

**DRAFT**

# **Burke Town Plan**

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**Burke Planning Commission  
Burke Selectboard**

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# Chapter 1. Introduction

## Vision

The Town of Burke is a dynamic community. Its rich history and heritage is grounded in the Vermont doctrine of freedom and unity. Our agrarian past has left a legacy that is prominent in our landscape and continues to influence the character of our community. While we are indebted to our past, the Town's recent history has been one of transition.

The changes that have affected the town mirror those influencing the state as a whole. Our resource-based economy, founded on agriculture and forestry, is now built on recreation and an enviable quality of life. The town has been transformed from a quiet farming town to a resort destination, and increasingly, a center for innovation and commerce. Resource-based industry and value-added processing has caused our community to re-evaluate the balance between innovation and commerce with quality of life. This transformation has not been without costs: to tranquility, to the landscape and to the insular nature of the community. Burke has managed, however, to retain many of the best elements of its past and merge them with a modern economy driven by tourism, technology, accessibility, and respect for our natural and social heritage.

As we look to the future, we can only conclude that change will continue. To best confront the future, the town should look to its past, to the path provided by our forefathers. In this way, we can arrive at the following principles which are found throughout this plan.

- Open debate, accessible institutions and democracy are the basis of our local government;
- Economic and cultural opportunities for local citizens enrich the entire community;
- Access to quality education, a livable wage, and safe and affordable housing are critical elements of a civil society;
- All current and future residents of the town share the same rights and responsibilities, regardless of status or background;
- As economies become more globalized, focusing on sustainable development and the careful stewardship of local resources will become increasingly important;
- The town's heritage, as defined by the historic settlement pattern of concentrated villages surrounded by an open countryside and forested mountains, is among its greatest resources;
- The Burke Mountain recreation area and other recreation businesses will be prosperous and join in public/private partnerships that benefit the town;
- Individual rights and their responsibility to the community should be balanced, as provided by local, state and federal law.

## Purpose of the Town Plan

The town plan is the principal policy document for the Town of Burke. It articulates the aspirations of the community, and provides a framework for achieving those aspirations. It is intended to guide how the town addresses such diverse community issues as land development, the provision of municipal services and facilities, environmental protection, economic development and transportation. In developing and updating the plan, an ongoing attempt has been made to consider the factors that will affect the town's growth well into the future.

In addition to guiding local officials and citizens in making decisions regarding Burke's future, the Town Plan is intended to be relied upon as the basis for making decisions in a number of specific settings. Uses of the plan include:

- Provide the framework for planning the future of the town.
- Guide local decision-making in local regulatory reviews.
- Serve as the basis for local decision-making during the Act 250 review process and Section 248 reviews, and guiding the Planning Commission and Selectboard in making determinations of compliance with the town plan.
- Provide a foundation for updating and revising subdivision, zoning bylaws, and flood hazard regulations.
- Assist with the formulation of local policies and programs.
- Serve as the primary resource document for private parties desiring to learn of the town and its goals and policies.
- Establish a basis for the town's interactions with Burke businesses, neighboring towns, and other levels of government.

Each chapter of the plan contains one or more overall goals for the topic, background information regarding the existing status of the topic and its sub-topics, statements about future possible actions, and strategies for achieving the future desired results.

Burke residents have a rich tradition of democracy and participation in town government. Spirited debate, and occasional discord, is a predictable part of resolving important community issues. This plan was built with a focused public outreach effort designed to solicit greater community input regarding key issues facing the town's future. The 2006 Town Plan was developed following a community survey of all town voters and landowners. Approximately 1,600 surveys were distributed and 500 surveys were returned, for an overall response rate of 31%. There were also a considerable number of comments and suggestions from survey respondents. A copy of the complete survey results along with all the comments is available at the Town Clerks office. The survey results were used to address a wide range of issues in this Town Plan. Valuable input was also provided as the result of several public meetings and from citizen advisory groups formed as the result of the public meetings.

As is usually the case, there is room for additional public involvement at all levels of the planning process. The use of surveys and questionnaires, public forums and greater coordination between interest groups and the town has ensured the past participation of town residents in local decision making. The ongoing coordination with owners of the Burke Mountain recreation area, local citizen groups, businesses, and regional agencies will ensure that such involvement continues to shape town policies.

The Burke Town Plan, as originally adopted in 2006, called for the creation of multiple zoning districts in order to protect the town's historic development patterns of compact village centers surrounded by open rural countryside. Following the adoption of the Town Plan, the Burke Planning Commission did further work to achieve this goal. The focus of their endeavor – which involved extensive public input – was on developing a clear understanding of the long-range impacts of the Town's planning and zoning bylaws. Using the goals and strategies outlined in the original town plan, the Burke Planning



Commission developed a new bylaw which created multiple districts. The new bylaw was adopted by Australian ballot in 2007.

Yet, as with any long-range land-use plan, the Burke Planning Commission's work was far from complete with the adoption of the new bylaw. In 2008, the Planning Commission completed a Community Character Inventory, which attempted to identify and quantify Burke's "rural character," which had been cited frequently, but not fully explored, in earlier planning and public outreach efforts. The project compiled information gleaned from a community-wide survey, as well as a series of focus groups.

Prior to 2009 much of the planning efforts have been focused on managing growth from the proposed development on Burke Mountain. In 2010 public discourse focused on siting industrial uses. The Town conducted another community survey and held more public planning sessions to gain more insight into desired goals and strategies. The endeavor resulted in an update to our zoning bylaws that established classes of industry and performance standards.

Where relevant, this updated Town Plan references public input, insights, and outcomes gained from the above-mentioned efforts. The public discourse is far from over. However, much has been learned in the past decade about what Burke residents want for their community, today and in the future.

The goals established for the Burke Town Plan include:

- Encouraging the widespread involvement of Burke citizens and landowners at all levels of the local planning and decision-making process.
- Providing opportunities for citizens input at every stage of the planning and decision-making process.
- Decision making only in an open, public environment.
- Adopting a Town Plan that is consistent with state planning goals in Title 24 VSA Chapter 117 {4302}.
- Recognizing statutory hearing requirements as a minimum level of public involvement, and additional ones held in all instances where public interest is evident.
- Public forums, direct mailings, and notices placed in local newspapers to inform the public of planning activities.
- Review of the Town Plan and related planning documents on a regular basis and modifications made as appropriate to address changing circumstances.
- Coordination of planning activities with those of neighboring towns and regions.
- Provide neighboring towns with an opportunity to comment on local matters of concern through notification of pending decisions that may affect them.
- To support and request support from regional organizations that provide municipal planning services.

## **Chapter 2. Town History**

The Town of Burke was chartered in 1782; the first settlers arrived in 1792. The town was organized in 1796 in the home of Lemuel Walter. He cleared land and built a cabin on land that was later Darling's

Mountain View Farm. The first surveyors divided the town into lots of approximately 160 acres. Deeds today still refer to the original proprietors, who were given the land as payment for their efforts in the Revolutionary War. Only one or two of these first land holders ever came to the Town of Burke. The land was sold through land agents to the early settlers. The charter of the Town of Burke granted lands to 65 proprietors, most of who came from Litchfield County, Connecticut.

Burke was named after Sir Edmund Burke, a member of the British Parliament who tried to promote conciliation of the American colonies and avert a war for independence. The proprietors of the Northeast Vermont grant took his name for their yet unsettled town of Burke. Sir Edmond Burke had so well expressed their hopes for freedom and independence.

The settlers came by boat as far as they could and then walked, or they came on horseback or in ox carts along blazed trails. They found the freedom they wanted, the land they needed, and with hard work cleared the land and established a home. From the forests came a cash crop of potash and lumber for construction and sale. With the waterpower available, sawmills became the first industry. Roads were constructed and trade commenced, primarily with the areas to the south. Cattle and turkeys were driven over the roads while oxen and horses carried other products. There was a need for merchants, inns, teachers, blacksmiths and other craftsmen. Gradually the farms grew as the trees were driven back, and the lumber industry flourished.

The first settlers opened the land along the central ridge. The first public building, which was built on Burke Green, housed a school, church and meeting house. The central ridge proved to be too windy and the center was moved down the hill to Burke Hollow. The town spread out from there. South Burke was at the fork of the road between Lyndonville and Sutton, with the fork in the road going to Burke Hollow by way of Bugbee crossing. East Burke was settled early, probably because of the river valley and its easy access to Lyndonville to the south. West Burke was probably settled because of its waterpower, lumbering and farming. The railroad caused West Burke to prosper as it was in a good location with the surrounding hills in Sutton, Newark and Burke. West Burke became an incorporated village in 1901.

In 1895, the residents of Burke founded the Burke Historical Society. The history of the town and its beginning has been kept by their early efforts to preserve the important documents and stories of early settlers. Their records contain histories of the principal families that settled in Burke. Two-hundred years and six generations later there are still descendants of those original settlers in town today.

Electricity came into town at the turn of the century and automobiles and trucks soon followed. Most of the lumber had been removed from the area so there were few mills. Dairy farms gradually became larger and tractors replaced horsepower in the early 1940's. Many of the farmers had started farming after WWI and as the farmers aged there was no one to replace them. The small farms could not compete so dairy farming declined. In the 1960's, a government program to remove land from production, changed agriculture in the town to the way it is today.

In the late 1800's there was a move in Vermont to create a tourist state. Westmore prospered with Willoughby Lake as a summer residence for visitors who came to West Burke on the train then continued to the lake. This provided business in the village. After the roads improved, rail traffic

declined while automobiles and trucks became the transportation of choice. Gas stations and garages replaced livery stables and feed stores. Stores changed as the townspeople started trading to the south. Social organizations declined as people were able to travel to larger places.

There were eleven school districts in the 1830's, the families were large and the school population was over 400 students. As the farm population shifted, some of the schools were not needed, so schools were consolidated and scholars were transported to other schools. In 1978, a more central building was constructed near the Town Hall. This left two school buildings. Currently there is one town school (kindergarten through 8<sup>th</sup>) on Burke Hollow Road in West Burke.

The early settlers worked hard during the week and wanted a church to attend on Sunday. Over the years there have been several denominations. The Congregationalist, Methodist, and Universalist churches are still active in the town.

Stock for saw mills was cut from the slopes of Burke Mountain and eventually a trail to the summit was cut and one shelter was built at the top. Gradually the timber on the mountain was turned into lumber. In 1904 Elmer Darling purchased Burke Mountain and in 1907 there was a forest fire. Elmer Darling saw the need for a fire detection service and agreed to furnish and erect a tower. A carriage road up the mountain was built in 1910 and became an auto road to the summit in 1932. With the road, the gift of Darling land by the Darling Family for a park, and the work of Civilian Conservation Corps (CCC), Burke Mountain started another phase of development. The CCC cleared over two miles of ski trails and constructed the stone house at the base of the toll road. The stone house was used as a home for the caretakers of the park. After the toll road was completed, local skiers used the road and trails for various events, mostly sponsored by the Lyndon Outing Club.

In 1953, 13 area men formed a corporation which began the development of the Burke Mountain ski area. With this development came vacation homes, an increase in out-of-town land ownership, and subsequent changes to Burke's landscape. The camp on the mountain summit was torn down in 1966 and Vermont Educational TV built a building to house its equipment. There is a steel tower that houses a variety of telecommunications facilities that service the area that once served as a fire tower. Several different groups have owned the ski area, each one adding something different and expanding some facet and success of the recreation area.

Elmer Darling made numerous contributions to the Burke area. He constructed buildings, purchased large amounts of land, operated mills, farms, and was actively involved in the community. When Elmer was 24 years old, he went to work for his uncle, Alfred, at the famous and elegant Fifth Avenue Hotel in New York City. He was so successful, he became part owner and began to purchase land in Burke. In 1883, he purchased the Harley Hall farm and gradually purchased more land until he was reported to have the largest farm in the state of Vermont. Elmer's brother, Lucius, was the superintendent and his sister, Louise, did the bookkeeping.

By 1896, Elmer Darling owned 953 acres, mostly farm land on "Darling Hill". By that time, most of the men of East Burke worked on the Darling Farm. Elmer Darling was very interested in the Morgan horse and successfully bred prize winning and handsome horses to be admired at all the fairs.



In 1905, Elmer Darling broke ground for the construction of a colonial style mansion which was finished in 1908. He called the mansion “Burklyn Hall”. It had 23 bedrooms and five caretakers. Elmer renovated the saw mill in the East Burke village in 1907 and put in a new dam and a dynamo to run water to his Mountain View farm on the hill. He also put in an electric light plant for the farm and supplied the village with electricity. The flood of 1927 destroyed the plant and it was never rebuilt.

Elmer Darling built the Burke Mountain Clubhouse in the East Burke village as a community center, gathering place and a library. He then built a gazebo near the Clubhouse for the Burke Band to perform.

At the time of Elmer Darling’s death in 1931, he owned between 7,000 – 8,000 acres. The acreage he owned on the mountain was deeded to the Forest and Parks division of the State of Vermont, hence, the name “Darling State Forest”.

## **Chapter 3. Land Use Plan**

### **Land Use Goals**

- To build upon historic precedent and past planning efforts and to be based upon the desire to maintain and reinforce the Town’s traditional settlement pattern.
- The regulation of land development in a manner which protects important cultural and natural resources while encouraging a range of land uses and growth in appropriate locations.

### **Land Use Overview**

Burke is a rural community with a working landscape, village centers, a tourist destination, and home to a variety of species, habitats, and natural resources. Existing land uses are the result of many years of Burke’s development and evolution. This development pattern is distinguished by:

- Compact, mixed use village centers, served by major transportation routes.
- A rural landscape surrounding the village centers, encompassing old farm fields, a few working farms, open meadows, and forests with low density residential development.
- Small, compact scattered residential “groupings” located in appropriate locations throughout the rural landscape.
- Undeveloped mountainous areas.

Today most homes and businesses are concentrated in the village centers of West Burke and East Burke, and adjacent to the Burke Mountain recreation area. There is also scattered development throughout other areas of the town.

Historically, most land use decisions were made by individual landowners. Because of the profound impact that these many individual decisions have on the community, such as the effect on property values, the demand for public services and facilities, environmental health, public safety, the availability of resources, economic opportunity, and the local quality of life, land use decisions are increasingly recognized as a legitimate public concern. This concern must be balanced with the legal rights of landowners, which are defined by historic precedents as well as a combination of local, state, and federal laws. Identifying a common plan for the use and development of land, and achieving that plan through government policies and regulations, is among the most important, and controversial, planning issues faced by local communities.

The protection and enhancement of cultural and natural resources, housing and economic development are closely related to land use. Likewise, questions concerning how Burke will meet the needs of a growing population, address transportation needs, and provide community facilities and services are all impacted by land use decisions and policies.

### ***Future***

Burke must manage future development and continue to refine standards to maintain and enhance its charm and rural character. The 2007 bylaw revision helped to manage future development and protect rural character by establishing multiple zoning districts. The original land use plan of 2006 identified areas and aspects of the community that merited special consideration to support the creation of multiple districts. These areas of concern were: villages, agricultural/residential areas, forested lands, and commercial development.

### ***Strategies***

- Maintain the town's historic settlement pattern of compact growth centers surrounded by rural countryside.
- Ensure that land subdivisions are designed to reinforce the desired pattern of development of the district in which the subdivision is occurring.
- Allow higher density housing development within approved PUDs.
- Regularly review administration and enforcement practices related to development regulations and ensure that all standards and associated permit conditions are efficiently administered and strictly enforced.

### **Forested Lands**

Distinguishing features of forested lands include:

- Extensive areas of steep slopes, especially above an elevation of 1,700 feet.
- Thin, highly erodible soils.
- Small, fragile headwater streams.
- Highly visible – and scenic – hillsides and ridgelines.
- Limited access to maintained roads, with no maintained roads serving land above 1,700 feet.
- Large tracts of productive forest land and extensive areas of “core” wildlife habitat.

Historically, development in the area of these lands has been limited, with scattered camps and a few single-family homes. Changing construction and transportation technology in recent years, however, and a growing market for land which affords a big view, have increased development pressure in these forested lands. Residential development could contribute to forest fragmentation and burden the Town with an increased demand for services in remote areas. Road upgrades could alter the character of these lands through increased pressure to subdivide large parcels for year-round and vacation residences, resulting in additional fragmentation. The potential exists for conflict between year-round automobile traffic and other traditional activities, such as logging operations and recreation. There is also the potential for negative impacts on wildlife habitat, including direct loss, reduced connectivity, and an increased vulnerability to the introduction of non-native plant species. Development in high-elevation forests can result in diminished water quality in headwater streams and have an adverse visual impact on prominent ridgelines and hillsides.



Good forest management can ensure a sustainable income from timber harvesting while maintaining a healthy, ecologically functioning landscape. Programs to provide financial incentives to landowners in return for sound management of their property are available. At present, there is a state current use program that provides tax relief for landowners in return for forest management, and several state and local programs are available to purchase conservation easements from willing landowners.

It is generally acknowledged that the town's existing zoning bylaw offers limited protection from fragmentation of the community's forest reserves. In 2007, an attempt to create a district with minimum lot sizes of 25 acres was unsuccessful. Nevertheless, past surveys indicate the protection of forested land and open space remains important to Burke residents. The Town and Planning Commission will continue to consider ways to discourage the siting of building envelopes and clearings away from important forest reserves and the wildlife corridors connecting those reserves.

### **Strategies**

- Protect forested lands and open space from fragmentation and development.
- In order to limit the adverse impacts of additional residential development of large forested parcels, the upgrade of Town roads and subdivisions of large forest parcels is discouraged, and any new roads will be the minimum length needed.
- When residential development does occur, including within an approved PUD, careful site selection and screening of new homes should occur, and landowners will be encouraged to restrict further subdivision of larger parcels.
- Development be limited to those areas that are most accessible and post the fewest physical constraints and lowest risk of environmental degradation.
- Forested lands should be managed in accordance with a forest management plan and with the aid of certified forestry consultants.

### **Agricultural-Residential**

This area encompasses the majority of the Town's open land, including a few farms, the majority of the Town's housing units, and a handful of small businesses. As its name implies, this district would accommodate two dominant land uses – agriculture and housing.

With single family homes on lots of varying sizes being the dominant type of housing today, maintaining this area's rural character is an ongoing challenge. The landscape within this area is a critical element of Burke's rural character and charm. Burke's rural character is the historic working landscape formed by open farmland, barns, farmhouses, sugar houses, and other historic structures, the scenic backdrop formed by forested hillsides and mountains, tree-shaded roads and a meandering river.

Methods to maintain the rural landscape include continued support and protection of the features of the landscape balanced with thoughtful development of new housing. Achieving this balance is among the most important land use challenges facing the community. The need for additional affordable housing for all income levels, especially ownership opportunities for middle income households, is critical to Burke's economic and social well-being.

Historically Burke had many small family farms and was an agricultural community, but over time the town has witnessed a substantial decline in agriculture. Maintaining a land base for farming not only helps to maintain Burke's rural character, it contributes to the local economic base in a sustainable manner. And, in the face of climate change and an increasingly complex and vulnerable food distribution system, maintaining a local food supply may prove in the long run to be critical to the community's sustainability. At the same time, the current demand for housing options for local residents and second-home owners is not expected to decline in the near future and much of the town's new residential growth will likely continue to occur in the Agricultural-Residential areas of the Town.

Due to traditional land uses, a great deal of property remains in large parcels. But with the decline in farming, land subdivision, primarily for residential purposes, has reshaped large portions of the landscape in recent decades. While the subdivision of large parcels can benefit the community by providing housing sites for local residents and allowing the transfer of property between parties, poorly conceived subdivision can result in a degradation of the environment and have significant negative impacts on scenic and natural resources.

Agricultural-Residential areas would support the continued operation and expansion of agricultural operations and forest management while accommodating low-density residential development and encouraging moderate or high-density clustered residential development in appropriate locations, including within any approved PUD.

Methods to prevent the conversion of farmland to development and support the economic viability of agriculture include both regulatory and non-regulatory programs. Both should focus on the most productive farmland characterized as supporting multiple resources. Non-regulatory tools could include a tax abatement program for working farms, which reduces the tax burden on farmers, and land conservation programs in which a conservation easement may be purchased on farmland, thereby removing the development rights and leaving the land affordable for farmers. Through land use regulations, the Town can ensure that:

- New development does not harm sensitive natural areas
- Adequate sewage disposal and water supplies exist
- New roads and utilities are coordinated with improvements on neighboring properties and will meet minimum standards
- Farm and forest land remain available for production
- Residential development is encouraged at appropriate densities in appropriate locations.
- Cluster development encouraged within large subdivisions with large areas designated as open space

Two common methods of limiting impacts on natural resources and fragile features are through the designation of building envelopes and through the use of conservation subdivisions. A building envelope is an area on a building lot where construction will occur, typically selected as the portion of the lot upon which development will have the minimum adverse impact. For example, if a particular lot were mostly open field, the preferred building envelope would not be to position the house and driveway in the center of the open field but rather have the development occur more on the outer perimeters of the field.



Conservation subdivisions are intended to ensure that subdivision design is based on the identification and protection of key site elements, such as open fields and steep slopes, and that building envelopes and site improvements are sited and property boundaries configured to minimize the impact and fragmentation of those features. Often, clustering of the development on the least sensitive portion of the subdivided parcel is an important feature of conservation subdivisions.

Single family homes on moderate sized lots would comprise the majority of housing in these areas of the town while some of its area might be better suited for higher density residential development. Higher density development is best suited for areas where current town services exist or where town or private services are planned for the future. Areas characterized by undeveloped open land, significant natural resources and limited proximity to town or private services, are less well suited for moderate and high density residential development. Planned Unit Development overlays should be utilized for higher density residential development to encourage flexibility in the application of land development regulations.

Any proposed commercial land use in the Agricultural-Residential areas should be carefully managed and directed to designated growth areas. Rapid growth of cycling with Kingdom Trails and the gaining popularity of gravel riding are a major consideration for conservation and land use.

The demand for the extraction of natural resources such as sand and gravel and potable water for commercial sale is also an important issue. Resource extraction by its very nature must occur where those resources are located. This presents the potential for conflict with other land uses. The impact of trucking sand and gravel on Town roads is a concern.

Many of the same issues also apply to water extraction, although the disruption of a site resulting from water extraction is not nearly as severe as a gravel pit. Commercial groundwater extraction could provide benefits to the town, including the potential for maintaining a large tract of undeveloped open space. As productive land becomes less economically practical to manage solely for agriculture and forestry, other financial incentives need to be available for landowners to maintain large tracts of undeveloped land. Commercial water extraction provides such incentive. Safeguards such as site screening, landscaping, restoration plans, bonding for restoration, restricted hours of operation, limited rates of extraction and appropriate traffic management should be considered when reviewing proposed extraction proposals.

### **Strategies**

- Encourage commercial development, higher density residential development and new residential settlements in those areas that are appropriate while discouraging development in other areas.
- Encourage cluster development.
- Create larger minimum lot sizes to prevent a checker board of houses.
- Control sand and gravel extraction to ensure minimal impact on scenic resources during operation and after restoration of the site.
- Prohibit large-scale activities and large traffic generators without adequate transportation upgrades.

- Ensure that buildings and uses are of a scale and design that is compatible with residential uses, and where practical encourage the use of historic structures that are no longer viable for their original function.
- Control the impact of trucking sand and gravel on Town roads with requirements for the number, duration and character of truck traffic to ensure road safety, minimize impacts on the neighborhood and avoid excessive deterioration of Town roads.

## Villages

East Burke Village and West Burke Village historically have served as the town's commercial and service centers. Although much of the retail and commercial services are based in other towns outside Burke there are retail services in both villages as well as community services, including two volunteer fire departments, town offices, meeting venues, libraries, and churches. Burke Hollow was also a commercial center in the early history of Burke, but has been a residential-only center for decades. The character of all three villages is valued by both Burke residents and by visitors, and it is important to preserve that character.

The vision for Burke is to maintain West Burke and East Burke as residential/commercial centers, and Burke Hollow as a residential cluster. The village areas should be separated by rural/residential areas, and not be allowed to grow together into one continuous development.

Burke Hollow should serve as a buffer zone between the more commercial East and West Burke areas, with small residential lots allowed in the center of Burke Hollow, surrounded by more rural residences. The residential character of the neighborhood should be preserved by prohibiting commercial development which might alter the residential and/or historic character of Burke Hollow. For the safety of the many children living in the villages, sidewalks, crosswalks, bike paths and traffic control measures should be considered.

Water, sewage and runoff water handling capacities for both East and West Burke village areas are limited, and may limit growth unless they are augmented by municipal facilities. Further study is needed to determine the appropriate municipal facilities.

Efforts are needed to maintain the existing housing base of the villages, and to discourage the conversion of residential properties to solely commercial uses and short-term rentals. Requiring that some commercial uses could be located within mixed-use buildings, and encouraging upstairs apartments and accessory dwelling units through incentives and favorable development standards, should maintain a housing base and protect the village's residential character. Restoration and maintenance of existing structures should be consistent with the architectural nature of the village. A village residential district should surround the historic commercial core, which would contain village-sized smaller lots, but only allow residential or very low-impact commercial buildings.

Historically, community surveys have revealed significant support for residential planning techniques that aid in slowing traffic, ensuring walkability, increasing pedestrian and bicycle safety, and managing noise levels. The preservation and adaptive reuse of historic structures has also been well supported by community members.



In 2009 Village Center Designation was obtained for West Burke and East Burke. Village Center Designation is granted through the State of Vermont Downtown Program. "Village Centers" are defined by statute as:

a traditional center of the community, typically comprised of a cohesive core of residential, civic, religious, and commercial buildings, arranged along a main street and intersecting streets. Industrial uses may be found within or immediately adjacent to these centers.

This designation permits commercial properties to generate tax credits for historically significant improvement and code compliance fit-up. The tax credits can be sold to a bank in exchange for a mortgage adjustment or cash. Income-producing properties constructed prior to 1983 are eligible for the tax credits. Government and religious buildings, as well as single-family residences, are not eligible. The Village Center Designation is valid for five years. The municipality applied for redesignation in March 2022 and was approved.

### **Strategies**

- Maintain Village Center Designation for East Burke and West Burke villages.
- Work to ensure that future development is compatible with the villages' historic character. Village improvements, such as sidewalks and streetlights, should also maintain the character.
- Discourage the demolition of historic structures and encourage the restoration and re-use of these structures.
- Support the creation of a network of pedestrian and cycling paths that interconnect the villages.
- Support low impact lighting, shared parking, sidewalks, crosswalks, and well-defined streetscapes.
- Explore means of controlling the lighting so that it is directed where needed, and does not create glare. Lighting should be maintained at consistent levels that are safe for vehicles and pedestrians, but does not create excess light trespass beyond property lines.
- Explore the use of street lighting fixtures that mimic the period of the historic buildings.
- Limit the size and lighting of signage to be consistent with the character of the villages.
- Study the feasibility and impact of providing a municipal water supply, and sewage and run-off water processing capabilities for both East Burke and West Burke villages.

### **Commercial/Industrial Development**

Burke does not have the infrastructure to support commercial or industrial development even though performance standards were adopted for industrial uses in 2011.

### **Land Use Documentation**

A land use map is on file at the Town Clerk's Office.

## CHAPTER 4. Transportation Plan

### Transportation Goals:

- To provide a safe, efficient and convenient transportation network for all Burke residents, visitors, and businesses.
- To consider "complete street" principles – to design streets to safely accommodate all users, including motorists, cyclists, and pedestrians– in town highway planning and project development, particularly for highway projects in East Burke, West Burke and Burke Hollow.
- To promote the development of alternative transportation modes, including expanded public transit to serve Burke residents and businesses.
- To continue to support Burke as a premier cycling destination, to include trail development, sustainable management and long-term public access and use.

### Town Highways

Primary access to the town of East Burke is provided by State Highway 114 from Lyndonville and East Haven. US Route 5 serves West Burke from Lyndonville and Barton and Vermont Route 5A connects to Westmore and Lake Willoughby. Interstate 91 (Exit 23) in Lyndon – located seven miles from East Burke and ten miles from West Burke – provides interstate access north to Newport and the Canadian border, and south to St. Johnsbury and points beyond.

Burke highways are classified for state highway funding and management purposes as follows:

Type	Mileage	Description
US Highway	4.30	Route US 5 – state highway that is part of the federal highway system
State Highway	5.67	Routes VT 114, VT 5A – state highways also maintained by the state
Town Class 2	17.46	Town roads, approved by the state, that connect to neighboring towns
Town Class 3	33.84	Town roads that are constructed and maintained for local, year-round use
Town Class 4	5.36	All other town highways, with limited maintenance requirements
Total	66.65	

Source: Mileage certificate filed with the state, 2015.

Burke's highway network consists of 61 miles of roadway that are managed for year-round use, including 51 miles that are maintained by the town. The town also has more than five miles of Class 4 roads, including some that are maintained for summer or recreational use. Major town roads, including the town's Class 2 roads, are paved, but most of Burke's back roads are gravel surfaced. Gravel roads were highlighted in recent surveys as an important component of the town's rural and scenic character. The town's highway infrastructure also includes eleven bridges and nearly four hundred culverts maintained by the town.

Highway maintenance costs are one of the town's largest annual expenses. Class 2 and 3 town highways qualify for state highway grants – the town receives around \$200,000 annually from the state for road maintenance. The rest is covered largely through local property taxes. Incentives are provided



under state grant programs for towns that adopt minimum road and bridge standards. The town's current standards were adopted by the Selectboard in 2009 and the most recent Certification of Compliance for Town Road and Bridge Standards and Network Inventory was signed on July 1, 2024.

Research shows that roads can contribute over 10% of sediment loads to water bodies. Excessive sediment and phosphorus can cause algae blooms, increase water turbidity (cloudiness), and degrade fish and invertebrate habitat. Act 64, passed by the legislature in 2015, represents sweeping legislation aimed to improve water quality. An important component of this legislation is a new regulatory framework addressing all work on town highways, known as "The Municipal Roads General Permit." This general permit is intended to reduce stormwater-related erosion from municipal roads, both paved and unpaved. Under this legislation, municipalities will have to develop and implement a customized, multi-year plan to stabilize their road drainage system. The plan will include bringing road drainage systems up to basic maintenance standards, and additional corrective measures to reduce erosion. The plan will be based on a comprehensive inventory of the road network that identifies priority road segments that are connected to surface waters through ditches, culverts or other drainage structures. The Town can seek assistance through the Better Back Roads Program, the County Conservation District, VTrans Maintenance District, Vermont Local Roads, and NVDA.

The Town of Burke's roads are generally in good shape and adequate to accommodate current traffic volumes.

### **Future**

While the town does not maintain a formal, long-term road improvement program, the Selectboard and Road Forman have attempted to schedule road maintenance in an efficient and cost-effective manner which minimizes year-to-year fluctuation in the municipal property tax rate. The town also has adopted highway and bridge standards.

Under a new state law enacted in 2011, the Selectboard and VTRANS are required to consider "complete street principles" – the redesign of paved public roads to more safely accommodate all users, including motorists, cyclists, transit riders and pedestrians of all ages – for major road upgrades. Complete street principles may not apply to all local road projects, but at minimum should be considered for major highway and enhancement projects in East Burke, West Burke, and Burke Hollow.

### **Strategies**

- Maintain and update town highway infrastructure inventories.
- Create a long-term road improvement program and review yearly.
- Secure a long-term supply of gravel as needed to maintain the town's gravel roads.
- Update the town's road ordinance and policies to include "complete street" principles; Class 4 road use, maintenance and upgrade standards, and best management practices as needed to qualify for additional state funding.
- Require a transportation impact study as part of any new large scale residential development.
- Analyze the impact of any new road on maintenance costs and emergency services.



- Require developers to pay for and install highway improvements needed to serve their developments.

## **Traffic**

Most traffic in town, especially on state highways, is through traffic. East Burke is a tourist and employment destination. Burke Mountain Resort and Kingdom Trails are the largest single traffic generators in town.

### **Burke Mountain Transportation Study**

The *Burke Mountain Area Transportation Infrastructure Study* was prepared for the Towns of Burke and Lyndon in 2007, in anticipation of regional growth and the planned expansion of Burke Mountain Resort. The study documents existing road and traffic conditions, projected conditions through 2027, and improvements needed to accommodate increased traffic and to enhance local roadways, village centers, and pedestrian and bicycle facilities in the vicinity of Burke Mountain. Study recommendations include:

East Burke Village improvements (streetscape, bike/ped, gateway, intersection, and access management enhancements).

VT144/Mountain Road intersection reconstruction.

Expanded RTC shuttle service from Lyndon to East Burke and Burke Mountain Resort.

Village design, streetscape and sidewalk standards under local regulations.

Access management standards.

Developing a village gateway enhancement plan.

Study recommendations are incorporated here by reference and should be considered for implementation by the town and, where applicable, in the review of new development.

## **Future**

Traffic conflicts have intensified as more commercial, recreational and residential development occurs in village and rural sections of Burke. New development has generated additional traffic that may intensify the conflicts between commercial trucks, automobiles, pedestrians and cyclists. Truck traffic in particular raises special issues related to greater wear on public roads and the impact on the quiet character of rural roads and residential neighborhoods.

### **Traffic Calming Techniques**

Techniques to maintain relatively slow traffic speeds in settled areas, enhance pedestrian safety, and improve the overall environment are often referred to as "traffic calming". Traffic calming is important in Burke Hollow, East Burke and West Burke villages where traffic volumes are high, but pedestrian and bicyclist traffic is encouraged.

As development in and near Burke continues and the resulting volume of traffic increases, the need for traffic calming will increase in Burke Hollow, East Burke and West Burke, and may become an issue in other parts of the town. Techniques for traffic calming include:

Narrow vehicle traffic lanes - Fog Lines

Medians

On-street parking

Intersection roundabouts

Wide sidewalks with curbs and planting strips

Clearly marked, raised or textured pedestrian crosswalks

Bump-outs or curb extensions at crosswalks that shorten crossing distances

Street tree plantings

Larger development projects also should be designed and reviewed to minimize traffic impacts and congestion on local roads, to maintain or improve existing "levels of service" (LOS) for local highways and intersections. Level of service is a measure used by traffic planners and engineers to determine how well roads and intersections carry traffic – ranking from "A" allowing for the free flow of traffic with no delays, through "F" for highly congested roadways. Highways and intersections operating at their full capacity have a level of service "E." In Burke, this includes segments of VT 114 in the vicinity of Burke Mountain – due in part to the steep terrain. Levels of service "C" and "D" are common and generally acceptable in rural and village areas.

### **Strategies**

- Consider adopting enforceable traffic and noise ordinances, particularly to address truck traffic, truck noise and traffic speeds in village areas.
- Work with the Vermont Agency of Transportation and legislative delegations to restrict commercial truck traffic to state highways and the Interstate highway system, rather than rural roads.
- Develop traffic calming measures in any improvements to Burke's existing roadways and any new connecting side roads.
- Minimize the impact of new development (trip generation) on local traffic patterns and the functional capacity (level of service) of local roads and intersections in the vicinity of the project. New development should not reduce existing levels of service (LOS).
- Consider Burke Mountain Area Transportation Infrastructure Study recommendations, as applicable, in the review of new development.
- Develop, under written agreement with Burke Mountain Resort and Kingdom Trails, a "recreation traffic management plan" that identifies strategies for minimizing and mitigating the impacts of resort and recreation construction and operations on town and state highways, and East Burke in particular.
- Develop a traffic calming and pedestrian circulation plan for East Burke.

### **Access Management**

The frequency, location, and design of highway accesses – or curb cuts – has a direct bearing on the safety and efficiency of both town and state highways. Approval by the Selectboard is required for access onto town roads, and by VTrans for access onto state highways. To receive local approval, the access also must be consistent with the local land use regulations and town highway ordinances. New development on state highways must meet VTrans' adopted access management guidelines.

### **Future**

There are many techniques for managing highway access, most of which may be applied through the town's zoning and subdivision regulations, and road policies and ordinances. These include requirements for:

- Minimum sight distances at driveway or street intersections.
- Maximum number of driveways per lot.
- Mandatory shared driveways.
- Maximum curb-cut widths.
- Minimum and maximum driveway lengths.



- Installation of turning lanes.
- Easements to allow for future road extensions or connections to adjoining lots.
- Minimum or maximum on-site parking, shared-parking, and parking design.
- Minimum areas for loading and unloading.
- Curbing, landscaping, and buffers to visually define and enhance access points.

### **Strategies**

- Evaluate and update access management provisions in existing bylaws and ordinances, in relation to road functional classes and rural or village context.
- Consider specific development and access management standards for major collectors (e.g., an access management overlay district) to improve access management and limit strip development along major highways.
- To ensure the safety of residents and the traveling public, require that all business ventures have adequate designated parking for all employees and visitors, including parking for recurring events, such as outdoor markets and yard sales.

### **Transportation Alternatives**

There are no formal park-and-ride facilities in Burke. The closest park-and-ride lot is owned and maintained by the Town of Lyndon, and also serves as a public transit stop. The nearest state park-and-ride facility is in St. Johnsbury.

Rural Community Transportation Inc. (RCT) schedules on-demand door to door transportation services for Burke residents through state Medicaid and Reachup programs, as well as programs offered by social service agencies. Currently there is no shuttle service to Burke Mountain Resort, as recommended in the 2007 Burke Mountain Area Transportation Infrastructure Study.

Interstate travel options are also limited. Greyhound (formerly Vermont Transit) no longer offers bus service out of Newport – the closest interstate bus service is based in Montpelier. The two public airports in the region – the Caledonia County Airport in Lyndonville and the Newport State Airport – serve the local aviation community. Charter flights, but no regularly scheduled passenger flights, are available out of both airports. The nearest full service airport is the Burlington International Airport, roughly sixty miles away.

There also is no passenger rail service in this part of the state –Amtrak service is available from Montpelier and White River Junction. The Washington County Railroad (WACR), a shortline subsidiary of the Vermont Rail System, operates on the former Boston and Maine and Canadian Pacific rail line between Newport and White River Junction, now owned and maintained by the state. This line (the Connecticut River Division) passes through West Burke, and carries an average of two through freight trains per day. Freight carried includes grain, lumber, wood pulp, petroleum products, urea, malt and potassium and calcium chloride (VT State Rail Plan).

The town has an extensive network of biking routes, including some local roads, described in more detail below, which are largely for recreational use.

### **Future**

As fuel prices increase and vehicle emissions continue to erode air quality, other transportation options – including carpooling, cycling, public transit, and telecommuting – and a shift to more fuel efficient and alternative fuel vehicles, will become more critical. Promoting local business and employment opportunities, including home-based businesses, can also reduce vehicle miles traveled, while supporting the local economy. Efforts to secure grants to install EV charging stations are also planned.

### **Strategies**

- Reasonable efforts should be made locally to promote ridesharing, alternative modes of transportation, and less auto-oriented patterns of development.
- Local initiatives that could help reduce the number of vehicle miles traveled include the building of extended sidewalk projects in the villages, the development of a park and ride facility, promoting transit and ensuring traffic safety and efficiency throughout the community, and shared parking areas in West and East Burke villages.
- Evaluate local roads for "share the road" use by cyclists.
- Consider improvements to VT 114 north of East Burke to Victory Road for safe bicycle use (e.g., wider shoulders, bike lanes).
- Develop centrally located municipal parking lots in each village, which could also be used as local park-and-ride or park-and-walk facilities, or public transit stops.
- Allow for higher density mixed use commercial and residential development in village centers, and expanded home-based businesses in rural areas of town, to reduce commuting distances and vehicle miles traveled.
- Work with RCT, Kingdom Trails, and Burke Mountain Resort to establish regular shuttle service from Lyndonville to East Burke and the resort to serve resort guests and employees, and local residents.

### **Pedestrian and Bicycle Travel**

Pedestrian and bicycle safety are top priorities. There are limited pedestrian sidewalks in West Burke villages and none in Burke Hollow. Sidewalks will become increasingly important for safety as commercial and traffic growth continue. Likewise, crosswalks are currently lacking, and will become an important safety feature.

As noted earlier, few if any local residents cycle to work, but Burke is a premier cycling destination – the multiuse trail system maintained by Kingdom Trails Association, a local nonprofit organization, was recently recognized as the best trail network in North America by *Bike Magazine*. Kingdom Trails has its home office in East Burke Village and has become an asset to the area. The trails bring in tourists that support local businesses, especially in the summer season. The Kingdom Trails network includes more than 100 miles of interconnected trails on Darling Hill and Burke Mountain, as well as some local roads. Trails are maintained for non-motorized uses, including mountain biking, hiking, trail running, Nordic skiing and snowshoeing. The "Burke Bike Park" – a gravity downhill trail system accessed by the high-speed quad lift on Burke Mountain, opened in 2011 in collaboration with the resort. Much of the trail system has been established on private land, with permission from more than fifty local residents and businesses.

Burke has many Class 4 roads and a few legal trails that provide excellent walking and biking opportunities. In addition, many miles of private logging roads and trails are available to the public



through the generosity of landowners. The local VAST chapter also maintains a network of snowmobiling trails, through landowner agreements, that connects to a statewide trail system.

### **Future**

Maintaining existing trail networks, and enhancing pedestrian and bicycle travel, offer many benefits to the community. These include reduced traffic congestion, air pollution and reliance on non-renewable fossil fuels, fostering healthy living, providing recreational amenities for residents and visitors and reinforcing historic, pedestrian-scale settlement patterns. Kingdom Trails is researching the development of a path from East Burke to Lyndonville, which would serve as an important pedestrian and bicycle connection.

Private roads are often at risk of being posted; public access may be prohibited as landowner-user conflicts arise. The continuing subdivision of land poses both a risk to the informal network of private logging roads and trails, and opportunities to obtain path easements.

Limited public parking to access existing trail networks has also become an issue particularly in East Burke. Future trail planning and development should incorporate access and parking considerations, and include the identification of available parking areas in the vicinity of existing and planned trail heads.

### **Strategies**

- Pedestrian facilities, including interconnecting sidewalks and crosswalks should serve as a dominant organizational element in village development.
- Develop a traffic calming and pedestrian circulation plan for East Burke.
- Develop, in association with Kingdom Trails, Burke Mountain Resort and interested landowners, a long-range trail plan to maintain and conserve existing trails for public access and use, and to identify new trail corridors and public parking areas.
- Evaluate local roads for "share the road" use by cyclists.
- Consider improvements to VT 114 north of East Burke to Victory Road for safe bicycle use (e.g., wider shoulders, bike lanes).
- Promote public education to discourage inconsiderate recreational use of private trails (e.g., littering, leaving gates open), which is important if local residents are to continue to benefit from the generosity of landowners.
- Plan for the inclusion of bicycle lanes and/or walking paths on all paved town roads when roads are upgraded, as part of a "complete streets" policy.

### **Scenic Roads**

Many of Burke's roads are scenic, but none to date have been formally designated by the town or the state as scenic roads. An initial inventory of scenic roads was developed by Smart Growth Vermont and NVDA. These should be considered for a more complete inventory, and potential scenic road

designation by the town. As noted, recent surveys also highlighted the importance of the town's gravel roads to its scenic and rural character and these roads are seeing more bicycle traffic.

### **Strategies**

- Conduct a more detailed scenic inventory of local roads, to identify the scenic values of both the road corridor (right-of-way) and scenic views (viewsheds) from local roads.
- Consider adopting a scenic road ordinance that designates scenic road corridors and specifies corridor maintenance and road upgrade standards for each.
- Require under local regulations that development along scenic roads be sited, designed and landscaped or screened to minimize and mitigate adverse impacts to designated scenic roads and viewsheds – e.g., under the Scenic and Conservation Overlay District and associated siting and landscaping standards.

### **Transportation Documentation**

The Transportation Map data is included in the appendices. The official town highway map is on file at the Town Clerk's Office.

## **CHAPTER 5. Utility and Community Facility Plan**

### **Utility and Community Facility Goals**

- To provide a full range of community services and facilities as needed to accommodate anticipated growth and development in a cost effective, environmentally sound manner without creating an undue burden on local taxpayers.
- To provide facilities and services in a manner that reinforces the town's land use, development and natural resource protection goals and policies.

### **Utility and Community Facility Overview**

A primary purpose of this town plan is to identify services currently available to town residents, anticipate future demands, and assess whether these demands can be met efficiently. Although Burke citizens have a municipal government, emergency services, and access to a variety of social and recreational services, Burke faces several challenges regarding specific facilities and services.

### **Town Government**

Burke is governed by a 3-member Selectboard elected to staggered terms by the voters. The Selectboard is responsible for preparing the town's budget, setting policy, and administering town finances and a variety of related duties. There is also a full-time elected Town Clerk and Treasurer. There is also a full-time Town Administrator, Zoning Administrator and an Assistant Treasurer/Assistant Clerk, hired by the Town Clerk. The Town Clerk and staff maintain regular hours in the town office building in West Burke.



Like most small Vermont communities, Burke is heavily dependent upon volunteers to fulfill many governmental duties. In addition to members of the Selectboard, several dozen local residents are elected or appointed to serve on boards and committees, and to represent Burke on regional organizations. This dedication and sense of duty helps define our community, and keeps local institutions open and accessible.

Most planning functions are carried out by a volunteer Planning Commission and a volunteer Development Review Board, both of which are appointed by the Selectboard. These boards are responsible for much of the regulatory oversight of the regulations.

## **Law Enforcement**

The Vermont State Police or the Caledonia County Sheriff, and the Burke constable are responsible for law enforcement in the Town of Burke. The constable is a part-time position and only the constable physically resides in Burke. Support from the State Police and County Sheriff comes from law enforcement resources that are based in other communities.

### ***Strategies***

- As Burke grows it will be critical that adequate law enforcement services continue to be provided.

## **Fire Department**

Fire protection services are provided by two volunteer fire brigades, one in East Burke and one in West Burke Village. The brigades periodically receive training in fire-fighting techniques and fire safety. The departments cover East and West Burke and Burke Hollow and maintain a mutual assistance agreement with surrounding towns. The Town of Burke appropriates funds annually to both fire brigades based upon their request and approval by Burke registered voters. This appropriation represents the single largest source of funding, but other sources include state and federal grants, fund-raisers and private donations.

### ***Future***

The past performances of the fire departments have been exceptional and there is no reason to believe that performance will change in the coming years.

### ***Strategies***

- Support the town's volunteer fire departments including financial support as appropriate.
- Assess the impact on the towns fire protection as the result of planned major developments and ensure it's addressed in any development review process.

## **Medical Service**

There are no capabilities in Burke for immediate emergency care. Emergency medical services and transportation are provided by Lyndon Rescue and the Caledonia Essex Ambulance Service (CALEX). Emergency medical services are provided at the Northeastern Vermont Regional Hospital in St.



Johnsbury. Helicopter transport via DART to Dartmouth Hitchcock Medical Center in, Lebanon, New Hampshire is also available.

Emergency 911 response service is available in Burke.

### ***Future***

As growth occurs in Burke, the level of emergency services may become inadequate. Future medical services for the town should not be allowed to decrease in availability or quality, but rather should continue to improve over time as needed. Whenever large scale developments are proposed, consideration should be given to the impact on emergency medical services and any adverse impact addressed as a component of the development permitting process.

### ***Strategies***

- All residents should be encouraged to prominently display their E911 addresses so that emergency services can easily find the location.
- Assess the impact on available medical services as the result of planned major developments.
- Evaluate annually the emergency medical services provided to the town and develop a plan to address any inadequate or insufficient services.
- Regularly review the E911 data on GIS maps and confirm the accuracy. (This should be done annually.)

### **Recreation**

Burke offers a rich variety of recreational opportunities to year-round residents, seasonal homeowners and visitors. These include a major downhill ski area, cross country skiing, snowshoeing, miles of mountain biking trails, on-road biking, hiking trails, snowmobile trails including access to the Vermont Association of Snow Travelers (VAST) plus an abundance of wildlife and scenic beauty to just relax and enjoy.

The Burke Mountain ski area located in East Burke includes 43 trails on 240 skiable acres. Kingdom Trails Association established in 1994 and located in the village of East Burke offers over 100 miles of interconnected, single-track and double-track biking trails.

Darling Park on Route 114 in East Burke offers a playground for small children, a Pavilion and picnic tables for gatherings, a baseball field, soccer field, and nature trails. The Village Park in West Burke offers playground equipment for all ages, picnic tables, benches and a basketball court. There is a softball field at the town school in Burke Hollow.

### **Town Forests**

In 2022, with the help of multiple organizations and community members, Burke acquired two town forests: the North Pasture Community Forest, 103 acres on Victory Road in East Burke, and the Willey Woods Community Forest, 283 acres off of Sugarhouse Road in West Burke. In 2025, a 60-acre adjoining parcel was purchased and added to Willey Woods, increasing its size to 343 acres. Both forests are open to the public and are permanently protected from future development by conservation easements.

### ***Future***

Recreational opportunities should be available year-round for all age groups.  
Strategies

- Balance growth or recreation with quality of life for full time residents and visitors.

### **Telecommunications**

*Wireless Services:* Wireless service is offered in Burke by several different companies but service is spotty in some areas.

*Internet Access:* Needs updating with accurate info

There are still many areas in Burke that do not have access to an affordable broadband service which puts the residents in these areas at a disadvantage for receiving the benefits of a high-speed service, and limits economic development when Internet access is required.

Wireless broadband and other forms of high-speed Internet access are critical to Burke residents, businesses and visitors.

### ***Strategies***

- Strive to encourage wireless telephone service providers to provide 100% coverage within the town.
- Proactively work with broadband data communication providers to encourage the availability of affordable high-speed Internet access for all Burke residents.

### **Solid Waste**

Trash collection services are provided by private companies. Burke residents can take their recyclables and compost to the Recycling Center in West Burke, located behind the Town Clerk's Office. Disposal of appliances, tires, and other approved items is also provided monthly during non-winter months by the town on "Bulky Day". Household Hazardous Waste Days are scheduled regularly. The town is proactive in education efforts, through literature regarding recycling, composting, reuse and reducing waste.

### ***Strategies***

- Encourage residents to recycle their solid waste through ongoing education and promotion.
- Prohibit the use of burn barrels and outdoor furnaces for trash disposal, and enforce it.

### **Sewage Disposal Systems**

With the exception of properties surrounding Burke Mountain, the residences in town are served by individually owned subsurface disposal systems. State regulations govern septic system standards that now allow alternative septic systems that could not have met previous standards.



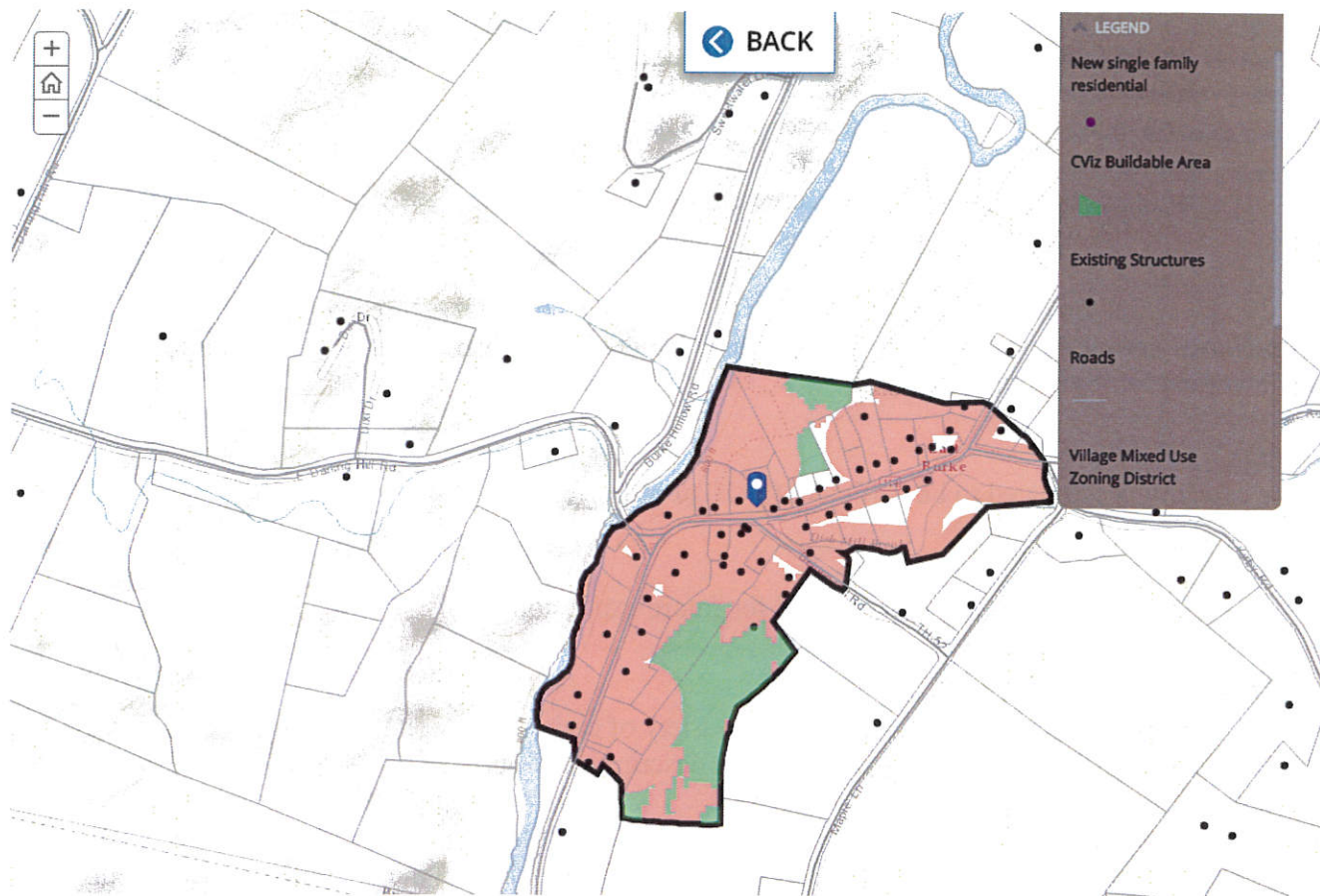
A spatial analysis (after development constraints were applied) showed that a maximum of about 150 housing units could be established in West Burke. Since the area lacked off-site water and sewer, constraints included soils with poor septic suitability and grades less than 3% and more than 20% (for drainage). The primary purpose of this buildout was to determine maximum single-family units (since a primary goal for the town is to retain residential uses). Only one new unit could be established inside the Designated Village Center area in West Burke (Figure 1).

Figure 1: Buildout Capacity in West Burke



By contrast, East Burke had virtually no buildable areas, except for one lot that at the time was being considered as for redevelopment as a RV and small camper park, and possibly two or three houses at the north end of the village district. (Figure 2)

Figure 2: Buildout Capacity in East Burke



### Strategies

- Consult engineers as needed to explore the feasibility of a wastewater system despite uncertainties regarding the cost and funding of such a facility.
- Should a municipal system become a practical reality, coordinate the allocation of available capacity with other policies of this plan so that the system reinforces – rather than undermines – land use, housing and economic development goals of the town.
- Sewage service areas should correspond with designated growth center boundaries, and allocation policies should foster the type and rate of development desired by the community.
- Explore the possibility of sharing a sewage disposal system with any large developments in Burke.
- Explore the potential to build central sewage systems in West Burke and other village mixed use zones.
- Explore commissioning an engineering study for central sewage in village mixed use zones.



## **Cemeteries**

Burke owns and maintains five cemeteries:

<b><u>Burke Cemeteries</u></b>	<b><u>Size</u></b>	<b><u>% Full</u></b>
Hillside	18 acres	50%
Howland	4.6 acres	65%
Burke Hollow	1.5 acres	75%
Burke Green	1.25 acres	100%
Woodmount	15 acres	65%

A Cemetery Sexton and an assistant manage the cemetery's burials. A hired contractor maintains the cemeteries during the season. The Woodmount Cemetery in East Burke is maintained through an endowment left by Elmer Darling.

### **Future**

The capacity is estimated to be sufficient for 10 or more years.

### **Strategies**

- Consider purchasing adjacent land for future expansion.

## **Town Properties**

The Town owns several properties used for a variety of civic, recreation, and maintenance purposes. The following is a list of town properties and a description of purpose.

- Burke Town Office: Located on 3.6 acres in West Burke, the space is occupied by administrative offices including the Town Clerk and staff and the Listers, a public meeting area, and a vault with the town's property records. The property also includes the recycling center. An addition was built in 2009. The Burke Community Building currently houses the Burke Senior Meal Site, provides space for other community functions, and functions as an emergency shelter.
- Town Garage: Located on 3.5 acres in West Burke the property contains buildings for the town's equipment and vehicles and storage areas for material needed to maintain the town's roads including a salt shed and gravel storage.
- Union Meeting House in Burke Hollow - 1.5 acres
- Darling Memorial Park - 22.7 acres
- Land on White School Road and Burke Mountain Road - 17.63 acres
- West Burke Fire House (Owned by the Village of West Burke)
- West Burke Village Park: (Owned by the Village of West Burke)
- Willey Woods Community Forest - 343 acres
- North Pasture Community Forest - 103 acres

### **Town Forests**

#### **Future**

The current town facilities are adequate to meet anticipated needs. The Town Office and Town Garage parcels can accommodate expansion should it become necessary.

### **Strategies**

- Although no additional town facilities are anticipated, any new facilities that may be required in the future should be accommodated on existing town owned properties unless it is not feasible to do so.

### **Utility and Community Facility Documentation**

Appropriate maps are on file at the Town Clerk's Office.

## **CHAPTER 6. Natural Resources Preservation Plan**

### **Natural Resources Goals**

- To protect and manage the sustainable use of Burke's finite natural resources in a manner that enhances the town's ecological well-being for the benefit of present and future generations.
- To preserve fragile natural features and communities that contribute to Burke's ecological health and biological diversity.

### **General**

Burke has an abundance of natural resources including beautiful landscapes, scenic vistas, diverse forests, critical wetlands, wildlife habitats, and air and water resources whose quality is of great value to the town. The town has benefited economically from the natural landscapes and also from the agrarian use of the land for many years.

### **Future**

To preserve the town's natural resources for present and future generations:

- The town will continue to support efforts to identify and sustainably manage and/or protect fragile landscape features such as streams, rivers, and ponds and their associated wetlands and riparian areas and high elevation forestlands and their associated steep slopes. Additional natural resources in the town to monitor and manage in a sustainable manner include primary agricultural land, large tracts of contiguous forest, and areas deemed to be critical wildlife habitat and travel corridors. Where possible, the management of identified natural resources shall be accomplished through measures and programs which support the protection or sustainable use and development of those resources. These include management of productive forests, agricultural use of productive soils, commercial and non-commercial recreational use of land and water, and the use of conservation easements to protect critical wildlife habitat.

### **Landscape**

Burke's traditional settlement pattern contributes significantly to the town's scenic character. The town is blessed with one of the most extraordinary scenic landscapes in Vermont. Blending rolling meadows, wooded hills, meandering rivers and streams, ridgelines, and imposing historic structures, the town's landscape is a source of pride to residents and an important resource and attraction to visitors.

Probably the most popular means of enjoying the Town's scenic landscape is from the vantage of town roads. Whether by automobile, bicycle, or on foot, many of the town's roads offer magnificent views. The features which contribute to the scenic qualities include stone walls, canopy trees, continuous panoramic views, unpaved roads, and historic structures such as turn-of-the-century mansions. Burke values the benefits of unpaved roads where slower traffic is more compatible with pedestrian and bicycling uses, scenic driving, and the maintenance of rural character.

In addition to rural roads, there is an immense trail network of more than a hundred miles covering much of Burke; it is maintained by Kingdom Trails.

#### Future

The preservation of the town's scenic character is important for a variety of reasons: to protect important natural and cultural landscape features, to preserve the agricultural land base, to enhance recreational opportunities, and to promote tourism. Careful site selection and design, and more detailed cultural, environmental and/or visual impact assessments where appropriate, will minimize adverse impacts to the town's cultural and scenic landscape and resources, and its rural character. The adverse visual impact of scattered or poorly located development on the landscape would be pronounced.

The town's scenic landscape includes features that are unsuitable for development because of predictable environmental degradation as well as health and safety concerns. Included in this category are floodplains, which are often used for agriculture and which lessen the effects of high water, and wetlands, which provide critical habitat for wildlife and filter pollutants from water.

Careful site selection and design, with incentives for responsible agricultural practices that protect water quality will help keep crops in production, important in the preservation of the Town's landscape and rural character. Development regulations are also a means of protecting important scenic and open lands. Through zoning, subdivision review and local participation during Act 250 and other state regulatory reviews, the Town can ensure that adverse impacts on scenic resources are minimized. Care must be exercised that the reasonable use of private property is not denied to the landowners.

The extraction of finite earth resources, including sand and gravel, should be carefully conducted to minimize adverse impacts on surrounding properties and the community at large. Development of such resources should be carefully sited to retain future access and to protect water quality. Extraction of earth resources is currently allowed to occur as a conditionally approved use in the Agricultural-Residential II district, which was established to maintain and preserve the agricultural character of Burke's outlying areas and allow for limited non-residential development and resource-based activities.

In 2007, the Town of Burke created a Scenic Conservation Overlay to provide regulatory protection to areas with exceptional scenic and visual quality. This overlay is currently composed of all areas of 1,500 ft elevation or higher, and most development in this area is subject to conditional use review. Deeper setbacks may be required to protect certain natural and scenic resources. Additionally, existing, forested cover must be maintained in a manner that softens the visual impact of new development as viewed from public roads and properties. Finally, structures in this overlay must be carefully sited



downslope of adjacent ridgelines and be constructed in a manner that minimizes glare and sharp contrast from the natural environment, as viewed from public roads and properties.

A number of scenic roads were mapped as part of the Community Character Inventory. These roads include Darling Hill (and East Darling Hill), Gaskell Hill, Burke Hill, Sugar House, White School, Burke Hollow, Burke Green, and Pinkham roads. Interestingly, virtually none of the scenic road segments fall within the Scenic and Conservation Overlay District. Therefore, while the Scenic and Conservation Overlay has significant value to protect some of the most important long-distance views, such as views to the mountains and other high elevation points, there is no local protection to protect the vantage points themselves.

### **Strategies**

- Support efforts of local, regional and statewide conservation organizations to conserve open space.
- Enforce development standards in the Scenic and Conservation Overlay to protect undeveloped high-elevation land and ridgelines.
- Carefully site new developments along scenic vantage points by screening and placement of building envelopes.
- Limit curb cuts along scenic roads whenever feasible. For new development on lots with frontage on more than one road, site access to the road that is more suited to handle traffic that results from the development.
- For uses that are exempt from zoning, such as small wind turbines, encourage landowners to use structures of unobtrusive colors (such as flat gray); site the structure at the edge of a scenic view, rather than the center; and site the structure at or below the horizon line.
- Utilize the services of a certified forestry consultant for land use and management advice.
- Encourage underground placement of utility wires wherever possible to improve sightlines in scenic areas.

### **Quality of Life Resources**

The health and quality of life of Burke's residents is highly dependent on many natural resources. Planning to address the management of the environmental impact of air pollution, water pollution, noise pollution and air trespass (light pollution) is critical to Burke.

### **Water Resources**

Clean, plentiful water is a basic resource that is too often taken for granted. Burke's water resources include abundant, naturally replenished surface and ground water supplies that sustain the natural environment and support a variety of human activities.

Surface waters include upland headwaters, the main stem and branches of the Passumpsic River, as well as small ponds scattered throughout the town. Surface waters can serve as a barometer of environmental well-being.

Burke's surface waters are included in the Passumpsic Upper Connecticut Tactical Basin Plan, which was approved in June 2014. This plan focuses on the projects or actions needed to protect or restore

specific waters and identify appropriate funding sources to complete the work, based on monitoring and assessment data. Since these tactical plans will guide all watershed work supported by the Watershed Management Division, the issues identified in the plan are the ones that will be prioritized for management attention, including funding.

Priority actions from the Tactical Basin Plan that are relevant to Burke include:

- Improve river corridor and floodplain protections for the Passumpsic, Millers Run, East and West Branch Passumpsic River through zoning bylaws to allow these streams to develop new floodplains and reduce flood damage.
- Implement an intensive water quality monitoring program to evaluate phosphorus, nitrogen, sediment and E. coli sources in the Basin. Use sampling results to identify pollution sources in the basin and work with basin partners to address these.
- Contact landowners in priority areas with important floodplain protection or restoration opportunities to encourage participation in conservation and restoration programs.
- Complete outreach to farmers to improve nitrogen management on farms through the use of Adapt N software, pre-side dress nitrate testing and demonstrating the use of shorter duration corn with legume cover crops.
- Complete a stormwater master plan in the Dish Mill Brook Watershed working with key partners to identify stormwater and sediment source areas, treatment options, and required maintenance schedule for proposed as well as existing infrastructure.
- Complete a capital improvement inventory that includes use of bridge and culvert assessment data.

Ground water currently provides 100% of the potable water supply for Burke's homes and businesses, through a combination of private water supplies, private wells and springs. There are no town operated water supplies. There are four private water supplies in Burke: Burke Mobile Estates, Burke Mountain, East Burke Village, and Mountain View Farms. The operators of each system have a responsibility to ensure that an adequate supply of safe drinking water is available.

### ***Future***

Gaining and protecting public access to surface waters is important. Monitoring data is needed to measure bacterial levels resulting from failing septic systems, agricultural runoff, storm water runoff, and other sources which could impair water quality. Surface waters should be protected and enhanced through the maintenance of forested buffers - riparian zones - along all stream banks. The ultimate goal is to restore and maintain the physical, chemical and biological integrity of the river system, and build public support for clean water. In addition, minimum building set backs are an effective regulatory tool for reducing surface water contamination. The Town of Burke requires a 50-foot vegetated buffer around rivers and natural lakes and ponds.

With residential and commercial development, there will be an unavoidable increase in the effects of impermeable surfaces: roofs, driveways and roads, parking lots, and related tree removal and vegetation disturbance. As an example, one of the watersheds facing increased risk is the Dishmill. It will not take many riparian intrusions and lawns-to-the-stream-banks to compromise the water quality of this stream. Many other streams are also vulnerable. Fortunately, there are a number of low-impact



development techniques that landowners can incorporate into small and residential development. Some of these techniques include:

- Disconnecting roof gutters from roads and driveways, allowing roof runoff to filtrate in soils or plants;
- Landscaping such as rain gardens, vegetated swales, or infiltration trenches to absorb run off from paved areas and roofs;
- Limiting impervious surface coverage.

While the town benefits from generally abundant groundwater supplies, this dependence on scattered wells poses risks of potential groundwater contamination from a variety of sources. Once a groundwater source is contaminated, remediation, if feasible, is typically very expensive.

The land around the public water supply is called a “wellhead protection area”. Within all of Burke, and with emphasis on designated “wellhead protection areas”, special consideration must be given to prohibiting, or carefully managing, development and practices that could contaminate local groundwater supplies. These include poorly designed or failing septic systems, underground storage tanks, the storage of hazardous materials and road salt, airborne debris including from burn barrels and outdoor furnaces, and the depositing of any hazardous material on the land or in the water. In general, “wellhead protection areas” should be highly protected from land use that might threaten in any way the quality or quantity of the water. These areas of land need to be delineated, as required by state regulations, to protect public community water systems and individual water systems serving schools and office buildings.

### **Air Quality and Outdoor Lighting**

Clean air coupled with a clear night sky unobstructed by night lights, and the lack of excessive noise common to urban areas enhance the Town's character and environment.

### ***Future***

The cumulative effect of several air pollution sources may increase with additional growth and may have a negative impact on air quality in the future. Any proposed land use that potentially threatens Burke's air quality should be carefully evaluated. The potential increased development around Burke Mountain as well as other future developments in Burke, that include wood burning fireplaces, should be carefully evaluated as to the potential air pollution that could occur as the result of increased fireplace usage within a relatively small area.

### ***Strategies***

- Land subdivisions and land development shall be designed to control storm water runoff and avoid adverse off-site impacts to water quality.
- Support the establishment of municipal water and sewer facilities to serve designated growth centers as a means of avoiding contamination of ground and surface waters.
- Work with the Conservation Commission and other interested parties to educate landowners on the importance of low-impact development techniques.



- Land development within mapped water supply Source Protection Areas (SPAs) shall conform to approved Source Protection Plans (SPPs), and be carefully designed to avoid ground water contamination. Uses posing a risk of contamination shall be avoided.
- New development should incorporate low-impact development standards that minimize impairment of watersheds and source protection areas.
- Enforce the creation and maintenance of vegetated buffers along streams, rivers, and ponds.
- Extraction of groundwater for commercial purposes shall be carefully controlled to ensure that water is extracted at sustainable rates and to prevent the depletion of water supplied in the community.
- Carefully evaluate any proposed land use that would threaten the town's air quality.
- Prohibit any land use that would cause noise levels above generally accepted standards and negatively impact the quality of life of Burke's residents.
- Promote outdoor lighting that minimizes obstructed views of the night sky.

## **Slopes**

Homes are being built on hillsides and slopes in Burke, often with clear cutting of the land to afford a better view. Clear cutting slopes increases storm water runoff and leads to slope failure, soil erosion, and the sedimentation of surface waters.

### ***Future***

The U.S. Natural Resource Conservation Service (NRCS) has identified general development constraints and management recommendations for different slope categories. These recommendations should be adopted for any proposed development on hillsides and slopes.

<b>Slope</b>	<b><u>Management Considerations</u></b>
0-3%	Suitable for development, may require drainage improvements
3-8%	Most desirable for development, having the least restrictions
8-15%	Suitable for low-density development with consideration given to erosion control, runoff, and septic design.
15-25%	Unsuitable for most development and septic systems; construction runoff and erosion problems likely
25+%	All construction should be avoided; careful land management required

### **Slope Construction Guidelines**

Careful management to limit site disturbance is necessary on slopes in excess of 15%. The Town of Burke prohibits development on slopes of 25% or greater, except for developments that cannot be completed in other areas, such as ski lifts. State regulations also prohibit the installation of on-site wastewater systems on slopes in excess of 20%. Site assessments may be needed to determine slope limitations and management requirements for a particular development site.

### **Strategies**

- Clear cutting of slopes for the sole purpose of view improvement should be prohibited.
- Enforce the limitations on clear-cutting in the Scenic and Conservation Overlay, and consideration should be given to regulating the number of trees that can be removed along scenic road segments and steep slopes.
- Contractors should be encouraged to leave trees on site when possible.
- Ensure that building envelopes are carefully sited downslope of ridgelines in order to minimize visual impact.

### **Agriculture**

Historically Burke had many small family farms and was an agricultural community. Only a few farms exist today in Burke. Nevertheless, retaining the rural atmosphere that is quintessential Vermont is as important as ever to Burke residents as well as to tourists. Even though agriculture – in its historical and traditional form – is no longer a part of the Burke landscape, the remaining haying fields and ancillary agricultural uses continue to be a vital contributor to Burke’s rural character.

### **Future**

Primary agricultural soils are a finite resource. Subdivision and associated development continue to threaten productive farm land. When this land is converted to other uses, it is rarely returned to agricultural production. It may be possible for innovative partnerships between farmers and developers to make farming more economically viable while preserving the active farmland.

Farms sustain and enhance local capacity for food production, and support of existing and future farming operations should be encouraged. Support of organic farming is especially encouraged because of its positive effects on agricultural resources. In addition, land development should attempt to minimize fragmentation of land characterized by primary agricultural soils.

### **Strategies**

- Support the continuation and expansion of the state current use program to tax farm and forest properties at their productive value rather than their development potential (i.e. highest and best use value) should be supported and property owners should be encouraged to participate in this program.
- Design land subdivision and development policies to prevent or minimize the fragmentation and development of land characterized by primary agricultural soils.

### **Forest Resources**

Burke used to be mostly farmland; however, the trend towards reforestation continues today as abandoned farmland reverts to forest growth. Today, forestland covers nearly 80% of Burke and provides benefits ranging from wildlife habitat to commercial use that provides valuable employment. With the exception of the Darling State Forest on Burke Mountain and the two town forests, the forestland is under private ownership. For commercial timber as well as firewood, woodlot management and intervention is a necessary tool in developing and maintaining a productive forest. In addition, other forests should be nurtured and encouraged for the many environmental and aesthetic values.



Burke is part of the state's "Forest Legacy Area". This enables a private landowner to participate in the "Forest Legacy Program" through the Vermont Department of Forest, Parks and Recreation. The Darling State Forest on Burke Mountain is under multiple use management, subject to a Land Management Plan developed by the Vermont Department of Forest, Parks, and Recreation. In addition to protecting much of a highly visible hillside, the state forest is actively used by local residents for hiking, skiing, and biking.

### ***Future***

Sound forest management results in a stable economic return for landowners, local resources to support local industry, and perhaps most importantly, an incentive for keeping large tracts of land free of development and available for recreation, wildlife habitat, and scenic enjoyment. However, poor forest management can result in the degradation of biological diversity and can damage scenic landscapes.

Sound forest management plans should be encouraged and include objectives for sustainable timber production, protection of water quality, maintaining a diversity of wildlife habitat, and aesthetic enhancement. Whatever the objectives of a forest property owner, developing and implementing a forest management plan is the best means of managing a forest parcel for long term, sustainable forest production.

In addition to commercial value for landowners, forests offer an almost unlimited range of benefits to the Burke community including clean water, recreation and educational activities, and scenery. Where income production is the primary interest of the landowner, forestry management plans should be encouraged to protect long-range values.

### ***Strategies***

- Inform landowners of modern techniques for forest management, proper harvesting and logging, timber stand mix, and continuous renewal of the forest resources.
- Encourage landowners to consider the long-term health of the forest as well as the short term economic gain from logging.

### **Sensitive Areas**

Burke's landscape includes a variety of unique and fragile natural areas. Examples include wildlife habits such as beech trees used by black bears, unusual wetlands which support rare plant growth, and cliffs used by rare birds. According to a preliminary inventory done by the Vermont Natural Heritage Program, Burke is home to these features. Conservation districts should be created, to be overseen by a commission or board.

### **Wetlands**

Wetland areas are now known to serve a variety of important ecological functions – including but not limited to storm water management and flood control, surface and ground water recharge and protection, rare and/or endangered plants, and wildlife habitat – that have garnered their protection under state, federal, and local regulations. Wetlands also present significant development constraints associated with poor drainage and high water tables.

Small wetlands are scattered throughout the area. The largest concentration is found on both sides of Route 114 in East Burke, and the flood plain along the Passumpsic River.

### ***Future***

The loss of wetlands is an issue of national, state, and local concern. Therefore, site-specific information and delineations may be required for the review of impacts associated with land development. Protection of wetlands should be provided through the designation of buffer areas at least fifty feet in width, within which only limited activities should be allowed. Also, land development should be prohibited on wetlands.

### **Wildlife Habitat**

Burke is home to a variety of plant and animal species that contribute to local biological diversity and ecological stability, and support traditional activities such as hunting, fishing, and foraging. The branches of the Passumpsic River and smaller streams support natural populations of fish. Wetlands also provide critical habitat for a variety of species. Certain species, such as the black bear, which requires large contiguous habitat areas that also support a variety of other species, serve as indicators of the health and diversity of local wildlife populations.

### ***Future***

Human activities can have devastating impacts on local wildlife populations, including:

- Direct loss of habitat to development
- Fragmentation of core habitats and the wildlife corridors connecting them.
- Habitat degradation from air and water pollution, forest extraction, and development
- Exploitation of natural populations (due to illegal hunting or fishing)
- Introduction of invasive non-native species

At this time two Endangered plants, one Threatened plant and one bird Species of Special Concern are recorded for Burke. However, consideration of only threatened and endangered species is not adequate to provide protection to perpetuate viable and healthy wildlife populations. To ensure Burke's landscape is ecologically functioning, planning must consider critical habitats such as deer wintering areas, bear feeding areas, vernal pools, wetlands and riparian areas; rare plants, animals, and their natural communities; wildlife road crossings and travel corridors, and sensitive, unique, or fragile habitats such, high elevation forests. The Vermont Non-game and Natural Heritage program currently has records of three deer wintering areas, three critical bear feeding areas, three road crossings heavily used by black bears, five significant natural community areas, numerous wetlands and several moose crossing areas in Burke. All of these natural resources are worthy of consideration in conservation planning. Additional undocumented resources will undoubtedly be discovered in the future. Review of development proposals should consider the impact on wildlife and wildlife habitat. Site specific evaluations may be required to determine the potential wildlife impacts associated with a particular subdivision or development proposal and to identify appropriate management strategies.

### **Habitat Blocks and Connectivity**

A recent inventory of Burke's wildlife habitat connections demonstrates interdependence with neighboring towns, the Northeast Kingdom, and beyond. Coordinated conservation efforts in New York, Vermont, New Hampshire, and Maine are working to identify important areas within the larger



northern forest region that provide a wildlife corridor from the Adirondacks in New York through the northern forest of Maine and beyond. A “wildlife corridor” at this larger, regional scale is composed of blocks of forest and connecting lands that many animals need for sufficient food, cover, and access to mates. The forest blocks provide prime wildlife habitat while the connecting lands—often small forest and woodland patches, wetlands and river corridors—allow wildlife movement across the landscape between larger forested blocks.

A key component of this work involved the identification and mapping of large unfragmented habitat blocks by the Department of Fish & Wildlife and the Vermont Land Trust. Habitat blocks of less than 20 acres were excluded from this study. Although these smaller areas may support some biological diversity and connectivity, such areas provide little interior forest habitat. Habitat blocks were then evaluated and weighted for their statewide importance based on a number of factors. The resulting ranking identified a high concentration of statewide “priority” habitat blocks encompassing most of Essex County and the eastern edges of Caledonia, including Kirby, Burke, and Newark.

Burke’s habitat blocks allow for north-south movement in eastern areas of the town that border Kirby, Victory, East Haven, and Newark. The greatest amount of habitat fragmentation appears to be in the southern area of the town that borders Lyndon, primarily along Routes 5 and 114, leaving very few opportunities for east-west movement. (There are, however, some important wildlife crossings that appear along Darling Hill.) Moreover, there are opportunities for east-west wildlife connectivity across the northernmost part of the town, from Sutton into Newark and East Haven.

This analysis creates a high-level view that requires more detailed study by Burke’s Planning and Conservation Commissions. For example, a Burke habitat block *not* considered of statewide importance may be very significant locally – the turtle crossing on Burke Hollow Road is one example. Local prioritization and conservation strategies can only be developed through more targeted study of Burke’s existing wildlife populations and the local habitat that sustains them.

Interestingly, much of the state’s priority blocks fall into the Scenic and Conservation Overlay, which limits clear-cutting. These lands, as well as the lands in the east-west Sutton to Newark corridor, are currently zoned with a five-acre minimum lot size. In fact, there are a large number of small parcels that have already been created, but not yet developed. Preventing fragmentation of this important wildlife habitat area should be a local priority.

In 2025 a thorough Natural Resources Inventory Report was completed for the Town of Burke as a resource guide for future development in the Town.

### **Strategies**

- Sensitive areas in Burke should be identified and considered for some level of protection through both regulatory and non-regulatory means.
- Carefully evaluate the impact of any proposed development in wetlands.
- Consider the habitat in undeveloped land prior to subdividing or developing it to determine whether any particular species would possibly be abolished.
- The use of conservation easements to protect critical wildlife habitat should be encouraged.

- Work with the Conservation Commission and others to conduct wildlife inventories in order to prioritize areas for protection.
- Pursue the acquisition of conservation easements for critical wildlife areas.
- Consider the use of clustered residential development – already allowed in Burke – to prevent fragmentation of important wildlife habitats. Consider requiring clustering in key wildlife habitats to preserve open space.
- Ensure that resulting open space does not fragment core wildlife habitat areas.
- Ensure that size and densities of residential clusters are appropriate to the unique needs of key wildlife habitats.

## **CHAPTER 7. Historic Features and Resources**

### **Historic and Cultural Resource Goal**

- To identify, protect, and preserve Burke's cultural landscape and resources, which include the traditional settlement pattern and features, and the historic built environment.

### **Historic and Cultural Resources**

Burke residents have long had an interest in preserving the town's rich social and cultural history, including its historic sites and structures. Burke's historic homes and settlement patterns are compiled in an inventory at the Town Clerk's office. Knowledge about the town's distant past is limited. The Burke Historical Society, founded in 1895, preserved records and some of this material is stored in the Burke Mountain Club in East Burke. Additional materials are stored at the Town Clerk's Office. Currently, the Historical Society is not active.

Burke's historic development is obvious in the clustered villages nestled between the east and west branches of the Passumpsic rivers, the forested uplands of Burke Mountain, Darling Ridge, trails and open meadows. The two town villages, East Burke and West Burke, have developed at a scale and density that is pedestrian-friendly, with clearly defined streetscapes and public spaces, prominent historic buildings, a variety of services and employment opportunities – all within easy walking distance of nearby residents.

The Town of Burke has historic resources that include historic sites and structures, and others that have yet to be identified or catalogued. In addition to many privately-owned historic homes and commercial buildings, some of the town's most historic structures are:

- Darling Farm
- Burklyn Hall
- Old White School House
- West Burke Methodist Church
- West Burke Library
- East Burke Congregational Church
- Union Meeting House in Burke Hollow
- Burke Mountain Club House



- Town Clerk's Office
- Cemeteries
- Barns - Many barns are no longer actively used for agricultural purposes; however, barns help culturally and visually define the town's agrarian heritage.

### **Future**

The preservation of the town's historic and scenic character is important for a variety of reasons: to preserve and teach our history to future generations, to promote tourism, to preserve the agricultural land base, to enhance recreational opportunities, and to protect important natural and cultural landscape features. Careful sight selection and design, and more detailed cultural, environmental and/or visual impact assessments where appropriate, can minimize adverse impacts to the town's cultural and scenic landscape and resources, and its rural character.

### **Strategies**

- Explore offering incentives for improvement to cultural and historic structures, such as adaptive reuse provisions for historic barns, or other historic structures that no longer serve their original function. Incentive and assistance programs and other non-regulatory means of cultural and scenic resource protection shall be encouraged.
- Support the Burke Conservation Fund for the purchase of land and interests in land which have historic significance.
- Support the designation of village centers and develop specific regulations for the historic preservation within each district. These regulations could maintain the rural character of the villages by subjecting structures within this district to exterior alteration.
- Encourage pedestrian friendly-businesses in the village centers.
- Adopt signage regulation to ensure that signs are designed to be harmonious with the historic character and pedestrian scale of the town's village centers, consistent with traffic safety, and to avoid roadside clutter of interference with the enjoyment of the rural landscape outside the village centers.
- The proposed demolition of any contributing structure must meet associated review standards intended to require the documentation and/or preservation of historic structures.
- Support the work of the Conservation Commission.
- Create an assessment of historical and cultural sites.

## **CHAPTER 8. Educational Facilities Plan**

### **Education Goal**

- To provide high quality educational services for the people of the community through the public school system and the promotion of other public and private educational programs.

## **Current Education Overview**

Providing quality public education for children and youth is amongst the most important functions of government in a democratic society. Burke performs this task extremely well by maintaining the Burke Town School in Burke Hollow for grades Pre K-8. High School Students attend Lyndon Institute, in the neighboring town of Lyndon, which is the designated high school for Burke. Also, about 20 percent of Burke's high school students attend St. Johnsbury Academy in St. Johnsbury. In addition, there are typically several students that attend one of the two private high schools in East Burke: East Burke School or Burke Mountain Academy.

The Burke Town School belongs to Kingdom East School District. The Principal and Superintendent oversee the daily operation of the school and serve as the town's liaison with the State Department of Education in ensuring that the Burke School meets all state and federal education and facility standards. The School District provides educational services that are shared amongst the schools for a more cost-effective approach for these special services.

### **Strategies**

- Continue to provide sufficient and adequate Pre K-12 school facilities to meet current and escalating educational requirements.
- Support local and state efforts to reduce reliance on the local property tax to fund education.

## **CHAPTER 9. Energy Plan**

### **Energy Goal**

To encourage the conservation and efficient use of energy, and the development of viable renewable energy resources in support of the energy goals and policies of the Vermont Comprehensive Energy Plan of 2016:

- Meet 90% of all energy needs from renewable resources by 2050;
- Reduce greenhouse gas emissions to 50% below 1990 levels by 2028 and 75% by 2050;
- Improve the energy efficiency of 25% of homes by 2025; and
- Meet the Vermont Renewable Energy Standard through renewable generation and energy transformation

### **Energy Use, Scarcities, Needs and Problems**

Reliable, affordable and sustainable sources of energy are vital to Burke's economy, social well-being, and future development. At present, factors influencing energy cost and availability are largely beyond the control of the local community. International events, such as disruptions in oil supplies, the rising costs of gasoline and heating oil are harsh reminders that such heavy reliance on finite energy sources is not sustainable. Current patterns of energy consumption contribute to global warming trends that, if left unchecked, will dramatically affect Vermont's climate and economy over ensuing decades.



Changing technologies, and evolving national and state energy policies – including utility deregulation, demand side management, infrastructure investment, and the promotion of more efficient and renewable “green” energy – all have an effect on local energy supplies. Viable renewable energy is that which will provide a direct energy benefit to Burke residents and businesses, at a competitive cost and with an acceptable impact to Burke’s environment.

Burke’s energy use estimates were developed by NVDA and follow the same data methodologies used for the 2018 amendment to the Regional Plan for the Northeast Kingdom. Addenda A and B to the Regional Plan document the methodologies used to develop usage estimates and targets.

([www.nvda.net](http://www.nvda.net)). Energy use data were based on the best available data and should be considered approximations rather than a precise count. Fuels are measured in different ways – by cord, by gallon, by kilowatt – so this plan converts units of measurement into **British Thermal Units (BTUs)** in order to compare their energy output consistently.<sup>1</sup>

While transportation usually accounts for the largest share of a municipality’s energy use, Burke’s usage patterns are not typical of the Northeast Kingdom. Thermal (heating space and water), transportation, and electricity usage are divided almost equally (Transportation typically is the largest energy use, and electricity tends to run well under 20% of total use). Ski resorts require a substantial amount of energy to run lifts, make snow, and operate vehicles. Additionally, Burke’s large seasonal population adds to total energy use during the colder months. (Figure 9.1)

#### Current Thermal Use

NVDA’s estimates for residential thermal energy use in Burke is based on data from American Community Survey five-year estimates. (See Table 9.1).

Collectively, total energy use for heating all occupied residences in Burke accounts for about 56,810 MM BTUs annually. Fuel oil is the predominant source, but home-owners in Burke are also

likely to rely on wood. Renters, who are less likely to have control over their heating sources, are more likely to rely exclusively on fossil fuels, with oil as the predominant use, followed by propane.

Figure 9.1: Burke's Energy Use

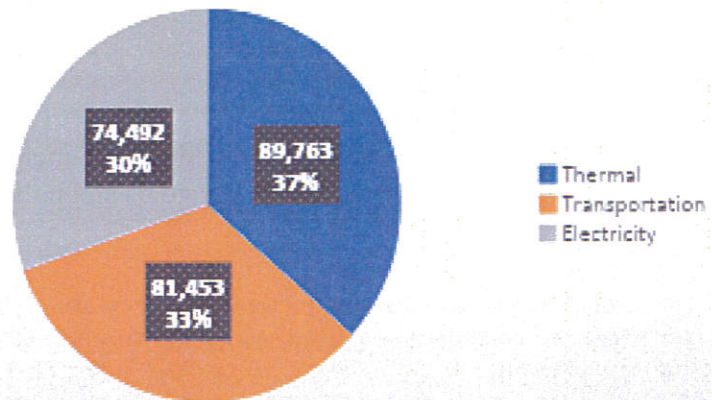


Table 9.1: Residential Thermal Energy Use in Burke

Fuel Type	# of Households	Total avg. use, annually	...in MMBTUs	% of use (all households)	% of use (owner-occupied)	% of use (renter-occupied)

<sup>1</sup> According to the US Energy Information Administration a BTU is the measurement of the quantity of heat required to raise the temperature of one pound of liquid water by 1° F at the temperature that water has its greatest density (approximately 39 °F.) One BTU is a miniscule amount, so BTUs are often measured in the millions (MM BTUs).

Bottled tank or LP Gas	71	68,785	gallons	6,282	12%	9.2%	21.5%
Electricity	26	602,981	kWh	2,057	4.4%	2.4%	11.1%
Fuel Oil	280	197,602	gallons	27,405	47.3%	46.6%	49.6%
Wood	180	959	cords	19,176	30.4%	36.1%	11.1%
Other	17		--	1,890	2.9%	3.7%	0%
No fuel used	18		--	--	3%	2%	6.7%

Source: NVDA estimates, based on American Community Survey 2017 Five-Year estimates

Although residential thermal estimates use best available data, they have some limitations. Like most Northeast Kingdom residents, Burke residents are likely to use multiple heating sources. Additionally, this estimate does not account for seasonal housing units, for which no published heating datasets are available. General estimation guidelines suggest that it is reasonable to assume that thermal use for a seasonal unit with winter occupancy is about 10% of the average owner-occupied housing unit. According to American Community Survey data, there are 458 seasonal units in Burke, collectively accounting for another 4,991 MM BTUs annually.

Age of housing stock also affects thermal energy use. Roughly 31% of Burke's owner-occupied housing units and 30% of renter-occupied housing units predate 1940. Pre-1940 structures are likely to be "leaky" and poorly insulated, which can nearly double thermal use to 80,000 BTUs per square foot. NVDA therefore assumed 80,000 BTUs per square foot for pre-1940 housing units, 45,000 BTUs for all others in its calculation.

Commercial thermal estimates are more difficult to calculate. The estimates in Table 9.2 were developed using data from the Department of Public Service (DPS) and the Vermont Department of Labor's economic and Labor Market Information. Heating fuels are not identified, but the DPS is able to estimate average heating loads on types of business. This estimate excludes commercial operations likely to be home-based, such as daycares, in order to avoid double-counting.

**Table 9.2: Current Non-Residential Thermal Energy Use**

Industry classification (North American Industry Classification System (NAICS))	Estimated avg. consumption (MM BTUs)	# of structures in town	Total MM BTUs
42. Wholesale trade	357	8	2,859
44-45. Retail trade	295	7	2,067
48-49. Transportation and warehousing	1,666	1	1,666
53. Real estate and rental and leasing	432	3	1,295
54. Professional and technical services	109	6	654
56. Administrative and waste services	302	4	1,208
61. Educational services	4,534	2	9,067
71. Arts, entertainment, and recreation	1,778	1	1,778
72. Accommodation and food services	812	8	6,497



81. Other services, except public administration	174	5	869
Total		45	27,960

Source: Department of Public Service, Vermont Department of Labor

### Future Thermal Energy Use

To meet 90% of Burke's thermal energy needs through the use of renewable resources by the year 2050, the town would have to reduce overall use through aggressive weatherization and efficiency improvements. Targets developed through localized data from statewide modeling (i.e. Long-Range Energy Alternatives Modeling, aka "LEAP") shows how aggressive weatherization would need to be.

**Table 9.3: Weatherization Targets for Burke**

	2025	2035	2050
Estimated number of households	641	680	721
# of households to be weatherized	207	360	385
Estimated number of commercial establishments	48	51	54
# of commercial establishments to be weatherized	3	6	10

Source: Department of Public Service: LEAP Projections

Whether it is as replacing weather stripping on a door or installing thermal shades, every weatherization measure can reduce thermal energy. A comprehensive, "whole-house" effort that matches improvements to air sealing with better ventilation that reduces mold can reduce total thermal energy use by 25% or more. According to Efficiency Vermont, which offers rebates and low-interest financing for completing such projects, Burke residents have completed 166 home performance projects in the past three years (2015-2017). Another 106 commercial & industrial projects took place during that same period. Table 9.4 breaks out the types of improvement measures completed so far, many of which have improved thermal efficiency.

**Table 9.4: Residential and Commercial and Industrial Efficiency Measures**

	2015		2016		2017	
	Res	C&I	Res	C&I	Res	C&I
Air Conditioning Efficiency	2	0	1	0	0	0
Cooking and Laundry	13	0	8	0	8	0
Health and Safety	2	0	0	0	2	0
Hot Water Efficiency	20	0	46	0	17	0
Light Bulb/Lamp	1,595	91	1,256	101	2,237	33
Lighting Hardwired Fixture	312	95	86	95	91	60
Motors	49	0	25	0	14	0
Office Equipment, Electronics	23	0	19	0	16	0
Refrigeration	7	0	11	0	3	0
Space Heat Efficiency	5	0	4	0	1	0
Space Heat Fuel Switch	4	0	0	0	0	0
Space Heat Replacement	2	0	2	0	19	0
Thermal Shell	30	0	53	0	9	0
Ventilation	4	0	1	0	5	0

Building design and construction methods can reduce energy costs. Orienting and designing buildings to take advantage of southern exposure allows passive solar heating in winter. In the same way, design and construction can afford homeowners opportunities for solar development. Consideration of the natural surroundings is also important in site design as the use of shelterbelts, or tree rows, can further reduce energy costs. Shelterbelts act as buffers to the cold winter winds (if located on the north side of the building) or provide cooling shed in the summer (if on the south).

In addition to *reducing* overall thermal energy use, Burke residents and businesses would have to *switch to cleaner, non-fossil fuel burning sources* in order to meet the 2050 goals. While LEAP scenario projections show that fuel oil use will be virtually eliminated by 2050, some LP gas use may remain. (Table 9.5) According to the latest Census, Vermont has the highest percentage of primary homes heated with wood. While cord wood use is prevalent and an enduring part of our culture, cleaner-burning wood options (such as wood pellets) will likely continue to gain popularity among residents. The overall use of wood in residences, however, could be partially offset by electric uses, such as heat pumps.

**Table 9.5: Thermal Fuel Switching Targets for Burke**

	<b>2025</b>	<b>2035</b>	<b>2050</b>
New Efficient Wood Heat Systems in Residences	548	460	334
New Efficient Wood Heat Systems in Commercial Establishments	10	12	17
New Heat Pumps in Residences	163	351	446
New Heat Pumps in Commercial Establishments	4	7	10

Source: Department of Public Service: LEAP Projections

Burke Mountain Academy heats with a wood pellet boiler system, which was installed with assistance from the Northern Forest Center Modern Wood Heat Program.

Geothermal, or “ground source heat pump systems”, extract natural low-temperature thermal energy from the ground during colder months for heating, and transfer thermal energy from the building to the ground in warm months for cooling. This technology operates much like a refrigerator, utilizing a heat pump, heat exchanger, and refrigerant. While geothermal systems do require electricity to operate the pumps, the systems generally deliver between 3 to 5 times more heat energy than the electrical energy they require to operate.

Geothermal pumps require excavation and duct work, pricing the technology out of reach for many residents. In recent years, however, manufacturers have developed a similar air-sourced heat pumps that operate more consistently over Vermont’s vast temperature ranges. Also called “cold climate heat pumps” or “mini splits”, these units can be two to three times more efficient than propane and fuel oils. Unlike geothermal units, they do not require excavation or duct work and can be much less expensive to install. Cold climate heat pumps have the capacity to heat about only 50% to 70% of a building, depending on the size and layout of the structure. Some buildings with multiple heating zones may be difficult to heat with heat pumps alone, but the pumps may be effective for boosting colder underserved zones. They also may be useful in outdoor workspaces. Despite recent improvements in effectiveness



on cold days, a backup heating source is usually required for sub-zero temperatures. Despite the limitations in open source heat pumps, their superior efficiency over combustion-based heating sources accounts for the overall decrease in the reliance on residential wood heat systems by the year 2050.

### Current and Future Transportation Energy Use

Energy use in transportation is greatly influenced by the development patterns of the region. According to NVDA estimates, long commutes and incidental trips require residents to drive an average of 14,000 miles per year. That means collectively, Burke residents drive more than 15 million miles annually, adding up to more than \$1.5 million in fuel costs. Nearly all of this energy is non-renewable. Ethanol is the most prevalent form of renewable transportation energy usage in Burke and represents only about 6% of total MM BTUs used annually.

There are three kinds of electric vehicles (EVs) available: all-electric, plug-in hybrid electric, and hybrid electric. The first two require a plug-in, and the latter simply recharges from the combustion motor and from braking.

Cost, terrain, and limited range in cold weather are the most common deterrents to switching to EVs. There are also few opportunities to charge EVs away from home, which may be a deterrent for visitors to Burke. The nearest public charging stations are in St. Johnsbury. Both are level 2 (240 volt), which can produce about 10 to 20 miles of range per hour of charge, depending on the weather.

Despite today's reliance on internal combustion engines, electric vehicles (EVs) will play a major role in Burke's future transportation energy use. "Refueling" currently costs the equivalent of about \$1.00 per gallon. Their efficiency over internal combustion can also reduce overall transportation energy consumption: Latest figures from the EPA show that EVs in the northeastern US get the equivalent of 102 miles per gallon.<sup>2</sup> Technological improvements over time will improve range and efficiency.

According to figures derived from statewide LEAP projections, meeting the statewide "90 x 2050" energy challenge will require a massive transformation of Burke's current transportation energy usage. (Table 9.6)

**Table 9.6: Transportation Fuel-Switching Targets for Burke**

	2025	2035	2050
Projected number of light duty vehicles (LDVs, i.e. cars, non-commercial trucks)	1,225	1,378	1,551
Projected number of LDVs powered by electricity	167	533	1,147
Projected number of LDVs powered by biofuel blends	1,135	781	137

Source: Department of Public Service, LEAP Projections

### Current and Future Electricity Use

Lyndonville Electric Department is the supplier of electricity to the town. Utility rates are regulated through the Vermont Public Service Board. Reports from Efficiency Vermont show that total electricity use has increased by 48% since 2015. While commercial and industrial customers saw the biggest

<sup>2</sup> <https://blog.ucsusa.org/dave-reichmuth/new-data-show-electric-vehicles-continue-to-get-cleaner>

increase, the residential sector saw an increase as well. Expansions to the ski operations (a large user of energy) may have contributed to this jump. Another explanation may be a substantial amount of switching from incandescent bulbs (which emit a substantial amount of heat) to LED bulbs (which emit very little heat) and may actually require additional energy to heat the space. Finally, it is possible while both sectors achieved savings in thermal use during that same period, some of the increase in electricity came from fuel switching. (Table 9.7)

**Table 9.7: Electricity Use in Burke**

	2015		2016		2017	
	kWh	MMBTUs	kWh	MMBTUs	kWh	MMBTUs
<b>Commercial &amp; Industrial</b>	6,897,378	23,533.85	9,651,946	32,932.44	10,736,313	36,632.30
<b>Residential</b>	7,812,177	26,655.15	10,320,540	35,213.68	11,096,083	37,859.84
<b>Total</b>	<b>14,709,555</b>	<b>50,189.00</b>	<b>19,972,486</b>	<b>68,146.12</b>	<b>21,832,396</b>	<b>74,492.14</b>
<b># of Residential Premises</b>	1,030	n/a	1,034	n/a	1,034	n/a
<b>Avg. Residential Usage</b>	7,585	25.88	9,981	34.06	10,731	36.61

Source: Efficiency Vermont (Commercial & industrial customer counts are not available).

The increase from fuel switching seems counterintuitive to energy use reduction goals, but electricity is far more efficient (and cleaner!) than the fuels it will replace. According to LEAP projections, for example, non-thermal residential electricity use in Burke could at least quadruple by 2050. Thermal residential electricity use could nearly triple during the same period. Demand-side management through ongoing replacement of equipment, bulbs, and hardwiring will be critical to meet 2050 energy use goals.

Burke's resort and hospitality businesses are energy-intensive and must pay attention to demand-side measures. The Burke Mountain Hotel, for example, has upgraded spaces with LED lighting. The resort also recently automated the electric fan heaters at each ski lift (the heaters are required to get the gear fluids to the optimal temperature for start-up). The automation process is based on time and outdoor temperature to ensure that the heaters run only the minimum time required.

**Table 9.8: Burke Residences with Upgraded Electrical Equipment by Year**

	2025	2035	2050
Estimated number residential customers	320	339	359
Number of residential customers to upgrade electrical equipment	89	140	205



## **Current and Future Renewable Energy Generation**

According to PUC records, solar installations in Burke currently have the capacity to generate more than 1,690 MWh of solar power annually.

A 123 foot wind turbine at Burke Mountain was installed in 2011. The turbine has a 100 kW capacity and can generate between 175 and 219 MWh annually. Energy generation from the turbine helps to offset the cost of snowmaking, which is arguably Burke Mountain's most energy intensive use.

To meet 2050 statewide energy goals for instate renewable generation, Burke would have to generate more than 500 MWh annually, in addition to current generation.

### ***Solar and Wind Resources***

There are areas in Burke where specific scales of solar and non-utility wind development are appropriate. The following map analyses, which comply with Act 174 standards for renewable resource mapping, provide information about potential solar and wind sites. Maps were generated using GIS (geographic information systems).

**Statewide 'Known Constraints:** These areas were removed entirely from available resource areas. Known constraints are conservation resources that shall be protected from all future development of renewable generation facilities.

**Locally Designated Unsuitable Areas:** This encompasses Burke's Scenic Conservation Overlay, which includes high elevations lands of 1,500 feet or more, critical wildlife habitat, large expanses of unfragmented forest cover, steep slopes, and scenic viewsheds. Development in this area, is at a minimum, subject to conditional use review in order to site building envelopes with respect to existing forest cover, vegetation, and critical natural resources. This area also limits clear cutting and restricts the location of structures to ensure that development is minimally visible from down slope properties and public roads by placing structures down grade of ridgelines and prominent knolls. Given that only residential additions, accessory structures, and recreational shelters with a footprint of 800 square feet or less are exempted from these specifications, the Scenic Conservation Overlay is deemed unsuitable for large scale renewable energy development.

**Statewide Possible Constraints:** These conservation resources should be protected from the development of renewable generation facilities. The presence of a possible constraint, however, does not necessarily rule out the possibility of citing renewable energy generation. It is possible that development can occur if the impacts to the possible constraint can be mitigated, preferably on-site.

**Local Possible Constraints:** As with statewide constraints, siting on these scenic and historic resources must mitigate impacts in accordance with the siting guidelines.

Remaining resource areas that do not overlap with any known constraints and unsuitable areas are called '**Prime**' resource areas. Resources that overlap with possible or local constraints are called '**Secondary**' resource areas.

According to Burke's solar resources map, there are 1,595 acres of "prime" solar potential. While about eight acres of land is generally required to produce one MW of solar power, not every acre of Burke's prime solar is actually available, due to lack of interest of the property owner, connectivity issues, neighbor objections, and an assortment of site-specific challenges. To account for this contingency, this plan applies a conservative estimate of one MW for every 60 prime acres, which results in more than 26 MW. This estimate does not account for secondary resources, which may still be productive, or roof top solar, which could produce as much as 650 MW in the future.

**Table 9.10: Constraints to Renewable Energy Development**

Known Constraints (Statewide layer developed in support of Act 174)	Locally Designated Unsuitable Areas	Possible Constraints (Statewide layer development in support of Act 174)	Local constraints
<ul style="list-style-type: none"> <li>• Vernal pools</li> <li>• River corridors</li> <li>• Floodways</li> <li>• State significant natural communities</li> <li>• Rare, threatened, and endangered species</li> <li>• Natural wilderness areas</li> <li>• Class 1 and 2 wetlands</li> </ul>	Scenic Conservation Overlay	<ul style="list-style-type: none"> <li>• VT agriculturally important soils</li> <li>• Special flood hazard areas</li> <li>• Protected and conserved lands</li> <li>• Deer wintering areas</li> <li>• Conservation design highest priority forest blocks</li> <li>• Hydric soils</li> </ul>	<ul style="list-style-type: none"> <li>• Open active agricultural fields larger than five acres</li> <li>• Historic sites either eligible or listed on the state or national historic registers.</li> <li>• Any other site of scenic value to the community.</li> </ul>

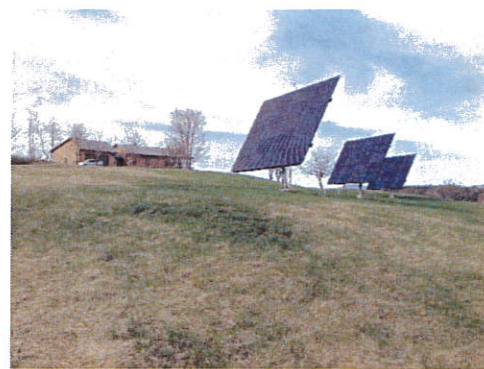
### ***Preferred Area for Siting Solar Development***

*For policy purposes of this plan, solar energy facilities are grouped into three categories:*

**Small-Scale Solar:** Solar electricity and transmission facilities up to and including 15 kW capacity;

**Mid-Scale Solar:** Solar electricity generation and transmission facilities greater than 15 kW capacity and less than or equal to 150 kW capacity or up to two acres of developed area including fencing, whichever is greater; and

**Large-Scale Solar** (also known as 'utility-scale'): Solar electricity generation and transmission facility more than 150 kW capacity or more than 2 acres of developed site area, whichever is greater.



The following areas are specifically identified as **preferred areas** for solar facilities, as they are most likely to meet the siting and screening requirements:

- Roof-mounted systems (see inset);
- Systems located in proximity to existing

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- commercial or industrial buildings;
- Former brownfields;
- Facilities that are sited in disturbed areas, such as gravel pits, closed landfills, or former quarries;
- Working farms, where more than 10% of the energy generated by the solar development is used by the farm.
- Solar developments on areas with no known or possible constraints, with a host community agreement (e.g. residents may purchase power or receive net metering in the project).
- Specific sites that may be added to the solar sources map, provided they have the attributes of a preferred area as listed above.
- Specific sites added to the Burke solar resources map, provided they have no known or possible constraints and are near existing hedgerows or other topographical features that naturally screen the entire proposed array. Preferred sites will be selected by the Planning Commission following a public hearing and submitted to the selectboard for approval prior to being added to the Town Plan. Criteria for selection will include a request by the property owner, visibility from public highways, visibility from nearby residences, ease of connection to the electric grid and the current land use.
- sites that do not contradict state and local constraints to agricultural soils and open agricultural fields.



#### **Rooftop Solar Potential**

The importance of rooftop solar should not be overlooked. Assuming one out of every ten residential and commercial structures could be suitable for rooftop solar generation (a very conservative estimate), Burke could generate as much as 650 MWh annually. This estimate assumes a 4kW capacity for residential, and a 20 kW capacity for commercial structures.

### **Solar Siting Criteria**

- The Town of Burke encourages solar installations, but ground-mounted installations shall be sited in such a way to prevent adverse impacts to state or federally designated historic districts, sites, and structures. Prohibited impacts to historical and cultural resources include:
  - Full or partial removal or demolition of the structure;
  - Physical or structural damage,
  - Impairment of a vista or viewshed from a historic resource that is a significant component of its historic character and history of use;
  - Visually overwhelming a historic setting, such as by being dramatically out of scale;
  - Isolating a historic resource from its historic setting, or introducing incongruous or incompatible uses, or new visual, audible or atmospheric elements.

- Open agricultural fields or contiguous fields (separated only by hedge rows, fence lines, drainage ditches, roads, etc.) larger than five acres should not be used for solar facilities. However, while the town does not support the replacement of agricultural fields with solar development, it does support the integration of on-farm solar generation into active agricultural uses that can help farms reduce expenses, generate extra income, and remain viable. Examples of integration of on-farm solar include siting solar on existing farm structures, or in a manner that supports grazing; the establishment of pollinator crops; or the creation of buffers between organic and non-organic production areas.
- All ground-mounted solar facilities shall be sited and screened so that visual impacts are mitigated when viewed from public streets, scenic viewpoints, and/or adjacent properties. Screening shall be year-round. If topography alone does not provide sufficient screening, a combination of materials (such as trees and shrubs) shall be used to create a naturalized screen rather than a large expanse of uninterrupted, uniform material. Plantings that die or become diseased shall be replaced within six months.
- Screening for solar development projects along the Toll Road and scenic roads as identified in this plan (Darling Hill and East Darling Hill, Gaskell Hill, Burke Hill, Sugar House, White School, Burke Hollow, Burke Green, and Pinkham roads) shall be held to a higher standard. Ground mounted solar projects shall not be visible within a thousand feet of a passenger vehicle travelling on the public roadway. All mid-scale proposed solar projects proposed in this landscape area shall have a landscape impact analysis completed by a certified landscape professional.
- All large-scale solar developments shall be sited only on preferred areas.
- Except for projects located on preferred sites, solar facilities larger than three acres, individually or cumulatively, that cannot be adequately screened or mitigated to blend into the municipality's landscape are, therefore, explicitly prohibited.

### ***Wind Siting Criteria***

*For policy purposes of this plan, wind energy facilities are grouped into three categories:*

**Small-Scale Wind:** Systems with generating capacities up to and including 10kW (Figure 4, Danville School 9.5kW turbine);

**Mid-Scale Wind:** Systems with generating capacities greater than 10kW (AC) and less than 1MW (Figure 5, Burke Mountain 100 kW turbine); and

**Utility-Scale Wind:** Systems with a generating capacity per turbine of 1 MW or greater.





Burke's Scenic Conservation Overlay contains high elevation lands and natural resources deemed unsuitable for large-scale commercial and industrial development. **Therefore, only small-scale and mid-scale wind power generation is appropriate in the town.**

Small-scale systems are appropriate at homes, businesses, schools, and other institutions. Mid-scale wind turbines are only appropriate for the purpose of supplementing onsite energy consumption for businesses or farms.

Noise from turbines shall not adversely affect neighboring residential properties, nor shall they be prominently visible from any state or historic districts.

### ***Biomass***

Burke's Biomass Resources Map is similar to the Solar and Wind Resources Maps in that it displays prime areas for woody biomass.

However, the map only illustrates areas of contiguous forest that might be used for harvesting wood for thermal or electric generation, accounting for areas that may limit excessive clear-cutting in the Scenic Conservation Overlay. The map does not indicate how much generation is possible. Nevertheless, wood is the town's most abundant, indigenous energy source and is a relatively low-cost fuel if it can be harvested from one's own land. New wood stoves and furnaces, if properly installed and maintained provide effective and efficient home heating. Stoves sold since 1990 must be air tight and meet EPA emission requirements. Though wood burning technologies have improved, wood heat remains less convenient than oil or gas heat.



If oil prices continue to rise, more households may turn to wood as their primary heating source. Wood has long been Burke's chief renewable source of heating energy and could supply electrical energy on a commercial scale if a chip plant located within or near the town. The use of a wood burning outdoor furnace allows an alternative to traditional hot water systems. They should adhere to Vermont air pollution regulations which require that only untreated natural wood may be burned in the furnace and that it must not be operated in such a manner that it becomes a nuisance. Health conditions of neighbors should also be considered. The town of Burke has a large amount of forested land. Under effective management, it could supply a sustainable source of energy. Extensive harvesting, however, if not properly managed, can cause increased storm water runoff and soil erosion, and habitat loss. Woodlot management reduces the adverse impacts of harvesting and can enhance timber stands to meet a variety of landowner objectives.

Other renewable energy options include co-generation which may be a cost-effective energy option, especially for larger business facilities, which could simultaneously generate both heat and power through one source using renewable energy. Another promising source of renewable energy that could provide fuel for transportation as well as heat and power is biodiesel processed locally from locally raised crops. Grass pellets are another major up-and-coming resource that may significantly reduce heating costs. For example, switchgrass is a woody fibrous grass that can essentially be grown by everyone, even homeowners, from which a pellet product similar to wood can be created. Absent large farms, landfills, or sewerage treatment, methane generation is unlikely.

### **Hydroelectric Generation**

Burke's hydroelectric map shows existing dam sites that are not used for electricity generation, but could be retrofitted to provide generation capacity. Data about these dams comes from a study commissioned by the Vermont Agency of Natural Resources. Since that study was completed, one of these dams (near East Darling Hill) has been removed. Given stringent licensing and permitting concerns to minimize impacts to aquatic biota, hydro development may be difficult in Burke. (The last new hydro production facility in Vermont was licensed in 1987.) Nevertheless, the Town encourages finding new ways to harness hydro power in an environmentally responsible manner.

**Table 9.11: Total Energy Generation Potential for Burke**

Energy type	Assumption Basis	Total Potential Output, in kWh
Roof-mounted solar, residential	10% of all residential structures, with a 4 kW capacity, by 2050	552.9
Roof-mounted solar, small commercial structures	10% of small commercial structures (smaller than 40,000 sf), with a 20kW capacity, by 2050	98.1
Roof-mounted solar, large commercial structures	3% of all commercial structures (more than 40,000 sf), with a 200kW capacity, by 2050	245.3
Ground-mounted solar	1 MW for every 60 acres of prime solar lands (no constraints at all), with a capacity factor of 14% (capacity factor of fixed panels only – factor would be higher for trackers).	35,147
Wind	9.5 kW (typical residential scale) for every 25 acres of prime wind land (no constraints at all).	22.6
<b>Total Generation Capacity</b>		<b>36,065.9</b>

### **Energy Efficiency**

To promote municipal energy efficiency and the use of renewable energy resources there are state energy codes for new residential, commercial and public buildings. There are also a number of other programs offered by the state that include Efficiency Vermont, electric vehicle leases, the School Energy Management Program (SEMP) targeted to school administrators, and programs that support the conversion of school heating systems to wood-burning systems. Participation in these energy efficiency programs should be supported and promoted in Burke.

### **Future**

Municipal energy savings can be realized through regular energy audits of municipal buildings and fiscal analysis of facility construction and equipment purchases. Such costing methods often demonstrate that long-term energy saving more than offset the higher initial purchase or construction cost of energy efficient equipment and building improvements.



Energy audits for the Burke Town Offices and the Burke Community Building were completed in 2011. The total cost of potential energy upgrades to the Burke Town Offices was \$7,474. Heating load should decrease by 15% to 20 %, saving about 70.9 MMBTUs/year or \$1772/year for a payback of about 4 to 5 years. The audit of the Community Building found no economically feasible measures except for the installation of a new thermostat.

### **Burke Energy Goals**

- Establish and pursue a common sense, sustainable energy policy which emphasizes efficiency, conservation, and energy independence.
- Establish land use policies to encourage concentrated village centers to reduce the need for extensive traveling within the town.
- Energy that efficiency and conservation should be a primary consideration in new municipal construction projects, equipment purchases and operations.
- Consider the impact of expansion and development activities on the current or planned capacity of local electrical supplies and transmission facilities.
- Encourage, through Transportation policies, opportunities for walking, cycling and other energy efficient alternatives to the automobile, such as carpooling and Rural Community Transit.
- Encourage energy efficiency for all new development.

### **Policies**

- Support efforts to supply affordable energy to meet the needs of current and future Burke residents in a manner that maximizes energy conservation.
- Maintain village center designations for West Burke and East Burke, which may help to incentivize reinvestment in established centers of development over more energy-consuming rural sprawl.
- Support municipal water/wastewater planning and investments that make redevelopment of village centers feasible.
- Support the development of renewable resources that provide or the protection of natural and cultural resources, and that reinforce traditional land use patterns and municipal development policies.
- Encourage wood and solar heating.
- Encourage ongoing forest management to maintain a local source of fuel-wood.
- Encourage dispersed, small-scale development of renewable energy generators, including solar panels and wind turbines.
- Support the development of locally produced biodiesel.
- Encourage net-metered facilities utilizing renewable energy sources.

### **Strategies**

- Establish a town Energy Committee.
- Use the Burke Town web site to collect resources for site planning, preferred sites, and energy efficiency.
- Consider co-generation using renewable energy resources for municipal facilities, especially for those build in the future.

- Conduct an “energy audit” of the town school and take corrective measures to reduce energy use.
- Review zoning regulations to identify appropriate incentives for energy efficient design.
- Pursue implementation of energy audit recommendations for the Town Offices.
- Educate the residents about “Efficiency Vermont” and the coupons and incentives it offers.
- Establish public EV charging stations in appropriate places for visitors, including the village centers.
- Consider providing a bike lane or walking path for new roads or when existing roads are reconstructed.
- Encourage the use of energy efficient municipal vehicles (e.g.; hybrid, bio-diesel)

## CHAPTER 10. Housing Plan

### Housing Goal

- Ensure the availability of safe and affordable housing for all income levels of Burke residents.

### Housing Overview

Housing is one of life’s basic necessities. Therefore, Burke should strive to have a range of adequate and affordable housing available to support a socially diverse and economically viable community. Affordable housing is defined by Title 24 VSA Chapter 117 § 4303(1) as either:

(A) Housing that is owned by its inhabitants whose gross annual household income does not exceed 80% of the county median income..., and the total cost of the housing..., is not more than 30% of the household's gross annual income.

(B) Housing that is rented by its inhabitants whose gross annual household income does not exceed 80% of the county median income..., and the total annual cost of the housing..., is not more than 30% of the household's gross annual income.

Burke has a wide variety of residential architecture and prices. East Burke is heavily influenced by single family homes and condominiums around the Burke Mountain ski area, many of which are second homes.

### *Future*

The average home price is increasing at a greater rate than the average income. Increasing demand for second homes from buyers with primary residences outside Burke, and often outside Vermont, and with average incomes well above Burke residents, is driving real estate values higher. Increased affordable housing may be required in the future to house employees. The implementation of a policy that requires builders of commercial housing developments to contribute towards the availability of affordable housing in Burke should be considered.



The safety of housing in Burke is an important consideration. To help ensure safe housing all building construction should meet nationally accepted building codes. Inspections by qualified personnel to ensure code conformity should gradually be implemented with the cost of the inspections borne by the builder.

### **Strategies**

- Consider accessory dwelling and multi-family dwellings as a way to address the Town's future housing needs.
- Inventory development capacity and update zoning regulations as needed.
- Annually compare average household income with average housing costs to monitor affordable housing availability.
- Allow residential development at a rate that does not exceed that which can be supported by existing and planned municipal facilities and services.
- Study the setting of multiple zoning areas for different uses, including zones that permit multi-family housing and manufactured housing.
- Review and update current zoning and subdivision regulations as needed to accommodate higher densities of housing with designated percentage of open space.
- Promote new housing within villages.
- Require that adequate municipal services and off-street parking are available, and the character of any historic structures is maintained, when converting single to multi-family dwellings
- Research housing priorities, with specific research into any needed development of subsidized elderly rental housing.
- Leverage town funding to support affordable or elderly housing developments.
- Encourage the development of affordable housing units within or near planned residential and planned unit developments.
- Implement and enforce building codes, and refine them over time.
- Consider expanding the Village boundaries in order to accommodate development particularly for the purposes of affordable housing.

## **CHAPTER 11. Economic Development**

### **Economic Development Goals**

- A diverse, sustainable local economy characterized by business and employment opportunities that ensures all local residents earns a livable wage.
- All economic development meets the needs of the present without compromising the ability of future generations to meet their own needs.

## **Economic Development Overview**

Burke maintains a surprisingly diverse economic base considering its small size and rural character. Tourism remains the dominant industry due to Burke's recreational opportunities and natural beauty. The recreation industry in Burke is an extremely valuable asset to be protected and supported. It is recognized as one of the major possibilities for economic development in the region. Local commercial and service businesses employ local residents; however, a large number of residents also commute to nearby towns for employment.

In addition, the town has worked hard to identify and promote appropriate sighting for industrial uses as well as clarifying and simplifying language for small household businesses. Three types of classifications (Class I, Class II and Class III) of Industrial type uses have been identified in recent years through the planning process. Class I and II are permissible as conditional uses in the Village Mixed Use and Agricultural-Residential I Districts. Class I and II are also allowed in the Agricultural-Residential II District but along Rt. 5 only. Class III Industry is permissible along Rt. 5 only although because of the potential size of this classification it is not a permitted use in the Village Mixed Use District.

An increasingly important economic driver in Burke and regionally is the emergence of home based businesses. Public input has indicated that flexibility in permitting is crucial to developing this type of business. Three types of home based businesses have been identified (Home Offices, Home Occupations, and Home Business). Home Offices and Home Occupations are allowable in all Districts while Home Businesses are permissible as a conditional use in all districts but the Village Residential District. Permits for Home Occupations can be issued by the zoning administrator directly and Home Offices are allowable by State Statute.

The types and sizes of the industrial use classes and the home-based businesses are differentiated by specific use standards. A standard is a level of quality, achievement, etc., that is considered acceptable or desirable.

### ***Future***

Maintaining the rural quality of life, while encouraging orderly growth, is the challenge ahead for Burke. A growing dynamic economy is vital to Burke's future. New commercial and industrial development is encouraged provided the long-term fiscal and environmental impacts are fully considered. However, without improved infrastructures such as municipal sewage and water systems, roads, and telecommunications including wireless telephone and affordable broadband service, the types and size of new developments are limited.

There is growing concern regarding the ability of full-time workers to earn an income sufficient to meet a family's basic needs, commonly referred to as a "livable wage". Wages for hourly workers in seasonal industries tend to be lower than in many other industries. Although small-scale industry is most desired, any proposal should be considered. Focusing economic development activities on the creation of well-paying jobs is especially critical in Burke to ensure that local residents can meet their basic needs.



Burke's economic outlook cannot be predicted. However, with the uncertainty of the impact of global climate change, resource depletion, population growth, environmental degradation, war, and a growing gap between an affluent minority and an impoverished majority it may become increasingly important to develop a sustainable local economy. A local economy that focuses on local markets and local resources, and which serves to strengthen the local community as a means of responding to global uncertainty.

### **Strategies**

- Continue to evaluate and refine performance standards for commercial and industrial development.
- Develop a municipal or municipal/private partnership for water and wastewater systems within the community. Study state and federal grant money options.
- Develop funding policies that focus on assistance for sustainable economic development.
- Support the economic viability of agriculture and forestry, including maintaining and expanding economic incentives, promoting access to local markets (farmer's markets, schools, meal sites) and maintaining an adequate land base.
- Explore strategies for local schools to purchase local agricultural products.
- Evaluate enacting a property tax policy that reduces the tax burden on agricultural land that is actively managed for farming.
- Support the creation and expansion of businesses and industries, in appropriate locations and that the East Burke and West Burke Villages continue to serve as commercial, cultural and civic centers of the town.
- Encourage the maintenance and expansion of the local tourism industry by supporting efforts to protect Burke's historic and natural resources, and expanding recreational and cultural opportunities for local residents and visitors.
- Promote economic development that utilizes the historical assets and character of Burke.
- Initiate and support efforts to ensure that 100% of Burke's residents have access to affordable broadband.
- Continue to review Burke's land use regulations to determine whether revisions are needed to carry out the policies set forth above.

### **Adjacent Communities**

Burke has a reciprocal relationship with adjacent communities. Adjacent communities include East Haven, Kirby, Lyndon, Newark, Sutton and Victory. Burke participates in many initiatives that address a wide range of issues on a multi-town basis, including:

- Affordable housing
- Economic development
- Growth management associated with the Burke Mountain ski area
- Highway improvements
- Public transit
- Recreation
- Rural resources and historic preservation
- Trails and greenways development
- Emergency services
- High school facilities

The policies set forth in this plan were crafted to strive for compatibility with the plans of neighboring towns and the region. Compatibility with neighboring towns is particularly important with regard to land use, where incompatible policies could result in conflicting development activities and land uses along town boundaries. The Town of Burke will continue to keep communication open between bordering communities. More importantly, will continuously consider the policies of the neighboring communities while developing the goals, policies, and tasks set forth in subsequent chapters. This is critical to maintaining the lifestyle that is important to all residents of the area.

## **Chapter 12. Flood Resiliency**

### **Burke Rivers and Streams**

In Burke, there are two major rivers that run the entire length of town. One runs along the Eastern side of the town while the other runs along the western side. These are the East and West Branches of the Passumpsic River. The two rivers flow into the Passumpsic River just South of Burke in Lyndonville and then proceed into Saint Johnsbury, Passumpsic and Barnet before flowing into the Connecticut River. The watershed that feeds the East and West Branch and ultimately the Passumpsic River is known as the Passumpsic River Watershed. A watershed is a geographic area where all water flows into a single river. The Passumpsic Watershed as a whole drains 507 square miles, a major portion in Caledonia County with minor portions in Essex, Orleans and Washington Counties.

The East Branch originates in the town of Brighton and into Burke from East Haven. From Brighton, it flows south-southwesterly for about 19 ½ miles draining a 65 square-mile watershed before meeting the West Branch. Its tributary inputs generally drain from Burke Mountain and East Haven along the river's east side and along the ridge referred to as Darling Hill and north to Burke Green/Maple Ridge Road on the west side. Northern tributaries include a large portion of Newark and a small portion of Westmore. One of its main tributaries, Dishmill Brook, drains Burke Mountain and the Burke Mountain Ski Area, flows into the East Branch in East Burke Village just upstream from the East Burke Dam. The East Branch's river valley is occupied by Route 114, with the majority of development clustered mainly around East Burke Village and in Lyndon along Deer Run Lane. Residences, businesses and agricultural land use are sprinkled throughout the valley and along the river, while the rest of the watershed is primarily mountainous and forested.

The West Branch originates with several tributaries in the town of Westmore and flows into Burke from Sutton. From Westmore and through Burke it flows south-southeasterly for about 14 miles before joining the East Branch. The West Branch drains a 68-square-mile watershed. The West Branch is fed by a tributary system that flows from the areas of Westmore, Newark, Sutton, Sheffield, Wheelock, Burke and Lyndon. Its main tributaries in Burke are the Roundy Brook and Sutton River. The Calendar Brook enters just south of Burke in Sutton. The West Branch river valley flows along routes 5A and 5 and there is a limited amount of development found along the West Branch although the highest amount of development is found in West Burke Village. Agricultural lands are present and forested land represents the dominant land cover type.



## **Flood Hazards**

The State Hazard Mitigation Plan (2013) identifies flooding as the most common natural hazard event in Vermont and the damages from flooding are due to inundation and fluvial erosion. Flooding, exacerbated by debris and ice jams, historic channelization practice, or the plugging and failure of stream crossing structures can threaten public safety, stress emergency services, cause widespread damage and property loss, bring about socio-economic disruption, and result in significant recovery costs for property owners, municipalities, the state and federal government.

Other flood hazards result from flash flood situations in particular along steeper stream sections. Clearing of vegetation cover and constructing impervious surfaces, like roofs and parking lots, increases storm runoff particularly in higher elevations. To prevent flash flood situations, developments cannot increase the volume or velocity of streams. Channelizing and straightening streams increases stream velocity and increases the risk of flash floods. Many times, roads and driveways up steep hills create perfect conditions for flash floods because they are designed to rapidly drain water from the surface and send it downhill in a straight steep ditch. The Better Backroads Program from the state has road standards to avoid erosion and flash floods resulting from road design and construction.

Historically in Burke, significant flooding has occurred. Flooding has occurred in East Burke Village and West Burke due to a myriad of reasons but mainly from heavy rain and spring run-off coupled with ice jamming or debris build up. Specifically, East Burke Village has flooded significantly in 1927, 1972 and in 2008. In addition to flooding in Burke, flooding has also consistently occurred downstream in the municipalities of Lyndonville and St. Johnsbury as well, most recently in 2002. Although the location of land use development in flood prone areas in both Burke and its surrounding communities is an underlying issue, the health of the East and West Branches of the Passumpsic itself is important to mitigating flooding. A healthy watershed is important not only to Burke but also to the communities downstream from Burke.

## **Topography, Flood Plains, Wetlands and Riparian Buffers**

There are several aspects of a watershed that are important to the health of the waterway and flood resiliency. These are the topography, soils, floodplains, wetlands and natural buffers that are found along the waterway and throughout the watershed.

- Topography and Soils factor into how susceptible an area is to erosion hazards. Areas of steep slopes with shallow soils are susceptible to erosion, particularly if cleared of natural vegetation.
- Flood Plain. A flood plain is a generally flat area of land next to a river or stream. It stretches from the banks of the river to the outer edges of the valley. The most important function of a flood plain is the storing of runoff during heavy rains and spring thaws, thus slowing the velocity of water flowing downstream. The resultant gradual release of storm water minimizes erosion, stream bank scouring and downstream flooding.
- Wetlands. Wetlands are a link between land and water. Specifically, wetlands are characterized as having a water table that stands at or near the land surface for a long enough period each year to support aquatic plants. Wetlands can be found within a flood plain and



along rivers and streams. Much like the flood plain a wetland can act like a sponge and store flood waters helping to keep rivers at normal levels.

- Riparian Buffers. A riparian buffer is a vegetated area near a stream, usually forested, which helps shade and partially protect a stream from the impact of adjacent land uses. A Riparian Buffer plays a key role in increasing water quality in associated streams and also helps to protect against erosion.

## **Identified Flood Hazard Areas**

In Vermont, there are two primary means of identifying areas subject to flood hazards: the areas mapped by the Federal Emergency Management Agency (FEMA) as areas of special flood hazard; and areas mapped by the State of Vermont Department of Environmental Conservation known as the State-wide River Corridors. The FEMA maps primarily identify areas of inundation (rising floodwaters), while the River Corridors identify areas subject to fluvial erosion hazards (when fast moving water in a river or stream erodes the streambank and adjacent land). The State of Vermont has mapped the River Corridors of the East and West Branch for the Town of Burke. Those maps are available to the Planning Commission, the Development Review Board and the Public in the Burke Town Offices.

The FEMA maps are known as the Flood Insurance Rate Maps (FIRM) because of their use in the National Flood Insurance Program (NFIP). The flood hazard and risk information presented on the FIRMS's is the result of engineering studies that are approved by FEMA. The Special Flood Hazard Area shown on a FIRM is the area that has a 1-percent or greater chance of flooding in any given year; this area is also referred to as the 1-percent-annual-chance floodplain, base floodplain or the 100-year floodplain. The FIRM maps for Burke, like most towns in the Northeast Kingdom, date back to 1980 and are also available to the Planning Commission, the Development Review Board and the Public in the Burke Town Offices. For the federal government to update these maps would be very beneficial to Burke and its surrounding towns in the Northeast Kingdom.

## **Stream Assessments and Recommendations**

Following the major flooding that occurred in Lyndonville and St. Johnsbury in 2002, the Caledonian County Natural Resources Conservation District set out to understand the dynamics of the Upper Passumpsic River Watershed and to implement restoration projects at the site level. Initial geomorphic assessments took place on the East Branch in 2003. As of 2008 assessments had been completed on both the East and West Branches. In addition, an assessment was conducted on one reach of the Dishmill Brook, a tributary of the East Branch that enters just upstream from the East Burke Dam. Finally, in 2013, a stream geomorphic assessment (study of stream dynamics and impacts to habitat and structure of streams and land adjacent to them) of the West Branch and the Sutton River was also conducted.

### **East Branch**

The assessment along the East Branch River identified that channel incision has occurred from both natural and human processes, and has resulted in a degraded channel bed, high banks and reduced access to flood plains. Flood flows within an incised river cannot overtop the channel banks and spill onto the floodplain, which causes a tremendous amount of high velocity flow



and power to be contained in the channel and lead to additional channel degradation. The containment of this powerful flow results in increased shear stress on stream banks, as well as increased erosion and inundation hazards. The East Branch channels the full force and volume of floodwater downstream instead of storing it while flows in the channel recede.

Compounding the channel incision on the East Branch is a disrupted sediment regime. The East Branch Dam deprives downstream reaches of sediment. This deprivation of sediment has led to increased bank erosion on these reaches to recapture this needed sediment. Upstream of the dam, the natural channel substrate is covered by fine sediments blocked from transport which is increasing channel elevation, decreasing slope and significantly altering the natural channel geometry and habitat conditions of the stream.

There is open and undeveloped land along the East Branch that could provide favorable conditions to accommodate the natural channel adjustments and floodplain development that could attenuate such flood flows. Restoring flood plain access to these areas would promote sediment attenuation and reduce flood hazards downstream.

### ***Dishmill***

A main problem along the Dishmill relating to geomorphic stability is channel straightening and corridor encroachment associated with the existence of major roads (Mountain Road) and development, particularly near the East Burke downtown area. In some cases, this encroachment has limited floodplain access and has caused moderate to extreme channel degradation (lowering of the bed). Storm water runoff along Mountain Road and from developed areas on Burke Mountain also contribute to channel adjustment.

Fluvial erosion hazards are present in the Dishmill corridor. A fluvial erosion hazard zone represents the land adjacent to the stream or river that is vulnerable to erosion and damage from flood waters based on the channel's need to migrate in its floodplain to achieve a balanced condition.

Potential restoration and conservation projects identified for the Dishmill include: river corridor protection through easements, improving riparian buffers, improved stormwater management, dam removals, bridge/culvert removal/replacement, gully remediation and alternative analysis for the removal of berms.

### ***West Branch***

Along the West Branch and Sutton Rivers channel straightening (like the Dishmill) and corridor encroachment associated with the existence of major roads (Route 5A) and development is again problematic. This encroachment has limited floodplain access and has caused moderate to extreme channel degradation. In addition, a lack of high quality streamside buffers is exacerbating bank instability in some locations. Fluvial erosion hazards (see Dishmill analysis) are also present within the West Branch and Sutton River Corridors.

Recommended restoration projects for these two corridors include corridor protection through easements, improving riparian buffers, improved stormwater management, dam removal, bridge replacements, analysis for the removal of an old berm and an old mill abutment.

## **Infrastructure Planning**

The combination of roads, steep slopes, and running water not only constitute areas of higher road erosion risk, it also marks areas where the Town of Burke has installed and maintains culverts and bridges. The Vermont Online Bridge and Inventory Tool (VOBSIT) database is an excellent tool available through the Northeastern Vermont Development Association (NVDA) that helps towns inventory and track the condition of their culverts and bridges. Burke last updated their culverts and bridges VOBSIT database in 2008. NVDA annually assists towns in updating their culvert data by hiring consultants to do the field work using G.I.S. and then uploading this to the VOBSIT. The VTTrans Maintenance Districts ideally want an inventory done every three years but NVDA can only do 4.5 towns per year. NVDA is working to get towns to use VOBSIT to input their annual updates so that they will always have an up to date inventory. However, the town has recently completed a road erosion and capital budget report that was written by the Caledonia County Natural Resources Conservation District and funded by the Vermont Agency of Transportation. This inventory provides a budget framework for a five-year plan to implement the projects identified. This report identifies eight road project sites and seven priority culvert sites.

## **Critical Facilities**

Critical facilities are essential to a community's resilience and sustainability. In general, there are two kinds of facilities that a community would consider "critical" during and after a flood:

- Those that are vital to the health and safety of the public, before, during, and after a flood, such as emergency responders, schools and shelters; and
- Those that, if flooded, would exacerbate the problem, such as a hazardous materials facility, power generator facility, water utilities, or wastewater treatment plant.

Because they are defined by their ability to quickly and efficiently respond to and recover from floods, critical facilities should never be flooded, and their critical actions should never be conducted in floodplains if at all avoidable.

Burke has two critical facilities in the Special Flood Hazard Area, the East and West Burke Fire Stations. The town should consider a full range of options to mitigate risk to these structures in the future in order to ensure continuity of services during a disaster. Potential mitigation measures should include either relocation of the facility or its elevation / flood proofing to the 500-year flood level.

## **ERAF**

The Emergency Relief Assistance Fund (ERAF) provides public assistance grants through FEMA to help Vermont municipalities repair damaged infrastructure after a presidentially – declared disaster. In past years ERAF funding typically covered half the required 25% non-federal match for approved projects (i.e. the State would provide 12.5% and the municipality 12.5% with FEMA covering 75% of the total project costs).

Effective October 23, 2014 towns must have adopted four flood hazard mitigation measures in order to maintain the same level of state funding in the event of such a disaster: 1) Flood Hazard Regulations that meet minimum standards for enrollment in the National Flood Insurance Program; 2) the most



recent Agency of Transportation Road and Bridge Standards; 3) a Local Emergency Operations Plan (LEOP); and 4) a local Hazard Mitigation Plan and submit to FEMA for approval.

The Town of Burke currently is a part of the National Flood Insurance Program (NFIP) and therefore its residents are eligible for federally backed flood insurance. Burke also has an up to date Local Emergency Operations Plan (LEOP) and has adopted the most recent Agency of Transportation Road and Bridge Standards. However, the town is lacking a Local Hazard Mitigation Plan whereas funds are now available to support such a plan through the Northeastern Vermont Development Association (NVDA). Since the Hazard Mitigation Plan is a critical component of ERAF it would be beneficial to complete the plan while NVDA still has funding to complete it.

Local Flood Hazard Regulations that include protection of State River Corridors are afforded a greater share of state matching funds – the State’s portion of the match increased to 17.5%. The planning Commission has been looking at adding language to the current zoning regulations that would limit development within River Corridors. Several public meetings have been held on the idea and the support from these meetings has been positive, both from the selectboard and the townspeople.

It is noted that besides the funding benefits under ERAF, each of the four required elements are beneficial on their own. As previously noted, membership in the NFIP enables residents to secure flood insurance, which is required if a federally – backed mortgage is sought for the property. It also lowers rates for all flood insurance policy holders in town.

#### **Goals:**

- 1) Increase awareness and then implement the most effective means of reducing future flood damage; as identified in the tactical basin plans produced by the State of Vermont and the stream geomorphic assessments provided for in the River Corridor Plans for the East and West Branch of the Passumpsic River which were produced by the Caledonia County Conservation District.
- 2) Identify and then protect areas designated as special flood hazard areas, river corridors, flood plains, land adjacent to streams, and upland forested areas within the watershed.
- 3) Ensure that the town can receive the maximum outside assistance in the event of the next federally declared disaster.
- 4) Minimize the risk exposure and associated expense to Burke Residents from flooding.

#### **Strategies:**

- 1) Work with the Caledonian County Conservation District and the State of Vermont to identify and obtain funding opportunities to carry out the specific project recommendations within the East and West Branch River Corridor Plans produced by the Conservation District.
- 2) Adopt flood hazard regulations that provide oversight of identified special flood hazard and river corridor areas. These regulations should at a minimum ensure eligibility for flood insurance through the National Flood Insurance Program and then strive to protect erosion-prone and floodwater storage areas from additional development and encroachment.
- 3) Adopt the four flood hazard mitigation measures and keep them up to date in order to obtain full Emergency Relief Assistance Fund (ERAF) funding. These are:
  - a) Flood Hazard Regulations as mentioned in (2) above.

- b) Most recent Vermont Agency of Transportation road and bridge standards.
  - c) Local Emergency Operation Plan.
  - d) Local Hazard Mitigation Plan.
- 4) Attempt to achieve yearly updating of the Town's transportation infrastructure information in the Vermont Online Bridge and Culvert Inventory Tool (VOBCIT).
- a) Identify and replace undersized and failing culverts.
  - b) Identify substandard road drainage areas and keep properly maintained.



