LDRC districts. Accessory apartments as required by the state are allowed in an existing owner-occupied residence if the statutory criteria are met. Responses to planning surveys and public comments made during community workshops suggest that residents are interested in expanding housing options, especially in relation to providing housing suitable for seniors so that people do not have to move out of town when they can no longer, or no longer want to, live in their current home.

Figure. 11 Agricultural Soils & Conserved Lands Map



3.3.03 Economic Development

Changes in the local economy reflect Starksboro's transition from a rural, agricultural town to a bedroom community. Historically, agriculture and forestry provided a living for most town residents. Currently, nearly all residents who work commute to jobs outside of town. The percentage of people working outside of Starksboro has increased from 75 percent in 1980 to 97 percent in 2015 according to the Census Bureau. In terms of the economic activity occurring in town, however, agriculture and forestry remain the primary industries and there has been little change in the amount of land devoted to agriculture and forestry.

Agriculture. There is very little current information available about the agriculture and forestry sector at the town level from either state or federal sources. Older data indicates that the trends experienced in the those sectors generally in Vermont over the last 40 years have been

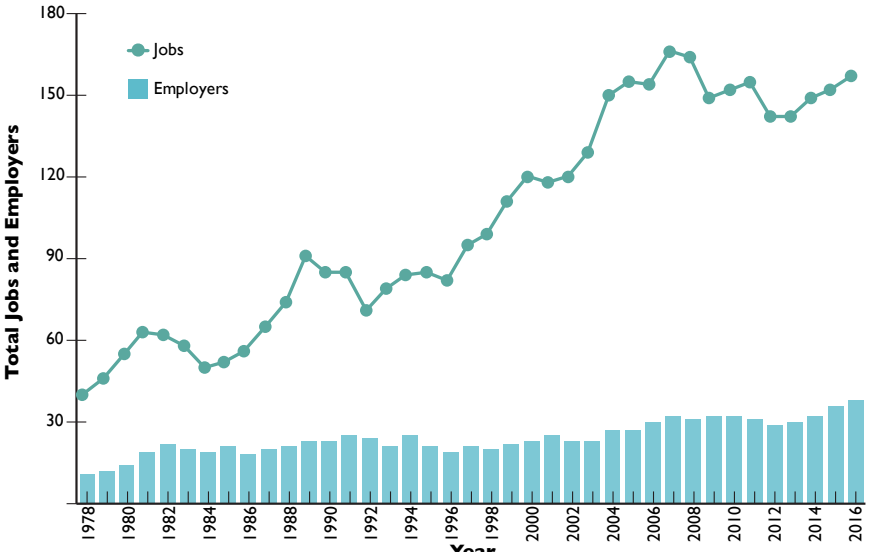
Figure. 12 Place of Work for Starksboro Residents, 1990-2000

Source: US Census Bureau (1990 & 2000 Census, 2015 On the Map)

	1990		2000		2015	
	#	%	#	%	#	%
Starksboro	127	16%	140	14%	19	3%
Burlington	201	26%	182	18%	116	15%
South Burlington	122	16%	132	13%	75	10%
Williston	30	4%	91	9%	66	9%
Essex	42	5%	76	8%	27	4%
Middlebury	47	6%	65	6%	62	8%
Bristol	44	6%	61	6%	56	7%
Elsewhere in Addison Co.	23	3%	51	5%	82	11%
Elsewhere in Chittenden Co.	78	10%	161	16%	113	15%
Elsewhere in Vermont	25	3%	41	4%	106	14%
Outside Vermont	3	0%	6	1%	29	4%
Total	**780**		**1,006**		**751**	

Figure. 13 Jobs and Employers in Starksboro, 1978-2016

Source: VT Department of Labor (Includes only jobs covered by unemployment



evident in Starksboro such as consolidation of dairy farms into fewer, larger operations, and more recently diversification with new, small farms producing food and specialty products.

To better understand Starksboro's agriculture and forestry sector, the Planning Commission conducted its own inventory and survey of agriculture and forestry businesses in 2016. Two dairy and two market gardening farms located in the Lewis Creek Valley are the largest operations in Starksboro. There are many high quality sugar maple orchards in town, a fishery, tree farms, and a number of smaller diversified farms located throughout town. Farming is a part-time activity, undertaken more for the lifestyle than for profit, for many Starksboro residents who may have horses, do some sugaring, keep chickens, raise livestock, have large gardens, etc. The lands occupied by these farms, both the full-time and part-time operations, keep the land open creating the scenic vistas valued by residents and enjoyed by visitors.

Local Businesses. According to the Vermont Department of Labor, which tracks the number of employers and jobs in the state covered by unemployment (this excludes most business owners and agricultural workers), there were 157 jobs in Starksboro in 2016 and 38 employers. The number of jobs in town has been relatively stable for the past decade.

Historically, Starksboro's village centers were a mix of residential, commercial and industrial activity. Over time, these settlements have become predominately residential and the number of businesses has declined. For town residents, the downtowns of Bristol and Hinesburg are close by and their businesses provide many needed services, many of which could not operate profitably in Starksboro. Community opinion surveys and other public comments gathered during this and past plan revisions suggest that residents want more

convenient access to basic goods and services or businesses like a coffee shop that could become a gathering place along with more job opportunities and non-residential property tax revenue in town, but they do not want to see out-of-scale or unsightly commercial or industrial buildings, franchise architecture, increased traffic, etc.

3.3.04 Energy Use

Energy is essential to our lives for heating and powering buildings, operating businesses, machinery and equipment, and transporting people and goods. The town's current energy use is summarized in the Enhanced Energy Plan (Appendix 1).

The State of Vermont has set a goal of generating 90% of the energy used in the state from renewable sources by 2050. Currently, Starksboro is only meeting about 30% of its energy needs through renewables. The Vermont Energy Dashboard estimates what it will take for Starksboro to meet the 90% goal through efficiency and renewables. That scenario requires that the total amount of energy used in town be reduced by nearly 50% and the amount of renewable energy used be increased by 60%. If energy demand were to remain at current levels, the amount of renewable energy needed would have to increase by nearly 160%.

Clearly, a future challenge will be to reduce energy consumption in general and to shift demand towards energy sources that are renewable and have an overall low environmental impact. Energy conservation is an important step in developing a comprehensive energy plan for the future of Starksboro. At the local level, energy conservation concerns generally fall into four categories:

- Energy efficiency of municipal buildings.
- Promotion of energy conservation.
- Efficient development patterns.
- Energy used for transportation.

Starksboro can promote energy conservation in many ways. Replacing fixtures and components with energy efficient units can save money in heating and lighting while helping to protect the environment.

Starksboro can also work with local utility companies to promote energy conservation programs aimed at residences and businesses – such as Addison County Weatherization Program – to reduce energy demand, save money and preserve natural resources.

Land use and energy are closely related. Land use patterns exert a strong influence on major end uses of energy, including transportation, heating and cooling of buildings, and the energy used in developing infrastructure.

Energy conservation and efficiency can also be promoted

through attention to development that reflects the principles of energy conservation and incorporates the best available technology for efficient use of recovery of energy.

Development that is clustered provides for greater efficiency. Clustering means fewer miles of road are needed to connect the homes or commercial buildings, school buses and snow plows travel smaller distances, and electric utility lines need not extend as far.

Carefully considered placement of a building on a lot adds to the efficiency of any new development by increasing passive solar gain and decreasing wind pressures.

Meeting the 90% renewable goal will require significant changes in many aspects of our lives as the target is not attainable given current technologies, lifestyles and settlement patterns. Energy used for transportation poses the greatest challenge for Starksboro. Currently, less than 15% of the energy town residents and businesses use for transportation is renewable. Transit service, walking and biking will not be viable transportation alternatives for many people given that Starksboro is a rural, hilly bedroom community with a low-density, dispersed development pattern.

3.4. COMMUNITY RESOURCES

3.4.01 Working Lands

Forestland. A significant portion of Starksboro's land area is forested and the bulk of this forestland lies in large blocks on steep slopes high above the valley floor that are relatively unbroken by roads and development. These forests exist along the northern terminus of the Green Mountain National Forest boundary and buffer the more pristine landscape of the Green Mountains against the more intensive land uses in the Champlain Valley to the north and west. The stewardship of this forestland has important implications for the water quality, wildlife and general ecological functions. This forestland provides numerous benefits including:

- Income generated from forest management, timber harvesting and sugaring.
- Recreation and tourism opportunities from hiking and skiing to hunting and snowmobiling.
- Avoiding increased costs and escalating property taxes associated with development by maintaining open land that pays more in taxes than in requires in municipal services.
- Ecological services such as wildlife habitat, water quality, groundwater recharge, flood attenuation, prevention of erosion and sedimentation, and sequestration of atmospheric carbon.

Feedback from various town forums and surveys show that residents value these benefits highly. Since the benefits seem to flow with little intervention by humans, we also tend to take them for granted. Measuring the status or condition of the forest and monitoring the flow of benefits is challenging. A project by Starksboro's Conservation Commission established the following baseline measures for the town's forestland.

- 16,800 acres of "core" forest in 1995 with little change since
- 15,930 acres of forest and agricultural land enrolled in the Current Use Program in the 2010 Grand List
- 1,476 acres of forestland conserved by easement
- 72 percent of the town's riparian buffer is forested
- Approximately 300,000 maple sugaring taps producing approximately $3 million worth of product annually

Starksboro also encourages the use of best management practices in forestry and timber harvesting.

Potential threats to Starksboro's forestlands and their benefits include:

- Subdivision and development that would fragment contiguous forest blocks
- Conversion of seasonal camps to year-round residences that would increase the intensity and associated impacts of human use and activity
- Climate change and air pollution that creates stress on forests and complicates the efforts of managers to improve tree quality
- Forest pests such as emerald ash borer, Asian long-horned beetle, hemlock woolly adelgid that are moving into Vermont's forests as a result of climate change
- Increasing property taxes that burden landowners and may lead them to subdivide, sell and/or develop forestland

Public Forestland. Starksboro's forests include more than 2,500 acres of state-owned wildlife management areas (Lewis Creek WMA and Fred Johnson WMA) and roughly 500 acres of state forest (the Stevens Block of Camel's Hump State Forest). WMAs are managed primarily to enhance habitat for game species, while the state forests are managed for multiple uses including recreation and timber management.

Starksboro's municipal forest consists of 300 acres adjacent to the Lewis Creek WMA (Hillsboro Lot) and 100 acres northerly of State's Prison Hollow Road (Cota Lot). A comprehensive inventory and management plan was completed on these parcels in 1998 resulting in a comprehensive management plan and Forest Stewardship Council green-certification." The town used maple lumber from the Hillsboro Lot for library shelving and has used this land for

school-sponsored educational programs. The Cota Lot is reserved as a natural area and will receive no active management.

3.4.02 Mineral Resources

The Route 116 valley and South Starksboro contain significant deposits of gravel. The town's gravel supply is taken from the former Colton gravel pit located to the north of Starksboro village. A small pit south of the village, located at the former town garage, is owned and used by the town. There are a few small, private gravel pits throughout Starksboro as well.

3.4.03 Groundwater Resources

Groundwater is the source of virtually every Starksboro resident's drinking water. In addition, groundwater contributes flow to surface water that in turn protects and supports aquatic life and wildlife. Lakes, streams, and wetlands are recharged by groundwater. Groundwater is an essential resource for both human use and ecological balance.

Groundwater supplies are replenished at locations known as groundwater recharge areas. Because recharge areas are generally unprotected, almost all activities within them, including forestry and agriculture, can directly affect the quantity and quality of water produced.

Starksboro has only minimal information regarding aquifer recharge potential in the various areas of town. A more complete assessment of bedrock geology, surficial geology, and the nature of the wells around town would be required to adequately characterize and categorize groundwater recharge potential. Mapping and reports on groundwater resources have been completed for towns around Vermont, including Bristol and Monkton, but has not been completed in Starksboro.

Private Water Supplies. There have been approximately 350 wells drilled in Starksboro since 1966, when well drilling records were first required by the State of Vermont. The majority of these wells have been drilled into bedrock, with the groundwater recharging these wells coming from fractures in the bedrock. Some Starksboro residents still obtain their drinking water from springs and shallow, or dug, wells, but that number continues to decline as such wells are often upgraded when property changes hands.

Community Water Supplies. There are three public community water systems in Starksboro that supply drinking water to Starksboro village, Brookside Mobile Home Park and Lazy Brook Mobile Home Park. These systems have state-approved Source Protection Areas (SPAs) around their wells or springs to protect the quality and quantity of groundwater. Each system has a source protection plan that identifies existing and potential sources of contamination within their SPA. Starksboro village system's water co-op is further reinforced by the watershed protection zoning district, in which all development activities are conditional uses.

3.4.04 Fragile and Unique Areas

While large areas of forested land and well-known species of animals and plants are relatively easy to recognize, gather data on and take steps to protect, some areas and species are either particularly fragile or especially hard to find (existing in small and highly specific ecosystems). These areas and species deserve our attention and care because they are so easily disturbed or lost forever. Wetlands, rare, threatened and endangered species, natural communities, steep slopes and vernal pools are a few of the areas and species that fit into this category.

Wetlands. Wetlands are quite varied and can be primarily swamp, marsh, fen or bog, or a mix of these features. Each type supports a unique collection of animals and plants, many of which would cease to exist without the specific conditions provided by these areas. Wetlands also provide essential ecological services such as flood storage, filtration of run-off, and groundwater recharge. The wetlands that appear on state and federal wetlands maps are protected by regulations. However, many wetlands – particularly small ones – are not yet mapped.

Rare, Threatened and Endangered Species. Rare, threatened and endangered species are species that are either on the brink of extinction or are declining in numbers due to habitat loss or human disturbance, or because they are living on the edges of their home range or are a long distance from their main populations. Many of our rare species reside in rare natural communities or highly specific habitat types. It is up to us to identify our rare, threatened and endangered species and to find ways to maintain, provide stewardship for, and conserve the habitats and natural communities that support them.

Vernal Pools. Vernal pools are typically found in upland forests or forested swamps Often they may appear as simply a small depression in the forest floor. These pools vary year by year in size and duration of water retention in response to precipitation and groundwater levels. Amphibians such as spotted salamanders, blue spotted salamanders, Jefferson salamanders and wood frogs all rely on vernal pools for breeding. Additionally, many birds, mammals and reptiles rely on those amphibians and frogs as a large part of their diet. Because of their inconspicuous appearance and the general lack of understanding surrounding their importance, vernal pools are especially susceptible to being disturbed or obliterated by nearby construction or timber practices. Knowledge of their locations and an understanding of the needs of the species that depend on them can help prevent the needless loss of many of these pools.

3.4.05 Archeological, Historic and Cultural Resources

Historic Resources. Many old houses and remaining commercial and business structures in Starksboro have both local historical significance and architectural merit.

The Hoag Grist Mill and the Knight House Complex at the Great Falls of Lewis Creek, the South Starksboro Friends Meeting House built in 1826, and the Starksboro Village Meeting House completed in 1840 are listed in the Register of National Historic Places.

The State Register of Historic Places includes many more Starksboro buildings, as well as the Starksboro Village Historic District. The maps of State Register sites are from “The Historic Architecture of Addison County” by Vermont Division for Historic Preservation.

Starksboro has an active Historical Society that sponsors lectures and programs, and works to inventory historic resources. Additional historical information and photographs are available on the society's website, www.starksborohistoricalsociety.org.

3.4.06 Rural Character and Scenic Resources

Rural Character. While Starksboro has become a bedroom community, it remains a rural town that is characterized by its working landscape of valley farmland and forested uplands. The low density of development, open land, ability to enjoy nature and wildlife, dark nighttime skies, privacy and quiet characteristic of rural settings are highly valued by town residents.

Scenic Resources. While Starksboro has not inventoried its scenic resources, but comments made during community meetings and on opinion surveys indicate that the town's scenic character is important to a large percentage of residents. When asked about scenic views, residents mention the views along either side of Route 116 over agricultural land in the Lewis Creek valley to forested slopes beyond most frequently, in addition to other scenic vantage points along roads elsewhere in town.

3.4.07 Public Lands, Trails and Recreation Resources

Recreation. Public recreation areas and facilities in Starksboro include the Lewis Creek and East Mountain Wildlife Management Areas (state-owned and managed), the Starksboro Municipal Forest and the Robinson Elementary School playground. A network of Vermont Association of Snow Traveler's snowmobile trails exists through town. There are ball fields at the Robinson School and the Cota lot. The Starksboro Sports program provides athletic programs for elementary-aged children, including basketball, baseball and soccer. The program's volunteers have spearheaded improvements at Cota Field and have plans for ongoing work at this town-owned recreation area.

There are also a number of good trails for horseback riding. There are great swimming holes in the New Haven River, as well as numerous ponds. Hiking trails abound including the Jerusalem Trail off Jim Dwire Road, which leads you to the top of Mount Ellen.

Due to the abundance of natural areas, diversity of topography, and a balance of large tracts of forested, open and farm land, Starksboro has the habitat to support many species of game animals. This makes Starksboro a great place for traditional outdoor sports (hunting, fishing, shooting). Historically these sports have been popular among Starksboro residents and have brought visitors to our town to enjoy these forms of recreation over the years.

The above-mentioned natural features and a network of agricultural roads (field accesses, log roads, etc.) make motorized ATV use another popular form of recreation in Starksboro. These activities have no designated areas. They take place across property lines and boundary lines. These activities have potential safety risks and inevitable impacts on the land and or people. As our town grows we need to find a balance to keep these recreational opportunities available

while recognizing the rights of landowners and assuring these pursuits are enjoyed safely and in accordance with state law.

3.4.08 Renewable Energy Resources

Solar. State planning maps suggest that Starksboro has limited areas with high potential for solar energy generation due to a combination of natural resource and infrastructure constraints. As demonstrated below, it is feasible for individual buildings or sites in many locations in Starksboro to incorporate rooftop or ground-mounted solar installations that could generate all or a portion of their own electrical needs, but it will not be feasible to locate a utility-scale project in Starksboro without significant upgrades to the electric power grid (see Section 3.5.06). Further, much of the open, level or gently sloped land potentially suitable for solar generation is primary agricultural soils and it has long been Starksboro's policy to encourage that the town's remaining farmland continue to be used productively for agriculture.

As of 2017, there were 68 active solar generation sites in Starksboro, which were producing approximately 720,000 kWh of electricity per year (roughly 10% of total electricity used in town). The largest solar project in town is the one at the Robinson school, which produces about 115,000 kWh of electricity per year and meets the majority of the electric demand of the town and school buildings. That project was installed in 2010 and consists of 25 net-metered, photovoltaic (PV) solar trackers located on approximately 1.5 acres of the 11-acre parcel of land adjacent to the school.

Wind. According to state mapping, much more of the town has potential for wind power generation than solar generation, including most of Starksboro's upland areas. As of 2017, there was only one small, residential wind turbine (2.5 kW capacity) operating in Starksboro. Town residents have long sought to conserve Starksboro's upland forest areas for forestry and conservation purposes. Starksboro's zoning regulations strongly discourage development in these areas due to the shallow soils, steep slopes, lack of roads and infrastructure and potential impacts to wildlife and environmental quality. The lack or limited capacity of existing roads and the electric power network in the upland areas deemed to have potential for wind generation will likely limit the feasibility of utility-scale wind projects in Starksboro.

Biomass. A large percentage of Starksboro's land is under acceptable timber management practices (AMPs). There are no statistics on the quantity of wood harvested annually in town or the amount used for fuel, but it is clear that the amount of energy generated from biomass in Starksboro each year greatly exceeds the amount currently being generated from solar or wind. The 2017 community survey indicated that most homes in Starksboro use wood as a primary or secondary heat source. Continuing to manage the town's forested uplands as productive timberlands is a way to meet multiple objectives expressed in this plan – protecting productive lands and rural character, supporting the local farm and forest economy, maintaining healthy forests and producing renewable energy.

3.5. COMMUNITY INFRASTRUCTURE

3.5.01 Transportation

State Highways. Starksboro has two major state highways passing through town, Route 116 and Route 17. Of these two, Route 116, classified as a minor arterial, has the greater traffic volumes and passes through the most densely populated part of town – Starksboro village. The need for traffic calming along Route 116 through Starksboro village has been recognized and studied for more than 20 years. Route 116 also passes through the town's agricultural and scenic district. This area is a critical to Starksboro's goal of maintaining a viable and vibrant local farm economy. High traffic volumes and speeds negatively impact the ability of farmers to efficiently utilize their land, increase the hazards associated with driving farm equipment along or across the road, and limit the feasibility of getting livestock from one side of the road to the other safely.

Route 17 passes through Jerusalem, the town center of South Starksboro. This highway is rapidly developing into a main east-west artery for commercial, agricultural, forestry, recreational and commuter traffic. In 2006, VTrans reported that the average daily traffic on 17 at the Bristol town line was 1,600 vehicles and at the Fayston town line it was 990. On Route 17 steep ascent and sharp turns provide spectacular views and challenging terrain for bicycle and motorcycle enthusiasts. Increasing numbers of pedestrians also share this busy roadway, characterized by its limited sight distance in many locations, with motorized traffic. With additional traffic has come an increased demand for emergency services responding to traffic accidents often in difficult weather conditions.

There are also many people in town who use the roadway network for pedestrian and bicycle travel. In some areas of town, particularly the Route 116 and Route 17 corridors, increasing numbers of pedestrians use the shoulder of the road for walking and jogging. The enjoyment and safety of the roadway system for pedestrian and bicyclists is an important issue as evidenced by comments made on public opinion surveys and at community meetings over the years.

Town Roads. Starksboro's Class 2 and 3 town roads serve as feeders to the state highway system. Town roads, significant portions of which are unpaved, serve the majority of Starksboro's residential areas. The town is responsible for maintaining 5.3 miles of Class 2 and 27.08 miles of Class 3 roads. No data is available to measure changes in traffic volumes or speeds on these roads. However, increased development has led to higher levels of usage and increased safety concerns on many of these town roads. Data indicates that higher levels of usage lead to increased maintenance costs.

Private Roads and Driveways. Private roads and driveways are a significant part of Starksboro's transportation system. There are 3.26 miles of private roads in Starksboro, serving approximately 240 residences. It is likely that much of the future residential development in town will be accessed via private roads. The town is not responsible for the maintenance of these roads, but it does have a responsibility to ensure that such roads are constructed to basic standards in order to protect public safety and prevent damage to public infrastructure from improperly designed or constructed private roads. Given the costs of road maintenance, the town is unlikely to accept any existing or future private roads.

Commuting and Transit. The majority of the town's residents travel to work outside of Starksboro. Carpooling can be beneficial for these residents not only in energy conservation and lower fuel costs, but also in reduced wear and tear and maintenance on vehicles. The Vermont Public Transportation Association maintains a website with a carpool bulletin board. Other options include vanpools and use of park-and-ride areas.

There is limited public transit service in Starksboro. Addison County Transit Resources (ACTR) currently runs a weekday morning and afternoon commuter bus on 116 that stops at the Starksboro town buildings park-and-ride.

3.5.02 Water

Most residents in the town make use of private on-site water systems. There are separate public community water systems serving the three mobile home parks and residents of the village. A public community water system is defined in the Vermont water supply regulations as a system for provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

The Starksboro Village Water Co-Op, a privately incorporated water system, serves the village area. Spring fed, the system supplies 63 private connections as well as two farms, the Robinson School and the Town Hall. The size of the pipe connecting the spring with system customers is limited to its present size - four inches - by deed restriction. The nearby privately owned "Creamery Spring" supplies about 10 connections.

The Starksboro Village Water Co-Op is a cooperative of the system's users and is now responsible for operating the system on a nonprofit basis. Now that the system is operating as a nonprofit it is eligible to apply for revolving grant funding to address system improvements that were not available to the system when it was a privately held water system.

Brookside Mobile Home Park has 48 connections. The Brookside Water System is fed from several drilled wells.

Hillside Manor has 29 connections all on "public" systems. The Addison County Community Trust has connected the Hillside Trailer Park water system to the Lazy Brook Trailer Park water system with 47 connections in an attempt to solve a potable water problem. The Lazy Brook Trailer Park water source is in the middle of the field near Hinesburg Hollow Road.

Addison County Community Trust plans to initiate a request for the siting of a low salt sign adjacent to the source protection area. Each park's water system does have a source protection plan. These plans have been shared with the Planning Commission and Development Review Board so that when development review occurs in that area of the community, no potentially contaminating development activities are approved for that area.

3.5.03 Wastewater

There is no municipal wastewater treatment service in Starksboro. All development relies upon private, soil-based septic systems to meet their wastewater disposal needs. All new and modified wastewater systems require a permit from the state. Many areas of Starksboro

have soils that are not well suited for septic systems. This is particularly true of the upland areas of town that have shallow soils and areas of exposed bedrock.

3.5.04 Stormwater

Vermont is in the process of implementing a new permit process for municipalities intended to address stormwater run-off from roadways. This run-off is a contributor to reduced water quality in streams and ultimately Lake Champlain due to sedimentation, pollutants and excess nutrients. To reduce the amount of stormwater run-off reaching the roadside drainage system, run-off from adjacent private land will need to be retained and managed on-site. Green stormwater infrastructure, such as rain gardens, can be an effective way to treat and infiltrate stormwater from homes and other small developed areas. The town's policies with relation to avoiding massive tree clearing and opening of the forest canopy in upland areas also limits potential increases in stormwater run-off.

3.5.05 Solid Waste

In 1992, Starksboro closed and capped its unlined landfill according to state and federal regulations. Currently, the town belongs to the Addison County Solid Waste District and municipal solid waste generated in the town goes to the district's transfer station in Middlebury. From there, trash is hauled to a landfill outside the district for disposal.

The district prohibits open burning of trash and has mandatory recycling. Starksboro has a volunteer run recycling program based at the town garage. The town currently recycles cardboard, fiber and containers such as glass, box board, and plastics, newspapers, magazines, tin and aluminum. As with any volunteer-operated program, there is a continuing need for more volunteers. Burning of clean, untreated or unpainted, wood or brush is allowed with a permit from the local fire warden.

3.5.06 Energy Facilities and Infrastructure

Two electric power companies serve Starksboro. Vermont Electric Cooperative serves the northeastern part of town and Green Mountain Power services the remainder. There are no major transmission facilities (33-46 kV lines or 115 kV lines) running through the community. State mapping indicates that the condition of the electrical infrastructure in Starksboro is poor in many areas and residents have frequently raised concerns about power reliability at community meetings and on surveys over the years. Three-phase power is not available in most of Starksboro. This is a limiting factor for increased renewable energy production in town as discussed in Section 3.4.08.

3.5.07 Telecommunications Facilities and Infrastructure

Demand for telecommunications is likely to continue to increase in coming years. Waitsfield and Champlain Valley Telecom provides land line telephone service throughout town and high-speed internet service over DSL in some areas of town. Cable television service has recently been extended to parts of town, which may allow residents to receive high-speed internet service via cable. Currently, there are no telecommunication towers located in town, but an antenna array mounted on a silo was installed in Starksboro around 2007. This has improved the cell phone service in some parts of town, but areas with no coverage remain.

Residents have expressed a desire for improved telecommunications service including cell phone coverage and high-speed Internet connections at meetings and on surveys for many years. However, there is concern about the impacts of infrastructure like telecommunications towers and utility lines on the town's scenic character and environmental quality.

3.6. COMMUNITY SERVICES

3.6.01 Town Buildings and Land

Town Buildings. Starksboro's community facilities include the following:

- The Town Hall was constructed in 1911. It is located in Starksboro village and is available for a variety of community activities such as weddings, educational activities or classes, and currently serves as the town library.
- Jerusalem Schoolhouse/Fire Station #2, located on about an acre of town-owned land in South Starksboro, is used for local meetings and activities and for the storage of a fire department pumper.
- The Robinson School located on Parsonage Road and Route 116 is the principal facility for school functions, town meetings, elections, sports, fund-raising affairs and other community gatherings.
- In 2003, the town's administrative functions were moved to an upgraded building between the Town Hall/Library and the Meeting House, which provided plenty of space for town offices and boards, as well as a much-needed larger vault for storage of town records. The project also provided improved access and parking for all three buildings and overflow parking for the Baptist Church across the street.
- The former town office building is still owned by the town. It was leased to the Starksboro Country Store, which closed in 2010. The building is now home to a pottery studio and the Town's Food Shelf. This building shares a parking lot with the Starksboro Post Office.
- The Starksboro Post Office also located in the village was built in 1976 on town property and leased to the U.S. Postal Service.
- A new town garage was built in 2016 and provides for the housing and repair of town equipment in a five-bay facility. There is also a separate salt shed on the site.
- In 1998, the town voted to purchase, with the assistance of the Vermont Land Trust, the Cota Farm and former Colton Gravel Pit with its facilities. The town uses the former Colton gravel pit for its gravel needs. The steel building associated with the gravel pit now houses Starksboro's Volunteer Fire Department.

Town Lands. Starksboro also owns the following:

- Starksboro owns more than 13 acres that contain a sand pit with a limited supply of material for regular maintenance of local roads. This land was also the site of the town's capped landfill.

- In 1998, the town acquired 42 acres, which comprised the former Cota/Colton gravel pit operation. In addition to the facilities and uses described above, two riparian areas associated with Lewis Creek were retained in town ownership for a combination of protection and recreation. The northern area, approximately 92 acres, is located north of State's Prison Hollow Road. The southern area, around 63 acres, containing the ball field is located south of State's Prison Hollow Road. A large wooded parcel formerly associated with Cota/Colton property is privately owned and the four farm-related parcels remain with the Vermont Land Trust.

- Two "farms" in Hillsboro make up the 265-acre Town Forest. The Town Forest Committee manages the forest for multiple uses including timber harvesting, recreation and wildlife habitat. In 2004, the committee reported that its first sale of timber netted more than $11,000 for the town, a portion of which has financed the ongoing maintenance and use of the forest.

Cemeteries. There are ten historic cemeteries in Starksboro overseen by the Town's Cemetery Commission. At this time, there may be an occasional burial in these historic cemeteries, but there are no new lots for sale. The Gore Cemetery, located partly in Huntington, is maintained privately.

- Village Cemetery, Route 116
- Hillsboro Cemetery, Hillsboro Road
- Crowley Road Cemetery
- Cemetery by Ruby Brace land, behind Dan Paquette
- Mason Hill Cemetery
- Jerusalem Cemetery
- Ireland Road Cemetery
- Quaker Meeting Cemetery, Dan Sargent Road
- Cemetery by Red Schoolhouse, Ireland Road
- Rounds Cemetery
- Green Mountain Cemetery, Cemetery Road

The Green Mountain Cemetery Association oversees the Green Mount Cemetery, which contains the only vault in town. At this time, it is the only cemetery with lots for sale. In 1983, the fifth division was laid out with 1,094 total possible burial sites. It is the association's assessment that there is ample burial space for the near future.

If there was a need to expand the cemetery in the future, there may be a possibility to expand in a terraced fashion at Green Mount. However, the area has some ledge, so it may not be the best spot for a cemetery expansion. In the future, the best remaining available site for cemetery expansion may need to be identified so that any remaining viable sites are not dedicated to development without that consideration.

3.6.02 Town Government

Starksboro's Current Fiscal Condition. The only significant revenue base for the town is the property tax. The Grand List in 2016 was composed of around 955 parcels with a total real value of approximately $188 million. Housing, including mobile homes, comprised nearly 74 percent of the total value.

Two state agencies, Forest and Parks and Fish and Wildlife own around 2,300 acres in Starksboro. Payment in lieu of taxes (PILOT) is computed at one percent of fair market value. Land enrolled in Use Value Appraisal prior to state ownership remains in this program once transferred to the state and is taxed based on a per acre value. In budget year 2015-16, the PILOT on state land in Starksboro was around $11,000.

Starksboro has sinking funds for town and fire equipment that set aside a depreciation amount against the replacement cost of each large dollar item. The equipment reserve fund, which is funded annually, assures that when equipment must be replaced sufficient dollars are available to meet these expenses.

Conservation Commission. Starksboro has a 9-member Conservation Commission. The Conservation Commission is an advisory board that provides current ecological information to other town boards to help those bodies make meaningful connections to the surrounding natural environment, and to make decisions related to land use and development in a way that minimizes disruption and damage to the environment. The commission maintains the Cota Field Creekside Trail, which runs ½ mile from the Cota Field parking lot along Lewis Creek to a location off Route 116 north of the village, and manages the town forests. The commission also has an important role in a number of annual community events including the Sugarmakers Open House, Green Up Day and the Harvest Dinner.

3.6.03 Civic Facilities and Organizations

Library. The town voted $25 to establish a municipal library in 1962 and the Starksboro Public Library opened in 1972 due to the efforts of the Friendship Homemakers Extension Club. In 2001. the library moved into the ground floor of the Starksboro Town Hall and hired its first paid librarian.

In 2017, the library – managed by two paid staff people and a number of dedicated volunteers – had more than 5,800 books, magazines, audio books and DVDs in its collection, and was open 20 hours each week. The library is a member of the Catamount Library network, which provides patrons with access to additional materials through interlibrary loan, and participates in ListenUp! Vermont, which allows patrons to download free ebooks and take free online courses.

The library sponsors a range of programs for adults and children – including a Bone Builders class, an adult reading group and preschool story time – along with special programs throughout the year.

3.6.04 Public Safety

Starksboro Volunteer Fire Department. Starksboro Fire Department has been incorporated as a private nonprofit since 1959. The department serves the entire Town of Starksboro, as well as the area of Buels Gore. The Fire Department is funded through

private effort and budget contributions from the town. The department is a member of Addison County Mutual Aid, and also has mutual aid arrangements with Huntington and Hinesburg.

The department could have a full roster of up to 30 volunteers, although membership typically runs closer to 22 members. Like many Vermont fire departments, availability of volunteers during business hours is particularly difficult. In 2016, the department responded to 55 calls.

The Fire Department is based in Fire Station #1, the former Colton building in Starksboro village, with a second single-bay station, Fire Station #2, in Jerusalem. The Old Fire Station in the village houses the Starksboro Rescue Squad.

Response time in the community is generally good. However, due to the layout of the community with "Up-South" both a good distance away from the main station and significantly uphill, response times are longer in the Jerusalem area and in Buels Gore. Location of the pumper in Jerusalem helps. Wildland or forest fires depending on their location can be difficult to access.

The ability to access new buildings for fire or rescue purposes can also be an issue. Homeowners often do not consider fire or rescue vehicle access in their construction or winter maintenance plan. Yet, these are critical considerations.

Rescue and First Response Squads. In Vermont, emergency services organizations are organized into three levels. There are Emergency Medical Services (EMS) Districts. Starksboro is located in District #7. Under the EMS Districts, there are licensed emergency transport services, which for Starksboro is Bristol Rescue Squad Inc.

The most direct link to emergency services for Starksboro residents is the town's licensed first response squad. The Emergency Rescue Unit of the Starksboro Volunteer Fire Department, the "First Response Squad," is a nonprofit volunteer group, which was formed in May 1975. The squad arrives on the scene of an emergency before the ambulance to treat, stabilize and prepare patients that need transport.

In 2016, the squad consisted of four EMTs, which responded to 120 calls. There is a standing need for more trained volunteers. Due to the significant amount of time and resources required to train new members, one year of residency in Starksboro is required before initiating the training program.

The squad's response time varies by the location in town relative to where squad members are when a call is received. Historical response time has averaged four minutes. The fire department provides important assistance to the squad in car accidents, lifting and other special calls (such as woods rescues).

Currently the squad has four defibrillators. This equipment has been proven to increase the survival rate of heart attack victims when used within the first few minutes after the

heart has stopped beating. Thus, having two defibrillators, together with additional oxygen units, located "Up-South" may improve the chances of a Jerusalem or Buels Gore resident's survival.

Currently the squad is funded through a combination of town contributions, auxiliary fund raising and other donations. The fund-raising work of the Fire Department Auxiliary is a very important service for both the fire department and the first response squad.

Emergency services are provided 24 hours a day, seven days a week with backup from Bristol when required. Bristol's response time runs about 15 to 20 minutes depending on where in town a call is located. The squad offers CPR training to people who are interested in learning this most basic level of medical intervention.

Dispatch services are provided through Porter Hospital. Heavy rescue services are provided through the Bristol Fire Department, although some Starksboro firefighters are trained in the use of heavy rescue equipment. There are also letters of agreement with Richmond ambulance regarding transport, and rarely Vergennes ambulance might be called. Transport is generally to either Porter Hospital in Middlebury or Fletcher-Allen Medical Center in Burlington.

Law Enforcement. The Vermont State Police and the Addison County Sheriff's Office provide police protection in Starksboro. State police are dispatched from the Williston barracks. There are currently no contract services for law enforcement coverage in Starksboro and no outpost officer in this area.

The Addison County Sheriff's Office also has jurisdiction to provide law enforcement and public safety services such as transport of prisoners and some special needs patients, court security at the county court, and crowd control and traffic control. They are the agency primarily responsible for civil service process in the county.

Court services are provided at the Addison County Court House in Middlebury. At the Addison County Court House the Family, Superior and District Courts are held. The residents of the county finance the Court House facilities through a county tax.

A 2008 town meeting vote limited Starksboro's constables from exercising law enforcement authority. Their duties are now limited to serving civil process, removing disorderly people from public gatherings, collecting taxes (in the absence of an elected tax collector), assisting the town health officer and animal control officer, and other such duties as requested.

An Animal Control Officer is available to address concerns related to dogs or other animals and to conduct reviews of resident compliance with dog registration in town. This position has been difficult to fill and keep filled. The game warden deals with any wild animals.

Emergency Management and Mitigation. Starksboro has designated an emergency manager charged with implementing the Local Emergency Operations Plan (LEOP), which was last adopted in 2016, to coordinate response to emergencies, disasters or other larger public safety incidents. The LEOP, which is incorporated by reference as most recently adopted into this plan, identifies high hazard areas and vulnerable sites, as well as the community's emergency operation centers and emergency shelters.

Starksboro has adopted an All Hazards Mitigation Plan, which is incorporated by reference as most recently adopted into this plan. That plan assesses the town's vulnerability to a range of hazards or disasters and recommends specific mitigation measures to reduce those risks.

Starksboro has been a member of the National Flood Insurance Program since 1985 and has adopted land use regulations that include a flood hazard overlay district as required to participate in the program. There are relatively few (17) structures within the town's mapped flood hazard areas and there is little opportunity for additional development in those areas under the adopted regulations.

3.6.05 Education

Facilities. Starksboro is located in the Addison Northeast Supervisory District, which serves the towns of Bristol, Lincoln, Monkton, New Haven and Starksboro. Students in grades K-6 attend the Robinson Elementary School located in the village. Students in grades 7-12 attend Mt. Abraham Union High School (District #28) located in Bristol. The Hannaford Career Center located in Middlebury offers vocational training to high school students and adults who do not have diplomas.

There is currently an elected three-member school board for the elementary school. Beginning in July 2018, the Mount Abraham Unified School District will have two elected school board members from Starksboro. The unified district will oversee elementary schools in Starksboro, Bristol, Lincoln, Monkton, and New Haven, as well as the Mt. Abraham High School.

The Robinson School Philosophy fosters cooperation and respect, promotes responsibility and learning, and encourages family awareness and involvement. The school believes a nurturing environment has a positive effect on the attitude, interaction and learning of children. The school encourages active community involvement and maintains a high standard of education.

The school develops a "local action plan" as required under state statues, to direct how the school will improve the performance of all enrolled students. That plan details goals and strategies for improving student learning. Budget priorities for instruction have been tied to the action plan with positive results.

Enrollment. During the 2016-17 school year, there were 182 students at the Robinson School (including pre-K students). Enrollment has been relatively stable for more than a decade and no significant changes in enrollment levels is anticipated given that number of births to town residents has ranged between 10 to 20 children for the past five years.

While enrollments and birth rates are down from peaks in the late-1990s and early 2000s, Starksboro remains an attractive community for families with school-age children. It is important to continue to track the relationship between new home construction and school enrollments to ensure that town's rate of growth does not exceed its ability to provide services.

Future Needs. Given the school's capacity, current facilities are anticipated to be adequate for the foreseeable future even with the school adding both full-time kindergarten and a pre-K program in recent years. Total capacity, however, does not address any individual program limitations.

The need for improvements in safety and circulation around the school for buses, private vehicles and pedestrians/bicyclists has long been noted. The lack of sidewalks within Starksboro village, coupled with the heavy volume and unsafe speed on Route 116 through the village limit the ability of children to safely walk or bike to school, and to nearby recreation areas. Within the school building itself, the lack of storage space has been identified as an on-going problem.

School Funding. Vermont's current method for determining need and obtaining funding for new educational facilities is through a statewide application process. Proposals are reviewed and decisions regarding funding are rendered by the legislature on an annual basis. Robinson School has been expanded three times – in 1976, 1985 and 1989. The first addition was financed with federal funds, the second and third were funded by bond issues. Bonds payments resulting from recent renovations of the school will continue through 2028. Any further expenditures before the bonds are paid off would put a burden on Starksboro residents.

Early Childhood Education and Childcare Services. There is an after-school program held in the Robinson School daily during the regular school year. It is a state-licensed program with a capacity to care for up to 75 children ages 5-12. Other childcare providers located in Starksboro in 2017 included the Starksboro Cooperative Pre-School, which operates out of the Meeting House in Starksboro village, and several in-home day cares. There are numerous childcare options in nearby communities.

3.7. LAND USE AND DEVELOPMENT

3.7.01 Current Land Use

The town covers about 44 square miles, or about 29,000 acres. Terrain, land use and historic development patterns have been used to divide the town into the following areas for planning purposes:

Lewis Creek Valley. The Lewis Creek Valley runs north-south in the western part of town. A large portion of the town's agricultural land remaining in productive use is in the valley. Five dairy farms and two vegetable farms are supported by the well-drained and fertile soil. Vermont Route 116, which runs through the valley, provides good transportation access. The open land created and maintained by agricultural use is valued for production, but as an essential component of the town's character – the scenic qualities generated by the pattern of fields, hedgerows and woodlots defined by the steep forested uplands to the east and west. The valley's farmland also contributes to maintaining a relatively modest town budget as these lands create minimal demand for public services as compared to residential property. The agricultural land is also important for its support of the local economy through family farms and the resulting contribution to community values and the character.

Starksboro Village. Starksboro village, located in the Lewis Creek Valley, is the principal town center. This historic center contains a mix of small businesses, agriculture and most of the town's public facilities and services, in addition to approximately 40 homes. There has been little new development in Starksboro village for nearly a century, with most of the buildings shown in the 1871 Beers' Atlas still standing. It is served by a private water system

fed by springs from the northeast of the village. Route 116 is the village's "main street." Big Hollow Road to the east and State Prison Hollow Road to the west provides further access.

Just south of the historic village center is Brookside Mobile Home Park. Established in 1969, the 48 homes in this neighborhood are within walking distance of the school and other public facilities.

In the heart of the village is the Lewis Creek Farm, the Leslie Rublee farm, and other land used by farms located outside the village. Having working farms in the center of Starksboro village has been a defining element of the town's identity for many years. Most of the undeveloped land within the village center is farmland. The possibility of conservation of the Leslie Rublee Farm has spurred an important public debate about the future of the village. If the farm were to be conserved, the possibility of significantly increasing the number of residences and businesses in the village in future years may largely disappear. On the other hand, many residents would prefer to maintain this land in agricultural use and maintain the village largely as it has existed for more than 100 years. Two principal goals of this plan, and previous town plans, are in conflict in this situation and it remains to be seen how they can be balanced.

South Starksboro. The area, locally known as "up south," high above and to the east of the Lewis Creek Valley includes the historic hamlet of Jerusalem. This area along the Route 17 corridor has long been one of the main transportation routes across the Green Mountains and several town roads intersect with the highway in this area. The hamlet of Jerusalem includes a general store, fire station and the old Jerusalem schoolhouse. While most of the small businesses have long-since disappeared from South Starksboro, this area has seen significant amounts of residential development in recent decades. A large percentage of South Starksboro residents do not want to see further residential development in the area.

Once home to many hill farms, the area remains generally open, creating a beautiful scenic and natural environment. While there are no large-scale farms currently operating in South Starksboro, there are several small or supplemental farms in the area. However, much of the open land is slowly returning to a predominately wooded state. Maintenance of the open landscape through full-time or supplemental agriculture is key to preventing the further overgrowth of pasture land, which would significantly alter the scenic character of the area.

Rural Areas. In recent decades, a large percentage of Starksboro's new homes have been built at low densities, scattered along the town's Class 2 and 3 roads. These roads travel up into the town's upland forest, following the terrain and various streams to create relatively narrow bands of level to moderately sloped land on either side. In places, that band widens out and vestiges of former hill farms are still visible on the landscape – pastures, hedgerows, stone walls.

Upland Forest. Starksboro's upland forest comprises the major part of the land in town. This land is used for forestry, recreation, scattered homes and isolated open land in limited agricultural use. Much of the upland forest provides opportunity for hunting, fishing, skiing and hiking. Many significant natural areas are found in this area. Large swaths of this land currently lack access to Class 2 or 3 town roads.

The town benefits economically from this area in a number of ways. While the tax income from the undeveloped forested parcels is relatively low, there is no impact on schools, and little on roads and other services. This area serves many vital ecological functions,

including cleansing surface and ground water, and serving as the recharge area for the village water supply. These areas provide a resource base for firewood and timber production, maple sugaring, providing local employment, fuel for local homes, and raw material for local mills and other businesses. Tourism and hunting contribute directly and indirectly to the local economy.

Residential development of this area would be very costly to the town, since in addition to the normal school impacts from residential developments, there are increased transportation and road maintenance costs in these more remote areas. Access to the homes in this area is by gravel roads and many of the seasonal residences are located on roads that are generally not maintained during the winter months.

3.7.02 Land Ownership Patterns

The majority of land in the town is privately owned. The state, however, maintains a significant presence through its holdings in the Lewis Creek and Fred Johnson Wildlife Management Areas and the Camel's Hump State Forest. According to the 2016 Grand List, the state owned around 2,300 acres in nine separate parcels through the Department of Fish and Wildlife, and the Department of Forests, Parks and Recreation. The State of Vermont makes payments in lieu of taxes on the land owned by the State Fish and Wildlife Department and Camels Hump State Forest.

In 2016, Starksboro residents held about 78 percent of the taxable value of real property in the town, while Vermont residents living outside of Starksboro held 13 percent, out-of-state residents 5 percent and corporations 4 percent (most of this value was in utility lines).

3.7.03 Development Capability

A fundamental principle of land use planning is to guide development towards the land best suited to accommodate the proposed use and away from the land not capable of accommodating it. Some of the factors affecting land capability include:

- Steep slopes are poorly suited for development. Large areas of Starksboro are characterized by steep slopes.
- Development in Starksboro is dependent on on-site septic systems for wastewater disposal. Many areas of town have soils that are poorly suited for on-site wastewater systems.
- Riparian areas, including floodplains and river corridors, pose hazards for development. This plan recommends siting development back from surface waters and maintaining naturally vegetated buffers along streams.
- Vast areas of Starksboro are remote and not currently accessible from maintained public roads. The cost of providing infrastructure and services to development in these areas would be significantly higher than for those located in village centers or along main roads. Extending roads into currently inaccessible areas would fragment forest blocks and increase impervious surface coverage along with the potential for erosion, sedimentation and downstream flooding.

4. community plan

4.1. HOUSING

4.1.01 Goals

G11 Maintain a mix of high quality housing consistent with the character of Starksboro for households with a range of incomes.

G12 Improve the quality of housing in the town by addressing common housing issues, such as energy, health and safety.

G13 Maintain Starksboro's historic homes and recognize their importance to the character of the community.

4.1.02 Objectives

O1 Limit the amount of residential development in those parts of Starksboro where homes would be far from services and difficult to access.

O2 Minimize the amount of productive farm and forest land that is converted to developed lots.

O3 Improve the quality of housing in the mobile home parks by addressing common housing issues, such as inadequate roofs, windows and skirting by seeking low-cost and energy efficient strategies to assist residents improve their housing.

- Recognize the role that the town's existing mobile home parks play in meeting the need for affordable housing in the region.
- Explore options such as cooperative purchasing of materials to lower the cost of home repairs to maintain the quality of the town's affordable housing stock.
- Seek alternatives to the traditional mobile home that would preserve affordability while offering greater homeowner equity, reduced energy costs and better living spaces.

O4 The town should implement a set of standards that speak directly to the seasonal nature of seasonal dwellings, to better achieve the goals of limiting impacts to sensitive resources or areas, limiting the cost of providing public services and maintaining the character of the Upland Forest Planning Area as a place people go to "get away."

- Seasonal camps in the Upland Forest Planning Area should not be converted to year-round homes. The land use regulations should be revised to implement conditions to seasonal-use permits to prevent adverse impacts and limit the negative impact on the town's fiscal condition of seasonal camp conversion. Such conditions should:
  - Prevent occupants of a seasonal dwelling from receiving municipal services such as attending school and registering as a voter in town, unless the owner has a year-round residence elsewhere in Starksboro.
  - Substantially reduce noise through mechanisms like limiting hours of generator operation or placing generators inside an insulated box.
  - Minimize outdoor lighting of any structure by down-shielding, reduced wattage and restricting use of timers and motion detectors. Prevent outdoor lights from being left on overnight.

- Restrict openings in the forest canopy for construction of roads, structures or power lines.

- Applicants seeking a seasonal-use permit and all existing seasonal residents should be able to prove that they have a principal residence elsewhere. A list of accepted proof of primary residence like those listed below should be developed:
  - Current voter registration.
  - Tax records.
  - Utility bills.
  - Vehicle registration.
  - Annual affidavits.

4.1.03 Policies

P1 Starksboro's land use regulations should continue to restrict use of land in the Upland Forest Planning Area to sustainable forestry that meets minimum accepted Vermont management practice standards, low-impact recreation, sustainable harvesting of non-timber forest products.

P2 Construction of year-round homes and conversion of seasonal camps to year-round homes in the Upland Forest Planning Area is generally inappropriate and should be discouraged. The town should continue to review residential development, including seasonal camps, as conditional uses.

P3 Under Starksboro's land use regulations, working farms, meeting the state definition of farming, should be allowed to construct accessory units to house farm workers and their families without having to subdivide property. Approval of such units should include conditions that require the removal, subdivision or conversion of the unit to an allowed use if it is no longer to be used to house farm workers. Seasonal labor housing will be exempted from the annual cap on permits for new dwellings.

P4 Starksboro's land use regulations should allow for accessory apartments where residences are permitted uses and multi-family housing in suitable areas, such as within or near existing settlements, in accordance with state law.

P5 Guide most of our future residential development to areas in or close to Starksboro's existing population centers.

P6 Guide residential development away from our most productive land.

P7 Recognize that those rural lands currently accessible from public roads that are maintained year-round are more suitable for residential development than lands that do not have such access.

P8 Protect environmental quality by locating new homes away from critical resources or fragile features such as steep slopes, wetlands, vernal pools, important wildlife habitat or travel corridors, streams, flood or fluvial erosion hazard areas, and source protection areas.

P9 Encourage housing that will allow Starksboro's residents to continue to live in the community through all stages of life.

P10 Encourage increased energy efficiency in construction of new dwellings and in renovations to existing homes.

4.2. ECONOMIC DEVELOPMENT

4.2.01 Goals

G14 Support a diverse, sustainable local economy that provides well-compensated economic opportunities.

G15 Maintain the land base needed to support environmentally sustainable and economically viable farming and forestry in town, thus preserving our rural way of life.

G16 Support our working landscapes - farms, forests and sugar bushes - for the livelihoods of residents and future generations who make their living off the land.

G17 Improve the balance between the number of people in the labor force living in Starksboro and the number of jobs located in town to reduce impacts associated with commuting and to enhance residents' sense of being part of this community.

4.2.02 Objectives

O5 Expand the town's economy with clean businesses that provide healthy working conditions and livable compensation for local people while causing minimal impact to the environment.

- 0 Seek new, well-compensated economic opportunities that utilize the skills of local residents from traditional crafts to new technologies and that are of a type and scale compatible with the infrastructure that exists or is planned in town.
- 0 Recognize the importance of providing affordable and reliable access to energy and communications infrastructure to the town's economic future, especially as it relates to supporting residents who work from home and small businesses in Starksboro.
- 0 Recognize the importance of providing high quality and affordable childcare locally, not only in the lives of Starksboro's families, but also as part of the town's economic development strategy.

O6 Sustain Starksboro's rural economy, encouraging future generations to continue farming, sugarmaking and forestry in town, thus maintaining these traditional activities as town's primary industry.

- 0 Encourage innovative, alternative strategies to allow their owners to profitably use these lands for agriculture and forestry.
- 0 Offer farmers the flexibility to diversify their operations to include agriculture-related businesses such as farm-product sales, manufacturing of value-added products, on-site processing, agri-tourism, recreation, or education in an effort to increase the profitability of the town's primary industry.
- 0 Encourage businesses that provide residents opportunities to purchase local foods and other products, and/or increase awareness of the products and foods available locally.

4.2.03 Policies

P11 Economic development in Starksboro should be evaluated based on how new businesses affect neighbors and the community as a whole. Commercial and light industrial development should be in character and scale with surrounding properties.

P12 When reviewing applications for new or expanding businesses, special consideration should be given to public safety, potential danger to community health, pollution (including odor), adverse impact on natural resources and environmental quality, drainage problems, traffic, light and noise pollution. In addition, the business' impact on facilities and town services, tax structure and the potential to adversely affect Starksboro's rural character should be considered.

P13 Allow the types of agriculture-supporting businesses that are necessary for farming to remain viable in the town and region, while ensuring that they are appropriate in scale and impact for their surroundings.

P14 Starksboro should recognize the value of supplemental and part-time agricultural operations in maintaining the town's open lands, scenic beauty, landscape diversity, tourism and wildlife habitat.

P15 Support continued small-scale, community-serving retail and service businesses primarily in Starksboro village and Jerusalem, and to a limited degree within the town's other population centers.

P16 Allow construction of structures associated with business enterprises, while ensuring their scale and architectural style is compatible with the character of their surroundings.

P17 Discourage large-scale or strip commercial development and franchise architecture throughout Starksboro.

P18 Provide flexibility for residents working from home or operating small businesses from their residential property that are compatible with the character of their surroundings, including consideration of the suitability of the road(s) serving the property to accommodate any increased traffic related to the business.

P19 Encourage affordable and reliable access to energy and communications infrastructure.

4.3. EDUCATION

4.3.01 Goal

G18 Provide high quality educational opportunities for all Starksboro residents.

4.3.02 Objectives

O7 Maintain and continue to improve the quality of the educational programs at Robinson School, Mount Abraham Union High School and the Addison County Vocational Center as resources permit.

O8 Provide lifelong learning opportunities for Starksboro residents.

O9 Investigate and address transportation and supervision issues so that children and youth have access to after-school and summer activities.

4.3.03 Policies

P20 Support efforts to provide early childhood education programs in town.

P21 Encourage increased access to educational programs for children and youth that need additional support.

P22 Encourage broad access to a range of after-school programs that include a mix of educational and recreational activities.

P23 Encourage youth to participate in programs, such as those offered by AmeriCorps/VISTA that can provide after-school and summer activities supervision

P24 Support efforts to develop an activities bus or other alternatives that can provide after-school and summer activities to children and youth in different parts of the town.

P25 Restrain inappropriate growth that would negatively affect Starksboro's ability to provide a quality education.

P26 Utilize existing community resources and facilities to provide lifelong learning opportunities.

4.4. COMMUNITY UTILITIES, FACILITIES AND SERVICES

4.4.01 Goals

G19 Achieve a pattern of development and rate of population growth that is consistent with the town's ability to provide services and minimize the impact on the fiscal condition of the town.

G20 Maintain quality groundwater as the supply of safe and clean drinking water throughout town.

4.4.02 Objectives

O10 Maintain groundwater quality to provide a supply of safe and clean drinking water throughout town, and to prevent the village water supply from needing to be treated.

O11 Support efforts to accurately map the town's groundwater resources and aquifer recharge areas, and to improve our knowledge of the quantity and quality of groundwater available in Starksboro.

O12 Encourage utilities and property owners to take the actions needed to increase the reliability of Starksboro's electric and communications infrastructure.

O13 Encourage utilities and service providers to improve Starksboro's access to communication technologies, such as high-speed Internet and cell service, and make upgrades as necessary in the future to continue to provide state-of-the-art service.

O14 Support the efforts of the library, school and other community organizations to provide free access to and training in the use of computers and internet technology.

O15 Recognize the services provided by the town's volunteer emergency responders as critical to the town and continue to support their efforts to provide high quality fire and rescue services in Starksboro.

O16 Maintain the firehouse and rescue squad station within Starksboro village and the fire department substation in South Starksboro, and explore the feasibility of other actions that could minimize response times, especially in the town's more densely populated areas.

4.4.03 Policies

P27 Encourage development that would minimize the negative impact on the town's fiscal health and ability to provide necessary services and facilities.

P28 Encourage the types of land use and development that would be beneficial to the town.

P29 Avoid construction of municipal wastewater treatment systems that would be costly for taxpayers and would promote a pattern of development inconsistent with this plan.

P30 Regulate land use within identified source protection areas in order to limit the potential for pollution and to safeguard the purity of drinking water supplies.

P31 Prohibit those land uses with significant potential for pollution that could endanger the health of residents and the environment including, but not limited to, nuclear power facilities, heavy industries, or storage or landfill sites for hazardous materials.

P32 Encourage new utility lines be buried in order to increase reliability and limit the visual impacts of overhead lines where feasible and cost-effective.

P33 Discourage the location of energy transmission corridors in Starksboro whose primary purpose would be to transport energy supplies through the town and region, rather than to provide necessary energy within the town or region.

P34 Encourage telecommunication antennas that provide service in Starksboro preferably on or within existing structures (steeples, silos, utility poles, etc.).

P35 Discourage wind and telecommunication towers in environmentally sensitive areas and take all reasonable measures in accordance with state and federal law to prevent towers that would require warning lights.

P36 Consider the town's ability to provide emergency services, especially during the winter months and mud season, when determining the appropriate types and densities of land use that will be allowed in outlying areas.

P37 Support a system of dry hydrants, fire ponds, cisterns, etc. to facilitate fire fighting efforts, and consider the needs of emergency responders when reviewing development proposals.

P38 Review, update, and readopt the Town of Starksboro All Hazards Mitigation Plan on a five-year cycle in conformance with federal and state requirements.

P39 Pursue the mitigation actions identified in the Town of Starksboro All Hazards Mitigation Plan as most recently adopted.

P40 Continue planning for the town's solid waste disposal needs through participation in the Addison County Solid Waste Management District.

P41 Ensure that use and management of the town forest and other public land is consistent with the needs of recreational users and wildlife.

4.5. RECREATION

4.5.01 Goals

G21 Preserve the interrelated values of community, neighborliness, independence and privacy essential to Starksboro's small-town character.

G22 Protect and enhance the natural resources of the town for the health, safety and enjoyment of all residents, current and future.

G23 Encourage all recreational users to be informed and respectful of the property rights of landowners and the users' responsibilities.

4.5.02 Objectives

O17 Develop low-impact recreation paths, including bike and walking paths throughout town.

O18 Support traditional outdoor recreational activities such as, but not limited to, hunting, fishing and hiking, with an emphasis towards education and safety.

O19 Support existing recreational infrastructure and programs that benefit youth and adult sports.

O20 Support development of recreational facilities for adults and children within or near the town's population centers that can be shared with all town residents.

4.5.03 Policies

P42 Discourage recreational uses and development that cause adverse impact to soils, water and other natural resources.

P43 Allow low-impact recreational activities within the Town Forest and state-managed public paths.

P44 Encourage development of and improve existing environmentally low-impact recreational opportunities for town residents.

4.6. TRANSPORTATION

4.6.01 Goals

G24 Restrain inappropriate growth that would negatively affect Starksboro's transportation network system.

G25 Provide a safe transportation network that protects water quality and meets the needs of automobiles, agriculture, forestry, pedestrians and bicyclists, as well as other users within the town's financial means.

G26 Provide a roadway system that recognizes the needs of wildlife populations and seeks to minimize disruptions to wildlife travel corridors.

G27 Reduce reliance on personal automobile use by promoting energy-efficient modes of transportation, public transportation, carpooling and other alternatives that reduce reliance on the automobile and petroleum products.

4.6.02 Objectives

O21 Maintain town roads consistent with their use and with state standards established for their class.

O22 Minimize the number of new curb cuts onto public roads and promote construction of shared driveways whenever feasible in order to protect public safety, preserve environmental quality, reduce infrastructure costs and encourage clustering of new development.

O23 Enforce established speed limits on all public roads in town.

O24 Seek opportunities to improve traffic and pedestrian safety, especially within Starksboro's population centers.

O25 Discourage use or designation of roads in Starksboro as "truck routes" and support efforts to redirect truck traffic off Route 17 during the winter months.

O26 Encourage public transportation along Starksboro's major travel corridors in order to provide reliable, affordable and energy efficient transportation opportunities for commuters traveling to and from work.

O27 Support the development of small-scale commuter parking areas along Starksboro's major travel corridors.

O28 Seek opportunities and funding to construct pedestrian and bike paths within Starksboro's population centers.

O29 Seek opportunities and funding to provide safe routes for children to walk or bicycle to the Robinson School and the town's recreation areas.

O30 Support efforts to improve bicycle and pedestrian access and safety along the Route 116 and Route 17 corridors. An off-road path system within the village may provide an option to either sidewalks, wider shoulders or an on-road bike lane.

4.6.03 Policies

P45 Public roads should not be upgraded, downgraded, or extended unless such action is deemed to have significant benefits for the community as whole, rather than primarily benefiting a small number of landowners. The town should develop a policy, largely based on trip generation and maintenance costs, to determine when upgrades – such as road paving or widening – should be undertaken. The town should approve extensions of town

roads or accept new roads only when such action will not adversely affect town finances, public safety or conflict with other town goals, including avoiding further fragmentations of the town's core forest areas.

P46 Private roads and driveways are a significant part of Starksboro's transportation system. Therefore, the town's land use regulations, road construction standards and highway access policies should be revised as necessary in accordance with the following policies:

- The town should develop and adopt construction standards for private roads and drives to ensure reasonable access by emergency vehicles and protect the safety of travelers. Private roads and driveways should be constructed in a manner that:
  - Minimizes the number of curb cuts onto state and town roads.
  - Provides safe access for emergency vehicles.
  - Provides for safe intersections with local roads.
  - Prevents erosion and protects water quality.
  - Reduces damage to public roads.
  - Minimizes the number of trees removed.
  - Is guided by construction standards such as the Vermont Local Roads Program.

P47 The town should work with the state and other partners to find options for bicycle and pedestrian access that would not have unwanted consequences. Particularly within Starksboro village, the town should discourage any further widening of Route 116 unless it can be shown that traffic calming measures are being implemented to prevent any increase in the speed of traffic on the road.

P48 Mitigate, to the greatest extent practical, the impacts of development and maintenance of town roads on clean water, clean air, soils, forests and wildlife.

P49 Perform maintenance of town roads consistent with their use and with state standards established for their class.

P50 Limit upgrades to the classification of town roads, the expansion of the town highway system and the acceptance of new town roads.

P51 Maintain safe and efficient use of the access to public roads, in accordance with the town's road access policy.

P52 Promote construction of shared driveways whenever feasible in order to protect public safety, preserve environmental quality, reduce infrastructure costs and encourage clustering of new development.

P53 Limit the amount of over-weight and over-length trucks and the transport of hazardous materials to the greatest extent feasible under state and federal law.

P54 Manage a roadway system that recognizes the needs of wildlife populations and seeks to minimize disruptions to wildlife travel corridors.

P55 Operate a roadway system that manages water-related issues including erosion, runoff and flooding.

4.7. ENERGY

4.7.01 Goals

G28 Ensure safe and reliable energy sources and infrastructure for future generations and seek renewable energy sources whenever feasible.

G29 Minimize any adverse effects related to the generation or use of energy on environmental quality and rural character.

G30 Minimize the use of energy and attempt to conserve all forms of non-renewable energy.

G31 Raise general awareness of means, methods and opportunities provided by improved energy-related technologies.

G32 Reduce transportation energy needs.

4.7.02 Objectives

O31 Encourage the use of safe non-motorized transportation.

O32 Promote the use and development of local renewable energy sources as a replacement for imported nonrenewable resources.

O33 Promote programs that inform and assist townspeople with energy conservation.

O34 Support regular energy audits for town and school buildings and seek opportunities and funding for improvements when shown to be cost-effective.

4.7.03 Policies

P56 Promote energy efficiency.

P57 Promote programs that inform and assist townspeople with energy conservation, such as Efficiency Vermont.

P58 Promote awareness of energy issues in the design and siting of all new homes.

P59 Encourage cluster development and other energy efficient patterns of land use.

P60 Support the creation of regional mass transit.

P61 Encourage the use of safe non-motorized transportation.

P62 Ensure that the development of both renewable and nonrenewable energy resources is consistent with sound environmental practices and will minimize negative environmental impacts including air, noise and light pollution.

P63 Support the use and development of local renewable energy sources.

P64 Allow landowners to construct clean, independent, alternative energy systems by considering them an accessory use to residential uses in Starksboro's land use regulations.

P65 Avoid the construction of new overhead transmission lines to the greatest extent feasible by burying required infrastructure.

P66 Inform permitees of their obligations under the Vermont Residential Building Energy Standard and the Vermont Commercial Building Energy Standard.

P67 Support the Energy Committee as it explores energy-related financing opportunities such as the Property Assessed Clean Energy program that enable homeowners to finance larger-scale energy retrofits and renewable energy systems for their homes.

4.8. NATURAL RESOURCES

4.8.01 Goals

Eight out of ten of this plan's General Goals (see Section 1.3) are directly related to natural resources. Survey results support these goals and encourage both natural resource protection and wise use. Residents see value in land-based enterprise (farming, forestry, sugar making), but also in recreation, tourism, local energy, and other ecosystem services (clean water, flood control, biological diversity) – all of which are provided by these resources. The objectives below attempt to balance these goals and describe policies that can help achieve them. Any mapping or inventorying suggested can only be accomplished with landowner permission.

4.8.02 Objectives

O35 Encourage multiple-use management of Starksboro's forestland, including sustainable forestry activities that incorporate best management practices for soil and water protection.

O36 Avoid degradation of water quality, disruption of wildlife corridors and large-scale fragmentation of wildlife habitat and productive forestland by carefully controlling development.

O37 Support voluntary protection of open space through conservation easements and other mechanisms.

O38 Encourage increased town-wide understanding of the ecological functions of different components of Starksboro's landscape, including the contributions of wetlands, stream corridors and areas of unbroken forest.

O39 Ensure the protection of groundwater resources and drinking water supplies.

O40 Restrict development along and in the headwater areas of major streams, including Lewis Creek and Baldwin Creek.

O41 Ensure that both landowner property within the Lewis Creek corridor and the ecological functioning of the Lewis Creek are protected. For the purpose of this plan, the terms "Lewis Creek Corridor" and "Fluvial Erosion Hazard Areas" are assumed to be the same. These areas are defined and delineated in the "Lewis Creek Corridor Plan: Reaches M14-M-18", dated February 2008 and revised March 2008.

O42 Protect or provide for long-term stewardship of wetlands that support significant functions and values for natural communities, rare species habitat, or wildlife habitat, and prevent

additional loss of wetlands within the town. Support efforts to enhance the functions and values of wetlands negatively affected by human disturbance.

O43 Strive to maintain a high quality of Starksboro's surface waters.

4.8.03 Policies

P68 Revise the town's land use regulations to ensure that any subdivision of forestland provides reasonable access to "back" lots for forestry uses. Land use and development should be compatible with natural resource-based enterprise.

P69 Roughly half of the land in Starksboro is enrolled in the Current Use program. This program helps to reduce the property tax burden on forest landowners and ensures these lands are managed responsibly. The town should support this program.

P70 Clear-cuts larger than 40 acres in size will be discouraged.

P71 The town's land use regulations should be revised to guide development away from steep slopes, significant wildlife habitat, and fragile natural features.

P72 Much of Starksboro's scenic quality is due to its large sweeps of unbroken forest and farm land. Maintaining the Forest and Conservation and Agriculture and Rural Residential districts will continue to protect these scenic resources. Developing an inventory of views that the townspeople find particularly valuable could be a useful tool in future planning efforts and help in the exploration of creative ways of preserving them.

P73 Starksboro is unusual for our region in that it still has large areas of core forest in relatively large parcels. The Planning Commission and Development Review Board should recognize this feature and discourage development that fragments this core. New roads into the core should be limited. Existing camps should remain as seasonal dwellings if they are within the Upland Forest Planning Area.

P74 Zoning and subdivision regulations help ensure that use is appropriate and compatible, but the town will also support voluntary conservation. This can be accomplished in various ways including:

- Inventory important natural resources and educate the public about their occurrence and value. Use these reports to guide decisions of the Planning Commission and Development Review Board and to mitigate impacts and prioritize important natural assets for protection.
- Ask town boards to write statements of support for conservation projects as opportunities arise that are appropriate and in the best interest of the town.
- Continue to encourage public dialogue on the balance between conservation and land development.
- Investigate the willingness of residents to support a local conservation fund.
- Evaluate and consider innovative, alternative strategies, including the transfer of development rights from significant natural resource properties to other parcels more suitable for development.

P75 Engage the Conservation Commission with identifying, mapping and studying the town's natural features and areas, outdoor recreation resources, and important wildlife habitat in order to better understand the environment around us and how we can develop and use land in a way that is less disruptive or damaging to the environment.

P76 Engage the Conservation Commission in helping to bring the best available ecological information into the town's land use planning and development review efforts.

P77 Place a high priority on monitoring, mapping and inventory, in order to better understand the town's natural resources. Seek grants and assistance from experts to build up our information base. In particular:

- Locate amphibian road crossing sites and organize public participation in assisting safe migrations.
- Begin mapping of vernal pools.
- Begin inventory of hard-nut mast stands, which are important feeding areas for deer, bear, and other species.
- Expand on existing road crossing data, including input from the town road crew, and develop a more accurate map of these areas. Take steps toward protecting key wildlife road crossing sites and coordinate with similar efforts in neighboring towns.
- Upgrade mapping of deer wintering areas.

P78 Under Vermont's water supply rules each public water system should have a Source Protection Plan, which identifies existing and potential sources of contamination within their SPA. The system operator should also develop the means to ensure long-term protection of the source, as well as the identification of alternative water supplies.

P79 The town should support efforts to better map and under-stand the town's groundwater supplies. Opportunities for grants should be explored, such as the STATEMAP program grant from the U.S. Geological Survey administered by the Vermont Geological Survey. The use of such grant money, combined with volunteer efforts of interested town residents, would help to enable the completion of groundwater mapping for Starksboro to help in planning efforts concerning this invaluable resource, including the identification of potential future public water supply areas.

P80 The town should support efforts to study the bedrock, surficial geology and hydrology in other areas of Starksboro to identify those areas that, if developed, may impact groundwater quality. Develop a water supply protection strategy and use the town's land use regulations to protect identified source protection areas from incompatible development or land use.

P81 These headwater areas exist in the Upland Forest Planning Area and have considerable protection under current zoning. Most of the upper reaches of Lewis Creek are within the state-owned Lewis Creek Wildlife Management Area. The town should coordinate with the state to develop a mutually acceptable plan for use of the approximately 3,000 acres of public land in this planning area in a manner that is consistent with this plan and the interests of the town.

P82 Delineate Fluvial Erosion Hazard areas for the major tributaries of the Lewis Creek watershed that have been identified in Phase 1 Stream Geomorphic Assessments and press for up-dated FEMA Flood Insurance Rate Maps upon which to base regulations intended to limit property damage and loss of life from natural hazards.

P83 Pursue funding to undertake a comprehensive inventory of wetlands in the town, with landowner permission, to update and enhance existing wetland maps.

P84 Monitor wetlands of high value and/or those that are under threat and pursue efforts to voluntarily protect such wetlands.

P85 Remove invasive species when possible to preserve the integrity of the town's wetlands.

P86 Use wetlands in the Town Forest for educational purposes, including programs for area students.

P87 Seek opportunities to work with state, federal, and other partners to continue monitoring water quality, pursue improvements in water quality when opportunities arise, and improve vegetated stream buffers.

P88 Review, on an ongoing basis, the water quality reports prepared by the Lewis Creek Association and the Addison County Riverwatch Collaborative, and consider their recommendations for methods to improve water quality in our town for swimmers, anglers, and wildlife.

P89 Starksboro's land use regulations should more clearly define "adverse effect" in the current language regarding stream set-backs, so that applicants have more specific guidance on what they must demonstrate in order to be exempted from the 100-foot setback from streams. Protections could be increased by changing all or a portion of the setback dimension to a buffer requirement. A simple no-build setback still permits removal of native vegetation along the riverbanks, which can lead to bank destabilization and accelerated erosion. Naturally vegetated buffers are important to filter sediment and nutrients from stormwater runoff, and attenuate flood flows.

P90 Starksboro should develop a comprehensive stormwater management plan, of which many models exist in Vermont. A variety of management practices such as vegetative and landscaping controls and other low impact development (LID) techniques should be considered as a component of this plan. Development on steep slopes equal to or in excess of 15 percent should be sited and constructed (and slopes stabilized) to minimize risks to surface and ground waters and to protect neighboring properties from damage.

4.9. LAND USE AND DEVELOPMENT

4.9.01 Goals

G33 Limit growth to a rate that does not negatively affect the sense of community, economic well-being, fiscal condition, existing infrastructure or environmental quality of the Town of Starksboro.

G34 Achieve a pattern of growth that maintains the rural agricultural and forested character of the town.

G35 Develop a capital program and budget that will assess the fiscal condition of the town and decide upon a rate of population, housing and budget growth consistent with that assessment and the town's ability to meet its current and future obligations. The town should seek state and regional funding or assistance to develop the budget and program.

4.9.02 Objectives

O44 Continue to limit the rate of growth and monitor the affects to the fiscal condition, existing infrastructure or environmental quality of the Town of Starksboro.

O45 Encourage residential and business development to concentrate in and around the town's existing villages, hamlets and neighborhoods.

O46 Acknowledge that not all residential development can or will occur in or around existing villages, hamlets and neighborhoods. Development in the agricultural district should not unduly reduce the amount of open agricultural land or disturb ecologically sensitive areas.

O47 Ensure that development in Starksboro is compatible with existing land uses and minimize adverse impacts from traffic, noise, light, odor and other off-site impacts.

O48 Seek to have development occur in areas where soils and other site characteristics are capable of supporting such development.

O49 Support the conservation of agriculturally viable or ecologically valuable parcels of land through the use of donations, conservation easements, purchase or transfer of development rights, and the use of permitting methods such as set-asides or building envelopes.

O50 Support the conservation of scenic vistas through the use of donations, easements or purchase or transfer of development rights.

O51 Continue to encourage development to minimize impact on the visual landscape and discourage development on prominent ridgelines and steep slopes.

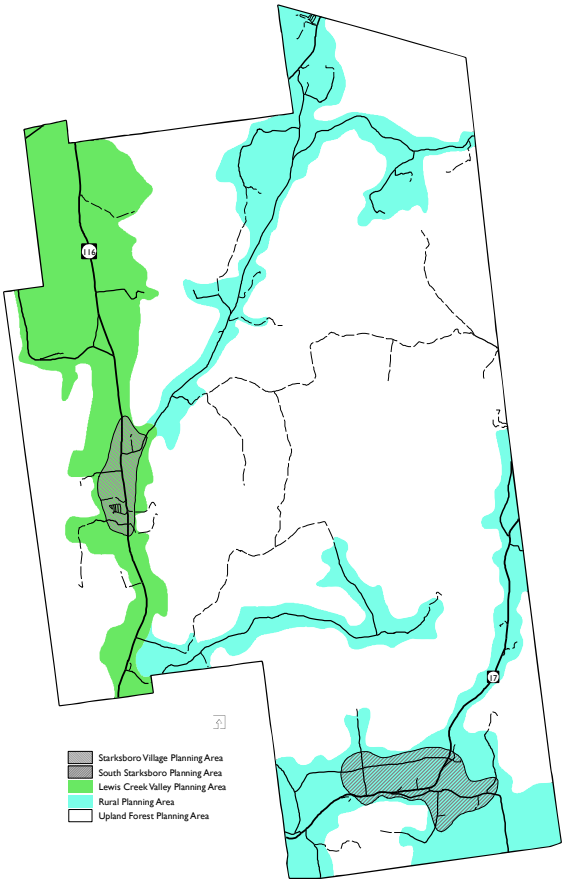
O52 Utilize ASRR and FC districts in order to discourage subdivision of land with agricultural and forestry value into parcels that are economically non-viable for those purposes due to shape, size or limited access.

O53 Continue to encourage cluster development by granting developers a density bonus for preserving large amounts of open land.

O54 Minimize light trespass, appropriate to the zoning district, from excessive negative effects associated with exterior lighting.

O55 Maintain land use regulations consistent with the goals of this plan.

Figure. 14 Future Land Use Map



4.9.03 Policies for the Land Use Planning Areas

This plan sets forth the following strategy to guide future land use and development in Starksboro in accordance with the vision, goals objectives, and

policies. The town has been divided into a number of land use planning areas for the purpose of describing the types and densities of development deemed appropriate based on factors such as historic and current land use, access and distance to public services, natural resource constraints and value for productive use.

These areas should not be interpreted as zoning districts, although they could form the basis for future revisions to the land use regulations. It should not be assumed that each planning area represents a single zoning district. Planning areas may include multiple zoning districts and/or a single zoning district may include land in multiple planning areas. The town's land use regulations and zoning map shall be used to determine the specific land uses permitted and the densities and dimensional requirements established for a specific property.

Lewis Creek Valley Planning Area

P91 As the Lewis Creek Valley includes most of the town's productive agricultural land, all available and feasible means should be used to preserve farmland and limit large-scale, large-lot and/or sprawling residential development in the area. Overall residential densities should remain very low with any additional non-farm residences carefully sited to minimize impacts on quality farmland. In revising the town's land use regulations, consideration should be given to creative approaches to achieving desired development patterns such as:

- Implementation of a sliding scale to establish maximum density of land in the area in a manner that discourages fragmentation of productive land.
- Using a site-based analysis, such as a LESA (land evaluation and site assessment), to establish maximum density of land in the area in a manner that guides development away from the most productive land.
- Offering incentives or bonuses for tightly clustered development and/or limit the size of non-farm residential lots in the area in order to preserve viable tracts of productive land.

P92 The town should support the economic viability of agriculture in this area by allowing for farm-related businesses, farm worker housing, farm product sales, agri-tourism and agricultural-support businesses.

P93 The town should support the purchase or transfer of development rights, or other innovative techniques, to ensure that farmland in this area will be conserved for future generations, thus protecting the town's rural heritage, character and way of life.

P94 The town should explore the feasibility of and interest in local options to the state's current use program and the Vermont Land Trust's farmland conservation efforts that would offer property tax or other financial benefits to landowners in exchange for keeping land in productive use, but without requiring land conservation in perpetuity.

Starksboro Village Planning Area

P95 Starksboro village should remain the town's primary center. The desired character of this planning area is that of a traditional New England village center. Specifically, it should be a place that has:

- A mix of uses in close proximity to each other bringing people together for a variety of activities –including town affairs, work, living, recreation, business, shopping, and entertainment – attracting and benefiting people of all ages and income levels.
- A physical layout with higher densities in comparison to outlying areas and a distinct, defined geographical edge that establishes an identity or a sense of place.

- A strong public presence, such as greens or parks, municipal buildings, post office, school or other public spaces or buildings.
- A presence of special features, such as historic buildings, landmarks and views.
- Diversity in the size of buildings and lots.
- A pedestrian-friendly environment in which most uses are within a five- or ten-minute walk (1,500 to 3,000 feet) of each other and a transportation system that is designed for pedestrian safety, as well as vehicular access.
- Buildings located close to the street with limited amounts of parking between the street and front of the building.
- Multi-story, mixed-use buildings whose main entrance is oriented to the street.

P96 This area is an appropriate location for the most compact and highest intensity residential, commercial and mixed-use development in town. Most of the town's public uses such as town offices, post office, school and library should be located in the village, although satellite locations for such uses in other areas of town should be considered if deemed necessary to serve nearby residents.

P97 The potential for new development within the village area is limited, so use of land within this area should be maximized. Densities should be as high as can be accommodated given the availability of infrastructure and soil capabilities. Dimensional standards within the town's land use regulations should be revised to reflect and extend the existing historic settlement pattern in this area.

P98 It should be recognized that this area exists within the Lewis Creek Valley Planning Area and includes important agricultural soils, as well as productive farmland. Indeed, the presence of working farms in the heart of the village is one of Starksboro's distinguishing characteristics. Residents support maintaining farming and farmland within the village, but they also support focusing growth in this area in order to prevent development of outlying rural lands. It has been and will continue to be a challenge to balance these competing goals, but with careful planning and ongoing dialogue creative solutions should be sought. Farm buildings, if no longer used for agriculture, should be considered for adaptive re-use as commercial or residential structures.

P99 The state has designated a portion of this area as the Starksboro Village Historic District and has inventoried its contributing historic structures. The importance of these historic resources should be recognized as critical components of the character of this area and the village's sense of place. The town should review its regulations to ensure that they provide flexibility for the ongoing use of historic structures and discourage demolition or inappropriate renovations. The town should consider seeking Village Center designation for Starksboro Village, making income-producing properties eligible for state tax credits in order to support maintenance and appropriate rehabilitation of historic structures. Village Center designation would also enhance the town's ability to obtain grant funding for public improvements in Starksboro Village.

P100 The possibility of constructing additional roads parallel to Route 116 in the village should be investigated, as much of the highway frontage is already built-out in this area. The town should undertake the planning necessary to identify potential road corridors and consider adoption of an Official Map to implement the plan.

P101 There are large and/or under-utilized buildings in this area that could be renovated into multi-unit or accessory dwellings. The town's regulations should support such re-use of existing buildings and allow for housing options other than single-family detached homes in this area. If new multi-unit buildings are to be built in the village, they should be designed to be compatible to the historic development pattern and be similar in scale and massing to large single-family homes.

P102 Consideration should be given to encouraging smart growth planning techniques that would cluster development in areas that provide easy pedestrian access, decreasing reliance on automobiles. This would serve both a conservation function and meet the needs of a growing population of older residents. This area is the most appropriate place in town for elderly housing, which has been recognized as a need by current residents. The town should explore the feasibility of siting a project like Lincoln's Weathervane in Starksboro village.

P103 Commercial uses should be permitted to the extent that they are compatible with adjacent residential uses in the village and are in conformance with this plan. The town's land use regulations should be revised to increase the types of businesses allowed in the village, while more tightly controlling their scale and impact. The town's land use regulations should be revised to strongly discourage single-story commercial buildings and franchise architecture in this area. Throughout this area, but especially along Route 116, commercial buildings should have shallow setbacks with little to no parking between the front of the building and the street.

P104 The town's land use regulations should be revised to extend its village-type zoning south to include Brookside Mobile Home Park. Efforts should be made to knit this existing high-density neighborhood into the fabric of the village. Within and adjacent to the park, the town's regulations should allow and encourage infill development with modest, affordable homes – starter homes, cottage-style homes, etc. – that would diversify the town's affordable housing stock, provide housing options for young families, empty nesters and seniors, and create a smooth transition between the historic village neighborhood and mobile home park neighborhood.

Rural Planning Area

P105 This planning area includes those lands outside the Lewis Creek Valley that have access from year-round maintained, public roads (state and Class 2 or 3 town roads) and that are not characterized by steep slopes or other significant environmental constraints to development.

P106 In the Rural Planning Area, overall intensity of land use and density of development should remain low with any additional residences carefully sited to minimize impacts on environmental quality. In revising the town's land use regulations, consideration should be given to approaches that achieve desired development patterns such as:

- Using a site-based analysis that would take characteristics such as soil conditions, slope and ecological features to establish maximum density of land in the area. Consideration should be given to incorporating distance from existing population centers and/or main transportation corridors as criteria in determining maximum density. The character, quality and accessibility of the road(s) serving the property to be developed could also be considered when determining maximum density.

- Offering incentives or bonuses for tightly clustered development that preserves large areas of undisturbed land.

P107 Land use patterns in rural planning areas are diverse and vary in lot use, setbacks and building type. The town's land use regulations should offer flexibility in the rural planning areas in terms of dimensional requirements and land uses while keeping overall density low.

P108 The "view from the road" is important in establishing character. As new development occurs in Starksboro's rural areas, consideration should be given to maintaining or enhancing that view to the greatest extent feasible. Where roadsides are forested, new buildings should be set back behind a wooded buffer. Where development will be occurring on open land, new buildings can be placed along the edges of fields or woodlands to reduce their visual impact (and potentially conserve productive farmland).

P109 Home-based, ag-based, resource-based and other small-scale businesses, along with forestry uses, should be permitted to the extent that they do not alter the character of the area or decrease quality of life for nearby residents. The town's land use regulations should be revised to increase the types of businesses allowed, while more tightly controlling their scale and impact, in recognition that the most effective way to prevent development of the town's rural lands is to support opportunities for other income-producing uses.

P110 No extension or upgrading of existing town roads should be permitted unless consistent with town policy on extension and upgrade of roads.

South Starksboro Planning Area

P111 South Starksboro should remain a secondary location for compact residential and small-scale business development in town. The desired character of this planning area is that of a rural, primarily residential hamlet. Specifically, it should be a place:

- That may have public spaces or buildings, and/or small-scale businesses that are readily recognizable and help define the area's identity.
- With a diversity of housing types and varying lot sizes that allow for multiple uses while maintaining the pre-dominantly rural look and feel of the area. Differences in building design, architectural detail and setbacks should break the mold of a cookie cutter, suburban development pattern.
- Offers a connection to nature through a consciously designed open space system, creating a 'livable' neighborhood that balances the convenient access of a traditional hamlet with the natural beauty and tranquility of a rural community.

P112 It should be recognized that South Starksboro is considered a rural area by many of its residents and that a significant amount of the residential growth that has occurred in town over the past several decades has been in this area. Residents have called upon the town to more carefully craft the land use regulations within this area to reflect the capability of the land and road infrastructure to support development, and to maintain the rural character of South Starksboro. Still, a majority of town residents support focusing growth within existing population centers. Careful planning and further dialogue is needed to resolve the competing land use objectives in this area.

P113 Densities and dimensional standards within the town's land use regulations should consider the existing historic settlement pattern within the traditional hamlet of Jerusalem. Densities in the remainder of the planning area should reflect the level of accessibility and capability of land to support development. Consideration should be given to protecting the important natural resources within this area including wildlife habitat and fragile environmental features.

P114 Consideration should be given to encouraging smart growth planning techniques that would cluster development in the parts of the area most suitable for development while maintaining a rural land use pattern and character. Maintain a diverse landscape that includes both compact development and open space, and that protects the view from public roads to the greatest extent feasible. This is critical to ensuring that the rural character of the area is preserved.

P115 Home-based and other small-scale businesses should be permitted to the extent that they do not alter the character of the area or decrease quality of life for nearby residents. The town's land use regulations should be revised to increase the types of businesses allowed, while more tightly controlling their scale and impact. The town's regulations should strongly discourage the construction of franchise architecture in this area.

Upland Forest Planning Area

P116 This planning area consists of many large parcels including the Lewis Creek Wildlife Management Area and the Town Forest. Land in this planning area is largely inaccessible from state highways or Class 2 or 3 town roads, and is characterized by steep slopes and unfragmented forests.

P117 Residential development in this planning area might have a detrimental impact on the town's fiscal prospects. Residential development might also destroy the natural, scenic and wildlife habitat features valued by residents. Therefore, all available and feasible means should be used to prevent year-round residential development in these areas. The town's land use regulations should continue to allow seasonal camps and recreational uses to the extent that they do not affect the essential character or environmental quality of the area.

P118 The town should attempt to ensure that forestry activity in this planning area does not have an unreasonably detrimental impact on environmental quality or the essential character of this area.

P119 This area is accessed primarily by class 4 town roads, private roads and trails. Extension or upgrade of town roads in this planning area should not be permitted unless consistent with town policy on extension and upgrade of roads.

Specially Designated Areas

P120 **Watershed Protection Area.** The town's land use regulations should continue to protect the quality of drinking water. The existing watershed protection district, currently located south of Brown Hill West and east of Big Hollow Road, should continue to be used to protect water quality. All possible regulatory measures should be taken to prohibit and discourage development that would have an adverse impact on the quality of water supplies in the watershed protection district. The town should explore the feasibility and desirability of public acquisition of land in the watershed protection district to permanently preserve the quality and availability of these resources.

P121 **Flood and Erosion Hazard Areas.** The town's land use regulations should continue to prevent development within designated flood hazard areas. Currently, the town's land use regulations include a Flood Hazard Overlay District, which encompasses all land designated by the Federal Insurance Administration in its Flood Insurance Study for the Town of Starksboro, with accompanying maps as most recently amended. The town should consider revising the town's regulations to include protections for fluvial erosion hazard areas, which include lands along the town's small streams that are at risk for flash flooding and significant stream bank erosion. The regulations should ensure that any new construction that is allowed be constructed to minimum standards in order to protect public health and safety, limit damage to public infrastructure and preserve environmental quality.

P122 **Mobile Home Parks.** Starksboro has three mobile home parks in town: Brookside, Lazy Brook and Hillside, owned and managed by the Addison County Community Trust. Having three parks in town places Starksboro among a small group of towns statewide with high concentrations of mobile home parks. The population of the three parks was estimated to be at least 347 people in 2008, or nearly 20 percent of the town's population. Starksboro's mobile home parks provide a stable source of affordable housing in the town. While these residents share many of the same issues and goals of townspeople in general, there are some land use planning issues unique to the three parks. There is a recognized need to improve the layout of housing in the parks in order to improve the social atmosphere and address health and safety concerns. Starksboro should consider revisions to its land use regulations, including an overlay or zoning district for these three properties, to address identified concerns including:

- Reconsidering the current layout within the parks to improve public health, safety, welfare and quality of life.
- Establishing setback standards between houses and buildings in order to reduce the likelihood of fire or other hazards to spread between buildings, and to allow access for emergency vehicles.
- Supporting efforts to address critical infrastructure issues in the parks, including road, water system and wastewater deficiencies as they occur.
- Supporting efforts to deconstruct and remove abandoned homes.
- Allowing for other types of affordable housing within the parks.

4.9.04 Growth Management Policies

Starksboro's development in recent years has been low. The town believes that managing growth is critical to keeping public services affordable for current residents and to protecting the town's rural character and way of life. To ensure that growth remains at a sustainable level, Starksboro should:

P123 Monitor the rate of development and consider adjusting the allocation of building permits to support desired development patterns (upon adoption of a capital budget) if the rate of growth becomes unsustainable.

P124 Monitor the rate of development and consider adopting a reasonable impact fee ordinance to offset the municipal and community costs of development (upon adoption of the capital budget) if the rate of growth become unsustainable.

4.9.05 Outdoor Lighting and Sign Policies

P125 Starksboro's land use regulations, which ensure that outdoor lighting and sign standards result in development that is compatible with the character of its surroundings, should continue to be implemented so that:

- Exterior lighting installations are turned off during daylight hours or nighttime hours when lighting is not needed.
- Light trespass onto adjacent residential properties is minimized. Lighting fixtures should be aimed downward and shielded in a manner that does not direct illumination on adjacent property. Fixtures should be shielded and designed to prevent glare from normal viewing angles.
- Outdoor lighting is designed to prevent light spill into the dark night sky to the greatest extent feasible through use of downward directed and shielded fixtures.
- Non-residential security lighting is installed only when necessary and uses the lowest possible illumination to effectively allow surveillance. Security lighting should be shielded and aimed so that illumination is directed only to designated areas such as doorways, gates, etc.
- Internally illuminated signs will be prohibited or require a higher standard of review.
- Signs will be of the minimum size and height necessary to communicate their message to the traveling public.

4.9.06 Telecommunications Tower Policies

P126 There is a desire for improved telecommunications in town, but this demand should be balanced with the town's goals of protecting environmental quality, human health, historic character, agricultural and rural uses, the tourist economy and aesthetics. The provisions of Starksboro's land use regulations related to telecommunications should continue to be implemented in accordance with all applicable provisions of federal and state law and the following policies:

- Any new telecommunication facilities should employ the least visually obtrusive technology with the lowest environmental impact available.
- Telecommunications facilities should not be located in environmentally sensitive areas.
- Developers of telecommunication facilities may be required to conduct an environmental impact statement of their proposed site.

4.9.07 Extraction Policies

P127 The extraction of earth resources should be carried out in a manner that minimizes or mitigates negative impacts such as erosion, or significant habitat. There should be plans for properly closing a site once its use is discontinued. Starksboro's municipally owned earth resources should be used to meet the town's needs in order to decrease the cost of road maintenance and other projects, as well as reduce the cost and impacts of hauling materials from out of town.

4.9.08 Public Land Policies

P128 Starksboro acknowledges the value of its publicly owned lands as recreational and educational resources. The town should coordinate with the state a mutually acceptable plan for use of the approximately 3,000 acres of public land in a manner that is consistent with this plan and the interests of the town. If additional publicly owned lands are to be

acquired, the town should only encourage such acquisitions after full consideration as to how it will affect the town's tax base.

4.9.09 Public Participation Policies

P129 The Planning Commission should spearhead efforts to involve the townspeople in the planning process on an ongoing basis. Planning forums, educational presentations and other interest generating techniques should be used for the most attended and useful public participation.

4.10. IMPLEMENTATION

4.10.01 Ongoing or Long-Term Strategies

S7 Continue to update and improve the plan as necessary to meet the needs of the town and in accordance with state law.

S8 Recognize and utilize existing data, planning methods and development trends from other towns or regions that add strength and value to Starksboro's Town Plan.

S9 Implement the objectives and policies in this plan through:

- Revisions to the town's regulations;
- Adoption of bylaws and ordinances;
- Adoption of a capital budget;
- Adoption of an official map or other implementation tools;
- Town spending decisions;
- Participation in regional and state planning and regulatory processes; and
- Support for the efforts of non-governmental organizations.

S10 Promote on-going participation and civic involvement by townspeople.

S11 Support grant writing to locate funding for a variety of in-town and inter-town planning projects.

S12 Investigate alternative strategies for managing growth.

S13 Support agricultural, forestry and appropriate businesses that provide healthy working conditions and livable compensation for local people.

S14 Work with the supervisory district to develop more accurate projections of population growth that are more sensitive to the actual conditions affecting the community.

S15 Support the development and seek funding for bike and pedestrian facilities and paths.

S16 Continue to support the efforts of the Energy Committee to develop and implement energy conservation and renewable energy generation policies that will address conservation, sustainability and long-term planning through actions such as the following:

- Conduct an energy audit of all town and school buildings that will identify steps that would improve the efficiency of these buildings, and provide a baseline for measuring progress towards achieving energy efficiency goals.
- Conduct an audit of energy resources available in town such as hydropower, wood and biomass, and wind corridors.
- Develop educational materials that can be issued with zoning permits related to energy-efficient siting and construction of buildings.
- Undertake outreach and education efforts to assist residents with improving the efficiency and sustainability of their homes and lifestyles.

S17 Continue to charge the Conservation Commission with identifying, mapping and studying the town's natural features and areas, outdoor recreation resources and important wildlife habitat in order to better understand the environment around us and how we can develop and use land in a way that is less disruptive or damaging to the environment.

4.10.02 Near-Term Actions or Projects

A1 Work with Addison County Regional Planning Commission, the Vermont Public Service Department and Green Mountain Power to assess and upgrade the town's electricity distribution infrastructure as necessary to support increased use and production of individual and community-scale renewable energy and economic development in accordance with the goals, objectivies and policies of this plan. [Energy Committee, Selectboard]

A2 Work with Addison County Regional Planning Commission, the Vermont Agency of Transportation, the Vermont Department of Environmental Conservation and water quality partners to meet Act 74 requirements for erosion control and stormwater management on town roads. [Highway Department, Selectboard, Conservation Commission]

A3 Continue to implement projects identified in Starksboro's Hazard Mitigation Plan. [Selectboard, Planning Commission, Conservation Commission, Highway Department]

A4 Prepare, adopt and maintain an updated capital program and budget that furthers the goals, objectives and policies of this plan. [Selectboard, Planning Commission, Highway Department, Fire Department]

A5 Seek partners and funding to expand educational, recreational and other support services to families living in Starksboro's mobile home parks. [Planning Commission, Selectboard, Addison County Community Trust]

Town of Starksboro | ENHANCED ENERGY PLAN

Introduction

INTENT OF THIS ENERGY PLAN

The Town of Starksboro recognizes our individual and collective responsibility to help reduce and conserve the energy we all use. Starksboro believes it serves its citizen's interests by conserving energy, reducing our consumption of non-renewable energy and shifting our usage to carbon free or carbon neutral renewable energy sources. Starksboro also believes that the Starksboro Town Plan must create a vision and clear policy statements for the Town to follow concerning energy conservation, reduced consumption and renewable generation within the Town. By this Plan Starksboro intends to exercise more control over the types of energy choices made within the Town.

One of the principal ways for Starksboro to gain more control over its energy usage and consumption is to create policies to meet the municipal determination standards for enhanced energy planning enabled in 24 V.S.A. 4352. By pursuing enhanced energy planning Starksboro agrees that its energy plan will further regional and state energy goals, including the goal of having 90% of the energy used in Vermont obtained through renewable sources by 2050 ('90 x 50') and the following:

- Vermont's greenhouse gas reduction goals under 10 V.S.A. § 578(a);
- Vermont's 25 by 25 goal for renewable energy under 10 V.S.A. § 580;
- Vermont's building efficiency goals under 10 V.S.A. § 581;
- State energy policy under 30 V.S.A. § 202a and the recommendations for regional and municipal energy planning pertaining to the efficient use of energy and the siting and development of renewable energy resources contained in the State energy plans adopted pursuant to 30 V.S.A. §§ 202 and 202b (State energy plans); and the distributed renewable generation and energy transformation categories of resources to meet the requirements of the Renewable Energy Standard under 30 V.S.A. §§ 8004 and 8005;

To receive a positive determination of energy compliance, an enhanced energy plan must be duly adopted, regionally approved, and must contain the following information:

An analysis of current energy resources, needs, scarcities, costs, and problems.
Targets for future energy use and generation.
"Pathways," or implementation actions, to help the municipality achieve the established targets.
Mapping to help guide the conversation about the siting of renewables.

A positive determination of compliance with the requirements of enhanced energy planning will enable Starksboro's Plan to achieve "substantial deference" from the Public Utilities Commission in Section 248 applications for energy generation facilities (ex. wind facilities, solar facilities, hydro facilities, etc.) under Criteria (b)(1) – Orderly Development of the criteria the Public Utilities Commission uses to evaluate proposed generation and transmission projects seeking Certificates of Public Good authorizing the construction of the proposed project. Substantial deference increases the respect the Public Utilities Commission will need to provide to clearly articulated policies in this plan (The current standard is "due consideration").

This chapter includes the required analysis, targets, "pathways," and associated mapping. Topics covered include energy conservation, reduction, and generation as it relates to thermal and electrical energy usage, transportation,

and land use planning. The plan also includes energy generation and siting standards. In addition to satisfying the above noted required criteria, this plan also contains a number of goals, objectives, and policies which describe actions Starksboro will undertake to achieve the described targets through implementation of conservation and appropriate generation strategies and as a part of the Town's efforts to meet the State's larger renewable goals.

STARKSBORO ENERGY COMMITTEE

The Town of Starksboro has recently formed an energy committee to consider, discuss, and address energy efficiency and renewable energy opportunities in Starksboro. Its mission is to work with residents, businesses and the Town to ensure our community's long-term energy future and energy independence by changing the way we use, produce and relate to energy.

OUTLINE OF HOW TO READ THIS PLAN

This plan breaks Starksboro's energy usage into the following four chapters, followed by a mapping section and associated appendix:

1. Thermal Use: This Chapter focuses mostly on Energy used for space heating.
2. Electrical Use: This Chapter focuses mostly on energy use within buildings for other end uses than space heating, for operating equipment, and is predicted to expand significantly to include transportation and heating loads.
3. Transportation Use: This Chapter focuses on energy used for transportation.
4. Land Use Generation and Transmission: This Chapter focuses on strategies for land use planning aimed at identifying appropriate siting opportunities for energy generation and transmission resources.
5. Mapping: This Chapter includes an analysis of the mapping of Starksboro's energy resources and constraints and a siting policy for new generation.
6. Appendix - Maps

Each chapter noted is broken into three sub-sections.

USE ANALYSIS: This sub-section providess current usage data in Starksboro for each of the four energy sectors. It includes charts of usage and a narrative describing the usage data.

TARGETS: The second sub-section will look at future projections of energy usage in the Town assuming Starksboro intends to meet the State goals of using 90% renewables by 2050. This subsection contains projections of usage targets. In 2016 through collaboration of the Addison County Regional Planning Commission worked with the Vermont Energy Investment Corporation (VEIC), and the Vermont Department of Public Service to develop regional targets for future energy use and generation. The intent of these targets is to meet the State of Vermont's 90 x 50 goal. The targets represent one scenario of what meeting this goal may look like. However, there could be numerous other ways for Vermont to achieve the 90 x 50 goal. For more information about the regional targets, please see the Addison County Regional Energy Plan (www.acrpc.com).

PATHWAYS: The third sub-section in each chapter provides goals, objectives, and policies for implementing the plan.

Additionally, the Land Use, Generation and Transmission chapter includes a mapping analysis of Starksboro's energy resources and constraints and a siting policy for new generation.

Thermal Use Analysis

THERMAL USE

An estimate of current residential thermal energy demand in Starksboro, based on data from the American Community Survey (2011-2015), is shown in Table 1. The data shows that the largest number of residences in Starksboro currently heat with fuel oil, (about 42%), followed by wood (41%) and propane (14%). Together these three heating sources account for about 97% of residential thermal heating fuel usage in Starksboro.

TABLE 1. CURRENT MUNICIPAL RESIDENTIAL HEATING ENERGY USE

Fuel Source	Municipal Households (ACS 2011-2015)	Municipal % of Households	Municipal Square Footage Heated	Municipal BTU (in Billions)
Natural Gas	0	0.0%	0	0
Propane	94	14.4%	168,839	10
Electricity	5	0.8%	10,360	1
Fuel Oil	272	41.6%	530,366	32
Coal	3	0.5	6216	0
Wood	269	41.1%	547,598	33
Solar	0	0.0%	0	0
Other	2	0.3%	4,144	0
No Fuel	3	0.5%	6,216	0
Total	654	100.0%	1,285,721	77

Wood constitutes a carbon neutral renewable resource. It is also currently abundant in much of Starksboro. Both fuel oil and propane gas are non-renewable fossil fuels. In order to meet State targets, their use will need to be largely eliminated by 2050. Making homes more thermally efficient is one way to reduce fossil fuel use. Another is to improve the heating and hot water equipment to make it work more efficiently. The third, and over the long-term best solution is to replace the fuel source with technology using an alternative, renewable fuel source, like electricity produced through renewable generation or wood. There are numerous barriers to efficiency adoption, including the higher first cost of new equipment. While the Town of Starksboro has little control over the costs of energy or equipment, it can work to encourage conservation, efficiency and lower local generation costs to help residents overcome some of the major barriers to adopting cost-effective efficiency improvements.

Estimates for commercial and industrial thermal energy use are more difficult to calculate. An estimate of total commercial energy use (thermal and electricity) is provided in Table 2 and based on data from the Vermont Department of Labor (VT DOL) and the Vermont Department of Public Service (VT DPS).

TABLE 2. CURRENT MUNICIPAL COMMERCIAL THERMAL ENERGY USE

Column1	Commercial Establishments in Municipality (VT DOL)	Estimated Thermal Energy BTUs by Commercial Establishments in Municipality (in Billions)
Municipal Commercial Energy Use	21	15

As the table immediately above shows, Starksboro has a very limited number of commercial establishments. Sugaring, however, should be noted as a commercial agricultural use as Starksboro does now have approximately 300,000 taps in the Town and which represents approximately four billion BTUs of thermal energy usage for boiling, not including

electrical use for pumps and motors. Most of the thermal energy changes that will need to take place in Starksboro to meet the targets will need to be done by individual home owners.

Energy conservation is the most cost-effective way to reduce energy costs in Vermont. A wide variety of state and federal subsidies and rebates are currently available for Vermont residents to conserve energy. Efficiency Vermont, the nation's only efficiency utility, has an informative home page at Efficiencyvermont.com. Visit it to learn about their current programs, including energy audits, incentives for Home Performance with Energy Star, information on appliances and LED bulbs, building an Energy Star home, home heating help, rebate information, and Efficiency Vermont's reference library.

Vermont also has residential energy standards. Officially called the "Residential Building Energy Standards" (RBES), the Residential Energy Code is a minimum standard of energy efficiency for all new residential construction in Vermont. The Vermont Residential Energy Code Handbook edition 4.1 March 1, 2015. REBS encompasses two requirements:

1. a technical requirement that includes minimum standards for energy-efficient building components and construction practices, and
2. a certification requirement for reporting compliance. Upon completion state law requires every Vermont builder to self-certify that the home complies with the Code as built. The builder must complete and sign a certificate and submit it to the Town Clerk for filing. This should be on record before the Zoning Administrator issues a Certificate of Occupancy.

THERMAL TARGETS

Thermal targets for Starksboro include increasing weatherization of homes, increase in new efficient wood heat systems and switching to efficient heat pump systems. See tables below for one example of targeted changes necessary to meet the 90 x 50 State goal.

TABLE 3. THERMAL EFFICIENCY TARGETS	2025	2035	2050
Residential - Increased Efficiency and Conservation (% of municipal households to be weatherized)	2%	9%	47%
Commercial - Increased Efficiency and Conservation (% of commercial establishments to be weatherized)	17%	18%	51%
Fuel Source Migration			
New Efficient Wood Heat Systems (in units)	1	3	24
New Heat Pumps (in units)	68	162	321

To hit the goal of 90% renewable energy use in Starksboro, targets have been established for each of the three major strategies to reduce or change the type of fuel used for space-heating. In order to hit the targets, by 2050 property owners in Starksboro will need to have made significant improvements to their homes and businesses. Approximately half of the houses and businesses in Starksboro will need to have been weatherized to conserve energy by using it more efficiently to heat those spaces. Additionally, a number of homes currently using wood as a heating source will need to invest in new technology to burn that wood more efficiently. Lastly, nearly all of the houses currently heating with oil or propane will need to have switched fuel sources to cleanly generated electrical heat by installing efficient electric heat pumps.

Thermal Pathways to Implementation - Goals, Policies and Recommended Actions

Given the significant enhancements noted above, Starksboro promotes the following Goals, Objectives and Policies for itself and its citizens.

Goals

1. Reduce annual energy needs and fuel usage for heating structures and space conditioning to foster the transition from non-renewable fuel sources to renewable fuel sources for residential, commercial, and municipal buildings and facilities in the Town of Starksboro.

Objectives

1. Support energy conservation efforts for all buildings.
2. Promote improved efficiency for all types of building systems and increased use of renewable fuels in all buildings, especially new ones.
3. Support the migration from non-renewable fuel sources to renewable fuel sources (i.e. oil and propane heating to efficient wood heating or electric heat pump systems)
4. Conserve forest land as a renewable local energy resource, tempered by the responsible use of wood for biomass energy production.

Policies

1. Coordinate with ACRPC, Efficiency Vermont, and other efficiency resources and service providers to encourage Starksboro residents to participate in weatherization programs.
2. Promote the residential and commercial building energy standards by asking the Zoning Administrator to distribute information about Vermont's Energy Codes to permit applicants, explaining options for energy efficiency and requiring a code certificate prior to issuing any certificate of occupancy.
3. Conduct energy audits of municipal and school buildings to identify efficiency retrofits and incorporate the recommendations into the municipal and school capital budgets.
4. Explore the funding opportunities and implementation possibilities to upgrade the efficiency of all town buildings including the school, town hall, library, town garage, volunteer fire department building, and town offices.

Electrical Use Analysis

An estimate of current electricity use in Starksboro is shown in Table 4. This data is from 2015 and is available from Efficiency Vermont and Green Mountain Power, ("GMP") the electric utility that serves the majority of the Town of Starksboro. Vermont Electric Coop serves a portion of the town but the data was not available. Residential structures consume 10 times as much electrical energy as the commercial entities within the Town.

TABLE 4. CURRENT ELECTRICITY USE	
Use Sector	Current Electricity Use (Efficiency Vermont)
Residential (kWh)	6,228,749
Commercial and Industrial (kWh)	652,079
Total (kWh)	6,880,828

Electrical Targets

Like the thermal targets noted above, Starksboro will need to focus on efficiency and conservation to positively affect the amount of electricity it uses. Since most of the electrical consumption in Starksboro is by residents, rather than commercial entities, the targets will largely require individual homeowners to improve the thermal efficiencies of their structures, as noted in the previous chapter, and increase the efficiency of the electrical fixtures, motors and bulbs used in their homes and appliances.

However, even with significant efficiency steps taken by businesses and residents, Starksboro's electrical usage is predicted to increase, largely because many of the new technologies needed to reduce fossil fuel consumption, like heat pumps and electric cars, increase Starksboro's consumption of electricity. This strategy only works to reduce greenhouse gases if one assumes the electricity is generated from renewable generation. Table 5, below, shows that Starksboro must increase its efficiency and conservation by nearly 60% by 2050 to meet the proposed targets. Technology advances, like better fuel or motor efficiency, will drive this change. However, this plan anticipates that Starksboro and its residents will also need to make significant conservation and efficiency improvements to meet the targets.

Table 5. Electricity Efficiency Targets	2025	2035	2050
Increase Efficiency and Conservation	10.8%	37.2%	59.2%

Electrical Pathways to Implementation - Goals, Objectives, and Policies

Starksboro promotes the following Goals, Objectives and Policies for itself and its citizens to meet the electrical targets above:

Goals

1. Conserve renewable and nonrenewable energy resources
2. Reduce reliance on nonrenewable fossil fuel energy sources, such as oil and gas, and shift reliance to renewable energy sources by encouraging conversion to electric heat pumps and electric vehicles.
3. Reduce emissions of greenhouse gases and substances that cause acid rain by switching from non-renewable resources to renewable electric resources.
4. Plan for increased electric demand with the support of Green Mountain Power, Vermont Electric Coop, and Efficiency Vermont.

Objectives

1. Support energy conservation efforts and the efficient use of energy in all our municipal buildings and encouraging the installation of efficient equipment in non-municipal buildings
2. Promote energy efficiency in all buildings, especially new ones.
3. Support the conversion from non-renewable heating systems (i.e. oil, gas and propane) to efficient renewably fueled systems (i.e. more efficient wood heating, electric heat pumps systems, etc.).
4. Discourage the use of "always-on" street lamps and other outdoor lighting.
5. Encourage the transition to renewable and lower-emission electrical energy sources for transportation.

Policies

1. Promote the use of the residential and commercial building energy standards by distributing code information to permit applicants and working closely with the Zoning Administrator.
    a. Encourage conversion to electrical systems (i.e. heat pumps and electric cars)
2. Plan for and install electric vehicle charging infrastructure on municipal property.
3. Investigate installation of community-based renewable energy project(s) to allow Starksboro's citizens to participate in the economic benefits of local energy production.
4. Explore the funding opportunities and implementation possibilities to upgrade the efficiencies in all town buildings including the school, town hall, library, town garage, volunteer fire department building, and town offices.
5. Incorporate EV ready standards into building code. (Ex. As simple as 220v outlet in garages)

Transportation Use Analysis

More than any other sector, the transportation costs borne by Starksboro's residential vehicle use demonstrate the scope of the change that will need to take place in Starksboro to meet the State's energy goals. Based upon the number of registered vehicles in Starksboro, assumed average vehicle miles travelled, gas mileage per vehicle, and assumed gas prices at their current level, Table 6 shows Starksboro residents spend over $1.8 million dollars per year on residential vehicle trips. While some money will go to local gas stations, the majority of the cost per gallon leaves the local economy. Reducing vehicle miles by transforming local infrastructure to provide for choices and opportunities other than single family vehicles will promote fuel conservation and monetary savings for individuals. Converting to different, locally produced energy generation sources for transportation could help reinvest some of this money locally. Table 6, below, depicts Starksboro's fuel usage for passenger vehicles (It does not include heavy trucks or farm vehicles).

TABLE 6. CURRENT MUNICIPAL TRANSPORTATION ENERGY USE	
Transportation Data	**Municipal Data**
Total # of Vehicles (ACS 2011-2015)	1,338
Average Miles per Vehicle (Vtrans)	11,356
Total Miles Traveled	15,194,328
Realized MPG (2013 - VTrans 2015 Energy Profile)	18.6
Total Gallons Use per Year	816,899
Transportation BTUs (Billion)	98
Average Cost per Gallon of Gasoline (RPC)	$2.31
Gasoline Cost per Year	$1,887,037

Breaking the numbers down further, since we know Starksboro has 654 households, this shows that on average, Starksboro's citizens average just fewer than two cars per household. If we divide the $1.8 million dollars spent by the number of households, it shows the average household spends, with two cars, approximately $2,885 per year on gasoline, not including other expenses associated with owning a vehicle. When one includes maintenance and depreciation on the vehicle, AAA estimated that in 2014 the cost per year of owning a single vehicle was nearly $9,000. Since the average household has two cars, that adds up to an average of $18,000 per household, per year.

Transportation Targets

Table 7, below, shows proposed Transportation Targets for the Town of Starksboro.

TABLE 7. TRANSPORTATION TARGETS	2025	2035	2050
Renewable Energy Use - Transportation	2.7%	18.2%	83.5%
Fuel Source Migration - Transportation			
Electric Vehicles	117	800	1559
Biodiesel Vehicles	26	44	63

As the Table 7 shows, to meet the proposed targets by 2050, over 83% (more than 4 out of 5) of vehicles in Starksboro will need to run on renewably generated electricity. Additionally, most commercial vehicles and farm equipment will need to switch from diesel to bio-diesel or electricity.

Transportation Pathways to Implementation - Goals, Objectives and Policies

To meet these targets Starksboro promotes the following Goals, Objectives, and Policies for itself and its citizens:

Goals

1. Reduce reliance on nonrenewable energy sources such as diesel and gas and shift reliance to renewable energy sources.
2. Reduce emissions of greenhouse gases and substances that cause acid rain.
3. Hold vehicle miles traveled per capita to 2011 levels through reducing the amount of single occupancy vehicle (SOV) commuter trips, increasing the amount of pedestrian and bicycle commute trips, and increasing public transit ridership.

Objectives

1. Support the reduction of transportation energy demand, reduction of single-occupancy vehicle use, and the transition to renewable and lower-emission energy sources for transportation.
2. Support regional efforts to increase access to safe every day walking and cycling within and across municipal borders.
3. Provide walking and biking paths in large developments.
4. Support state and regional public transportation programs serving Starksboro and ask major employers wishing to construct or expand businesses in the region to promote energy efficient commuting.
5. Support use of the Park and Ride in Starksboro at the Town Office and encourage Starksboro residents to consider using ride-sharing programs in order to reduce use of fossil fuels.
6. Support actions to encourage switching to electric vehicles (ideally powered by renewables).

Policies

1. Work with ACTR to understand ways in which service to Starksboro could be improved.
2. Plan for and install electric vehicle charging infrastructure on municipal property.
3. Review municipal road standards to ensure that they reflect all “complete streets” principles applicable to our rural roads.
4. Nominate a Starksboro representative to sit on the Walk-Bike Council of Addison County to foster safe and accessible opportunities for walking and cycling as an alternative SOV.
5. Incorporate EV ready standards into building code. (as simple as 220v outlet in garages)

Land Use, Generation and Transmission Analysis

LAND USE ANALYSIS

Starksboro currently constitutes a largely rural, agricultural town with some density of vacation and year-round homes, a small village center which includes town offices, municipal facilities and an elementary school. Because of its existing settlement patterns and a lack of significant numbers of commercial and industrial facilities, Starksboro residents are probably more dependent on their cars than many Vermont towns. While Starksboro desires to retain its rural feel, it can adopt land use policies that encourage more densely settled areas that have the capacity to allow for more transportation alternatives within those areas, while also potentially saving energy and promoting healthier options, like walking or biking. As with other conservation type goals, conserving energy by reducing the need for cars can be more cost effective for Starksboro's citizens than migrating to electric vehicles as discussed in the previous chapter. Therefore, the Land Use Section of this Plan promotes greater density and housing options in Starksboro's village areas. Other Land Use policies to limit energy use are listed in the Policy Section below.

GENERATION

Existing Renewable Generation: Current Energy Generation

Starksboro's energy supply is largely consistent with statewide patterns. For example, Starksboro does have a number of alternative energy installations that provide energy utilizing local renewable energy resources. A growing number of homes have photovoltaic systems that supply a portion of their electrical energy. Thanks to Vermont's net-metering law, owners of these systems can sell excess power back to the grid during periods of high solar production, and purchase grid power when needed. Thus, the grid serves as a kind of storage system for solar-produced electrical energy. Since 2015 these numbers have continued to increase and a couple of other homes now have solar domestic hot water systems. Table 8 depicts Starksboro's existing renewable generation resources as of 2015 for GMP and 2018 for VEC.

TABLE 8. EXISTING RENEWABLE GENERATION (2015 GMP & 2018 VEC)	Sites	MWh
Solar	70	683
Wind	1	2.5
Hydro	0	0.00
Biomass	0	0.00
Other	0	0.00
Total Existing Generation	71	685.5

As Table 8, demonstrates, 71 different sites generate renewable energy from solar within the Town of Starksboro. The discussion below encompasses all of the types of renewable generation potentially available to Starksboro's residents and how they might harness it to meet statewide generation targets for the community.

TYPES OF RENEWABLE GENERATION POTENTIAL

Solar Energy

Starksboro's location and climate mean our share of solar energy is less than average. Nevertheless, the rate of solar energy input to Starksboro ranges from about 500 kilowatts per acre in January to 900 kilowatts per acre in June; these are for solar collectors tilted at an angle equal to our latitude, 44°. (National Renewable Energy Laboratory, Solar Radiation Data Manual for Flat-Plate and Concentrating Collectors)

For comparison, our January figure is just over half that of Albuquerque, New Mexico—an excellent place for solar energy—and our June figure is more than three-quarters that of Albuquerque. Given our total energy consumption rate of 10,500 kWh per annual average household consumption, this means that even in January Starksboro could, in principle, meet our average energy demand with solar energy, using just 30 of our town's 13,952 acres. Inefficiencies would raise this figure many times over, as would our increased energy consumption in January. Nevertheless, it's clear that the solar resource at Starksboro is theoretically more than adequate for our energy needs.

While the technology exists to convert solar energy into heat and electricity to supply all of Starksboro's energy with in-town solar installations, the current costs are prohibitive. However, use of solar energy for electricity and/or heat in individual homes and for charging electric vehicles is technologically feasible and ranges from solidly economical to marginally so. Solar energy facilities ranging from 150 kW to 5MW are starting to be constructed in neighboring Addison County towns with varying visual and other impacts. Table 8 describes some of our town's current solar installations.

As noted earlier, Starksboro supports renewable energy generation installations sized, sited, and constructed pursuant to the community Siting Standards contained later in this section. Starksboro believes the best commercial/industrial solar sites in the Town would be in the area Starksboro has zoned for industrial use.

Biomass

Trees' leaves act as solar collectors, storing solar energy through the process of photosynthesis. Although the efficiency is low, Vermont's large areas of forest make for a substantial rate of solar energy storage in the form of tree biomass. Biomass can be burned for heat or to generate electricity. Many homes in Starksboro use wood either as the primary heating fuel or to supplement another heat source, usually oil but sometimes solar or geothermal. As Table 1 shows, about 41% of Starksboro's households burn wood for heat, generating approximately 33 Billion BTUs. Burning wood for heat in Starksboro certainly makes a significant dent in our town's oil consumption.

Local foresters agree that each acre of Addison County forest might sustainably yield about one-third of a cord of firewood each year. Given that the majority of Starksboro is generally wooded, if we assumed that 10,000 of Starksboro's approximately 16,800 acres were sustainably harvested for firewood, that could yield nearly 3,300 cords per year, a little more than 4 cords per household.

Starksboro also has significant land area devoted to farming. While not currently economical, biomass crops, for both space heating and as a liquid alternative to diesel fuel could support Starksboro's farming economy in the future.

Accordingly, Starksboro supports the use of biomass for residential and small commercial heating applications within town, and as a renewable biodiesel alternative to diesel fuel. As a cautionary note, widespread use of wood and other biomass materials as a heat-producing or energy producing fuel might result in unacceptable levels of air-born particulates and other forms of air pollution. Therefore, while supportive, Starksboro should consider biomass in the context of public health impacts in addition to whether supplies are sustainable and effective to meet short and long term demands for renewable heat source energy.

Biogas

Biogas can be derived from methane capture in a digester from manure on farms, the capped landfill or sewage treatment plants and can be burned to generate heat or electricity.

Wind

Mapping of New England wind resources by the National Renewable Energy Laboratory (TrueWind Solutions, "Wind Energy Resource Map of New England," available through Massachusetts Technology Collaborative www.mtpc.org/rebates/green_power/NE_spd100m.pdf) shows that most of Starksboro has average winds in the

Class 1 category (speeds below 12 miles per hour). This is the lowest class, which is unsuitable for commercial-scale wind power.

A small portion of Starksboro–probably the ridge on the northern end of town West side of Big Hollow Road and north of Shaker Hill Road–appears to have class 3 winds (around 12 miles/hour at 100 meters above the ground), considered marginally suitable for larger-scale wind installations. However, all of Starksboro is likely capable of producing significant wind energy at the smaller scale of individual- or multiple-home wind turbines. Experience with wind installations in Starksboro and surrounding communities confirms this; see the section "Alternative Energy in Starksboro," below.

Starksboro supports residential and community scale wind projects that are also able to meet its siting standards contained later in this chapter. Residential scale wind consists of a single tower less than 120 feet high generating less than 15kW of energy. Community scale wind consists of 1 or more towers all less than 200 feet high (so as not to require night lighting) and producing less than 1 MW of electricity. Industrial wind projects that have towers over 200 feet or generate over 1 MW of power are prohibited.

Geothermal Energy

Due to geothermal and solar input the upper layer soil temperatures in Vermont average around 45°F to 50°F year-round. This temperature is too low for direct heating, although it can help with summer cooling. Nevertheless, the constant ground temperature represents a significant energy resource, and with appropriate technology it can be used as a heat source.

To date, no one has used geo-thermal systems relying on heat pump technology in Starksboro. However, the technology is potentially viable and therefore included above.

Hydropower

Historic hydro sites in Starksboro include Baldwin Pond, the Great Falls on Lewis Creek (States Prison Hollow Road) and Lewis Creek near lower Ireland Road, among others. While this has historically been a viable energy source, it isn't currently, but could be again at some point in the future.

Energy Storage

Should Starksboro permit large-scale generation in its jurisdiction, it may also want to include some type of storage facility to supplement the power generated to improve its short-term resiliency. Battery storage, while expensive, is decreasing in price, is commercially available to support homeowners and may work well with generation assets. Other options for storage are in development as well. Storage would not necessarily need to be sited with intermittent renewable generation but may be desirable to increase the value of the system. As a result, Starksboro may want to be supportive of co-siting of renewable generation and storage.

The following chapter describes mapping that was done of the Town of Starksboro and the resulting maps are included at the end of this section. As an outcome of the mapping exercise, ACRPC calculated the amount of renewable generation potential in Starksboro. These calculations were based on the maps and some assumed values for the amount of land needed to produce specified amounts of solar and wind energy. The results of this analysis are depicted below in Table 9, Renewable Generation Potential. As the table demonstrates, the amount of renewable generation potential is substantial, especially when compared to the numbers of actual generation that currently exists in Starksboro, contained in Table 8.

Renewable Generation – Potential and Targets

Renewable Generation Constraints

As part of the mapping exercise described below, ACRPC created maps identifying potential renewable generation sites in Starksboro. The first map, Map 1, "Known Constraints" shown on page 16, depicts natural resource layers that will preclude renewable energy development. These "Known Constraints" depict places where natural resource characteristics would be prohibitive to securing a permit for energy development. Map 2, entitled "possible constraints" depicts places where natural resources exist, but may not prohibit development. Prime agricultural soils would be an example of a possible constraint. A lot of prime agricultural resources exist within Starksboro. However, depending on how a development is proposed and/or sited, it may or may not prevent wind or solar development.

The next set of maps show the location of where solar wind and biomass resources exist in quantities that would support generation. These maps are depicted below as Map 4. Solar Resources, Map 5. Wind Resources and Map 6. Biomass Resources. While these maps depict where resources exist, they depict baseline resources, not necessarily the "best" resources in the area. For example, the Wind Resource Map depicts where the wind blows at the minimum velocity necessary to support wind power. As noted in the wind discussion above, while many places may meet the minimum criteria for wind development, the best area for wind in Starksboro is probably the Shaker Mountain ridge. This area is identified as having class 3 winds (around 12 miles/hour at 100 meters above the ground). This is considered marginally suitable for larger-scale wind installations. Accordingly, users are cautioned to read the maps in this context.

Mapping

Mapping Methodology

Spatial data showing the location of potential energy resources (solar, wind, hydro, and biomass) formed the basis of the maps developed by ACRPC.

This Appendix includes maps provided to the Town of Starksboro by ACRPC. These maps show data as required by the Department of Public Service Determination Standards, including access to energy resources, and constraints to renewable development, and are a required element of enhanced energy planning.

The maps show areas that are potentially appropriate or inappropriate locations for future renewable generation facilities. The maps are a planning tool only and may not precisely indicate locations where siting a facility is acceptable. When a generation facility is proposed, the presence of all natural resources and other specific characteristics of the site shall be verified as a part of the application.

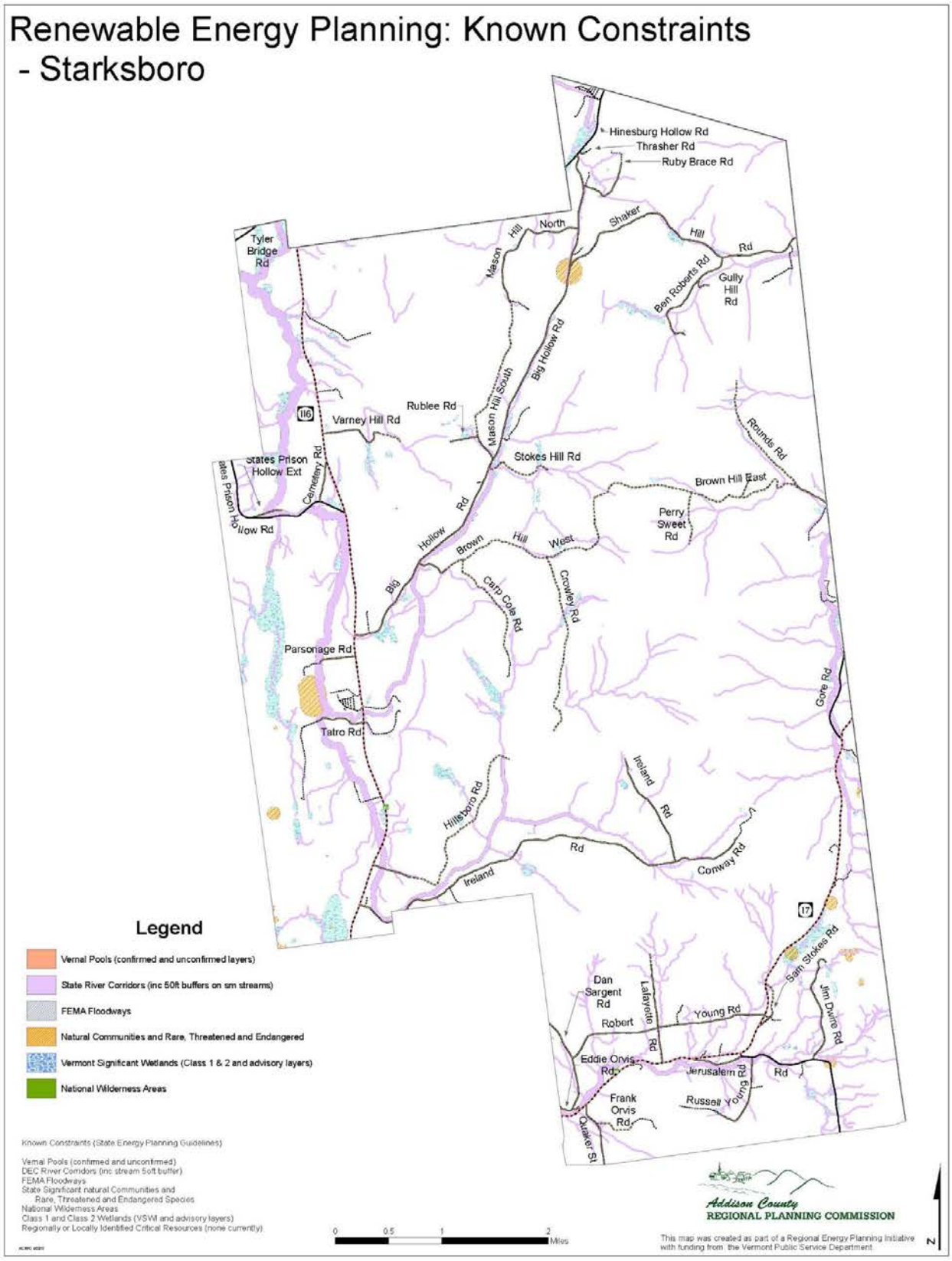
Energy Resources and Constraints

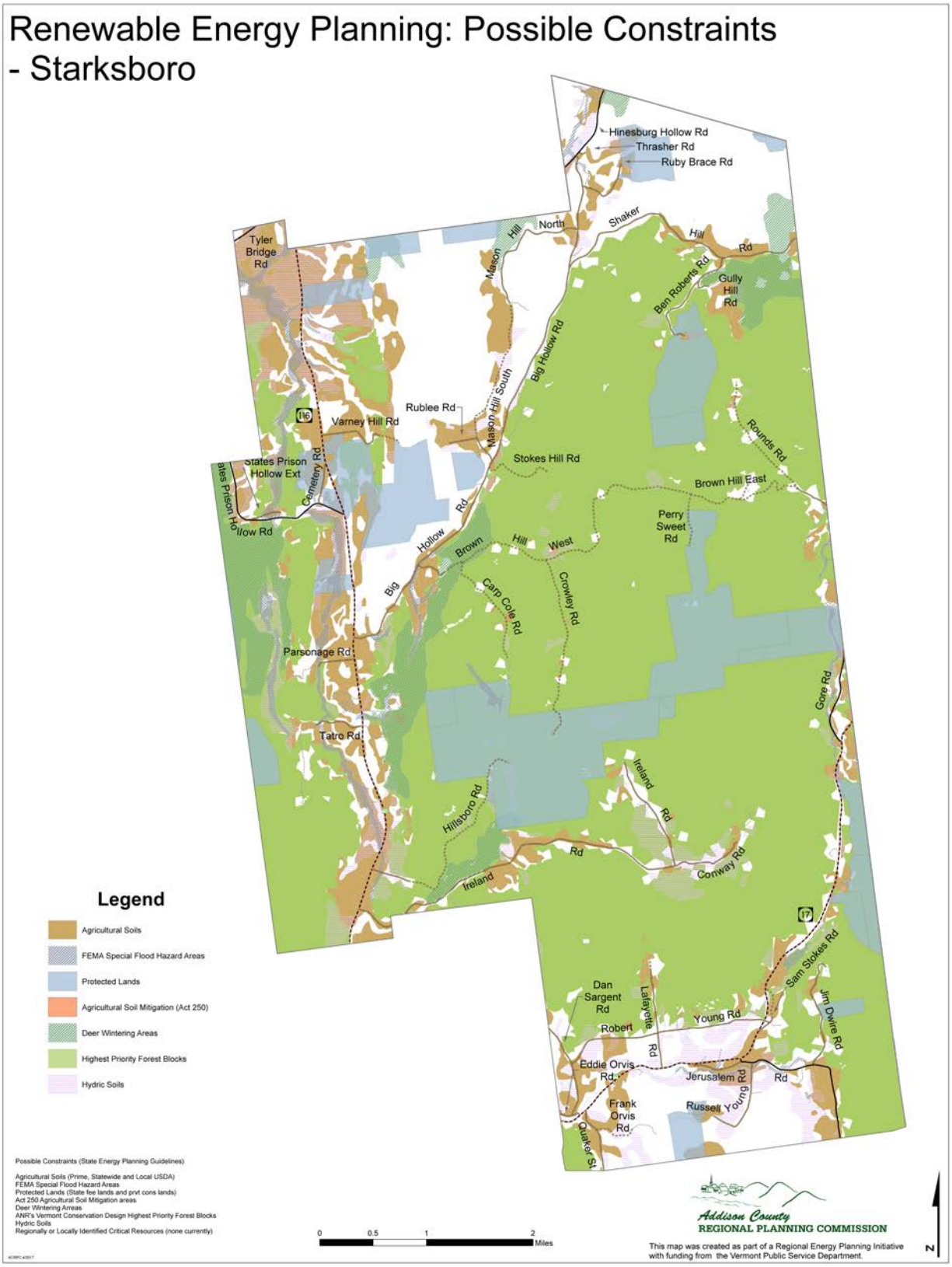
"Known" and "possible" constraints were subsequently identified on the maps. Known constraints are conservation resources that shall be protected from all future development of renewable generation facilities. Possible constraints are conservation resources that shall be protected, to some extent, from the development of renewable generation facilities. The presence of possible constraints on land does not necessarily impede 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.

A full list of known and possible constraints included on the maps is located in Table 9. The known constraints and possible constraints used to create the maps include constraints that are required per the State Determination Standards from the Department of Public Service and constraints that were selected by ACRPC.

TABLE 9 – MAPPING CONSTRAINTS		
SOLAR, WIND AND BIOMASS MAPS - KNOWN CONSTRAINTS		
CONSTRAINT	DESCRIPTION	SOURCE
Confirmed and unconfirmed vernal pools	There is a 600-foot buffer around confirmed or unconfirmed vernal pools.	ANR
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.	VCGI
River corridors	Only mapped River Corridors were mapped. Does not include 50 foot buffer for streams with a drainage area less than 2 square miles.	VCGI
National wilderness areas		VCGI
FEMA Floodways		VCGI/ACRPC
Class 1 and Class 2 Wetlands		VCGI
Designated Village Centers	These areas are the center of dense, traditional development in the region. This constraint does not apply to roof-mounted solar within such designated areas. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Addison County Regional Plan.	ACRPC
FEMA Flood Insurance Rate Map (FIRM) special flood hazard areas	Special flood hazard areas as digitized by the ACRPC were used (just the 100-year flood plain -500-year floodplain not mapped). The inclusion of this resource as a regional constraint is consistent with goals and policies of the Addison County Regional Plan.	ACRPC
Ground and surface waters drinking protection areas	Buffered Source Protection Areas (SPAs) are designated by the Vermont Department of Environmental Conservation (DEC). SPA boundaries are approximate but are conservative enough to capture the areas most susceptible to contamination. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Addison County Regional Plan.	ANR
Vermont Conservation Design Highest Priority Forest Blocks	The lands and waters identified here are the areas of the state that are of highest priority for maintaining ecological integrity. Together, these lands comprise a connected landscape of large and intact forested habitat, healthy aquatic and riparian systems, and a full range of physical features (bedrock, soils, elevation, slope, and aspect) on which plant and animal natural communities depend. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Addison County Regional Plan. (Source: ANR)	ANR
Public water sources	A 200-foot buffer is used around public drinking water wellheads. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Addison County Regional Plan.	ANR
Municipal Conservation Land Use Areas	Conservation Land Use Districts, as designated in municipal plans, that include strict language that strongly deters or prohibits development have been included as a regional known constraint. The inclusion of this resource as a regional constraint is consistent with the goals and policies of the Addison County Regional Plan.	ACRPC

SOLAR, WIND AND BIOMASS MAPS - POSSIBLE CONSTRAINTS (TABLE 9 CON'T)		
Constraint	**Description**	**Source**
Protected lands	This constraint includes public lands held by agencies with conservation or natural resource oriented missions, municipal natural resource holdings (ex. Town forests), public boating and fishing access areas, public and private educational institution holdings with natural resource uses and protections, publicly owned rights on private lands, parcels owned in fee by non-profit organizations dedicated to conserving land or resources, and private parcels with conservation easements held by non-profit organizations.	VCGI
Deer wintering areas	Deer wintering habitat as identified by the Vermont Agency of Natural Resources.	ANR
Hydric soils	Hydric soils as identified by the US Department of Agriculture.	VCGI
Agricultural soils	Local, statewide, and prime agricultural soils are considered.	VCGI
Act 250 Agricultural Soil Mitigation Areas	Sites conserved as a condition of an Act 250 permit.	VCGI
Class 3 wetlands	Class 3 wetlands in the region have been identified have been included as a Regional Possible Constraint. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Addison County Regional Plan.	ANR
Municipal Conservation Land Use Areas	Conservation Land Use Districts, as designated in municipal plans, that include strict language that deters, but does not prohibit development, have been included as a regional possible constraint. Specific municipal land use districts included are outlined in Section D. The Forest/Conservation District was included in this category.	ACRPC


Renewable Energy Planning: Known Constraints
- Starksboro
Hinesburg Hollow Rd
Thrasher Rd
Ruby Brace Rd
Tyler Bridge Rd
Mason Hill North
Shaker Hill Rd
Ben Roberts Rd
Gully Hill Rd
Big Hollow Rd
Mason Hill South
Rublee Rd
Varney Hill Rd
116
Rounds Rd
States Prison Hollow Ext
Cemetery Rd
States Prison Hollow Rd
Stokes Hill Rd
Brown Hill East
Perry Sweet Rd
Big Hollow Rd
Brown Hill West
Carp Cole Rd
Crowley Rd
Parsonage Rd
Gore Rd
Tatro Rd
Hillsboro Rd
Ireland Rd
Ireland Rd
Conway Rd
17
Sam Stokes Rd
Jim Dwire Rd
Dan Sargent Rd
Lafayette Rd
Young Rd
Robert
Eddie Orvis Rd
Jerusalem Rd
Rd
Frank Orvis Rd
Russell Young Rd
Quaker St
Legend
Vernal Pools (confirmed and unconfirmed layers)
State River Corridors (inc 50ft buffers on sm streams)
FEMA Floodways
Natural Communities and Rare, Threatened and Endangered
Vermont Significant Wetlands (Class 1 & 2 and advisory layers)
National Wilderness Areas
Known Constraints (State Energy Planning Guidelines)
Vernal Pools (confirmed and unconfirmed)
DEC River Corridors (inc stream 50ft buffer)
FEMA Floodways
State Significant natural Communities and
Rare, Threatened and Endangered Species
National Wilderness Areas
Class 1 and Class 2 Wetlands (VSWI and advisory layers)
Regionally or Locally Identified Critical Resources (none currently)
0 0.5 1 2 Miles
Addison County
REGIONAL PLANNING COMMISSION
This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.
N


Renewable Energy Planning: Possible Constraints
- Starksboro
Hinesburg Hollow Rd
Thrasher Rd
Ruby Brace Rd
Shaker Hill Rd
North Hill
Tyler Bridge Rd
Mason Hill
Ben Roberts Rd
Gully Hill Rd
Big Hollow Rd
Rublee Rd
Mason Hill South
Varney Hill Rd
Rounds Rd
States Prison Hollow Ext
Cemetery Rd
States Prison Hollow Rd
Stokes Hill Rd
Brown Hill East
Perry Sweet Rd
Big Hollow Rd
Brown Hill West
Carp Cole Rd
Crowley Rd
Parsonage Rd
Gore Rd
Tatro Rd
Ireland Rd
Hillsboro Rd
Ireland Rd
Conway Rd
Sam Stokes Rd
Jim Dwire Rd
Dan Sargent Rd
Lafayette Rd
Young Rd
Robert
Eddie Orvis Rd
Jerusalem Rd
Russell Young Rd
Frank Orvis Rd
Quaker St
Legend
Agricultural Soils
FEMA Special Flood Hazard Areas
Protected Lands
Agricultural Soil Mitigation (Act 250)
Deer Wintering Areas
Highest Priority Forest Blocks
Hydric Soils
Possible Constraints (State Energy Planning Guidelines)
Agricultural Soils (Prime, Statewide and Local USDA)
FEMA Special Flood Hazard Areas
Protected Lands (State fee lands and prvt cons lands)
Act 250 Agricultural Soil Mitigation areas
Deer Wintering Areas
ANR's Vermont Conservation Design Highest Priority Forest Blocks
Hydric Soils
Regionally or Locally Identified Critical Resources (none currently)
0 0.5 1 2 Miles
Addison County
REGIONAL PLANNING COMMISSION
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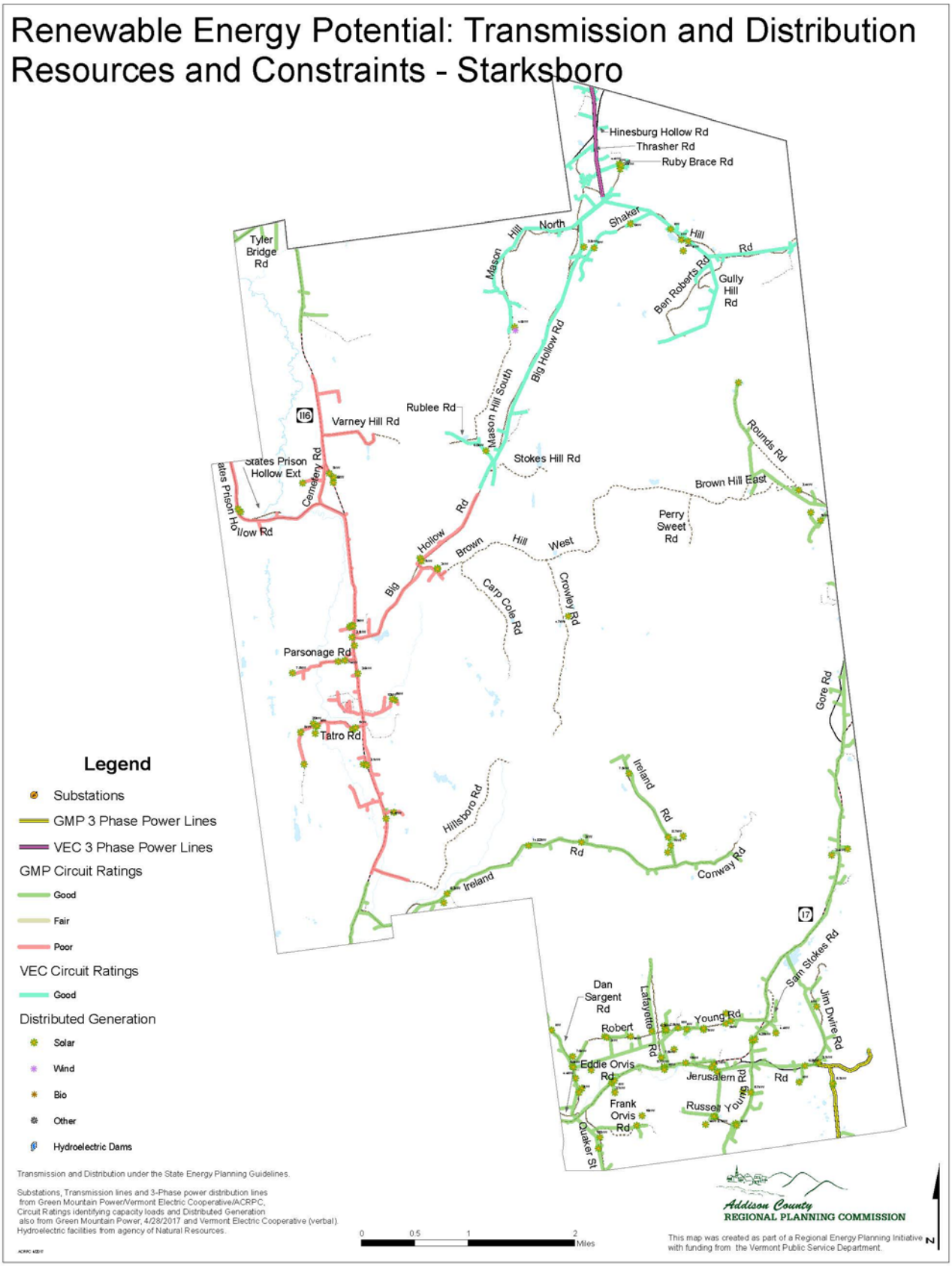
Renewable Energy Potential: Transmission and Distribution Resources and Constraints - Starksboro
Hinesburg Hollow Rd
Thrasher Rd
Ruby Brace Rd
Tyler Bridge Rd
Mason Hill North
Shaker Hill Rd
Ben Roberts Rd
Gully Hill Rd
Big Hollow Rd
Mason Hill South
Rublee Rd
Varney Hill Rd
116
Stokes Hill Rd
Rounds Rd
States Prison Hollow Ext
Cemetery Rd
States Prison Hollow Rd
Brown Hill East
Perry Sweet Rd
Big Hollow Rd
Brown Hill West
Carp Cole Rd
Crowley Rd
Parsonage Rd
Gore Rd
Tatro Rd
Ireland Rd
Hillsboro Rd
Ireland Rd
Conway Rd
17
Sam Stokes Rd
Jim Dwire Rd
Dan Sargent Rd
Lafayette Rd
Young Rd
Robert
Eddie Orvis Rd
Jerusalem Rd
Rd
Frank Orvis Rd
Russell Young Rd
Quaker St
Legend
Substations
GMP 3 Phase Power Lines
VEC 3 Phase Power Lines
GMP Circuit Ratings
Good
Fair
Poor
VEC Circuit Ratings
Good
Distributed Generation
Solar
Wind
Bio
Other
Hydroelectric Dams
Transmission and Distribution under the State Energy Planning Guidelines.
Substations, Transmission lines and 3-Phase power distribution lines from Green Mountain Power/Vermont Electric Cooperative/ACRPC, Circuit Ratings identifying capacity loads and Distributed Generation also from Green Mountain Power, 4/28/2017 and Vermont Electric Cooperative (verbal). Hydroelectric facilities from agency of Natural Resources.
0 0.5 1 2 Miles
Addison County
REGIONAL PLANNING COMMISSION
This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.
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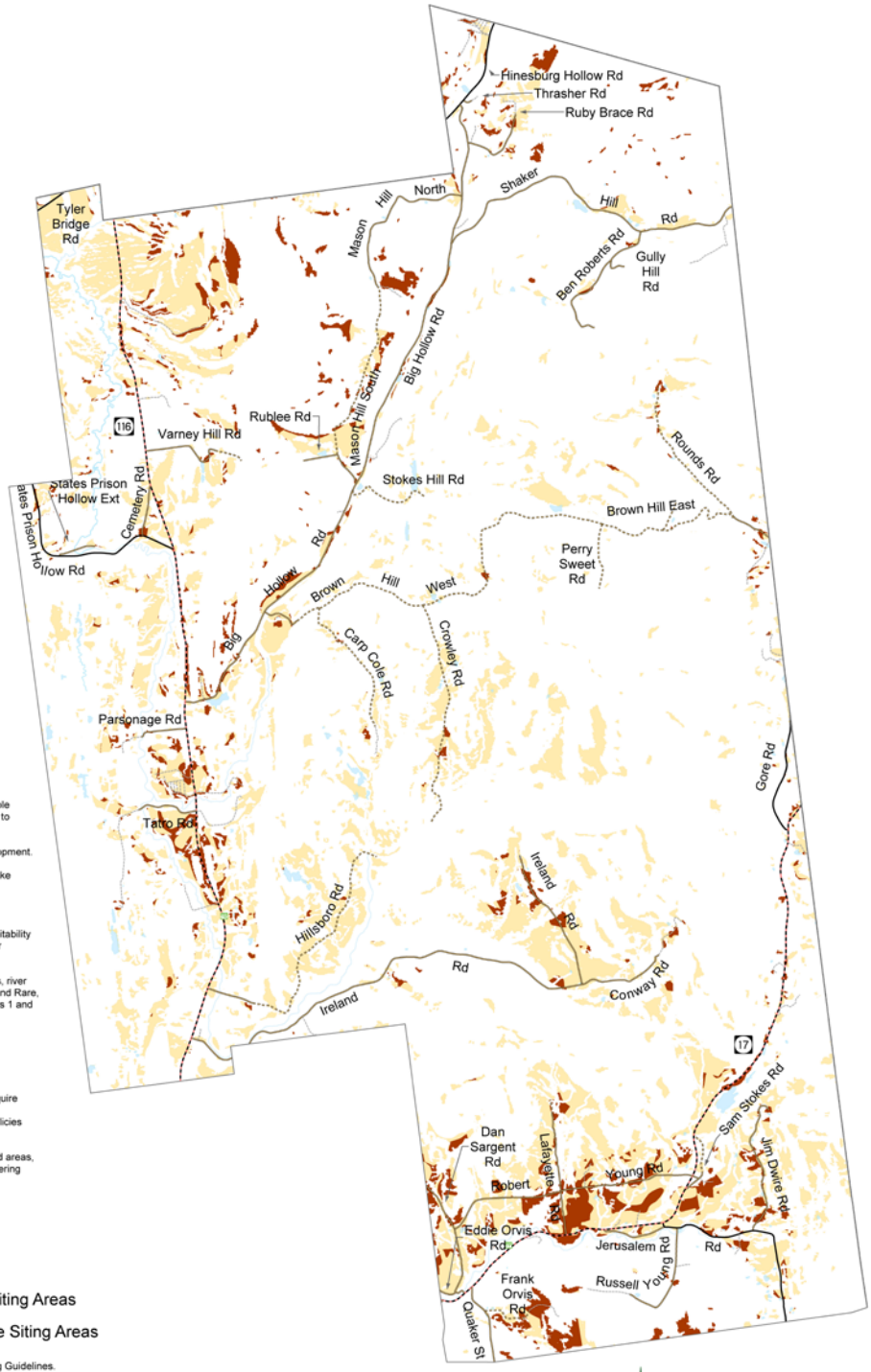
Renewable Energy: Potential Solar Resource Siting Areas - Starksboro



Dept of Public Service Methodology

This map shows areas of resource potential for renewable energy generation from solar, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as natural resource areas, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime solar potential exist where the natural conditions make development feasible and no constraints exist.

Known Constraints

Known Constraints signal likely, though not absolute, unsuitability for development based on statewide or local regulations or designated critical resources.

Known Constraints include: Vernal pools, FEMA floodways, river corridors,Federal wilderness areas,Natural Communities and Rare, Threatened and Endangered Species, and wetlands (class 1 and 2) and wetland advisory layers.

These areas have been removed and are not shown on this map.

Possible Constraints

Possible Constraints signal conditions that would likely require mitigation, and which may prove a site unsuitable after site-specific study, based on statewide or regional/local policies that are currently adopted or in effect.

Possible Constraints include: Agricultural soils, FEMA flood areas, Protected Lands, ACT 250 soil mitigation areas, Deer wintering areas, Highest Priority Forest Blocks, and Hydric soils.

These areas are shown on the map where they coincide with areas of renewable solar potential identified in the solar analysis.

Legend

Primary Solar Resource Siting Areas

Secondary Solar Resource Siting Areas

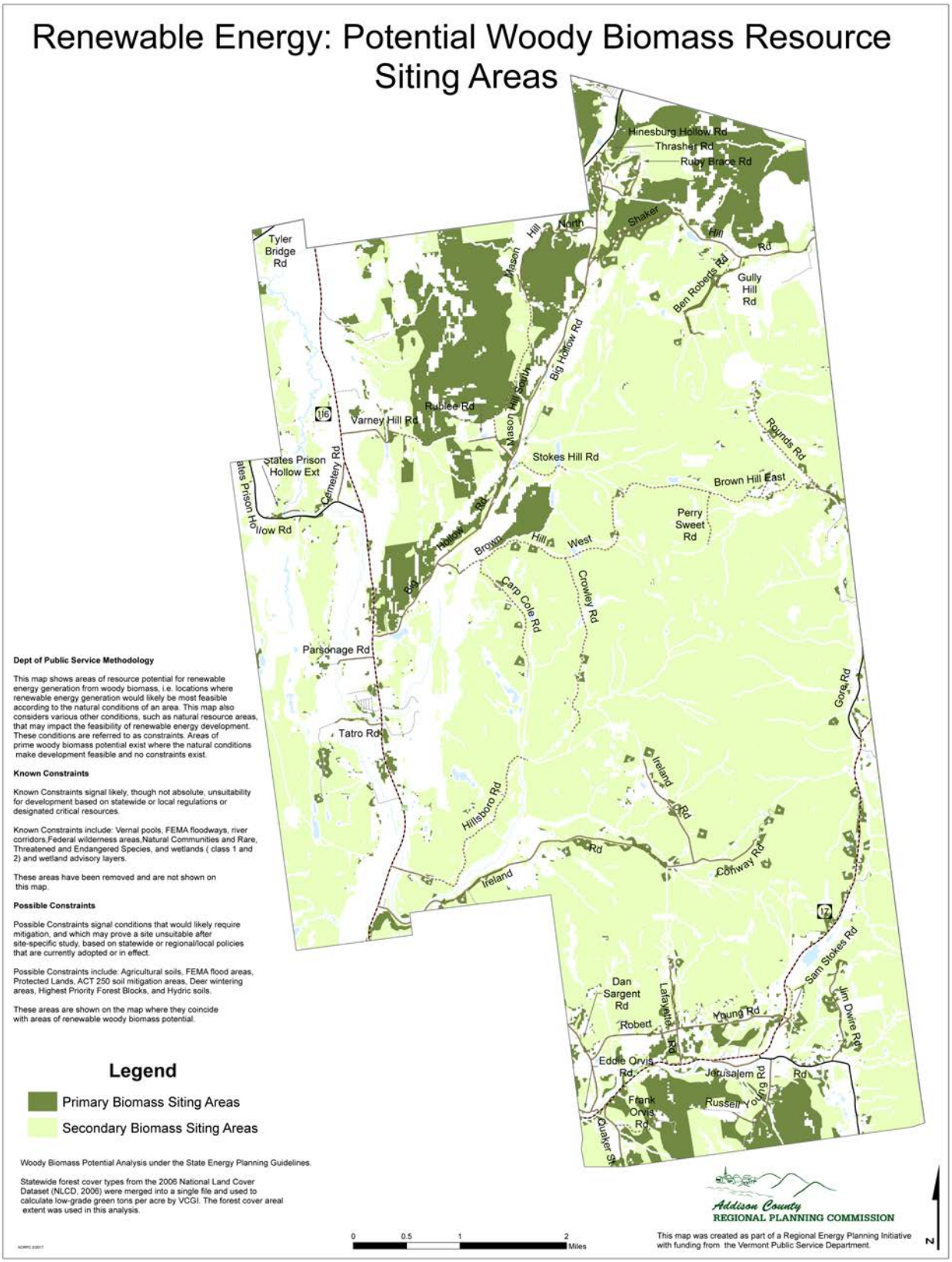
Solar Potential Analysis under the State Energy Planning Guidelines.

Statewide ground based (30m USGS DEM) solar potential layer created with ESRI solar analyst by VCGI. Filtered by SLOPE (<= 14%), ASPECT (90-270 degrees) and values >= 1,000 kWh/sq meter.

ACRPC 4/2017

Addison County REGIONAL PLANNING COMMISSION

This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.


Renewable Energy: Potential Woody Biomass Resource Siting Areas
Hinesburg Hollow Rd
Thrasher Rd
Ruby Brace Rd
Shaker
Hill
Rd
Tyler Bridge Rd
Mason Hill North
Ben Roberts Rd
Gully Hill Rd
Big Hollow Rd
Mason Hill South
Rublee Rd
Varney Hill Rd
116
States Prison Hollow Ext
Cemetery Rd
States Prison Hollow Rd
Stokes Hill Rd
Rounds Rd
Brown Hill East
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Carp Cole Rd
Crowley Rd
Parsonage Rd
Gore Rd
Tatro Rd
Ireland Rd
Hillsboro Rd
Ireland Rd
Conway Rd
17
Sam Stokes Rd
Jim Dwire Rd
Dan Sargent Rd
Lafayette Rd
Young Rd
Robert
Eddie Orvis Rd
Jerusalem Rd
Russell Young Rd
Frank Orvis Rd
Quaker St
Dept of Public Service Methodology
This map shows areas of resource potential for renewable energy generation from woody biomass, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as natural resource areas, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime woody biomass potential exist where the natural conditions make development feasible and no constraints exist.
Known Constraints
Known Constraints signal likely, though not absolute, unsuitability for development based on statewide or local regulations or designated critical resources.
Known Constraints include: Vernal pools, FEMA floodways, river corridors,Federal wilderness areas,Natural Communities and Rare, Threatened and Endangered Species, and wetlands (class 1 and 2) and wetland advisory layers.
These areas have been removed and are not shown on this map.
Possible Constraints
Possible Constraints signal conditions that would likely require mitigation, and which may prove a site unsuitable after site-specific study, based on statewide or regional/local policies that are currently adopted or in effect.
Possible Constraints include: Agricultural soils, FEMA flood areas, Protected Lands, ACT 250 soil mitigation areas, Deer wintering areas, Highest Priority Forest Blocks, and Hydric soils.
These areas are shown on the map where they coincide with areas of renewable woody biomass potential.
Legend
Primary Biomass Siting Areas
Secondary Biomass Siting Areas
Woody Biomass Potential Analysis under the State Energy Planning Guidelines.
Statewide forest cover types from the 2006 National Land Cover Dataset (NLCD, 2006) were merged into a single file and used to calculate low-grade green tons per acre by VCGI. The forest cover areal extent was used in this analysis.
0 0.5 1 2 Miles
Addison County
REGIONAL PLANNING COMMISSION
This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.
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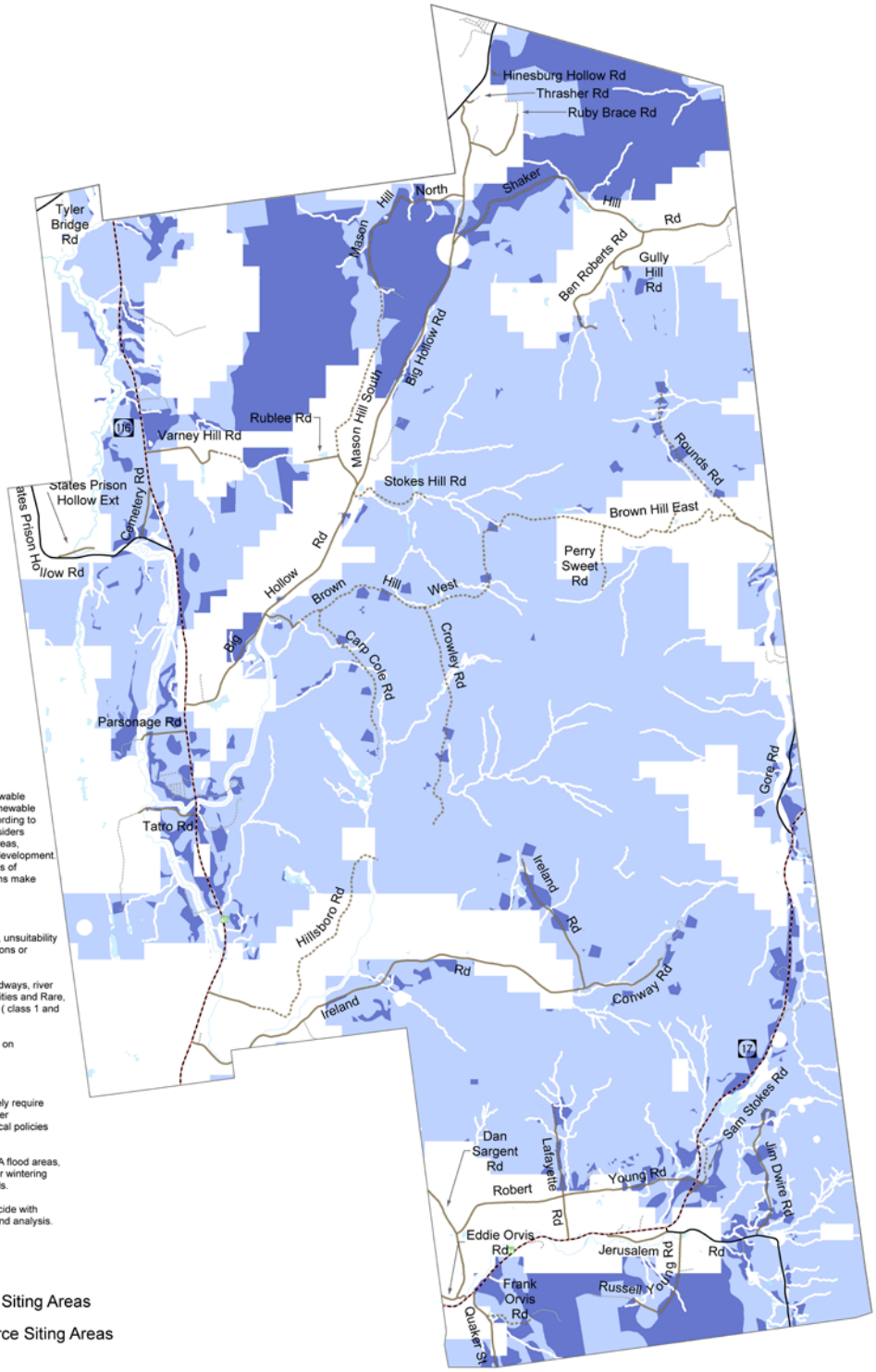
Renewable Energy: Potential Wind Resource Siting Areas - Starksboro



Dept of Public Service Methodology

This map shows areas of resource potential for renewable energy generation from wind, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as natural resource areas, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime wind potential exist where the natural conditions make development feasible and no constraints exist.

Known Constraints

Known Constraints signal likely, though not absolute, unsuitability for development based on statewide or local regulations or designated critical resources.

Known Constraints include: Vernal pools, FEMA floodways, river corridors,Federal wilderness areas,Natural Communities and Rare, Threatened and Endangered Species, and wetlands (class 1 and 2) and wetland advisory layers.

These areas have been removed and are not shown on this map.

Possible Constraints

Possible Constraints signal conditions that would likely require mitigation, and which may prove a site unsuitable after site-specific study, based on statewide or regional/local policies that are currently adopted or in effect.

Possible Constraints include: Agricultural soils, FEMA flood areas, Protected Lands, ACT 250 soil mitigation areas, Deer wintering areas, Highest Priority Forest Blocks, and Hydric soils.

These areas are shown on the map where they coincide with areas of renewable wind potential identified in the wind analysis.

Legend

Primary Wind Resource Siting Areas

Secondary Wind Resource Siting Areas

Wind Potential Analysis under the State Energy Planning Guidelines.

Statewide 30m, 50m, and 70m wind speed layers from Mass.Tech Collaborative wiere filtered for minimum wind speed, then merged into a single file by VCGI.

ACRPC 2/2017

0 0.5 1 2 Miles

Addison County REGIONAL PLANNING COMMISSION

This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.

N

At the end of the mapping exercise, ACRPC calculated the amount of renewable resource generation possible in Starksboro based upon the maps and some assumed values for the amount of land it took to produce specified amounts of solar and wind energy. The results of this analysis are depicted in Table 10, Renewable Generation Potential. As the table demonstrates, the amount of renewable generation potential is substantial, especially when compared to the numbers of actual generation that currently exists in Starksboro, contained in Table 8.

TABLE 10. RENEWABLE GENERATION POTENTIAL	MW	MWh
Rooftop Solar	1.2	1,461
Ground-mounted Solar	504	618,106
Wind	9407	28,841,096
Hydro	N/A	Potential to be determined
Biomass and Methane	N/A	Large biomass potential but depends on technology - cogeneration (electricity + heat) is ideal. There is also agricultural biomass potential, and maybe methane from Town dump.
Other	N/A	N/A
Total Renewable Generation Potential	9,912	29,469,662

Renewable Generation Targets

As part of the same exercise, DPS also provided Renewable generation targets that all municipalities would need to meet in the context of the State meeting its goal of producing half of its energy within the State. Those goals for Starksboro, shown in Table 11 below, are based upon a combination of Starksboro's population (correlated to its potential use) and to the amount of potential resources available in Starksboro.

When one compares the goals in Table 11 with the potential in table 10, it is readily clear that, at least theoretically, Starksboro's resource potential dwarfs its generation goals.

TABLE 11. RENEWABLE GENERATION TARGETS	2025	2035	2050
Total Renewable Generation Target (in MWh)	25,817.1	51,634.2	78,233.7

Starksboro has chosen to use the following community land use standards to help guide energy projects to locate in areas it deems acceptable and to prohibit them in other areas.

Community Standards for Siting and Decommissioning Energy Projects

Starksboro recognizes that financial considerations require large solar and wind projects be located in close proximity to electric power lines capable of transmitting the load proposed to be generated and with easy access to major transportation networks for construction. However, Starksboro also desires to maintain the working and open landscapes, adopted conservation and habitat protection measures, scenic rural views

important to its economy and to the rural cultural aesthetic and quality of life. All commercial or community scale generation projects must meet the policies and standards set forth in this energy plan.

A. **Siting.** Where a project is placed on the landscape constitutes the most critical element in the siting of a project. Poor siting cannot be adequately mitigated. Accordingly, all renewable energy projects must evaluate and address the proposed site's aesthetic, environmental and cultural impact on the surrounding landscape and significant viewsheds.

Preferred Sites:
Systems sited within Starksboro's Industrial Use Planning Area shall be considered "preferred sites"

Good sites have one or more of the following characteristics:

- Roof-mounted systems;
- Systems located in close proximity to existing larger scale, commercial, industrial or agricultural buildings;
- Proximity to existing hedgerows or other topographical features that naturally screen the proposed array from view from at least two sides;
- Systems fit the scale and context of their location.
- Reuse of former brownfields or otherwise impacted property.
- Glare and noise are minimized to the extent possible.

Poor Sites have one or more of the following characteristics:

- No natural screening;
- Topography that causes the arrays to dominate the skyline from common vantage points like roads or neighborhoods (recognizing that this is more difficult for wind towers);
- Locations in floodways or mapped river corridors;
- A location in proximity to and interfering with a significant viewshed
- The removal of productive agricultural land from agriculture use; and
- Sites that require public investment in transmission and distribution infrastructure in order to function properly.

B. **Mass and Scale**. The historical working landscape and other open lands, rural residential development, and rolling hills set against the backdrop of the Green Mountains define Starksboro. Starksboro desires to preserve these types of viewsheds. Rural structures like barns fit into the landscape because their scale and mass generally do not impact large tracts of otherwise open land. When houses are added to Starksboro's landscape, sensitive siting and appropriate screening are required whenever possible. Renewable energy systems shall also be limited in mass and scale, or have their mass and scale broken by screening, to fit in with the landscape. Systems of 150 kW and less (which comprise 1.5 acres or less) should fairly easily conform to these standards given the smaller size. All commercial scale solar arrays (i.e. above 15kW) shall also be limited in mass and scale, and/or have their mass and scale broken by screening to fit in with the landscape. Commercial solar projects larger than 1 MW are only allowed if, adequately screened or otherwise mitigated visually.

Projects which on the balance are found to have poor siting characteristics pursuant to the community standards contained above or in other parts of Starksboro's Town Plan violate Starksboro's Plan regarding orderly development.

Mitigation methods.

A. *Solar Installations*: In addition to properly siting a project according to the criteria set forth above, solar developers must take the following action to mitigate all project sites:

- Locate the structures on the site to keep them from dominating the skyline above the horizon from public vantage points;
- Shorter panels may be more appropriate in certain spaces than taller panels to keep the project lower on the landscape.
- At a minimum, all solar arrays must observe the setback restrictions contained in Act 56 governing solar installations. However, developers are encouraged to increase setbacks to at least those listed in Starksboro's Zoning Regulations within the Zoning District in Municipality in which the array lays.
- Use the existing topography, development or vegetation on the site to screen and/or break the mass of the array;
- In the absence of existing natural vegetation, the commercial development must be screened by native plantings beneficial to wildlife and pollinators that will grow to a sufficient height and depth to provide effective screening within a period of 5 years. Partial screening to break the mass of the site and to protect public and private views may be appropriate.
- Practice a "good neighbor policy". The siting of the array should be done in such a manner that the array creates no greater burden on neighboring property owners or public infrastructure than it does on the property on which it is sited. As an example, a landowner may not site an array on his or her property in a location calculated to diminish the visual impact of the array from his or her residence, but places the array immediately within their neighbor's or the public's viewshed.
- Use black or earth tone materials (panels, supports, fences) that blend into the landscape instead of metallic or other brighter colors), and take all possible steps to eliminate or reduce reflection on affected properties or views from the public roads.
- Allow wildlife passage through fencing or using the solar site as wildlife habitat

B. *Wind*: The actual footprint of a wind turbine tends to be small but its surrounding impact is more substantial than the footprint area. Wind turbines (particularly wind farms) are likely to have scenic or aesthetic impacts, sometimes quite dramatic. Scale and landscape context are important considerations in siting wind installations. In addition to the relevant goals, policies and standards set forth above, the following additional criteria will be used to evaluate whether on the balance potential wind installations meet or violate Starksboro's Town Plan:

- Glare and noise will be considered in locations that are adjacent to residential or recreational properties. Lower gloss paint or darker color blades may be required where reflective characteristics could present an annoyance.

- Wind turbines are likely to be most appropriate within agricultural, commercial or industrial contexts and should be sited, where practical, near other structures.
- In landscapes valued for natural or scenic features, particularly the views around siting will be evaluated for potential visual impacts on scenic views and the experience of a natural landscape.
- Impact on the flight and migration patterns of birds.
- No wind towers requiring night lighting shall be allowed within the Town of Starksboro (Generally, turbines with a total height greater than 200 ft.)

C. Transmission lines and infrastructure: Transmission infrastructure, including sub-transmission lines, or any lines equal to or greater than 45kW and substations can also have a substantial impact on the environment around them. In fact, one of the reasons to support distributed generation is to reduce the need for expensive transmission line upgrades. If any transmission lines are proposed within the Town of Starksboro shall meet the following mitigation guidelines:

- Substations shall be screened in a manner similar to solar sites as noted above.
- Lines shall be located at the edge of fields, not through the middle of the field;
- Lines shall not rise above the level of the treeline (Presumed to be 60 feet);
- Where lines cross distribution lines, the distribution lines shall be buried to reduce the height of the transmission lines.
- Plantings shall be used to screen transmission infrastructure form residences or prominent communal viewpoints.

Decommissioning and Restoration. All projects shall be decommissioned at the end of their useful life. This means equipment shall be removed, landscaping kept and disturbed areas restored. Developers of all projects 100 kW and greater shall provide the municipality with appropriate assurances to guarantee funding exists to decommission the project. In keeping with Starksboro's desire to retain its agricultural land base, a solar array's useful life shall be deemed to be at the end of its useful life when the array(s) are taken off line.

Land Use, Renewable Generation and Transmission - Goals, Objectives, and Policies

Given the generation targets, noted above, to meet statewide targets, Starksboro promotes the following for itself and its citizens.

Goals

1. Conserve renewable and nonrenewable energy resources
2. Reduce reliance on nonrenewable energy sources such as oil and gas, and shift reliance to renewable energy sources.
3. Reduce emissions of greenhouse gases and substances that cause acid rain
4. Support responsibility sited and responsibly developed renewable energy projects, which includes such structures as solar panels, wind turbines and all supporting infrastructure

5. Plan for increased electric demand with the support of Green Mountain Power, Vermont Electric Coop, and Efficiency Vermont.
6. Lead by example. Encourage the use of alternative means for energy production in town buildings, the school and residences such as geothermal and solar.
7. Conserve forest land as a renewable energy resource, tempered by the responsible use of wood for biomass energy production.

Objectives

Land use

1. Encourage settlement patterns that reduce travel requirements for work, services, and recreation.
2. Encourage development of compact neighborhoods.
3. Concentrate development within our residential-agricultural-commercial districts which results in the conservation of natural resources, land, energy used and infrastructure demands.
4. Allow general stores and other businesses in village areas.
5. Allow infilling of existing large-lot development if higher density development is desirable and appropriate.
6. Provide opportunities for appropriate home occupations.
7. Support local farms and local food system which decrease energy demands of trucking and shipping and gives value and purpose to our open agricultural lands.

Generation

1. Support the development and siting of renewable energy resources in the Town that are in conformance with the goals, strategies, and mapping outlined in this energy plan.
2. Development of generation utilities shall be favored in identified preferred locations over the development of other sites.
3. Support production of energy from methane for on -farm use only as a desirable agricultural practice
4. Encourage the use of wind energy with due regard to aesthetic and environmental considerations, especially in high and medium density residential areas.

Transmission

1. Plan for improving the infrastructure to accommodate the increased electric demand with the support of Green Mountain Power, Vermont Electric Co-op, and Efficiency Vermont.

Policies

1. The Starksboro Energy Committee will continue to work closely with the Starksboro Planning Commission, DRB and Zoning Administrator on any proposed energy development projects within Starksboro.
2. Investigate the installation of municipal solar and/or wind net-metering facilities to off-set municipal electric use.
3. Investigate installation of community-owner renewable energy project(s) to allow Starksboro's citizens to participate in the clean energy and economic benefits of local energy production.