

# BARNET TOWN PLAN

Adopted January 8, 2024

<b>Introduction</b> .....	4
<b>Purpose</b> .....	4
Vision.....	4
Social Connections .....	6
The Lay of the Land: Barnet’s Historic and Current Development Patterns.....	6
Population Trends.....	7
Recreation.....	8
McIndoes Academy.....	9
Churches & Religious Institutions .....	9
Lakeview Grange.....	9
Adjacent Towns and Region.....	10
Local Prosperity.....	12
Income and Employment Patterns .....	13
The Working Lands Economy.....	13
Recreation and Visitor Tourism .....	14
Housing .....	15
Education .....	17
Childcare .....	17
Communications .....	17
Climate Resilience .....	20
Flood Resilience .....	20
Hazard Mitigation Planning.....	22
Public Assistance from Natural Disasters .....	22
Climate Migrants.....	22
Energy .....	23
Energy Equity Challenges.....	24
Renewable Energy Siting Guidelines.....	25
Climate Resilience Goals and Strategies .....	27
Environmental Stewardship.....	29
Water Quality.....	29
Required Agricultural Practices/Best Management Practices.....	29
Restoration of Natural Infrastructure .....	30
Sediment and Erosion Control on Roads .....	31
Preventing Spread of Aquatic Invasives.....	31
Habitat Blocks .....	31

Extraction of Earth Resources.....	33
Governance and Services.....	35
Town Properties.....	35
Barnet Town Forest.....	35
Harvey Lake Beach and Picnic Area .....	35
Town Garage .....	35
Town Offices .....	35
Town Library .....	36
Town School and Land .....	36
Fire Station.....	37
Discontinued/Derelict Town Buildings.....	37
Cemeteries.....	37
Solid Waste: Transfer Station and Recycling .....	37
Water and Sewer .....	38
Dam Committee.....	38
Transportation .....	38
Emergency Response: Police, Fire and Rescue .....	39
Barnet’s Good Neighbor Fund .....	39
A Sense of Place .....	41
Historic and Cultural Assets .....	41
Scenic Areas .....	41
Putting the Plan into Action.....	43
Appendix I. Twelve Elements of Chapter 117.....	45
Appendix II. Location Codes.....	46
Appendix III. Energy Plan Information .....	47
Space Heating .....	47
Transportation .....	49
Development of Renewable Energy Resources.....	51
Existing generation .....	51
Target Generation and Potential Generation .....	51
Appendix IV. Plan Maps .....	53
A : Historic Resources of Barnet	
B. Town of Barnet Base Map	
C. Land Use/Land Cover Map	
D. Natural Resources Constraints Map	
E. Soils Constraints Map	

- F. Zoning Districts – Parcel – Town Properties
- G. River Corridor Map
- H. Habitat Map
- I. Scenic Vistas Map
- J. Solar Resource Map
- K. Wind Resources Map
- L. Biomass Resources
- M. Hydropower Resources
- N. NEK Broadband Service Map

# Introduction

## Purpose

This Town Plan supersedes the August 2015 Plan for the Town of Barnet. It has been prepared in accordance with Title 24 V.S.A., Chapter 117, as amended. This Plan is intended as a policy guideline without the same legal standing as zoning and subdivision regulations. However, it is considered by the District Environmental Commission in their hearings under Act 250, the development law of the State of Vermont. The Town Plan is also given due consideration by the Vermont Public Service Board in deciding whether to issue a “certificate of public good” under 30 V.S.A. Section 248 for the siting of utility projects (e.g., industrial wind turbines, cell towers). Furthermore, under Vermont statutes, the revised plan is required justification to produce new or revised zoning and subdivision regulations.

The spirit of this document is the promotion of the maximum local control of planning that is allowed by state and federal law, to encourage the most desirable and appropriate use of land, to minimize the adverse impact of one land use upon another, and to provide for the gradual amelioration of undesirable conditions.

The primary purpose of the Town Plan is to encourage the appropriate private development of all land in the Town in a manner that will promote the public health, safety, prosperity, comfort, convenience, efficiency, economy, and general welfare. The purpose is also to provide means and methods of planning for the prevention or minimization of such land development problems as may presently exist or which may be foreseen, and to implement such planning when and where appropriate. (Title 24 V.S.A., Chapter 117, Section 4382, paraphrased.)

The Plan helps to define the community by laying out the general direction for future development. It also identifies local needs and desires. Each section of the Plan identifies issues and recommends actions to help resolve the Town's problems. This document, then, attempts to identify the areas and resources which possess economic, historic, natural and scenic value and attempts to set reasonable priorities where two or more uses or values may conflict. The Plan provides guidelines for orderly growth and the intelligent appraisal of appropriate land use in Barnet, while maintaining a reasonable flexibility to allow for the consideration of changing trends.

We are fortunate to live in a beautiful, fertile township on the western slope of the Connecticut River Valley. Over the years since the founding of the town in 1763, the basic community structure has been made up of small villages and family farms, a combination that has preserved our pastoral beauty through the centuries.

## Vision

It is our belief that the future of the Town of Barnet lies in the enrichment of our social connections with one another, the preservation of our natural resources and the enhancement of our local economy, to provide opportunities for prosperity to our residents while preserving the rural character of the town. All plan goals and recommended actions are based on seven underlying principles of our stewardship:

1. The encouragement of places, development, and programming to deepen social connection among Town residents.
2. The preservation of traditional land uses, particularly the remaining farms that dot our hillsides, forest and wildlife habitat, and compact village centers.
3. The encouragement of residential development that ensures a variety of housing units for all income groups, while improving our quality of life and preserving our natural resources.

4. The belief that as a small municipality, our fortunes are very much interconnected with those of neighboring towns, especially the County seat, St. Johnsbury. As such, we approach our goals and recommended actions with an open spirit for regional cooperation where appropriate.
5. The conscientious use and protection of our abundant natural resources and recreation areas, and a recognition of their inherent value, as well as their potential social and economic value to the citizens of Barnet.
6. The recognition that preservation of traditional land uses, such as agriculture, may conflict with the preservation of common natural resource values in some instances, both short and long-term. Resolution of these conflicts will demand compromise solutions.
7. The preservation of the quality of air, water, and all common properties is beneficial to the quality of life in Barnet.

The residents of Barnet are custodians of a town of unquestioned natural beauty and significant resources which require diligent attention. Through adoption and implementation of this Plan, the Town's officials and its residents are exercising their best stewardship for those resources with which nature, history, and geography have so abundantly endowed them.

## Social Connections

*A town is more than a bounded area of land; a matrix of fields, forests, mountains, and streams; a collection of structures dotted across a landscape. It is most importantly the people who live there, and the connections they make with one another. When people in a town are richly interconnected, with a shared sense of ownership for their town and an active interest in supporting one another's well-being as neighbors, that place will thrive over time, resilient to unexpected challenges that may arrive.*

### **Challenges and Opportunities:**

- Barnet's villages are greatly dispersed, creating physical barriers for community interaction and connectedness.
- Development trends favor large-lot rural residential development, running counter to traditional settlement patterns and furthering patterns of rural isolation.
- Access to year-round outdoor recreation is central to Barnet's culture.
- Recent demographic changes, school district reorganization, combined with a declining enrollment reduces Barnet school's role as a social gathering space.
- Community gathering spaces need to be located where people live – in established centers of development.

### **The Lay of the Land: Barnet's Historic and Current Development Patterns**

Settled by Scottish immigrants, Barnet was chartered in 1763. The town of Barnet, located at an altitude of 452 feet, occupies 27,136 acres, seven percent of the landmass of Caledonia County. Barnet lies along the shore of the Connecticut River, the eastern boundary of the State of Vermont. This section of the Connecticut, with its breathtaking scenery, is considered by some to be the best canoeing on the river. Barnet has several lakes and ponds, including Harvey Lake (352 acres), which occupies a dramatic setting among open fields and wooded hills. Warden Pond and Jewett Pond are two other major water bodies in the town. Roy Mountain is the town's highest peak at 2,091 feet. It is surrounded by the state-owned, 1,590-acre Roy Mountain Wildlife Management Area.

Exit 18 off Interstate 91 is in the town, as is US Route 5, both of which pass through the entire north/south axis of Barnet.

The historic Bayley-Hazen Military Road passes through the town. Fifty-four miles long, it was designed as a means of entrance into Lower Canada at a time during the Revolutionary War when it was hoped to capture Canada as the fourteenth colony. Although it never served an important military purpose, the road helped to facilitate settlement of Barnet and other towns along the road when the war ended.

From the beginning, Barnet had no single town center. Its hilly terrain and pockets of arable land along winding river courses encouraged dispersed settlement around multiple centers. Barnet's five villages (Barnet Village, East Barnet, West Barnet, Passumpsic, and McIndoe Falls) all have evolved along separate and distinct historic traditions. Each of the villages is a separate "fire district." Initially the fire districts were created to provide local firefighting; now they primarily provide and maintain streetlights, sidewalks, and other village assets. The five villages continue to define Barnet settlement patterns, as well as social and civic life.

Increased traffic congestion, rural residential sprawl, inharmonious new construction, and the lack of affordable housing within the villages are all threats to Barnet's unique rural culture. A 10-year GIS analysis (conducted by Northeastern Vermont Development Association) found that from 2005 to 2014, Barnet had 53 new residential structures, only two of which were in an established development center. This trend is typical of the Northeast Kingdom, where the market preference for dispersed large-lot rural

residential development is eroding traditional development patterns and leading to social isolation. Age of housing stock in villages, compounded by deferred maintenance and accumulation of household debris may be accelerating this trend.

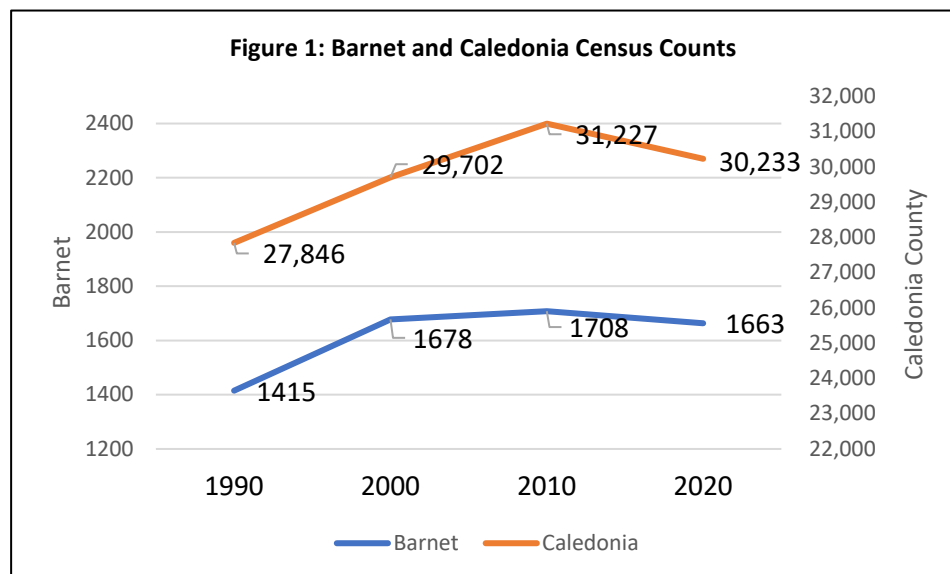
While zoning is one tool that the Town can use to shape future development patterns in a way that complements the Town’s rural culture, non-regulatory tools are available as well. Village Center Designation, for example, can influence future development by providing powerful incentives for reinvestment in traditional village centers. The primary benefits of this program are state tax credits for fit-up and rehabilitation of income-producing properties built before 1983. Credits are awarded annually on a competitive basis. The designation also makes village projects more competitive for many grant programs, such as the Agency of Commerce and Community Development Municipal Planning Grants program, State Historic Preservation grants, Vermont Community Development Program (VCDP) grants, VTrans Bike/Ped and Transportation Alternatives grants, Northern Border Regional Commission Grants, ANR Water and Wastewater subsidies and loans, and various other state grants and resources.

In 2019, Village Center designation was awarded to Barnet Village, McIndoe Falls, Passumpsic, and West Barnet. To date, the historic McIndoes Academy has received planning grants for repurposing it as a regional cultural center, as well as historic preservation grants to stabilize the building. No tax credits have been awarded to date, but there is potential for future benefit. Tax credits are relatively easy to apply for and sell. Unlike federal tax credits, there is no recapture if the property is sold. Tax-eligible activities include accessibility, sprinkler, code compliance, and improvements to the façade. The tax credit is applied against state income tax; however, most credits are sold to a bank in exchange for a mortgage adjustment or cash.

### Population Trends

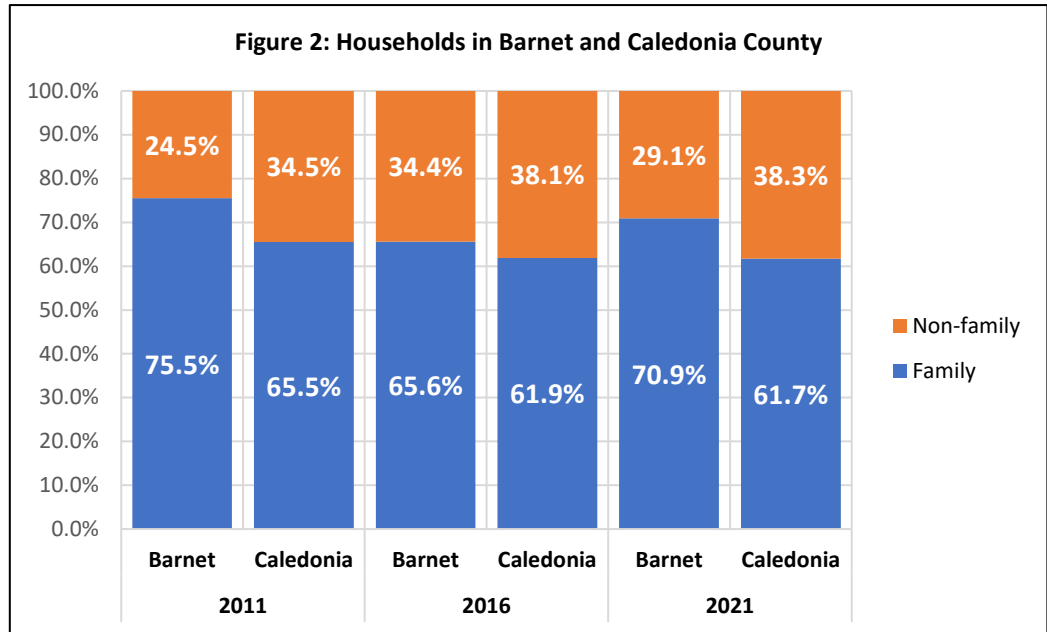
According to the 2020 Census, Barnet has a total population of 1,663, which is roughly 5% of the total population of Caledonia County. The Town covers a land area of 42.2 square miles and accounts for about 7% of the County’s land mass. Barnet has a low density of less than 40 persons per square mile.

The most recent Census shows that Barnet experienced a 2.6% drop in population over the previous decade, while the county saw a decline of 3.2%. (Figure 1) State population increased by 2.8% over the same period.





Barnet's average household size of 2.4 is just slightly higher than the county average, which might be indicative of the Town's lower concentration of non-family households compared to Caledonia County. Non-family households are largely made of up people who live alone and are more likely to be middle-



aged and older. Nevertheless, the three most recent 5-Year Averages from American Community Survey (ACS) indicate that non-family households have accounted for a larger share of Barnet's population over time. (Figure 2.)

According to the most current 5-Year ACS Averages, fewer than one-quarter of Barnet's households have school-age children (under the age of 18). Does the data indicate that Barnet's population will continue to age, our households shrink and become increasingly childless? The reality is more complicated:

- Census and ACS data only show what has happened to date. They're not a crystal ball for the future, which is more likely shaped by disruptive factors such as a global pandemic and climate change. Since the pandemic, the Town has seen a spike in urban newcomers with a preference for higher-end homes. Additionally, there are already anecdotal reports of climate migration to the region.
- Barnet's relative absence of families with young children does not mean that they don't prefer to live here. What's more likely is that they cannot afford to live here because they can't find suitable housing. For example, McIndoes has added rental properties in recent years, and that village now has a high concentration of school-age children. This plan explores housing needs and gaps in greater detail in the Local Prosperity Chapter.

What we can learn from the data is this: Barnet needs to guide its development in a manner that allows a diverse range of households to thrive in a supportive community that promotes social connectivity.

### Recreation

Outdoor recreation is central to Barnet's culture and offers a valuable opportunity for people to connect. Boating, swimming, water skiing, and fishing are permitted on the many high-quality waters of the Town. Opportunities for snow travel by cross-country skis, snowshoes, and snowmobiles are plentiful through Barnet's forests and meadows. Hunters enjoy easy travel, fine scenery and game. Bicycling, hiking, picnicking, ice skating, snow sliding, softball and other activities are enjoyed informally by Barnet's residents. Wednesday Soccer Night at the school is open to all ages and has been

cited by all those who participate at a high point for socialization. An active program of organized sports activities, including swimming lessons and basketball are offered through the school and the Harvey Lake Beach Committee. Besides a recreation field for soccer and baseball, the Barnet School property includes a Nature Trail and cross-country ski trail. The McIndoes Academy Community Center has established snowshoeing and cross-country ski trails as well.

In 2010 Barnet selectmen adopted an All-Terrain Vehicles (ATV) Ordinance that requires there to be a Barnet Club that uses the VASA rules and establishes trails on private property, using Town Highways as connectors as needed, which are reviewed each March. Trails are open May 15 through October 1. The local Snowmobile Club follows the VAST rules and manages the private trails with Town Highways as connectors as needed.

Despite many existing informal recreation opportunities, a multi-purpose trail dedicated to outdoor recreation should be considered. Abandoned railroad beds and flood plain areas on riverbanks make ideal locations for multi-purpose greenways. In addition, the improvement of boating access to the Town's scenic rivers can be combined with the development of greenway trails to create a network of recreational and transportation opportunities.

### [McIndoes Academy](#)

Although the McIndoes Academy closed its doors as a high school in 1969, a half century of committed stewardship has positioned the building and grounds for its next life as a vibrant and engaging community center. In support of its mission as a self-sustaining and all-inclusive community center, the Academy board of trustees has hired a development director and soon plans to add a programming director. The board will soon launch an active fundraising plan, with the intention of having all renovations complete by 2024. Current plans for the McIndoes Community Center include a co-working space and central coffee bar, which will enhance the dynamic relationship with the library and the co-located post office.

The McIndoes Academy building has hosted a library inside since the 1970's. In 2023, the McIndoes Academy Community Center board decided to dissolve the library, keeping only a small number of books to be used on an honor system basis. The Community Center will oversee programming for the facility with a hired Program Director who will maintain the educational aspect of the McIndoes Academy Community Center's mission.

### [Churches & Religious Institutions](#)

All the villages have historic churches, which fulfill a variety of evolving social needs in their respective communities, including community dining, senior meals, and a thrift store. The McIndoe Falls First Congregational Church has been unused for a decade and is being transferred to the McIndoes Academy Community Center. Adaptive reuse of the structure will include a ground-level meeting space with a full kitchen, which will complement continued programming in the Academy. The Congregational Church in Barnet Village is transitioning to more of a community center as well. There are currently four active churches and three Buddhist retreat centers in Barnet.

### [Lakeview Grange](#)

The Lakeview Grange is located at 4770 Garland Hill Road in West Barnet. An alcohol-free building, the Grange offers community activities including weekly cribbage games and monthly Saturday morning breakfasts. The Grange also supports David's House at Dartmouth Hitchcock as well as other organizations.

## Adjacent Towns and Region

Barnet depends on adjacent communities for many services. The town is part of a mutual aid agreement for firefighting. Town's high school students all go out of Barnet for their education, and many of the jobs that residents rely on are in other communities. Barnet has always maintained an excellent relationship with its neighbors, a relationship that should continue. Moreover, the people of Barnet recognize that, because the Town does not exist in isolation from the region, Barnet should take an interest in regional planning and planning decisions made by adjacent communities.

**Goal: Create an inclusive and welcoming environment for new residents.**

**Recommended action:**

Recruit a Welcome Wagon team to develop orientation materials and organize events and programming for new residents.

**Goal: Promote village vitality.**

**Recommended actions:**

Identify which commercial enterprises and essential services needed by village residents are currently lacking, and work with regional economic development organizations to attract them.

Maintain Village Center designation for qualifying village cores, including McIndoe Falls, Barnet Village, West Barnet, and Passumpsic. Make sure that owners of income-producing properties and real estate brokers are aware of the potential tax incentive benefits of income-producing properties in the designated village.

Support village beautification efforts through programming (such as Yard of the Month awards) and events (Village Cleanup Day), and seasonal awards to the prettiest Village.

**Policies:**

Commercial enterprises such as stores should be encouraged, but not limited, to be located where they are convenient for the walking public, thereby contributing to village life and reducing the traffic congestion which results from dependence on the automobile.

Acceptable commercial structures for the I-91 interchange area should be limited in number and carefully situated to maintain the rural character of the village of Barnet.

**Goal: Enhance and co-ordinate the existing informal recreation opportunities in Barnet.**

**Recommended actions:**

Study recreation needs and work with existing organizations to develop greenway trails and improved river recreation access in Barnet.

Identify on- and off-road connections to the Lamoille Valley Rail Trail and the Cross Vermont Trail, as well as measures to improve cycling safety.

Obtain recreation easements to secure public access for low-impact recreation like fishing and walking along Joe's Brook, the Steven's River, the Barnet Center Road, Sara Moore Pond, Warden Pond and the Rake Factory and Bony Woods area.

Encourage recreational use of the Roy Mountain Wildlife Management Area and other scenic areas through local Scouting activities or as a Capstone project.

**Policies:**

Continued co-operation between organizations such as The Vermont Association of Snow Travelers (VAST) and Vermont All-Terrain Vehicle Association (VASA), and private landowners should be encouraged so responsible enjoyment of nature will not be encumbered by trespassing problems.

Development and maintenance of trails in remote areas by public or private sector should be encouraged to provide the opportunity for serious hiking.

**Goal: Deepen social interaction and interconnection among town residents by enhancing or expanding community spaces, and by developing and supporting community-wide activities and gatherings.**

**Recommended actions:**

Create an inventory of current community spaces and activities and consider how to increase access to and use of those spaces by community members.

Identify and support opportunities to develop new social connections, such as conducting a community survey, or a Community Visit from the Vermont Council on Rural Development. Provided at no cost to the community, VCRD's Community Visit program establishes a neutral and facilitated platform to engage residents, set common goals, and access resources that will help them take action on those goals. More information about the VCRD process is available here: <https://www.vtrural.org/programs/community-visits>

Review Zoning Bylaw to ensure that adaptive reuse of under-used gathering spaces is supported.

## Local Prosperity

*Barnet's primary economic assets are its skilled and hard-working people, its abundant natural resources, and the beauty of its landscape. Our important rivers provide the opportunity for hydropower generation, which has provided an economic advantage to the town. Forests support wood-using industries vital to continuing the economic viability of rural economies. Forests provide the environment for a host of non-timber forest activities ranging from hunting, fishing, and viewing fall foliage to camping and water storage. Harvey Lake, Barnet's scenic roads, recreational opportunities, and the unspoiled rural landscape attract visitors to the town.*

*We believe the economic future of Barnet lies substantially in the wise use of our renewable natural resources: the water and the land. Sustainable development in Barnet should be based on providing a wholesome residential setting for those employed in the region in services, trade, manufacturing, agricultural, and forestry, and other categories and for those in their retirement years. The underlying strategy of a development plan for Barnet is to plan for orderly growth which maintains a sound tax base and anticipates the potential tax burdens for current and future needs.*

*In recent years, much of Barnet's development has been residential, both year-round and seasonal. This trend will probably continue and can be compatible with a working agricultural and silvicultural landscape when planning techniques are effectively applied.*

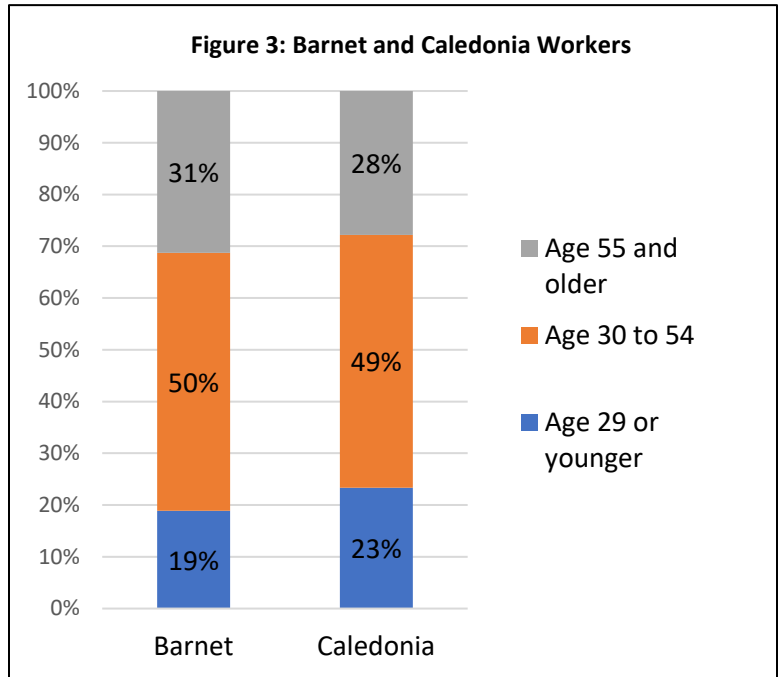
### **Challenges and Opportunities:**

- Barnet has a rich history of agriculture and forestry.
- Barnet and the region have seen growth in the recreation and visitor tourism sector.
- Patterns of large-lot rural residential development can conflict with maintaining unfragmented tracts of working lands.
- There are significant gaps in our housing supply.
- Improved broadband and cell service may attract more entrepreneurs.

### Income and Employment Patterns

Most Barnet workers are employed out of town. Census data using 2019 W-2s indicate the bulk of the 588 primary jobs for Barnet workers were in St. Johnsbury (nearly 34%), with remaining employment in all surrounding towns, Littleton NH, and Lyndon. Only 18 workers lived and worked in Barnet during that period. Education (80 primary jobs) and healthcare and social assistance (144 primary jobs) were the largest employment sectors. It is not clear from this data how many Barnet workers were working from home, although remote work in the region has increased since the pandemic.

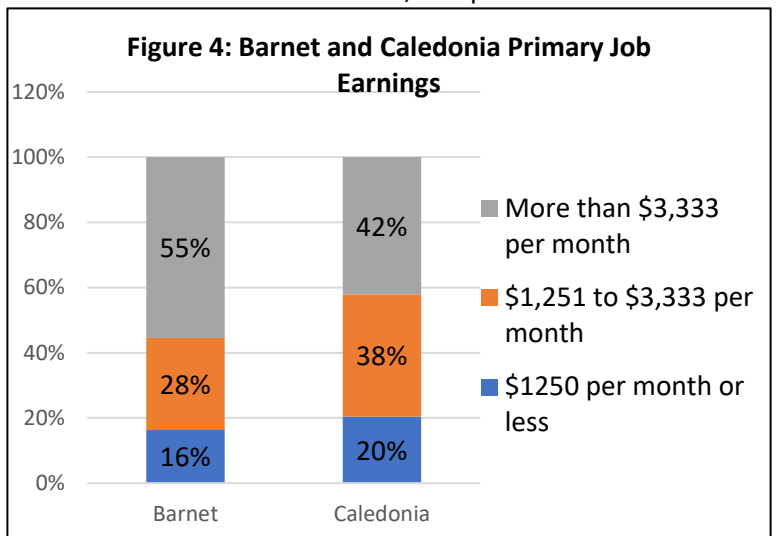
Barnet workers are slightly older than workers countywide (Figure 3), and they tend to earn more (Figure 4). While Barnet’s median age is higher than the county median (47.7 year compared 44.7 years), the trend toward an older, higher paid workforce may be indicative of a lack of housing options for younger workers.



### The Working Lands Economy

Barnet enjoys a heritage of agricultural production which began when the first cow was brought to Barnet in 1775. This agricultural heritage is intrinsic to our vision of the Town, and preservation of the working agricultural landscape is a major goal of this plan. The Plan recognizes that prime forested land is also worthy of preservation. It is the patchwork of open fields and forested hillsides dotted with compact villages and scattered farmhouses which characterizes our landscape. Preservation of the rural integrity of Barnet is a priority of the recommended actions in this section of the Plan.

Agriculture in Barnet is diverse. There are working dairy farms, several sheep farms, commercial fruit and vegetable operations, horse farms, beef farms, poultry farms, alpaca farms and hemp operations, as well as landscape stock growing operations and intact farm properties not presently in active use.



About 80 percent of Barnet's land area is forested today. Forest growth in the town is diverse due to its location at the junction of the northern hardwood/oak and spruce/fir forests. The combination of this diversity and generally good soils makes Barnet a good site for long-term forest investment. Much of

Barnet's forest land is currently maintained for sustained timber yield. Barnet's forest land produces a variety of wood products: saw logs, pulpwood, and fuel chips. Barnet expects that all timber harvesting in the town will comply with the Acceptable Management Practices (AMPs) for water quality required by the State. The AMPs are intended to prevent discharges, such as mud, petroleum products and woody debris from getting into our streams, ponds, lakes, and rivers. They are meant to maintain natural water temperatures by requiring that trees be left as buffers along streams and other water bodies.

To ensure sustainable harvesting techniques are used, individual owners should consider working with a professional forester to draw up a forestry plan such as that required by the Use Value Appraisal Program.

Much of Barnet's farm and forest land is currently enrolled in the state Use Value Appraisal Program. Enrolled farm and forest landowners pay property tax based on the use value of their land with the state reimbursing the town for the difference between use value and fair market value. In exchange for this, farm and forest landowners agree to pay a penalty should the land ever be developed for other uses. Moreover, forest landowners agree to manage the land according to a state approved management plan.

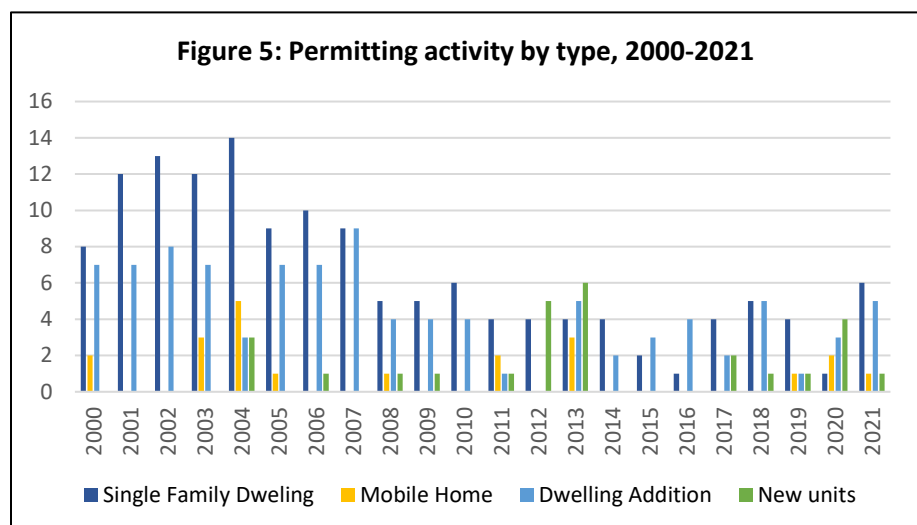
Barnet's farm and forest land provides substantial economic, social, and environmental benefits to the town. Therefore, it is in the town's best interest culturally and economically to encourage the continuation of farming and to preserve the rural character of the town. From an environmental standpoint, Barnet's forest land performs a critical role by collecting, cleaning, regulating and recycling the water we drink and the air we breathe. The forest is crucial to many watersheds, which in turn irrigate farmland and form wetlands for wildlife.

The characteristics that make land desirable for farming also make them attractive for large lot residential development, which has been the predominant trend for decades. The two uses can coexist, but the Town must take care that further development does not fragment working lands until they are no longer productive. Barnet's Zoning Bylaw allows for planned unit development, which provides a more creative approach to site design. These Zoning provisions should be reviewed for new opportunities to protect unfragmented open space and working lands.

### Recreation and Visitor Tourism

The region has seen a surge in leisure, hospitality, and recreation, largely in part to investments that have helped make the region a year-round destination such as the newly completed Lamoille Valley Rail Trail. Tourism thrives on a

nexus with farming and forestry, which lends authenticity to the visitor experience. There is an opportunity to expand Barnet's hospitality base of bed and breakfasts, farm stays, short-term rentals, and camping in a manner that is compatible with the rural character of Barnet. Barnet's Zoning regulations should be reviewed to

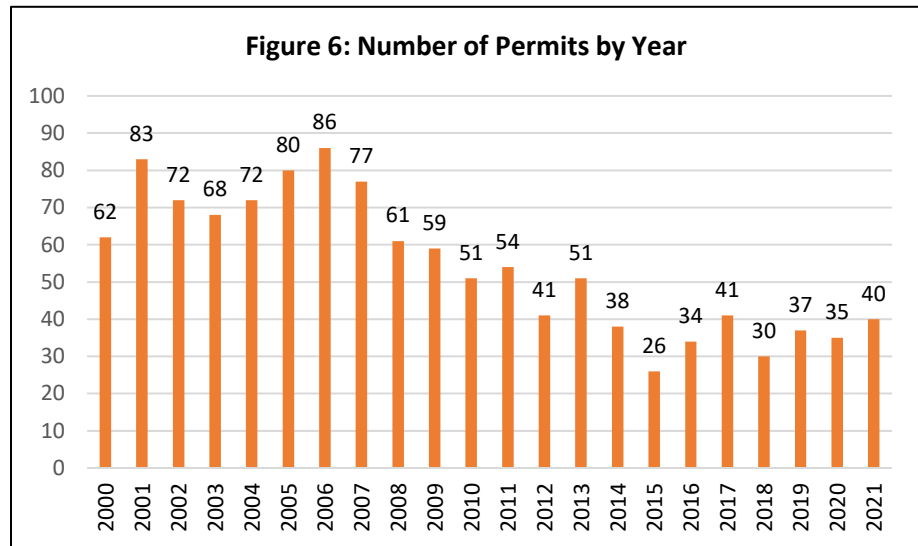


ensure that growth in the hospitality sector can be balanced with Barnet’s rural character and environmental integrity.

## Housing

Development in Barnet is primarily residential, and in a typical year permitting activity is mostly focused on single family home development, followed closely to permitted additions to dwellings. (Figure 5). In recent history, permitting activity reached a peak in 2001 and 2006. (Figure 6).

Like the rest of the state, Barnet is facing a housing shortage. Nearly every sector of the community faces cost and availability challenges, from families with young children, one-person households, to seniors who wish to downsize or age in place. Barnet’s housing supply, which is predominantly single-family in a rural



residential setting, cannot meet the needs of a socioeconomically diverse population. The housing crunch affects the local and regional economy as well. As our workforce ages into retirement, area businesses are struggling to attract and retain new qualified workers -- and those workers cannot find appropriate housing.

Recent market pressures might price housing out of reach for locals. Home prices soared during the pandemic, as people left urban areas for rural privacy. Barnet listers reported a spike in home sales, particularly among high-end rural properties and lakefront homes. Additionally, Vermont saw a significant increase in home purchases from “investors” (buyers who have owned three or more properties simultaneously over the past 10 years). Although not all investor purchases are intended for income generation (such as dedicated short-term rentals), the popularity of short-term rentals may be limiting long-term housing as well.

Many Vermont towns (and Barnet is no exception) enforce minimum lot sizes through zoning to support low-density development and protect environmentally sensitive areas. Although the preservation of rural character is certainly a valid concern, zoning has resulted in large residential lot sizes, higher development costs, and higher housing prices<sup>1</sup>. A new study has found that Vermont has the largest median lot size in the country with 78,408 sq. ft., well ahead of New Hampshire, which has the second largest median lot size of 49,223 sq. ft.<sup>2</sup>

Housing affordability is determined by a complexity of factors, many of which exceed the capacity of a small rural town, including high construction costs and limited wastewater capacity. However, there are two strategies that are within Barnet’s reach:

<sup>1</sup> <https://www.vhfa.org/news/blog/large-new-england-lot-size-requirements-push-home-prices>

<sup>2</sup> <https://www.visualcapitalist.com/cp/the-median-lot-size-in-every-american-state-2022/>



- **Amend zoning to eliminate needless barriers to housing.** The Vermont Department of Housing and Community Development (DHCD) has developed guidelines for simple zoning changes that can accommodate more housing that is affordable at a range of incomes, in walkable, inclusive, and age-friendly neighborhoods. Similarly, the DHCD offers grants to help communities update their bylaws.
- **Work with regional partners to improve existing housing stock.** Barnet's housing stock is old, with nearly 40% of housing units built before 1940. Emergency repairs from deferred maintenance and high heating costs from insufficient insulation can add a significant cost burden. Organizations such as USDA Rural Development, HEAT Squad, Efficiency Vermont and Northeast Employment Training Organization offer a variety of grants and loans to cost-burdened households.

## Education

The high quality and reasonable cost of public education in Barnet tends to attract new residents to the community. The availability of school choice for High School makes Barnet extremely attractive. The increased space requirements and other costs related to providing educational services may become burdensome to the Town. The capabilities of our schools, particularly maintaining the current student-teacher ratio, should keep pace with expanding new requirements to retain the high quality of education Barnet now provides.

## Childcare

Affordable childcare is critical to sustaining Barnet's workforce. According to most recent American Community Survey Estimates, there are 51 families with children six years or younger with all parents in the workforce, and 149 families with children between the ages of six and 17 with all parents in the workforce. Childcare in Barnet is provided by several small home daycare services in the community and neighboring towns. Community members have been exploring the feasibility of an after-school program at the school which would serve a need for many working families within Barnet.

## Communications

The pandemic ushered in a new approach to work, with more Vermonters expecting to work from home<sup>3</sup>. Improvements in communication will have an enormous impact on how and where business is conducted in Barnet. We also have an opportunity to attract new teleworkers to the community. Unfortunately, Barnet still has areas with poor or no connectivity. The availability of the most advanced communication technology is a priority for Barnet, not only because of its economic value to residents, but also because it has the potential to bring the outside world into the lives of residents.

Barnet is a member of NEK Broadband, a Communications Union District formed in 2020 under 30 VSA 82. NEK Broadband's mission is to ensure equitable and affordable access to high-speed internet across the region. NEK Broadband will be offering service in parts of Barnet in 2023 and is working to ensure all addresses in Barnet with electric service have a solution for high-speed internet over the next five years

**Goal: Ensure that residential development in the town is consistent with orderly growth and preserves the rural character of the town.**

### **Recommended Actions:**

Consider adopting subdivision regulations.

Review and amend Barnet's Planned Unit Development provisions to allow for more creative site design to preserve open space, large tracts of working lands, and rural character.

Study the feasibility of adopting a Transfer of Development Rights program to encourage development on the edges of existing villages and to preserve open space.

### **Policies:**

Affordable housing opportunities for low- and moderate-income families should be encouraged by the development of affordable single, low and moderate income housing, multifamily dwellings, and accessory apartments.

---

<sup>3</sup> [https://www.uvm.edu/sites/default/files/Center-for-Research-on-Vermont/pdf/Final\\_Report\\_June\\_14\\_2021.pdf](https://www.uvm.edu/sites/default/files/Center-for-Research-on-Vermont/pdf/Final_Report_June_14_2021.pdf)

The Town should encourage development which preserves meadowland (land including pastureland, hay land or cropland) in rural districts by encouraging siting of new structures which are to be located outside the village districts in less visible areas along the edges of open fields or in wooded areas which border them.

Those seeking building permits in less-accessible locations should be made aware that fire-fighting services for them may be limited, as compared to more accessible parts of town.

**Goal: Ensure a variety of housing units for all income levels within the town, emphasizing when possible the rehabilitation of existing structures.**

**Recommended Actions:**

Review Barnet's Zoning Bylaw to eliminate unnecessary barriers to housing. Begin by reviewing dimensional standards, parking requirements, and accessory dwelling units. Consider a Bylaw Modernization Grant if technical assistance is needed.

Inform residents about federal and state programs for weatherization, rehabilitation, and home financing. Make information available through the Town Clerk's office, the Town web site, the libraries, and the Energy Committee.

Consider density bonuses and other incentives for planned unit developments that provide affordable housing.

Work with public and private housing agencies to provide adequate rental assisted apartments within the village district to meet the needs of Barnet's elderly, long-term residents.

Participate with neighboring communities in a regional housing study.

Maintain Barnet's Village Center designations.

**Goal: Ensure the ongoing viability, productivity, proper management, and conservation of large contiguous tracts of working lands.**

**Recommended Actions:**

Promote the use of "Acceptable Management Practices" (AMP's) by forest landowners and commercial timber harvesters through locally sponsored education programs that also address sustainable harvesting techniques and the advantages of forest management plans.

Promote opportunities for agricultural and forestry innovation through programs such as the Farm Viability Program, USDA Rural Development, and the Working Land Enterprise Initiative.

Review Barnet's Zoning Bylaw to identify opportunities to support accessory uses for farming and forestry that can diversify income.

Establish a local conservation commission who can work with land conservation organizations to inventory working lands to prioritize conservation.

**Policy:**

The Town encourages more local marketing of agricultural and forest products. Local consumption of local products profits the producer, the consumer, and the environment.

**Goals: Encourage the development of businesses and services, while enhancing the economic potential of our renewable natural resources, recognizing that tourism and recreation are economic drivers.**

**Recommended Actions:**

Review Barnet’s Zoning Bylaw for areas that may need clarity, such as commercial uses and hospitality uses. Consider performance standards for commercial uses.

Explore various models of short-term rental regulations to ensure they do not limit long-term housing.

**Policy:**

Large, heavy industry incompatible with the agricultural, rural, and natural resource values of Barnet should carefully considered before being located in the town. There should be a diversity of local commercial and service enterprises, and the local labor market should be used as much as possible in these enterprises.

**Goal: Continue to provide a high quality and affordable education to the children of Barnet, acknowledging that in addition to educational outcomes, the reputation and strength of the school system also impacts property values and community connection.**

**Recommended Action:**

Maintain communication between the Planning Commission and the School Directors concerning long-range facility needs.

**Goal: Encourage the development of an adequate number of childcare facilities to meet the needs of working families.**

**Recommended Action:**

Support efforts to expand afterschool programming in the McIndoes Library and the Barnet School.

**Goals: Establish ubiquitous and affordable high-speed broadband in Barnet.**

**Recommended Action:**

Continue to participate in the Communications Union District.

## Climate Resilience

*Climate change is already changing our lives. We are seeing rising temperatures and annual precipitation, resulting in warmer winters with diminishing snow cover, as well as increasingly erratic patterns of precipitation. Flooding, already the most damaging and costly natural hazard in our region, will become more frequent. Ironically, we can also expect periods of drought, due to the unpredictability of climate change: There's either too much precipitation or not enough.*

*Barnet is committed to minimizing the impacts of climate change as well as its contribution to greenhouse gases. While this region is likely to become an attractive destination for climate refugees from other parts of the country, we must pursue equitable solutions to those who are already here – especially those who are more vulnerable to hardships, such as residents living in flood prone areas and lower-income energy burdened households.*

### **Challenges and Opportunities:**

- Flooding is the most damaging and costly natural disaster to affect our community. Climate change will heighten the risk of future flood damage.
- Barnet faces additional threats from climate change, including invasive species, infectious disease outbreaks, and extremely hot summer weather patterns to which our population is not acclimated.
- Despite the local impacts of climate change, northern Vermont is becoming more attractive to climate refugees from other more severely impacted areas.
- Barnet supports the statewide energy goal of meeting 90% of our energy needs through renewables by 2050.

## Flood Resilience

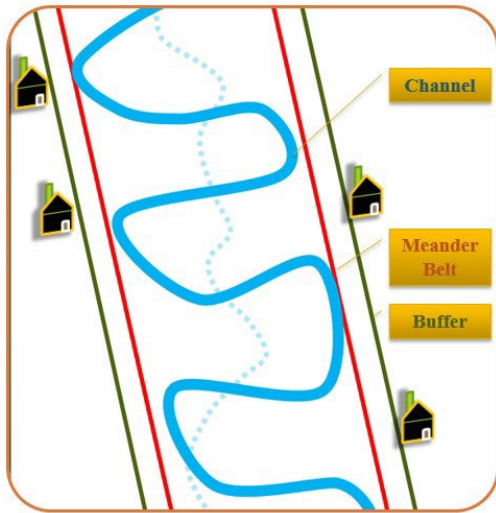
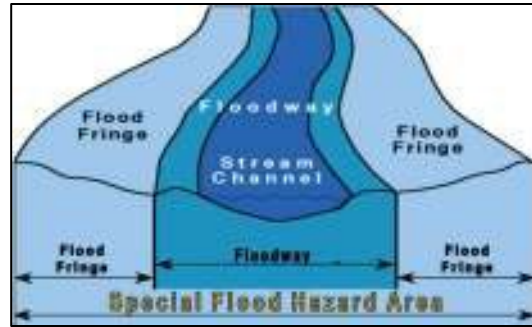
Barnet has an extensive history of flooding, and damage to public and private property has intensified over the past two decades. Since 2002, Barnet's roads and bridges have been damaged by flooding in five presidentially declared disasters, requiring FEMA assistance to pay for repairs. The drinking water supply in Barnet Village also experienced damage from flooding and riverine scour, requiring investments by Fire District #2.

Barnet participates in the National Flood Insurance Program, and private property owners have obtained coverage through it. The program has paid out eight claims totaling \$98,000. Two structures were repetitive losses, meaning that there have been multiple claims. Barnet residents have also had to turn to other FEMA programs for financial assistance, such as temporary housing, following severe storms.

Barnet experiences two types of flooding – inundation flooding and erosive flooding. Inundation flooding occurs when water levels on a river or lake rise, and the water spreads out onto adjoining lands. Property damage is caused by everything getting submerged and very wet. Areas along a river that are likely to become submerged are called floodplains. They provide an important ecological function by storing and conveying floodwaters, reducing downstream flood velocities, and mitigating riverbank

erosion. Floodplains also help to protect water quality by filtering nutrients and impurities from runoff, so keeping them free from development can help mitigate the impacts of flood.

Barnet property owners can obtain flood insurance because Barnet participates in the National Flood Insurance Program. To participate, the town must regulate development in flood hazard areas, using a map provided by FEMA. The map depicts Special Flood Hazard Areas, which are inundation areas that would be affected by a historically significant flood. (The image on the right illustrates the elements of Special Flood Hazard Area.)

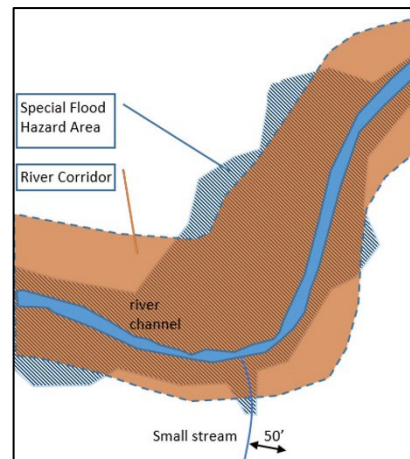


FEMA’s mapped floodplains do not adequately depict the full range of flood risks a community might face. River channels are constantly undergoing some physical adjustment, leading to risk of erosive flooding. The shift in the stream channel might be gradual, resulting in gradual stream bank erosion or sediment deposit – or it might be sudden and dramatic, resulting in a stream bank collapse.

The Vermont Department of Environmental Conservation has identified areas prone to erosive flooding, known as river corridors and has mapped them along streams with a watershed of two square miles or more. This image on the left depicts this concept. The river corridors consist of a meander belt and a riparian buffer, both of which help to maintain stream equilibrium conditions. The meander belt is

an area calculated to accommodate the lateral movement of the stream channel that may occur over time. The width of the meander belt will vary, depending on the amount of land draining to a given point on a stream. The riparian buffer component is designed as an extension of the meander belt to provide additional development setback space so that when the stream channel reaches the edge of the meander belt, there is still room to establish or maintain a naturally vegetated buffer that would function as resistance to further lateral streambank erosion. For streams with smaller watersheds, it is assumed that a 50-foot vegetation buffer will usually provide ample room for a meander.

Not surprisingly, mapped, river corridors are likely to overlap with the Special Flood Hazard Areas, at least to some degree. (See the image on the right for an example).



Barnet’s existing flood hazard regulations are only based on the inundation risks depicted on FEMA maps, which are decades old, lack significant detail, and can be difficult to interpret. Fortunately, FEMA is producing new digital maps that will be more user-friendly, and draft maps could be available in about a year. Before the final maps become effective, FEMA will request a review of Barnet’s flood hazard bylaws to ensure that they meet or exceed the criteria for the National Flood Insurance Program. This is an important opportunity for the entire community to review Barnet’s flood hazards and identify more

effective ways to reduce risks, such as limiting development in areas prone to erosive floodings, limiting fill in the floodplain, or elevating structures above the base flood elevation.

### Hazard Mitigation Planning

In addition to flooding, climate change is exposing Barnet to a proliferation of new natural hazards, such as the spread of invasive species, drought, ice accumulation from warmer winters, and windstorms. The Local Hazard Mitigation Plan (LHMP) forms the foundation for the community's long-term strategy to reduce losses from natural hazards and break the cycle of repeated damage. The LHMP also makes Barnet eligible to receive FEMA funds to mitigate known risks before the next disaster hits. Funded activities include upsizing culverts or elevating or relocating repetitive loss structures. Barnet's LHMP expired more than a decade ago, but funds are available to develop a new one.

The LHMP will need to profile known natural hazards in Barnet, including dams. Barnet has several dams that would be hazardous were they to fail. The Comerford Dam is classified as a High Hazard Dam. The classification is independent of the dam's overall condition and is not indicative of the structural integrity of the dam, but rather the effects if a failure should occur. The Moore Dam, of similar size to the Comerford Dam, 6 miles upstream is also considered a High Hazard dam. The dam at Harvey Lake is considered a Significant Hazard Dam.

### Public Assistance from Natural Disasters

When a community requires public assistance for damaged infrastructure in a federally declared disaster, FEMA usually covers 75% of the loss. The State's Emergency Relief and Assistance Fund (ERAF) covers half of the remaining matching funds (12.5%), if the community has taken all these steps to reduce flood damage:

1. Adopt the most current Town Road and Bridge Standards (which can be found in the VTrans Orange Book: Handbook for Local Officials).
2. Adopt flood regulations that meet the minimum standards for enrollment in the National Flood Insurance Program
3. Maintain a Local Emergency Management Plan (adopt annually after town meeting and submit before May 1)
4. Adopt a FEMA-approved Local Hazard Mitigation Plan

Barnet currently meets requirements 1 through 3, which means that ERAF will cover only 7.5% of the loss. If the Town were to update the Local Hazard Mitigation Plan that expired in 2010, ERAF would cover 12.5% of the loss. Additionally, Barnet may receive an increased state match, if we were to adopt flood regulations that are more aggressive than the minimum standards of the National Flood Insurance Program.

### Climate Migrants

There is already plenty of anecdotal evidence of climate migration. The media regularly feature stories of newcomers who are fleeing wildfires, poor air quality, and serious water shortages in other parts of the country. While we still don't have reliable data on climate migration, we believe that it will intensify. The Town must ensure that future development to accommodate climate migration does not increase our greenhouse gas emissions by fragmenting forest cover, contribute to water pollution, or reduce our ability to feed our region by fragmenting farmlands. This plan includes several initiatives to revisit the Town's zoning standards to protect our natural assets. The inevitability of climate migration simply elevates the urgency of those initiatives.

## Energy

Barnet's Town Plan is intended to align with the State Comprehensive Energy Plan, which in turn, is structured to meet the greenhouse gas requirements of the Global Warming Solutions Act. The Comprehensive Energy Plan seeks to meet 90% of our energy use through renewables by the year 2050 and:

- in the transportation sector, meet 10% of transportation energy needs from renewable energy by 2025, and 45% by 2040.
- in the thermal sector, meet 30% of energy needs from renewable energy by 2025, and 70% by 2042.
- in the electric sector, meet 100% of energy needs from carbon-free resources by 2032, with at least 75% from renewable energy.

These are clearly ambitious goals, since most Barnet residents travel out of town for work, shopping, and other necessities. According to estimates from the Regional Planning Commission, Barnet uses more than 2 billion BTUs annually to meet its energy needs (Figure 7). The largest share of energy use is for transportation. <sup>4</sup>

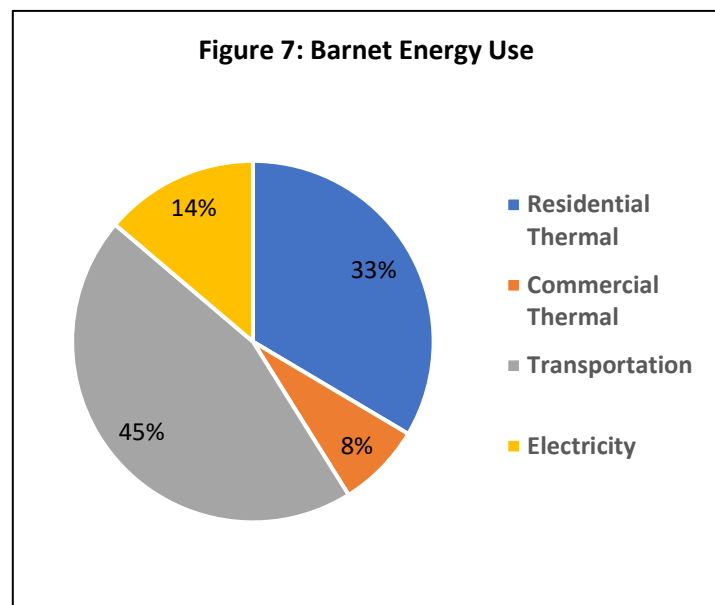
Barnet's existing energy use is dominated by fossil fuels. Although residents rely heavily on the use of wood for heating, more than half of heating sources still come from fuel oil and propane. Just 7% of Barnet's transportation energy use can be attributed to renewable resources, and much of that is from ethanol.

To meet the 90% of its energy use through renewable resources by 2050, Barnet will need to pursue a two-fold strategy:

**1. Reduce overall energy use:** Barnet's housing stock has grown in recent years, leading to increased energy demand. Aggressive efficiency and conservation measures can neutralize demand, but they

require a sustained effort between local and regional entities and residents. It is therefore essential that Barnet residents are well informed about efficiency and weatherization opportunities.

**2. Switch to clean-burning sources:** Replace traditional fossil-fuels with electricity, which can come from clean renewable sources like solar and hydro.



<sup>4</sup> Energy use data were based on the best available information 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. 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) or thousands of MMBTUs (billions of BTUs).



Appendix III contains a more detailed analysis of existing energy use, as well as a potential pathway to meet the “90 by 2050” energy goals based on a LEAP analysis.<sup>5</sup> Although it’s a hypothetical scenario, the LEAP analysis conveys the scope and scale of change that will need to occur by 2050:

- Deep weatherization (reducing overall energy use by 20% to 30%) of about 44% of Barnet’s housing stock.
- Heat pumps installed in nearly 50% of homes.
- Efficient wood heat systems in more than one-third of homes; and
- More than 60% of cars in Barnet to be fueled by electricity.

Local land use policy plays a critical role in Barnet’s energy conservation strategies. This plan, for example, encourages new and denser development in and around the village areas, which is close to existing development and services. The Town can also discourage growth in areas not well-served by roads and public infrastructure. Allowing for flexibility in site design of new properties should allow for access for passive solar orientation for residential uses.

Nevertheless, there are limitations to how much compact, dense development a rural community like Barnet can support. With limited goods and services and public transit options, the town’s clearest path to reduced reliance on automobiles may be through better telecommunication infrastructure that allows more residents to work from home. The town can also help to coordinate and promote ride sharing opportunities through Front Porch Forum and similar community-focused media.

There are several “green building” developmental techniques that lend themselves to the conservation of energy. Southern orientations, cluster housing, and the use of topography or vegetation to shield structures from the prevailing winds reduce energy usage. A careful review of Barnet’s Zoning Bylaw should ensure that development standards do not interfere with energy efficient design.

### Energy Equity Challenges

According to a report from Efficiency Vermont, Energy burden, which is expressed as energy spending as a percentage of income, tends to run higher than average in the Northeast Kingdom. (Statewide, the burden is about 10%, but in Barnet, it is estimated to be 10.5%.) The greatest determinant of energy burden is income, not fuel cost, so even though many residents are able to reduce their costs by burning wood, they still struggle to make ends meet.

Energy burden complicates meeting 2050 challenges of weatherization and fuel switching. Even if those measures save money in the long run, energy burdened households simply can’t afford them. The same economic challenges that drive inequities across the state are likely to reduce energy program participation among low-and moderate-income Vermonters. While energy efficiency utilities typically focus on the largest users to achieve more dramatic savings, services must be better aligned to help energy-burdened users as well. Heat Saver loans, for example, offer 0% financing to low-income customers for weatherization and heating improvements. Heat Squad’s recent entry into the Northeast Kingdom makes affordable whole energy audits available to low- and moderate-income households. Northeast Employment and Training Organization (NETO) offers free weatherization to income-qualified households. Outreach and education about these programs may improve participation for the 260+ households in Barnet with incomes below the county median income.

---

<sup>5</sup> LEAP stands for Long-Range Energy Alternative Planning Systems, a widely used software tool for energy policy analysis. Barnet’s LEAP projections are derived from statewide projections, using the town’s population as a percentage of the statewide population.

## Renewable Energy Siting Guidelines

The Northeast Kingdom Regional Plan has a new net generation target of 18,680 MWh (i.e., new generation) for the Northeast Kingdom. Barnet's generation target, which is based on the town's share of the region's population, is 488 MWh. The Regional Plan uses a conservative estimation process for Barnet's generation potential. Even after accounting for major contingencies constraints and connectivity issues, Barnet's estimated total solar production capacity alone exceeds the target of 488 MWh. More details are in Appendix III.

### General Standards

In-place upgrades of existing facilities, including existing transmission lines, distribution lines, and substations are needed to serve the town and region: To the extent physically and functionally feasible, existing utility systems, including transmission lines, distribution lines, and substations, should be upgraded or expanded on site or within existing utility corridors before new facilities or corridors are considered.

Energy facility development must benefit the Town of Barnet and its adjacent communities (residents and businesses). The benefit must be in direct relation to and proportion to the documented impacts of the proposed development on community facilities, services, economy, and resources.

The height, setbacks, and access of renewable energy projects must be carefully considered with the goal of minimizing impact to the viewshed and neighboring landowners.

Siting should involve the Agency of Natural Resources at the start of the project to avoid problems with wetlands and protected and threatened species. Siting must avoid hazard areas such as floodplains and steep slopes, conservation areas where there will be an adverse impact on surface waters, primary agricultural land as mapped by the USDA Natural Resource Conservation Service for the state and significant wildlife habitat areas. Impacts to forestland should be minimized by using existing roads and locating along existing tree lines to avoid forest fragmentation.

All facility certificates shall specify conditions for system decommissioning, including required sureties (bonds) for facility removal and site restoration to a safe, useful, and environmentally stable condition. All materials and structures, including foundations, pads, and accessory structures, must be removed from the site and safely disposed of in accordance with regulations and best practices current at the time of decommissioning.

### Wind Generation Siting Standards

Barnet has very limited potential for wind energy development, and the municipality lacks areas with elevations sufficient to support utility scale wind development (100KW or greater). Moreover, the Town supports the policy of the NVDA's regional plan, which states that upland areas of 2,000 ft elevation or more, headwaters, forest coverage of site class 1, 2, or 3, priority forest habitat blocks, and state natural areas and fragile areas are unsuitable for utility-scale energy development. Because no locations in Barnet have a suitable wind resource, infrastructure availability, or areas free from significant environmental constraints, no utility-scale wind energy facilities should be sited in town. Smaller scale wind projects, including residential-scale turbines (generally less than 10 kW) may be appropriate as long as noise from the turbines does not adversely affect neighboring residential properties.

### Solar Siting Standards

The Town of Barnet encourages solar energy development, of any scale, on building rooftops.

The Town strongly supports the development of small-scale (150 kW capacity or less) electricity generation from solar energy at homes, businesses, schools, and other institutions, as well as

community solar projects, which may benefit people who might not otherwise be able to participate in a clean energy project. (For purposes of this plan, “community solar projects” are group net metered installations between 15 kW and 150kW in capacity, with shares in the facility sold to the site owner, neighbors, community members, nonprofits organizations, and local businesses and from which renewable energy credits (RECs) remain with the project)

The Town strongly supports the integration of on-farm solar generation into active agricultural uses that can help farms reduce expenses, generate extra income, and remain viable. The town supports 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.

#### Preferred Areas:

Only sites identified as Preferred solar sites on the Solar Resource Map or Preferred Areas as identified above may be developed for solar generation facilities with a capacity of more than 150 kW. All siting and screening requirements as identified above must be met. 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.
- Systems located in proximity to existing commercial, municipal, or industrial buildings.
- Proximity to existing hedgerows or other topographical features that naturally screen the entire proposed array.
- Former brownfields.
- Facilities that are sited in disturbed areas, such as gravel pits, closed landfills, or former quarries.
- Working farms, where more than 50% of the energy generated by solar development is used by the farm.

#### Prohibited (Exclusion) Areas:

Development of solar generating facilities shall be excluded from (prohibited within), and shall not be supported by the Town, in the following locations:

- Floodways shown on Flood Insurance Rate Maps (FIRMs).
- Fluvial erosion hazard areas (river corridors).
- Class I or II wetlands.
- A location that would significantly diminish the economic viability or potential economic viability of the town’s working landscape, including productive forest land and primary agricultural soils (as defined in Act 250 and as mapped by the U.S. Natural Resource Conservation Service).
- Rare, threatened, or endangered species habitat or communities as mapped or identified through site investigation, and core habitat areas, migratory routes and travel corridors.
- Steep slopes (>25%)
- Surface waters and riparian buffer areas (except for stream crossings).
- Topography that causes a facility to be prominently visible against the skyline from public and private vantage points such as roads, homes, and neighborhoods.
- Not in scenic vistas (see Appendix IV.I Scenic Vistas)

Solar energy installations, trackers and roof mounts, should be sited in such a way to prevent adverse impacts to historical and cultural resources including:

- Removal or demolition.
- Physical or structural damage,

- Significant visual intrusion, or threat to the use.
- Significant intrusion in a rural historic district or historic landscape with a high degree of integrity.
- Significant visual intrusion into a hillside that serves as a backdrop to a historic site or structure.
- Creation of a focal point that would disrupt or distract from elements of a historic landscape.
- 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.

### Climate Resilience Goals and Strategies

**Goal: Protect and restore areas identified and designated as floodplains, river corridors, and land adjacent to streams.**

**Recommended Actions:**

Continue to enforce Barnet’s flood hazard regulations.

Review new FEMA draft maps when they become available and amend Barnet’s Flood Hazard Regulations as necessary to maintain enrollment in the National Flood Insurance Program.

Consider amending Barnet’s Flood Hazard Regulations that further reduce flood risk and increase ERAF funding.

Work with the Regional Planning Commission, the Natural Resource Conservation District, and landowners to investigate channel management easements, berm removal, fencing, and buffer plantings along segments of streams identified as high-asset areas.

Work with the Regional Planning Commission, the Natural Resource Conservation District, and officials from upstream communities to address control of stormwater runoff and access to floodplains.

**Goal: Mitigate risks to public safety, critical infrastructure, historic structures, and municipal investments.**

**Recommended actions:**

Update the Local Hazard Mitigation Plan, seek FEMA approval, and seek FEMA funding for mitigation projects.

Replace and upsize culverts based on stream geomorphic assessments and hydraulic studies.

Educate residents on high-risk areas in Town so that they can be prepared in a flood event.

**Goal: Protect upland forested areas and wetlands that attenuate and moderate flooding and streambank erosion.**

**Recommended action:**

Encourage property owners seeking to develop their land to utilize the existing Planned Unit Development provisions in the Town’s bylaws to minimize impervious coverage and clearing.

**Goal: Reduce local dependence upon costly non- renewable energy sources.**

**Recommended Actions:**

Support the activities of the local energy committee and participation in regional energy planning efforts.

Encourage the development of alternative energy sources in the Town, especially renewable energy sources such as solar and hydroelectric.

Establish town policy that projects for the construction or maintenance of public buildings will consider energy efficiency and costs in the planning process.

Publicize successful examples of efficiency, weatherization, and renewable energy production to promote change.

Make information available about lending programs that can improve the efficiency of older housing stock, such as Efficiency Vermont's "Heat Saver" loan and USDA Direct and Guaranteed Loan Programs, for single homes and multi-family homes.

Collect data on current energy usage in Town Buildings.

Complete energy audits of Town Building and carry out the recommendations. Publicize success stories from Town residents that have installed renewable systems. Consider the Town funding of a bulk purchase of LED light bulbs to sell to Barnet residents.

Continue public education and publicize success stories on weatherization, heating systems and renewable energy projects.

Reduce vehicle idling in private and public spaces.

Review zoning bylaws to ensure that existing regulations do not conflict with net-zero and near net zero development, such as "passive design" principles, and Vermod.

Establish public EV charging stations. Consider the Village Center Designation program as a potential funding source.

## Environmental Stewardship

*The purpose of planning for orderly development is to encourage and promote that kind of community growth which will preserve the health of the Towns natural environment, its scenic and architectural beauty, physical beauty, unique character, quality of life, and the economic welfare of its citizens.*

### Challenges and Opportunities

- Stormwater related erosion from roads, both paved and unpaved, degrades water quality.
- Rural residential sprawl is causing the parcelization of our largest forest blocks.
- The spread of invasive species is endemic in Vermont.
- There is a growing public awareness of the benefits of forests, including carbon sequestration and the working lands economy.

### Water Quality

A watershed or *basin* is an area of land drained by a river and its tributaries. The Vermont Department of Environmental Conservation develops Tactical Basin Plans to monitor, assess, and protect water quality in each basin. Tactical Basin Plans highlight the projects or actions needed to protect or restore specific waters and identify appropriate funding sources to complete the work.

Barnet, for water quality planning purposes, contains three Tactical Basin Planning Areas.

**Upper Connecticut (Basin 16):** Stretching from Canaan to Barnet, this basin comprises multiple sub-basins that drain to the Connecticut River north of the Passumpsic River confluence. The northeast corner of Barnet, including the Comerford Reservoir, is in this basin planning area.

**Passumpsic (Basin 15):** Draining from major portions of Caledonia County and minor parts of Essex, Orleans, and Washington Counties, the Passumpsic basin originates in Brighton and drains south, where it reaches the Connecticut River in East Barnet. The northern half of the Town is in this planning area.

**Ompompanoosuc, Stevens, Wells, Waits and Connecticut River Direct Tributaries (Basin 14):** This basin drains portions of Caledonia, Orange, and Windsor Counties. The northern-most point of the basin originates in Peacham around the headwaters of the Stevens River and terminates in Norwich, near to where Dothan Brook flows into the Connecticut River. The southern half of Barnet is in this planning area.

All three basin plans are focused on reducing nutrient loading to Long Island Sound from the Connecticut River and its associated tributaries. River-borne nutrients, especially nitrogen, fuel the excessive growth of algae. When the algae die, they sink to the bottom, where they are consumed by bacteria. The microbial decay of algae and the respiration of these organisms use up the available oxygen in the lower water column and in the bottom sediments, gradually reducing the dissolved oxygen concentration to unhealthy levels. Research suggests that Vermont's nitrogen export to Long Island Sound accounts for about 12% of the total load. Consequently, the basin plans focus on a variety of sources of nutrient loading and strategies to reduce it.

### *Required Agricultural Practices/Best Management Practices*

While contributions of non-point source pollution from agriculture may vary from watershed to watershed, the overall impact to water quality from agricultural lands is significant. Act 64, Vermont's Clean Water Act, extended Required Agricultural Practices to all farms, establishing standards such as cover cropping, nutrient management plans, and vegetation buffer zones. The Natural Resources Conservation Districts, UVM Extension, Agency of Agriculture, and the Natural Resources Conservation Service (NRCS) can help facilitate compliance with technical assistance and funding. In forestry

operations, Vermont's Acceptable Management Practices (AMPs) help to prevent sediment, petroleum, or woody debris from entering water bodies. The Department of Forests Parks and Recreation will loan temporary bridges to foresters to comply with the AMPs.

#### *Restoration of Natural Infrastructure*

Pollutants such as soil particles, fertilizers, pesticides, and road salts, are washed by rainfall from developed and agricultural lands into water bodies. Protecting Barnet's natural infrastructure helps to prevent and abate pollution.

Forests, for example, can reduce nutrient loading and runoff. Although all three basin areas have a significant level of forest cover, just 5-10% developed land use in a watershed may cause altered flows significant enough to increase the risk erosion damage and runoff. The Stevens River watershed has reached an 8% percent level of developed land cover. Wetlands also have an extraordinary capacity to reduce nutrient load and runoff and remove pollutants from surface waters. Three pollutant removal processes provided by wetlands are particularly important: sediment trapping, nutrient removal, and chemical detoxification. Barnet has about 570 acres of mapped wetlands, but it's likely that there is more acreage to be identified.

Rivers are constantly adjusting to achieve a state of equilibrium through a process of erosion, deposition, transport of sediment. Historically, many of our region's rivers have been straightened, causing the stream channel to become incised and disconnected from their floodplains. This results in more sedimentation being carried downstream. Giving streams and rivers more room to shift over time not only increases flood resilience, but it protects water quality as well. (See Climate Resilience for an exploration of flood hazard risks).

Natural vegetation along lakes and ponds filters sediment out of runoff before it enters lakes. Many mammals, insects, amphibians, and birds need significant amounts of undeveloped shoreline for habitat and hunting grounds. Humans depend on these waters for recreational activities and the quiet appreciation of nature in an undisturbed state.

There are three lakes in Barnet with a combined shoreline of 30,560 feet. Harvey Lake, the largest of the three with over 21,000 feet of shoreline, is entirely developed. Nearly all of Warden Pond's 6,449 feet of shoreline is undeveloped, as is about half of the 3,061 feet of shoreline of Sara Moore Pond. Jewett Pond is part of the 1,590-acre Roy Mountain Wildlife Management Area that encompasses lands in Barnet and neighboring Ryegate. The pond has a significant wetland complex that provides wildlife habitat to nesting birds, amphibians, and moose. Shoreline areas are important scenic and natural resources which should be protected. Without adequate protection these beautiful and fragile environments can be easily destroyed. Once damaged, shore lands are not easily returned to their natural state.

Barnet has adopted Shoreline Regulations which have effectively guided development on shoreline property. In 2014, the Vermont Shoreland Protection Act became effective requiring a jurisdictional determination or permit from the State for development and clearing activities within 250 feet of lakes greater than 10 acres in size. The Department of Environmental Conservation within the Vermont Agency of Natural Resources administers the Shoreland Permit Program. Lakes regulated under this program in Barnet include the Comerford Reservoir (formed by the hydroelectric dam on the Connecticut River), Harvey Lake and Warden Pond.

## Sediment and Erosion Control on Roads

Vermont's roadways are responsible for about 10% of sediment and phosphorus sources to our waters, and municipal roads make up 70% of the State's total road miles. To address this, Act 64 mandated the creation of the Municipal Roads General Permit (MRGP), which set road drainage standards that improve water quality and establish a plan for Towns to meet these standards over time. All municipalities must develop and implement a multi-year plan to identify sections of local roads that do not meet standards for sediment and erosion control, starting with road segments that pose the highest risks to surface waters.

The MRGP helps towns find and fix road erosion problems through a three-step process:

1. **Road Erosion Inventories:** All road segments that drain into a stream, river, or lake are identified and GPS-inventoried for drainage conditions and erosion locations. (A typical road segment length is 328 feet.) The regional planning commission assisted Barnet with this process.
2. **Prioritization:** Towns analyze the results from that road erosion inventory, and then prioritize the road projects based on the highest potential impact to water quality.
3. **Implementation:** Road crews respond by implementing Best Management Practices (BMPs) to protect water quality. Required practices include road crowning, lowering of road shoulders, grass- and stone-line ditching, and upgrading driveways, drainages, and intermittent stream culverts. Grants from VTrans and the Agency of Natural Resources are available to assist with implementation. In FY23, Barnet received \$33,500 for this purpose.

According to recent data from the Agency of Natural Resources, 681 of Barnet's road segments will need to be brought into compliance by 2036.

## Preventing Spread of Aquatic Invasives

Aquatic invasives species are a serious threat to water quality because they can change the surrounding ecosystem and out-compete native species for food and habitat. Once established, they are nearly impossible to eradicate. Some invasives, such as Eurasian milfoil are easy to detect, while others, such as larval zebra mussels and the spiny waterflea, are too small to see. To date, Harvey Lake is free of invasives, but visitors to the Lake can unwittingly transport invasives from other waterbodies on boats and equipment that have not been properly drained, cleaned, or dried. Lake Harvey Greeter Program and The Lake Harvey Association work with the Agency of Natural Resources to collect data on boat and watercraft usage, offer a hot water boat wash and educate lake visitors on best preventive practices. In 2022, the Greeter Program reported more than 600 boats launched at the Lake.

## Habitat Blocks

There are places in Barnet which are quite unusual because of their wildlife, plants, or geological features. The Roy Mountain Wildlife Management Area is an example of such a place. Often remote, quiet, or beautiful, these places have been frequented for generations. Our increasing ecological awareness and the pace of land development have made these natural areas more critical than ever before.

Intact forestlands provide a wealth of biodiversity for wildlife species, migration to new habitat, and a vital source of carbon sequestration in the adaptation of climate change. They also provide integral economic and recreational value for the community and are cherished in Barnet's community values. The Town is committed to protecting and preserving such habitats while providing access to working forests. In 2018, Act 171 was passed by State legislation, which requires town plans to identify important areas of forest blocks and habitat connectors and plan for land development in those areas to minimize forest fragmentation. The Agency of Natural Resources' (ANR) "Biofinder" mapping tool



provides critical insight into the ecological function of unfragmented forest blocks, which provide core habitat as well as vital connectivity to larger forest blocks beyond town boundaries. Here are some of the key concepts deployed by Biofinder:

**Forest Block:** a contiguous area of forest in any stage of succession, not currently developed for other uses.

**Habitat Block:** Forested areas of at least 20 acres with no roads or low densities of Class IV roads. They contain little or no human development such as buildings, parking areas, lawns, gravel pits, active agricultural land, and so forth, but can be composed of any natural land cover type: various successional stages of forest, wetland, old meadow, among others.

**Connectivity Blocks:** land or water that links wildlife habitat within a landscape, essentially acting as a “stepping-stone” that allows for migration of animals and plants and the functioning of ecological processes. Riparian areas along streams and rivers, strips of forest cover between developed areas, and even hedgerows/ fencerows all represent potential connecting habitat for wildlife and other organisms. Generally, such areas are characterized by undeveloped forested and riparian corridors, including forest cover reaching to road rights-of-way, which serve to link large tracks of unfragmented core habitat.

**Interior forest block:** Also known as core habitat, these are areas of the most highly contiguous forest and other natural habitats that are unfragmented by roads, development, or agriculture. The defining factor is that there is little or no permanent habitat fragmentation from roads, agricultural lands and other forms of development within an interior forest block.

**Fragmentation:** When roads, land clearing, development, or other land uses divide forests, waterways, or other natural habitats into smaller and smaller areas. Depending on the location and scale, fragmentation can negatively affect plant and animal species, wildlife habitat, and water quality.

Barnet’s priority interior forest blocks are largely concentrated in the eastern portion of town, following the Passumpsic River. They support viable populations of wide-ranging animals that require large areas to survive by allowing access to important feeding habitats, the ability to move and find mates for reproduction, and as a result ensure genetic integrity of populations. The largest and highest ranked priority habitat blocks are contained in the Roy Mountain WMA, and in the area where Barnet, Danville, and Peacham boundaries meet.

Barnet’s priority interior forest blocks also function as highest priority *connectivity* blocks, allowing for north movement along the Passumpsic valley up into vast concentrations of interior forest blocks in Essex County, as well as movement south into the Groton State Forest.

Barnet also contains a vast network of riparian connectivity corridors along its lakes and streams. Many wildlife species use riparian corridors for travel to find suitable habitat, but certain species are almost entirely restricted to riparian areas, including mink, otter, beaver, and wood turtles. Maintaining vegetation buffers along these corridors is critical.

After a century of forest regeneration, Vermont is now losing forest cover. While some of this loss comes from conversion of forests to agriculture and commercial uses, the main cause is incremental, low density residential development. Subdivision is contributing to parcelization as well. While large areas of the state were once made up of large parcels owned by a single family or company, properties are now often split and sold to many different buyers. Parcelization impacts forests, even when the land is not converted for development. Overall, economically and environmentally sustainable forest management is very difficult on parcels smaller than 50 acres. The Vermont Parcelization web site

indicates that Barnet's acreage in its largest parcels (200 acres and up) lost about 400 acres from 2004 to 2020. As climate migration to the Northeast Kingdom intensifies, so could the parcelization of our habitat blocks and connectivity corridors. The Town will need to give special consideration to the effects of development on these critical natural resources.

### Extraction of Earth Resources

Earth and mineral extractions and their transport have the potential to be damaging to the environment and public infrastructure if carried out improperly. While many communities rely entirely on Act 250 jurisdiction to minimize impacts, Barnet has added additional regulations to our By Laws including limiting:

- Excessive dust and noise may result in unreasonable nuisance to neighboring properties and create air quality issues.
- Improper site management which may lead to excessive soil erosion, soil compaction, water quality impacts, or inadequate site restoration.
- Site degradation which may result in aesthetically unpleasing conditions in the immediate vicinity of the project and/or the community,
- Deterioration of town and state highways or other public infrastructure due to frequent truck traffic.

#### Goals:

**Maintain and improve the water quality found in Barnet's lakes, ponds and streams and springs.**

**Preserve and enhance our wetland resources.**

**Ensure the protection of Barnet's shorelines.**

**Enhance the recreation, scenic and natural resource values of the rivers, streams and brooks in Barnet.**

#### **Support the goals of the Tactical Basin Plans**

##### **Recommended actions:**

Consider a minimum 50' vegetation buffer requirement around waters bodies not regulated by the Vermont Shoreland Regulations and streams. Consider adding Sutton Brook to the Bylaw list of protected waterways.

Support State and Local efforts to prohibit Wake Boats on our waterways.

Pursue a diverse base of funding sources to support mitigation of aquatic invasive species, including state grant programs, and federal hazard mitigation programs.

Support efforts of the regional partners (Natural Resource Conservation Districts, UVM Extension, Natural Resource Conservation Service, Vermont Agency of Agriculture Farm and Markets, the Vermont Department of Forests Parks and Recreation, Passumpsic Valley Land Trust, Vermont Land Trust, Connecticut River Joint Commission) to coordinate outreach, technical assistance, and financial assistance to farmers and foresters to address water quality issues.

Support the efforts of the Dam Committee, Lake Harvey Greeter Program and Lake Harvey Association.

Work with VTrans, Better Back Roads, and NVDA to bring road segments into compliance in accordance with the Municipal Roads General Permit.

Develop and adopt a River Corridor Protection Ordinance to reduce potential erosion in river corridors. (See Climate Resilience.)

**Goals:**

**Maintain and improve forest blocks and habitat connectors in Barnet.**

**Identify, designate, and preserve significant natural areas in Barnet.**

**Maintain the diversity of habitat and species that exist in Barnet.**

**Policies**

Development that takes place within identified priority interior forest blocks shall be located at the edges of the blocks to reduce fragmentation by roads, clearing, and development. If there is no land that is physically suitable for development at the edge of the blocks, the development must be sited to minimize fragmentation of the blocks.

Roads, driveways, and utilities shall be designed to avoid the fragmentation of priority interior forest blocks.

Private roads longer than 1,000 feet are prohibited within the priority interior forest blocks, as identified on Barnet's Proposed Land Use Map, unless a longer road reduces impacts on natural resources.

When land is subdivided, provision shall be made to ensure access for forest management and shall avoid potential conflicts between land uses.

**Recommended Actions**

Review and update Barnet's Zoning Regulations to create stronger incentives for Planned Unit Development and minimize the creation of private roads. Consider a density-based approach as an alternative to minimum lot sizes, or a maximum lot size for rural residential development.

Consider the development of subdivision regulations.

Promote the Use Value Appraisal ("Current Use") Program and encourage property owners to follow a management plan.

Work with property owners and land trusts to identify priority areas for conservation easements.

## Governance and Services

*Supporting an active and engaged citizenry requires a range of services and amenities – all of which can strain the budget of a small rural community. The Town must achieve a delicate balancing act to ensure that facilities and services are maintained in a manner that keeps pace with a changing population.*

### Challenges and Opportunities

- Barnet’s local governance relies heavily on a limited pool of volunteers, many of whom serve in multiple capacities. Recruiting new volunteers is difficult.
- Barnet residents are highly auto dependent.
- Barnet’s existing Town Offices are undersized and inadequate.
- The historic Town Hall has the potential to become the new municipal offices.

### Town Properties

#### *Barnet Town Forest*

Lot # 05-01-15 at the end of Town Highway # 14 (now called Town Forest Road) was acquired in 1957 for Town use. It was a farm consisting of 196 acres with a brick farmhouse, on the east side of the Passumpsic River and contained a substantial stand of hard and softwood timber, which has been harvested multiple times.

A year after the purchase there was an article on the agenda at the Town Meeting to apply for Town Forest designation. After discussion, the matter was tabled and there are no records to show that it was brought up again.

The area is now a MSHA regulated rock, gravel, and sand pit, supplying all the material to maintain Barnet’s roads. It is only called a Town Forest because in 1997, when the road came up to be named, we chose, “Town Forest Road” because it was felt that nobody wanted to live on “Dump Road.”

#### *Harvey Lake Beach and Picnic Area*

The Harvey Lake Beach, traditionally called Sunny Beach, and the adjoining picnic areas, which contains a permanent picnic shelter, are situated at the north end of Harvey Lake. The beach and picnic area are bordered on the east by the Stevens River and cover about one half the north beach area. The area is supervised in the summer months and organized swimming instruction is offered. A fee is charged for the use of the parking, beach, bathhouse, and picnic area.

#### *Town Garage*

The Town Garage, built in 2010, which is capable of housing the equipment for the highway department, is located at 131 Granger Street with easy access to US Route 5. A salt shed was added at this location in 2012. Equipment is updated or replaced as required by funds put aside in each budget.

#### *Town Offices*

The Town Clerk's Office is a two-story wood-frame building on the east side of US Route 5 just north of the center of Barnet Village. The Town Office on the first-floor level is open on weekdays from 9:00 AM to 12:00 PM and 1:00 PM 4:30 PM. Meeting space on the first floor is extremely cramped and limited, and vault capacity is growing short.

Beginning in 2021, the Selectboard explored the creation of new municipal office space using the Town Hall on the north side of Church Street in Barnet Village. The Town Hall is a wood-frame building built circa 1875.

The Town Hall is being renovated to become the future home of the Barnet Municipal Offices. The Selectboard is working with Black River Design and Estes and Gallup to use the current Town Hall's footprint to create energy-efficient space to house offices for our Town Clerk, Assistant Town Clerk, Listers, Zoning and Planning Board and Selectboard. It will have offices, a reading room, a large meeting voting room and provide more storage space in the vault and other storage areas. The building will be lifted and moved in the summer/fall of 2023 with construction to begin in the Winter of 2023/24. The Selectboard is hoping to utilize local craftsmen and artisans for some of the work. A parcel of land at the junction of Bimson Drive and Church Street has been donated to the Town by the Wells River Savings Bank, and this land will provide overflow parking for the facility in addition to the small parking lot adjacent to the west side of the Town Hall.

#### *Town Library*

The Barnet Public Library was established in 1900 and funded with donations by Horace Fairbanks and Albert Warden. The library opened its doors above the Town Clerk's Office on January 16, 1902. The library has served the community continuously since that day. In January of 2001, the Library moved into the first floor of the former Barnet Village Schoolhouse. The new location allowed for handicapped accessibility and provided twice the space.

The library currently offers books, magazines, local newspapers, downloadable audio and ebooks, videos, high-speed wireless internet access, public computers, inter-library loans, deliveries, story hour, summer reading programs, special events and public meeting space. The library serves as a hub for people seeking resources and information of all kinds. The library has retained a flexible format to serve its patrons better. There are patron computers available for use and individual areas for patrons to sit and use their own devices. There is a thriving story hour and summer reading program, and hands-on art classes for adults. Located in the center of Barnet Village, it is the place for people to come for all kinds of answers. When the old Town Hall across the street is restored, the library's social mission is likely to expand.

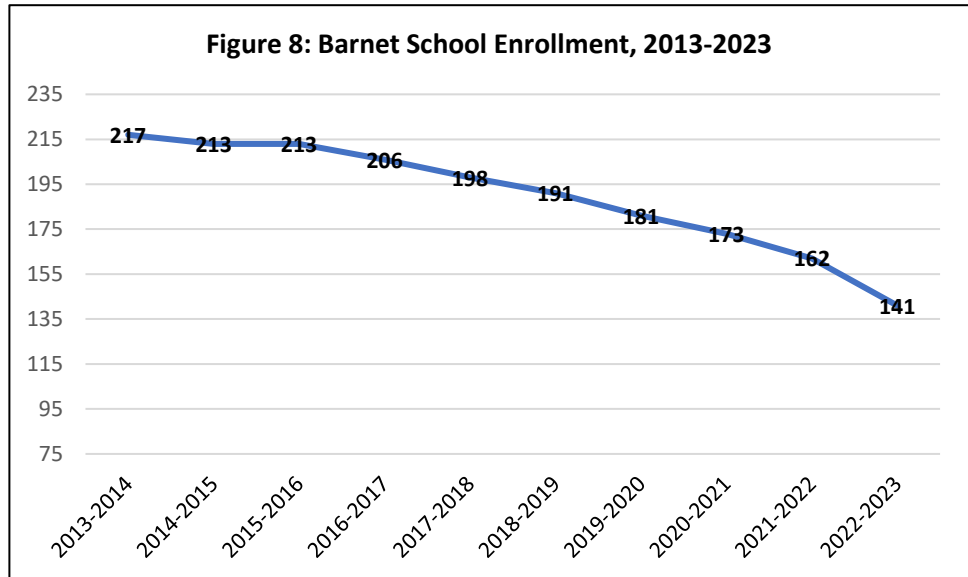
The Barnet Public Library is committed to promoting reading, literacy and community engagement in a safe and welcoming environment for everyone in Barnet and beyond. The library defends the idea of free and public information resources for all.

#### *Town School and Land*

The Barnet School, completed in 1990 and replacing the five village schools, and the adjoining recreation field occupy a ninety-six acre site at 163 Kid Row, off the West Barnet Road. The school Vision Statement follows: "Barnet School strives to be a supportive community of learners in which every member meets the highest standards. We are becoming local and world citizens who honor the environment, people, and cultures of the world". The school provides education from PreK through the eighth grade. All ninth through twelfth grade students are tuitioned to area high schools. The school also provides 7th and 8th grade education for Peacham students. In 2020 ACT 46 created the Caledonia Cooperative School District including Barnet, Walden and Waterford. CCSD is part of the Caledonia Central Supervisory Union.

The Barnet School has experienced a long-term drop in enrollment, which aligns with overall demographic changes in Vermont. The largest drop in enrollment came from the transition to home study during COVID 19, but many of those students came back after the pandemic. (Figure 8)

In the coming years, the school facility will need nearly \$350,000 in improvements and upgrades, which include replacement of windows, gym floor refinishing, repairs to curbing and sidewalks, and replacement of siding.



#### *Fire Station*

The Fire Station, built in 2004 at 151 Bimson Drive in Barnet Village, houses the majority of the town’s fire-fighting equipment. The Barnet Fire and rescue volunteers respond to emergency medical calls and all fire calls. Also residing in the fire House is the Vermont Hazmat first response vehicle.

#### *Discontinued/Derelict Town Buildings*

As town properties change use or become obsolete, we believe retaining ownership of the property will best serve future generations. Demolition of structures with no significant value, use, or historical attributes is preferable to the sale of town property at auction as has occurred historically with properties such as the original 5 schoolhouses. The West Barnet Fire Station and the soon to be Old Town Clerk Office are structures that will soon require big decisions about their long-term future.

#### *Cemeteries*

The Town contributes to the maintenance of four cemeteries: Stevens Cemetery, Palmer Cemetery, Pleasant View Cemetery, and McIndoe Falls Cemetery. Other cemeteries include the West Barnet, Barnet Center, and Walter Harvey.

#### *Solid Waste: Transfer Station and Recycling*

**Transfer Station:** Upon the closing of the dump in 1991, the Selectboard opened a transfer station on July 10, 1991, with roll off containers and the shed used by North Country Recyclers Inc. used in the eighties to collect paper, cardboard, metal, and glass, for the attendant. In August 2007, the Selectboard added a household trash compactor with an attendant office, electricity, and a phone. The hours are Saturdays 8 a.m. to 3 p.m. Wednesday, Memorial Day to Labor Day 3 p.m. to 7 p.m.

Act 78 established Waste Management Districts. Barnet was a founding Member, with one supervisor and one alternate on the board of Northeast Kingdom Waste Management District (NEKWMD). NEKWMD works cooperatively with the Town to manage solid and hazardous waste in accordance with the District’s solid waste implementation plan as it is updated.

Recycling: Barnet had recycling as early as the 1960's. In 1980 North Country Recycling Inc. was formed as a non-profit by volunteers from Barnet, Danville, Peacham and St. Johnsbury. Each had a shed to collect paper, cardboard, metal and glass. With the closing of the dump, recycling was moved to the new school, using a roll off and a U-Haul truck body, collecting paper, plastic, metal, cardboard, and glass, on the first Saturday of the month 8 a.m. to noon and the fee was 25 cents per brown paper bag. This was all done by volunteers. March 8, 2003, recycling moved into the new building at the transfer station. More recyclables were added as the NEKWMD found markets, which required two more additions, the last in 2021 which included lights! On July 1, 2015, ACT 148 took effect banning recycling and hazardous waste from landfills. The final item to be banned was food scraps July 1, 2020. All banned items are free at the Barnet Recycling building. Some items can also be swapped or repurposed if they are usable.

### Water and Sewer

Barnet Village has a water system owned by Fire District #2. McIndoe Falls water system is owned by the Fire District #3. Passumpsic Village is served by the Town of St. Johnsbury Water System. The remaining Barnet households maintain private water supplies. There are presently no public sewage treatment facilities in the Town.

### Dam Committee

The Town of Barnet has had a Dam Committee for many years. The main purpose of the committee is the care, maintenance and upkeep of the West Barnet dam on the Stevens River. The dam was built by Green Mountain Power and served, for many years, as the control for the Steven's River flow to the Barnet Village Dam electricity. Eventually, it was absorbed by the town of Barnet and the town used it to help maintain the water level of Harvey Lake. Currently this is not an option for the town as manual manipulation of the dam is discouraged by the State of Vermont. The Dam Committee is currently working on the hazard reclassification of the dam in an attempt to get permitted for a dam alteration. The dam alteration is essential to maintaining the health of Harvey Lake as it will facilitate the flow of water leaving the lake and the South Peacham brook.

### Transportation

Barnet's geography dictates that transportation needs within its boundaries are met almost exclusively by the private automobile. Barnet residents are therefore dependent upon a well-maintained road system. Other transportation services are available, though limited. Rural Community Transportation (RCT) currently provides van transportation to disabled, elderly or incapacitated Barnet residents, primarily on a contract basis with local health care and social service providers. These services are available on a limited basis for other residents on a fee-for-service basis. Nevertheless, Barnet residents remain highly dependent on their automobiles, which adds thousands of dollars annually to their living expenses.

Approximately 82 miles of roads are maintained in Barnet. Many of these are used by school buses, which makes it especially important that they be passable and safe. Many of the Class III roads are difficult to plow because of close banks and trees. The Town Highway Department continues to improve Class III and Class II roads as money becomes available. There is some resistance to the change in scenery that road improvements cause. Such surface improvements can have a negative impact on the scenic value of a road.

Highways. The following classes of highways have been designated within the town of Barnet:

Class I (State highways maintained by the Town) There are no Class I highways in the Town of Barnet.

Class II (State-aid highways) There are 23.51 miles of state-aid roads in Barnet consisting of Joe's Brook Road, Comerford Road, West Barnet Road, Barnet Center, Roy Mountain Road, Harvey Mountain Road and several short pieces. The Vermont Agency of Transportation allows the Town a variable sum per mile per year for maintenance and Construction of Class II roads.

Class III (Town highways) There are 58.46 miles of Town highway for which the state allows a variable sum per mile per year for maintenance but gives no construction costs. The State has its own minimum standards for these roads, which frequently are not in keeping with the wishes of property owners because the density of traffic may not warrant required upgrading. The unnecessary upgrading of a little-used road can change the character of an area and should be carefully considered prior to approval.

Class IV (10.95 miles) No work is done, except for water crossings, on these roads.

Legal Trails. There are 0.09 miles of Legal Trails, (that were part of Town highways #27 and #37).

Interstate 91. Maintained by the State of Vermont, I-91 runs for approximately ten miles within the Town and Exit 18 is located on the edge of Barnet Village. The right-of-way acquisition of land to construct this highway removed approximately 380 acres from the Town's tax base.

US Route 5. A major north-south highway in the State, Route 5 links four of Barnet's villages and is maintained by the State of Vermont.

Rail Service. The Railroad has been important to the Town of Barnet ever since the first train arrived in 1850, linking the town with Canada to the north, and rest of New England to the south. For over a hundred years, the railroad took butter, cheese, and milk to market, brought in western grain, and provided passenger service. Today, the right-of-way is owned by the State of Vermont, which has granted an operating lease to the Washington County Railroad division of Vermont Rail Systems. Daily freight service has been restored after extensive repairs to the line, and Morrison's Custom Feeds is one of the line's biggest customers. There is no passenger service available.

### Emergency Response: Police, Fire and Rescue

Town-organized police protection and law enforcement is limited. Accordingly, strong support should be given the State Police, the County Sheriff, and local constables. The Caledonia County Sheriff provides regular highway patrol services to the Town.

Fire protection is provided by Barnet Fire & Rescue, backed up by mutual aid from surrounding towns. A facility built in 2004 at 151 Bimson Drive in Barnet Village houses the majority of the firefighting equipment. The Barnet Fire and Rescue volunteers respond to emergency medical calls and all fire calls. Also residing in the Fire House is the Vermont Hazmat first response vehicle. In addition, Barnet is served by the Caledonia-Essex Area Ambulance Service (CALEX) which provides pre-hospital emergency care.

### Barnet's Good Neighbor Fund

Barnet's Good Neighbor Fund is supplemented with money from the bottle returns at the recycling center, as well as occasional fundraising events. Its four-person committee receives input from a



number of residents to direct financial aid to about 15 families a year, typically providing no more than \$500 per family.

**Goal: To provide adequately for the health, safety and general welfare of the citizens of Barnet.**

**Recommended actions:**

Develop ideas for recruiting volunteers for Town committees and Fire & Rescue.

Work with the Selectboard to develop a Capital Budget and Plan

**Goal: To maintain a safe and passable network of roads at a cost affordable to the Town.**

**Policy**

Keeping in mind that the improvement or upgrading of roads can have a negative impact on the scenic value of an area, the wishes of adjacent property owners and the density of traffic should be considered by the Selectmen in the improvement of Class II and Class III roads in Barnet.

**Goal: To decrease the dependence of Barnet's residents on private automobile transportation whenever possible.**

**Recommended actions:**

Encourage the continued availability and extension of public van service like the Rural Transportation Corporation now provides.

Encourage the development of better bicycle-pedestrian pathways within the developed areas of Barnet.

Maintain the Leigh Larocque commuter parking area (Park & Ride) in the vicinity of the I-91 Interchange 18 to encourage car-pooling and to discourage roadside parking.

## A Sense of Place

*The general constancy of late 18th and 19th-century Vermont farm and village architecture has caused the Barnet area to be visited and photographed by thousands of tourists who appreciate its uniqueness. Barnet's scenic areas and magnificent vistas are too numerous to list; each of us has a particular favorite. They offer pleasure to residents and visitors alike, enjoyed from our roadsides and our porches, and are an integral part of our community's identity. As we embrace change and growth, we must strive to preserve the integrity and character of our historic and scenic assets that makes Barnet an extraordinary community.*

### Issues:

- Maintenance of historic structures can be expensive, and some have fallen into disrepair.
- Some historic structures no longer serve their original purpose, creating opportunities for adaptive reuse.
- Historic structures may require energy retrofits.
- The Town has no formal inventory of scenic viewsheds.

### Historic and Cultural Assets

Very historic houses, barns, and commercial buildings which have retained most of their original character should be preserved as having both historic and cultural significance. Examples of historic houses are the Galbraith-Kitchel House (also known as the Gilkerson Kitchel Stone House), the Thurston-Kinney-White Place (also known as the Thurston, Phineas House), and the Strobridge House on West Barnet Road, a salt box. Examples of unusual barns are the Moore-Willis round barn, Ernest Roy's high-drive barn, the Bailey New-England-style barn, and Hoyt's English-style barn. Examples of the prominent remaining commercial buildings are Ben Thresher's Mill, Burbank's Store (The Barnet Village Store), Fairbank's Store (The Dunbar home) and the former Ide's Feed Store. These structures, and others, exemplify both our historic and our cultural heritage and should be preserved for future generations.

In addition to being identified on the Town's historic properties list, the following properties are also individually listed on the National Register of Historic Places: McIndoes Academy; Thurston-Kinney-White House; William and Agnes Gilkerson Farm; and Ben Thresher's Mill. In addition, the Barnet Center Historic District is listed on the National Register. The Goodwillie House in Barnet Center houses the Barnet Historical Society.

The National Register listings can be viewed on the "Online Resource Center" maintained by the Vermont Division for Historic Preservation: <http://www.orc.vermont.gov/Resource/Show-Resource-Table.aspx>.

Radical departures from traditional architecture are inappropriate and should be discouraged in areas where particularly fine old buildings now stand.

### Scenic Areas

Located in the towns of Barnet and Ryegate, the Roy Mountain Wildlife Management area is state-owned and contains approximately 1,590 acres that are within the Town of Barnet. The area is located in the south-central part of Town and contains the summit of Roy's Mountain, part of Jewett Pond and wetlands south of Harvey Lake to the Ryegate town line. It is managed by the state as wildlife habitat and is accessible to the public.

Barnet's other scenic areas and magnificent vistas are too numerous to list; each of us has a particular favorite. They offer pleasure to residents and visitors alike, enjoyed from our roadsides and our porches, and are an integral part of our community's identity. A map has been attached listing some of the more popular.

**Goal: To protect areas and structures of historic, architectural and cultural merit and to preserve the visual integrity of Barnet's villages and historic districts and individual structures.**

**Policy**

The protection of existing churches and cemeteries should have a high priority.

**Recommended actions:**

Encourage the owners of historic structures to preserve and maintain them for posterity and continue their historic use.

Encourage regulatory agencies to respect the value of preserving our historical buildings and to support the restoration of Ben Thresher's mill and waterworks. (Ben'smill.com)

Markers should be erected where appropriate indicating locations of historic brick kilns, granite quarries, and the Marl Kiln, and an inventory of archeological sites within the Town should be created.

Maintain Village Center Designations, which makes historic cultural facilities in those designated areas more competitive for historic preservation grants.

Ensure that Zoning Bylaws allow for adaptive reuse of historic properties that are no longer carrying out their original purpose.

**Goal: Protect Barnet's many scenic vistas for the enjoyment of residents now and in the future.**

**Recommended Actions:**

Encourage the siting of residential development which does not degrade our scenic vistas. A map has been attached listing some of the more popular scenic vistas.

Using the attached viewshed map as a starting point, identify viewshed elements that can be protected through policies such as screening provisions for large ground-mounted solar installations and similarly scaled development.

## Putting the Plan into Action

The Implementation Plan relies heavily on the ongoing participation and support of the Barnet Planning Commission -- which does double-duty as the Zoning Board of Adjustment by reviewing proposed development that requires a board approval. Since 2004, municipalities have had the option of creating a single Development Review Board, which would be responsible for ALL development review functions, including site plans, subdivisions, conditional use, variances, and appeals of the Zoning Administrator decisions.

The primary advantage of creating a Development Review Board is that this board can focus solely on development review responsibilities, allowing the Planning Commission to tackle other critical responsibilities, such as updating the municipal plan and bylaws, and, just as importantly, implementing the municipal plan.

Many of the implementation actions in this plan have nothing to do with zoning. Rather they require specialized support in diverse topics such as housing affordability, natural resource management, renewable energy development, economic development, public engagement and more. We therefore propose that Barnet establish a Development Review Board (DRB) in accordance with Vermont Statute. The DRB would have a minimum requirement of five members. The Planning Commission, which can overlap with the DRB's membership, can have a maximum of nine members. To meet the challenges of plan implementation, we recommended appointing additional members to the Planning Commission to establish a vibrant and diverse cross-section of expertise and perspectives, such as representatives from education, real estate, agriculture, and local business sectors, as well as a balance of long-term residents with an institutional memory and newcomers with fresh perspectives.

While the Barnet Plan proposes multiple objectives and strategies, we have chosen the following priorities for immediate action:

### **Priority 1: Continue to Invest in our road crew through training, equipment purchases, and competitive salaries.**

- Explore methods to reduce re-pavement costs,
- Consider de-pavement of certain roads,
- Create criteria for evaluating development and utility along Class IV roads and any long-term maintenance with those decisions.
- Increase culvert use and consider options on steep sections to help mitigate issues during mud season.

### **Priority 2: Affordable Housing**

- Re-evaluate Zoning Districts, including lot size.
- Discuss Short Term Rentals impact on housing availability.

### **Priority 3: Education**

- Barnet has a long tradition of academic excellence that needs to continue to be nurtured.
- The Selectboard, School Board, Administration, and PTF need to work to re-integrate the School with the Community following Covid and the School District Merger
- Evaluate the Consolidated District, both positives and negatives.

**Priority 4: Broadband**

- Continue to work with NEK Broadband and other groups to assure it is available to all Town Residents.
- Continue to support the elderly and disadvantaged through training and support as currently happens at the Barnet Library.

**Priority 5: Water Quality**

- Continue to educate residents about the importance of buffers along streams.
- Continue to support the Greeter Station's work to reduce Invasives.
- Continue to support Lake Harvey Association's work to prohibit Wake Boats.
- Develop a new management structure and plan with the State, Select Board, Dam Committee, and Lake Harvey Association for the Harvey Lake Dam

## Appendix I. Twelve Elements of Chapter 117

Vermont Statute Title 24, Chapter 117, as amended through 2013, is the enabling legislation for local land use planning and regulation in Vermont. It requires that the twelve elements in Section 4382 be addressed in the municipal plan.

The following list gives the location of each element within the plan.

- 1) **A statement of objectives and policies**  
Each Section within the document presents policies and objectives.  
Priorities: Pages 42-43
- 2) **A land use plan consisting of a land use plan and maps**  
Pages 3-4, 11-13 and Appendix IV
- 3) **A transportation plan**  
Pages 37-38 and Appendix IV
- 4) **A utilities and facilities plan**  
Pages 34-38 and Appendices II&IV
- 5) **A plan for the preservation of natural areas, and scenic and historic features**  
Pages 3-4, 25, 28-32, 40-41 and Appendix II & IV
- 6) **An educational facilities plan**  
Pages 16, 18, 35-36 and Appendix IV
- 7) **An implementation program**  
Pages 42-43
- 8) **Adjacent Municipalities**  
Pages 8-9
- 9) **An energy plan**  
Pages 22-27 and Appendix III
- 10) **A housing element**  
Pages 14-15
- 11) **Economic development**  
Pages 11-13
- 12) **Flood Resilience**  
Pages 19-21, 29

## Appendix II. Location Codes

### LOCATION CODES FOR SITES, STRUCTURES AND TOWN PROPERTY OF BARNET, VERMONT

#### HISTORIC HOUSES

1. 26-01-24 Hall-Sizen
2. 09-02-18 Goodwillie
3. 04-01-07 Gilkerson Kitchel Stone
4. 05-02-04 Thurston-Kinney-White
5. 08-01-63 Stuart-Strobridge saltbox
6. 12-01-39 Hadley-Cookson
7. 21-21-05.1 Lackey-Roy
8. 08-01-51 Cross-Somers
9. 04-02-05 Shearer-Chamberlin
10. 04-02-27 McCallum-Ackerman
11. 09-01-03 Laird-Carrick
12. 14-01-59 Gilchrist-Rider brick
13. 03-01-04 Laird-Smith-Gray brick
14. 26-01-47 Senator Flanders birthplace
15. 12-01-04 Alexander Harvey Homestead

#### WATER-POWER MILLS

- 16.09-01-54 Ben Thresher's Mill
- 17.20-21-25 Ide's Grist Mill
- 18.26-01-45 For All Grist Mill

#### COMMERCIAL BUILDINGS

19. 20-21-21 Ritchie-Warden Gen. Store
20. 24-01-18 Parks General Store
21. 26-01-36 Johnson Shoe Shop
22. 26-01-51 Hardware Store
23. 26-01-52 Fairbanks General Store
24. 25-01-23 Gilfillian General Store
25. 26-01-37 Burbanks Store

#### INNS AND TAVERNS

26. 26-01-18 Old Homestead
27. 05-01-03 Cushman-Willey
28. 24-01-20 Passumpsic Hotel
29. 23-01-55 Hawes Tavern
30. 25-01-12 Roy Mill Boarding House

#### QUARRIES AND KILNS

31. 09-01-24 Warden Marl Kiln
32. 21-21-05.1 Somers' Hill Quarry

#### CHURCHES

33. 13-01-26 Walter Harvey Meeting House
34. 09-02-26 Barnet Center Presbyterian
35. 14-01-58 McIndoe Falls Congregational
36. 26-01-54 Barnet Village Congregational
37. 20-21-21 West Barnet Presbyterian
38. 25-01-38 St. Johnsbury United Pentecostal Church, Inc.
39. 24-01-41 Passumpsic Baptist

#### CEMETERIES

40. 20-21-02 West Barnet
41. 09-02-25 Barnet Center
42. 13-01-27 Walter Harvey
43. 14-01-58 McIndoe Falls
44. 01-01-12 Palmer (county)
45. 26-01-13&19 Pleasant View
46. 26-01-10 Stevens

#### FORMER SCHOOLS

47. 14-01-53 McIndoes Academy
48. 14-01-51 McIndoe Village
49. 12-01-34 Walter Harvey
50. 08-01-81 Roy
51. 08-01-43 Four Corners
52. 04-01-67 Joe's Brook
53. 25-01-58 Little France
54. 24-01-27 Passumpsic Village
55. 25-01-41 East Barnet Village
56. 26-01-60 Barnet Village
57. 01-01-11 County

#### AGRICULTURAL STRUCTURES

58. 09-01-06 Warden Granary
59. 25-01-49 Bailey Barn
60. 08-01-75 Ernest Roy Barn
61. 05-01-41 Moore Round Barn
62. 04-01-54 Hoyt Barn
63. 20-21-08 West Barnet Creamery
64. TH #34 Stone Livestock Underpass

## Appendix III. Energy Plan Information

Note: The following information is provided in accordance with Act 174. The Town of Barnet intends to request certification of its plan so that it will receive “Substantial Deference” (heightened consideration) in Section 248 proceedings. The following information is provided in accordance with Act 174, which establishes standards for plans that receive Substantial Deference.

Barnet’s energy use estimates were developed by Northeastern Vermont Development Association and follow the same data methodologies used for the 2018 amendment to the Regional Plan for the Northeast Kingdom. ([www.nvda.net](http://www.nvda.net)). Energy use data were based on the best available information and should be considered approximations rather than a precise count.

Targets for weatherization, fuel switching, and electrical efficiency upgrades come from a statewide LEAP analysis (long-range energy alternative planning) performed in 2017. The analysis just illustrates one path to 2050 energy goals and is not a precise count. It’s intended to demonstrate the scope and scale of change that’s needed to meet statewide energy goals.

### Space Heating

According to most recent American Community Survey (ACS) Five-Year estimates 2021, most of Barnet’s houses are primarily heated by fuel oil, followed closely by wood. About one-fifth are heated by bottled, tank, or LP gas, and handful of homes use a variety of “other” resources.

**Table AIII.1: Occupied Residential Heating by Primary Fuel Source**

<b>Fuel Type: Space Heating</b>	<b>Households</b>	<b>Avg. Use (Annual)</b>		<b>% of Use: All</b>	<b>% of Use: Owner</b>	<b>% of Use: Renter</b>
Tank/LP/etc. Gas	149	167,898	gallons	26%	26%	29%
Electricity	3	96,245	KWH	1%	0.6%	0%
Fuel Oil	218	154,477	gallons	38%	33%	71%
Wood	168	919	cords	30%	33%	0%
Coal/Coke	9	50	tons	2%	2%	0%
Other	21	-		4%	4%	0%

Latest ACS data show that Barnet has 260 housing units for seasonal or recreational use. There are no published datasets on heating sources for this form of housing, but Department of Public Service guidelines indicate that they usually account for only 5% of overall thermal use for occupied housing. NVDA estimates therefore assume that Barnet’s seasonal housing stock adds another 1,423 MM BTUs to the Town’s total thermal use.

Commercial thermal estimates are difficult to calculate because there are no published datasets on heating sources. Estimates from the Department of Public Service and the Vermont Department of Labor’s Economic and Labor Market Information assume that total commercial thermal use in Barnet is about 15,762 MM BTUs annually. The methodology identifies 18 commercial (i.e. non-residential) establishments, and all but the Barnet School are considered very low thermal users.



LEAP projections for Barnet show a substantial reduction in total thermal use by 2050: for residential, a reduction of more than 50% from 2015 levels, and for commercial, a 26% reduction over the same period. Even though these estimates assume a slight increase in residential and commercial structures by 2050, the overall use declines because of:

- aggressive weatherization projects (ones that reduce overall thermal use by 20% to 30%)
- fuel switching, such as replacing residential heating units with heat pumps, and efficient wood burning systems (like wood pellet furnaces)

According to ACS 5-year estimates, roughly 36% of Barnet’s owner-occupied housing units and 60% of renter-occupied housing units predate 1940. These older structures are likely to be “leaky” and poorly insulated, accounting for as much as 80,000 BTUs per square foot. (By comparison, statewide estimates put average thermal residential use to be about 63,000 BTUs per square foot). According to most recent data from Efficiency Vermont (June 2022), total lifetime savings from weatherization projects in Barnet is nearly 23,000 MMBTUs. More effort is needed.

**Table AIII.2: Weatherization Targets for Barnet (LEAP Projections)**

	2025	2035	2050
Estimated number of households	608	645	684
# of households to be weatherized	184	320	342
Estimated number of commercial establishments	19	20	21
# of commercial establishments to be weatherized	1	2	3

Wood pellets are cleaner burning, more efficient than cord wood, and relatively easy to use. Stoves and furnaces can be controlled by a thermostat. Cold climate heat pumps, which are sometimes called “mini splits”, are a significant form of fossil fuel replacement for thermal uses. Thanks to major technical improvements in recent years, 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, so many homes will need more than one. Despite recent improvements in effectiveness on extremely cold days, a backup heating source is usually required for sub-zero temperatures. According to most recent Efficiency Vermont data, 25 cold climate heat pumps and 16 heat pump water heaters have been installed in Barnet residences over the past three years (2019-2021). Twenty efficient wood heating systems have been installed over the same period. Note that Table AIII.3 predicts a drop in wood heat systems as efficiency in heat pumps increases.

**Table AIII.3: Thermal Fuel Switching Targets for Barnet (LEAP Projections)**

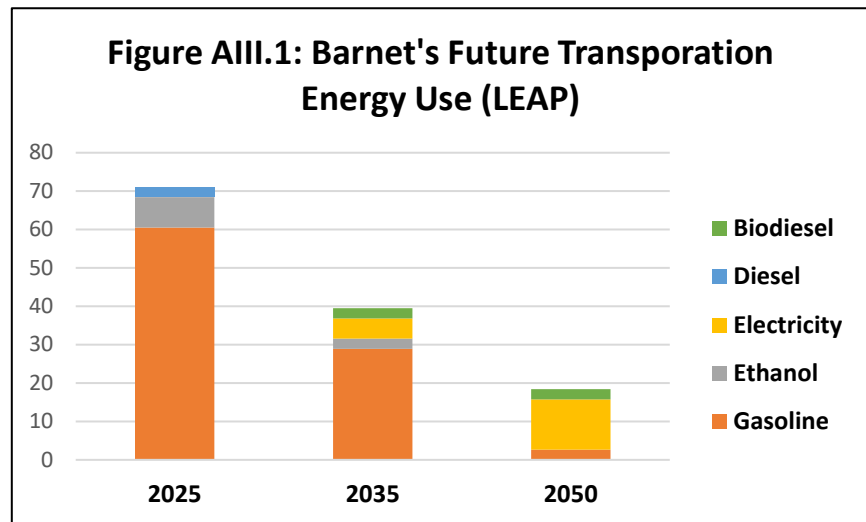
	2025	2035	2050
New Efficient Wood Heat Systems in Residences	484	405	294
New Heat Pumps in Residential Units	144	309	392
New Efficient Wood Heat Systems in Commercial Establishments	3	3	5
New Heat Pumps in Commercial Establishments	1	2	3

## Transportation

Energy use in transportation is greatly influenced by the development patterns of the region. Long commutes and incidental trips require NEK residents to drive an average of 14,000 miles per year. Collectively, Barnet residents drive more 17 million miles annually, accounting for nearly 800,000 gallons of fossil fuel. Nearly all this energy is non-renewable. Ten percent ethanol is included in nearly all locally available gasoline and amounts to about 7% of total transportation BTUs in Barnet. Electricity used for transportation currently accounts for a mere .04%.

Plug-in electric vehicles (EVs) have the greatest potential to reduce Vermont’s statewide greenhouse gas emissions. “Refueling,” which is as simple as plugging into an electric outlet, costs the equivalent of about \$1.00 per gallon.

Much of the dramatic reduction of energy use in the 2050 LEAP projections is predicated on the superior efficiency of electric vehicles (EVs), as well as anticipated improvements to the fuel economy of EVs and biofuels (Figure 2). Electric end-uses are three to four times more efficient than the combustion versions they replace. For example, figures from the EPA (2016) show that an EV in the northeastern US typically has the efficiency



equivalent of about 102 miles per gallon, up from about 78 miles per gallon in 2009. With even more efficient models coming onto the market, increased average efficiency will lead to lower greenhouse gas emissions. Despite the lack of infrastructure and rough rural terrain of the region, industry forecasts predict that more than half of all new car sales will be EVs by the year 2040.

**Table AIII.4: Transportation Fuel-Switching Targets for Barnet (LEAP Projections)**

	2025	2035	2050
Estimated # of cars in Barnet	1,413	1,590	1,788
Total number of using electricity	161	513	1,105
Total number of cars using biofuel blends	1,096	753	131

### Electricity Use

Nearly all of Barnet is served by Green Mountain Power. A small area along the border with Ryegate is served by Washington Electric Coop.

**Table AIII.5: Barnet's Electrical Usage 2019-2021 (Efficiency Vermont)**

	2019		2020		2021	
	KWh	MMBTU	KWH	MMBTU	KWh	MMBTU
Commercial & Industrial	2,076,346	7,084	1,861,369	6,351	1,857,273	6,337
Residential	5,548,968	18,933	5,952,870	20,311	6,124,631	20,897
Total	7,625,314	26,018	7,814,240	26,662	7,981,904	27,234
# of Residential Premises	937		969		974	
Avg. Residential Usage	5,922	20	6,143	21	6,288	21

Barnet's electric utility data are collected by Efficiency Vermont. Thanks to efficiency measures, customers have reduced their average use in recent years. The predominant efficiency measures have been replacement of light bulbs and hardwired lighting fixtures. Residents also received rebates for improved water heating efficiency, purchase of Energy Star appliances and more efficient electronic equipment, and installation of cold climate heat pumps and wood heating systems.

**Table AIII.6: Annual Thermal and Electrical Savings in Barnet (Efficiency Vermont)**

	2019	2020	2021	Total
Electric Savings (KWh)	105,563	119,440	34,339	259,342
Residential	75,468	55,388	16,760	147,616
Commercial & Industrial	30,095	64,052	17,579	111,726
Thermal Savings (MMBTU)	250	441	633	1324
Residential	265	403	644	1312
Commercial & Industrial	(15)	38	(11)	27
Total Emission CO2 Equivalent (in lbs.)	140,684	178,300	121,837	440,821
Total Customer Cost Savings	\$22,119	\$26,604	\$17,761	\$66,484

The *negative* savings (increased thermal usage) incurred by the Commercial & Industrial sector may be illustrative of interactive effects of electrical and thermal efficiency measures. In industrial settings, for example, a switch from incandescent bulbs (which emit a substantial amount of heat) to LED bulbs (which emit very little heat) requires additional energy to heat the space.

Interestingly, the installation of a cold climate heat pump may produce thermal savings, but it may increase overall electrical use simply because it is replacing a fuel-oil system. This switching to clean electrical sources, sometimes called beneficial electrification, will increase Barnet's electricity usage

exponentially, making demand side management critical. More electrical upgrades, such as replacement of fixtures, appliances, and power strips will therefore be necessary.

**Table AIII.7 Targets for Electrical Efficiency Upgrades (LEAP Projections)**

	2025	2035	2050
Estimated number of residential customers	913	967	1,025
# of residential customers to upgrade electrical equipment	275	432	634

## Development of Renewable Energy Resources

### Existing generation

As of the end of 2020, ISO New England reported that Barnet had a total installed solar capacity of 871.68 kW. Barnet also generates a significant amount of hydropower through five dams, two of which are located on the Connecticut River, two on the Passumpsic, and one on the Stevens. These five hydropower sites have a collective capacity of 154,390 kW.

### Target Generation and Potential Generation

The attached solar and wind resource maps identify potential areas for siting and quantifying generation output. Underlying assumptions were made about suitability factors, such as slope and direction of land, elevation and wind speeds, and access to three-phase power. Prime areas for renewable generation are locations with no known or potential constraints.

Known constraints are considered unsuitable for renewable energy because they contain one or more of the following: vernal pools; river corridors; FEMA floodways; significant natural communities; rare, threatened and endangered species, national wilderness areas, and wetlands (Class 1 and Class 2).

Possible constraints are areas that would likely require mitigation because they contain the one or more of the following: agricultural soils; special flood hazard areas (outside of the floodway); protected (conserved) lands; deer wintering areas; Act 250 mitigated agricultural soils; hydric soils, and highest priority forest blocks.

In addition to known and possible constraints, unsuitable areas are shown in yellow in the wind and solar map. These are lands with an elevation of 2,000 feet or more that should be protected from any large-scale commercial or industrial development characterized by a constructed height of 100' or more, and an acre or more of permanent site disturbance, such as clear-cutting. These lands contain one or a combination of factors that make them unsuitable to such development: contiguous forest cover; sensitive wildlife and plant habitat; conservation lands and recreational assets; managed forestland; and headwaters and ephemeral surface waters, which are highly vulnerable to erosion and man-made disturbance. This high-elevation forest cover must be kept unfragmented for the attenuation of flood flows, the benefit of wildlife habitat and linkage, and public enjoyment through passive recreation.

To calculate total generation potential, this plan uses generous contingencies to conservatively account for potential constraints and connectivity issues.

**Table AIII.8: Estimated Generation Potential for Barnet (NVDA Estimates)**

	Capacity (MW)	Output (MWh)	Assumptions
Roof-mounted solar	.24	296.3	One out of every 10 existing year-round residences, each with a 4 KW capacity, and a capacity factor of 14%.
Small commercial rooftop structures (including barns)	.036	44.2	Two structures, both with a 20 KW capacity, with a capacity factor of 14%
Ground-mounted solar	20.0	24,525.1	One MW for every 60 acres of prime solar land, all with a capacity factor of 14%.
Wind	.09	153.1	One 9.5 kW system for every 25 acres of prime wind, with a capacity factor of 20%. (Barnet has no lands suitable for utility-scale wind, so only home-scaled systems are used in this calculation.)
Small hydro	.686	2,403.7	Based on a 2008 study on existing dams. Stringent licensing requirements make the establishment of new hydro generation very unlikely.
Total	21.052	27,422.4	

## Appendix IV. Plan Maps

- A : Historic Resources of Barnet
- B. Town of Barnet Base Map
- C. Land Use/Land Cover Map
- D. Natural Resources Constraints Map
- E. Soils Constraints Map
- F. Zoning Districts – Parcel – Town Properties
- G. River Corridor Map
- H. Habitat Map
- I. Scenic Vistas Map