

TOWN OF BARRE VERMONT

Chartered in 1781

2020 TOWN PLAN



Adopted
June 23, 2020

www.barretown.org

This page is intentionally left blank

Table of Content

1	Introduction	
1.1	The Barre Town Municipal Plan	1
1.2	Goals	3
1.3	Objectives	4
1.4	Programs	4
1.5	The Planning Process	5
1.6	Yesterday and Today	5
2	Land Use Plan	
2.1	Introductory Statement	9
2.2	Current Land Use Patterns	9
2.3	Future Land Use	9
2.4	Current Zoning Designators	10
2.5	Zoning Districts Purpose Statement	10
2.6	Proposed Zoning	11
2.7	Zoning Map (Map 2)	11
2.8	Municipal Uses	11
2.9	Infrastructure	11
2.10	Land Use and Land Cover (Map 4)	12
2.11	Forest Integrity (Map 11)	12
2.12	Guidance Statement	13
2.13	Land Use Goals	14
3	Transportation	
3.1	Highway Plan	15
3.2	Accommodation of Trucks, Bicycles, and Pedestrians	17
3.3	Public Transportation	20
3.4	Transportation Goals	22
4	Facilities, Utilities, and Public Safety (Map 3)	
4.1	Sewer and Septic Disposal	23
4.2	Water Supply	24
4.3	Town Buildings	26
4.4	Town Land	26
4.5	Library Resources	27
4.6	Cemeteries	28
4.7	Recreation Facilities	30
4.8	Solid Waste	33
4.9	Solid Waste Facility	34
4.10	Emergency Services	35
4.11	Conclusion	39
5	Preservation	
5.1	Introduction	40
5.2	Scenic and Historic Features	40
5.3	Historic Areas	41
5.4	Historic Sites	41
5.5	Historic Structures	42

5	Preservation (Continued)	
5.6	Historic Districts in Barre Town	43
5.7	Recommendations	43
5.8	Scenic Preservation	44
5.9	Resources to be Preserved for Recreational Value	45
5.10	Natural Resources	46
5.11	Climate, Topography, Soil, and Earth Resources	46
5.12	Forest Lands	48
5.13	Agricultural Lands	49
5.14	Groundwater Resources and Geology	50
5.15	Natural Resources Goals and Objectives	52
6	Educational Facilities	
6.1	Introduction	54
6.2	Schools	54
6.3	Conclusion	56
7	The Region and Our Neighbors	
7.1	Regional Context	57
7.2	Adjacent Municipalities	59
7.3	Barre City / Barre Town Shared Services	61
7.4	Demographics	62
8	Energy	
8.1	Overview	64
8.2	Energy Plan	64
8.3	Energy Opportunities	64
8.4	Energy Conservation	65
8.5	Town Buildings	66
8.6	Energy Efficiencies	67
9	Housing	
9.1	Basis and Objectives for Housing Plan	72
9.2	Affordable Housing	73
9.3	Available Housing	75
9.4	Community Involvement and Information on Housing	77
9.5	Housing Rehabilitation	77
9.6	Housing Goal and Recommendations	78
10	Economic Development	
10.1	Introduction	79
10.2	Economic Development Initiatives, Present and Future	79
10.3	Economic Development Criteria	80
10.4	Municipal Tax Stabilization	80
10.5	Average Wages	81
10.6	Recommendations	81
10.7	Childcare	82
11	Flood Resilience	
11.1	Introduction	84
11.2	Surface Water Condition	84

11 Flood Resilience (Continued)	
11.3 Flood Hazard Areas	85
11.4 Wetlands	86
11.5 Storm Water Management	86
11.6 Mitigation Goals and Objectives	87
11.7 Proposed Programs, Projects and Activities	88
12 Implementation	89
Maps	91
Map 1: Region	
Map 2: Zoning	
Map 3: Utilities and Facilities	
Map 4: Land Use/Land Cover	
Map 5: Transportation	
Map 6: Road Map by Functions Class	
Map 7: Bike and Pedestrian	
Map 8: Housing Resource	
Map 9: Forest Integrity	
Map 10: Potential Future Land Use	
Addendum	101
Energy Plan	

This page is intentionally left blank

1. INTRODUCTION

1.1 THE BARRE TOWN MUNICIPAL PLAN

The Barre Town Municipal Plan (the "Plan") is a guide to long range land use and development in the Town and is a plan which reflects the vision and the values of its citizens. By state law, town plans must be reviewed, revised and re-adopted every eight years or face expiration status, the consequence of which is explained below. This 2020 document is consistent with the statutory and community related goals as authorized by the Vermont Planning and Development Act, 24 Vermont Statutes Annotated (VSA) § 4381 following the purpose and goals of 24 VSA § 4302 in part as follows:

The Development Act and Town Plans are intended to **"encourage the appropriate development of all lands... in a manner which will promote the public health, safety against fire, floods, explosions, and other dangers; to promote prosperity, comfort, access to adequate light and air, convenience, efficiency, economy and general welfare...to encourage appropriate architectural design; to encourage the development of renewable resources...to facilitate the growth of villages, towns, and cities and of their communities and neighborhoods so as to create an optimum environment, with good civic design... and to provide means and methods for the municipalities and regions of this State ...to implement those plans when and where appropriate."**

The Plan lays out goals, recommendations and possible policies for future growth and to do so in a comprehensive, coordinated and cooperative fashion while promoting the common good and respecting the rights of individual landowners. There are a number of topics addressed in the Plan including the following: present and future land uses; constraints in land use due to terrain; the availability of public utilities and services; the protection of the environment and natural resources; compatibility of land uses between adjacent parcels and neighboring municipalities; public health and safety; preservation of community character; economic development; educational facilities; energy; housing; recreation; governance; and the community's role within the region. The Plan also attempts to balance the needs of the various components where they may be considered contrary to one another.

Title 24 VSA § 4382, requires that municipal plans include the following elements:

- 1) a statement of objectives, policies and programs
- 2) a land use plan with subsections a-d
- 3) a transportation plan
- 4) a utility and facility plan
- 5) a statement of policies on the preservation of rare and irreplaceable natural areas, scenic and historic features and resources
- 6) an education facilities plan
- 7) a recommended program for the implementation of the objectives of the development plan
- 8) a statement indicating how the plan relates to development trends and plans for adjacent municipalities, the area and the region
- 9) an energy plan
- 10) a housing element which includes a recommended program for addressing low- and moderate-income persons' housing needs

11) an economic development plan

12) a flood resilience plan.

Each of these elements is addressed in separate chapters or sections of this Plan.

In addition to the elements, 24 VSA § 4302 states that plans should further the following specific goals:

- 1) To Plan development so as to maintain the historic settlement pattern of compact village and urban centers separated by rural countryside.
- 2) To provide a strong and diverse economy that provides satisfying and rewarding job opportunities and that maintains high environmental standards, and to expand economic opportunities in areas with high unemployment or low per capita incomes.
- 3) To broaden access to educational and vocational training opportunities sufficient to ensure the full realization of abilities of all Vermonters.
- 4) To provide for safe, convenient, economic, and energy efficient transportation systems that respect the integrity of the natural environment, including public transit options and paths for pedestrians and bicyclers.
- 5) To identify, protect, and preserve important natural and historic feature of Vermont landscape.
- 6) To maintain and improve the quality of air, water, wildlife, and land resources.
- 7) To make efficient use of energy, provide for the development of renewable energy resources, and reduce emissions of greenhouse gasses.
- 8) To maintain and enhance recreational opportunities for Vermont residents and visitors.
- 9) To encourage and strengthen agricultural and forest industries.
- 10) To provide for the wise and efficient use of Vermont's natural resources and to facilitate the appropriate extraction of earth resources and the proper restoration and preservation of the aesthetic qualities of the area.
- 11) To ensure the availability of safe and affordable housing for all Vermonters.
- 12) To plan for, finance and provide and efficient system of public facilities and services to meet future needs.
- 13) To ensure the availability of safe and affordable childcare and to integrate childcare issues into the planning process, including childcare financing, infrastructure, business assistance for childcare providers, and childcare work force development.
- 14) To encourage flood resilient communities.

The foundation for the first formal Barre Town Municipal Plan in the late 1980s was a study cooperatively contracted by Barre Town and Barre City through a state-funded grant and performed by Humstone Squires Associates in 1989. State planning laws have changed extensively since then and now prescribe many new goals. Further, Regional Planning Commissions are required to help municipalities prepare and update municipal plans and, when requested, review such plans for formal approval by the commission. While a duly adopted plan can be used to guide development and serve as evidence in ACT 250 and Section 248 hearings, only municipalities with a plan *approved* by their Regional Planning Commission are eligible for Municipal Planning Grants and Community Development Block Grants. In addition, State

agencies proposing projects must consider approved local plans before proceeding. Regardless of whether a locally adopted plan is approved by the Regional Planning Commission, it is still in effect. The previous version of the Barre Town Plan was adopted in 2014 and revised in 2017.

Although the Plan itself is the final document, there is as much or more value in the process of engaging stakeholders along the way. Viewed as a series of steps, this includes:

- 1) Formulating the planning program which seeks public participation.
- 2) Collecting and analyzing background information that identifies the community's problems and opportunities using a broad resource of citizens, technicians and stakeholders.
- 3) Establishing goals and objectives related to the twelve required elements of a plan.
- 4) Outlining recommended actions to achieve the goals and objectives.
- 5) Creating an implementation program which may include both non-regulatory and regulatory activities.
- 6) Adopting the plan – a process which includes public hearings by both the Planning Commission and the Selectboard which is the adoption authority.
- 7) Implementing the plan to carry out the recommendations.
- 8) Evaluating the plan and planning program which results in the cycle starting anew.

The Plan includes policies, goals, objectives and programs needed to guide the current and future development of the community.

1.2 GOALS

The goals, objectives and programs of the 2020 Barre Town Plan are a reflection of the values and vision of its public-spirited citizens and elected officials.

The review of proposed developments, buildings, renovations and other land use projects and the creation, implementation and enforcement of land use regulations and bylaws in Barre Town shall reflect the following goals:

1. Growth is likely and desirable and should be managed in such a way so as not to burden the capacity of public utilities, facilities, services and infrastructure.
2. The Town's allocated capacity at the Barre City Sewer Treatment plant and the Town's system of sewer mains must be planned, improved, and maintained so as to accommodate anticipated residential, commercial, industrial growth and development.
3. Growth and development should be planned and managed so as to respect, enhance (if possible) and minimize adverse effect on visual beauty and natural areas including land based recreation and forest integrity. The Town wishes to ensure that all development include the provision of appropriate landscape plans to screen and enhance the aesthetics of residential and commercial areas.
4. The Town should encourage economic development in a manner which keeps pace with the employment needs of Town residents and the Central Vermont labor market in order to reduce the Town's reliance on its residential tax base and strengthen and diversify the local economy.

5. Growth and development should be balanced among residential, industrial and commercial uses. Growth and development of industry and of housing for low/moderate income residents is encouraged. Growth and development should include rehabilitation and continued use of existing structures, where considered feasible.

6. The phased road improvement plan should be continued and sustained. Both paved and gravel roads should be reviewed annually for construction improvements and updates. The Town currently utilizes a 5-year plan for upgrades and maintenance of both paved and gravel roads.

7. Ground and surface waters (for drinking and recreation), open lands, forests, farms, natural recreational areas, archaeologically sensitive areas, and wildlife habitats should be recognized as valued resources and their preservation should be balanced with other considerations in making planning decisions.

8. Protection of Town water supplies and its maintenance, improvement and development of water distribution systems should be planned and implemented by the various Fire Districts and public and private entities which have assumed water responsibilities. This should be done with respect for anticipated growth and development and for the citizens' health and need for consistent/dependable service at a reasonable cost. The Town, along with the remaining fire district, Graniteville District #4 has implemented a source protection plan.

9. Because of Barre Town's hills and valleys collect water at higher elevations, flash flooding is the primary concern with regard to flooding. Working towards becoming more flood resilient as well as monitoring and mitigating fluvial erosion when possible is important.

1.3 OBJECTIVES

Sewer

Consult with Barre City regarding the growth expectations and needs, both residential and industrial, in Barre Town, so that sewer use/needs/impacts can be properly accounted and planned for. The Town should continue working to minimize groundwater infiltration to better utilize the Town's allocation. The billing for biochemical oxygen demand (BOD) from industrial producers has been reviewed by the Town's consultant Aldrich & Elliott; a plan has been developed and billing for BOD is now occurring.

Water

Consider a capital improvement plan for Town water systems. The Town is considering upgrades to the water system supply in the East Barre area off Waterman Street and Lowery Road. Interconnecting the Town system and the old Websterville Fire District system (now owned by the Town) should also be considered.

Roads

Continue updates of 5-year projected road improvement plan, in-house, based on what has been done and known needs.

Land Use Regulation

Revise Zoning and Subdivision regulations to implement this Plan. Ensure that Town attends and participates in ACT 250 review of all major projects in Town to ensure that the Town's plan and interests are properly interpreted and protected.

1.4 PROGRAMS

An annual look at local programs, development activity, and plan goals and objectives help maintain the Plan's standing and relevance. The annual review offers a chance to identify plan amendments for consideration in the next year or two, or to add to a list of more comprehensive updates to consider in the future. Regional confirmation of the planning process requires a town to actively engage in implementing the plan. Ongoing Zoning Bylaw and subdivision amendments also help to implement the plan.

1.5 THE PLANNING PROCESS

The essence of community planning is choice. Planning in Barre Town is an effort to make public choices which will shape the future of the community with respect to land use, capital improvements, community design, local finances and other issues. Planning is a necessary activity if a community is to grow in an orderly and economically productive manner.

The process of planning is continuous. Once a community begins a planning program it must realize that, to a great extent, it has entered into a continuous process. New ideas, values and conditions have an ongoing effect on the community. Planning can be a difficult and sometimes painful process for the citizens of a community, but it can also be rewarding when people reach consensus and move into the future together.

Planning helps to establish the ground rules for development within a community. A community that has an adopted comprehensive plan and has implemented bylaws has given a clear signal to current and future residents and developers that certain standards of development are expected within the community. The acceptance and publication of the standards facilitates equal treatment of all proposals that come before the community. Planning does not eliminate the possibility of conflict, but it does help to reduce the potential.

Effective planning decisions have the potential to save money for a community in the long term. The development of Zoning Bylaws and Subdivision Regulations, which allow and encourage residential development in areas adjacent to existing development while discouraging random sprawl in outlying areas, would be one example. The reduced demand for municipal utility extensions as a result of these regulations could save substantial tax dollars.

The planning process provides the opportunity for residents of a community to make some fundamental decisions concerning its future direction. The objective is to allow people an opportunity to discuss the issues and to reach a majority conclusion. A major effort to include as many citizens as possible in planning is important in order to accomplish this objective.

Property values within a municipality can be preserved by allowing for a separation of incompatible and potentially harmful land uses. Zoning bylaws ensure that residential land uses are appropriately insulated from more intensive uses, such as industrial parks. Community plans for parks, trails, recreational facilities and other amenities can also add to the livability and general attractiveness of a community.

Planning can also help a community to identify areas where development may not be appropriate due to environmental conditions. This may be due to conditions evident at the site such as excessive slope, aquifer recharge areas, erosion of stream banks or to the existence of other natural resources such as an important wildlife habitat.

1.6 YESTERDAY AND TODAY

Barre is known as the “Granite Center of the World” and has within its borders the world’s largest granite quarry.

Before human intervention most of Barre Town, like the rest of Vermont, was covered by virgin forest land. Settlers of the 1700s and 1800s encountered a wilderness much of which was eventually cleared to create the meadows and pastures of today. Some of the first settlers came from southern New England and received land through the New Hampshire land grants.

The Coos Trail was the American Indian pathway by which the Abenakis of the Swanton-Isle LaMotte area in the northwest corner of Vermont traveled across Vermont to the Coos Indian country. The Coos country extended from Bradford to Guildhall on the east side of Vermont and on both sides of the Connecticut River that flows there.

On August 12, 1781, 19,900 acres of this wilderness were chartered to William Williams and 60 others and given the name “Wildersburgh”. The area comprised the present Town of Barre and City of Barre. It is believed that none of the original 61 grantees ever settled the area. Present day Barre Town consists of approximately 19,668 acres. Boundary adjustments between abutting towns in the years since the original charter is the most logical explanation for the current combined size of Barre Town and City of 22,245 acres (Barre Town-19,668 acres, Barre City-2,577 acres).

Among the early settlers was John Goldsbury who first settled in Wildersburgh in 1789 followed by: Stephen Morrison, Zebidee Beckley, Amazaiah Peck, Nathan Harrington, Joseph Trow, William Richardson, Daniel Nye, and Dennison Smith. Many of these names are still familiar as names throughout the Town and provide insight into the various areas where the forefathers originally located.

By 1790, as interior roads were being cut throughout the township, rapid settlement started to take place. By the 1800s the population shifted from the Upper Village (present day South Barre) to other areas throughout Wildersburgh.

The first Town Meeting in Wildersburgh was held on March 11, 1793.

At a subsequent Town Meeting, it was voted to petition the General Assembly of Vermont to change the name of Wildersburgh. The person honored with renaming the Town was decided by whoever gave the most money towards building a meeting house, described as "a house of worship". Ezekiel D. Wheeler earned the right with a high bid of sixty-two pounds and named the Town "Barre".

In another more colorful story, local legend insists that the name "Barre" resulted from a fist fight won by Jonathan Sherman at the Calvin Smith farm on West Hill on September 3, 1793. Winner Sherman named the Town after his native township of Barre, Massachusetts. This story is the best-known version of how the Town was named however, no evidence has ever been found to support it.

The name Barre is in honor of Isaac Barre who was an Adjutant General in the British Army. After fighting alongside John Goldsbury at the Battle of Quebec in 1759 during the French and Indian War, Barre was wounded and sent back to England to carry the news of the capture of Quebec. General Barre, who was born in Dublin Ireland in 1726, went on to serve as a member in the British Parliament for 30 years as well as Vice Treasurer of Ireland, Treasurer of the Navy, and Paymaster General. During General Barre's time in Parliament, he was the most vocal opponent to the Stamp Act of 1765 which affected the American colonies by way of a new tax. The Act became a lightning rod in our Nation's march towards independence. General Barre's "Sons of Liberty" speech against taxing the Colonists became a source of inspiration for Colonists as they considered fighting for their independence. General Barre died in 1802. Four towns in the United States continue honoring his legacy in their names, Wilkes-Barre, PA; Barre, MA; Barre City and Barre Town VT.

In the early 1800s it became clear that the hills of the Town of Barre had something that could become a very important part of the Town's vitality: granite. History indicates the granite industry began soon after the War of 1812. Two returning soldiers, Robert Parker and Thomas Courser, opened what is believed to be the first commercial granite quarry in the country. The quarry was located on Cobble Hill on the east side of the Town. This quarry produced granite foundations and granite used for construction. Prior to this first quarrying operation, American Indians had used granite to carve arrowheads, hammers, spearheads and crude axes. In 1832, granite blocks were quarried and hauled to Montpelier on rollers for construction of the current State Capitol which was completed in 1837. Verbal history relates that workers were paid \$1.00 a day for the effort.

Between 1830 and 1880 the Town's growth and the granite quarries grew slowly. Not until 1875 and the coming of the railroad did the granite industry become a full-fledged enterprise. This began the migration of workers from Scotland, Italy and soon after Scandinavians, Spanish, Greek and Lebanese. Later, during a strike of workers that was called to improve working conditions in the granite industry, a large number of French Canadians converged on the now rapidly growing Town. By 1884 the population had grown to 10,000. While granite was the largest of all local industries, others also existed: carpentry, milling, stone shaping, soap making, tanning, and blacksmithing supported the new settlers.

The concentration of growth, primarily in the valley and adjacent to certain areas of the Stevens Branch of the Winooski River that flowed through the Town, led to the desire by the citizens of that more populated area to have increased municipal services such as public water, sewer and electricity, and better roads. In turn, they petitioned the General Assembly for their own Charter, which was granted in 1895, creating the City of Barre as a separate municipality from the Town of Barre. Citizens of the outlying areas in the Town preferred not to participate in the additional cost of the new services that they judged, correctly, would likely not serve them directly.

The remaining lands are what now constitute the current Town of Barre, which, except for a small section to the North, surround the City. Land characteristics of Barre Town are significant acreage at higher elevations and areas generally less populated and often associated with agricultural and recreational use, as well as the historic small village centers, granite quarries, and later day industrial development.

The Town of Barre originally included three small settlements: Upper Village (South Barre), Millstone Hill (Graniteville/Websterville), and Carnes Mill (East Barre). These three original settlements still exist today, characterized as compact villages separated by rural countryside. They are unincorporated villages within the Town, each distinguished by their own post office and zip code. This frequently causes confusion among the public by appearing to be separate municipalities. While the "hill" is still referred to as Millstone Hill, in many ways Graniteville and Websterville are their own distinct villages with upper and lower sections to them.

The "Upper Village" (South Barre) was Wildersburgh's and Barre Town's first settlement and a center of activity. Many of the first physicians, lawyers, politicians and businesses were located there. A number of their residences are still evident along Route 14 today. South Barre also boasts the first post office and granite shed. Some time ago, a subterranean passage was found across from the "Dennison Smith" residence at 397 South Barre Road/VT RT 14 and local lore is vivid with stories of a local branch of the Underground Railroad. Today, South Barre is a typical small village distinguished by convenient access to I-89 (via VT RT 63), multiple businesses, and is home to one of the two Town fire stations.

The Graniteville/Websterville areas continue today to be the heart of the granite industry. Websterville is also the location of the municipal building (a former neighborhood school), the police station and the municipal garage. Also located there is the K-8 Barre Town Elementary and Middle School which, in 1966, replaced the previous nine (9) neighborhood schools scattered throughout the Town (Upper and Lower Graniteville, Upper and Lower Websterville, East Barre, South Barre, Trow Hill, Springhouse, and Brookside). Adjacent to the school grounds is a large and popular recreation area and bike/walking path. Many of the old school locations still have Town playgrounds.

The last settlement to develop, Carnes Mill (East Barre), was described in early days as a "small mill town". At present East Barre is a small village with several commercial businesses as well as one of two fire stations of the Town Fire Department.

Several historic sites significant to Barre Town's history remain:

A large brick building located on Beckley Hill Road was built in the early 1920s to serve as a sanitarium for victims of silicosis. Silicosis, which is a form of tuberculosis, was an unfortunate by-product of the granite industry in the early days of the industry. Workers inhaling the fine granite dust as they sawed, hammered and chiseled monuments from blocks of granite fell prey to the dreaded disease for which there was no known cure. Over time, with improved dust collection equipment, the incidences of silicosis began to fall. Now that today's granite manufacturing plants have modern collection systems, early detection programs, and regular health screening, the occurrence of the disease is rare.

The first wood-framed house in Barre was built on Richardson Road by William Goldsbury in 1800. While the house no longer stands, a granite monument signifies its location.

The Pliny Wheaton house located at the intersection of West and East Cobble Hill Road is the area's first granite house which has been designated an official State Historic site. Pliny Wheaton owned and operated the Wheaton Quarry on Nuisl Road.

Several quarries remain prominent in the area. The quarry once owned by George Milne and later by (George) Milne, (James) Boutwell and (Harvey) Varnum in 1925 became the property of the world-famous Rock of Ages Company whose outstanding craftsmanship was depicted in a famous, iconic Norman Rockwell painting entitled "Kneeling Girl" 1955. The painting depicted a school-age girl, her textbooks tied together, paying her respects at the grave of someone named Newton. While still a tourist attraction, the original Milne, Boutwell and Varnum Quarry was closed in 1992. Now most of the Rock of Ages quarrying operations are focused at the E.L. Smith quarry located on Millstone Hill (McLeod Hill Road). The Wells-Lamson Quarry, located on the Websterville Road, almost within eyesight of the Town Municipal Building was discontinued, but was one of the longest, continuously-run and deepest quarries in the world.

Geological surveys have indicated the land around these quarries and on Millstone Hill contains vast amounts of underground granite, sometimes referred to as an “in-exhaustible” supply. Throughout the woods around Websterville and Graniteville are small abandoned quarries, many of which are now part of the Barre Town Forest.

Granite produced in the area is known as “Barre Gray” and is sought after worldwide for its fine grain, even texture and superior weather resistance. Many sculpture artists prefer it for outdoor sculptures.

2. LAND USE PLAN

2.1 INTRODUCTORY STATEMENT

The Town of Barre has a total of 19,668 acres of land. Land use growth and development in Barre Town should be planned to balance market needs and demands with the capacity of the land, municipal services and infrastructure network to accommodate it. The plan should anticipate and seek, within reason, to accommodate the results of market demands and growth pressures while recognizing the need for standards, limitations and regulation to contain extremes which may result. Land use planning should always seek to make the most effective and efficient use of existing infrastructure.

2.2 CURRENT LAND USE PATTERNS

Barre Town has a very diverse land use development pattern. Barre Town's development began early, even before the City and Town split in 1895. South Barre area is well documented as being the first section to see development. Granite has played a key role in how settlement patterns have been created. Granite on Millstone Hill necessitated places for workers to live, recreate, and worship. The villages of Graniteville and Websterville were close to the numerous quarries and provided all the needs for workers, housing, stores, taverns, and churches of different denominations. The two villages were quite vibrant and self-sufficient. Graniteville actually had an upper and a lower village (that exist today) while Websterville to a lesser degree did as well (more prevalent today). East Barre was also well established as a village known early on as Carnes Mill.

For most of the 1800s and even the first half of the 1900s Barre Town's development was on the South side of Town in the four villages. Farms dotted the rest of Town on the Southwestern portion (West Hill), Northwest (Richardson Road), Northeast (East Hill), and all along the fringe areas bordering the City of Barre. These areas were slow to develop and didn't have much in the way of infrastructure.

Development of some of the areas surrounding Barre City began to take place in the 1950s and '60s. The Richardson Road, Beckley Hill, Camp/Cassie Streets, and Hill Street areas began to see considerable development mostly centered around single-family housing with an occasional neighborhood general store. Infrastructure such as municipal water and sewer began to be developed. The numerous neighborhood schools that dotted the Town disappeared because a new and prominent school was built in Lower Websterville.

The Town's commercial development cropped up along the main State highways, VT. Rt. 14 (South Barre Road) and US Rt. 302 (East Barre Road). This development included supermarkets, gas stations, offices, auto sales, and many other consumer-based businesses. Industrial uses were prevalent in the Graniteville and Websterville areas mostly centered around granite quarrying. Wilson Industrial Park in Lower Websterville came to birth in the 1970s.

Rock of Ages granite quarrying operations in Graniteville and Websterville was a primary employer for much of the 20th century. By the 1980s as the Wilson Industrial Park developed, more employers came to Town such as the Bombardier Corporation which manufactured train cars. In the wake of Bombardier eventually leaving the park, the park was expanded and saw a variety of manufacturing and food processing businesses take hold. Today the Wilson Industrial Park, along with Rock of Ages, Hannaford Supermarket and Washington County Mental Health Services, both in South Barre, and numerous smaller businesses provide much of the commercial and industrial uses today.

To a large degree, the development pattern today has a close similarity to the pattern begun in the mid-1800s and the decades that followed. While Barre Town is a much more diverse community, granite and industrial uses still play a large role in its vitality.

2.3 FUTURE LAND USE (Map 10)

Barre Town's Zoning Map (Map 2) very closely mimics the development pattern laid out over 150 years ago. As development centered around the granite industry and the villages, along with areas close to public infrastructure, Barre

Town's public infrastructure such as water and sewer to a large degree provides a natural pattern for development now and in the future. Further development, in large scale, beyond the existing water and sewer infrastructure is not desired. Infill or taking advantage of open space within the infrastructure area is the planned route for development moving forward. Commercial and Industrial development also rely heavily on the water and sewer infrastructure as well as paved roads.

2.4 CURRENT ZONING DESIGNATORS

The current Zoning Bylaw utilizes the following districts to help the Town develop in an organized and compatible manner with regard to uses:

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Very High Density Residential
- East Barre Commercial
- Office Building Retail
- Office Building Business
- Highway Commercial
- Industrial
- Earth Resource Extraction
- Conservation

2.5 ZONING DISTRICTS PURPOSE STATEMENT

The four residential zones are to help distinguish different intensities of development and gradually transition from one area to the next. Very high density is intended to incorporate the areas of Town with the greatest concentration of existing residential uses which include the four villages and areas such as Richardson Road and Camp Street. Further concentrated residential and compatible commercial development is encouraged there. Low density residential is primarily land that does not have municipal services and where larger tracts of land with both wooded area and open fields exist. Less intense development in this area and the preservation of open land for agricultural use when possible is encouraged.

The four commercial zones reflect areas of desired commercial development with an eye towards the intensity of the uses and the lands available for it. An example of office building retail is that some commercial businesses need more room and the South Barre area has greater potential for such uses because larger land sizes are possible. Office building retail may not need the larger land mass so that areas zoned as such do not have the potential for larger lots. East Barre commercial attempts to reflect the existing development pattern in East Barre which includes commercial and residential uses.

Industrial and earth resource extraction recognize significant existing patterns with regard to granite quarrying and the extraction of gravel. Barre Town's foundation sits on granite and the importance of that resource is significant. Residential development patterns have, to a large degree, been created because of the granite industry. As times change and the granite industry sees fluctuations in demand, landowners turn to other types of uses. Industry is important to any community's economic development and it is important to find a balance between land uses given the proximity of industrial land (including earth resource extraction) and highly dense residential areas. Utilizing the conditional use process is a good way to help mitigate concerns.

Conservation areas are mainly those with steep slopes or other features that make development difficult.

2.6 PROPOSED ZONING

The Town of Barre completed a zoning rewrite shortly after the last Town Plan adoption in 2008. Future lands use, as outlined in the 2008 Town Plan were extensively incorporated into the new zoning. At present, the land use designations are sufficient and meeting the needs of the Town of Barre with the possible exceptions below:

- The 2008 zoning rewrite eliminated the public land zoning designation creating conflict between certain zones when abutting cemeteries. Allowing cemeteries to have their own designation, with limited use, should be considered in future zoning amendments.
- With the adoption of the 2020 Town Plan and subsequent Town Plans the Planning Commission should review Zoning Bylaw to ensure compatibility with the Plan.

2.7 ZONING MAP (Map 2)

The zoning map is used to identify current zoning designators and is used to determine allowed uses within certain areas. It can also be used to plan for future changes to land use.

2.8 MUNICIPAL USES

Most of Barre Town's municipally related uses are centralized in the Websterville area including the municipal building and public works truck garage and vehicle maintenance shop. Also, in Websterville is the Town's main recreation area located adjacent to the Barre Town Middle and Elementary School. There are many other municipally run uses such as fire stations in East and South Barre, emergency medical service building along US RT 302, neighborhood playgrounds, the town forest, water and sewer infrastructure spread throughout town for reasons of necessity or practicality. The Town also has three bike/pedestrian paths providing even more recreational opportunities.

- It is important to keep a centralized government seat for efficiency and character. It would benefit the Town if future municipal expansion stays centrally located.

2.9 INFRASTRUCTURE

Barre Town maintains a vast network of both paved and unpaved roads. These roads provide access to all land uses with much of the land use centered around the road types. In other words, commercial and industrial land is primarily located along either Town paved Class II or III roads or along State and Federal highways such as VT RT 14, US RT 302, or VT RT 110. Residential uses are primarily located on Class III roads either paved or unpaved. Unpaved roads are in the more rural area where uses are primarily residential or agricultural.

- The type of road should be considered when reviewing land use to ensure the highways system is suited for the use.
- It is not always recommended that heavy trucks travel on Class III or unpaved roads, or at least travel should be limited and regulated by permit. Unpaved roads have unique concerns of their own during the spring months when mud can affect travel.

Barre Town also owns and maintains many miles of water and sewer lines throughout the town. In the past there were numerous fire districts that supplied water to certain areas of Town, now only the Graniteville fire district exist and is operated by the residents of that village. The City of Barre provides water to many Town residents in the South Barre, Trow Hill, Richardson Road, Camp and Cassie Streets sections of town. Barre City owns and operates the sewer treatment plant and Barre Town has allocation at the plant for sewerage originating in Barre Town.

Water and sewer availability play a major role in land use development. As such, Barre Town has a designated sewer service territory and has ample capacity at this time to serve the territory and beyond.

- Barre Town has taken an approach against allowing extensions of sewer lines that requires pumping. This stance is especially true if the pumping would have to become part of the Town's system.
- Private and typically on lot pumping stations have been allowed in some residential uses but it is not preferred.
- Commercial and Industrial uses should be located in areas with municipal services such as water and sewer.

The Town of Barre has no plans for extension of its infrastructure relating to roads and the water and sewer distribution network. The one exception to these plans is the Wilson Industrial Park. Developers are the primary reason expansion of infrastructure occurs.

- It is the policy of the Town of Barre that if infrastructures expansion is required as part of new developments, including residential or commercial, the developer shall construct the infrastructure to a standard required by the Town and then convey the infrastructure to the Town for future maintenance.

2.10 LAND USE AND LAND COVER (Map 4)

The attached map shows the current land cover in Barre Town. Much of Town is still covered by forest or open land. The urban land, as shown on the map, indicates areas of more intense development. The map displays areas where agricultural uses may still find land suitable for the needs associated with that use and forest blocks important to forest integrity

- Future land use should refer to this map as a guide along with the zoning map when planning development to continue to find a good balance between intense land uses and less intense uses.

2.11 FOREST INTEGRITY (Map 9)

Forests provide residents and visitors of Barre Town with enormous benefits and a range of critical goods and services. Vermonters rely on healthy forests across the state to maintain a thriving forest economy and functioning natural systems that influence our quality of life. Forests benefits include water supply and water quality protection, flood control and protection, wildlife habitat and biodiversity, clean air, outdoor recreation, and scenic beauty. Forests also provide cultural, spiritual, and intellectual enrichment. All these benefits are known as ecosystem services because of the value they provide. Without forests, these services would need to be replaced and at a great expense.

Like the rest of Vermont, Barre Town's forestland is not virgin forest (pre-European settlement) after widescale harvesting in the 1800s. Approximately 48% of Barre Town is wooded with the primary species being maple, beech, and spruce. Barre Town's forestland is considered to be in second stage generation of 30 to 50 years' growth.

Municipal plans are required by State Statute to identify forest blocks and habitat connectors and plan for future land development in those areas of minimize forest fragmentation. Map 9 is used to show forest integrity in Barre Town. This map identifies priority connectivity blocks, priority interior blocks, and highest priority wildlife crossings.

The mapped priority connectivity and interior blocks align with Barre Town's least dense land use areas and much of it is enrolled in the State of Vermont's current use program.

The loss of forests and their benefits reduces the overall sustainability and resiliency of communities both near and far from the forest. In the short term, a forest loss results in a reduction of economic goods and services, wildlife habitat, and flood mitigation capabilities.

Barre Town's forestlands should be managed to maintain and improve forest blocks and habitat connectors when possible and practical by using the following:

- Strategies to protect long-term viability of agricultural and forestlands should be encouraged and should include maintaining low overall density.
- Sound forest and agricultural management practices should be encouraged.

- Maintain and improve the ecological integrity of intact forest blocks.
- Maintain and improve forest blocks that are large enough to support working forest.
- Maintain and improve the ecological integrity of functionality of habitat connectors.

Support landowners working to reduce the fragmentation of important forest blocks and habitat connectors. A forest block is defined as a contiguous area of forest in any state of succession and not currently developed for non-forest use. A forest block may include recreational trails, wetlands, or other natural features that do not themselves possess tree cover and uses exempt from regulations under 24 VSA § 4413 (d).

A habitat connector is defined as land or water, or both, that links patches of wildlife habitat within a landscape, allowing the movement, migration, and dispersal of animals and plants and the functioning ecological process.

Forest fragmentation is the division of a forest block by land development other than by a recreational trail or use exempt from regulation under 24 VSA § 4413 (d).

2.12 GUIDANCE STATEMENTS

Below is a statement concerning current uses and land size that should be considered when looking at zoning and land use:

Very High Density Residential: Lot size of 8,500 sf. or above with off-site water and sewer available requiring an increase in lot size if not. Mixed uses are common and while all of the villages are zoned as such, other compact areas also share the density but without the mixed use.

High Density Residential: Lot size of 1/3-acre or above with off-site water and sewer available as a rule with lot size increases required if not. Non-residential uses would be minimal.

Medium Density Residential: Lot sizes 2-acres and above as a transition between high density and low density. Past zoning practice has not incorporated this idea and the only real difference between medium and low density zoning at this time are a few uses. Off-site water and sewer, as a rule but onsite is likely permitted with larger lot sizes.

Low Density Residential: Lot size 2-acres, semi-developed, semi-rural and natural areas (typically not served by Municipal water and sewer), reduction in lot size with off-site water and sewer available. This zone is primary area for higher intensity agricultural use.

Commercial: Lot size ½ to 2 acres depending on actual zone. Areas of commercial zoning include East Barre Road (US RT 302) between Barre City and East Barre, also land in the Wilson Industrial Park zoned Commercial and intended for office park. Mixed use along South Barre Road (VT RT 14 – South) and East Montpelier Road (VT RT 14 – North). Quarry Hill from the City line has some commercial and could be expanded.

Industrial: Lot size 2-acres or more. The areas in Town exclusively industrial for the purposes of this Land Use map are the Wilson Industrial Park land and areas around Graniteville and Websterville.

Village Centers: Not a zone, but incorporates dense development with lot sizes as low as 8,500 sf. As its name suggests, a village center is a centralized, usually "self-contained", settlement including a concentration of residences, commercial use(s) and, perhaps, a church or churches and a post office. These features usually give a village center a sense of place and identity. Village Centers are generally located in very high density residential zones with the exception of parts of East and South Barre. Barre Town may consider applying for village center designation through the Agency of Commerce and Community Development's Village Center Designation Program.

The following are locally recognized Village Centers of Barre Town:

- | | |
|----------------------|----------------------|
| • Lower Graniteville | • Upper Websterville |
| • Upper Graniteville | • East Barre |
| • Lower Websterville | • South Barre |

Conservation: Lot size of 25-acres and above. This is the area most restricted from development, since it is land difficult to develop given natural features or designed to conserve needed natural resources.

Earth Resource Extraction: Lot size of 15-acres and above. Approximate location of the major land masses dedicated to the quarrying of granite, the Town's major "export" product and sand and gravel operations.

Mixed Uses: While not a zone, there are many areas which contain a mix of uses and are an important part of Barre Town's economic development, character, and quality of life. Mixed uses include, residential, commercial, and industrial and, in some cases, agricultural. Mixed use is predominately along VT RT 14 and US RT 302 as well as the village centers.

2.13 LAND USE GOALS

- Creative design and clustering is encouraged to minimize infrastructure costs and preserve open spaces. Open spaces to be maintained by homeowners' associations or by municipality with public/community access.
- The Town should continuously review Zoning Bylaws, site plan criteria and density bonuses, as provided by State Law (24 VSA § 4417), as these will help realize land use goals and policies.
- Low density residential land should continue to have less dense development for the preservation of open land and agricultural uses.
- Consider requiring all industrial uses to be reviewed as conditional uses to help mitigate potential conflict between them and residential uses.
- The protection of recreation opportunities should always be considered when looking at land use. Of particular interest is the protection of snowmobile trails and other paths that are important given the dependency of landowner's permission to use the land.
- Development and growth should be encouraged in areas where municipal water, sewer and roads are available. Growth should be done in ways that do not burden existing systems and cost of operating those systems on the taxpayer. Sewer pumping stations should be discouraged.
- When planning, balance market needs and demands with the capacity of the land while at the same time recognizing the need for standards and regulations.
- Continue to review zoning as a way to transition from one zone to another.
- Continuously review Zoning Bylaws to ensure compatibility with the Town Plan.
- Review the zoning designation of cemeteries.
- Maintain a centralized government seat.

3. TRANSPORTATION

3.1 HIGHWAY PLAN

Highways form the backbone of the transportation system in Barre Town. Proper location, design, construction and maintenance of this important public investment are essential if economic vitality, environmental preservation and quality of life are to be assured for the Town's citizens. A properly designed highway system contributes directly towards the environmental goal of reducing highway miles traveled using fossil fuels. The Energy Plan (Addendum A) of this plan provides further transportation policies and goals.

The Selectboard maintains an ongoing five-year paved and gravel road plan that contains specific projects and priorities. Since this is updated on a yearly basis, the improvement plan was not included in this Plan. Those interested in the Highway Improvement Plan should contact the Town Manager's Office.

In 1991, the Selectboard adopted a Highway Ordinance intending to assure that new roads are built in accordance with sound engineering practices to protect existing roads from overweight vehicles and to clarify responsibilities for Class 4 roads and trails.

Highways are classified first as urban or rural, and then into one of four functional categories: controlled access highways, arterial, collector and local. Controlled access highways and arterials are main roads whose primary purpose is the efficient movement of vehicles. Collector highways feed the arterial system and also provide land access to a significant degree. Local highways are primarily oriented toward land access.

Most of the roads in Barre Town fall into the local classification but a significant number are also collectors or arterials. For example, Cummings Road and the Plainfield Brook Road are both Class II roads but in addition, traffic counts indicate that the roads carry high volumes of traffic to/from Plainfield. A few of the Town highways and all of the State highways passing through Barre Town (VT Routes 14, 63 and 110 and US Route 302 are classified arterials.

Federal and State Highways

Two US highways and three State highways lie within Barre Town. With the exception of a short US RT 2 segment which connects to no town highway, these arterial highways are the principal means of access in and out of Barre Town. They provide the principal travel routes for inter-town trips whether for work, shopping or entertainment. Although these highways are of great significance to the Town, maintenance and construction of them is the responsibility of the State. There are 11.593 miles of US and State Highways in the town. US and State Highways within Barre Town are illustrated on the road map by functional class in the map section of this document (Map 6).

- US RT 302, arterial highway, runs generally east and west passing through East Barre Village. To the west, it provides a connection to Barre City and access to Berlin and Montpelier. To the east, it runs through the Town of Orange and provides access to the Connecticut River Valley and New Hampshire.
- US RT 2, an arterial, provides a link between Montpelier and St. Johnsbury, and has a very short segment which passes through the northwest corner of the Town.
- VT RT 14, an arterial, runs north and south through Barre Town and Barre City. RT VT 14 serves as a vital link between the northern half and the southern half of Barre Town. It connects to Williamstown and points south, and in the North, it provides access to East Montpelier where it intersects US RT 2.
- VT RT 63, an arterial, is better known as the South Barre Access Road and provides important linkage to Interstate 89 (a freeway). VT RT 63 is the only controlled access highway within Barre Town. Access is prohibited except at approved public highway intersections.
- VT RT 110, a collector highway, provides access to the Town of Washington south of East Barre.

Town Highways

The town highway system is the network of roads that all town residents rely on for personal land access, travel to other places within the Town, convenient travel to adjacent towns and connection to the State highway system. All town highways are categorized into one or another of the following classes for the purpose of receiving highway aid:

Class 1 Highways

There are no Class 1 town highways in Barre Town.

Class 2 Highways

Are considered the most important town highways and serve as truck routes within the Town and between Barre Town and surrounding towns. They are generally the more heavily traveled routes in town. They have an all-weather surface and provide links between major business and residential centers within town. The Selectboard determines which highways will be designated as Class 2, subject to approval of the State Transportation Board. There are 21.56 miles of Class 2 highways in Barre Town.

Class 3 Highways

Are all traveled highways other than Class 1, 2, or 4. The Selectboard, after conference with a representative of the State Transportation Board, determine which highways will be designated Class 3. Construction and maintenance of Class 3 Town Highways is the primary responsibility of Barre Town, but state highway aid is provided to assist in the expense. There are 73.72 miles of Class 3 Town Highways in Barre Town.

Class 4 Highways

Are all other town highways and pent roads. The Selectboard determines which highways will be designated Class 4. There are currently 4.64 miles of Class 4 roads in Barre Town.

Legal Trails

There are 1.84 miles of legal trails in the Town.

Town Highway Bridges

Providing safe and adequate bridges for the highway transportation system is extremely important.

- Adequate periodic maintenance of bridges is essential to avoid catastrophic or costly loss. There are two bridges and 22 major culverts on Barre Town highways. The two bridges are both located in South Barre, one on Snowbridge Road the other on Bridge Street. Long in need of replacement, the Bridge Street bridge was replaced by the State of Vermont in 2013. Barre Town paid 5% of the total cost.
- Continued maintenance and inspection of bridge and culverts is necessary to ensure an adequate and safe transportation network. Grant opportunities should be explored whenever possible.

Town Highway System Deficiencies

- Identification and prioritization of system deficiencies is necessary to guide Town officials in the effective use of limited highway budgets. Top priority should be placed on projects which will preserve the existing facilities and enhance safety. Periodic inspection of roads and bridges should be carried out to determine those needs. Periodic bridge inspections by the State Agency of Transportation provide critical maintenance information on structures. These activities should continue. In addition, the Town should continue the formal pavement management system to assist in making optimal use of limited resources.

- Secondary priority should be given to those projects which will relieve congestion and provide greater capacity. Identification of those needs requires careful consideration of many factors, including current system capacity, present and future growth, desired lines of travel, sources and availability of funds, and character of the area (i.e. residential neighborhoods). Several alternatives should be investigated in finding solutions to a given problem, and public input into the location and design processes should be actively solicited.
- Deficiencies which are presently apparent involve the efficient movement of people from major population centers within town to the major arterial highways in the area. Most significant examples are: (1) travel between the Websterville/Graniteville area and I-89, (2) travel between the Websterville/Graniteville area and VT RT 14 in Barre City, and (3) travel between the Trow Hill area and US RT 302 in Barre City.
- Another present deficiency involves travel between the northeast portion of Barre Town and US RT 2 in Plainfield. The recent improvement of US RT 2 and VT RT 14 in the East Montpelier area may provide an attractive alternative to the present unpaved rural roads connecting these areas. Efforts have been made by the State of Vermont to improve the intersection of VT RT 63 and Miller Road which seems to have improved this historically high accident location. Monitoring to ensure traffic is managed most efficiently at this location is important. VT RT 14/Bridge Street/Sterling Hill Road intersection is also a high crash location. Plans are well in the works to perform a slight realignment and make overall improvements to the intersection including signalizing. Mill Street at VT RT 110 had poor visibility, but the intersection was realigned into a T intersection in the fall of 2019 which should help traffic flow more safely at this intersection. All of these projects are important to and highly supported by Barre Town with regard to safety and economic development. It is hoped that the State of Vermont will make any of these projects not already completed a high priority.
- In addition to these deficient categories, system needs may arise as a result of planned development. These needs should be carefully analyzed to ensure that the developer is assessed a fair share of the costs of needed improvements. All such improvements should be constructed to the Town's established standards.

Recommendations for Future Improvements

- Future improvements to the Town Highway System may come about as a result of relocation or widening of existing facilities or as a result of new development. Relocation or widening should be done within existing rights-of-way whenever feasible. It should be accomplished with minimal disturbance to homes, businesses, streams, ponds, wetlands, schools and public recreational facilities and to important historic and archaeological resources. Highway location and construction should also be accomplished in such a way as to minimize encroachment on agricultural and significant forest areas, and with minimal adverse impact on ground water, scenic trees and vistas. Conservation of resources should be a goal in all highway construction and rehabilitation. The reuse of pavement grindings for surfacing shoulders or parking lots is to be encouraged. New roadways which will eventually be taken over by the Town should adhere to the same location, design and construction standards as indicated above.

3.2 ACCOMMODATION OF TRUCKS, BICYCLES, AND PEDESTRIANS

Trucks

It is important that adequate highways be provided to support safe and efficient truck travel because trucking is vital to the economic vitality of the Town. Therefore, it is necessary to identify those routes principally used by trucks to ensure that they are properly constructed and maintained for safe use by everyone.

Principal Truck Routes

The principal truck routes on Town highways are (list may not be inclusive):

No excess weight permits necessary (Legal Load Same as State Highway (LASH)):

Quarry Hill Road; Graniteville Road (to #773); Websterville Road; Pitman Road; Parker Road.

Others that would require an excess weight permit:

Farwell Street; Pine Hill Road; Plainfield Brook Road; East and West Cobble Hill Road; Windy Wood Road; Cummings Road; Hill Street; Airport Road; Upper Prospect Street; Morrison Road; Bridge Street; Church Hill Road; Cogswell Street.

Excess weight permits are issued by the Town Manager.

Bicycles (Map 7)

This section deals with shared use of roads between vehicles and bicycles, not bike paths. Bicycles provide a clean, economical and energy efficient mode of transportation. They are a primary means of transportation for some and have become an increasingly popular form of recreation and transportation for adults. The hilly terrain found in much of the Town does not encourage long, cross-town trips. Therefore, in addition to the limited bike paths that have been constructed to accommodate bicycles, safe and convenient bicycle routes encompassing Town roads should be provided or developed in the Town.

Bicycle traffic can be expected on nearly all, if not all, of the highways within the Town. The reasons for bicycle trips range from commuting to recreational. The commuter rider desires the most direct route with few interruptions, whereas the recreational rider is riding for pleasure and a specific route has less importance. Riding ability differs greatly among bicyclists. Some feel comfortable riding on a busy highway, other riders prefer to ride on a quiet street or rural road.

The planning and design of bicycle facilities whether they are improvements to existing highways, provisions included in new highways, or separate exclusive routes for bicycles need to accommodate a broad range of bicyclists.

- Designating certain roadways as principal bicycle routes can be effective in discouraging bicycle traffic on otherwise hazardous roadways. The principal routes must be generally hazard free in order to encourage the more serious rider to take a less direct route.
- Some bicycle paths are physically separated from the highway and can be either within the highway right-of-way or within a separate right-of-way. If bicycle paths are less than five feet from highways, physical barriers such as fences or guardrails should be considered in order to divide the bicycle lane from the highway.

There is no completed bicycle route network within the Town. Most of the highways used by bicyclists do not have sufficient shoulder width to safely accommodate them. Most of those highways which do have wider shoulders do not have markings or signs delineating a preferred bike route.

Recommendations for Future Improvements

- The Town should identify roads that would be conducive to bike travel that also fit into a master plan of creating interconnected bike routes.
- Future improvements should begin with a needs analysis; facilities should be developed based on the results of this study, as well as accessibility to existing and future facilities in adjoining communities; routes should be located to improve accessibility to natural, scenic areas and bicycle traffic generators such as schools, parks, playgrounds, and major employment centers.

- New roadways that are built and existing roadways which are improved should include provisions to safely accommodate bicycles. Old railroad beds and Class 4 Town Highways provide excellent opportunities for bike routes.
- A bike path from East Barre to the elementary school should be created.
- Both State and Federal funds are available for construction of bike paths. Cost of long-term maintenance and overall safety of all path users should be considered during the review process of any proposed path, as well as community benefits.
- Parking areas for vehicles should be conveniently located along bike routes to accommodate both the recreational rider and the commuter; this is an important consideration given that the steep grades separate areas within the Town, as well as separate the Town from its neighboring communities. Consideration should also be given to the construction of a parking area at the bottom of Richardson Road or one in the Cobble Hill area for scenic rural trips. A well-planned bicycle path system, with multiple nodes connecting to strategically placed vehicle park-n-rides will allow residents to minimize their use of fossil fuels.
- Any new bike path should be planned with consideration for additional width, signing, and striping in order to facilitate sharing the facility with bicycles, pedestrians, and joggers.
- Consideration should be given to the addition of a bicycle corridor along Route 14 using existing right-of-ways.

Pedestrians (Map 7)

Pedestrian walkways are an important and integral part of the transportation system.

- The construction of these facilities should be considered for the safety and convenience of pedestrian and vehicular traffic.
- These byways should be provided for in those areas where the volume of traffic warrants the cost and utilization of land for them.

Sidewalks are the most formal means of delineating walkways to separate pedestrian and vehicular traffic. They are generally needed in areas of moderate to high density development. These facilities are found in a wide variety of types as to width and surface materials and should be designed in accordance with acceptable standards to satisfy traffic volumes.

- Sidewalk improvements should be planned at the same time that road improvements or other construction projects are planned.

Footpaths are informal pedestrian walkways which may be utilized to move traffic between points or as nature trails and other recreational purposes. These paths generally have specific uses and are not necessarily associated with the need to separate pedestrian and vehicular traffic. Easements should be acquired or dedicated and maintained for the public use of these footpaths.

Shared use paths serve as part of a transportation circulation system and support multiple recreation opportunities, such as walking, bicycling, etc. Shared-use paths should always be designed to include pedestrians even if the primary anticipated users are bicyclists.

Recommended Future Improvements

- Future improvements may be either in the form of reconstruction of existing transportation facilities or new development.

- Consideration should be given to pedestrian needs, such as provision of wider, raised sidewalks, in the case of reconstruction or relocation of existing highways. The design of highway projects should include an analysis of pedestrian byway needs.
- All new and reconstructed sidewalks should include appropriate ramps at crosswalks and side streets to allow their use by the mobility impaired.
- Sidewalk Improvement - There are areas of the Town that are deficient in providing facilities for pedestrian traffic. Areas of primary concern are South Barre along VT 14 beginning at the existing sidewalk (at the intersection of Sterling Hill Road) north to Barre City at Parkside Terrace and south from the end of the existing sidewalk to Kings Row near the Williamstown town line and also along Richardson Road from the City line northerly to the intersection of Misty Mountain Drive.

Additional areas that should be incorporated into a study of pedestrian traffic facilities are along the through roads in East Barre, Upper Graniteville and Upper Websterville, and the Windy Wood and Hill Street areas.

3.3 PUBLIC TRANSPORTATION

Public transportation types and facilities are limited in Barre Town because the Town's population is dispersed over a wide area. The three types of most significance to Town residents are discussed in the following paragraphs.

Air Transportation

Air transportation services are available at the Edward F. Knapp State Airport in Berlin and the Burlington International Airport in South Burlington. Access to the latter is attained primarily by Interstate I-89. Access to the E. F. Knapp Airport is gained most directly by use of Airport Road and Morrison Road. Timely and adequate maintenance of these two routes is very important for a large number of Barre Town residents for airport access and for access to the hospital and shopping mall in Berlin.

Rail Transportation

Passenger transportation via Amtrak is available to Town residents in nearby Berlin. This rail access provides service south to the eastern U.S. seaboard and north to St. Albans. Passenger service within the Town itself is not considered feasible at this time.

Rail freight service is presently available via the New England Central Railroad to Websterville. Use of this line for hauling granite and other heavy industrial products into Barre City and beyond has the potential to relieve the Town highway system of much wear and tear. Moving large, bulky products by rail is far more energy efficient than using truck transportation.

- Continued and expanded use of such facilities should be encouraged.
- Industrial growth should be encouraged primarily in those areas currently served by or close to rail transportation. As demand for rail service develops, the frequency of rail pick-up will increase, making rail transport as reliable as truck transport.
- A common unloading/loading area along the rail line in the Wilson Industrial Park should be explored to allow greater access to the line for business located within the park.

School and Commercial Bus Transportation

School bus transportation for Barre Town Middle and Elementary School students is currently contracted, taxpayers pay for this expense. This service benefits the Town in several ways. It provides a safe and dependable way to pick up

and transport children to school, it is more economical than transportation of children by private automobile, and it reduces the amount of traffic congestion and air pollution which would result from private automobile transportation.

- Although private transportation to the school is becoming more popular, for all the reasons listed previously, public busing should continue to be a high priority.

Public bus transportation services are provided locally by Green Mountain Transit (GMT) and other privately-owned bus/van companies.

Commuter Services

The State of Vermont currently operates several commuter or ride share parking lots in the area. There is one such lot located along South Barre Road (VT RT 14) in South Barre near VT RT 63 and another just west of East Barre along US RT 302. VTrans also provides ride share parking lots in the adjacent communities of Berlin, Montpelier, East Montpelier, Orange, and Williamstown. This leads to a reduction in vehicle miles traveled.

Many of these lots could be expanded in size in the future as demand grows. There is also the option of adding additional lots or utilizing existing business lots that have lower traffic volume. Note that any of these changes would be done at the discretion of VTrans and are not town driven outcomes, although, they would certainly meet our goal of reducing private vehicle and fossil fuel use. Green Mountain Transit currently operates a ride share program. This type of program increases the mobility of Barre Town residents who are limited in their personal resources or access to family vehicles. This also reduces the demand of private vehicle use and its associated fossil fuel use.

- GMT should be encouraged to continue its services and if possible, expand them in the future as funding becomes available. One such beneficial expansion to consider would be expansion of bus services into South Barre.

Other Transportation Proposals

The Town may also wish to look into the following:

- Use of roundabouts is encouraged to reduce stop and go traffic and reduce accidents and improve safety;
- Study functional efficiency of highways as well as quality/materials standards;
- "Flex-time" – staggered work hours at granite manufacturing facilities and Industrial Park businesses to reduce peak hour congestion;
- Specify intersections and roads which need improvements to improve traffic flow/safety and efficiency;
- Support improvements to the Beckley Hill/US RT 302 intersection;
- Continue to support and be involved with the Quarry Hill Road/Quarry Street Intersection upgrade at South Main Street (RT 14) which is proposed for construction within the next several years;
- Add Traffic Safety Committee review requirements to Subdivision Regulations;
- Include a review of engineered traffic and warrants for signals;
- Developers putting in new roads should continue to pay for stop, speed limit and street signs and traffic signals as warranted. This should be required as a condition to subdivision approval;
- Developers putting in new curb cuts from driveways should utilize shared driveways design whenever possible to eliminate curb-cuts off the roadways;

- The Town should encourage developers of commercial solar arrays to incorporate a plan to install public access charging stations within Town limits;
- The Town should encourage businesses within the community to install charging stations.

3.4 TRANSPORTATION GOALS

- Preserve existing roads, bridges, and culverts by regular maintenance and continued inspections;
- Maintain the formal road plans to ensure good quality roads and to help make optimal use of limited resources;
- Explore whenever practical ways to help reduce deficiencies as noted herein;
- Road projects should have minimal impact to the public, natural resources, and recreation;
- All new Town roads developed to a standard as called for by Town Code;
- Plan road projects with bicycles and pedestrians in mind;
- Encourage and support public transportation initiatives;
- Encourage residents to reduce their use of transportation related to fossil fuels.

4. FACILITIES, UTILITIES, AND PUBLIC SAFETY (Map 3)

4.1 SEWER AND SEPTIC DISPOSAL

Sewer Systems

The Barre Town municipal sewer system serves at least 60% of the Barre Town residents. It consists of approximately fifty miles of sewer line and two pump stations. The system primarily serves the more densely populated residential, industrial and commercial centers of the community. The entire sewer system is plotted on individual maps which are maintained on the sewer plan map of the Town.

Starting in 2016, Barre Town worked with the Central Vermont Regional Planning Commission (CVRPC) to map the location of every sewer manhole in Barre Town. The impetus of this project was the mere fact that there only existed paper maps of the sewer manholes and line locations. Over the course of two years a total of 1,212 manholes were mapped, inspected, and given GPS coordinates with connecting sewer lines. This digital map will serve to be a resource for future operators of the Barre Town sewer system.

The age and condition of the sewer mains vary greatly. Some lines are nearly 50-year-old clay pipes which are subject to considerable ground water infiltration through cracks and joints. Others are less than 25 years old PVC lines which have been utilized in the industrial park, recent subdivisions and in-line replacement projects in Upper Websterville, Graniteville, East Barre, Trow Hill, Sterling Hill Road and the Buick/Ferris Streets.

The Town's sewage collection system is maintained by the Department of Public Works (DPW). The Town Engineer provides technical advice and planning. DPW employees have responsibility for day-to-day sewer service.

The Department of Public Works has the following equipment specifically for sewer maintenance:

- A service van
- A vacuum/flushing unit
- Sewer camera for pipe inspection

The Barre Town Sewer System is served by the Barre City Wastewater Treatment Plant which has a total design capacity of 3.4 million gallons per day. Of that total, Barre Town currently has a per day allocation of 1.54 million gallons. As of September 30, 2018, the town was using slightly over 1 million gallons per day of that allocation. The Selectboard acts as the Town Sewer Commission. The Town Zoning By-laws require that applications for sewer connections be reviewed and approved by the Town Engineer. The following recommendations are submitted in regard to the operations of the Barre Town sewer system:

- The sewer allocation policy should continue to be updated annually.
- The allocation policy has been revised to encourage sewer extension and connections in certain areas and discourage them in others. Growth is preferred where municipal services are available. All requests for sewer allocation shall be in accordance with the Town's current sewer allocation policy and shall be approved by the Town Engineer.

Septage Disposal

Septage disposal in the Town of Barre is generally accomplished by private companies that pump out the septic tanks in the community. State environmental regulations require that septage be disposed of at facilities where it can be properly processed such as municipal wastewater treatment plants.

4.2 WATER SUPPLY

The water supply for the Town of Barre consists of numerous sources and the systems are maintained by a variety of entities. There is one fire district remaining in Barre Town, the Graniteville Fire District provides full service with varied sources of water to residences in the Upper and Lower Graniteville area. Water is also provided by the Town of Barre to Quarry Hill, Sterling Hill, East Barre, and Lower Websterville. This water comes from a variety of sources: Barre City water, well water from Graniteville Fire District and a well owned by the Town of Barre in East Barre. The Town also owns and operates the former Websterville Fire District System, now known as the Websterville water system. The Websterville Water System uses a quarry hole for its source of water with a sand filtration water treatment plant.

Other sources are noted below.

Barre City

The largest single water supply source for the Town of Barre is the City of Barre which provides water from the Thurmond W. Dix Reservoir in Orange. This source provides water to a variety of areas of Barre Town.

- Richardson Road
- Camp and Cassie Streets
- US RT 302
- East Cobble Hill Road
- South Barre
- Trow Hill area

A. Barre Town Water System

1. Connections – 466 including the industrial park.
2. Well capacity – 40,000 to 50,000 gallons per day (GPD).
3. Daily demand approximately 80,000 GPD (supplemented by the various sources noted above).
4. Storage tanks (2) 300,000 gallon storage tanks in Websterville and 250,000 gallons in East Barre.
5. Water pipe network – 12" ductile iron (DI) and cast iron – 4,800' main, 8" DI and cast iron – 4,000' main, 8" DI and cast iron – 3,700' distribution, 6" cast iron – 2,800', 2" unknown – 2,000'.
6. Age - 10 to 45 years.
7. Condition - good to very good.
8. Pumping stations - Wilson St. and Old US RT 302.
9. Pressure – varies 20-120 pounds per square inch (PSI) (50 psi increase due to storage tank).
10. Fire prevention – hydrants.
11. Personnel - Town staff, two certified Class II operators.
12. Consumers:
 - residential – 90%
 - commercial - 7%
 - industrial – 3%
13. Consumption:
 - residential – 74.3%
 - commercial – 15.4%
 - industrial – 10.3%

B. Websterville Water System

1. Source – Barclay Quarry – main source, Casanova Street and the “summer supply” to fill Barclay Quarry in summer.
2. Connections – 134 residential and one store in upper Websterville.
3. Avg. daily use – 29,000 GPD – installed filter plant in 1997 to filter water.
4. Water pipe network – 12" pipe from storage tank to intersection of Violette Street and Church Hill Road. Approx. 5,000' of 8" ductile iron and approx. 2,500' of 4" cast iron used for distribution.
5. Age - 68 years.

6. Tanks, reservoirs and pumping stations – pumping station to service higher elevations; low lift booster pump to Barclay Quarry; and a pump to lift water from the summer supply quarry hole. 1991 – New 100,000-gallon reservoir with chlorination facilities. About two-day supply of head water.
7. Pressure – Average 30-40 PSI in the system. Lower end of the system, approx. 100 PSI pressure. gravity fed system.
8. Fire prevention – 10 hydrants.
9. Consumers – Residential – 93%, Commercial – 2%, Industrial, Public and leakage – 5%.

C. Graniteville Fire District # 4

1. Source – 52 springs or infiltration galleries and two wells.
2. Connections – 275 (of which 50 are outside the district).
3. Capacity – 438,000-gallon storage capacity, 72,000 GPD usage.
4. Water pipe network – 8" cast iron – 8000' main, 8" cast iron – 2,000' distribution, 6" cast iron – 3,000', 1 1/2" to 2" cast iron – 5,200'.
5. Age – 57 years.
6. Tanks, reservoirs and pumping stations – 3 reservoirs; # 1 – 77,000 gallons, # 2 – 111,000 gallons, # 3 new 250,000 gallons.
7. Pressure – 40 to 143 PSI.
8. Fire prevention – 42 hydrants.
9. Personnel – Prudential Committee (3).
10. *Consumers – Residential 88%, Commercial/residential 9%, Public/leakage 3% (*percentages based on number of connections and not quantity of water used).
11. Other – system upgrades were completed in 1998 with new reservoir, system booster station, filtration and supplement from Barre Town system.

D. Mountain View Acres Water System (Meadow Wood Drive)

1. Source – drilled well, 265 feet.
2. Age – drilled in 1972 or 1973.
3. Capacity – 70 gallons/minute.
4. Holding Tank – 4,900 gallons.
5. Pressure – 30-50 PSI.
6. Privately owned.
7. Connections – There are 10 single-family residential users at the maximum capacity.

E. Birchwood Park System

1. 14 existing connections (14 maximum). Any additional will require improvements to well and reservoir volume.
2. Drilled well, 60+ gals/min, 5 hp pump.
3. 2" plastic main.
4. Birchwood Park Homeowners Association.
5. Pump house on property line between Miller lot/ Homeowners Association.
6. System built in 1974 by Harry Miller-Birchwood Park Subdivision.

Water Supply Recommendations

- The Town should continue to explore adding wells in the Waterman St. Lowery Road area to provide core capacity and lower the dependency on other sources of water.
- Study interconnecting Websterville Water System to Barre Town system.
- Complete 8" water line from Mill Street to East Cobble Hill Road.

4.3 TOWN BUILDINGS

The Town has an interest in eight principal structures: Town Office, Barre Town Middle School and Elementary School, East Barre Fire Station, South Barre Fire Station, Public Works truck garage and vehicle maintenance shop, Ambulance Station, 22 Wilson Street, and Websterville Water System treatment plant and pump station/storage building. These buildings, including the school, are ADA compliant.

4.4 TOWN LAND

Barre Town owns numerous parcels of land within town boundaries and two in Williamstown, the most significant ones are listed below.

In June of 2018 the Barre Town School District conveyed 68 acres of land to the Town which includes all the recreation areas adjacent to the school except for the school's playgrounds and parking lot. During the time the District owned the land, the Town had maintained the recreation fields via the Town Recreation Board and part-time staff. The land was transferred because of the looming State mandated school district consolidation (which has occurred) between the Barre Town School District, Barre City School District, and Spaulding High School.

Town Forest

The Central Vermont Regional Plan (2008) recognized the importance of conserving scenic areas, ecological systems, wildlife habitats, recreational opportunities, and Source Water Protection Areas. Barre Town is also conscious of the importance of preserving land for future generations to enjoy.

Beginning in 2012, the Trust for Public Land (TPL) assisted the Town of Barre obtain five forested properties totaling 355 acres, combined with 25.7 acres owned by the Town, to become a new municipal forest in Graniteville and Websterville.

A conservation easement for 355 acres was conveyed to Vermont Land Trust and Vermont Housing and Conservation Board to protect the property from development and ensure it is open for public use in perpetuity. The 25.7 acres previously owned by the Town are part of the Town Forest, and included in this Community Forest Plan, but are not restricted by the easement.

The Town of Barre manages the property as a municipal forest for wildlife habitat, timber harvesting and management, public recreation, education, and water quality protection. Protection of the land as a conserved Town Forest also ensure public access, safeguards drinking water resources, supports the local timber, recreation, and tourism economies, provides occasional timber revenue to the Town, and restores and protects connectivity by assembling parcels that have fragmented ownership. The property's extensive network of trails is a regional destination for mountain biking and pedestrian recreation, providing unique economic and health-related values to the people of Barre Town and surrounding communities.

Wilson Industrial Park

The Wilson Industrial Park consist of approximately 160 acres of land and is used for both industrial and office purposes. The Town of Barre still owns about 58 acres of undeveloped land that is available for development. The Town, working with Barre Area Development, will continue its efforts to develop, subdivide, market, and sell lots within the park to promote economic growth, generate jobs, and expand the local tax base. Much of the necessary infrastructure such as water and sewer lines, road, and underground utilities are ready for future development.

Located within the industrial park is 5½ acres of land that is owned by the Town and is being used as a recycling depot. The depot is now being run by a private company. Barre Town and area residents can dispose of trash, recyclables, tires, appliances, and other used materials.

Adjacent to the Wilson Industrial Park is a 10 acre privately owned parcel of land.

- Including this parcel in the industrial park would provide for additional growth opportunity of the park and place it under the same standards, making it more likely for uniform development.

Former Pike Industry Land

In 2011, the Town of Barre and Pike Industries engaged in a land swap that saw the Town acquire 39-acres of land in Websterville across the from the Wells-Lamson Quarry, just above the municipal building. In exchange, Pike received 10 acres of former gravel pit land in Williamstown that was owned by the Town. The so called “Pike land”, hosts a 3.5 acre, 500 kW solar generation plant. The use of this property is consistent with this Plan and energy from this plant is used by the Town of Barre and Barre Town Middle and Elementary School. This solar installation helps Barre Town meet its energy goal as required by the Town Energy Plan.

Gravel

The Town owns a 34-acre gravel pit in Williamstown, just over the town line off VT RT 14, which has been in operation for over 40 years. The Town is currently mixing granite into the gravel to provide material for road work. The Town should investigate purchasing of other land for gravel given that no gravel source is endless, and the Town will continue to have a need in the future.

Property List and Acquisition Recommendations

The Town of Barre owns several parcels of land and buildings which are listed on an inventory and maintained in the Assessor's Office.

The Town may want to acquire property when it is in the public interest for such things as:

- Strips for highway connectors
- Parcels abutting Town owned property
- Parcels along significant water resources
- Recreational uses
- Preservation of natural resources

4.5 LIBRARY RESOURCES

Aldrich Public Library serves the residents of Barre Town as well as the City of Barre at two locations, on 6 Washington Street in Barre City and the York Branch, at 135 Mill Street in East Barre. The library serves the community of Barre with a mission to inspire the joy of reading, promote lifelong learning, and develop community. Annually, over 125,000 people visit Aldrich Libraries.

The library's collection includes over 62,000 physical titles. The library's website also offers over 25,000 digital titles, as well as encyclopedia and information databases that can be accessed in the library and at home. Aldrich patrons use these items over 88,000 times annually.

Digital access to information and digital literacy training have become a large part of information services, and Aldrich Library offers free Wi-Fi and 20 public computers for patron use throughout both locations. Specialty computer services are also offered on 3-D printers, microfilm computers, and bulk printer.

The central location and beautiful architecture make the Washington Street location a hub for the community. In 2019 renovations to the Katherine Paterson Children's Library and Milne Community Room were completed with Federal grant funding. Bob Vila, of *This Old House* magazine, listed Aldrich Library's Washington Street building as #5 on “The 25 Most Beautiful Libraries in America”. Three community meeting spaces are available at the Washington Street building, and many groups use these spaces throughout the year. Aldrich Library staff host additional programs

and activities at both libraries and throughout the community, with over 3,000 participants annually. Aldrich hosts programs throughout the year, including two weekly Children's Storytime programs, before open hours

As municipal supporters of Aldrich Library, all Barre Town residents are eligible for a patron membership. Barre Town contributes \$180,000, or \$19.85 per resident to the Aldrich Public Library. This meets 28.8% of the operating budget for Aldrich Library. Barre City, user fees, fundraising activities, community groups, and investment returns complete the Aldrich operating budget of \$626,050.

Aldrich Public Library
6 Washington Street
Barre, VT 05641
802-476-7550

York Branch
134 Mill Street
East Barre, VT 05649
802-476-5118

Future Needs of the Aldrich Library

Our libraries are constantly evolving. Today our libraries serve as more than reading rooms, for they offer access to the world via the internet, books and media in new formats from e-readers to downloadable audiobooks, from VHS to Blu-Ray, from e-mail to Facebook. Our libraries are gathering places for the community, educational facilities for preschoolers, and children in need of hot lunch.

To continue to serve the residents of Barre Town and Barre City, the Aldrich Library needs:

- Increased municipal support
- Improved parking
- Additional hours, especially in late afternoon and evening
- Source of funds dedicated to building maintenance

4.6 CEMETERIES

There are three public cemeteries in Barre Town: Maplewood, Wilson and West Hill. There are about thirty burials per year most of which are now cremation burials, not caskets. The public cemeteries, as presently utilized, have the capacity to continue to provide the needs of the Town for about 100 years. In addition, there are over ten acres of cemetery land which may also be used which are as yet undeveloped. The Town Cemetery Commission consists of five citizen volunteers appointed by the Selectboard who serve 5-year terms. Grounds are managed by a part-time sexton.

Wilson Cemetery

The Wilson Cemetery, located on a 21 acre parcel on Websterville Road near Quarry Hill Road, contains about twelve acres of cemetery space of which about seven acres are occupied. This cemetery is over 200 years old and is the final resting place for several Revolutionary War and War of 1812 veterans. Also, many of the Wildersburgh and early Barre prominent figures were laid to rest here, including Colonel Benjamin Walker, Revolution War Veteran and the Town's first Justice of the Peace. Both Jonathan Sherman and Joseph Thompson of the legendary naming fist fight (see section 2, for more details) are buried here. Ezekiel D. Wheeler, the person who won the right to name the Town, and chose the name Barre, is here. Finally, Ira P. Harrington, the owner of the Cobble Hill Quarry that provided granite for the State House has numerous family plots here. It is also important to note that one section of the cemetery was dedicated to "welfare" burials where many infants and young children are buried. Most of these graves are not marked.

While the age of the Wilson Cemetery is somewhat noticeable based on the stone and layout, newer sections are laid out more consistently and have hedges to separate lots and trees to provide summer shade. The new section provides a modern setting for families. Another sign of a modern cemetery can be found in the area where the columbaria is located.

In an attempt to meet an increasing demand, the Wilson Cemetery became the first publicly owned cemetery in Vermont to have a columbarium in 2008. Time, circumstances, and culture have made cremation a more viable option in bringing loved ones to the final rest. The Wilson columbarium allows the placement of ashes into 12" x 12" niches. The current columbarium has capacity for 96 niches but there are plans and room for expansion.

The Wilson Cemetery also offers a vault for storage of caskets for those that pass during the winter months. Most cemeteries in this area do not perform winter burials. The Wilson vault provides a safe repository for those awaiting interment.

West Hill Cemetery

The West Hill Cemetery is located in Barre Town near the intersection of Miller and Perry Roads. It is the oldest cemetery in the Town. Unfortunately, its records have been lost over the years. In 1996, residents Robert M. and Shannon M. Murphy searched the cemetery records of Barre Town and Barre City and discovered neither municipality has records of those buried. The following information is taken directly from information submitted by the Murphys. "Review of the tombstones indicates that the earliest burials were probably in the latter part of the 18th century, with the most recent burials in the early part of the 20th century. The oldest stone is dated 1799; the most recent, 1912." The cemetery stones have been inventoried and numbered and an all-person index has been created with the names spelled exactly as they appeared on the gravestones.

Maplewood Cemetery

The Maplewood Cemetery is located on Farwell Street and Nichols Road on a lot of 3.63 acres of which about 2.1 acres is presently available for cemetery use. It is about one-half full. Maplewood is notable as the final resting place of William Farwell who founded the Universalist Church in Barre City. William Goldsbury, whose first wood framed house is commemorated with a monument on Richardson Road and members of the Beckley family are also buried here.

Other Burial sites

Saint Sylvester Cemetery

The Saint Sylvester Cemetery is located on Websterville Road across from the Wilson Cemetery, is not municipally owned or operated but is significant when discussing cemeteries. St. Sylvester Cemetery origin dates back to September 10, 1916 when ten acres of land was purchased for \$1,030. The first burial at the cemetery took place in November of 1916 for a gentleman who died as a result of an accident at the nearby granite quarries. The cemetery expanded when Rock of Ages kindly donated approximately five acres of land south of the existing cemetery, and, in February 2000, the cemetery acquired just less than ten acres of land known as the "Churchill" property on the Graniteville Road. There are no immediate plans for burials in these sections, but the space does provide ample room for burials far into the future.

On average, there are 30–35 burials annually. Recent improvements to the cemetery include shrubbery and a new entrance off the Graniteville Road. The original granite posts leading into the cemetery on the Websterville Road have been unused for many years and are scheduled to be erected at this new entrance in 2020.

The cemetery is governed by six volunteer trustees and the pastor of the Saint Sylvester Church. The cemetery is staffed by a sexton and his assistant. They are responsible for all day-to-day operations of the cemetery including the sale of the cemetery plots.

Notable burials in the cemetery include the Reverend Napoleon LaChance and Eugene H. Nerney, both buried within the first circle in front of the granite cross located near the entrance to the Cemetery. Both gentlemen were instrumental in getting the cemetery established. Mr. Nerney was also the Town Clerk of Barre from (approx. 1919 to 1945), Fr. Bernard Messier, Fr. Campbell and Fr. Paul Bouffard, all past priests from St Sylvester's Church are also buried in this cemetery. The granite Cross was originally located at the St Sylvester Church rectory and was moved to the cemetery around 1930.

Private Burial Sites

There are a few private burial sites in Barre Town. The so-called “Sherman Cemetery”, located off Sherman Drive, is the historic, family plot of Colonel Nathaniel Sherman. Some people believe he was related to Jonathan Sherman, the man who, according to legend, renamed the Town by winning a fist fight in 1793. Col. Sherman constructed the two brick houses currently located on Sherman Drive today.

Gould Cemetery on Beckley Hill is just above what is now Washington County Mental Health building that was once the sanatorium. There are only a few graves at the cemetery and the people and dates are still unverified.

Cemetery's Future

Between public and private cemeteries in Barre Town, there is sufficient space to bury the deceased for many years to come.

- Continued efforts to properly manage and plan for the future should continue to ensure Barre Town's cemeteries continue to be modern, attractive, and comforting for the deceased and their families.

4.7 RECREATION FACILITIES

Barre Town Recreation Plan

The Barre Town Recreation Plan is designed to provide recreational opportunities for individuals and groups in every age range. Ball fields (baseball, softball and soccer) are available for team activities involving youth and adults. There are tennis and pickleball courts, horseshoe pits, a dog park, and bike/pedestrian paths. Families and other groups can enjoy the picnic areas (cookers, water, toilets, tables and shelters) as well as lawns, woods and playground areas. The estimated average weekly usage of all Barre Town recreation facilities in the spring, summer and fall exceeds 1,500.

Town Forest

Barre Town residents have identified recreation as a long-term management priority for the Barre Town Forest.

Trails throughout the 355-acre Barre Town Forest connect people to the landscape, to the local history of Barre, and to each other, by providing a place for year-round recreation and cultural education. Due to its proximity to residential areas, the Wilson Industrial Park, Barre Town Middle and Elementary School, and Websterville Christian Academy, the Barre Town Forest is easily accessible to a large number of residents for recreation and draws visitors from around central Vermont, New England, and beyond. Recreation and recreation management must be guided by the permitted and restricted uses set forth in the conservation easement (see Barre Town Forest management plan available in the Town Manager's office) and should also adhere to several other guiding principles. Through the terms of the easement, passive, non-commercial public access is granted to the property, provided it does not conflict with the other purposes of the easement. Public access benefits the local and regional tourist economy, provide educational and cultural opportunities, and provide health benefits for residents and visitors alike.

Pedestrian Recreation: The property is available to the public for all types of non-commercial, non-motorized, non-mechanized, non-equestrian, dispersed recreational purposes including hiking, hunting, trapping, fishing, wildlife viewing, skiing, snowshoeing, and environmental education.

Equestrian, Mechanical, and Motorized Recreation: Uses such as snowmobiling, mountain biking, horseback riding, and ATV use are permitted only on designated trails and only at the discretion of the Town of Barre in accordance with the easement.

Trails, multi-use trails and single track trails are available.

Trail Signage: Trail Corridor Managers are required to clearly mark designated trails in coordination with the Barre Town Recreation Board.

Recreation Facilities

The Barre Town recreation facilities are located on eight different sites within its geographic boundaries. The total space reserved for recreation totals approximately 46 acres. The distribution is as follows:

Barre E.M.S. lot	- 1 acre - basketball
Upper Websterville	- 1 acre - basketball, swings, see-saw, shelter
Upper Graniteville	- 1 acre - basketball, swings, see-saw, shelter
Lower Graniteville	- 1 acre - basketball, swings, see-saw, shelter
Trow Hill	- 1 acre - basketball, swings, see-saw, shelter
East Barre	- 4.8 acres - basketball, swings, see-saw, shelter, open field (Christa & Mikayla Foster Memorial Playground)
South Barre	- 1 acre - swings, see-saw, open field, picnic shelter

Barre Town Recreation Area

68 acres - (~ 30 acres are presently used)
2 small baseball fields
1 regulation lighted baseball field
1 lighted softball field
1 soccer field and a running track
2 lighted tennis courts and 6 pickleball courts
nature trails
hiking trails
1 picnic area with shelter and barbecue and tables, horseshoe pits
2 school playgrounds with swings, see-saws, slides, etc.
2 basketball courts at school
1 paved basketball court
1 sand volleyball court
1 Travis Mercy Memorial skate park
1 bike path to Graniteville (1.4 miles)
2 restrooms structures with flush toilets
2 pit toilets

Recreational Opportunities

Barre Town residents enjoy a wide range of recreational opportunities both in Barre Town and Barre City. Facilities in Barre City, often used by Town residents include the municipal pool, "Charlie's Playground 2012", municipal auditorium and a Bureau of Outdoor Recreation facility, providing ice skating in the winter and basketball, tennis, and street hockey in the summer. The North Barre outdoor ice rink also provides skating. The Barre Youth Sports Association organizes football, soccer, basketball, hockey, figure skating, and lacrosse programs for area youth. Also available are adult softball, adult hockey, adult broomball, adult soccer, adult baseball, Little League baseball and softball, Babe Ruth League baseball and American Legion baseball. The Thunder Chickens Snowmobile Club and SnoBees Snowmobile Club are also very active and an important winter recreation in this area. Millstone Trail Association is open year around and offers mountain biking, and cross-country skiing. The Town Forest provides for walking, hiking, snowshoeing and a host of other opportunities.

The area enjoys many regional opportunities including: skiing at Sugarbush, Mad River Glen, Stowe, and Bolton Valley. Golfing in Plainfield, Northfield, Montpelier, and Sugarbush. Additional ice skating facilities are located at Norwich University's Kreitzberg Arena, The Ice Center in Waterbury and the Civic Center in Montpelier. There are many open lands to fish and hunt on in the area.

Recreation Paths (Map 7)

Bicycle/Pedestrian paths create a safe means of alternative transportation for bicyclists and pedestrians of all ages and they have the potential to reduce vehicular traffic.

- There should be links planned and constructed between residential community centers and business areas with key destination points such as schools, businesses, quarries, recreation fields, and downtown areas in Barre City, Berlin and Montpelier located along path alignments.

A path's recreational value is in the wide variety of outdoor activities it provides. Walkers, joggers, cyclists, skaters, snowshoers, and cross-country skiers enjoy the benefits of exercise and recreation on community transportation paths. Paths also provide places for families and neighbors to meet and socialize, strengthening the sense of community.

Barre Town has several paths either built or in various stages of planning:

1. The Bridge Street to Fairview Street path follows the abandoned railroad bed and extends 1.2 miles. The path is an eight-foot-wide paved facility that accommodates bicycle, pedestrian transportation and recreational needs. It begins at the Bridge Street bridge in Barre Town and follows the rail bed past the Barre City municipal pool and recreation park. It continues past the Barre City Middle and Elementary School and terminates on Fairview Street in Barre City. The path is available to all Town and City residents.
2. The Millstone West segment is a completed section of the Central Vermont Regional Path that is approximately 1.4 miles extending from the Barre Town Middle and Elementary School to Compo Street in Graniteville and passing by the Rock of Ages Craftsman's and Visitor Center.
3. In 2009, long time Barre Town resident Charles Semprebbon, left \$500,000 to each the City and Town to create a path that would connect the two communities. Still in the planning stages, the "Semprebbon Connector Path" will connect the Millstone West to the Bridge Street path.
4. The East Barre path runs on an old railroad bed from the sharp curve on the Websterville Road in East Barre village approximately ½ mile to Millstone Boulevard. The Town is considering an extension of the path to the Municipal Building, which would allow connection to the Millstone West path using Websterville Road.
5. The proposed Central Vermont Regional Path is a 14-mile regional bicycle/pedestrian facility which, when completed, will extend from the Dog River Recreation area in Montpelier through Berlin, Barre City and end in Barre Town. Citizen committees in each community have been planning the path since 1994. The Barre Town Conceptual Alignment is available to the public at the Municipal Building.

Barre Town's section of the Central Vermont Regional Path is approximately 5.3 miles located primarily on abandoned railroad beds. In some areas, the path must leave the railroad bed and follow existing town roads.

Other sections of the Barre Town Regional Path include the Millstone Hill North segment, the Millstone Hill East segment, the Graniteville Road segment and the Websterville Road segment. Each of these short sections will be planned and constructed as funding becomes available. For additional information on these path segments please refer to Chapter 3, Transportation, Bicycle Accommodations in this document.

Class IV roads also play an important role when it comes to recreation. These roads are generally not Town maintained but Town controlled public rights-of-way. Today, many of these roads provide vital links for snowmobiles and horseback riders to name a few. The rights to use Class IV roads should be retained by the Town to continue the current recreational use and expand it if desired.

Recreation Governance, Funding and Administration

The main recreational site is located adjacent to the Barre Town Middle and Elementary School and owned by the Town of Barre. Other sites are located in East Barre, South Barre, Graniteville and Websterville. The Recreation Board oversees the recreation program activities and maintenance of the facilities. There are seven citizens appointed to the Recreation Board by the Selectboard. The recreation facilities are maintained by a seasonal part-time supervisor and crew.

Operating expenses for Barre Town's Recreation program are provided through a line item in the general fund of the Town's budget as well as volunteer services and contributions.

The Barre Town Recreation Board, with the help of donated money and volunteer efforts of users and others, has succeeded in developing, improving and maintaining each of the facilities (ball fields, skate park, tennis/pickleball and basketball courts, and picnic area). Oversight of these facilities and programs is its major on-going task. This volunteer board has come to appreciate and recognize the crucial role of volunteerism and donated funds and gifts, not only for maintaining present programs but especially for new initiatives to succeed. In keeping with this tradition of citizen-generated recreational facilities and programs, the Recreation Board invites community support and citizen participation.

4.8 SOLID WASTE

Barre Town is a member of the Central Vermont Solid Waste Management District (CVSWMD), represented by an appointed citizen. The CVSWMD provides solid waste implementation planning to meet State of Vermont requirements. This planning includes the development of state required 10-year Solid Waste Implementation Plans and updating of the plan; all public hearings on the plan and plan changes; and all responses to the state's review of the plan. All administration, reporting, monitoring, enforcement, and outreach involved with meeting state requirements that Barre Town would have to take on our own if not for being a part of the solid waste district. This would include writing and adopting solid waste ordinances such as the mandatory recycling ordinance; public education about solid waste laws; and monitoring and enforcement of solid waste ordinances.

Central Vermont Solid Waste Management District member cities and towns get the benefit of many services as part of their membership in the district. One of the main services offered is that they are the go-to resource on all things solid waste in Central Vermont. CVSWMD provides leadership, education, and services for residents and businesses in reducing and managing their solid waste in order to protect public health and the environment to the greatest extent feasible.

An important part in solid waste disposal is the many privately-operated roadside collection sites throughout Town. These sites provide easy disposal of household trash and recyclables. Barre Town also provides space within the Wilson Industrial Park for a large transfer station which allows Town residents and others a centrally located site to conveniently dispose of household trash and recyclables as well as many other items such as tires, scrap metal, and food scraps. This site, while once run by the CVSWMD is now privately operated.

- The Town should continue to support these convenient methods of trash disposal.

The Town augments the CVSWMD and private sector services with its own solid waste services. Twice a year the Town affords residents an opportunity to dispose of bulky trash items. In 1997, the Town started a lawn waste drop-off and composting site on Holden Road. The site was further developed in 1998 again in 2005. Residents may drop off grass clippings, leaves, tree branches, and hedge clippings. The grass and leaves are composted. The branches are chipped. These materials are available free to residents. The Holden Road site hours vary based on the time of year but generally it is open four days a week, Saturday being one of them. The site has extended openings in the fall. The site is staffed by volunteers or Town employees to help control illegal dumping. A Christmas tree collection is offered as well, and the trees are mulched at this site for use by residents.

Barre Town participates annually in Vermont's Green Up Day. From time to time, residents or groups clean up illegal dump sites and/or Adopt-A-Sites. The Town may offer general assistance and pay for disposal costs.

The Town should:

- Continue participating in regional approaches to solid waste management;
- Support recycling efforts whenever possible;
- As long as necessary, offer the bulk trash collection services;
- Enhance the lawn waste drop-off site to serve the growing suburban population;
- Consider offering disposal services for other types of items/materials as the need arises;
- Continue keeping roadsides clean and cleaning up illegal dumpsites with volunteers or Town Employees.

4.9 SOLID WASTE FACILITY

A solid waste facility may be permitted as a conditional use in Low Density Residential zones (or similar large lot residential zoning districts, except the Conservation zone) or in Industrial zoning districts provided the facilities are constructed, maintained, and operated so as not to unduly impair the public health, safety, welfare, or the natural environment. The solid waste facility may be permitted as a conditional use and may be recertified to continue operating only if it is in compliance with all State and local regulations. The term *facility*, for this paragraph and those that follow, includes landfills, waste incinerators, waste composters, waste processors, waste collection, storage, and transfer stations. The term *solid waste* is defined in 10 VSA Chapter 159, Section 6602.

The first permit for a solid waste facility shall not be issued and a finding of conformance with this Plan under 10 VSA Section 6605 (c) shall not be declared when the area of operation and/or ingress or egress is within 2,500' of:

- One or more residences;
- A food processing facility;
- A licensed or registered daycare;
- Schools;
- Health care facilities;
- Publicly or privately-owned outdoor recreation facilities.

A solid waste facility shall not be permitted when its disturbed (graded, excavated, filled, improved, built-on) land is within 300' of environmentally sensitive areas. A permit or finding of conformance for a re-certification of a previously-permitted facility shall not be denied solely on the basis of setback non-compliance for any of the above listed facilities, land uses, or businesses if they were sited after the original permit was issued.

Before a finding of conformance with this Plan under 10 VSA Section 6605 is issued, the applicant must: 1) obtain all required approvals or permits from the town; 2) pay up-front all of the town's projected cost (if any) for hiring a qualified public health professional who will conduct a health risk assessment; 3) pay up-front all of the Town's projected cost for consulting services (if any) necessary to evaluate the application and impacts caused by the facility; and 4) negotiate and sign a host town agreement (negotiations cannot be concluded before all town permits are issued).

The host town agreement shall address, but is not limited to, provisions for:

- Funding of the costs associated with Barre Town hiring an appraiser to determine real property depreciation related to the development and operation of the facility;
- Compensating impacted property owners for the full amount of property devaluation resulting from the proposed facility;
- Paying annual impact fees to cover any increased cost for infrastructure development and maintenance;
- Paying Barre Town, a per ton tip or processing fee surcharge for solid waste received at the facility;

- Protecting prime agricultural land elsewhere in Barre Town as off-site mitigation for prime agricultural lands impacted by the facility's development. This protection may be accomplished by either outright purchase of similar agricultural value land not already protected or through the procurement of a conservation easement on land of similar agricultural value.
- Granting rights of entry to town officials for the purposes of inspecting the facility for compliance with town and any other facility permits;
- Establishing aesthetic buffers to minimize off-site visual impacts from residences or public highways that are within 1,500' of the facility and have a clear view of the facility;
- Mitigating conditions predicted by the health risk management.
- Ensuring the facility operator, for as long as potential for public impact exists, will be responsible for, including financial post closure requirements such as monitoring, testing, repairs, replacements, and mitigation.

4.10 EMERGENCY SERVICES

Police Department

The Barre Town Police Department is housed within the Town of Barre's Municipal Building located at 149 Websterville Road in Websterville, VT.

An outside storage area is located at Department of Public Works, also on Websterville Road.

Currently the Town of Barre Police Department has one (1) Chief, one (1) Sergeant, one (1) Corporal, five (5) Police officers, and a specialized unit of one (1) canine and also employs one full time dispatcher/clerk, who works at the department during normal business hours. The dispatcher/clerk handles the administrative functions of the department, including data entry and preparation of paperwork that is sent to the State's Attorney office for prosecution. In addition, the dispatcher/clerk has been trained in the answering and dispatching of both routine and emergency calls for service. The police department has the capability to dispatch for the Town police, fire, and ambulance services should the need arise.

Currently, the Town of Barre Police Department is dispatched 24 hours a day, seven days a week by the Lamoille County Sheriff's Department as per contract while patrolling a little over 100 miles of road . The dispatcher/clerk also serves as a backup dispatcher when Lamoille is unable to provide the service.

- The Police Department sees a need for two (2) more police positions to be added to the seven (7) officer force. A total of nine (9) police officers and one (1) Chief would allow the department to keep up with the demands of continuing quality police services to the community.
- A larger force opens the possibility for the Town to partner with Barre Town Middle and Elementary School to establish a School Resource Officer.

Growth, both commercial and residential, affects police department staffing levels.

- Strategies to assure an effective enforcement in the future must include additional staff development and a continuing commitment to ensuring community safety.
- This can be done by continued training and keeping the department well equipped.

In looking towards the future, the Barre Town Police Department projects an increase for public service. The number of calls for service are expected to increase in future years.

The Barre Town Police Department has a vehicle inventory of four marked cruisers and one unmarked used by the Chief of Police. One of the marked cruisers is used by the canine officer. The Town replaces a vehicle every year.

The Department purchases, maintains and replaces a variety of uniforms and equipment to support department personnel including side arms, shotguns, patrol rifles, radar equipment, leather gear, uniforms, communications, emergency lighting equipment, portable and mobile radios, body cameras, and tasers.

Valcour™ computer aided dispatching (CAD) is used by dispatchers and officers to manage all on-going and past incidents. All police cruisers utilize iPads for Valcour™ and other applicable applications. In the near future, there will be a move from using paper tickets for issuing citations to using an integrated electronic platform (E-ticket) that communicates directly to the Vermont Judicial Bureau making the issuing of tickets easier for officers and more efficient to process.

Emergency Medical Services (Ambulance) Department

Barre Town EMS is a regional ambulance providing primary Paramedic level service to six towns in Central Vermont 24 hour a day seven days a week utilizing five ambulances. The Department operates two 24-hour staffed stations, and a third site at the South Barre Fire Station that is staffed during daytime hours, Monday through Friday. The primary station is located at 4 McLaughlin Road in East Barre and houses three ambulances. This station is responsible for emergency coverage of Barre Town, Washington, Orange and Topsham, as well as all non-emergency long-distance transfers.

The secondary station is located in Berlin fire station at Berlin Four Corners, (intersection of Paine Turnpike North and Route 62) and houses one ambulance. This station is responsible for emergency coverage in the Town of Berlin, including emergency transfers, and the Northern half of Brookfield.

The department also has a 12-foot Mass Casualty Incident trailer capable of resupplying the ambulances in the field, treating up to 75 adult and 50 pediatric patients.

There are 13 full-time employees, including the director: 8 Paramedics and 5 advanced EMTs. Full-time employees work 24 hours on shift and 48 hours off. There are approximately 24 per diem employees, 13 licensed at the advanced EMT level, 11 Paramedics. Per diem employees provide emergency coverage when either station is empty, for long-distance transfer coverage, or to fill openings in full-time shifts.

The EMS Department is capable of fielding three ambulances immediately and a fourth ambulance in twenty minutes or less as the coverage crew reports to the East Barre station. All five ambulances are identically equipped, and the crews are able to provide advanced airway management, drug therapy, and cardiac care. The department is also capable of transporting patients requiring specialty care such as ventilators and syringe pumps. The EMS Department can transport as many as five critically ill or injured patients or up to ten less severely ill or injured patients. Barre Town also has mutual-aid agreements with the cities of Montpelier and Barre, as well as Williamstown, Northfield, Cabot, Waterbury and Mad River Valley. These departments can provide an additional seven ambulances for emergency coverage or mass casualty incidents.

The EMS Department also provides Paramedic Intercept service to: Cabot, Marshfield, Woodbury, Hardwick, Northfield, Roxbury, Warren, Fayston, Waitsfield, Moretown, Waterbury, Duxbury, and Williamstown. In addition, backup coverage to the following ambulance services: Barre City, Montpelier, Northfield, Williamstown, East Montpelier, Mad River Valley, Cabot, Waterbury, and First Branch.

Advanced life support training is available in-house for all employees. These certified courses include: pre-hospital trauma life support (PHTLS), emergency pediatric care (EPC), advanced cardiac life support (ACLS), pediatric advanced life support (PALS), advanced medical life support (AMLS), and Critical Care Paramedicine.

Fire Department

Fire protection for the Town is provided by the Barre Town Fire Department. The department was formed in 1962 when it took over the assets of the East Barre Hose Company. The East Barre Hose Company was formed in the 1890s

and provided fire protection to the village of East Barre (formerly known as Carnes Mill). Fire protection for the remainder of the Town, at that time, was provided by the City of Barre.

Upon forming in 1962, The Barre Town Fire Department expanded its coverage area around the village of East Barre. However, it was difficult for the entire Town to be protected from East Barre, so the City was still relied upon for fire protection to a large part of the Town. The dependence on Barre City changed greatly when in the early 1970s; Barre Town added a second fire station in the village of South Barre. With these two stations, the Town was able to cover the entire Town with fire protection. There have been various agreements (some written, some not) over the years with the City to continue to assist the Town with structure fires by way of the Capital Fire Mutual Aid System.

- A more formal automatic mutual aid agreement for structure fires should be entered into.

The South Barre Fire Station was doubled in size in 2001 by adding two additional full-length bays. The roof to the rear of the building was constructed higher than the rest of the building to allow for storage now and the possibility of living quarters in the future. A new dispatch and training room were also added with the addition.

The fire department is a call/paid fire department whose members are Town Employees. Call/paid means that the firefighters are paid an hourly rate when dispatched to a call. Many hours are donated by members on a yearly basis for special projects and fundraisers which sometimes gives the department the feel of a volunteer department.

Because of the success of their fundraising, the members of the Fire Department formed the Barre Town Firefighters Association, a 501(c)3 non-profit organization in 2018. The association is governed by a seven-member Board of Directors and a full slate of officers, all members of the department. Under the umbrella of the association each station has a club entity, these clubs known as the East Barre Hose Firefighters (East Barre Hose Company) and the South Barre Firemen's Club conduct numerous fundraising projects throughout the year. Profits of the fundraising go towards buying equipment that is then donated to the Fire Department.

The department is dispatched by the Lamoille County Sheriff's Department, along with Barre Town's other emergency services. Department members are issued voice pagers that have unique "tones". Upon receiving an emergency call, dispatchers will send out a tone, which in turn activates the pager, the tone followed by a voice message as to the nature of the emergency. This method of alerting members to calls replaces the old phone system that was in place many years ago.

- It is important for this paging equipment to be kept up to date given its significance in the response process.

In years past, the Town was divided into two response territories with each station being assigned a territory and responsible for being the primary responder to that territory. The location of the emergency dictated which station was "toned". That method was changed as it was felt the citizens were better served by drawing from all personnel and equipment for most all calls regardless of where the emergency was located. It was also confusing for dispatchers and now offers better continuity between stations.

- This method has worked well and should continue to be the way the department responds to calls.

Barre Town Fire Department and East Barre Hose Company has been fortunate over the years to have many dedicated individuals serving the people of the Town. That tradition continues today. However, what seems to be a national trend towards less and less volunteerism has been felt locally by the Fire Department. The Barre Town Fire Department has a roster capacity of 45 members, the average membership is around 30.

- Greater efforts towards recruitment and retention and incentives should be explored to help attract new members to the department.

A Chief and a Deputy Chief oversee the day to day operations of the department as a whole, while each station has a "Station" Chief. The Station Chiefs are Assistant Chiefs. Each station has a Captain and two Lieutenants as well.

The Chief is appointed by the Selectboard, with the recommendation of the Town Manager. All other officers are appointed by the Chief with Town Manager approval. Officers, including the Chief, serve three-year terms. Firefighters are hired in the same manner as all other Town employees.

The department operates under Standard Operating Guidelines (SOGs) created by the officers and approved by the Town Manager.

- Regular review and revision of the SOGs is important to ensure the department is run in a manner that reflects the constantly changing world of firefighting.

The equipment listed below is what the Town currently utilizes to provide fire protection. Planning for future equipment needs and how the equipment is used is ongoing. Currently the life span of a pumper is about 25 years. Typically, the 25-year life span is accomplished by refurbishing equipment as necessary. Tankers make up an important part of any rural fire departments equipment. Tankers bring water to the fire when fire hydrants aren't available. In the past, in what was a common practice, Barre Town would convert old Town plow trucks into tankers by removing the dump bodies and putting large water tanks in their place. Using old equipment as tankers has been abandoned by most fire departments because of the need to have engineered trucks that are certified to do the intended job safely.

- The practice of professional design and build of all trucks should continue as the best way to ensure the safest and most dependable equipment available.

Current Vehicle Inventory

East Barre

2 – Pumpers
1 – Tanker
1 – Heavy Rescue
1 – 4x4 pickup/wild land truck
1 – All terrain off road rescue vehicle w/med skid
1 – Enclosed trailer

South Barre Station

2 – Pumpers
2 – Tankers
1 – Multi Purpose pumper/rescue/wild land

Emergency Management Department

The Town of Barre Office of Emergency Management is established under Vermont Statute Annotated, Title 20, Section 6 and the Town of Barre Emergency Management Ordinance Chapter 3, Section 3-1 to 3-2.

The Town Manager is the Emergency Management Director who appoints the Emergency Management Chair. The Chair is in charge of the day-to-day operation of the Emergency Management Office.

Emergency Management is charged with carrying out the basic government functions of maintaining the public peace, health, and safety during an attack or disaster.

The Town of Barre has an operating Emergency Operation Center and disaster plan. The operation center is located in the basement of the Municipal Building in Lower Websterville.

Display E911 Street Addresses

The rural character, climate and terrain of Central Vermont all impact the ability of emergency responders to find property in a timely manner. Displaying E911 addresses, which is the physical address of a property, is required by Town Ordinance. A property owner can be fined for not properly displaying the address. To properly display an E911 address, 4" numbers must be displayed, and they must clearly be visible from the road. Structures with long driveways

or ones that sit back from the road need to have numbers out by the road and on the structure itself. If a structure shares a driveway, then numbers on the structure or at the driveway split should also be installed. The Town should more actively pursue enforcement of non-complying property owners.

- The Town should continue to encourage compliance with the numbering.
- The Town should continue to offer low-cost reflective building number signs.

4.11 CONCLUSION

While growth is inevitable and desirable, it can have many impacts on a Town. Town facilities can be impacted if not considered in the planning process. In addition, expenses related to municipal services can burden tight budgets if not managed carefully. At this time, the Town has capacity to adequately handle increases in population and economic growth.

5. PRESERVATION

5.1 INTRODUCTION

Barre Town is rich in natural resources and areas of natural beauty as well as in numbers of historic sites and structures within its land mass of 31.8 sq. miles. This plan touches on examples of some of those and recommendations for preserving these unique assets whenever possible.

Barre Town's early development occurred without much concern for aesthetics. Early settlers' needs were based heavily on agricultural and deforestation that occurred in order to accommodate pastures and fields for livestock and land for growing of food. Granite quarrying developed in the Town during the 19th and 20th centuries further stripping the land.

As time progressed – so did appreciation for the natural resources and history of the area and recognition of our multi-national culture, prompted in large part by immigrants who came to work in the granite industry. Within the last 30 years, the Town has shown a marked increase in the protection of aesthetics and protection of natural areas. Recent development has been conceived and planned with “the view” and “green spaces” as dominant factors. Some developments have incorporated restrictive covenants concerning the height and placement of structures thereby protecting views of neighbors and passers-by. Aesthetics have also made their way into local zoning and state development laws.

5.2 SCENIC AND HISTORIC FEATURES

Quarries

Most notable of all Barre's scenic resources is the multitude of quarries from which are built such fine granite structures as the Vermont State House in Montpelier, the renowned Robert Burns statue located on the grounds of the Vermont History Center in downtown Barre, and thousands of cemetery memorials and commemorative structures throughout the country, and hundreds of other granite-faced, granite-trimmed buildings throughout the world. The Wells-Lamson Quarry, now dormant and owned by the Rock of Ages Corp. is notable because at over 600 ft. deep, it is among the deepest granite quarries in the world. A few “quarries” are not the expected holes in the ground that later quarrying methods came to develop but rather, were “walls” of granite from which stone was taken.

Views and Vistas

The Town of Barre is bound on two sides (East and West) by South to North oriented ridgelines with elevations of 1,200' to 1,800'. The center of town, referred to as Millstone Hill, is elevated with valleys on either side as much as 600' or more below. This geography has blessed Barre Town with a natural “rim” nearly surrounding the valley below. Views from elevated areas of Barre Town are also among the most recognized scenic assets of this community. Notable scenic views include Camel's Hump in Huntington, Spruce Peak in Plainfield, the Worcester Mountain range to the North, and the Orange Highlands to the East including the Knox Mountains. The lights of the City of Barre add to the evening and nighttime vistas. Any development within Barre Town that impedes or degrades these views is considered to be a negative impact.

These view sheds are considered an important part of our scenic resources and a valuable part of our quality of life as well as a sense of pride setting Barre Town apart from other towns. People respond positively to places that are visually appealing thus many people live in or move to Barre Town for these wonderful views and what that means to their quality of life. Businesses have also relocated to Barre Town for these same reasons. While scenery is important to the overall quality of our community, scenic vistas and view sheds are often destroyed during rapid change, both by nature and society. Protection of these assets is an important component to smart development and preserving scenic beauty. In this context, protecting views may be considered an extension of the concept of promoting the general health and welfare of Barre Town.

Roads and Waterways

Within the Town are a number of beautiful maple tree-lined dirt roads such as upper Cassie Street, Sunset and Neddo Roads, Phelps Road, Littlejohn Road and Snowbridge Road. Peck's Pond, Bolster Reservoir, Gunners and Scott Brooks, Jail Branch River, and Windy Wood Pond are examples of other scenic areas.

5.3 HISTORIC AREAS

Villages

Early development of Barre Town occurred in village areas surrounding employment centers. These villages eventually developed their own names and post offices within the Town — Graniteville, Websterville, South Barre and East Barre. Within them are examples of early quarry workers homes, usually similarly constructed, such as on the east side along Cogswell Street in Upper Graniteville. Another popular house style is the Sears Roebuck and Montgomery Ward early version of pre-fabricated houses (available with plumbing and electrical if one chose to purchase the whole package) such as the house at 54 Brook Street in Websterville. The South Barre village has notable large wood framed houses thought to be custom built - one at the corner of Seager Lane and South Barre Road (VT RT 14) dating to 1803, and two side by side on the west side of VT RT 14 at 397 and 411 South Barre Road, one of which local lore relates was a safe haven offered as part of the Underground Railroad which moved African American people to safety in the north.

Also, a part of village history are the traditional churches such as the East Barre Congregational Church and First Presbyterian Church in Graniteville. Traditional construction also remains for several grocery stores such as 34 Church Hill Road in upper Websterville. Scattered throughout the town are barns that remain though the "farming" may have stopped some years ago — examples are the Swift barn on Swift Road, the Usle "Strawberry Grove" barn at 109 West Cobble Hill Road, and the Paquet Farm at 179 Morrison Road established in 1909 in the South Barre area.

Town Forest

The Town Forest, 355 acres in size, gives visitors a very real sense of following the paths of industrial history as they ramble on through old railroad beds, over steel cables, and up onto grout piles of long ago. These places now offer scenic lookouts such as the stunning Empire Lookout at the northeast corner of the Forest. On hot days, visitors can stop by a cool spot created by ice deep inside some of the large grout piles. Throughout the Town Forest are some 70 early and very early quarries that supported small, often family-run, stone businesses.

Stone Walls

Prized among the "locals" also are the numerous stone walls throughout the Town traversing fields and woods — built to clear fields and mark boundaries of landowners.

Cemeteries

Barre Town cemeteries are local treasures, showcasing examples of the work of exceptional artisans, present and past. Older stones are of particular interest because they were carved without benefit of modern methods but rather using the very basic tools of the industry at that time. A rich history can be gleaned from the cemeteries of West Hill (Perry Road), Wilson (Websterville Road), Saint Sylvester (Websterville Road), and Maplewood (Farwell Street). Singularly situated off Miller Road is the family plot of Col. Nathaniel Sherman, early settler, whose relative Jonathan Sherman reportedly chose the name "Barre" in the legendary "naming of Barre fight".

5.4 HISTORIC SITES

Calvin Smith Farm

The Calvin Smith farm is located at 277 Morrison Road where the legendary "naming of Barre fight" occurred in

which Jonathan Sherman of Barre, Massachusetts won the fight over Capt. Thompson of Holden, Massachusetts. In actuality, Town records indicate the most generous contributor to “a house of worship”, Ezekiel Dodge Wheeler, was given the privilege of naming the town. The farmhouse dates to 1791.

The Morrison Farm

A large two-story brick farmhouse at the intersection of Morrison and Jensen Roads which was the site of the first settlement in what was then called Wildersburgh.

The Goldsbury Site

The site of the first framed house, a cape, built in 1800 and lost by fire in the 1960s is at the east side of Richardson Road near Goldsbury Woods Road. The site was appropriately memorialized in 1969 with a granite marker donated by the Barre Historical Society and the Rebecca Hastings Chapter of the Daughters of the American Revolution.

“Sky Route” Railroad Spur

Built in 1890, a rail spur leading to Millstone Hill (Websterville/Graniteville) from Barre City was used to transport the heavy granite down the hill to numerous granite “sheds” and for shipment abroad. The rail line had a tremendous economic impact on the industry because it made transporting granite much easier. The Sky Route was noteworthy for being the steepest grade rail line east of the Mississippi at the time, climbing 250 feet every mile.

Nine Former Neighborhood School Sites

Many of the early schools were one and two room schools offering education for grades 1 through 8. Locations were Upper and Lower Graniteville, Upper and Lower Websterville, East Barre, South Barre, Trow Hill, Springhouse and Brookside. Many of the old school bells from these sites are on display at the Barre Town Middle and Elementary School on the Websterville Road. School buildings continuing to be re-purposed and used are Brookside (office building), Springhouse (Barre Town EMS Building), and Lower Websterville (Barre Town Municipal Building). Demolished were Trow Hill and Graniteville, both of those sites are now Town playgrounds, and the South Barre and East Barre school locations, now both sites host Town fire stations.

5.5 HISTORIC STRUCTURES

Antique Brick Capes

Many such capes are scattered around the town and were often built by early quarry founders. Most if not all are currently in use as private residences.

Trow Farm

Notable among the antique brick capes is the Trow Farm at 262 Hill St., after which the Trow Hill area is named. At one time, the farm reportedly had 7 barns and offered transportation and overnight accommodations to travelers on the Haverhill, NH and Boston to Montreal Stagecoach route disembarking downtown.

The “Granite House”

The first granite house in town is located at 216 West Cobble Hill Road at the intersection with East Cobble Hill Road. Known as the Pliny Wheaton house, granite was used from the Wheaton Quarry a short distance away on Nuisel Road.

The Nichols House

Located at the intersection of Waterman Street and Littlejohn Road in East Barre, the Nichols House may represent Barre Town's only structure listed on the National Register of Historic Sites. It is a very early example of this popular building type in Vermont and is one of few remaining dwellings in the area built by a family in the first wave of settlement.

Robin's Nest Covered Bridge

This is a privately owned covered bridge over the Jail Branch of the Winooski River at 625 East Barre Road (US RT 302) and that leads to a log home situated on 16 +/- acres, also privately owned. Built in 1962 by the Robbins family and, even though not historic, the bridge is notable for its queen post design, built as a replica to one that stood just downstream and was swept away in the Vermont Flood of 1927. It is of authentic design and construction. In 1990 owners installed steel beams to reinforce the deck. This represents the Town's only covered bridge.

Washington County Sanatorium

Now home to Washington County Mental Health, this three story large brick structure at 260 Beckley Hill Road was built to house patients with tuberculosis, an unfortunate circumstance from working in granite sheds before modern dust-collecting machinery was available.

5.6 HISTORIC DISTRICTS IN BARRE TOWN

Upper Graniteville, Lower Graniteville, East Barre, South Barre Village

The list of Vermont Historic Sites and Structures, identified for Barre Town, is available in six volumes (not available in digital form) from the Vermont Division for Historic Preservation located at: 1 National Life Drive, Davis Building, 6th Floor, Montpelier VT 05620-0501. Phone: 802-828-1093.

Additional information available at: accd.vermont.gov/community-development

Information from the National list of Historic Structures is available at nps.gov/subjects/nationalregister/

5.7 RECOMMENDATIONS

- It is in the best interest of Barre Town to preserve and promote its significant historic resources, architecture, and sites, therefore the Town will pursue and encourage maintenance of those currently in existence and plan for future such preservation needs.
- The Town should establish a Town Historical Society and/or join existing Historical Societies or similar groups for the following purposes:
 - Creating a master list of historic structures and sites and making the list readily and locally available to the public.
 - Locating Town historic structures/sites on Town maps to be used for planning and zoning.
 - Providing educational programs to schools and the general public.
 - Encouraging rehabilitation and recognition of historic structures/sites including, for example, a program to put dates of construction on older homes, antique capes, now-extinct neighborhood school sites, and notable historic as well as operating granite quarries.
- Require a local permit and public hearing for the proposed demolition of a listed historic structure/site. As part of that permit, the State Division for Historic Preservation should be consulted prior to the demolition.
- Explore state and federal funding for restoration such as Grants Administration for non-profit or Town-owned historic structures and the Tax Reimbursement Act for Commercial Structures, etc.

- Encourage the preservation of our heritage through support of similar preservation efforts, such as the Vermont Granite Museum of Barre, the Barre Heritage Festival, etc.
- Encourage the preservation of stone walls when considering subdivisions.
- Undertake the planting and re-planting of maple trees along roadsides.
- Establish and enforce enhanced penalties for damage to cemeteries caused by vandalism and carelessness.
- Take steps to assure public access to “nature” - swimming holes, fishing, hunting, trail walking/biking, picnic areas, river parks, etc.
- Encourage stream bank preservation and buffer zones.
- Preserve public use of Ancient Roads – roads appearing on maps but not currently suitable for vehicle use.
- In all matters of historic preservation, Town officials are encouraged to partner with others of the same purpose so as to maximize results toward achieving the goal of preservation.

5.8 SCENIC PRESERVATION

As noted above in 5.2, Views and Vistas, Barre Town’s visual beauty is an asset which must be protected. Therefore, the Town of Barre’s policy regarding aesthetics is one of encouraging enhancement and conservation of natural areas, the environment, and views. Of particular interest are the following areas of town:

- Western ridge: Commonly referred to as West Hill, this ridge runs from VT RT 63 north to the boundary line with the Town of Berlin.
- Eastern ridge: Encompassing Taplin Hill, Trow Hill, and East Hill, from US RT 302 in East Barre north to the boundary line with the Town of Plainfield in the vicinity of the Pinnacle (elevation 1,821’).
- Any area that is visible from an opposing ridge or face more than one mile away.

Any development that displaces more than two acres of natural land or vegetation is discouraged and at a minimum shall be subject to site plan review with special emphasis on size, bulk, location, heights, setbacks, and construction material as they relate to how a project may be seen.

Any development above the ridgeline shall be limited to established height regulations.

The following are goals and recommendations regarding scenic preservation in the Town of Barre:

- Consider aesthetic upgrades and visual enhancements on Town owned land and rights-of-way.
- Ridge lines have yet to be mapped within the Town but doing so may prove helpful as ridge lines play a greater role in both power production and aesthetics. Those areas which are identified should be protected by zoning and subdivision regulations to preserve natural ridge lines.
- Full size industrial wind turbines are not a good fit for the Town and should not be allowed due to relatively low ridge lines, aesthetics, the absence of large tracts of unpopulated land, and numerous other negative effects (see 8.5 Renewable Energy). Small to mid-size units have similar concerns and siting criteria must take into account all the potential negative effects before being allowed. An example of a medium size turbine would be the one located at Rock of Ages.

- Overhead power lines can also have a negative effect on aesthetics. The Development Review Board should continue the practice of requiring underground power whenever possible for new development. This would also include transmission lines for both wind and solar projects such as stated above.
- Zoning regulations should continue to control the height of structures to preserve the scenic view of citizens and visitors.
- Tree-lined areas of roadways should be preserved particularly if the trees are old and such areas encouraged by appropriate subdivision regulations and encouragement to property owners. However, new trees along roadways should be set back away from roadways far enough to prevent interference with highway maintenance.
- The Town should promote the preservation of public scenic areas such as trails, ponds, swimming areas, picnic areas and railroad beds for continued public use.
- The Town may wish to consider acquiring other properties if a change of use is contemplated in the future, if doing so will prevent a negative impact on something viewed as significant to scenic preservation.
- Site plan approval under 24 VSA § 4416 should continue to be used to ensure that landscaping and appropriate screening of all applicable projects occurs. Site plan criteria should be continually evaluated to ensure they are effective.
- Developers of subdivisions and any commercial/industrial development should be required to provide landscaping as a part of their projects. Greenbelts are defined as those areas located between any road and lot or building frontage that designates an area for the planting of grass, shrubs, flowers, trees or landscaping of any other kind. They should be provided in all subdivision, conditional use and site plans, for existing properties or new projects. Greenbelts contribute aesthetic beauty and favorably affect the scenery and character of the neighborhood. Scenic paths and public areas may be required by the Development Review Board (DRB), as appropriate. Those plans shall require approval by the DRB during project review.
- Zoning provisions should be adopted which require appropriate energy efficient project lighting, including, but not limited to LED technology or other subsequent energy efficient technologies

5.9 RESOURCES TO BE PRESERVED FOR RECREATIONAL VALUE

The Town supports the preservation of rare and irreplaceable natural areas, scenic and historic features and resources in recognition of the value of recreation. The following opportunities should be continued, maintained, preserved, developed and/or upgraded, including any or all within the Barre Town Forest:

- Playgrounds, basketball courts, skate parks, soccer field, ball fields, tennis courts, a volleyball court, and picnic shelters.
- The Gunner Brook Fishing Derby is an annual tradition for children sponsored by the Barre Fish and Game Club. The fishing derby was the first designated derby in the nation for children under sixteen.
- Traditional links between natural resources and recreation: skiing, cross-country skiing, fishing, sledding, skating, hiking, camping, hunting, snowshoeing, snowmobiling, geo-caching, and four wheeling.
- The Town encourages recreational activities for Town residents and visitors.
- Bicycle/pedestrian paths and abandoned railroad rights-of-way.
- Class IV roads and public trails.
- Fishing streams; Stevens Branch, Gunners Brook, Jail Branch and Scott Brook.

5.10 NATURAL RESOURCES

Natural resources play a major role in the selection process used in deciding to live and work in a location. Some natural resources such as, topography, soils and water resources alter the capability of land to support population. Others, such as forestlands, farms and natural areas present aesthetic features which help define the quality of life for citizens. All natural resources warrant careful consideration in the Town Plan and review of future development in a continued effort to maintain and improve the quality of air, water, wildlife and land resources.

5.11 CLIMATE, TOPOGRAPHY, SOIL, AND EARTH RESOURCES

The Town of Barre enjoys the complete range of seasonal changes and a true New England climate.

Average summer temperatures of 67 degrees Fahrenheit and winter averages around 29 degrees Fahrenheit are prevalent, with winter extending from November through April. Winter and spring thaws may create conditions known as "mud season", on unpaved roads which make up approximately 30% of Barre Town's highway system. As a result, transport of heavy loads over some roads is restricted, or may require special permits; this permit period runs from about November 1 to May 1 annually. Deep frost lines also result in a construction season of limited length, especially affecting infrastructure and foundation construction.

Summer, with a growing season of about 110 days, enjoys mild temperatures of 75 degrees to 85 degrees; seldom more than five (5) 90-degree days; lush green landscapes; occasional showers or thunderstorms and profuse wild-flower displays. Average annual rainfall is 33+/- inches. Average annual snowfall is 75-90 inches.

The fall colors in Barre Town, enhanced by a topography offering a wealth of panoramic views and tree-lined byways, are some of the most spectacular in the Northeast.

Extreme climate events, such as hurricanes and tornadoes, are rare. However, recent severe and prolonged rainstorms have caused localized serious erosion and road washouts. While we cannot predict with certainty that these events will be the norm in the future, it would be reasonable to be adequately prepared.

- It is important to consider the best mitigation measures when repairing and planning Town infrastructure.

Topography and Slope

Barre Town, being a series of hill-tops surrounding valley feeder "branches" for the Winooski River, offers impressive views; lush landscapes; and, steep, winding roadways. Views of Camel's Hump and Spruce Mountain are prized by residents, though more pastoral settings and scenic locations prevail in the community. The railroad on Quarry Hill is the steepest grade in Vermont and revolutionized granite mining in the town. Astride Barre Town's highest elevation are the granite quarries and man-made peaks of granite waste (grout), which highlight this unique scenery. Slopes in excess of 20% are not uncommon, and simultaneously serve to enhance the aesthetic appeal of Barre Town while posing environmental planning challenges for development. The challenges include erosion control, sewage management, site design, road or driveway integrity, surface water run-off and seasonal access. The advantages are: residential privacy, outstanding views, and seasonal beauty. Elevations vary from South Barre at 680', East Barre at 1,130' and Lower Graniteville at 1,269' and Upper Websterville at 1,313' to Upper Graniteville at 1,500', which represents the highest of the village centers elevation. The highest elevation of 1,825' in Barre Town is the Pinnacle off Cutler Corner Road.

Soil Types and Earth Resources

Soil Types

The US Department of Agriculture Soil Conservation Service has recorded and mapped soil types throughout Barre Town. Soil types predict the physical capability of the land to handle development and the resource production potential of the land. Unfavorable soil types for development typically contain the following properties: excessive slope, shallow depth to bedrock, wet, unstable, and erodible soils. Before development,

these soil maps should be reviewed to learn of possible on-site septic limitations, drainage problems, bedrock interference, etc.

For example, near the granite quarries, the soils have been removed to facilitate the mining of granite. Beyond that excavation, the soils are Glover-Vershire complex rocky soils. The slopes in this area range from 15 to 35 percent and the soils are composed of soils that are generally unsuitable for septic tank absorption fields and cultivated crops, there may be, however, pockets of suitable soils for on-site septic disposal. Mound systems in areas that are not steep can be utilized.

As the slopes become more gradual, prime agricultural soils can be found throughout Barre Town. These soils are well suited for crops, hay and pasture. Buckland silt loams are found at slopes of 3 to 15 percent and are generally deep to bedrock. It is susceptible to erosion at the steeper slopes and drainage ditches can be used to help control it. The soils have seasonable high water tables at various depths and on-site monitoring should be done to determine suitability for on-site septic disposal. In the South Barre area, between Berlin and Route 63, significant pockets of prime agricultural soils extend down towards Barre City. These soils are valuable for crop production and should remain in farming/low density type uses.

Knowing the soil types on parcels of land, particularly where primary agricultural soils are is a valuable planning tool that benefits the public. Maps are available from the Town of Barre Planning and Zoning Office to assist residents and developers alike.

Earth Resources

Barre Town's earth resources include granite, gravel, sand and topsoil. Barre Town presently owns and operates a sand and gravel pit on VT RT 14, in Williamstown. The quarries provide jobs and yield important materials for construction and manufacturing. The Town of Barre recognizes the granite grout piles as a natural resource and encourages their appropriate use.

While mineral extraction areas do provide important and needed materials for road and building construction as well as manufacturing:

- It is vital that care be taken in the siting and operation of future mining and extraction operations in order to avoid land use conflicts, environmental damage and habitat destruction.
- Additionally, in residential and conservation areas, standards should be established for the operation, maintenance and ultimate restoration of mineral extraction land.

Air Quality

The quality of the air we breathe is important to the vitality of a community. Communities tend to thrive better when the air is clean and health issues are not a concern and visibility is generally good. Most of Vermont air quality concerns are generated from out of state.

Similar to most parts of Vermont, Barre Town is considered to be in attainment/unclassified status with regard to air quality as determined by the State of Vermont, Air Quality Division through their Air Quality Implementation Plan. This means that Barre Town is assumed to have attained the standard but that there really isn't a classification. Barre Town's air quality, again like most if not all of Vermont is considered to be excellent.

While Barre Town's air quality is excellent, it can be affected by many different things including industrial uses, traffic, heating systems, and some agricultural uses. In Barre Town, most industrial uses are under ACT 250's jurisdiction and as such must meet State of Vermont air quality standards in order to get a permit.

- That may not be the case for all uses and as such, if not already under some form of air quality review, uses being considered during the permit process should be carefully reviewed for air quality concerns and if necessary be required to show how standard air quality standards are being met.

5.12 FOREST LANDS

By the mid-1800s some 75% of Vermont had been cleared of forested land and since then, much of Vermont has been returned to wooded land.

Vermont is now 80% wooded while Barre Town is approximately 48% wooded, (estimated from 1979 composite orthophoto map of the Town). Present uses of forested land include recreation, water quality, scenic backyards, as well as wildlife habitat and wood products (lumber, firewood, maple syrup, etc.). The forest land in Barre Town is presently divided into the following major categories: Protective, Productive, Transition, and Urban.

Protective

Protective forest lands (22% of the forested area) are defined as those areas with forest cover identified as natural and fragile area, heron rookery near the East Montpelier town line, forest preserve and aquifer protection areas (cf. well head protection area maps in Utilities and Facilities Plan).

Productive

Productive forest land (8% of the forested area) is all large tracts which in themselves, or when combined, form a major economic unit for long-term timber production.

Transition

Transition forest lands (52% of the forested area) are those resulting from fragmentation of larger tracts. They are intensively used for recreation, wood production, and wildlife habitat. Their value as watershed protection is also recognized. Larger than 25-acre parcels, this forest land category is appropriate for development, particularly rural, residential development, due to its proximity and accessibility to population areas.

Urban

Urban forest land (18% of the forested area) refers to small parcels in or adjacent to the urbanized areas. The land is generally owned by private non-industrial landowners and are used most intensively for recreational purposes. These parcels are less than 25-acres in size and generally not economically viable for long-term timber production.

Development pressure seems to be greatest on previously open or agricultural sites. However, where soils are suitable or where access to public water and sewer is available, the transition and urban forest areas are also under great development pressure.

"Prime" forest land as such has not been identified. However, there is a FLESA (Forest Land Evaluation and Site Assessment) process available which could assist the Town in identifying, quantifying, and evaluating its prime recreation, scenic, wildlife, and timber-producing forest land.

Scenic vistas, recreational opportunities, timber production, wildlife habitat, forest integrity (see section 2.9) and water protection are important assets that forest lands provide.

- The Town encourages careful and long-term management for the multiple uses of our forest resources.

In Barre Town, forest land may be described today as "maple-beech-spruce climax forest" in second stage generation of 30 to 50 years' growth. While there appears to be no distinct "mature growth forests", some mature, grown trees exist in the second stage woods. Barre Town is generally guided by State GAFF, — "generally accepted forest practices"—for protection and perpetuation of existing forest land.

Beginning in 2012, the Trust for Public Land (TPL) assisted the Town of Barre in obtaining five forested properties totaling 355-acres, to be combined with 25.7-acres owned by the Town, to become a new municipal forest in Graniterville and Websterville, Vermont.

A conservation easement over 355-acres was conveyed in 2013 to the Town of Barre by the Vermont Land Trust, the Trust for Public Land, and the Vermont Housing and Conservation Board to protect the Property from development and ensure it is open for public use “in perpetuity”. The 25.7-acres previously owned by the Town are part of the Town Forest, and included in this Community Forest Plan, but are not restricted by the easement.

Town of Barre will manage the property as a municipal forest for wildlife habitat, timber harvesting and management, public recreation, education, and water quality protection. A conserved Town Forest also ensures public access, safeguards drinking water resources, supports the local timber, recreation, and tourism economies; provides occasional timber revenue to the Town and restores and protects connectivity by assembling parcels that have fragmented ownership. The property’s extensive network of trails is a regional year round destination for mountain biking and other pedestrian recreation, providing unique economic and recreation benefits to the people of Barre Town and surrounding communities.

Conservation and proper management of the Barre Town Forest will also help to ensure the water quality and the safety of two drinking water supplies, specifically:

- 179-acres (69%) of the Source Water Protection Area for the Websterville Water System that supplies drinking water to 420 people.
- 27-acres (39%) of the Source Water Protection Area for Barre Town Water System that supplies drinking water for 1,210 people.

Wildlife Habitat

Barre Town, like most of Vermont, is home to diverse species of wild animals and with roughly half of the Town forested, habitat is plentiful. Any day while walking or driving around Town, you may have the good fortune of running across white-tailed deer, turkeys, bear, and maybe even a moose or two.

While Barre Town does not have any organized effort to protect wildlife habitat, the State of Vermont does to a large degree by classifying over 1,700 acres of land inside Barre Town as deer wintering land and over 4,000 acres as bear habitat. The deer wintering land has significant development restrictions placed on it and is managed by the Vermont Fish and Wildlife Department. According to the Fish and Wildlife Department, valuable yarding areas are lost each year to road construction, housing, and other forms of development. Additional threats are over-cutting of timber and pest outbreaks, such as spruce budworm and emerald ash borer. Each lost wintering area results in great pressure on the remaining areas of winter range.

- While not always easy, it is beneficial for communities to find a balance between wildlife habitat and development.
- Barre Town supports wildlife habitat preservation but does not see the need for further restriction beyond what the State already has created.

5.13 AGRICULTURAL LANDS

Agriculture and Farmlands

Barre Town’s history has been closely linked to agriculture since it was originally settled. The initial clearing of the land and the construction of roads were accomplished by farmers in the eighteenth century. The rolling hills provided springs for agricultural water supplies, and the streams provided limited power for the processing of agricultural goods.

Barre Town has only one active dairy farm left and a variety of other farms with crops such as hay, grapes, vegetables, beef cattle, horses, Christmas trees, maple syrup and maple products, herbs and perennial flowers. There are several equine operations and boarding stables as well. There are vacant fields, meadows, and pastures which are no longer part of active farms, but which remain as open spaces. In Barre Town, there are 83 landowners, owning approximately 5,778-acres, who are enrolled in the State’s Current Use Program. The Current Use Program seeks to preserve forest and

agricultural lands through the use of tax reduction incentives.

The remaining farms produce a locally created product, and they provide employment as well. Local farms usually preserve scenic open spaces, recreation during off-season, and wholesome uses of natural resources. Farms sometimes create buffers between differing land uses such as industrial and residential. They also create minimal demands on public services.

- It is a policy of the Town of Barre to encourage the preservation and continuation of economically viable agricultural uses including all of the farms which are currently active.
- Additionally, the Town encourages the creation of new agricultural uses which are economically viable.
- Farm preservation should be accomplished through positive inducements for farmers, rather than restrictions on growth. It is the intent of the Town that the owners of farms enjoy the economic benefits of their investment and ownership.

5.14 GROUNDWATER RESOURCES AND GEOLOGY

Many residents and businesses in Barre Town obtain their water from groundwater sources. Groundwater comes from both fractured bedrock and from unconsolidated sediment in stream valleys. Any saturated sand and gravel deposits might provide a source of ground water for larger groupings of houses. With expanding commercial development, larger projects may be sited. The nature of the subsurface materials, including depth to bedrock, is of importance when alignment choices are made, and effects assessed. Water well and boring data provide a potentially valuable source of data in areas lacking exposures. Depth to bedrock measurements, are reliable aids in determining the thickness of surface materials and can be used to reconstruct the hidden bedrock topography.

“Geology for Environmental Planning in the Barre-Montpelier Region, Vermont” by David Stewart, 1971, contains an extensive set of maps delineating surface materials, ground water potential, solid waste conditions and sand and gravel reserves for Barre Town. In the ground-water potential map, most of Barre Town occupies areas of very low ground-water potential in which most water is available from bedrock sources at depths to 300 feet. Areas of moderate to good potential, where water is available in gravel and sand, follow the valleys of the Stevens Branch and Jail Branch. These areas, containing permeable sand and gravel, are not generally suitable for solid waste and sewage disposal because of the increased potential for leachate to seep through and contaminate ground water. Areas identified by Stewart for solid waste disposal include upland areas covered by thin (less than 25 ft.) impermeable silts and clays.

The surface materials in the region are dominantly of glacial origin and were deposited while the area was covered by an ice sheet and during and shortly after the retreat of that ice. Most of Barre Town is mapped as having a thin layer of till over bedrock and/or exposed bedrock. Thicker surface materials occupy the valleys of the Stevens Branch and the Jail Branch, and the area just west of VT RT 14. The materials, varying from low permeability silts and clay to high permeability sand and gravel, provide constraints on development, land use, and resource availability.

Barre Town is on the Barre West USGS map and East Barre 7.5 minute quadrangles in north-central Vermont. The bedrock geology of the area consists of low to moderate grade metasedimentary rocks. The metasedimentary rocks are phyllites, schists, limestones and, of course, granite. Granite is an igneous rock formed approximately 340-360 million years ago. It is Barre Town's most significant natural resource and its commercial extraction has provided the Town with employment opportunities since the early 1800s.

Gravel resources are predominantly restricted to the area along VT RT 14, although not all as is evident along Farwell Street and US RT 302. Sand and gravel deposits, as shown on Stewart's map are limited in extent and nearly half the original reserves are depleted. Stewart estimates, however, that an adequate reserve for the near future remains.

The Vermont Geological Survey has mapped the three-dimensional distribution of surface materials in Central Vermont's largest cities (Montpelier and Barre) and the surrounding rural areas that are experiencing growth. This map will serve as a basis for land use planning that includes identifying and delineating surface aquifers, sand and gravel

deposits, areas prone to slope failure, areas suitable for septic systems, and areas underlain by significant thicknesses of low-velocity clay-rich sediments where seismic risks are amplified. New data for the west portion of Barre Town is available. Interested citizens can find this information from the VCGI (Vermont Center of Geographical Information) website through the State of Vermont site located at vcgi.vermont.gov/

Ground Water Protection Plan

A useful resource for ground water protection planning is the report “*Ground Water Resources and Protection for the Town of Barre, Vermont*”, (“Smith Report”) July 1988, prepared by Michael B. Smith, Hydrogeologist for the Vermont Agency of Natural Resources which is still timely and relevant.

- Recognizing the importance of protecting present and potential future ground water resources to provide for water consumption by Town citizens, it is recommended that the Town adopt a ground water protection policy. This policy should be implemented by a Ground Water Protection Strategy which includes the following:

Public Education:

- Town should take an active role in making its citizens aware of the need and benefits of protecting groundwater resources.

Ground Water Resources Inventory

- Inventory should be taken to determine all available ground water resources. This data should then be looked at alongside other (e.g. ground & surface) water resources currently in use and being developed. This total resource picture should then be measured against the Town growth projections and land use plan in order to determine the need. The Town Ground Water Protection strategy then should be developed in response to that need.

Land Use Inventory

- An inventory of current land uses is essential to determine whether ground water resources are subject to existing dangers and whether available and accessible for community use. (cf. Smith Report, Appendix 4, Model ordinance, p. 4, list of business activities which represent a potential danger to ground water drinking water supplies.)

Amend Town Code

- Amendments to the Town code should include Hazardous Materials Ordinance (cf. Smith Report, Appendix 4, Model ordinances, pp. 6-13.)

Draft Amendments to Town Zoning Bylaw and Subdivision Regulations

- As needed, calling for an Aquifer Protection Area Overlay District to ensure all zoning and subdivision applications are checked for potential impact on ground water resources. (See Appendix 4 of Smith Report.)

Consider other Zoning Amendments

- Designed to protect identified well-head protection areas which serve as an existing or potential municipal water supply. Boundaries of any districts created should be based on geological data (contact point of sand and gravel deposit with surrounding till or bedrock materials). Within that area, land uses should be **restricted** within the cone of depression of an existing well, while the rest of the recharge area (to the boundaries) should be **protected** from incompatible land uses or mismanagement. Consultation with an expert is essential to lay out this two-district zoning.

Ground Water quality should be checked first

- If an aquifer is already contaminated by industrial, commercial or densely developed residential uses, zoning will serve no purpose. Likewise, if ground water resource is not of sufficient quantity to meet present or future needs, over protection may not be warranted.

Zoning

- This is best suited for regulating prospective land uses, since present uses are “grandfathered” in. Please see Smith Report, Appendix 4, Model Ordinances, pp. 14–19 for model Water Resource Protection District language for Zoning Bylaw. This model should be studied for its suitability for Barre Town; then, if suitable, adapted as needed and proposed for adoption.

Subdivision Amendments and Other Proposals

The Smith Report contains model subdivision amendments and other regulations besides those cited herein. These are available for perusal and possible proposal by interested citizens.

- Town's involvement in ground water protection and accessing should, of course, be coordinated with fire districts in which said areas may lie, or with other public water systems.

The Town Public Works Department controls storm water runoff by a system of ditches, culverts, and catch basins to protect its road infrastructure. Most of the runoff not absorbed into the ground eventually flows into natural waterways. In response to ACT 64, the Vermont Clean Water Act, the State's Department of Environmental Conservation began implementing a Municipal Roads General Permit (MRGP) in 2018 to reduce impacts to waters of the state from storm water runoff from municipally owned roads. The Town abides by the MRGP conditions for its “hydrologically connected road segments.” This refers to stretches of road where water runoff would eventually make it into waters of the State. MRGP standard include road crowning, hydroseeding disturbed soils, ditch design, turn-outs for drainage outlets, culverts, and culvert outfall management.

5.15 NATURAL RESOURCES GOALS AND OBJECTIVES

- To assure long-term, sound stewardship of natural resources through reliable planning and management practices.
- To ensure that development is in harmony with the natural features of each site and limited where development is imprudent and/or questionable due to excessive negative impacts.
- The Town will encourage and enlist the assistance of residents, landowners, schools, businesses and other entities to study inventory, manage, preserve, protect and enhance natural assets.
- The Town should enlist existing organizations and boards such as: Recreation, and Housing Committees; Development Review Board; Planning Commission; and the Traffic Safety Committee to propose and implement policies to protect natural resources and enhance natural features throughout Barre Town.
- Mapping and natural resources information should be readily available to applicants as part of any review process. Expectations, as well as opportunities, for appropriate management practices and development choices should be offered to applicants. This information should also be accessible to the public.
- The Town should encourage the appropriate siting and reclamation of any future mining and/or extraction operations to avoid land use conflicts and minimize environmental damage and habitat destruction.

Suggested Actions & Initiatives

- The Town should encourage protection of mature landscape and geological features (i.e., native rock and ledge) seasonal and indigenous waterways, privacy screens, recreation space, etc. to serve the goals of the Town Plan while increasing marketability of developments and confidence in applicant planning capacity. Applicants should be advised to incorporate mitigation measures to protect natural resources, rather than to delay proposals strengthening planning considerations.
- The Town should encourage Barre Town businesses to landscape with native vegetation and materials, through the Zoning Bylaws and Subdivision Regulations.

6. EDUCATION FACILITIES

6.1 INTRODUCTION

Every community strives to provide sound educational systems which address the needs of every sector of the population. Planning decisions have significant impacts upon educational services as housing growth, location and type of housing fosters changing demands.

Barre Town has a modern, well-maintained PK-8 facility that meets Vermont's Public School Approval (PSA) standards. Barre Town and Barre City share a common high school, Spaulding High School. Barre City, Barre Town, and Spaulding share a PK-12 superintendent and central office. In 2019 the three entities were merged into the Barre Unified School District. Several private schools help round out the choice's parents have in the education of their children.

6.2 SCHOOLS

Spaulding High School

Spaulding High School and the attached Central Vermont Career Center provide secondary educational programs for students from Barre Town and Barre City as well as several tuition students from surrounding towns. In recent years, improvements to the school include a renovated library, interactive boards in all classrooms, new unit-ventilator heaters throughout the building, renovated bathrooms, and upgraded science labs. The school is fully accredited and meets the Public School Approval requirements.

HIGH SCHOOL ENROLLMENT / COST PER PUPIL

<u>Year</u>	<u>Barre Town Students</u>	<u>Cost per Pupil</u>
2010-11	403	\$ 10,153
2011-12	390	\$ 11,108
2012-13	368	\$ 11,580
2013-14	380	\$ 12,340
2014-15	398	\$ 12,448
2015-16	363	\$ 12,474
2016-17	369	\$ 12,892
2017-18	377	\$ 13,347
2018-19	359	\$ 13,352
2019-20	359	\$ 13,556
Total Change		-44
Avg. 10-year cost per pupil		\$ 12,325

Statistics for CPPs are reported in the annual Barre Town Report of the Town Officers in a configuration that includes changing variables. Please see reports for clarification of expenses and classes/ grades included in these figures. High School means grades 9-12 in these charts.

Barre Town Middle and Elementary School

The Barre Town enrollment for the 2019-2020 school year was 838 which includes Pre-Kindergarten students which is down by 28 over 2010-2011. With the passage of ACT 166, the Universal Pre-Kindergarten law, enrollment for Pre-Kindergarten includes students who attend a qualified private center in Vermont, for which the district pays tuition for 10 hours per week, as well as for students who attend the half-day program in the school, which has capacity for 120. Because the school program has such large capacity, relatively few students are enrolled in private provider centers.

The charts below describe total enrollment over the last decade. Enrollment has fluctuated between the low and high eight hundreds over these years.

PRE-SCHOOL TO GRADE 8 ENROLLMENTS / COST PER PUPIL

<u>Year</u>	<u>Student Body</u>	<u>Cost per Pupil</u>
2010-11	867	\$ 9,920
2011-12	829	\$ 10,375
2012-13	867	\$ 10,611
2013-14	877	\$ 11,055
2014-15	871	\$ 11,094
2015-16	844	\$ 11,595
2016-17	869	\$ 11,860
2017-18	864	\$ 12,038
2018-19	821	\$ 12,591
2019-20	839	\$ 13,556
<hr/>		
Total Change -28		
Avg. 10-year cost per pupil \$ 11,470		

Websterville Christian Academy

The Barre Town area, in addition to public school options, also offers a private Christian School K-12 in Websterville. Websterville Christian Academy was established in 1977 and has a current enrollment of 110± students. Students to teacher ratio is 6:1 and has a full complement of basic and traditional courses along with Bible teaching and character training. Websterville Christian Academy is a recognized Independent School by the Vermont Department of Education and enjoys accreditation by VCS (Christian Schools of Vermont). Approximately 90% of the graduating seniors go on to College or Universities, to include Vermont Technical College, Norwich, Liberty, Grand Canyon and others. Many of the graduate are serving in different fields and careers throughout the world.

St. Monica-St. Michael School

St. Monica-St. Michael School (SMSM) is a private parochial Catholic school accepting students of all faiths. St. Monica School, founded in 1927 in Barre and St. Michael school, founded in 1923 in Montpelier were consolidated into one school in 2008 and located on the St. Monica Parish campus in Barre City. The school accepts students from Pre-K through Grade 8 with 102 students currently enrolled, 27 from Barre Town.

SMSM holds NEASC (New England Association of Schools and Colleges) accreditation as well as its Pre-K program is a 4-STAR VT licensed center. The school offers Religion, Language Arts, Reading, Math, Science, Social Studies, Art, Music, including Band, Physical Education, Spanish, Library and Technology/Computer Skills. Older students receive a Chrome Book, learn to play an instrument of choice and participate in sports' teams. The school uses traditional grading, teaches cursive writing and has an After-School Program. Students go on to thrive in their community public high school or Rice (Catholic) High School in South Burlington.

Area Colleges, Universities and Continuing Education

The Town of Barre is fortunate to be located within reasonable commuting distance to colleges and universities in Central Vermont. These include Vermont College of Fine Arts, Norwich University, Goddard College, Community College of Vermont (CCV), Vermont Technical College (VTC) and Woodbury College. New England Culinary Institute (NECI) provides a unique two-year educational program in cooking and hospitality related careers in nearby Montpelier. In addition, Champlain, St. Michael's, UVM and CCV in Chittenden County are within 45 minutes to an hour commute distance from Barre Town. Numerous opportunities for adult education and extension courses are also available locally.

6.3 CONCLUSION

Educational opportunities and school quality are, perhaps the two most significant basic services to make available to residents of a community. Real estate professionals attest to the importance most buyers attach to the reputation of local educational facilities. Whether potential property owners have school-age children or not, they acknowledge the importance of good schools in the stability of the community; the viability of taxes paid; and, salability of real property.

Town planning processes and subdivision review offer early indications of increased or decreased demand upon educational facilities. As an example, applications for an unusual number and percentage of “affordable”, three bedroom housing units would be an indication that the market is moving toward young families with school age children in the near future. In another example, large subdivision applications for smaller, higher density condos – suitable to singles and couples – would suggest diminished future demand upon local school districts. Master Planning, where developers of sizable parcels of land may “phase construction” but illustrate full development in drawings and plans in the earliest submission of subdivision application, will assist schools and government in planning for the future.

7. THE REGION AND OUR NEIGHBORS

7.1 REGIONAL CONTEXT

As the second largest community in Central Vermont, many of Barre Town features play a large role in the region as a whole. Below is a list of some of those features important to not only Barre Town but the Central Vermont Region.

Aesthetics and Family Life

Open spaces, colorful views, a variety of housing developments, year round recreational opportunities, and K-12 local education facilities (including private options), as well as proximity to employment have long made Barre Town a residential community of choice in the region. Many residents find Barre Town such a desirable place to live that they commute as much as an hour to work, a “blink of an eye” in a Metropolitan area, but time well spent in Vermont to live here.

Rural Village/Open Space

The Town is unique in that it contains at least four distinct village centers; East Barre, South Barre, Graniteville, and Websterville as well as numerous other smaller population clusters, all easily traversable in the course of “being a neighbor”. The remaining lands outside the village centers are primarily open and lightly populated.

Unique Geography

Geographically, the Town envelops (almost completely surrounds) the City of Barre to the north, east and south. Barre Town also abuts 6 other communities, Berlin, Plainfield, Washington, Orange, Williamstown, and East Montpelier. Barre Town primarily holds the “high ground” where the bulk of the granite deposits and quarries are located. Barre Town’s highest point of elevation is The Pinnacle (elevation 1825’), while dropping to an elevation of 700’ at the valley floor. The valley portion of the Town is bisected by two rivers; the Stevens Branch and the Jail Branch both of which are part of the Winooski River basin.

Farming

Barre Town sustains one active dairy farm, as well as several farms involved with horses, silviculture, maple sugar bushes, vineyard and winery, and vegetables. A nod toward history would recall such notable farms as the “Routhier” farm on East Hill (with outstanding views), and the Trow Farm (for which the Trow Hill area is now named). Also, the “Paquet” farm in South Barre (which produced a “Paquet” student every year for 49 years to the then – South Barre neighborhood school). Over time, other Barre Town farms disappeared, some of which have become housing developments.

Numerous granite quarries

Rock of Ages Corp. is now the only granite quarrying company in Barre Town, currently quarrying stone from the E.L. Smith quarry. The area is dotted with numerous inactive quarries – both large and small. The Town and City are recognized by many as the “Granite Capital of the World”, serving to attract tourists as well as provide employment. The area includes numerous large and small manufacturing plants, which produce world-renowned granite building and commemorative products. The history of Barre’s unique granite products and its talented craftsmen is commemorated in the Vermont Granite Museum and Stone Arts School of Barre, an ongoing effort by the community to recognize the significant role of granite to the region. The museum is located at 7 Jones Brothers Way in Barre City.

Industrial Park

In the spring of 1997, Wilson Industrial Park celebrated a ribbon cutting ceremony for a 94-acre expansion and infrastructure installation. In 2008, another significant infrastructure investment was finished including utilities and a road extension (Parker Road). The expansion was entirely funded with money obtained from the sale of lots in the park. The park has 58 acres of land still earmarked for development and over 40 acres of land that won't be developed. This does not include 87 acres of adjacent land that is protected as open space in exchange for the land that will be developed in the park. With the preserved land and a recycling center, the Town has made a commitment to economic development while maintaining aesthetics and good neighborhoods. The Wilson Industrial Park enjoys a wide range of businesses that include granite manufacturing, food distribution, spirit (liquor) production, and high-tech manufacturing. These businesses provide valuable jobs that serve the region.

Housing Rehabilitation

For several years now Downstreet Housing and Community Development (formerly Central Vermont Community Action) has been managing the Barre Town Housing Rehabilitation fund with good success. Over \$80,000 has been lent to town residents with Downstreet's oversight. Many of the original Barre Town Housing Rehabilitation loans remain in a deferred status (houses transferred/sold) but will someday be paid off and reentered into the program.

Emergency Medical Services

Barre Town EMS provides paramedic-level ambulance services to the communities of Barre Town, Orange, Washington, Topsham, Berlin, and half of Brookfield. The EMS Department also provides Paramedic Intercept service to; Cabot, Marshfield, Woodbury, Hardwick, Northfield, Roxbury, Warren, Fayston, Waitsfield, Moretown, Waterbury, Duxbury, and Williamstown. In addition, backup coverage to the following ambulance services: Barre City, Montpelier, Northfield, Williamstown, East Montpelier, Mad River Valley, Cabot, Waterbury, and First Branch.

Barre Town is among the most populous municipalities in Central Vermont

Taken together with Barre City, Berlin and Montpelier, Barre Town is part of the major commercial & industrial population center of Central Vermont with a combined population of approximately 28,000 people. The Town experiences slow but steady growth in population as well as in commercial and industrial development. Now the second largest community in Central Vermont, the Central Vt. Regional Planning Commission predicts Barre Town to become the largest community in Central Vermont over the course of the next several years.

Proximity to Major Highways

Barre Town is the beneficiary of a direct connection to I-89 by way of Exit 6, VT RT 63 accessible in South Barre at VT RT 14. Also convenient is access via Exit 7, using VT RT 62 in Barre City which connects at North Main Street. Additionally, the crisscrossing of VT RT 14, US RT 302, US RT 2 and VT RT 110 allow for convenience of travel throughout the area in "every" direction.

Air & Rail

The Edward F. Knapp Airport in Berlin, a state owned airport, services small passenger planes and numerous business-related services such as UPS, Fed-Ex, etc. as well as private planes including small jets. The Washington County Railroad provides rail service through Montpelier, Berlin and the City of Barre to the Wilson Industrial Park in Websterville on tracks owned by the State of Vermont and used by the railroad under an operating agreement. This rail line has seen a resurgent in recent years with a market for grout (granite previously discarded as waste) to be used as breakwaters and other construction projects.

Proximity to the Capital City and Central Vermont Medical Center (CVMC)

Seven miles north lies Montpelier, the Capital of Vermont, which provides many employment opportunities to the region. State government offices, insurance companies – including the National Life Group headquarters – and numerous other businesses and professional offices are major employers. Between Barre and Montpelier is Berlin, home to the Central Vt. Medical Center and a State Psychiatric Care Hospital. CVMC is one of the largest employers in the region.

Higher Education

The area offers several educational institutions such as the New England Culinary Institute, Vermont College of Fine Arts, Community College of Vermont, Norwich University and Vermont Technical College, all within 30 minutes of Barre. Within an hour's drive is the University of Vermont, Champlain College, St. Michael's College, Northern Vermont University (Lyndonville and Johnson), Vermont Law School and a handful of other quality institutions.

Regional Planning

The Town of Barre, along with 23 other municipalities in Washington and adjacent Orange County, is a member of the Central Vermont Regional Planning Commission (CVRPC). CVRPC is a planning agency charged with numerous tasks among them developing a comprehensive regional plan, making recommendations concerning development, and commenting on regional impacts of ACT 250 applicants. The CVRPC also assists communities with local planning issues; review and confirmation responsibilities relative to planning process and goals under 24 VSA § 4302; and provides Geographic Information Services (GIS) assistance including housing the GIS equipment, data and staff for the benefit of member municipalities.

Barre Town is also closely involved with the regional Transportation Advisory Committee.

7.2 ADJACENT MUNICIPALITIES

Successful planning in Barre Town requires coordination with the plans of neighboring communities. Seven different municipalities adjoins Barre Town: East Montpelier, Plainfield, Orange, Washington, Williamstown, Berlin, and Barre City.

Except for the City of Barre, all of the adjoining communities are rural in nature where they adjoin Barre Town. As such their land uses are generally compatible with Barre Town's. In terms of zoning, it should be noted that the towns of Orange and Williamstown do not have zoning laws.

East Montpelier

VT RT 14 North and VT RT 2 are the major roads connecting Barre Town with East Montpelier and its small village commercial center along VT RT 2. Both major highways are accessed by numerous town highways within Barre Town. Lands in East Montpelier adjacent to Barre Town are zoned rural residential and industrial, while Barre Town's land is zoned low density residential. Depending on the type and density of industrial uses proposed for East Montpelier there could be some conflicts on land use.

Plainfield

Plainfield is accessed from Barre Town by three town roads along Barre Town's north eastern boundary. Several of these roads provide a relatively direct commuter route from Plainfield to Barre City and on to I-89. Likewise, they provide a commuter route from Barre City and Barre Town to US RT 2 East. The shared border is zoned low density residential on the Barre Town side of the line and Forest and Agricultural Land District on the Plainfield side. The lands in both are primarily forest and agriculture, and there is little in the way of land use conflicts.

Orange

Orange is accessed from Barre Town by way of US RT 302 and VT RT 110, as well as several secondary roads. The Town of Orange shares Barre Town's south eastern border. The lands in both communities are heavily forested with some agriculture and low density residential. The Thurman W. Dix Reservoir, the water source for the Barre City water system, is in Orange and is located less than a mile from Barre Town's border. This border area was once zoned conservation by Barre Town in order to control development and provide water shed protection for the reservoir however, as the development potential on this side of Town was thought to be relatively slight and since Orange has no zoning, this area was re-zoned to low density residential in 2008. The Town of Orange contracts with Barre Town for much of its fire protection and all of its ambulance service.

Washington

The Barre Town/Washington boundary is very small – only one road (Lowery Road in the East Barre area) connects the two communities. Land use along adjacent borders is primarily low density residential/agriculture. There are no perceived conflicts in land usage between the two communities.

Williamstown

Williamstown adjoins almost the entire boundary on the south side of Barre Town. Connecting roads include VT RT 14 South, West Road, Snowbridge Road, Miller Road Extension, Cogswell Street, Baptist Street, Drury Hill Road and McLeod Road. Barre Town sewer serves a part of Williamstown over the border in Upper Graniteville. The Graniteville Fire District also serves water to portions of Williamstown in the Upper Graniteville area. Williamstown is largely rural in nature throughout, with a traditional village center on VT RT 14 several miles south of the Barre Town border. It also has a commercial /industrial area along VT RT 14. Barre Town land uses/zone districts along boundary include a wide variety of zones: high, low and medium residential, commercial, and industrial. The uses are similar on both sides of the town lines.

Berlin

Major road links include VT RT 63, which serves as Exit 6 from South Barre to I-89, Airport Road, and Gun Club Road. A new bridge on Bridge Street was completed in the fall of 2013 and a significant upgrade at the intersection of Bridge Street and VT RT 14 is planned in the coming years. These links lead to the major commercial, industrial, transportation and hospital-medical offices hub of Berlin. Principal Barre Town uses/zones near this boundary are rural residential with farms, fields and forests and spots of industrial and conservation. Zoning conflicts are minimal.

City of Barre

The Town of Barre and the City of Barre, although two separate municipalities, share many common interests and services.

Barre City and Barre Town share common major highways, US RT 302, and VT RT 14 and have a multitude of interconnecting city/town streets. Traffic from or through one community also can have a significant impact on traffic and highway intersections in the other community. Major development within Barre Town is done with this mind.

In general, zoning along the Barre Town/Barre City borders is compatible. Two areas of potential conflict are on Allen Street where Barre Town is zoned low density residential, and Barre City has a small industrial zone area, and Farwell Street where Barre Town is zoned industrial (currently Lepage's gravel pit) and Barre City is zoned commercial (currently ball fields). However, given current land use patterns and the small size of the affected zones it is unlikely that conflict will ever occur.

An expanded discussion of the interaction with Barre City is contained in Section 7.3

7.3 BARRE CITY/BARRE TOWN SHARED SERVICES

Water and Sewer:

Municipal Water

Water is distributed along the valley floor, and to an elevation of 1050' in the areas of Richardson Road, Trow Hill, East Cobble Hill Road, Camp Street and Cassie Street, South Barre, and US RT 302 areas of the Town. Residents in these areas are water customers of the City of Barre.

Municipal Sewage

Barre City owns and operates a sewer treatment facility located on the North end along the Stevens Branch River. Barre Town has a network of piping and other infrastructure that covers much of the Town but not all of it. Sewer flows through the Town's piping network to the Barre City treatment facility for which the Town of Barre pays a fee to the city. The Town is provided a certain amount of capacity at the treatment facility. Town residents that utilize the sewer system are customers of the Town of Barre.

The Town is currently paying off a \$725,000 bond (retires in December of 2022) that upgraded the City sewer treatment plant's capacity, expanding the Town's allotment from 941,250 gallons a day to 1,555,000 gallons a day providing much needed additional sewer allocation to Barre Town. As of January 2019, the total reserve capacity is 502,462 gallons per day which equates to 1,675 units of sewer based on 300 gallons per unit.

Education

Barre Town and Barre City share a common high school, Spaulding High School. Barre City, Barre Town, and Spaulding share a PK-12 superintendent and central office. In 2019 the three entities were merged into the Barre Unified School District.

Shared Interest

- (1) Sewage treatment facility;
- (2) Water supply/purchase;
- (3) Barre Unified School District and Central Vermont Career Center;
- (4) Barre Youth Sports Association (BYSA);
- (5) Aldrich Public Library and York Branch of the library located in East Barre;
- (6) Mutual Aid Police/Fire/EMS;
- (7) Winter maintenance of some streets on the City/Town borders such as Quarry Hill, Camp Street, and Hill Street;
- (8) Barre Area Development;
- (9) Other organizations both communities are involved which include
 - Barre Housing Authority
 - Central Vermont Economic Development Corporation
 - Central Vermont Regional Planning Commission
 - Central Vermont Solid Waste Management District

Other Topics of mutual concern to the Town and City:

Transportation/Traffic

Plans are in the works to upgrade the Quarry Street/South Main Street (VT RT 14) intersection to address traffic congestion at that intersection, along with the water and sewer lines at that location.

Economic Development

Both communities recognize the need for on-going efforts to maintain a vital downtown retail district as well as to expand industrial job opportunities. See Section 10.

Zoning

Zone districts and land uses along Town/City boundaries are viewed as compatible.

Spaulding High School

Town and City students continue to enjoy the new gym, increased space for music, new technology including accessibility to the Internet and new energy efficient updates from previous voter approved projects. Cooperative bonds between the Town and City over the years have provided significant upgrades and improvements to the high school.

Storm Water Run-off

Storm water runoff from the Town into the City has always existed. However, as development has occurred and continues to occur, good storm water planning is essential to limit negative impacts anywhere in a watershed but especially in the City. Plans should be reviewed for storm water management so that best practices are followed to limit impacts to surrounding properties and properties located in a particular watershed area.

7.4 DEMOGRAPHICS

This section of the Plan provides a statistical overview of Barre Town and the region. It makes comparisons regarding statistical elements which are pertinent to planning issues.

The analysis will focus on key aspects of community life including population, housing and the economy. It is important to view Barre Town in its regional context as these variables are considered. Below you will find a table reflecting housing and income as of estimates by the U.S. Census Bureau, American Community Survey 5 year estimates 2018.

2010 Census Data ¹	Barre Town	Vermont
Housing Units	3,384	331,106
Household Income	\$ 70,521	\$57,808

Barre Town is located in Washington County. The growth of Washington County continues to be a little below the state average with estimates showing a growth of 2.6% since the 2000 census. The state estimated average is 2.8%². Barre Town is estimated by the Central Vermont Regional Planning Commission to be the most populated town in Washington County within the next decade. The primary difference between Washington County and other areas with slower than average growth is that the economy here remained strong during this slower growth period.

There is a high concentration of government related jobs in the region. However, diversity of the economic base results from substantial amounts of employment in the areas of insurance, agriculture, granite industry, banking, healthcare and manufacturing. There is also a large amount of employment in the trade and service sectors.

¹ United States Census Bureau, American Community Survey 5-year estimate 2018

² Based on United States census data from 2000 to 2010

Population

Below illustrates that the Barre Town population growth has been relatively steady. The Barre Town rate of growth has approximately equaled the county average rate, but it is only half of the state average rate.

TABLE 1

	1990	2000	2010	2018³	% Growth since 1990
Barre Town	7,411	7,602	7,924	7,706	4%
Barre City	9,428	9,291	9,052	8,605	8.7%
Washington County	53,928	58,039	59,534	58,140	7.8%

Since 1990, Barre Town's percentage of the total county population has remained at approximately 13.2%. It is anticipated that it will remain the same.

There has been a nationwide decrease in the average size of households in the past twenty years, and Barre Town has followed this trend. This reduction in size is attributed to a number of factors including increased affluence, a conscious desire for smaller families, increasing numbers of two income households; and an increased rate of divorce. Barre Town's household size has decreased from 3.0 persons in 1980 to 2.45 in 2010 while the county average size declined from 3.13 to 2.36 during the same period.

³ United States Census Bureau, American Community Survey 5 year estimates 2018

8. ENERGY

8.1 OVERVIEW

Energy is an important component of any town's vitality. An energy plan is important to promote numerous benefits which include municipal cost savings, increased revenues, a strong economy, greater energy independence and security, local influence over energy facility siting, more efficient communities, healthier communities, a clean environment, and regional coordination and collaboration. State incentives may be available to communities that have energy plans.

To a large degree, energy costs are not controlled by a municipality; they are dictated by outside sources. The number one demand for energy use in Vermont is in transportation. Heating is second followed by electrical use. So, while Barre Town and its residents may not be able to control the cost of energy, they can always look toward conservation and fuel switching as a way to cut cost and meet many of the benefits mentioned above.

- Other methods of energy conservation can also be encouraged such as the use of renewable energy sources and energy efficient buildings. Promoting these things can also lead to job creation for the local work force.

8.2 ENERGY PLAN

This energy chapter introduces and provides a synopsis of the Energy Plan which is hereby adopted by reference and included as an addendum to the Town Plan. This chapter goes into great detail about energy opportunities, energy conservation, and how it relates to conservation measures Barre Town has taken with renewable efficiencies and recommendations. It is vital when discussing energy practices to do so in conjunction with the Energy Plan. **While there is duplication from a regulatory standpoint, the Energy Plan shall always take precedence.** The Energy Plan goes into a much more comprehensive analysis of existing conditions and has specific targets related to conversion or conservation of energy.

The Barre Town Energy Plan is a result of the 2016 legislative session that passed ACT 174. ACT 174 is an act related to improving the siting of energy projects and outlines whereby regional and municipalities could receive "substantial deference" before the Public Utility Commission and Section 248 hearings. According to ACT 174, substantial deference means "that a land conservation measure or specific policy shall be applied in accordance with its terms unless there is clear and convincing demonstration that other factors affecting the general good of the public outweigh the application of the measure or policy".

The Energy Plan is a collaborative effort between the Town of Barre and the Central Vermont Regional Planning Commission (CVRPC). After ACT 174 was passed, the Public Utility Commission provided guidance on how to create an Energy Plan that would meet the requirements of the ACT. CVRPC drafted the plan and the Barre Town Planning Commission molded it further.

8.3 ENERGY OPPORTUNITIES

Most of the opportunities for energy savings are within the confines of the private sector in transportation, homes and commercial and industrial properties. However, there are a few opportunities for the municipality to save energy as well. They include the following:

- Encourage cluster housing and neighborhood commercial services along established transportation routes;
- Encourage the development of pedestrian and bike paths, and park and ride facilities throughout town;
- Promote public transportation and ride-sharing;
- Promote the use of energy efficient streetlights in the community;
- Purchase the most energy efficient or alternative powered municipal vehicles that will, at the same time, perform the necessary functions of the particular department.
- Promote brining jobs to the community to where people live.

8.4 ENERGY CONSERVATION

The greatest impact on reducing dependence on fossil fuels, both domestic and foreign, is to decrease the overall demand for energy through conservation. Conservation also produces the most economic gain because it represents money not spent for energy. Basic conservation efforts involve little or no monetary investment, but most likely will involve changes in both culture behavior and lifestyle. Additional efforts require an investment in reducing the energy requirements of buildings.

While the Town of Barre cannot require energy conservation by citizens of the Town, the Town can certainly actively promote energy conservation measures. This can be achieved through zoning bylaws, encouragement and listing resources in the Town Newsletter, and on its website.

Transportation

Public Sector

While public transportation such as buses and trains provide minimal opportunity in Barre Town for energy conservation, there are several options available to residents to reduce the use of private motor vehicles. The first is to utilize formal “park and ride” lots for carpooling. There are two established VTRANS commuter lots in Barre Town. One is located on US RT 302 in East Barre, near the intersection of VT RT 110. The second is located on VT RT 14 adjacent to VT RT 63 (across from McDonald’s). In addition to those located in Barre Town, there are also AOT commuters lots located in Berlin, Montpelier, East Montpelier, Orange, and Williamstown. Use of these managed (well-lit and maintained year-round) lots is free, and they are provided to promote carpooling

Another option for setting up a carpool can be found at connectingcommuters.org, which helps those seeking carpooling opportunities find car or vanpooling partners. For carpool matching, vanpools, and bus routes please call 800-685-7433 or visit their website.

Within the Town, development of multiple charging station locations will encourage the conversion from fossil fuel vehicles to plug-in hybrid and full electric alternatives.

Green Mountain Transit currently operates a ride share pool and the Wheels Program for seniors. These types of programs greatly increase the mobility of Barre Town residents who are limited in their personal resources or access to family vehicles. This also reduces the demand of private vehicle use and its associated fossil fuel consumption.

One component of reducing fossil fuel-based energy used in the transportation sector is to convert or replace those vehicles with alternative fuel options such as hybrid (fossil fuel/electric), electric or biodiesel or emerging technologies such as hydrogen fuel.

Commercial Sector

Businesses are encouraged to utilize rail transport when available. The Town’s Wilson Industrial Park (WIP) and areas of Quarry Hill, Websterville, and Graniteville have rail service connecting to Montpelier via the New England Central Railroad.

Lighting

Yard Lights

Options energy efficient outside lighting include:

- Homeowners and businesses are encouraged to replace or upgrade current outside lights with LED’s or current energy savings technology.
- There may be funds available to pay for some or all of the light conversions from Green Mountain Power or Washington Electric Co-op. or through Efficiency Vermont (efficiencyvermont.com).

Interior Lights

Homes and businesses have several light replacement options available.

- Incandescent light bulbs can be changed out with CFLs or LEDs. Older fluorescent tubes, ballast, and fixtures can be replaced with new energy efficient styles or LED tubes and strips.
- Likewise, halogen and metal halide lights should be replaced with more efficient lighting. Efficiency Vermont can assist with this. T-12 tubes are essentially no longer available so new construction will by default use the newer more efficient skinny tubes.
- New construction of homes and businesses is encouraged to utilize energy efficient lighting.

Building Energy Audits

Home and business owners:

- Are encouraged to have a professional energy assessment performed by a certified home energy specialist or ENERGY STAR[®] contractor to determine both energy losses from the building and to have a plan developed to correct energy and heat loss deficiencies.
- Contact Efficiency Vermont for a list of certified contractors.

Other

- The use of power strips to fully turn TV's, computers, and other electronic devices off is encouraged. Turning off unnecessary lights and electronic devices, turning down the thermostat, reducing the hot water temperature, using water saving faucets, and shower heads are some of the other options.
- Using an outside clothesline or inside clothes bars can greatly minimize the need for an electric clothes dryer. Older electric appliances can be replaced with newer energy star rated efficient units.

8.5 TOWN BUILDINGS

Evaluation of the amount of thermal-sector conservation, efficiency, and conversion to alternative heating fuels needed to achieve these targets.

Barre Town has taken a proactive role in ensuring the facilities that it owns are evaluated and upgraded to improve thermal efficiency and/or to install more efficient heating sources. This process can help extend the life of existing facilities while maintaining high quality services. These conversions and conservation measures can also result in reduced operations costs which are beneficial to all residents. Specific examples include:

- A. The East Barre Fire Station has had lighting upgrades done (both interior and exterior), and the heating plant was converted from #2 heating oil to propane. The roof was replaced with an additional 1" of insulation added. Note –adding more than 1" of insulation would have compromised the roof's structural integrity.
- B. The South Barre Fire Station has had lighting upgrades (interior and exterior) and building occupancy sensors installed. The heating plant has been converted from oil to propane, and the roof will be replaced in coming years. A building energy audit recommended that the outside concrete walls be weatherized/insulated, With the work to be performed in 2021.

- C. The Town Office Building has been subject to several energy upgrades in the past. Weatherization and insulation of the front part (the oldest part) of the building has been completed, and an insulation project is under consideration for the new part of the building. Changes to the heating plant are also under consideration for the future. Some of the exterior lights have been converted to LED's. Circulator pumps, fin tube radiation valves, and the sprinkler air compressor pump will also be replaced.
- D. The Emergency Medical Service building has updated lights and the heating and hot water system is propane. An energy audit performed in 2018 has recommended insulating and air sealing the attic, presently scheduled for 2020.
- E. The Department of Public Works (DPW) maintenance facility's roof was recently replaced and insulation added.
- F. DPW's truck garage is scheduled for window replacement in 2022.
- G. Barre Town Elementary School (BTMES) – The school has undertaken a series of energy saving and conservation efforts over the past few years as part of an ongoing program to make the school more energy efficient and to reduce the cost of operating the school's facilities:

The school's heat and hot water is supplied by a wood chip fueled boiler during the winter months. The chip plant's control panel was recently upgraded to Variable Frequency Drive programming which allows the circulator pumps to operate on a demand basis. Sections of the roofing membranes have been replaced resulting in a significant reduction in heat loss, as well as preventing water leakage into the building. Lighting throughout the school is systematically being replaced with LED lights and appropriate fixtures. Exterior lights were replaced with LED lighting, and HVAC units replaced with more efficient units. Exterior windows and doors were also replaced. Finally, the dishwasher in the kitchen was replaced with a more energy efficient one.

BTMES receives electricity credits from the solar project located on Town owned property in Websterville. This has resulted in lower costs to operate the school as well as supporting the move to using renewables for electricity. Going the next step and converting town owned heating systems from fossil fuel based to higher efficiency renewable energy-based systems may possibly benefit the Town of Barre Town. However, currently is not reasonably cost effective to make those conversions. Something to review and access in the future as the technologies evolve.

8.6 ENERGY EFFICIENCIES

In general, the Town of Barre supports the use of renewable energy systems, to the extent that it does not over burden the town with a disproportionate share of the State's renewable energy goals and provided that they fit into the goals of the Town Plan, taking into account noise, scenic vistas, location, negative impacts on residents, and represents an orderly development of renewable energy systems.

Renewable energy sources are represented by wind, solar, wood, geothermal and hydro. While renewables represent a chance to move away from fossil fuel sources, they are not without their own negatives such as; aesthetics, noise, cost, reliability, and availability.

It is a long-standing practice within the town to have utility lines placed underground as opposed to above ground to minimize their overall visual impact and reliability. Therefore, any extension of three-phase power lines should be underground.

Wind Turbines

Wind turbines are relatively expensive, can be high maintenance, have siting issues (works best at higher elevations, and on ridgelines), require significant property line setbacks, may cause noise issues, moving shadows, etc. with adjacent property owners, may negatively affect property values, and of course only work when there is sufficient wind speed.

Turbines can be shut down due to excess wind speeds or at night to preserve and protect bats and migrating birds. Additionally, there has to be sufficient line capacity to move the power generated out onto the grid.

- As a result of the factors listed above as well as the Town's relatively low elevation (ridgelines less than 1800') and overall size relative to the topography, full size industrial wind turbines (greater than 300' tall) are not a good fit and are prohibited. Small to mid-size turbines, such as the one currently located on property owned by Rock of Ages, also have some of the same potential impacts and will only be supported if compliant with preservation efforts noted in Chapter 5.
- Set back requirements for all net metered wind turbines shall at a minimum comply with the most recent Public Service Boards net metered rules so that blade and tower failures do not impact adjacent properties.

Solar Energy

Solar energy is represented by both solar hot water heating systems (domestic hot water), and solar electricity (photovoltaics – PV). The most appropriate location for solar arrays is roof tops, existing impervious surfaces, or industrial/earth resource land (identified by the Town) not well suited for conventional development. Any new ground mounted solar array should utilize existing topography, development, or vegetation on site to break up the visual mass of the arrays.

Renewables cannot be sited in predominately visible locations on hillsides or ridgelines and shall be sited to preserve open space.

Renewables shall be constructed using earth tone colored materials for panel frames, structural supports, and fences. All surfaces shall use non-reflective materials. Use of bright metallic materials is prohibited.

With the goal of maintaining the Town's rural character, protecting rural open space and agricultural heritage, removal of productive agricultural lands and green fields for solar development is prohibited.

Lot coverage for solar panels is defined as the area encompassed by the panels when viewed from above.

Solar Hot Water

Solar hot water systems require minimal space and can be located on roofs or ground mounted and could be located in all zones. Solar hot water systems are subject to setback requirements (same as any accessory building). Roof mounted arrays are subject to building height requirements and need to be sensitive to neighborhood aesthetics.

Solar arrays ideally require full sun and unobstructed southern exposure. Essentially all the solar heat generated is stored in a hot water pre-heater tank (think of it as a battery) and used on an as needed basis, which has the potential to reduce the morning and evening spikes in electrical demand required to produce hot water. Payback on the systems are fairly short term given that there are both state and federal rebates/incentives currently available. These systems would also be appropriate for heating swimming pools.

Photovoltaics (PV)

PV requires a much larger array of panels and will have a more visual impact on surrounding properties. Residential PV systems are more expensive than hot water and even with incentives, payback can be up to 20 years. As with solar hot water systems, these can be roof mounted or ground mounted. Mounting solar arrays on existing buildings will utilize space that is already impervious and has minimal impact on land use.

- Ground mounted residential systems (<15kW) shall be subject to the same property line set back requirements as other structures.

The Town of Barre supports a “good neighbor policy”. The design and siting of a solar array shall be done in such a manner that the array creates no greater burden on neighboring property owners or public infrastructure than it does on the property on which it is sited. As an example, a landowner may not site an array on his or her property in a location calculated to diminish the visual impact of the array from his or her residence or business but place the array immediately within their neighbor’s or the public’s viewshed. Locating a solar array in a manner designed to reduce impacts on neighbors, or public viewsheds constitutes reasonable mitigation.

Lands adjacent to a solar development can be developed in conformance with existing Town and State regulations regardless of the impacts.

Conflicts about the use of solar panels may arise between property owners. Potential issues would include the sun reflection into adjacent homes or blocking views. Or a neighbor, who plants a tree or trees, constructs a building or other structure that blocks the sun from reaching the panels.

Visual Mitigation

Residential on-site net-metered systems (<15kW) should be sited to minimize aesthetic impacts, minimize reflection of light into an adjacent home, and avoiding blocking a neighbor’s view.

Larger systems (>15 kW) must meet the setback requirements of ACT 56 and the Public Service Boards net metering rules. Additionally, these systems would be located on an existing impervious surface or brownfield in an area that minimizes direct view from adjacent businesses, homes, and roads. In the absence of existing natural vegetation, solar arrays must be screened by native plantings beneficial to wildlife and pollinators that will grow to a sufficient height and depth to provide effective screening within a period of 5 years. These arrays are not permitted in “green fields” (actively used agricultural sites or sites with prime agricultural soils). They shall provide for an orderly development of solar within the Town and be compatible with adjacent property uses and be sited to preserve rural cultural aesthetics.

Private development of solar arrays is prohibited in the Wilson industrial park or within the Town’s TIF District (should the Town designate one). Siting of arrays in commercial zones (East Barre Commercial, Highway Commercial, Office Building Retail, and Office Building Business) are also prohibited, unless being used for on premise electric needs. All of the above zones were established to encourage the growth of new businesses and create jobs, both of which bolster the local economy and grow the grand list. The business zones (with exception to Town owned lands) generally follow the major highways (VT RT 14 and US RT 302) in town and are relatively shallow in depth. Land suitable for industrial and business development is a scarce commodity within the Town and decisions on renewable energy project siting must be very carefully evaluated in this context.

Commercial solar arrays larger than 500 kW would encompass a land mass greater than any other structure within Barre Town and even with somewhat rolling topography cannot be screened or mitigated to blend into the Town’s landscape or rural cultural aesthetics and are therefore prohibited.

The Town should develop a delineated “solar overlay district” based on the current availability of three-phase power and current land use. This district should contain a provision for allowing “proximity solar development”, as well as allowing fringe siting along wetlands or in wetland buffer zones.

All solar projects shall be decommissioned at the end of their useful life and the property shall be restored to its pre-project condition. Developers of all projects 150kW or greater shall provide the municipality with appropriate assurances to guarantee funding exists to decommission the project. Decommissioning includes, but is not limited to, proper disposal and/or recycling without burdening the Town.

For the purpose of this plan, either the Selectboard or the designated appropriate municipal panel shall be deemed to represent the voice of the communities “average person” with respect to the “Quechee Test” when evaluating the aesthetics of a proposed solar array. The Quechee test is a two-step test for determining whether a project will have an undue adverse aesthetic impact.

Wood

Wood is available as both firewood and pellets. Generally, firewood is produced in or within a few miles of Barre Town which minimizes transportation costs and supports a local economy. Firewood removal from forest land is also an important tool for forest, wildlife, and agricultural land management. Pellets used in Vermont are generally produced regionally, also minimizing transportation costs.

While using firewood for heat in stoves and inside boilers is a logical step to supplement fossil fuels, outside wood boilers have their own particular set of issues. Generally, the flue pipe (smokestack) is short and in certain meteorological conditions can cause significant ground level smoke plumes to the detriment of the neighbors or neighborhood. Outside wood boilers used in the summer solely for hot water production may create low lying smoke plumes which might impact neighbor's health and enjoyment of their property. Their use is best limited to winter heating.

The use of wood pellets for heat in stoves and inside boilers as a means to supplement fossil fuels has its own set of challenges. Pellets are delivered in the form of 40-pound plastic bags or loose when a silo is part of the boiler system. Unlike the use of a firewood system, the wood pellet system requires electricity as a means to power the auger and the blower. An uninterruptible power supply battery backup or an alternative connection to a separate battery can be used during power loss.

Pellets at this point are not produced locally so not unlike fossil fuels there is a transportation cost associated with them. Pellets burn more efficiently than firewood and hence are less of a concern for contributing to chimney fires reducing demands on the fire department.

Hydroelectric

At this time, there is little opportunity for hydroelectric production due to the small size of the streams and rivers in the Town, and the extensive and expensive permitting (state and federal) required.

- Should Barre Town ever establish a larger water supply system (from wells), an in-line electric generating system in the water transmission pipe may be worth considering.

Geothermal

Geothermal heating is a clean, emission free technology which has minimal impact on adjacent property owners and Town services. Federal tax incentives may be available to installing a geo-thermal heating system. A state permit may also be required to operate a geo-thermal system.

Energy Storing

Energy storage is becoming an effective way to store electricity from the electric power grid when the cost is lower, to be used during peak demand when electricity is more expensive. This includes residential and commercial storage batteries where the power can be stored onsite or put back into the grid. Industrial battery storage systems is an emerging technology which can store and transfer three-phase power into the electric grid on an as need basis.

Recommendations:

- Continue to inform the public through zoning of State Residential Energy Standards and the requirement that new construction meet those standards;
- The Development Review Board should encourage developers (residential and commercial) to utilize energy efficient insulation, weatherization, heating and lighting in all projects;

- The Town should encourage the use of the Energy Efficient Mortgage Program which helps homeowners finance energy efficiency improvements at lower than normal interest rates. The Town also encourages use of CAPSTONE Community Action (802-479-1053) Weatherization and Energy Efficiency Services for eligible residents;
- The Town should encourage developers to design subdivisions for appropriate solar orientation and the use of solar hot water systems and photovoltaics when appropriate;
- Building designs should include roof construction capable of supporting solar panels;
- Selectboard should create an Energy Committee comprised of Town citizens and officials to explore ways to make the Town government operations more efficient in the use of energy;
- Encourage homeowners to have a whole house energy audit performed to review: lights, insulation, weatherization, heating, appliances;
- The public should be encouraged to use more efficient transportation methods;
- The public should be encouraged to utilize renewables whenever appropriate;
- The Town should encourage developers of commercial solar arrays to incorporate a plan to install public access charging stations within Town limits;
- The Town should encourage businesses within the community to install charging stations if it can be determined that the projects are cost effective and not an additional cost.

9. HOUSING

9.1 BASIS AND OBJECTIVES FOR HOUSING PLAN

Vermont law requires municipal plans to include a housing element with a recommended program for addressing low and moderate income persons' housing needs as identified by the regional planning commission, 24 VSA § 4382 (a) (10). This plan seeks to identify areas of potential weakness in the Town's current housing situation and proposes possible solutions to ease housing burdens for Town residents, especially those identified as low or moderate income. By properly managing and planning for development of new housing stock as well as rehabilitation of existing residences, the Town will be better able to attract new residents.

Title 24 of Vermont Statutes Annotated, Section § 4302 (11) states the following: To ensure the availability of safe and affordable housing for all Vermonters.

(A) Housing should be encouraged to meet the needs of a diversity of social and income groups in each Vermont community, particularly for those citizens of low and moderate income.

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

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

Objectives related to housing include:

- Encouraging urban growth to take place in clusters within already settled centers with established infrastructure.
- Promoting sound development practices.
- Promoting safe and sanitary houses for all residents within an environment that is visually attractive.
- Conserving natural resources while allowing for convenient public access and recreation.
- Encouraging pedestrian and traffic safety.
- Attracting business/employment for economic stability, energy conservation, and local opportunity for our young people.

This plan seeks to carry forward and expand upon these goals and objectives, while looking at the events that have occurred since previous Plans were adopted.

The factors affecting housing availability to all income groups in Barre Town go beyond the costs of buildings and land. They include job creation, access to services, community spending on adequate infrastructure, and the viability (and desirability) of Barre Town's neighborhoods as places to live. When looking at the overall housing picture in the Town, it is impossible not to tie in other parts of the plan including demographics, economic development and recreational opportunities. The latter two, as well as the quality of the Town's elementary and middle school, are strong factors that influence whether or not people move to Barre Town. Barre Town has experienced modest population growth in the last two decades when compared to Vermont as a whole, but when compared to neighboring towns it is apparent that the Town has attracted people while others have experienced net losses in population.

	General Population				Change	Change
	2016*	2010	2000	1990	00-10	90-10
Barre City	8,710	9,052	9,291	9,482	-2.6%	-4.5%
Barre Town	7,792	7,924	7,602	7,411	4.2%	6.9%
Berlin	2,802	2,887	2,864	2,561	0.8%	12.7%
East Montpelier	2,586	2,576	2,578	2,239	-0.1%	15.1%
Montpelier	7,535	7,855	8,035	8,247	-2.2%	-4.8%
Northfield	6,042	6,207	5,791	5,610	7.2%	10.6%
Washington County	58,504	59,534	58,039	54,928	2.6%	8.4%
Vermont	62,4594	625,741	608,827	562,767	2.8%	11.2%

* Information taken from page 22 of 2018 Economic Demographic Profile Series produced by the Vermont Department of Labor - www.vtmi.info/profile2018.pdf

What is particularly striking about Barre Town's population growth is that the elderly population has been growing at a pace more than double than that of Vermont as a whole. In the past two decades, the population of residents 75 and older has risen by almost 154%, or 361 persons.

	Population 75+			Change	Change
	2010	2000	1990	00-10	90-10
Barre City	767	1,005	818	-23.7%	-6.2%
Barre Town	596	443	235	34.5%	153.6%
Berlin	427	260	223	64.2%	91.5%
East Montpelier	161	121	80	33.1%	101.3%
Montpelier	641	643	667	-0.3%	-3.9%
Northfield	331	371	312	-10.8%	6.1%
Washington County	4,011	3,679	3,300	9.0%	21.5%
Vermont	42,440	36,827	28,887	15.2%	46.9%

9.2 AFFORDABLE HOUSING

The U.S. Department of Housing and Urban Development (HUD) states the following:

"The generally accepted definition of affordability is for a household to pay no more than 30 percent of its annual income on housing. Families who pay more than 30 percent of their income for housing are considered cost burdened and may have difficulty affording necessities such as food, clothing, transportation and medical care. An estimated 12 million renter and homeowner households now pay more than 50 percent of their annual incomes for housing, and a family with one full-time worker earning the minimum wage cannot afford the local fair-market rent for a two-bedroom apartment anywhere in the United States. The lack of affordable housing is a significant hardship for low-income households preventing them from meeting their other basic needs, such as nutrition and healthcare, or saving for their future and that of their families" (source: hud.gov).

Vermont is very fortunate to have a robust network of state, federal, private and non-profit entities that focus on affordable housing. Whether assisting with the purchase, rehabilitation or construction of owner-occupied dwellings or providing rental units at affordable and/or subsidized rates, a wide array of programs exists to help ease the housing

burden. Unfortunately, all such programs are subject to budget constraints, and can only go so far in even the best of economic times. Identifying all potential housing partners is beyond the scope of this Plan, but the predominant ones include:

Vermont Agency of Commerce and Community Development (ACCD) One National Life Drive 6th Floor Montpelier, VT 05620-0501 Phone: (802) 828-3211 Fax: (802) 828-3258 Website: accd.vermont.gov	Vermont Housing and Conservation Board (VHCB) 58 East State Street Montpelier, VT 05602 Phone: (802) 828-3250 Fax: (802) 828-3203 Website: vhcb.org
Vermont Housing Finance Agency (VHFA) PO Box 4–8 - 164 St. Paul Street Burlington, VT 05402-0408 Phone: (802) 864-5743 Fax: (802) 864-5746 Website: www.vhfa.org	Vermont State Housing Authority (VSHA) 1 Prospect Street Montpelier, VT 05602-3556 Phone: (802) 828-3295 Fax: (802) 828-3248 Website: vsha.org
U.S. Department of Housing and Urban Development (HUD) Vermont State Office 95 Saint Paul Street, Suite 440 Burlington, VT 05401-4486 Phone: (802) 951-6290 Fax: (802) 951-6298	USDA-Rural Development (RD) 87 State Street, Suite 324 PO Box 249 Montpelier, VT 05601 Phone: (802) 828-6080 Fax: (802) 828-6018 Website: rd.usda.gov/vt
Barre Housing Authority 30 Washington Street, Suite 1 Barre, VT 05641-4529 Phone: (802) 476-3185 or (802) 476-3186 Fax: (802) 476-3113 Website: barrehousingauthority.com	Downstreet Housing & Community Development 22 Keith Avenue, Suite 100 Barre, VT 05641 Phone: (802) 476-4493 Fax: (802) 479-0120 Website: downstreet.org
Housing Vermont 100 Bank Street Burlington, VT 05401 Phone: (802) 863-8424 Fax: (802) 660-9034 Website: hvt.org	Capstone Community Action 195 US Route 302, Berlin Barre, VT 05641 Phone: (802) 479-1053 Fax: (802) 479-5353 Website: capstonevt.org
Vermont Affordable Housing Coalition 275 Northgate Drive Burlington, VT 05408 Phone: (802) 660-9484 Fax: (802) 859-9540 Website: vtaffordablehousing.org	Vermont Housing Data Website c/o Vermont Housing Finance Agency P.O. Box 408 Burlington, VT 05402 Fax: (802) 864-5746 Website: housingdata.org

Barre Town does not have any family housing units that are subsidized but does have 45 units of elderly subsidized housing. These include 30 units at Quarry Hill Apartments (Graniteville) and 15 units at Avery Apartments (East Barre). Both apartment complexes were built around 1985-6.

- The Planning Commission recommends that the Town investigate ways in which it can work with various partners to expand the number of affordable housing choices locally, including both units for rent and affordably priced single-family homes.

Families are important to overall stability. Families keep attendance up in schools, in theory more disposable income to spend in the area. The average wage paid in Barre Town is \$37,460.

9.3 AVAILABLE HOUSING

Vermont State Statutes (24 VSA § 4347) requires the Regional Planning Commission's plan for anticipated growth in the region that they cover. Based on a forecast through the year 2020, the Central Vermont Regional Planning Commission (CVRPC) has devised a housing distribution plan by town, so that towns can plan for how they can meet the expected demand and fulfill their contribution to the region's housing needs. Projections made by CVRPC show that Barre Town will be asked to create the most housing units of any other town in our region. This is probably due to many factors, many of which are detailed in this plan but also due to Barre Town's quality of life, land availability and proximity to infrastructure.

CVRPC projects Barre Town's contribution to be as follows:

2010–2014	268 housing units
2015–2020	382 housing units
2000–2020	956 housing units total

The total number of housing units projected for the region is 8,835. Barre Town's 956 is 11% of the region. The next closest Town is Montpelier at 9% or 779 housing units.

There are many factors that go into why people build housing in certain places. Certain towns like Barre Town, Montpelier, Barre City, Northfield, and Waterbury for example each have different characteristics which make them desirable, but all have a variety of municipal services. Conversely, towns like Orange, Washington, and Calais have characteristics totally different and may not have municipal water, sewer, full-time police protection, etc. Certainly, land use regulations can have an effect on development and Barre Town continues to support development and our zoning is designed for that purpose.

- It is prudent to take advantage of existing infrastructure and development patterns and provide incentives to develop in these areas. However, it is largely up to developers and the market to decide where and how much housing is created. Barre Town understands its place in the region and its proximity to many economic centers and will continue to encourage controlled growth and not put barriers in the way to inhibit it.

The attached zoning & future land use maps (Maps 2 & 10) shows broad areas of dense development. These dense areas would include Barre Town's very high density and high density zoning areas. The housing assessment map (Map 8) shows areas of Barre Town where affordable housing would be best suited because of the availability of municipal sewer and water which allows for more dense development. The assessment map also shows new housing construction from July 2015 through June of 2019 which generally follows the target development area.

Prior to 2008 less than 35 new houses a year was a lean year. Yearly zoning permits for new construction continue to run behind the years prior to 2008 and home additions have generally decreased as well. There is no doubt the economy has had a great impact on housing development in Barre Town. However, occupancy rates remain high.

Zoning Permits Issued					
Year	17-18	16-17	15-16	14-15	13-14
Dwellings (Includes all homes)	26	18	11	21	14
Home Additions	17	15	13	3	11
Totals	46	33	24	24	25

While subdivisions have increased over the last few years, the net gain in new lots is minimal, most are boundary line adjustments. A Planned Unit Development (PUD) was approved in 2017 that will create 47 new lots and 90 new housing units that may be low to moderate income affordable.

Subdivisions Approved					
	18-19	17-18	16-17	15-16	14-15
Subdivision request approved	7	6	5	3	2
New Lots created	2	53*	8	2	2

*Fecteau PUD

Barre Town expects that at some point in the future, because of factors detailed earlier in this section, both subdivision activity and new home construction should begin to gradually increase.

The 2010 census reported Barre Town had 3,228 housing units, an increase of 6% from 2000. The occupancy rate average is 95%. Of the total housing units, 2,738 were owner-occupied, and 490 were rental units. This correlated with an average household size in 2010 of 2.1 persons per occupied rental unit. In owner-occupied households, the average household size is 2.45.

Barre Town, through the Zoning Bylaw, has tried to encourage cluster development with density bonuses for Planned Unit Developments (PUD). There are many benefits to having PUD's including fewer infrastructures and preserving land from development. This preference for green space allocations is a major contribution to community planning for Barre Town. Continued review of PUD incentives should be done and incorporated into Town Zoning and Subdivision Regulations so that development can be incorporated into existing densely developed areas and in conjunction with existing infrastructure.

Barre Town Zoning allows for housing in several zones. While housing is not a primary use in commercial zones, mixed use development is permitted and encouraged. Further larger scale multi-family dwellings are allowed by conditional use permit

- Future zoning revisions may include incentives for mixed use development.
- Mixed use development was added to allow for a better use of commercial areas. Prominent commercial space on main routes is scarce and developing these areas with too many residential uses and not enough commercial can have a negative impact on economic development. The mixed-use concept is a fair compromise.

Beyond the mixed-use residential development Barre Town supports the use of commercial land for residential purposes if the number of units created is maximized with at least 8 units of housing with no maximum.

Barre Town also supports the creation of accessory dwellings anywhere residential uses are allowed. Accessory dwellings are an important way of allowing single-family dwellings to benefit from having a second living unit with little permitting. Some important benefits include economic, by allowing residents extra income, and family orientated, by allowing sick or older family members to be cared for close by but giving them the space and privacy that many desire.

Zoning was changed to allow accessory dwelling by issuance of a change of use permit reviewed and issued by the Zoning Administrator assuming no exterior alterations are being made. Previously, accessory dwellings were reviewed and approved by the Development Review Board. Accessory dwellings altering the exterior still are required to get a Conditional Use Permit. Another recent change allows detached accessory dwellings.

In the past five years, Barre Town has permitted a total of 92 new housing units encompassing all types of residential use including accessory dwellings. The Planned Unit Development by Fecteau Residential on Beckley Hill Road has State and local permits (not building permits) for 90 housing units. Significant infrastructure still need to be built before this development is ready to build houses. Other developments which would create several hundred housing units have been master planned but no serious plans at this time have come forward for them to proceed.

9.4 COMMUNITY INVOLVEMENT AND INFORMATION ON HOUSING

Many of the resources needed to ensure housing opportunities and a quality neighborhood environment for all citizens will have to be found in Barre Town itself. Federal and state housing funds are not enough to meet the needs of communities throughout Vermont and the rest of the country. To accomplish realistic goals in an effective housing plan, the Town must recognize that this is a problem affecting all residents and work together. Enhanced community understanding is needed to dispel negative misconceptions about affordable housing.

Given Vermont's emphasis on public participation in planning decisions, an informed public is essential to meaningful discussion of this complex issue. Negative reactions can be so strong that momentum can be stopped unless grassroots "pro-action" leads people to get involved at the local level. Education can help Town residents to be more open to different ideas such as infill development in existing neighborhoods, changes to existing Town ordinances, and public/private partnerships with the Town taking an active lead.

9.5 HOUSING REHABILITATION

Since 1992, Barre Town has been committed to affordable housing rehabilitation through the use of Vermont Community Development Program (VCDP) funds. The Town established a Citizen's Housing Advisory Committee to oversee a program of housing rehabilitation loans designed to assist homeowners in making needed repairs and improvements to their properties.

In the fall of 2003, the Town of Barre and Downstreet Housing and Community Development (Downstreet) (formerly the Central Vermont Community Land Trust) entered into an agreement whereby Downstreet handles loaning Town of Barre housing rehabilitation money. Downstreet takes all applications for loans, processes them, makes decisions on them, and provides the money and the follow-up. This has been a good cooperative effort as it helps Downstreet meet some of the demands they come across through other programs they handle and helps the Town distribute this money without the extra strain on staff to manage it.

Barre Town has a citizen, appointed by the Selectboard, sitting on the Downstreet Loan Committee. Downstreet amended their policies to allow this to happen and to ensure program compliance. The loan funds have been used to repair and upgrade a number of Barre Town residences.

- While funds available for lending fluctuate, the Planning Commission recommends studying ways in which it can increase participation and the supply of funds available to lend to Town residents, as well as explore other opportunities to secure public monies that can be used to retrofit and/or improve the energy efficiency of private housing units locally.

Dilapidated and Unsafe Structures

Housing quality is a concern to the community of Barre Town. While the quality of housing varies, Barre Town has not seen a significant problem as it relates to inhabitant's safety.

- At some point, Barre Town may wish to consider greater scrutiny over housing standards as they relate to health and safety. If the Town sees a need in the future, Zoning Bylaws and Subdivision Regulations may be revised to include safe housing codes for old and new structures. Revised Zoning Bylaws and Subdivision Regulations that include safe housing standards and/or codes will ensure that dilapidated or unsafe structures will be renovated to meet current standards for health and safety or be torn down.

Additionally, the Town may want to review, using the conditional use criteria, and approve all interior and exterior renovations for all structures deemed dilapidated or unsafe by the Zoning Administrator.

9.6 HOUSING GOAL AND RECOMMENDATIONS

The Town supports the responsible development of housing that meets the needs of persons in all income categories.

Recommendations to alleviate housing shortfalls:

- Encourage clustered housing units as an economical way to reduce infrastructure and land costs, thereby promoting affordability;
- Fund the Town's existing housing rehabilitation program (when needed) with additional monies to assist low income families;
- Pursue housing funds, in conjunction with developers and local housing partners, to provide assistance in financing affordable housing development;
- Promote the development of housing for the elderly;
- Create incentives for mixed use development that includes residential uses.

10. ECONOMIC DEVELOPMENT

10.1 INTRODUCTION

Economic Development strategy and planning are imperative to Barre Town's goals of success and growth by creating jobs, adding wealth to the community and enhancing the Town's property tax base. Successful economic development is implemented, in large part, by a team that consists of area professionals, municipal leaders, Town staff and elected officials. All existing Town of Barre businesses and potential new or relocating businesses interested in locating in Barre Town should be assisted in every way possible.

The mission of the Barre Town Economic Plan is as follows:

- To create sustainable jobs and assist existing businesses as may be necessary to retain existing jobs.
- To add commercial and industrial properties to the Town's grand list thereby reducing the Town's reliance on residential property owners to fund the operation of Town government and reduce travel emissions.
- To strengthen and diversify the local economy by actively supporting the growth of priority businesses.

Priority Businesses:

- Existing and new businesses.
- Businesses that pay at or above the area median wage.
- Businesses that are responsive to community interests.
- Primary income generators (those that create other business opportunities).
- New added value producers and companies that export products or services outside the region or State.
- Businesses that support existing Barre Town and regional businesses.
- Businesses that use existing Town resources efficiently and procure raw materials within the region and State.

Objectives of Program:

- Continue to improve the Town's median per capita and household income in relation to the state and county medians (Barre Town is currently higher than both of these medians).
- Contribute new jobs to the Central Vermont economy.
- Assist in the development of start-up, new, and existing businesses.
- Promote economic development initiatives such as tax stabilization and a climate that is conducive to the creation of new jobs.

10.2 ECONOMIC DEVELOPMENT INITIATIVES, PRESENT AND FUTURE

Barre Town and Barre City are symbiotic municipalities, each with unique attributes that, when utilized in tandem, create a comprehensive community that offers an economic development environment that is beneficial to businesses. Like Barre City, Barre Town contributes annually to Barre Area Development, Inc. (BADC)—a local, private, not for profit development corporation—to provide complete, professional economic development services to both municipalities. BADC employs a full-time Executive Director for this purpose.

The Economic Development Revolving Loan Fund (RLF) provides Barre Town residents with small business loans for startup or expansion. These loans are being administered for nineteen Central Vermont communities by Community Capital of Vermont, Barre VT (communitycapitalvt.org). RLFs are specific to businesses in Barre Town and Barre City, funded through loan repayments of a Community Development Block Grant (CDBG) loan to SB Electronics (SBE) is also available to assist businesses. BADC markets the Loan Program and is administered by the Vermont Community Loan Fund. To date three loans have been made to Barre Town businesses: New England Excess Exchange, Tenco Industries Inc. -VT, and Old Route Two Spirits.

Wilson Industrial Park (WIP) is a distinctive commodity in Barre Town as it houses a collection of very successful and diverse businesses including iDRY, Vermont Creamery (formerly Vermont Butter and Cheese), New England Excess Exchange, Highland Sugarworks, Tenco Industries, Inc.-VT, Adams Granite, Hillside Granite, Trono Fuels, Vermont Food Bank, Spruce Mountain Granite, and Old Route Two Spirits. These solid employers continue to appreciate WIP's attributes and aesthetics, which boast mountainous views; modern and convenient infrastructure, and rail service that bisects the park. Both Vermont Creamery and The Vermont Foodbank constructed major additions in 2019. As the Town plans for the consolidation and relocation of its public work facilities, there is the possibility of existing buildings and lots becoming available for new Industrial Park tenants, thereby creating additional economic opportunities and jobs.

The Barre Town Forest, a \$1.37 million endeavor, has seen the opening of hundreds of acres of Town Forest that may be used for such recreational activities as mountain biking, hiking, cross-country skiing and running, snowmobiling, disc golf and horseback trail riding. Other future activities may include scuba diving, ropes courses, and possible but limited ATV use on a connecting trail. This one-of-a-kind property offers incredible vistas and a peek into the rich granite industry history on which the area was founded. Already, the acreage is being used as a marketing and recruiting tool for Barre Town companies whose clients and employees find the outdoor offering attractive. Tourism, recreation and economic development opportunities are a catalyst to the creation and expansion of eateries, hotels, equipment rental and other hospitality enterprises.

Rock of Ages and Northeast Materials Group teamed up to pursue contracts that will utilize the abundance of large granite aggregate found on Rock of Ages property. The likelihood of such contracts will require the use of rail to move this product. To that end, the Vermont Agency of Transportation has gone to great lengths and expense to upgrade the rail line between Montpelier Junction and Barre Town. Consistent use of this rail asset has the potential to reduce transportation costs of bulk commodities such as granite and crushed rock, and perhaps enable other enterprises to import materials and export products that economically arise from rail capacity.

Northeast Materials Group operates an asphalt plant as well as a granite crushing operation. This location in Central Vermont has greatly reduced the amount of transportation costs to move the aggregate thereby saving energy.

The Town's seasonal changes, scenic vistas and pastoral beauty provide tourist related opportunities. It also has much to offer in terms of the tours of Rock of Ages, local cemeteries' exhibiting truly exceptional granite sculpture, headstones, and local history. To underestimate these attractive assets would be to under serve the visitors to Central Vermont. One element of economic development is promoting the unusual and unique attractions that are taken for granted every day.

10.3 ECONOMIC DEVELOPMENT CRITERIA

The following criteria will be used to guide decision making in the course of implementing the Economic Development Plan:

- Industrial/commercial growth should conform to Land Use Planning.
- Development efforts in the Town should focus on net new jobs and value added to the Barre economy.
- Development should produce a net benefit to the Town in terms of added value opportunities to the Grand List when measured against new demands on Town services.
- Development should occur at a measured pace that does not overwhelm the Town's resources of land, labor and services.

10.4 MUNICIPAL TAX STABILIZATION

The Town has an Industrial and Commercial Tax Stabilization Policy. This policy is intended to ensure that the community subsidy of tax stabilization will result in a public benefit. The policy outlines detailed criteria and eligibility standards. The process outlined in the policy allows the Board of Selectboard to evaluate each tax stabilization request in a fair and equitable manner. New Municipal taxes can only be assessed on new construction and qualifying renovations which increase tax values.

10.5 AVERAGE WAGES

Central Vermont has accomplished much in regard to its goal to bring the county average wages up to nationwide averages. The 2004 data shows Central Vermont is above or just below the average of all employees in the United States. Labor force composition, cost, skills, reliability and availability weigh heavily in decision making for corporations seeking new locations. The chart below shows evidence of a strong economy with annual average wages increasing across the board.

The following chart illustrates annual average wages for, 2004, 2010, and 2018 Source: Vermont Department of Employment and Training:

Annual Average Wages VT Department of Labor			
	<u>2004</u>	<u>2010</u>	<u>2018</u>
Washington County	\$33,331	\$40,878	\$50,314
Orange County	\$27,513	\$33,080	\$39,554
Chittenden County	\$38,433	\$46,213	\$52,263
Vermont	\$33,276	\$39,425	\$46,115
Barre City	\$30,199	\$37,631	\$43,778
Barre Town	\$33,338	\$37,460	\$48,379

Median Household Income <u>US Census</u>	2017 census <u>5-year survey estimate</u>	
	<u>2010</u>	<u>2017</u>
Washington County	\$57,163	\$60,602
Orange County	\$52,407	\$56,584
Chittenden County	\$62,260	\$66,906
Vermont	\$53,422	\$57,808
Barre City	\$41,349	\$35,225
Barre Town	\$64,088	\$70,521
Connecticut	\$69,243	\$73,781
Massachusetts	\$65,981	\$74,167
New Hampshire	\$64,664	\$74,305
United States	\$52,762	\$57,652

10.6 RECOMMENDATIONS

Economic Development efforts should include:

- 1) Visitation by BADC to:
 - a) Understand each business and its objectives;
 - b) Make businesses aware of business planning, technical, employment and marketing assistance programs available to them;

- c) Promote the availability of capital to businesses that wish to grow, including special programs that are available for companies creating additional employment;
 - d) Assist businesses with permitting and regulatory issues;
 - e) Help businesses with tax stabilization if appropriate.
 - f) Look for synergistic opportunities wherein one Barre business can provide assistance to another to mutual benefit of both entities.
- 2) Ongoing promotion and marketing of the Wilson Industrial Park and entire community:
 - a) Through print and digital media in appropriate markets especially the new initiative “Barre Rock Solid”;
 - b) Make sure potential new or existing businesses are aware of the financing and tax incentives available for locating in the Industrial Park.
- 3) Promote outdoor recreation and tourism related activities:
 - a) Such as snowmobile trails, bike paths and trails, bed and breakfast, Rock of Ages Visitor Center etc.;
 - b) Work with Town committees to explore all options to promote recreational activities in the Town;
 - c) Specifically promote the Town Forest and its trail system for year round recreation;
 - d) Assist local organizations and businesses with promotion of events that will bring visitors to the Town.
- 4) Identify available commercial/industrial land and real estate for sale or lease so that potential new or relocating businesses can be quickly informed of what is available.
- 5) To the extent that it is feasible and within the resources available to the Town, look to assist businesses in reducing energy costs through incentives and new technology.
- 6) Support CVFiber, a nonprofit organization, made up of 16 Central Vermont Towns with a goal of getting fast, dependable, and affordable internet to every resident of member Towns.

10.7 CHILDCARE

There is a strong link between having sufficient and quality childcare and economic development. Childcare supports economic development by investing in our children, providing choices to working parents, and fueling our regional economy. Demographics show there are more one-parent households as well as more two working-parent households than existed at the time of adoption of the previous Municipal Plan and the trend is expected to continue for some time.

The Town should ensure that its policies encourage, rather than impede, private childcare providers from providing the service. One way the Town does this is by encouraging citizens to have in-home daycares and it supports that policy by not requiring a regulatory process if the care provider is not required to be registered by the State of Vermont. For registered in-home childcare providers and larger commercial childcare centers, zoning requires site plan review. While childcare is important, there is still a need to review larger projects to ensure that issues associated with traffic, parking, noise, and other potential impacts are reviewed for safety and nuisance concerns. Commercial childcare centers may also be subject to conditional use review.

The Town is not currently involved, nor does it plan to provide municipal childcare.

Childcare facilities are regulated by the Vermont Department for Children and Families, Child Development Division (dcf.vermont.gov). State law requires that a childcare provider be registered with the Child Development Division if they provide care to more than two families, not including their own. Barre Town currently has 13 licensed in home and 8 commercial providers. It is unknown how many unregistered providers there are due to the aforementioned lack of regulatory process.

Recommendations

- Zoning regulations should continue to support in-home care providers as an allowed use and zoning regulations should not place undue burdens to providers.
- Public and privately operated after-school programs should be encouraged as an option.

11. FLOOD RESILIENCE

11.1 INTRODUCTION

The greatest impact to Barre Town with regard to flooding typically comes from flash flooding. Barre Town's hills and valleys allow for water to be collected at higher elevations in numerous tributaries, brooks and streams, to both the Jail Branch and the Stevens Branch Rivers. Elevation change between the heads of these brooks or streams and the rivers can create tremendous fluvial erosion. Fluvial erosion is the removal of soil and rock from the bank of a water channel and is a concern throughout Vermont including Barre Town.

Saturated spring soils, valley river branches and alluvial fans can bring moderate flooding. True 100-year floodways are significant only along the valley basin branches which feed the Winooski River and in a few tributary stream beds which tend to be of moderate impact.

Barre Town has an approved Local Hazard Mitigation Plan that was effective May 11, 2018. This plan will be annually reviewed and updated on a five-year plan. The plan contains maps to identify the flood hazard and fluvial erosion hazard areas and outlines a maintenance plan in accordance with 44 C.F.R. §201.6.

11.2 SURFACE WATER CONDITIONS

Barre Town is entirely located within the Winooski River watershed. All the water of the Winooski River watershed flows north into Lake Champlain. Barre Town has a wide variety of waterways and manmade ponds. Two rivers flow through Barre Town, the Stevens Branch, flowing along VT RT 14 from the Williamstown Town line north to the Barre City line, and the Jail Branch which flows north along US RT 302 from the Orange Town line to the Barre City line.

The Stevens Branch is listed by the Vermont Agency of Natural Resources, Department of Environmental Conservation, Water Quality Division as one of seven important tributaries of the Winooski River. The Winooski River originates in the Town of Cabot and flows northwesterly approximately 90 miles to Lake Champlain with a total drainage area of 1,080 square miles which is 11.9 percent of Vermont. The Stevens Branch is 14.7 miles long of which approximately 2.6 miles are in Barre Town with a total watershed of 129 square miles.

The Jail Branch is a tributary to the Stevens Branch and originates in the Town of Washington. Collecting water from a 49 square miles area, the Jail Branch travels 14 miles, 4 of it in Barre Town, to its confluence with the Stevens Branch just south of Barre City's downtown.

Both the Stevens and Jail Branch Rivers offer Town residents a variety of recreational opportunities. The opportunities include but may not necessarily be limited to swimming and fishing. According to the State of Vermont Water Quality Division, there are no recognized swimming holes on either the Stevens or Jail Branch Rivers in Barre Town. However, while the Jail Branch does not offer many opportunities due to terrain and speed of the river, the Stevens Branch does and is used for swimming in the South Barre area. Fishing is popular on both rivers with wild brook trout the prominent species of fish although you may find brown and rainbow trout as well.

Testing of the water in both rivers is done periodically by the Department of Environmental Conservation as well as local high school science classes. Water quality is reported to generally be good. The Stevens branch has had negative impacts on it over the years, but remedial efforts have proven successful in protecting the water quality. Some of the hazardous sites that have impacted the Stevens Branch in Barre Town or upstream over the years include Quarry Hill Quick Stop (296 Quarry Hill Road) and the former Unifirst dry cleaning plant in Williamstown, the Williamstown land fill where sludge was dumped that had contaminants from the Unifirst site, South Barre Mini Mart/Barre Home Supply (663 South Barre Road). All of these sites have had remedial programs to mitigate contaminants.

The Jail Branch River has not been subject to the same types of hazardous contaminants that the Stevens Branch has. The Jail Branch is impacted by the East Barre Dam which was constructed between 1933 and 1935 in response to the flood of 1927 when water from both the Jail and Stevens Branch Rivers decimated much of Barre City. Construction was done almost entirely with hand labor by the Civilian Conservation Corps. Flooding upstream of the dam is common which is by design. Most of the flooding occurs in the Town of Orange.

There are other smaller tributaries to both the Stevens and Jail Branch Rivers that since the installation of the East Barre Dam have proven to be more troublesome than the rivers themselves when it comes to flooding. These brooks include both Gunners Brook and Honey Brook.

Aside from the undeveloped Pecks Pond, Barre Town does not have any formal bodies of water such as lakes or ponds, the woods in the Millstone Hill Area (Graniteville and Websterville) are riddled with small and medium sized abandoned granite quarries. Now filled with ground water, these quarries provide their own uniqueness and opportunities. Many of these old abandoned quarry holes are contained within the Barre Town Forest and will be preserved for future generation to enjoy and learn about Barre Town's heritage.

The health of a river is vital to a community's well-being whether it be for recreation or aesthetics. Barre Town should take measure whenever possible to protect rivers and streams. Some of these methods to protect surface water may include:

Surface water protection goals:

- Although the State of Vermont now regulates on-site septic systems, Barre Town should remain active in the siting of these systems. Identification of failed systems and helping homeowners find remedial solutions when feasible should also be done.
- Proper stormwater management and erosion control should be considered for all development. Non-point pollution surface run-off from impervious surfaces and erosion can threaten water quality and the health of streams. Runoff can harm water quality through the addition of petrochemicals, heavy metals and other toxins from parking areas and other facilities and can cause excessive sedimentation that endangers fish habitat.
- A minimum of a 50-foot buffer from significant streams banks should be maintained to help protect them. Buffer management plans should also be required for development close to or within a 50 foot buffer zone. Maintaining a vegetated buffer along all streams is important to the overall health and well-being of the river because it provides shade, stabilizes stream banks, and provides habitat for a variety of wildlife.

11.3 FLOOD HAZARD AREAS AND FLOODWAYS

A special flood hazard area is defined in terms of likelihood of damage impact's in a one hundred (100) year period. A floodway is the pathway and watercourse that must be reserved to carry flood water away during the 100-year incident. These areas in Barre Town have been mapped by the Federal Emergency Management Agency (FEMA) and used as part of the National Flood Insurance Program showing flood hazard areas on Flood Insurance Rate Maps (FIRM's), which indicate flood hazard locations. Properties located near the primary rivers (Stevens Branch and Jail Branch) are subject to floodway regulations. Flood hazard regulations are incorporated in the Town's Zoning Bylaw enforced by the Zoning Administrator. The flood hazard regulations restrict development in special flood hazard areas to prevent loss of property and life. These FEMA maps are available in the Barre Town Planning and Zoning Office.

Soil composition, slope and contours also create pockets of minor (though problematic) flood impact due to spring thaws and intense rainfall. Sections of Lower Graniteville; Websterville Road, East Barre, and Quarry Hill, for example, can be vulnerable to "spot" flooding, basement impact, storm sewer over-capacity and road erosion.

There are fluvial erosion concerns throughout Barre Town. Of specific concern are areas on both side of East Barre Road (US RT 302) from the Barre City line to East Barre. This area has experienced significant fluvial erosion creating

ravines in several locations. Recent severe and prolonged rainstorms have caused localized serious erosion and road washouts. While we cannot predict with certainty that these events will be the norm in the future.

The Town considers the areas with higher risk of flash flooding when reviewing plans and addresses those needs. The Town can work with landowners in the areas of higher risk of flash flooding to provide the awareness and the best practices if how to reduce the risk and not exasperate the conditions.

The Town may prevent fluvial erosion by following stormwater best practices and the current Municipal Roads General Permit to reduce the flow rates and sediment transport in hydraulically connected waterways prior to entry into the and rivers and streams. To capture the stormwater along the roadway and reduce its flow, the Town has created a road inventory to identify areas in need of additional or improved stone-lined and vegetated ditching.

11.4 WETLANDS

Wetlands are defined as areas which are inclined to retain sufficient ground and surface water to support significant types of vegetation and aquatic life, which depend on consistently saturate soil conditions. Wetlands provide wildlife habitat and are important as indicators of possible groundwater contaminates.

Wetlands, regulated by both the State and Federal government, are identified on the Vermont Significant Wetland Inventory Map. There are many available sources to review the wetland maps including the Planning and Zoning Office and on the State of Vermont Water Quality website (www.vtwaterquality.org). Barre Town has no Class 1 wetland but does have Class 2 and 3. Class 2 wetlands are considered more significant than Class 3 wetlands and while Class 2 wetlands are generally mapped, Class 3 are not. Both Class 2 and 3 wetlands are prevalent throughout Barre Town and represent significant environmental assets. Some of the wetlands have been protected by private landowners. In recent years, wetlands, regardless of their category, mapping, or size, have been considered significant. This is important because all uses where impact to a wetland is possible should use care before disturbing the wet area.

- Developers and homeowners should consult with a wetland consultant.
- Barre Town's Zoning Bylaw regulates wetland development but may need to be amended to include additional language regarding the importance of even non mapped wetlands.

11.5 STORM WATER MANAGEMENT

Much of Barre Town is comprised of hilly areas that are like the rim of a bowl, the center of which is Barre City. Storm water runoff traveling down the hills impacts on the City. It also impacts areas of Barre Town by its adverse impact on homes, leach fields and driveways as well as roadways. Uncontrolled runoff can create a variety of problems. These problems are often made worse when new development reduces the amount of vegetation which controls the absorption of the ground water. Examples of the problems are silt deposits; erosion and/or undermining of private property, roadways, railroad beds and bridges; accumulations of water that will flood or freeze which produce hazards on driveways or roads; and flooding and contamination damage to basements, yards or streams.

The Town Public Works Department controls storm water runoff by a system of ditches, culverts, and catch basins to protect its road infrastructure. Most of the runoff not absorbed into the ground eventually flows into natural waterways. In response to ACT 64, the Vermont Clean Water Act, the State's Department of Environmental Conservation began implementing a Municipal Roads General Permit (MRGP) in 2018 to reduce impacts to waters of the state from storm water runoff from municipally owned roads. The Town abides by the MRGP conditions for its "hydrologically connected road segments." This refers to stretches of road where water runoff would eventually make it into waters of the State. MRGP standard include road crowning, hydroseeding disturbed soils, ditch design, turn-outs for drainage outlets, culverts, and culvert outfall management.

Reports of maintenance needs for the storm water control system are handled by the Town Highway Department as part of the routine maintenance of town roads.

The Town should ensure that all plans for future construction within the Town are reviewed for storm water runoff impact on adjacent property owners and municipalities to ensure the health and safety of the public. Wherever appropriate, the Town will require the developer to provide a right of way, an easement or retain necessary private property for the maintenance of the storm water control system.

There are fluvial erosion concerns throughout Barre Town. Of specific concern are areas on both side of East Barre Road (US RT 302) from the Barre City line to East Barre. This area has experienced significant fluvial erosion creating ravines in several locations. Repairing these ravines may be difficult and expensive; however, controlling runoff may be a manageable way to help slow erosion. Development, where stormwater runoff is collected and travels through these ravines should be reviewed for stormwater management, controlling the rate of runoff.

There are also problems with the infiltration of storm water into the domestic sewer lines which need to be resolved as well. The State of Vermont has a storm water and construction permit process; the process refers to one to five-acre developments. The developers must obtain a state permit referred to as a 3-9020. This permit deals with low risk sites and erosion issues on the sites; prevention and sedimentation control. All developments one to five acres must submit a preliminary notice of intent per new state law.

11.6 MITIGATION GOALS AND OBJECTIVES

Barre Town has adopted a Local Hazard Mitigation Plan with mitigation goals and objectives. These goals are based on the proposed programs, projects and activities identified by the Town.

- Guide the future growth and development of land, public service and facilities.
- Identify areas where development may not be appropriate due to environmental conditions. This may be due to conditions evident at the site such as excessive slope, aquifer recharge areas, erosion of stream banks or to the existence of other natural resources such as an important wildlife habitat.
- Land use growth and development should be planned to balance market needs and demands with the capacity of the land, municipal services, and infrastructure network to accommodate it. Development and growth should be encouraged in areas where municipal water, sewer, and roads are available. Growth should be done in ways that do not burden existing systems and costs of operating those systems on the taxpayer.
- Highways form the backbone of the transportation system in Barre Town. Proper location, design, construction and maintenance of this important public investment are essential if economic vitality, environmental preservation and quality of life are to be assured for the Town's citizens.
- Preserve existing roads, bridges, and culverts by regular maintenance and continued inspections. Maintain the formal road plans to ensure good quality roads and to help make optimal use of limited resources.
- The Town of Barre has an operating Emergency Operation Center and disaster plan. The operation center is located in the basement of the Municipal Building in Lower Websterville.
- Review of future development in a continued effort to maintain and improve the quality of air, water, wildlife and land resources. Encourage stream bank preservation and buffer zones.
- Consider the best mitigation measures when repairing and planning Town infrastructure.
- Take measures whenever possible to protect rivers and streams.
- Proper stormwater management and erosion control should be considered for all development with a minimum of a 50-foot buffer from significant stream banks should be maintained to help protect them.
- Development, where stormwater runoff is collected and travels through these ravines should be reviewed for stormwater management, controlling the rate of runoff (East Barre location).

- Allowable volumes of stormwater run-off need to be calculated using State standards. Consider a no disturbance buffer/setback area around steep slopes of 20% or greater and buffer areas for streams and wetlands.
- Ensure long-term, sound stewardship of natural resources through reliable planning and management practices.
 - The development must be in harmony with the natural features of each site and limited where development is imprudent and/or questionable.
 - Encourage and enlist the assistance of residents, landowners, schools, businesses and other entities to study inventory, manage, preserve, protect and enhance natural assets.
 - Enlist existing organizations and boards such as; the Recreation, and Housing Committees; Development Review Board and Planning Commission, and the Traffic Safety Committee to propose and implement policies to protect natural resources and enhance natural features throughout Barre Town.
 - Take a proactive approach to prioritization of natural resources in the interest of expanded development amenities, respect of property rights, and incentives of developers and landowners. These may be reflected in ordinances, pursuit of planning and implementation project funds, community demonstration programs, and/or open space/recreation/tax/site design incentives, for example.
 - Encourage protection of mature landscapes, geological features, seasonal waterways, and indigenous waterways to serve the goals of the Town Plan while increasing marketability of developments and confidence in applicant planning capacity.
 - Applicants should be advised to incorporate mitigation measures to protect natural resources, rather than to delay proposals strengthening planning considerations.
- Continue to inform the public, through zoning, of State Residential Energy Standards and the requirement that new construction meet those standards.
- Explore other opportunities to secure public monies that can be used to retrofit and/or improve the energy efficiency of private housing units locally.
- Fund the Town's existing housing rehabilitation program with additional monies to assist low income families.
- Planning Commission consults Town Plan for implementation of goals, objectives, policies, and recommendations.

11.7 PROPOSED PROGRAMS, PROJECTS, AND ACTIVITIES

The state emphasizes a collaborative approach to achieving mitigation on the local level, by partnering with ANR, VTrans, ACCD, Regional Planning Commissions, FEMA Region 1 and other agencies, all working together to provide assistance and resources to towns interested in pursuing mitigation projects and planning initiatives. The mitigation strategies identified by the Town are listed in regard to local leadership, possible resources, implementation tools, and prioritization. Prioritization was based upon the economic impact of the action, the feasibility of the action, the Community's need to address the issue and its capacity to address the issue, the action's cost, and the availability of potential funding.

During development, some identified and listed mitigation actions were started, and a couple projects have been completed. Barre Town understands that in order to apply for FEMA funding for mitigation projects that a project must meet FEMA benefit cost criteria. The Town must also have a FEMA approved Hazard Mitigation Plan in effect. The Planning Team considered actions to address all profiled hazards.

RECOMMENDATIONS:

- The Development Review Board should review plans regarding storm water management for new subdivision proposals to ensure that new development will not adversely affect the community.

- Allowable volumes of storm water run-off need to be calculated using State standards for 10, 25, and 50 year storms. Calculations in subdivision applications, detention areas, throttling devices for all storm water run-offs need to be provided to the Development Review Board at the time of new development.
- Town should consider a no disturbance buffer/setback area around steep slopes of 20% or greater.
- Buffer areas for streams and wetlands.
- Consider a fluvial erosion plan.

12. IMPLEMENTATION

The purpose of the Vermont Municipal and Regional Planning and Development Act, Title 24, Chapter 117, from which the Town draws its authority to implement the goals of this Plan, states the General Purposes as follows:

"It is the intent and purpose of this chapter to encourage the appropriate development of all lands in this state by the action of its constituent municipalities and regions, with the aid and assistance of the state, in a manner which will promote the public health, safety against fire, floods, explosions and other dangers; to promote prosperity, comfort, access to adequate light and air, convenience, efficiency, economy and general welfare; to enable the mitigation of the burden of property taxes of agricultural, forest and other open lands; to encourage appropriate architectural design; to encourage the development of renewable resources; to protect residential, agricultural and other areas from undue concentrations of population and overcrowding of land and buildings, from traffic congestion, from inadequate parking and the invasion of through traffic, and from the loss of peace, quiet and privacy; to facilitate the growth of villages, towns and cities and of their communities and neighborhoods so as to create an optimum environment, with good civic design; to encourage development of a rich cultural environment and to foster the arts; and to provide the means and methods for the municipalities and regions of this state to plan for the prevention, minimization and future elimination of such land development problems as may presently exist or which may be foreseen and to implement those plans when and where appropriate. In implementing any regulatory power under this chapter, municipalities shall take care to protect the constitutional right of the people to acquire, possess, and protect property."

This Plan is intended to carry out the General Purposes of the Planning and Development Act and should be implemented in conjunction with Title 24, Chapter 117 in its entirety.

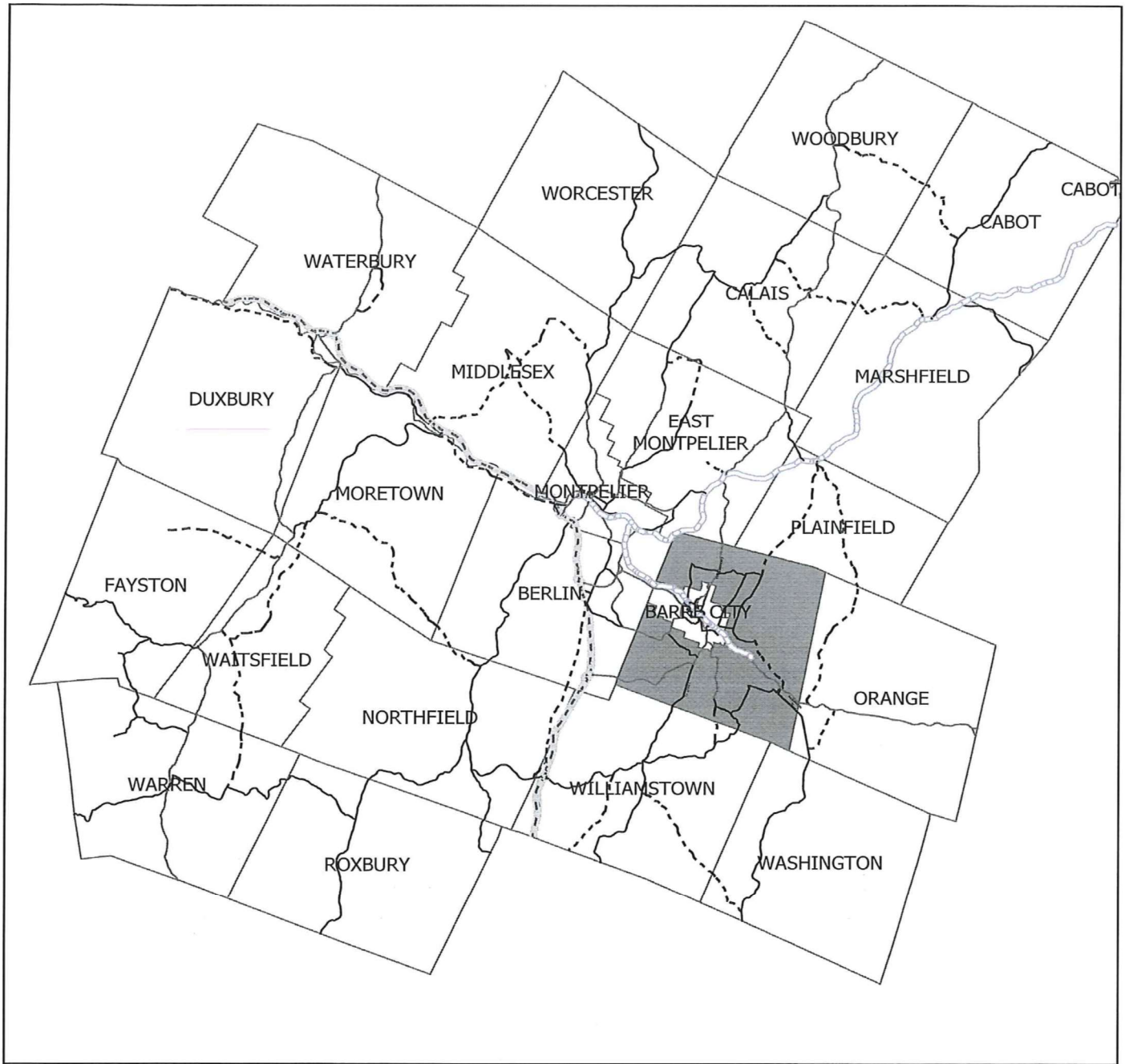
The Planning Commission is the body responsible for preparing the Town Plan. While the plan expires eight years after adoption, planning is an ongoing process and this plan should be continuously reviewed for updates and relevant amendments incorporated as is warranted. The plan should be regularly consulted for implementation of goals, objectives, policies, and recommendations that can be incorporated into or used as a guide for:








1. Subdivision Regulations
2. Zoning Bylaws
3. Zoning Districts Map
4. Budgeting and Capital Improvement Planning
5. Infrastructure planning
6. Community services
7. Economic development
8. Improved housing
9. Preservation of historic and scenic features
10. Improve energy conservation

The Town Plan is also used for ACT 250 proceedings to determine whether a project conforms to the plan. The Town Plan will also be used by the Vermont Public Service Board during Section 248 hearings (energy distribution). It is important that the Town Plan is useful in proceedings before the aforementioned boards. It is important for the Town to stay informed of these proceedings and use the plan during the process to protect the Town's interests which have been clearly documented within the Barre Town Plan.

MAPS

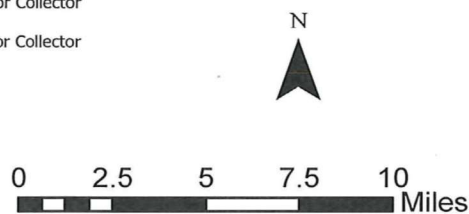
This page is intentionally left blank.



- | | |
|--|--|
|  Barre Town |  Minor Arterial |
|  Central Vermont Boundary |  Principal Arterial |
| |  Major Collector |
| |  Minor Collector |
|  Interstate/ Expressway | |

Data Sources:
Roads: VTRANS 2019

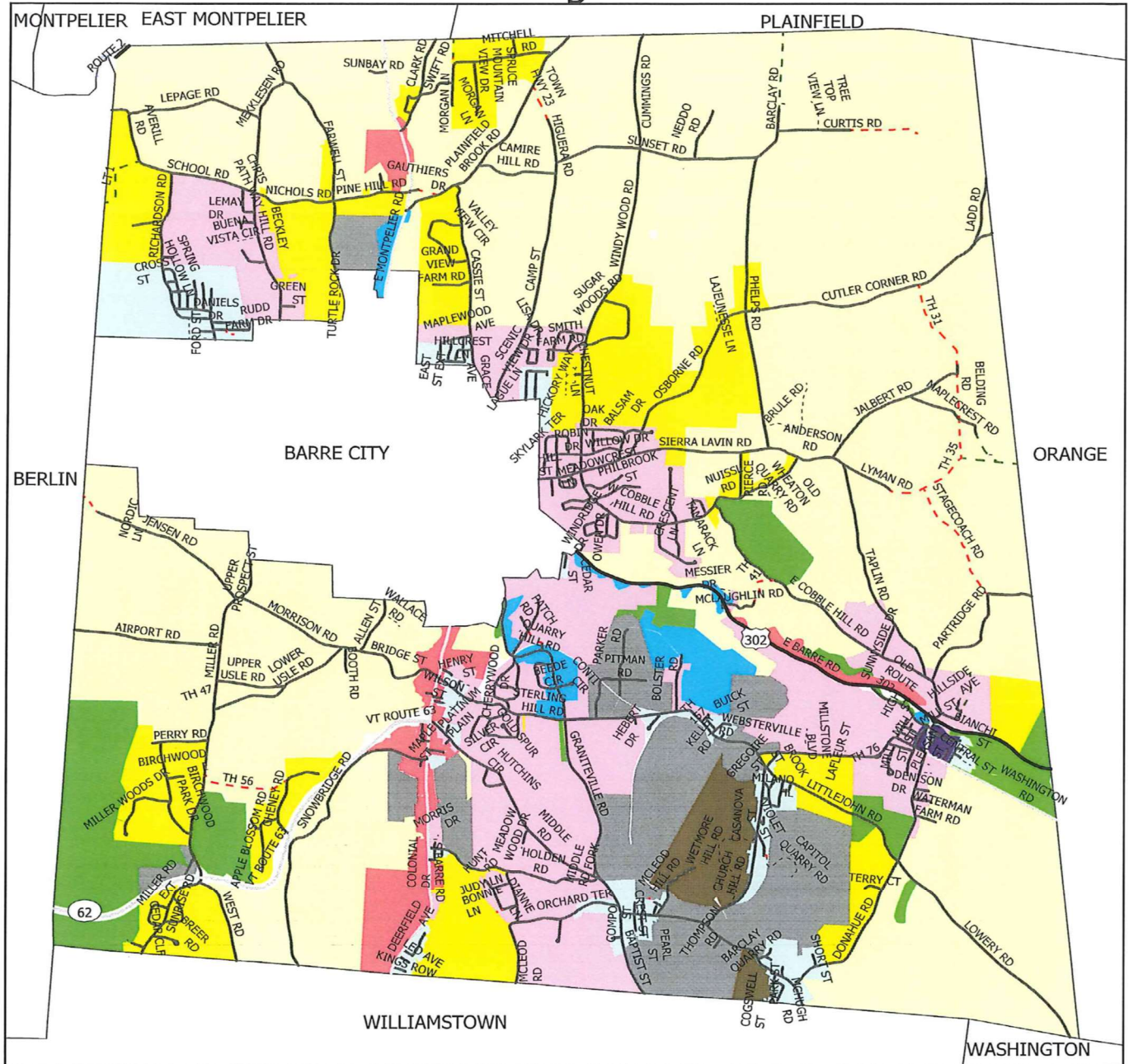
Map Created by CVRPC October 2019
This map is for planning purposes.
Data is only as accurate as the
original sources.
This map may contain errors and or omissions.












Map 1



Zoning

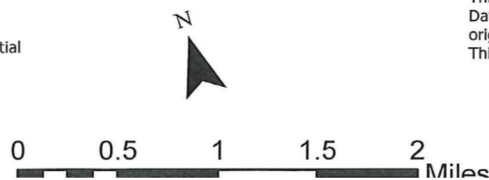


2012 Zoning

- | | | | |
|---|---------------------------|---|-------------------------------|
|  | Conservation |  | Highway Commercial |
|  | Earth Resource Extraction |  | Industrial |
|  | East Barre Commercial |  | Low Density Residential |
|  | High Density Residential |  | Medium Density Residential |
| | |  | Office Building Retail |
| | |  | Very High Density Residential |

Data Sources:
Zoning: Town of Barre 2012
Roads : VTRANS 2019

Map Created by CVRPC October 2019
This map is for planning purposes.
Data is only as accurate as the
original sources.
This map may contain errors and or omissions.










Map 2










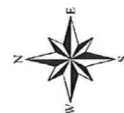
Barre Town

Utilities and Facilities

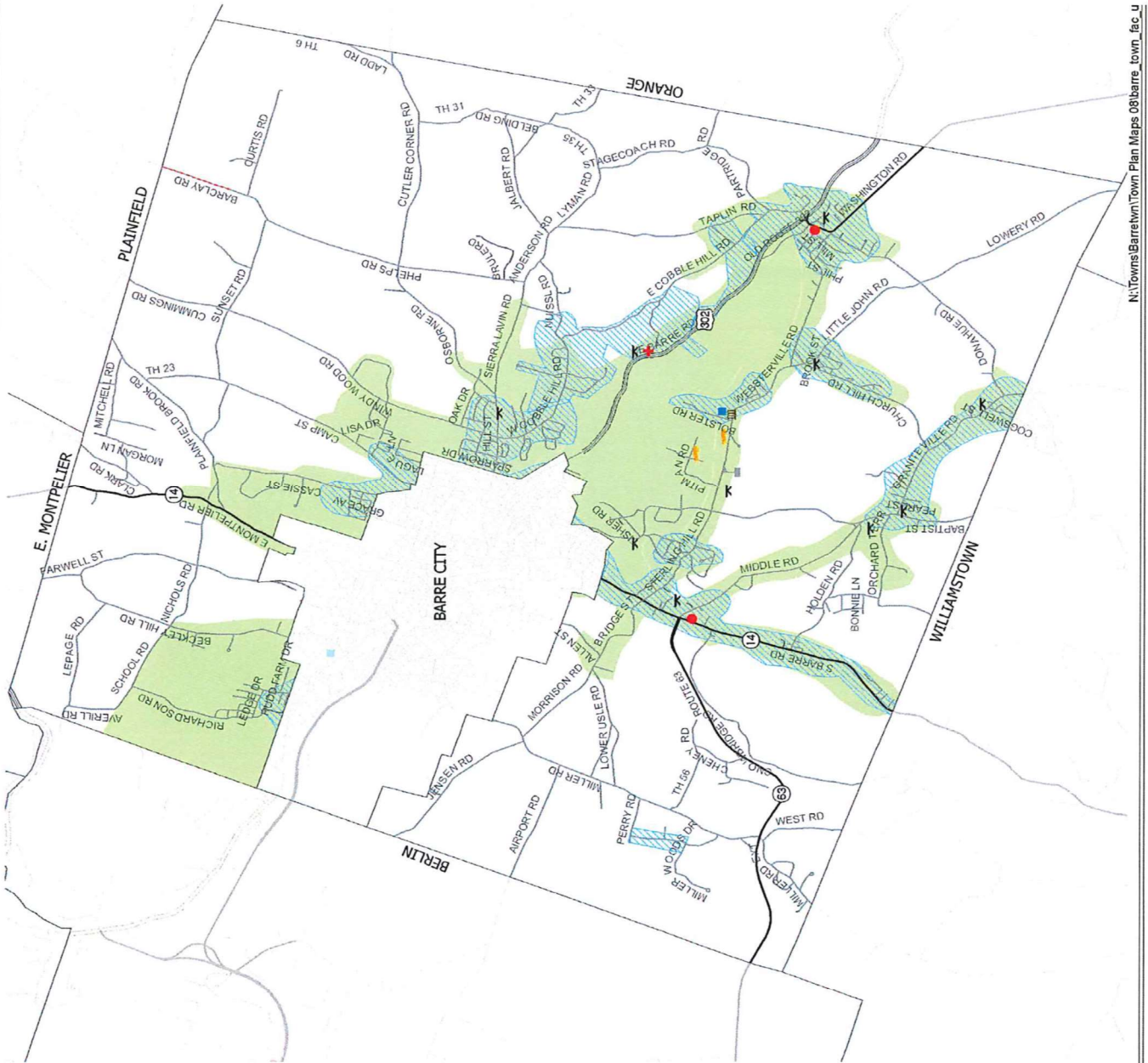
-  Municipal Building
-  Public Works Facilities
-  Police Station
-  Fire Station
-  Ambulance House
-  School
-  Recreation/Picnic Areas

Roads

-  Town Highway
-  Legal Trail
-  Private
-  VT State Highway
-  US Highway
-  Water
-  Sewer



0 0.25 0.5 1 Miles
 1 inch equals 4,000 feet



Barre Town

Land Use/Land Cover

Roads

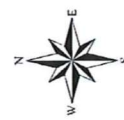
- Town Highway
- Legal Trail
- Private
- VT State Highway
- US Highway

Land Use/Land Cover

- Agriculture and other
- Urban
- Forest
- Water

Individual E Sites

- Commercial
- Industrial
- Public
- Multi-family
- Single Family

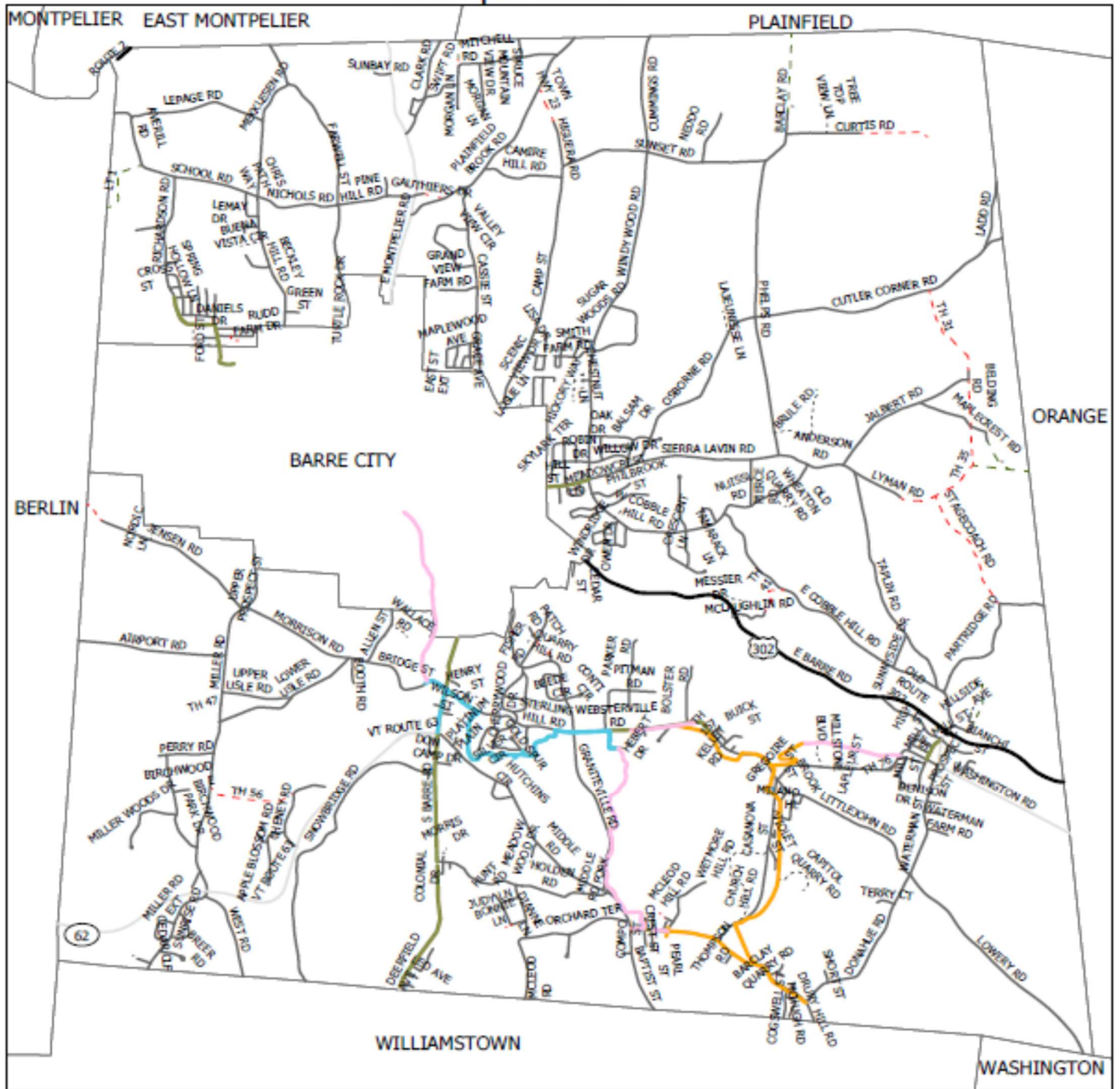


0 0.25 0.5 1 Miles
1 inch equals 4,000 feet



Map 4

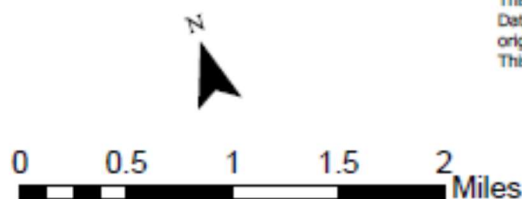
Transportation



- | | |
|---|---|
| Barre Town Bike Path | Roads |
| — Path Design Plans | — US Highway |
| — Bike Lane | — State Highway |
| — Existing | — Town Highway Class 2-3 |
| — Proposed | - - - Town Highway Class 4 |
| — sidewalk | - - - - Private Road |
| | - - - - Legal Trail |

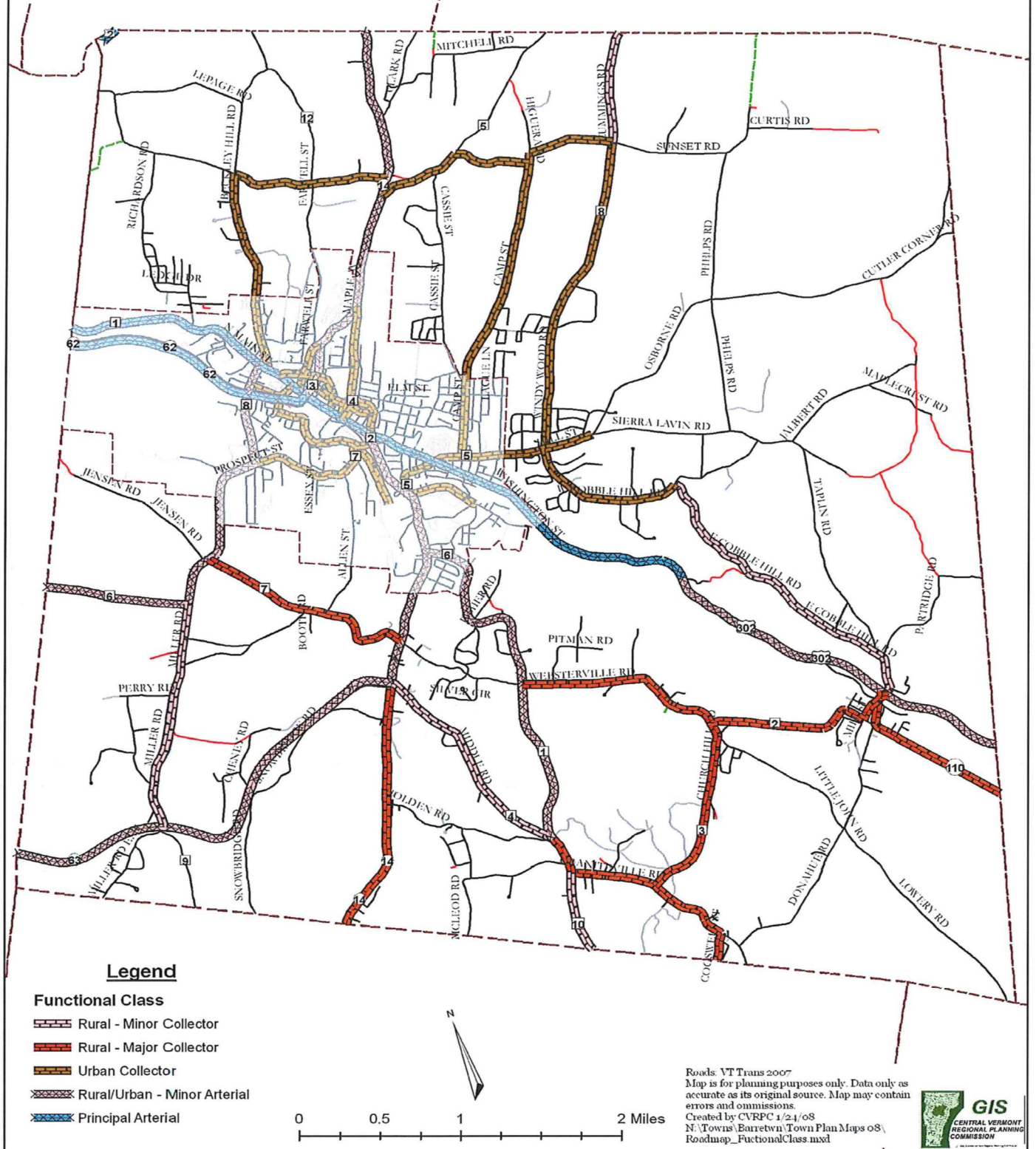
Data Sources:
 Roads : VTRANS 2019
 Bike Path: VTRANS 2012

Map Created by CVRPC October 2019
 This map is for planning purposes.
 Data is only as accurate as the
 original sources.
 This map may contain errors and or omissions.



Town of Barre

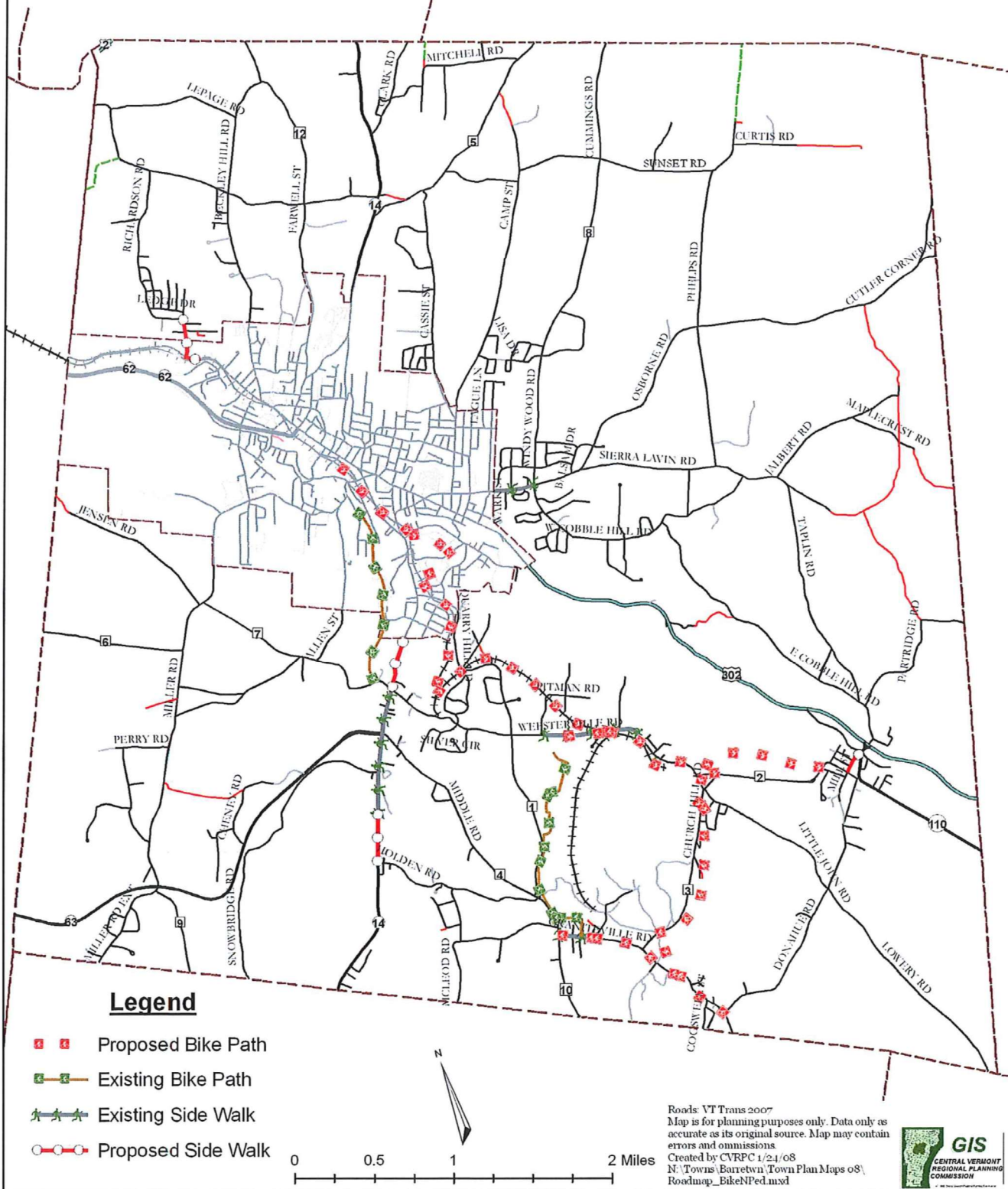
Road Map by Functional Class



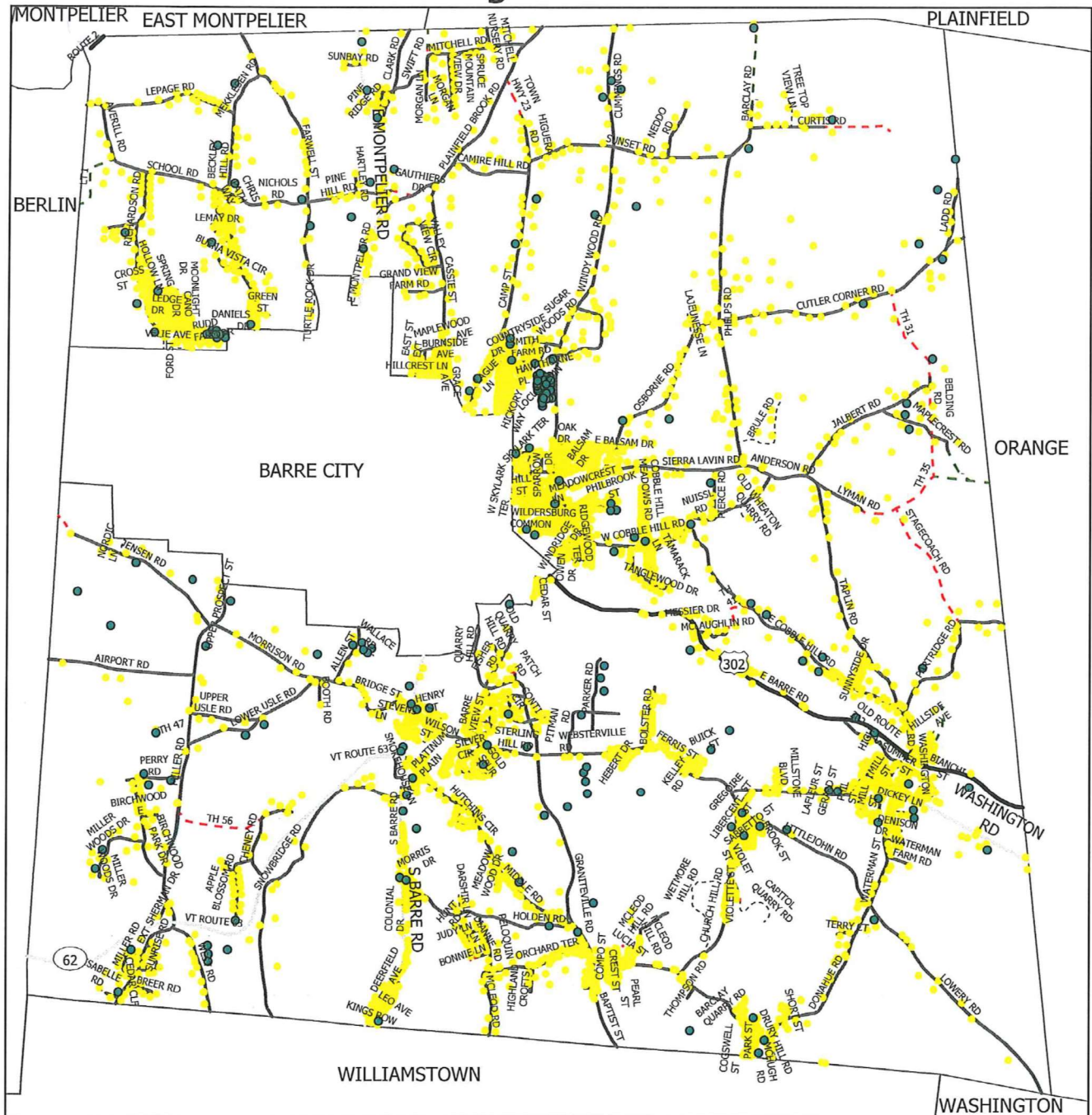
Map 6

Town of Barre

Bike and Pedestrian Paths



Housing Resource



- New Housing from 2012 to 2019
- 2012 and older Housing

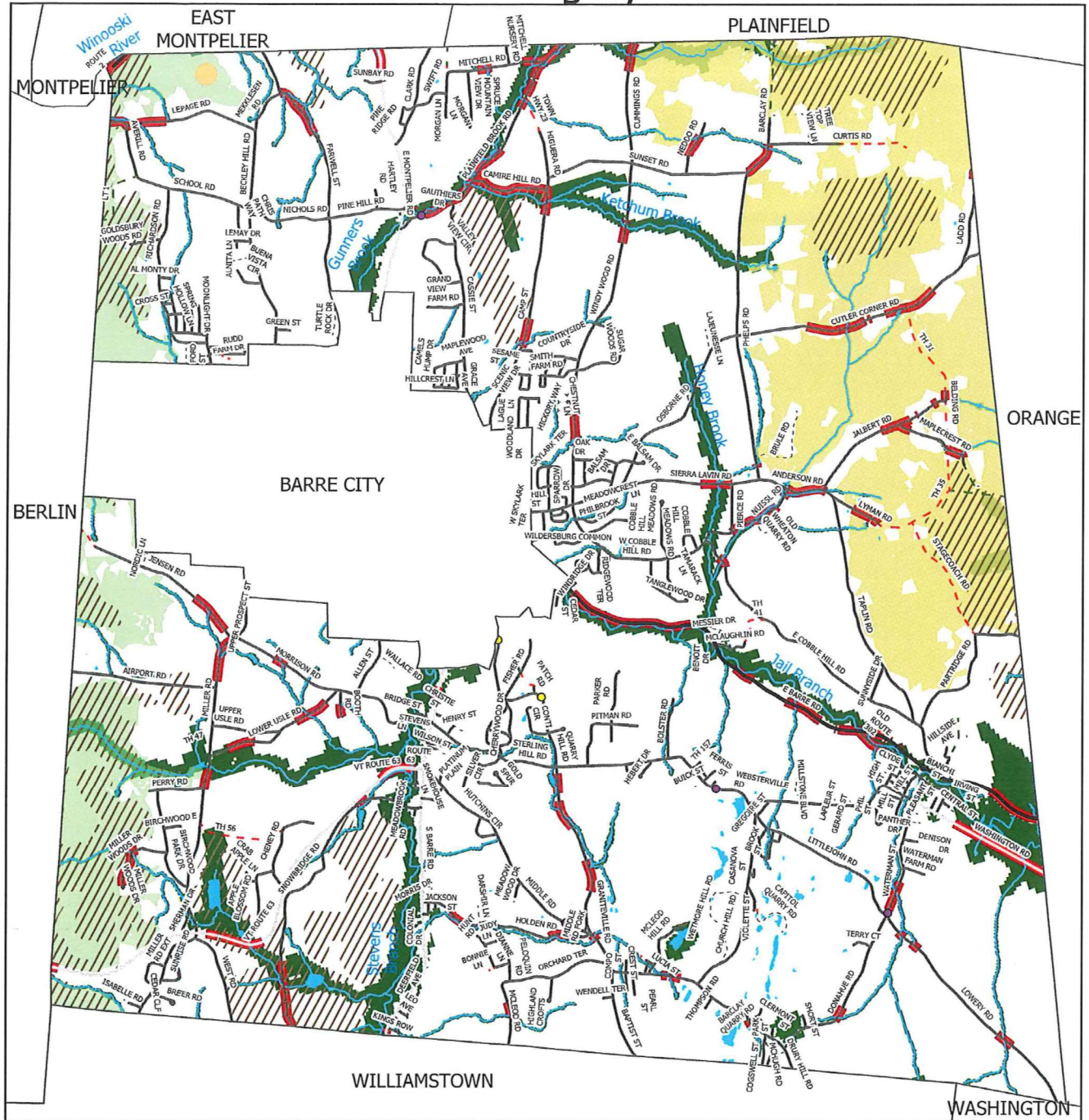
Data Sources:
Housing: E911 2019, and 2012
Roads : VTRANS 2019

Map Created by CVRPC October 2019
This map is for planning purposes.
Data is only as accurate as the
original sources.
This map may contain errors and or omissions.



0 0.5 1 1.5 2 Miles

Forest Integrity



Species and Community Scale

Highest Priority Wildlife Crossings

Uncommon Species

Type

Animal

Plant

Vermont Conservation Design - Landscape Scale

Priority Connectivity Blocks

Priority Interior Forest Blocks

Highest Priority Surface Water and Riparian Areas

Deer Wintering Areas

Bear Collision

Bear Crossing

Streams

Rivers, Lakes, and Ponds

Data Sources:

Biofinder 2016

Deer Wintering Areas: VTANR 2010

Roads : VTRANS 2019

Map Created by CVPRC October 2019

This map is for planning purposes.

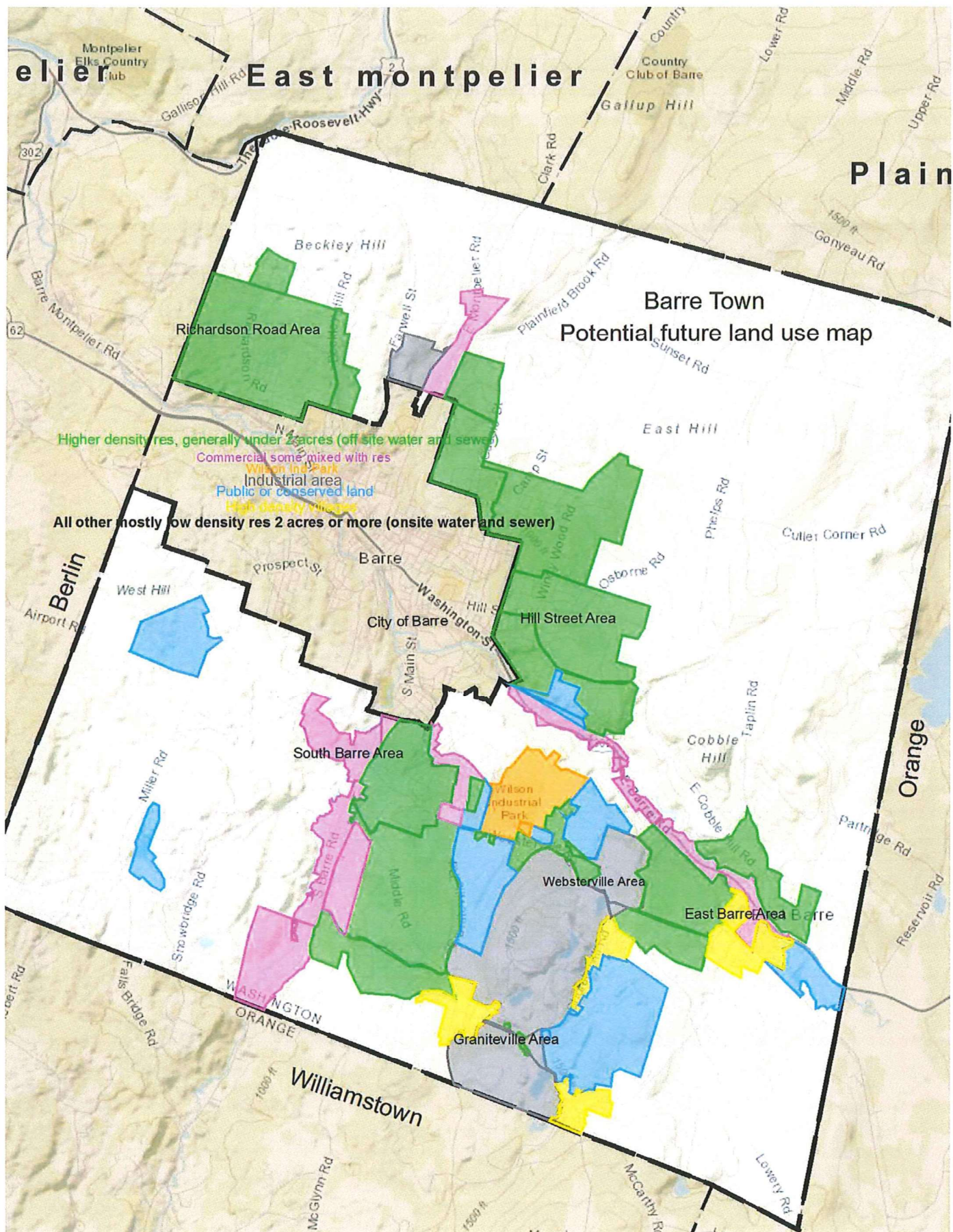
Data is only as accurate as the

original sources.

This map may contain errors and or omissions.



0 0.5 1 1.5 2 Miles



Map 10



Town of Barre

ENERGY PLAN 2020

~ ~ Notes ~ ~

TABLE OF CONTENTS

Analysis & Targets	1
Pathways & Implementation Actions	16
Mapping	26
Appendix A—Constraint Definitions	30
Appendix B—Local Resource Maps	35

This page is intentionally left blank.

ANALYSIS & TARGETS

It is important to understand there must be a correlation between energy efficiencies and the mandate to switch energy sources to renewables. The renewable benchmarks do not come without increased costs and therefore conservation is imperative to lessen the financial burden. It is also critical that financial incentives continue and are kept at a pace that at a minimum incentivizes the direction mandated. Within we are only addressing laser point targets which exist today. We must however allow a broad-brush method in order to release the ingenuity and creativity needed to meet the mandate while taking all practical steps to ensure renewables have sound management which take place in such a manner that protects human health and the environment against the adverse effects of activity, processes, products or substances.

In order to adequately determine if the Town of Barre is on the right path to meeting its share of the state's goal of 90% of the energy used being produced by renewable sources, an identification and analysis of current energy use is necessary. To this end, the following questions have been identified to help determine current energy use and targets for moving forward.

- I. Does the plan estimate current energy use across transportation, heating, and electric sectors?*
- II. Does the plan establish 2025, 2035, and 2050 targets for thermal and electric efficiency improvements, and use of renewable energy for transportation, heating, and electricity?*
- III. Does the plan evaluate the amount of thermal-sector conservation, efficiency, and conversion to renewable fuels needed to achieve these targets?*
- IV. Does the plan evaluate transportation system changes and land use strategies needed to achieve these targets?*
- V. Does the plan evaluate electric-sector conservation and efficiency needed to achieve these targets?*

These five questions and their respective responses serve as the basis for identifying where Barre Town is now, where it needs to go, and how it will get there in terms of its energy future.

The information needed to answer the five questions listed above was procured from various sources. This includes information from the American Community Survey (as part of the residential 2017 U.S. Census), The Vermont Agency of Transportation, the Vermont Department of Labor, the Vermont Department of Public Service, Efficiency Vermont, the Vermont Energy Investment Corporation (VEIC), and the Central Vermont Regional Planning Commission. A significant portion of the data related to targets was provided by the VEIC through a process known as Long-Range Energy Alternatives Planning or LEAP by drawing on sources mentioned above. This modeling factors in a significant number of data points and has been used extensively throughout the world for energy planning such as this.

The data that is used throughout this section was developed using a bottom up approach as well as a top down approach. In some cases, data was provided at a regional level and thus was allocated to each municipality based on a methodology appropriate for that particular dataset. In other cases, information was provided at the municipal level and then aggregated to identify the regional total. While these two methods are generally the same in concept, these two processes may produce anomalies in the information. To that end, it is important to note that the data provided herein is only a starting point and should be used to establish a general direction, not a required outcome. This data is presented as a way to gauge Barre Town's overall progress towards achieving 90% of its energy used produced from renewable sources. As new or better data is provided or developed, these tables will be updated to reflect the changes.

Barre Town has two utilities that provide electricity to its residents, Green Mountain Power(GMP) and Washington Electric CO-OP (WEC). GMP services the majority of the Town. WEC electrical needs are met by utilizing 100% they say renewable energy. A portion of GMP's electricity comes from renewables. Because both electric utilities serve Barre Town their renewable energy "portfolio" should be considered towards overall progress in reaching 90%. However, we cannot guarantee their energy portfolio going forward.

Another important factor that should be considered is measures taken by the Town and its residents with regard to energy conservation. The easiest way to save energy is that which we don't use. Barre Town has invested considerable tax dollars to upgrade and make Town buildings more energy efficient. Likewise, residents have also, at considerable expense, made weatherization improvements themselves or taken advantage of weatherization programs.

While progress has been made weatherizing homes, there is much to be done. Much of Barre Town's housing is very old and as a result not energy efficient. Barre Town can't mandate home improvement projects that increase energy efficiency, however, we can and do support it and at the same time support expanding any program that improves the weatherization of homes not only in Barre Town but across the State. All new construction shall be constructed in accordance with State building energy standards if applicable. Builders and homeowners should be familiar with the State mandate.

I. Estimates of current energy use across transportation, heating, and electric sectors

Energy is an important component of Barre Town's vitality. Our energy plan is a guide to promote numerous benefits which include municipal cost savings, increased revenues, a strong economy, greater energy independence and security, local influence over energy facility siting, more efficient communities, healthier communities, a clean environment, and regional coordination and collaboration. State incentives may be available to communities that have energy plan.

To a large degree, energy costs are **NOT** controlled by a municipality; they are dictated by outside sources. The number one demand for energy use in Vermont is in transportation. Heating is second followed by electrical use. So, while Barre Town and its residents may not be able to control the cost of energy, they can always look toward conservation, behavior changes, and fuel switching as a way to cut cost and meet many of the benefits mentioned above.

Other methods of energy conservation can also be encouraged such as the use of renewable energy sources and increasing the energy efficiency of buildings. Promoting these methodologies can also lead to job creation for the local work force.

TRANSPORTATION

In many cases, energy use related to transportation is a significant component to the overall energy use within a municipality. Table One provides an overview of the current energy usage in Barre Town related to transportation.

TABLE ONE	
CURRENT RESIDENTIAL TRANSPORTATION ENERGY USE	
DATA CATEGORY	INFORMATION
Total number of vehicles	5,934 vehicles
Average miles traveled per vehicle	12,500 miles
Total regional miles traveled	74,175,000 miles
Average gallons of fuel used per vehicle per year	576 gallons
Total gallons of fuel used per year	3,987,903 gallons
Transportation energy used per year	480 billion BTUs
Average regional cost per gallon of fuel	\$2.31/gal
Fuel costs per year	\$9,212,056/yr.

Notes:

1. Total vehicles provided by the American Community Survey.
2. Average miles traveled & Average gallons of fuel used per vehicle provided by VTrans.
3. Average cost per gallon of fuel provided by the CVRPC.
4. Information related to public transit is not included in this table.

Identifying current levels of electricity use provides a baseline for a community to understand how much energy is being consumed. Electricity use does not take into account the source of the electricity generation. As such, electricity being consumed in Barre Town that is not renewable is governed by the utilities purchase power portfolio.

Barre Town's current electricity use is noted in Table Two.

TABLE TWO CURRENT ELECTRICITY USE	
USE SECTOR	CURRENT ELECTRICITY USE
Residential	20,360.6 megawatt hours
Commercial & Industrial	12,718.8 megawatt hours
TOTAL	33,079.4 megawatt hours

Notes:

1. Information provided by Efficiency Vermont

Home Heating

The residents of Barre Town depend upon, propane, electricity, fuel oil, and wood for their home heating needs with fuel oil being the most dominant. In many cases, the housing stock that exists was built when fuel oil was inexpensive, and systems were easy to maintain. Over the years, these systems have become less efficient and more costly to maintain Table Three provides a breakdown of the fuel sources used for residential heating in Barre Town while Table Four lists the current commercial energy use.

TABLE THREE CURRENT RESIDENTIAL HEATING ENERGY USE				
FUEL SOURCE	NUMBER OF HOUSEHOLDS	PERCENT OF HOUSEHOLDS	HEATED SQUARE FOOTAGE	BTUs (in Billions)
Propane	353	11.30%	658,350	39.5
Electricity	85	2.70%	156,870	9.4
Fuel Oil	2,236	71.40%	4,326,540	259.6
Coal	0	0.00%	0	0
Wood	398	12.70%	811,920	48.7
Other (includes solar)	60	1.90%	117,180	7
TOTAL	3,132	100%	6,070,860	364.3

Notes:

1. Data provided by the American Community Survey.

TABLE FOUR CURRENT COMMERCIAL ENERGY USE		
COMMERCIAL ESTABLISHMENTS	AVERAGE THERMAL ENERGY USED PER ESTABLISHMENT	COMMERCIAL THERMAL ENERGY USED REGIONALLY
131	0.8	105.3

Notes:

1. Thermal energy use is expressed in Billions of BTUs.
2. Information provided by the Vermont Department of Labor and Department of Public Service.

II. 2025, 2035, and 2050 targets for thermal and electric efficiency improvements, and use of renewable energy for transportation, heating, and electricity

To effectively identify efficiency improvements for Barre Town, the Central Vermont Regional Planning Commission has provided targets for efficiency improvements for each of the target years as percent reductions below 2014 levels. These improvements relate to residential, commercial, and overall building efficiency. The target number may seem to be skewed towards the later years, however there is an expectation that efficiencies will increase with technological advances and occur over time regardless of additional actions being taken. The targets are noted in Table Five.

TABLE FIVE TARGETS FOR THERMAL EFFICIENCY IMPROVEMENTS			
SECTOR TYPE	2025	2035	2050
Residential Thermal Efficiency	20%	42%	92%
Commercial Thermal Efficiency	22%	33%	61%

Notes:

1. Information derived from VEIC LEAP Modeling

In order for Barre Town to help support the state's goals of 90% of the energy used being derived from renewable sources by 2050, the Central Vermont Regional Planning Commission allocated megawatt hour targets for the years 2025, 2035, and 2050. This municipal target is based on an allocation from a region-wide target for renewable energy generation. Table Six notes Barre Town's targeted renewable energy use and Table Seven identifies the targets for renewable energy generation.

TABLE SIX			
TARGETS FOR RENEWABLE ENERGY USE			
SECTOR TYPE	2025	2035	2050
Transportation Renewables	9.60%	31.30%	90.20%
Heating Renewables	51.60%	66.20%	92.90%

Notes:

1. Information derived from VEIC LEAP Modeling

TABLE SEVEN			
TARGETS FOR RENEWABLE ENERGY GENERATION			
SECTOR TYPE	2025	2035	2050
Electricity Renewables (in megawatt hours)	12,749	20,398	50,995
Heating Renewables	51.60%	66.20%	92.90%

Notes:

1. Information provided by The Department of Public Service

In general, the Town of Barre supports the use of renewable energy systems, to the extent that it does not over burden the town with a disproportionate share of the State's renewable energy goals and provided that they fit into the goals of the Town Plan, taking into account noise, scenic vistas, location, negative impacts on residents, and represents an orderly development of renewable energy systems. The build out of renewable energy systems (solar and wind) within the town should proceed at the same rate as the rest of the region.

Some renewable energy sources in the town are represented by wind, solar, and wood. While renewables represent a chance to move away from fossil fuel sources, they are not without their own negatives such as aesthetics, noise, cost, reliability, and availability.

It is a long-standing practice within the town to have new utility lines and utility line extensions placed underground as opposed to above ground to minimize their overall visual impact and enhanced reliability. Therefore, any extension of 3-phase power lines should be underground.

Wind Turbines

Wind turbines are relatively expensive, can be high maintenance, have siting issues (works best at higher elevations, and on ridgelines), require significant property line setbacks, may cause noise issues, moving shadows, etc. with adjacent property owners, may negatively affect property values, and of course only works when there is sufficient wind speed. Turbines can be shut down due to excess wind speeds or at night to preserve and protect bats and migrating birds. Additionally, there has to be sufficient line capacity to move the power generated out onto the grid.

Aesthetics are a major concern, as Barre Town is geographically defined by 2 north/south ridges, with expansive views from both ridges to the east as well as the west.

Solar Energy

Solar energy is represented by both solar hot water heating systems (domestic hot water), and solar electricity (photovoltaics - PV). The most appropriate location for solar arrays is roof tops, existing impervious surfaces, or industrial/earth resource land (identified by the Town) not well suited for conventional development. Any new ground mounted solar array should utilize existing topography, development, or vegetation on site to break up the visual mass of the arrays. Renewables shall not be sited so that they are predominately visible from hillsides or ridgelines unless determined to be a preferred location by the Planning Commission and the Selectboard and shall be sited to preserve open space.

Commercial solar arrays larger than 500 kW would encompass a land mass greater than any other structure within Barre Town and even with somewhat rolling topography cannot be screened or mitigated to blend into the Town's landscape or rural cultural aesthetics and are therefore prohibited.

Solar Hot Water

Solar hot water systems require minimal space and can be located on roofs or ground mounted and could be located in all zones. Solar hot water systems are subject to setback requirements (same as any accessory building). Roof mounted arrays are subject to building height requirements and need to be sensitive to neighborhood aesthetics.

Solar arrays ideally require full sun and unobstructed southern exposure. Essentially all the solar heat generated is stored in a hot water pre-heater tank (think of it as a battery) and used on an as needed basis, which has the potential to reduce the morning and evening spikes in electrical demand required to produce hot water. Payback on the systems is fairly short term given that there are both state and federal rebates/incentives available. These systems would also be appropriate for heating swimming pools.

Photovoltaics (PV)

PV requires a much larger array of panels and may have a more visual impact on surrounding properties. Due to their larger size and system connection needs residential PV systems are more expensive to install than hot water systems. Even with the present state and federal incentives, payback can be up to 20 years. As with solar hot water, these systems can be roof mounted or ground mounted, and are subject to residential set back and height restrictions. Annual electricity production may be negatively impacted by winter months snow covering the panels, and panel angle.

Wood

Wood is available as both firewood and pellets. Generally, firewood is produced in or within a few miles of Barre Town which minimizes transportation costs and supports a local economy. Firewood removal from forest land is also an important tool for forest, wildlife, and agricultural land management. Pellets used in Vermont are generally produced regionally, also minimizing transportation costs.

While using firewood for heat in stoves and inside boilers is a logical step to supplement fossil fuels, outside wood boilers have their own particular set of issues. Generally, the flue pipe (smokestack) is short and in certain meteorological conditions can cause significant ground level smoke plumes to the detriment of the neighbors or neighborhood. Outside wood boilers used in the summer solely for hot water production may create low lying smoke plumes which might impact neighbor's health and enjoyment of their property. Their use is best limited to winter heating.

The use of wood pellets for heat in stoves and inside boilers as a means to supplement fossil fuels has its own set of challenges. Pellets are delivered in the form of 40-pound plastic bags or loose when a silo is part of the boiler system. Unlike the use of a firewood system, the wood pellet system requires electricity as a means to power the auger and the blower. An uninterruptible power supply battery backup or an alternative connection to a separate battery can be used during power loss.

III. Evaluation of the amount of thermal-sector conservation, efficiency, and conversion to alternative heating fuels needed to achieve these targets

Barre Town has taken a proactive role in ensuring the facilities that it owns are evaluated and upgraded to improve thermal efficiency and/or to install more efficient heating sources. This process can help extend the life of existing facilities while maintaining high quality services. These conversions and conservation measures can also result in reduced operations costs which is beneficial to all residents. Specific examples include:

- The East Barre Fire Station has had lighting upgrades done (both interior and exterior), and the heating plant was converted from #2 heating oil to propane. The roof was replaced with an additional 1" of insulation added. Note – the added weight of adding more than 1" of insulation would have compromised the roof's structural integrity.
- The South Barre Fire Station has had lighting upgrades (interior and exterior) and building occupancy sensors installed. The heating plant has been converted from oil to propane, and the roof will be replaced in coming years. A building energy audit recommended that the outside concrete walls be weatherized/insulated. Work to be performed in 2021.
- The Town Office Building has been subject to several energy upgrades in the past. Weatherization and insulation of the front part (the oldest part) of the building has been completed, and an insulation project is under consideration for the new part of the building. Changes to the heating plant are also under consideration for the future. Some of the exterior lights have been converted to LED's. Circulator pumps, fin tube radiation valves, and the sprinkler air compressor pump will also be replaced soon.
- The Emergency Medical Service building has updated lights and the heating and hot water system is propane. An energy audit performed in 2018 has recommended insulating and air sealing the attic. Presently scheduled for 2020.
- The Department of Public Works (DPW) maintenance facility's roof was recently replaced and insulation added.
- DPW's truck garage is scheduled for window replacement in 2022.
- Barre Town Elementary School (BTMES) – The school has undertaken a series of energy saving and conservation efforts over the past few years as part of an ongoing program to make the school more energy efficient and to reduce the cost of operating the school's facilities:

The school's heat and hot water is supplied by a wood chip fueled boiler during the winter months. The chip plant's control panel was recently upgraded to Variable Frequency Drive programming which allows the circulator pumps to operate on a demand basis. Sections of the roofing membranes have been replaced resulting in a significant reduction in heat loss, as well as preventing water leakage into the building. Lighting throughout the school is systematically being replaced with LED lights and appropriate fixtures. And exterior lights were replaced with LED lighting. HVAC units replaced with more efficient units. Exterior windows and doors were replaced. Finally, the dishwasher in the kitchen was replaced with a more energy efficient one.

BTMES receives electricity credits from the solar project located on Town owned property in Websterville. Resulting in lower costs to operate the school as well as supporting the move to using renewables for electricity.

Going the next step and converting town owned heating systems from fossil fuel based to higher efficiency renewable energy-based systems may possibly benefit the Town of Barre. However, currently is not reasonably cost effective to make those conversions. Something to review and access in the future as the technologies evolve.

In order to address thermal sector conversions, Table Eight notes the number of new efficient wood heat systems and heat pumps needed in each target year to achieve the state's comprehensive energy goals. These include both residential and commercial heating systems.

TABLE EIGHT THERMAL SECTOR CONVERSIONS (RESIDENTIAL & COMMERCIAL)			
SYSTEM TYPE	2025	2035	2050
New Efficient Wood Heat Systems	6	36	76
New Heat Pumps	320	818	1,555

Notes:

1. Information derived from VEIC LEAP Modeling
2. Heat pumps includes both space heating and hot water heating.

IV. Evaluation of transportation system changes and land use strategies needed to achieve these targets

As noted previously, energy for transportation is one of the major components of non-renewable energy use. Providing readily available, convenient, and accessible alternatives to single occupancy vehicles is one way to reduce these costs. Another way to reduce fossil fuel usage is to convert from strictly fossil based vehicles to either hybrids (using both gasoline and electric) to alternative fuel driven such as biodiesel, hydrogen, or electric vehicles. The information in this section will discuss the various options related to transportation and land uses. The downside to being a very rural state with jobs located in distant towns is that reducing vehicle miles traveled and occupancy rates in vehicles is problematic. Behavior change within the community will ultimately happen once there are practical alternatives through land use and company cultures. Support of communication reliability will also reduce transportation use by creating a community that can work from satellite locations and attract companies that rely on wireless connectivity.

Technology

Barre Town has and will continue to bring awareness to the practical opportunities in future development when it presents itself. The use of hybrid, plug-in, hydrogen, and biodiesel as alternative fuels to reduce the fossil fuel demand are explored during the purchasing process. As the range and power of these alternative fueled vehicles increases, the economics will work in favor of investing in the municipal fleet, perhaps even heavy-duty vehicles. Barre Town is challenged with having steep inclines and rural demands that will add to demands of an alternative fueled vehicle. The addition of charging stations will attract owners of alternative vehicles. However, the efficiency of batteries during frigid, cold winter months is drastically reduced. Also, seasonal dilemma's (mud season) on rural back roads are limiting factors when relying on such power.

Another technology not typically associated with transportation efficiency is the support of increased communications in the village centers and industrial park areas. The support of communication towers, repeaters, and boosters in these targeted areas of Barre Town will reduce commuter travel and create a stronger commercial economy. A reliable and strong connection will support residents in search of a telework-friendly home and will attract companies that rely on wireless connections for day-to-day activities.

Bicycles

Dramatic urbanization increases the need for compact transportation. Cities can plan or implement massive expansions of public transportation and of communal bicycle schemes and other efforts to make more people go by bike. The rural and hilly terrain of the Town has inspired more recreational use than demand use transportation.

The commuter rider desires the most direct route with few interruptions, whereas the recreational rider is riding for pleasure and a specific route has less importance.

The Town of Barre has constructed and continues to expand upon its bike paths. Although we coin the route as "bike paths" they are enjoyed as much by pedestrians. As the Town continues their expansions of these routes the Town should consider opening their use to a broader audience of compact commuters.

The planning and design of compact routes, whether they are improvements to existing highways, provisions including in new highways, or separate exclusive routes need to accommodate a broader range of commuters.

Several targets might include:

- Designating certain roadways as principal routes can be effective in discouraging compact traffic on otherwise hazardous roadways. The principal alternate routes must be generally hazard free in order to encourage the more serious rider to take the a less direct route.
- Some routes are physically separated from the highway and can be either within the highway right-of-way or within a separate right-of-way. If paths are less than 5 feet from highways, physical barriers such as fences or guardrail should be considered in order to divide the two distinct facilities.
- Most of the highways used by bicyclists do not have enough shoulder width to safely accommodate them. Highway sizing is not determined by Barre Town and limited by regulations in most cases. Most of those highways which do have wider shoulders do not have markings or signs delineating a preferred route.

The amount of road rage that occurs today in car to car incidents should be horse sense enough that education on road courtesies should be posted along roadsides which share space.

Pedestrians

Pedestrian walkways are an important and integral part of the transportation system.

- The construction of these facilities should be considered for the safety and convenience of pedestrian and vehicular traffic.
- These byways should be provided for in those areas where the volume of traffic warrants the cost and utilization of land for them.

Sidewalks are the most formal means of delineating walkways to separate pedestrian and vehicular traffic. They are generally needed in areas of moderate to high density development. These facilities are found in a wide variety of types as to width and surface materials and should be designed in accordance with acceptable standards to satisfy traffic volumes.

- Sidewalk improvements should be planned at the same time that road improvements or other construction projects are planned.

Footpaths are informal pedestrian walkways which may be utilized to move traffic between points or as nature trails and other recreational purposes. These paths generally have specific uses and are not necessarily associated with the need to separate pedestrian and vehicular traffic. Easements should be acquired or dedicated and maintained for the public use of these footpaths.

Shared use paths serve as part of a transportation circulation system and support multiple recreation opportunities, such as walking, bicycling, etc. Shared-use paths should always be designed to include pedestrians even if the primary anticipated users are bicyclists.

Public Transportation & Ride Public Transportation & Ride Shares

The State of Vermont currently operates several commuter or ride share parking lots in the area. There is one such lot located along South Barre Road (VT RT 14) in South Barre near the VT RT 63 intersection and another just west of East Barre along US RT 302. VTrans also provides ride share parking lots in the adjacent communities of Berlin, Montpelier, East Montpelier, Orange, and Williamstown. Ride share lots are a very low cost and effective way to achieve a reduction in vehicle miles traveled.

Green Mountain Transit currently operates a ride share pool and the Wheels Program for seniors. These types of programs greatly increase the mobility of Barre Town residents who are limited in their personal resources or access to family vehicles. This also reduces the demand of private vehicle use and its associated fossil fuel use.

One component of reducing fossil fuel-based energy used in the transportation sector is to convert or replace those vehicles with alternative fuel options such as hybrid (fossil fuel/electric), electric or biodiesel or emerging technologies such as hydrogen fuel. Table Nine identifies the targets for Barre Town to reduce its transportation energy consumption to a point that will help meet the state's comprehensive energy planning goals. Again, this information assumes efficiency and improved technologies will be included in the development of vehicular fuel technology.

TABLE NINE			
TRANSPORTATION FUEL SWITCHING TARGETS			
FUEL TYPE	2025	2035	2050
Electric Vehicles	510	3,522	7,031
Biodiesel Vehicles	889	1,647	2,671

Notes:

1. Information derived from VEIC LEAP Modeling (information is suspect because Barre Town's current vehicle inventory is 5,934 and the overall increase just in alternative fuel vehicles alone makes up a 61% increase in vehicles. Barre Town's population is not expected to grow at a pace to support these numbers).

Land Use

Early development of Barre Town occurred in village areas surrounding employment centers. These villages eventually developed their own names and post offices within the Town - Graniteville, Websterville, South Barre and East Barre. Within them are examples of early quarry workers homes, usually similarly constructed, such as on the east side along Cogswell Street in Upper Graniteville. Another popular house style is the Sears Roebuck and Montgomery Ward early version of pre-fabricated houses (available with plumbing and electrical if one chose to purchase the whole package) such as the house at 54 Brook Street in Websterville. The South Barre village has notable large wood framed houses thought to be custom built - one at the corner of Seager Lane and South Barre Road (VT RT 14) dating to 1803 and two side by side on the west side of VT RT 14 at 397 and 411 South Barre Road, one of which local lore relates was a safe haven offered as part of the Underground Railroad which moved African American people to safety in the north.

Also, a part of village history is the traditional churches such as the East Barre Congregational Church and First Presbyterian Church in Graniteville. Traditional construction also remains for several grocery stores such as 34 Church Hill Road in upper Websterville, now the Millstone Hill Touring Center. Scattered throughout the town are barns that remain though the “farming” may have stopped some years ago – examples are the Swift barn on Swift Road, the Usle “Strawberry Grove” barn at 109 West Cobble Hill Road, and the Paquet Farm at 179 Morrison Road established in 1909 in the South Barre area.

The Barre Town Plan discusses the need to establish compact development patterns like these historic villages. This is noted for multiple reasons including minimizing the costs of infrastructure, creating opportunities for walkable communities, and increasing the population density needed for public transit. This village concept establishes a land use pattern that is still viable and desirable today and is supported by the Town Plan’s goals.

V. Evaluate electric-sector conservation and efficiency needed to achieve these targets

Conservation and efficiency of electricity is a key component to achieving the state's comprehensive energy planning goals. Over time, advancements in technology will provide a degree of the needed efficiency and conservation measures to achieve these goals, but also, efforts can be taken now to ensure that Barre Town is on track to meet our conservation and efficiency targets. Table Ten outlines the electric efficiency improvements needed for each of the three target years. Additionally, information related to more proactiveways to achieve these efficiencies are also noted below.

TABLE TEN			
TARGETS FOR ELECTRIC EFFICIENCY IMPROVEMENTS			
SECTOR TYPE	2025	2035	2050
Electric Efficiency	1.50%	7.30%	15.20%

Notes:

1. Information derived from VEIC LEAP Modeling

Energy Conservation

The greatest impact on reducing dependence on fossil fuels, both domestic and foreign, is to decrease the overall demand for energy through conservation. Conservation also produces the most economic gain because it represents money not spent for energy. Basic conservation efforts involve little or no monetary investment, but most likely will involve changes in both culture behavior and lifestyle. Additional efforts require an investment in reducing the energy requirements of buildings.

While the Town of Barre cannot require energy conservation by citizens of the Town, the Town can certainly actively promote energy conservation measures. This can be achieved through zoning bylaws (as recommendations), encouragement and listing resources in the Town Newsletter, and on the Town website. The Town is also leading by example in making Town owned buildings more efficient. These improvements are highlighted on the Town website and in the newsletter. Barre Town actively reviews and participates in planning workshops and meetings to understand additional opportunities for efficiency support to include consideration in adopting stretch codes, financing resources, and planning manuals for residents.

Transportation

While public transportation; buses and trains provide minimal opportunity in Barre Town for energy conservation, better utilization of commuter ride share parking lots would help residents reduce the use of private motor vehicles. Many of these lots could be expanded in size in the future as demand grows. There is also the option of adding additional lots or utilizing existing business lots that have lower traffic volume. Note that any of these changes would be done at the discretion of VTTrans and are not town driven outcomes. Although, we would be supportive of them.

A roundabout has been constructed in East Barre at the Intersection of Route 302 and 110 and use of roundabouts is encouraged to reduce stop and go traffic and reduce accidents and improve safety.

Another option for setting up a carpool can be found at www.connectingcommuters.org, which helps those seeking carpooling opportunities find car or van pooling partners. For carpool matching, van pools, and bus routes please call 800-685-7433 or visit their website.

Within the Town, development of multiple charging station locations will encourage the conversion from fossil fuel vehicles to plug-in hybrid and full electric alternatives. Businesses will be encouraged to make their electric vehicle charging stations available to the public.

Businesses are encouraged to utilize rail transport when available. The Town's Wilson Industrial Park (WIP) and areas of Quarry Hill, Websterville, and Graniteville have rail service connecting to Montpelier via the New England Central Railroad.

Street Lighting

Barre Town completed a public streetlight survey in 2012 of all lights that the Town pays for. It was a great opportunity to survey the lights in use and to make recommendations for additions or deletions to the streetlight inventory. The goal was to replace existing streetlights which were generally either mercury vapor, or high-pressure sodium, with LED lights. The changeover was conducted in cooperation with Green Mountain Power. Expected savings are around \$10,000 per year for the Town. In all, there were 86 existing lights removed and 24 added for a net loss of 62.

Renewable Energy

As noted previously in Section II, renewable energy development throughout the state is necessary to meet the Vermont's renewable energy goals. This puts the source of generation closer to where it is needed. Table Eleven identifies the current renewable energy generation in Barre Town.

TABLE ELEVEN		
EXISTING RENEWABLE ENERGY GENERATION		
RESOURCE TYPE	MEGAWATTS	MEGAWATT HOURS
Solar ¹	4.02	8,803.80
Wind	0.1	219
Hydroelectric	0	0
Biomass	0	0
GMP/WEC	TBD	TBD
Other		
Total Existing Renewable Energy Generation	4.12	9,022.80

Notes :

1. Information provided by the Department of Public Service.
2. Due to rounding, totals may not be accurate.

¹ Information based on known commercial solar that has been constructed in Barre Town as of the end of 2019

Siting

An analysis of existing land and renewable resource potential will help determine the amount of local renewable energy that could be developed within Barre Town. Table Twelve identifies the amount of renewable energy generation (in megawatt hours) that Barre Town would need to generate by 2050 to help meet our share of the Region's total renewable energy generation. This is the same information that is included in Table Seven.

TABLE TWELVE			
TARGETS FOR RENEWABLE ENERGY GENERATION			
SECTOR TYPE	2025	2035	2050
Total Renewable Generation Target (in megawatt hours)	12,749	20,398	50,995

Notes :

1. Information provided by the Department of Public Service.

These totals may be reduced by taking advantage of utility renewables.

To provide a comparison, the information in Table Thirteen includes an analysis of the renewable energy generation potential and will be complemented by information and maps that are in **Appendix B** of the plan. Table Thirteen notes the amount of generation that could occur if all the areas identified as prime or secondary resources were developed with renewable energy, specifically for solar and wind. By comparing the two tables, it becomes clear that there is adequate land area available for Barre Town to accommodate renewable energy generation that can meet their share of the region's renewable energy allocation.

Vermont's 2016 Comprehensive Energy Plan ("CEP") serves as the electrical energy plan in Vermont. The CEP recognizes that battery storage has an important role as the state integrates more renewable resources into the electrical grid. Page 229 of the CEP states that "energy storage is increasingly important as our reliance on intermittent resources increases," and goes on to comment on the "wide variety of purposes" it can serve, "from shaving electricity demand peaks and supporting grid voltage to providing backup power and "firming" the output of intermittent renewables." In other words, energy facilities like these are an effective tool to reduce utility costs and can facilitate the connection of distributed resources as required under Tier II of the RES (Renewable Energy Standard). To that end Barre Town has recently welcomed a 499 kW battery storage project located within Wilson Industrial park. The battery storage facility will work closely with Green Mountain Power to optimize the use of the storage system to stack a number of different value streams. Its operational flexibility has the potential to help Vermont achieve several policy mandates, including expansion of renewable generation, addressing climate change risks, and modernizing an aging electrical grid.

Notes :

1. Information gathered from Public Service Board Case # (18-1658-PET).

TABLE THIRTEEN POTENTIAL RENEWABLE ENERGY GENERATION		
RESOURCE TYPE	MEGAWATTS	MEGAWATT HOURS
Rooftop Solar	3.79	4,644
Ground-mounted Solar	1,019.98	1,250,902
Wind	652.58	2,000,810
Hydroelectric	0	0
Biomass & Methane ¹	0	0
Battery Storage (unsure how to capture currently)		
Other	0	0
Total Potential Regional Renewable Energy Generation	1,676.35	3,256,356

Notes: 1. Information calculated by the CVRPC based on data provided by the Vermont Center for Geographic Information and efficiency factors provided by the Department of Public Service.

1. Biomass and methane are not restricted by resource locations and should be sited accordingly to provide maximum benefit to the greatest number of end users or to meet municipal needs. Siting will be more dependent on local regulatory controls and should be planned for accordingly.

One final factor to consider is efficiency of renewable resources and their ability to generate energy. These efficiency factors will allow Barre Town to utilize whatever renewable resource is most appropriate for the specific circumstances. Table Fourteen notes the efficiency factors for common types of renewable energy generation.

TABLE FOURTEEN RENEWABLE GENERATION OUTPUTS & CAPACITY FACTORS		
RESOURCE TYPE	CAPACITY FACTOR	ANNUAL MEGAWATT HOUR OUTPUT PER INSTALLED MEGAWATT
Solar	14% - 16%	1,300
Small Wind	20% - 25%	2,000
Utility Scale Wind	25% - 35%	2,600
Methane	60% - 90%	6,600
Biomass	60% - 80%	6,100
Small Hydroelectric	40% - 60%	4,400

Notes:

1. Information provided by the Vermont Department of Public Service.

Conclusion

As noted throughout this section, Barre Town face challenges similar to the rest of the state regarding its energy future including the need for conservation, renewable energy generation, development, and changing habits and attitudes towards renewable technology and land use choices. All of these components need to work together in order to ensure a collective and comprehensive approach to energy planning is initiated.

The State Comprehensive Energy Plan has set a goal of 90% renewable energy by the year 2050. This goal is achievable if all stakeholders including the state, the region, the municipalities, the energy developers, the private land owners, the special interest groups, and the interested citizens come together to discuss the issues and work collectively to identify the outcomes that to the best of its ability satisfy the Town's targets.

This plan primarily explores renewable energy related to the production of electricity and electrification of the grid. In addition to the resources noted herein, it's important to consider other forms or technologies that could contribute to our renewable energy future. With advancements in safety, efficiency, and technology, the Region's energy future could look vastly different in the next five or ten years. This will not only impact the generation of energy, but the delivery and infrastructure to support distribution of energy.

PATHWAYS & IMPLEMENTATION ACTIONS

The following goals and implementation actions outline the specific pathways for Barre Town to consider in order to effectively support the State of Vermont's goals that are outlined in the 2016 Comprehensive Energy Plan. These goals are intended to cover a variety of pathways that address land use and siting of developments (including renewable energy generation); efficiency of building construction and weatherization; and fuel switching from fossil-based fuels to more sustainable and renewable options.

A. Conservation and Efficiency

Policy A-1: Increase conservation of energy by individuals and organizations.

Conservation of energy is a key component to achieving the State's goals of 90% energy derived from renewable sources by 2050. Conservation of energy in-turn will reduce the amount of energy (both renewable and non-renewable) needed to support the existing and future systems thus allowing small increases in generation to support more uses overall.

	IMPLEMENTATION ACTION	RESPONSIBILITY	PRIORITY/ TIMELINE	COST ²	MEASURE OF SUCCESS
1	Barre Town will encourage homeowners and businesses to replace or upgrade current outside lights with LED's or current technology.	Municipality	Medium 3 to 5 years	TBD	Increase in energy efficiency by homeowners and businesses
2	New construction of homes and businesses should utilize energy efficient lighting.	Municipality	Medium 3 to 5 years	TBD	Update local codes to require efficient lighting be utilized in new construction
3	Work with regional partners to identify programs or funding that supports efficiency and conservation initiatives and provide information to residents.	Municipality regional partners	High 1 to 3 years	TBD	Information distributed as appropriate

2. All implementation actions will require funding to support the efforts. In some cases, these costs will be associated with other programs or activities. For the purposes of this section, the "cost" column will indicate the funding that may be needed to support the identified implementation action. Costs are To Be Determined (TBD) as implementation actions are more specifically defined.

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY/ TIMELINE	COST	MEASURE OF SUCCESS
4	Create an Energy Committee comprised of Town citizens and officials to explore ways to make homes and businesses more efficient in the use of energy.	Municipality	High 1 to 3 years	TBD	Local Energy Committee formed

Policy A-2: Promote energy efficiency in the design and construction of buildings.

Energy efficient building designs provide benefits to the owners and occupants by reducing the amount of energy needed to heat, cool, and maintain the mechanical systems within the building. Establishing and promoting energy efficiency in design and construction will ensure new buildings and building practices will be more efficient into the future.

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY/ TIMELINE	COST	MEASURE OF SUCCESS
1	Continue to inform the public through zoning of State Residential Energy Standards and the requirement that new construction meet those standards.	Municipality	High On-going	TBD	Information disseminated as needed
2	The Development Review Board will recommend developers (residential and commercial) to utilize energy efficient insulation, weatherization, heating, and lighting in all projects. Encourage structures to be built to take advantage of passive solar.	Municipality Development Review Board	Medium 3 to 5 years	TBD	New developments utilize energy efficient building materials
3	Encourage home and business owners to have a professional energy assessment performed by a certified home energy specialist or ENERGY STAR® contractor to determine both energy losses from the building and to have a plan developed to correct energy and heat loss deficiencies.	Municipality	High 5 to 10 years	TBD	Increase in number of assessments performed

Policy A-3: Identify ways to decrease the use of fossil fuels for eating.

Establishing alternative sources of renewable fuels for heating or conversions to heating. This will promote a more sustainable thermal energy future.

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY/ TIMELINE	COST	MEASURE OF SUCCESS
1	Identify funding programs or partners that can assist with conversion of heating sources utilizing renewable based systems for homes and businesses.	Municipality, CVRPC, regional partners, state agencies	High 1 to 3 years	TBD	List of funding sources established & maintained
2	Identify technologies such as cold climate heat pumps, district heating, wood stoves or boilers that would be suitable for home and business conversions and educate users on their advantages.	Municipality, CVRPC, industry experts	High 1 to 3 years	TBD	Information sessions conducted bi- annually
3	Identify potential locations throughout the community that could benefit from district heating projects based on building density, proximity to resources such as biomass, or status as a use by right where applicable.	Municipality	Low	TBD	Locations identified and mapped

3. District heating is a system for distributing heat generated in a centralized location for two or more homes and/or buildings' heating requirements.

Policy A-4: Demonstrated municipal leadership regarding efficiency of municipal buildings.

Leading by example is the most effective way to show the municipality is committed to implementing the actions that will support a renewable energy future. Municipalities typically own multiple buildings that can benefit from energy efficiency measures. This could include replacing appliances in the Town Hall, adding solar panels to the town garage, or replacing outdated oil burning heating systems for high efficiency heat pumps.

IMPLEMENTATION ACTION	RESPONSIBILITY	PRIORITY/TIMELINE	COST	MEASURE OF SUCCESS
1 Barre Town will continue to evaluate and upgrade municipal buildings to ensure energy efficient practices are being utilized.	Municipality	High 1 to 5 years	TBD	Municipal buildings are upgraded regarding energy efficiency and weatherization
2 Identify municipal buildings or properties that could support renewable energy development to serve municipal facilities.	Municipality	High 1 to 3 years	TBD	Renewable energy projects installed as appropriate
3 Develop protocols for life-cycle analyses of municipal buildings and facilities to ensure costs for upgrades and improvements are planned.	Municipality	High On-going	TBD	System developed to evaluate buildings and facilities

B. Reducing Transportation Energy Demand, Single-Occupancy Vehicle Use, and Encouraging Renewable or Lower-Emission Energy Sources for Transportation

The State of Vermont currently operates several commuter or ride share parking lots in the area. There is one such lot located along South Barre Road (VT RT 14) in South Barre near VT RT 63 and another just west of East Barre along US RT 302. VTTrans also provides ride share parking lots in the adjacent communities of Berlin, Montpelier, East Montpelier, Orange, and Williamstown. This leads to a reduction in vehicle miles traveled.

Green Mountain Transit (GMT) currently operates a ride share pool and the Wheels Program for seniors. These types of programs greatly increase the mobility of Barre Town residents who are limited in their personal resources or access to family vehicles. This also reduces the demand of private vehicle use and its associated fossil fuel use.

Policy B-1: Encourage increased use of transit.

Public transit offers communities the ability to move multiple persons utilizing existing roadway or railway infrastructure. Convenient, reliable and efficient public transit provides an alternative mode for individuals that might otherwise choose to drive alone. Public transit has the ability to reduce the need for parking, provide more walkability in communities, and reduce congestion on local roads. However, to achieve maximum results they must use sound management practices to ensure the most effective use of the service provided. An example of this would be to utilize vans instead of buses on low volume passenger routes to receive better fuel consumption.

	IMPLEMENTATION ACTION	RESPONSIBILITY	PRIORITY/ TIMELINE	COST	MEASURE OF SUCCESS
1	Barre Town will work with GMT to continue its services and if possible, expand them in the future if demand warrants and funds becomes available. One such beneficial expansion to consider would be expanding bus service into South Barre.	Municipality, GMT, VTrans, CVRPC	Medium On-going	TBD	Public transit routes are expanded
2	Work with large employers to identify if public transit could be more effectively scheduled to provide service to these locations.	Municipality, business community, GMT, VTrans	Medium 3 to 5 years	TBD	Transit routes evaluated for proximity to large employers
3	Identify under-served populations to ensure transit options are available or will become available.	Municipality, GMT, VTrans, CVRPC, transportation providers	High On-going	TBD	Populations identified and transit services planned as identified by the Energy Committee

Policy B-2: Promote the shift away from single-occupancy vehicle trips.

Due to the rural and suburban nature of Barre Town, single-occupancy vehicle trips are a common occurrence. While many people rely on their vehicle to perform general day-to-day tasks, reducing the rate of these trips can improve congestion on local roads; reduce conflicts with vehicles and pedestrians; and provide more support for ride shares, public transit, or similar multi-occupancy trips.

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY/ TIMELINE	COST	MEASURE OF SUCCESS
1	Encourage developers to incorporate pedestrian and bike paths and park and ride facilities where applicable within or in proximity to new developments.	Municipality	Medium On-going	TBD	Municipal regulations updated to require bicycle and pedestrian infrastructure
2	Work with transit providers to identify possible future park & ride locations that will support areas with current or future development density.	Municipality, GMT, VTrans, CVRPC	Medium On-going	TBD	Potential park & ride locations identified
3	Work with utility companies to inventory and map infrastructure such as fiber optic cable to identify gaps that may prohibit information accessibility or telecommuting options.	Municipality, utility providers	High On-going	TBD	Identify gaps and prioritize needs
4	Conduct regular inventories of park & ride facilities to ensure adequate space exists to accommodate users.	Municipality, VTrans, CVRPC, GMT	Medium On-going	TBD	Inventories conducted and facilities evaluated
5	Pursue grant funding that can support any of the above noted Activities	Municipality	High On-going	TBD	Grants applied for or funds secured

Policy B-3: Promote the shift away from gas/diesel vehicles to electric or non-fossil fuel transportation options.

Reducing the dependency on fossil fuels and other non-renewable fuels is a key pathway to achieving the state's energy planning goals. Switching to renewable fuel-based vehicles will help reduce greenhouse gas emissions and promote cleaner fuel alternatives.

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY/ TIMELINE	COST	MEASURE OF SUCCESS
1	Identify businesses in the municipality that operate large fleets of vehicles to provide assistance evaluating the possibility of integrating electric or non-fossil fuel-based vehicles into their fleets.	Municipality, business community	Medium 3 to 5 years	<i>TBD</i>	Businesses inventoried and contacts established
2	Inventory existing locations of electric vehicle charging stations to identify where infrastructure gaps may exist or where needs could be met to provide greater access for electric vehicle owners	Municipality, Drive Electric Vermont	Medium Out-going	<i>TBD</i>	Inventory of locations mapped to identify potential gaps
3	Update municipal regulations to encourage new non-residential developments to include or provide accommodations for electric vehicle charging stations within the development.	Municipality	Medium 3 to 5 years	<i>TBD</i>	Regulations updated

Policy B-4: Facilitate the development of walking and biking (shared use)

Walking and biking provide valuable alternatives to motorized vehicle travel. Develop and ensure a safe, efficient, and convenient infrastructure exists to promote walking and biking. It is essential to the future growth and sustainability of Barre Town.

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY TIMELINE	COST	MEASURE OF SUCCESS
1	Identify roads that would be conducive to bike travel that also fit into a master plan of creating interconnected bike routes.	Municipality	High 1 to 3 years	TBD	Roads identified
2	New bike paths should be planned with consideration for additional width, signing, and striping in order to facilitate sharing of the facility with bicycles, pedestrians, and joggers.	Municipality, VTrans	Medium 3 to 5 years	TBD	Planned paths accommodate multiple user groups
3	Parking areas for vehicles should be conveniently located along bike routes to accommodate both the recreational rider and the commuter; this is an important consideration given the steep grades which separate much of the Town as well as separating the Town from neighboring communities.	Municipality, VTrans	Medium On-going	TBD	Specific locations identified and prioritized
4	Specific consideration should be given to a parking area at the bottom of Richardson Road or one in the Cobble Hill area for scenic rural trips via bicycle.	Municipality	Medium 3 to 5 years	TBD	Sidewalks widened where appropriate
5	Pedestrian needs, including wider, raised sidewalks, should be incorporated into the reconstruction or relation of existing highways.	Municipality, VTrans	Medium On-going	TBD	Pedestrian facilities are incorporated into roadway projects
6	Conduct an analysis of pedestrian needs to identify which roadways should be prioritized to accommodate pedestrian facilities.	Municipality, VTrans	Medium On-going	TBD	Roadway analysis conducted

Policy B-5: Demonstrated municipal leadership with respect to efficiency of municipal transportation.

Leading by example is the most effective way for a municipality to convince its residents and business owners to comply with regulations or actions that may seem onerous or costly. Barre Town's actions can serve as an example to the community of their commitment to reducing energy demand.

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY/ TIMELINE	COST	MEASURE OF SUCCESS
1	Promote the use of energy efficient streetlights in the community.	Municipality	High Out-going	TBD	Streetlights are replaced as needed
2	Purchase the most energy efficient or alternative powered municipal vehicles that will, at the same time, perform the necessary functions of the department.	Municipality	High On-going	TBD	Municipal vehicles purchased as needed

C. Patterns and Densities of Land Use Likely to Result in Conservation of Energy

Policy C-1: Land use policies that demonstrate a commitment to reducing sprawl and minimizing low-density development

Land use policies that work to limit the proliferation of large lot development in favor of small lots in a compact area help communities address conditions that create sprawl, or the outward pattern of development that is characterized by auto-centric uses in an expanded geography. By limiting conditions that lead to sprawling development patterns, Barre Town has effectively supported energy independence.

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY/ TIMELINE	COST	MEASURE OF SUCCESS
1	Evaluate municipal regulations to ensure higher density development patterns are located within the very high density residential areas to maintain existing settlement patterns and do not inadvertently promote sprawling development.	Municipality	Medium On-going	TBD	Regulations are evaluated as needed and recommendations are included
2	Prioritize development and growth in areas where municipal water, sewer and roads are available.	Municipality	Medium On-going	TBD	Development areas are identified and prioritized
3	Growth should be done in ways that do not burden existing systems and cost of operating those systems on the taxpayer.	Municipality	Medium On-going	TBD	Growth patterns and areas are identified

Policy C-2: Strongly prioritize development in compact, mixed-use centers when feasible and appropriate or ways to make compact development more feasible.

Compact development patterns create opportunities whereby land uses that support where people live, work, and recreate, are all within close proximity. This not only creates a greater sense of place, but it provides opportunities to walk, bike, or utilize public transit as the primary mode of transportation. Additionally, compact development patterns can promote conservation of energy through the redevelopment of underutilized spaces therefore including more energy efficient building designs.

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY/ TIMELINE	COST	MEASURE OF SUCCESS
1	Evaluate alternative land use regulations such as form-based codes and identify communities where similar regulations have been successfully implemented to determine effectiveness of creating desired development patterns	Municipality, CVRPC	Low 5 to 10 years	TBD	Evaluations completed
2	Evaluate existing regulations and amend as necessary to support and encourage infill development, redevelopment, adaptive reuse of existing buildings such as historic structures, and reuse of "brownfield" sites	Municipality, CVRPC	Medium 3 to 5 years	TBD	Regulations evaluated and recommendations made as appropriate
3	Inventory and map existing infrastructure such as water and wastewater to evaluate capacity and development potential.	Municipality	Medium 3 to 5 years	TBD	Infrastructure mapped and updated as needed
4	Review and amend regulations as appropriate to require creative design and clustering to minimize infrastructure costs and preserve open spaces.	Municipality	Medium 3 to 5 years	TBD	Regulations updated

MAPPING

D. Development and Siting of Renewable Energy Resources

Policy D-1: Evaluate generation from existing renewable energy generation including the identification of constraints, resource areas, and existing infrastructure by energy type.

Policy D-2: Evaluate generation from potential renewable energy generation including the identification of constraints, resource areas, and existing infrastructure by energy type.

The siting and generation of renewable resources is a critical part to identifying whether or not Barre Town can meet its share of the state's renewable energy goals by 2050. Furthermore, this analysis is important to determine where resources are available throughout the community to ensure the Town of Barre is not unduly burdened with supporting more than should be reasonably anticipated. Finally, this information better positions Barre Town to evaluate the renewable energy generation options that are available to meet these goals.

The Central Vermont Regional Planning Commission created maps for Barre Town that identifies resources related to solar, wind, hydroelectric, and woody biomass. Maps were also created to identify constraints that may limit the overall area of possible resource development within the town. The following information will address the evaluation of current and future generation potential within Barre Town.

Existing Renewable Energy Generation

As noted in the Analysis and Targets section, Table Eleven identifies the existing renewable generation for Barre Town. Information on existing generation is a representation of all projects that were issued a Certificate of Public Good by the Public Service Board through the end of 2016. Projects that are currently under review are not included in these numbers therefore additional renewable energy generation may be developed that will not be noted in the total generation represented in Table Eleven.

Potential Renewable Energy Generation

Table Thirteen in the Analysis and Targets section identifies potential generation of renewable energy for Barre Town. This information is based on mapping data provided by the Vermont Center for Geographic Information (VCGI) and the Department of Public Service. This information includes specific data related to prime resource areas for solar and wind development which is an indication of where the conditions are most ideal for generation of the specific resource. Also included with this data is information regarding constraints to be considered when evaluating areas for renewable energy development. Additional detail regarding known and possible constraints is discussed below.

Constraints⁴₂

As part of this effort, the Central Vermont Regional Planning Commission has identified information for each municipality related to renewable energy generation that includes an analysis and evaluation of resource areas within each municipality and how those resource areas are impacted by statewide and regionally identified constraints. In order to determine the impacts, an understanding of the constraints needs to be discussed.

4. Appendix A provides specific definitions for the known and possible constraints

For the purpose of this plan, constraints are separated into two main categories: known and possible. Known constraints are those areas where development of a renewable resource are very limited and therefore are not likely to occur. Known constraints that have been identified include:

- Vernal Pools (confirmed or unconfirmed)
- River Corridors as identified by the Vermont Department of Environmental Conservation
- Federal Emergency Management Agency Identified Floodways
- State-significant Natural Communities and Rare, Threatened, and Endangered Species
- National Wilderness Areas
- Class 1 and Class 2 Wetlands (as noted in the Vermont State Wetlands Inventory or Advisory Layers)
- Regionally or Locally Identified Critical Resources

Similarly, the state has identified a list of possible constraints to be considered. Possible constraints identify areas where additional analysis will need to occur in order to determine if development of renewable energy resources is appropriate. In some cases, conditions may be prohibitive, but in others the conditions may be suitable for renewable energy development. The possible constraints include:

- Agricultural Soils
- Federal Emergency Management Agency Special Flood Hazard Areas
- Protected Lands (State fee lands and private conservation lands)
- Act 250 Agricultural Soil Mitigation Areas
- Deer Wintering Areas
- Vermont Agency of Natural Resources Conservation Design Highest Priority Forest Blocks
- Hydric Soils
- Regionally or Locally Identified Resources

In addition to the items listed above, the Regional Planning Commission, through its Regional Energy Committee, has identified additional constraints to be included for all the municipalities that were noted as being regionally significant. For the purposes of this mapping exercise, all of the regional constraints are considered possible constraints. This is due to the fact that the Regional Energy Committee determined that, like the statewide possible constraints, conditions could be such that developing renewable energy resources in these locations could occur but should be studied further at the municipal level to determine if the specific conditions regarding these locations are suitable. The possible regional constraints that were identified include:

- Elevations above 2,500 feet
- Slopes greater than 25%
- Municipally Owned Lands
- Lakeshore Protection Buffer Areas of 250 feet

Methodology

With all the known and possible constraints identified, this information was overlaid on the resource's maps for solar and wind resources. Where known constraints existed the resource, areas were deleted. Where possible constraints existed, the resource areas were shaded. The resulting areas included those lands where prime resources exist without any constraints and prime resource areas with possible constraints. The total area within these two categories served as the basis to determine the amount of resource that is available for potential development within Barre Town.

As noted in Table Thirteen of the Analysis and Targets section, based on the solar, wind, and hydroelectric potential within Barre Town, approximately 3,250,000 megawatt hours of energy could be produced, well above the town's allocation of 50,995 megawatt hours by 2050 as noted in Table Twelve. The potential energy generation for Barre Town increases when other sources of renewable energy generation such as biomass, biogas, and methane are included. No specific generation numbers are listed in Table Thirteen for these types of energy generation as their siting is not specifically tied to the availability of a resource, therefore calculating a potential for generation would be difficult.

Transmission Infrastructure

In addition to identifying and calculating possible generation of renewable energy based on resources and constraints, the mapping included in this plan also incorporates the existing three phase power infrastructure throughout the municipality. This is important to include because renewable energy generation needs three phase power to provide energy generation back to the grid. Without three phase power, renewable energy generation would be limited to scales necessary to serve uses in close proximity that would not require transmission infrastructure.

Similar to limits on three phase power are potential limitations on existing transmission infrastructure and the ability to transmit energy from its point of generation to the possible users. As noted previously, the mapping includes three phase power, but it also includes information on current transmission infrastructure. This is another component to consider when identifying where specific generation types should be located to ensure the transmission capacity exists within the grid or to identify areas where upgrades may be needed before development of renewable energy generation can occur. Based on the factors noted above, it may be appropriate for mapping to identify areas where significant energy loads are currently occurring or anticipated based on future land use and zoning.

Preferred & Unsuitable Siting Locations

Barre Town recognizes the preferred locations that have been identified by the State of Vermont. Additional preferred locations may be identified after an analysis of the needs with the community have been conducted. The state preferred locations include:

- Parking lots
- Gravel pits
- Brownfield sites
- Landfills
- Rooftop installations

There are several locations throughout Barre Town that have been identified as being unsuitable for development. In general, these areas have been identified due to their significance as supporting wildlife habitat. In these locations' development may be possible, however, the specific siting, scale, and amount of land disturbance will be a critical factor to consider. These areas include as show on the attached maps:

- Class 1 and 2 wetlands
- Vernal pools
- Deer Wintering
- Identified bear habitat

Finally, the Barre Town Municipal Energy Plan supports the development of renewable energy generation technology that will not adversely impact the built or natural environment or conflict with identified policies. Due to the diverse nature of Barre Town including urban and rural areas, there was no way to develop a consistent policy that would be equitable to all areas, therefore renewable energy generation types (both current and developed through future advances in technology or innovations in the industry) may be considered for application in Barre Town.

Local Mapping

To provide a more specific visual representation of resources and constraints, mapping was developed by the Central Vermont Regional Planning Commission that includes:

- Solar Resource Areas
- Wind Resource Areas
- Hydroelectric Resource Areas
- Known Constraints
- Possible Constraints
- Woody Biomass Resource Area

These maps should be used as a starting point to determine what areas may exhibit characteristics consistent with conditions that would support renewable energy development. More detailed review and analysis should be conducted to determine specific boundaries for resource areas or constraints. These maps can be found in Appendix B.

APPENDIX A

KNOWN & POSSIBLE CONSTRAINT DEFINITIONS & DESCRIPTIONS

The following is a list of the known, possible, and regional constraints that were used and referenced in the mapping section of this document. A definition of the constraint including source of the data is provided.

Known Constraints

Vernal Pools (confirmed and unconfirmed layers) –

Source: Vermont Fish and Wildlife, 2009 - present

Vernal pools are temporary pools of water that provide habitat for distinctive plants and animals. Data was collected remotely using color infrared aerial photo interpretation. "Potential" vernal pools were mapped and available for the purpose of confirming whether vernal pool habitat was present through site visits. This layer represents both those sites which have not yet been field-visited or verified as vernal pools, and those that have.

Department of Environmental Conservation (DEC) River Corridors –

Source: DEC Watershed Management District Rivers Program, January 2015

River corridors are delineated to provide for the least erosive meandering and floodplain geometry toward which a river will evolve over time. River corridor maps guide State actions to protect, restore and maintain naturally stable meanders and riparian areas to minimize erosion hazards. Land within and immediately abutting a river corridor may be at higher risk to fluvial erosion during floods.

River corridors encompass an area around and adjacent to the present channel where fluvial erosion, channel evolution and down-valley meander migration are most likely to occur. River corridor widths are calculated to represent the narrowest band of valley bottom and riparian land necessary to accommodate the least erosive channel and floodplain geometry that would be created and maintained naturally within a given valley setting.

Federal Emergency Management Agency (FEMA) Floodways –

Source: FEMA Floodway included in Zones AE – FEMA Map Service Center

These are areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

State-significant Natural Communities and Rare, Threatened, and Endangered Species –

Source: Vermont Fish and Wildlife, National Heritage Inventory

The Vermont Fish and Wildlife Department's Natural Heritage Inventory (NHI) maintains a database of rare, threatened and endangered species and natural (plant) communities in Vermont. The Element Occurrence (EO) records that form the core of the Natural Heritage Inventory database include information on the location, status, characteristics, numbers, condition, and distribution of elements of biological diversity using established Natural Heritage Methodology developed by NatureServe and The Nature Conservancy.

An Element Occurrence (EO) is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential

continued (or historical) presence and/or regular recurrence at a given location. For species Elements, the EO often corresponds with the local population, but when appropriate may be a portion of a population or a group of nearby populations (e.g., metapopulation).

National Wilderness Areas –

Source: United States Department of Agriculture Forest Service

A parcel of Forest Service land congressionally designated as wilderness.

Class 1 and Class 2 Wetlands –

Source: Vermont Significant Wetland Inventory (VSWI) and advisory layers

The State of Vermont protects wetlands which provide significant functions and values and also protects a buffer zone directly adjacent to significant wetlands. Wetlands in Vermont are classified as Class I, II, or III based on the significance of the functions and values they provide. Class I and Class II wetlands provide significant functions and values and are protected by the Vermont Wetland Rules. Any activity within a Class I or II wetland or buffer zone which is not exempt or considered an "allowed use" under the Vermont Wetland Rules requires a permit.

Class I wetlands have been determined to be, based on their functions and values, exceptional or irreplaceable in its contribution to Vermont's natural heritage and, therefore, merits the highest level of protection. All wetlands contiguous to wetlands shown on the VSWI maps are presumed to be Class II wetlands, unless identified as Class I or III wetlands, or unless determined otherwise by the Secretary or Panel pursuant to Section 8 of the Vermont Wetland Rules.

Possible Constraints

Agricultural Soils –

Source: Natural Resources Conservation Service (NRCS)

Primary agricultural soils" are defined as "soil map units with the best combination of physical and chemical characteristics that have a potential for growing food, feed, and forage crops, have sufficient moisture and drainage, plant nutrients or responsiveness to fertilizers, few limitations for cultivation or limitations which may be easily overcome, and an average slope that does not exceed 15 percent. Present uses may be cropland, pasture, regenerating forests, forestland, or other agricultural or silvicultural uses.

The soils must be of a size and location, relative to adjoining land uses, so that those soils will be capable, following removal of any identified limitations, of supporting or contributing to an economic or commercial agricultural operation. Unless contradicted by the qualifications stated above, primary agricultural soils include important farmland soils map units with a rating of prime, statewide, or local importance as defined by the Natural Resources Conservation Service of the United States Department of Agriculture.

FEMA Special Flood Hazard Areas -

The land area covered by the floodwaters of the base flood is the Special Flood Hazard Area (SFHA) on NFIP maps. The SFHA is the area where the National Flood Insurance Program's (NFIP's) floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

Protected Lands –

Include State fee land and private conservation lands. Other state level, non-profit and regional entities also contribute to this dataset. The Vermont Protected Lands Database is based on an updated version of the original Protected Lands Coding Scheme reflecting decisions made by the Protected Lands Database Work Group to plan for a sustainable update process for this important geospatial data layer.

Act 250 Ag Mitigation Parcels –

Source: Vermont Department of Agriculture

All projects reducing the potential of primary agricultural soils on a project tract are required to provide “suitable mitigation,” either “onsite or offsite,” which is dependent on the location of the project. This constraint layer includes all parcels in the Act 250 Ag Mitigation Program as of 2006.

Deer Wintering Areas(D W A) –

Source: Vermont Department of Fish and Wildlife

Deer winter habitat is critical to the long term survival of white-tailed deer (*Odocoileus virginianus*) in Vermont. Being near the northern extreme of the white-tailed deer's range, functional winter habitats are essential to maintain stable populations of deer in many years when and where yarding conditions occur. Consequently, deer wintering areas are considered under Act 250 and other local, state, and federal regulations that require the protection of important wildlife habitats. DWAs are generally characterized by rather dense softwood (conifer) cover, such as hemlock, balsam fir, red spruce, or white pine. Occasionally DWAs are found in mixed forest with a strong softwood component or even on found west facing hardwood slopes in conjunction with softwood cover. The DWA were mapped on mylar overlays on topographic maps and based on small scale aerial photos.

Vermont Conservation Design include the following Highest Priority Forest Blocks: Connectivity, Interior, and Physical Landscape Diversity –

Source: Vermont Department of Fish and Wildlife

The lands and waters identified in this constraint are the areas of the state that are of highest priority for maintaining ecological integrity. Together, these lands comprise a connected landscape of large and intact forested habitat, healthy aquatic and riparian systems, and a full range of physical features (bedrock, soils, elevation, slope, and aspect) on which plant and animal natural communities depend.

Hydric Soils –Source: Natural Resources Conservation Service

A hydric soil is a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part. This constraint layer includes soils that have hydric named components in the map unit.

Regional Constraints

Elevations above 2500 feet –

This constraint uses USGS contours over 2500 feet.

Lake Shore Protection Buffers (250 Foot and 800 Foot in Calais Only) –

For this constraint, CVRPC selected Vermont Hydrologic Dataset lakes and ponds greater than 10 acres and then buffered those by 250 feet and use the Town of Calais Land Use Regulations for shore lands in Calais.

Slopes Greater Than 25 % –

For this constraint, CVRPC performed a slope analysis using a 10 meter Digital Elevation Model.

Municipal Lands –

For this constraint, CVRPC used the Vermont Center for Geographic Information's Protected Lands Database.

APPENDIX B

MUNICIPAL RESOURCE MAPS

This page is intentionally left blank

BARRE TOWN Known Constraints Map

Known Constraints

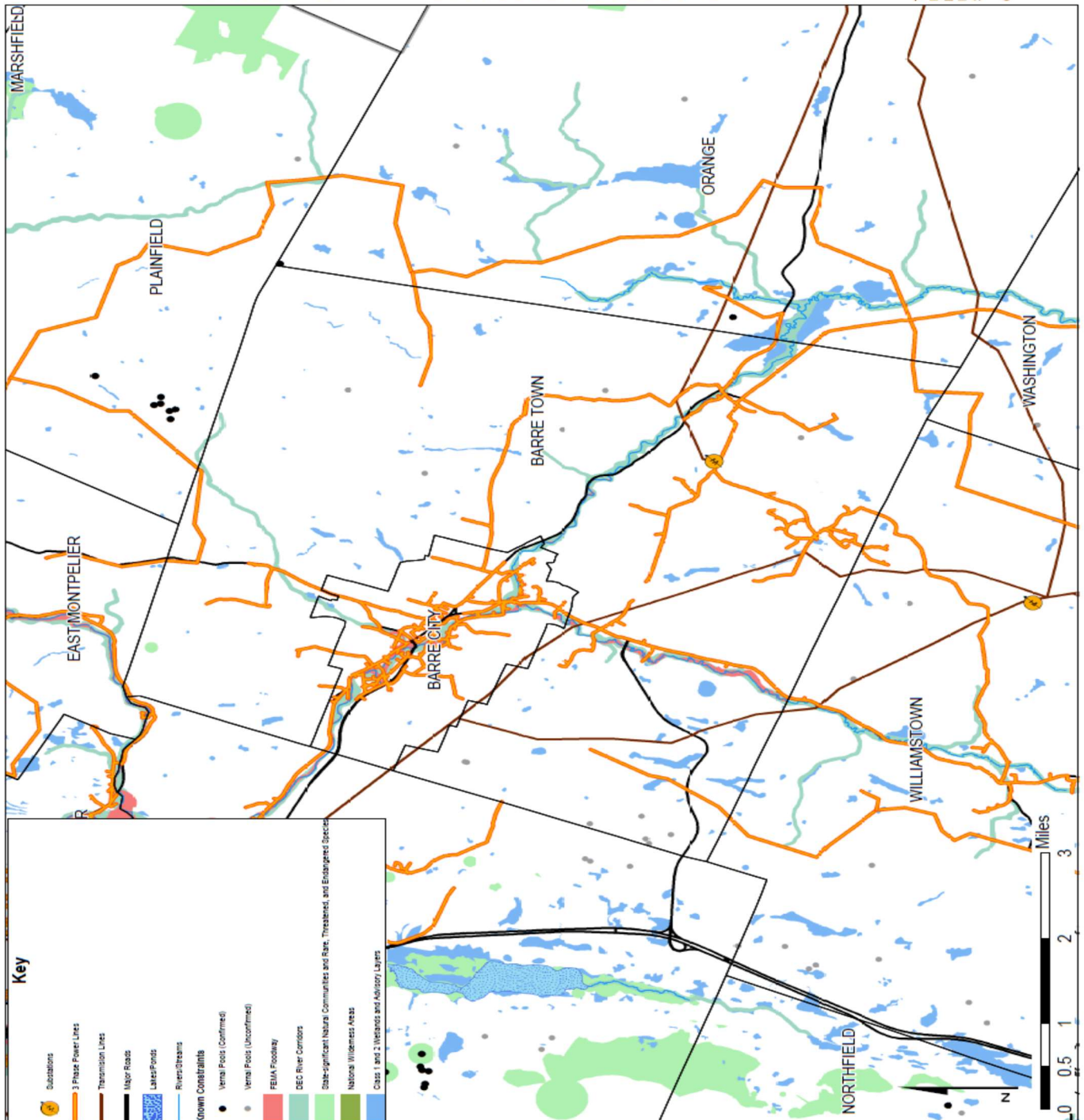
These constraints signal likely, though not absolute, unsuitability for development based on statewide or local regulation or designated critical resources.

Link to Data -
<http://vcgi.vermont.gov/opendata/act174>

Known Constraints
Vernal Pools including confirmed and unconfirmed -
Vermont Fish and Wildlife
DEC River Corridors -
DEC WSMR Rivers Program 12/15
FEMA Floodway included in Zones AE -
FEMA Map Service Center
State-significant Natural Communities and Rare, Threatened, and Endangered Species -
Vermont Fish and Wildlife, Natural Heritage Inventory
National Wilderness Areas -
USDA Forest Service
Class 1 and Class 2 Wetlands (VSWI) and Advisory Layers - VT Watershed Management Division

This map was created as part of a Regional Energy Planning Initiative being conducted by the Bennington County Regional Commission, and the Vermont Public Service Department.

Created: December 2018 by CVRPC GIS.



BARRE TOWN

Possible Constraints Map

Possible Constraints

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

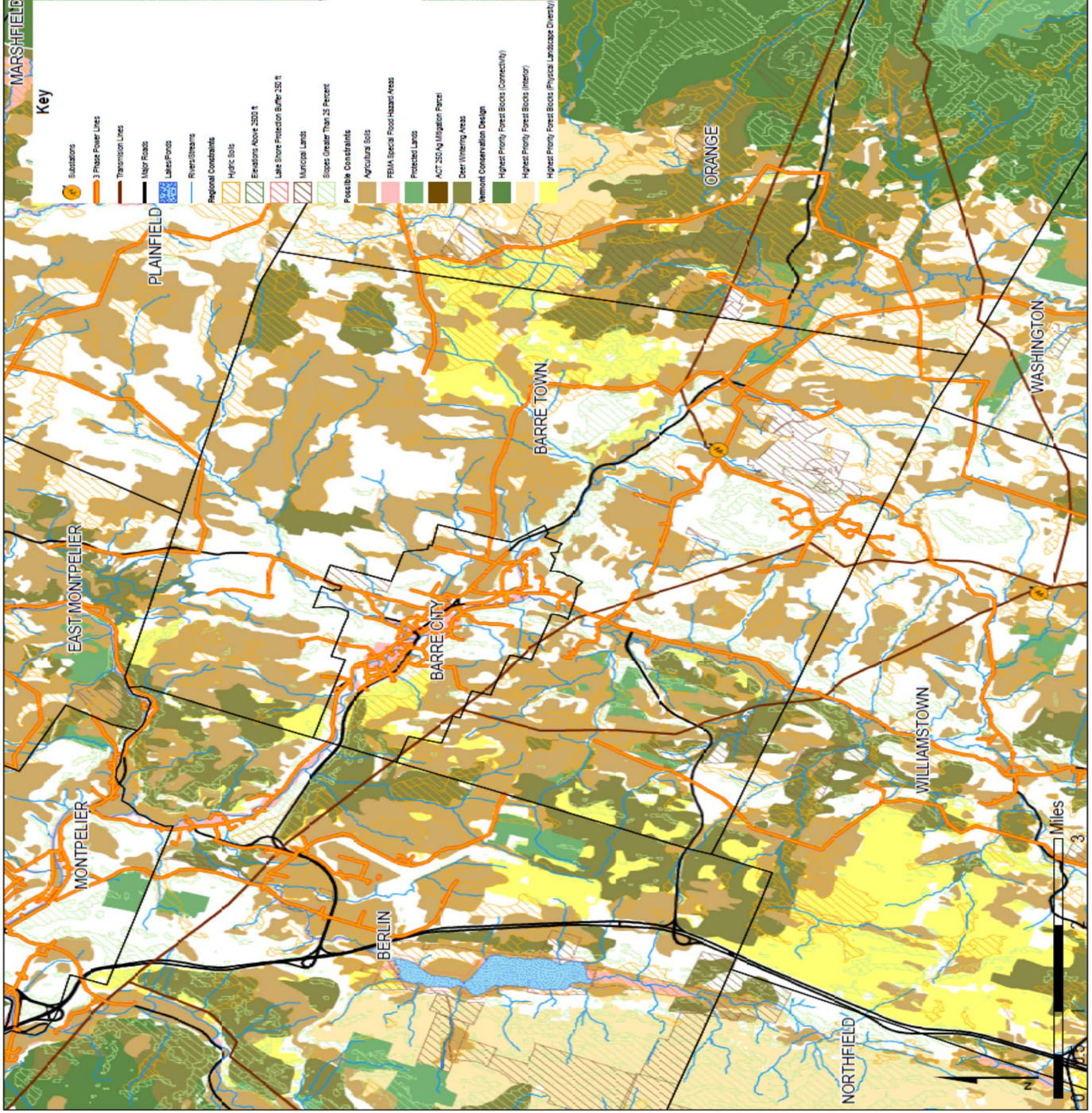
Link to Data - <http://vcgi.vermont.gov/legenddatafact174>

Possible Constraints Data Sources
Agricultural Soils include local, prime and statewide classifications - NRCS
FEMA Special Flood Hazard Areas include Zones A and AE - FEMA

Map Service Center
Protected Lands - Include State fee lands and private conservation lands - VCGL
Act 250 Ag Mitigation Parcels include parcel as of 2006 - VT Dept. of Ag
Deer Wintering Areas - VT Fish and Wildlife
Vermont Conservation Design include the following Highest Priority
Forest Blocks: Connectivity, Interior, and Physical Landscape Diversity - VT
Fish and Wildlife
Hydric Soils include soils that have hydric named components in the map unit - NRCS

This map was created as part of a Regional Energy Planning Initiative being conducted by the Bennington County Regional Commission, and the Vermont Public Service Department.

Created: December 2016 by CVRPC GIS.



Solar Resources Map



Legend

- Substations
 3 Phase Power Lines
 Distribution Lines
 Solar Potential
 Prime (No Constraint)
 (Possible Constraint)
 □ Parcels
 Roads
 Interstate
 US Highway
 Vermont State Highway
 Town Class 1-3

Known Constraints

Areas not shown on map

Vernal Pools

River Corridor

FEMA Floodways

Natural Communities & Rare

Threatened and Endangered

Series

National Wilderness Areas

Wetlands Class 1 and 2

Possible Constraints

VT Agriculturally Important Soils

FEMA Special Flood Hazard Areas

Protected Lands

Act 250 Agricultural Soil Mitigation Areas

Deer Wintering Areas

Highest Priority Forest Blocks

Hydric Soils

Elevations Above 2500Ft

Lake Shore Protection Buffer 250 Ft

Municipal Lands

Slopes Greater Than 25 Percent

Created by: CVRPC GIS 4/4/2017

N:\Region\Projects\2017\

Act174_Energy/Solar Resources 11X17
































Data is only as accurate as the original source materials.
This map is for planning purposes.

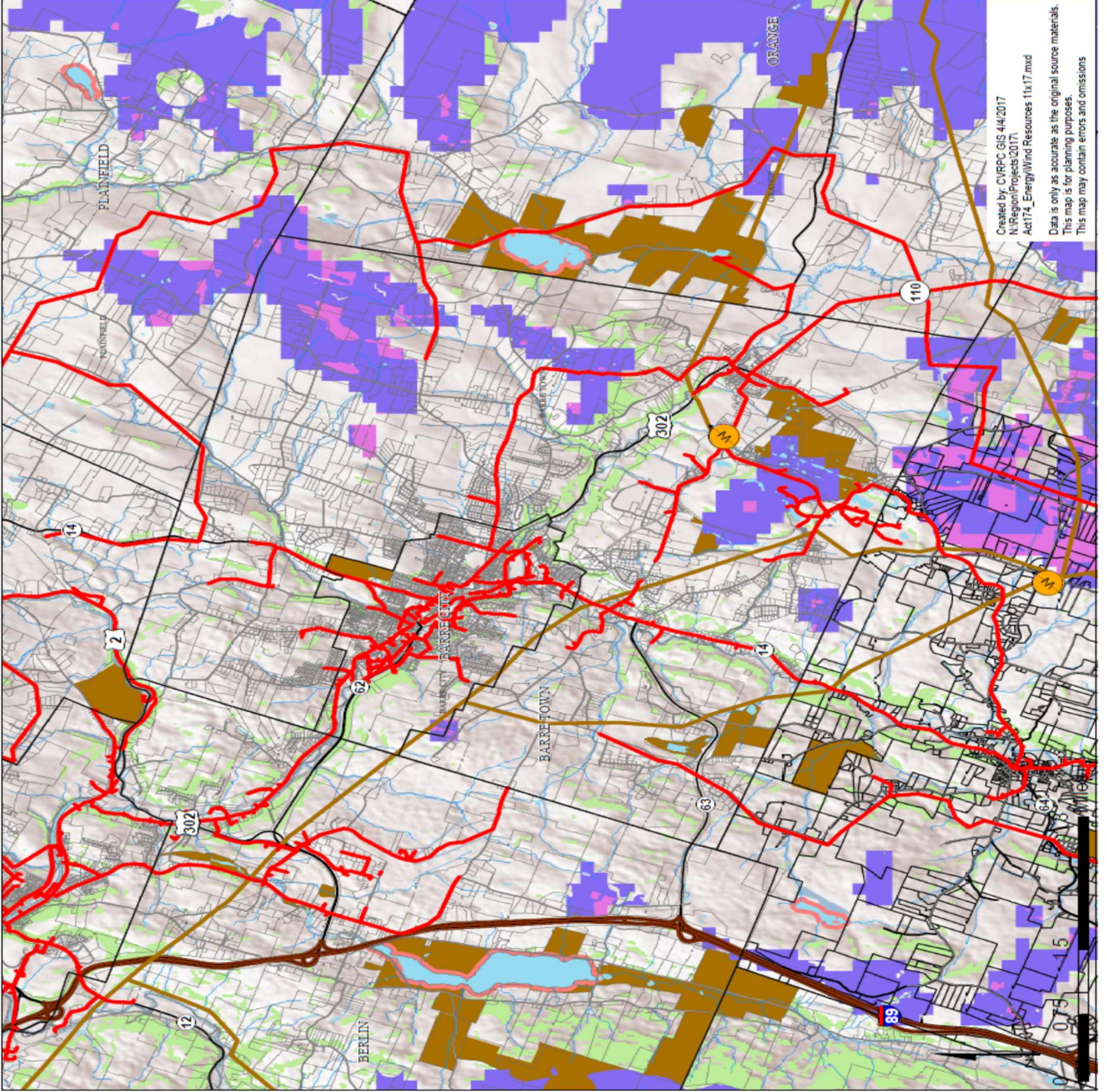
This map is for planning purposes.
This map may contain errors and omissions



BARRE TOWN Wind Resources Map

Legend

-  Substations
-  3 Phase Power Lines
-  Transmission Lines
- Wind Potential**
-  Prime Wind (No Constraint)
-  Hub Height (m)
-  Secondary Wind (Possible Constraint)
-  Hub Height (m)
-  Parcels
- Roads**
-  Interstate
-  US Highway
-  Vermont State Highway
-  Town Class 1-3
- Regional Constraints**
-  Elevations Above 2500 ft
-  Lake Shore Protection Buffer 250 ft
-  Municipal Lands
-  Slopes Greater Than 25 Percent
- Known Constraints**
-  Areas not shown on map
-  Vernal Pools
-  River Corridors
-  FEMA Floodways
-  Natural Communities & Rare Species
-  Threatened and Endangered Species
-  National Wilderness Areas
-  Wetlands Class 1 and 2
- Possible Constraints**
-  VT Agriculturally Important Soils
-  FEMA Special Flood Hazard Areas
-  Protected Lands
-  Act 250 Agricultural Soil Mitigation Areas
-  Deer Wintering Areas
-  Highest Priority Forest Blocks
-  Hydric Soils



Created by: CVRPC GIS 4/4/2017
 N:\Region\Projects\2017
 Act174_Energy\Wind Resources 11x17.mxd
 Data is only as accurate as the original source materials.
 This map is for planning purposes.
 This map may contain errors and omissions.

A map of the Barre, Vermont area. The map shows several towns: Barre City (center, outlined), Barre Town (north of Barre City), Berlin (south of Barre City), Northfield (south of Berlin), Williamstown (east of Barre Town), Orange (north of Barre Town), Washington (east of Williamstown), Plainfield (north of Barre Town), East Montpelier (west of Barre City), and Montpelier (west of East Montpelier). The map features a network of roads, with major roads shown in yellow and other roads in red. Water features, including rivers and streams, are shown in blue. A scale bar in the bottom right corner indicates distances in miles (0, 0.425, 0.85, 1.7, 2.55, 3.4). A north arrow is also present in the bottom right corner.

This map shows areas of resource potential for renewable energy generation from hydroelectric, i.e., dams that could be converted to hydroelectric facilities as well as active hydroelectric sites. Existing hydroelectric dam information was extracted from the Vermont Dam Inventory, while potential hydroelectric sites were derived from a study conducted by Community Hydro in 2007.¹ Based on estimates conducted within the report, this map categorizes dams based on their potential hydroelectric generation capacity, and the downstream hazard risk that would be involved in hydroelectric production at each site.

High hazard potential dams are those where failure or mis-operation will probably cause loss of human life. The other rankings were grouped together and their failure or mis-operation

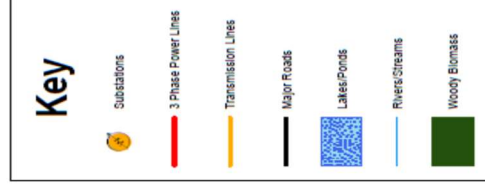
...but could cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. These dams are often located in predominately rural or agricultural areas, but could be located in areas with population and significant infrastructure.

This map was created as part of a Regional Energy Planning Initiative being conducted by the Bennington County Regional Commission, and the Vermont Public Service Department.

Created: December 2016 by CVRPC GIS.
N:\Region\Projects\2017\Act174_Energy\Hydroelectric Resources 11x17.mxd



BARRE TOWN Woody Biomass Resources Map

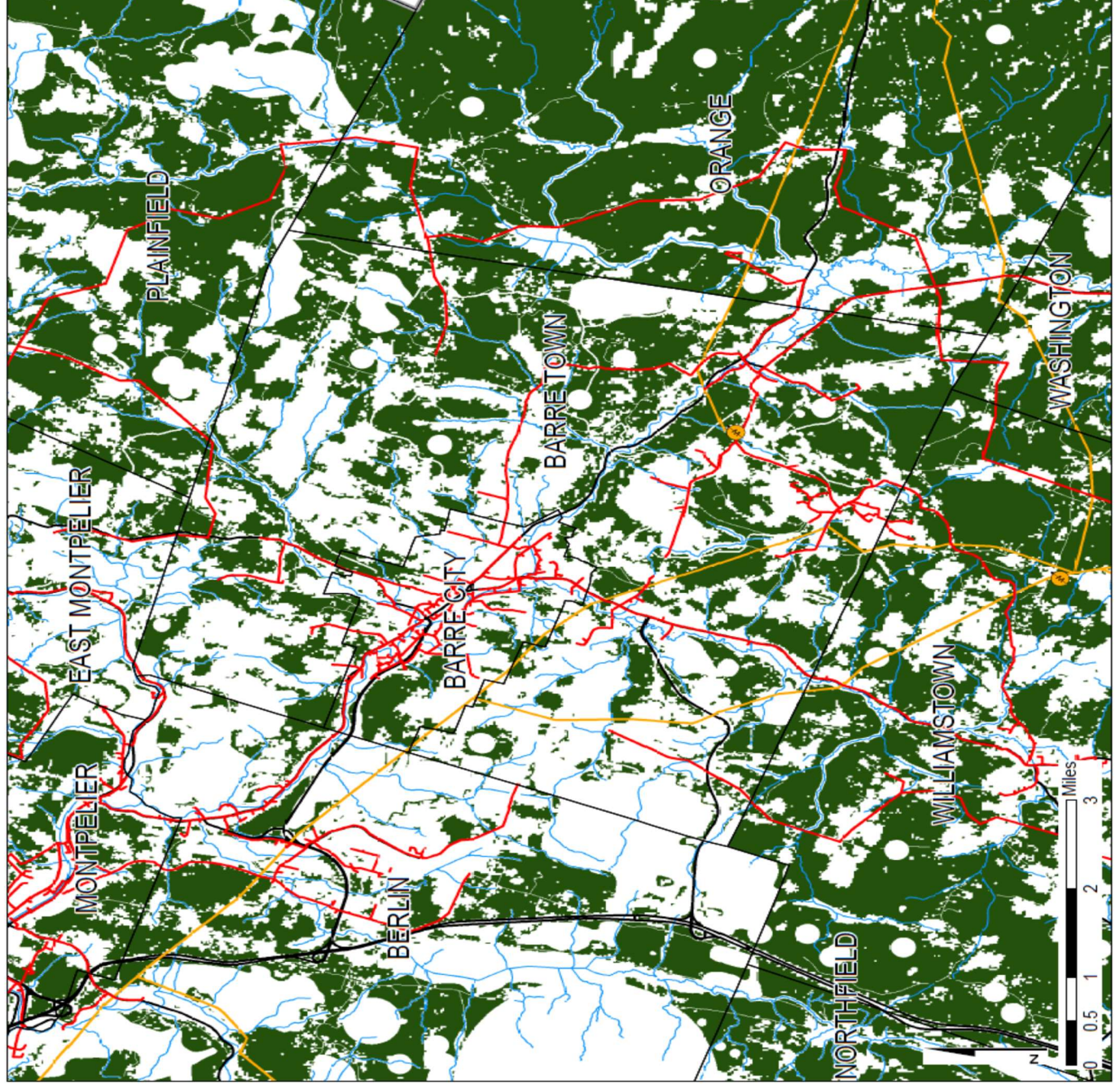


Methodology

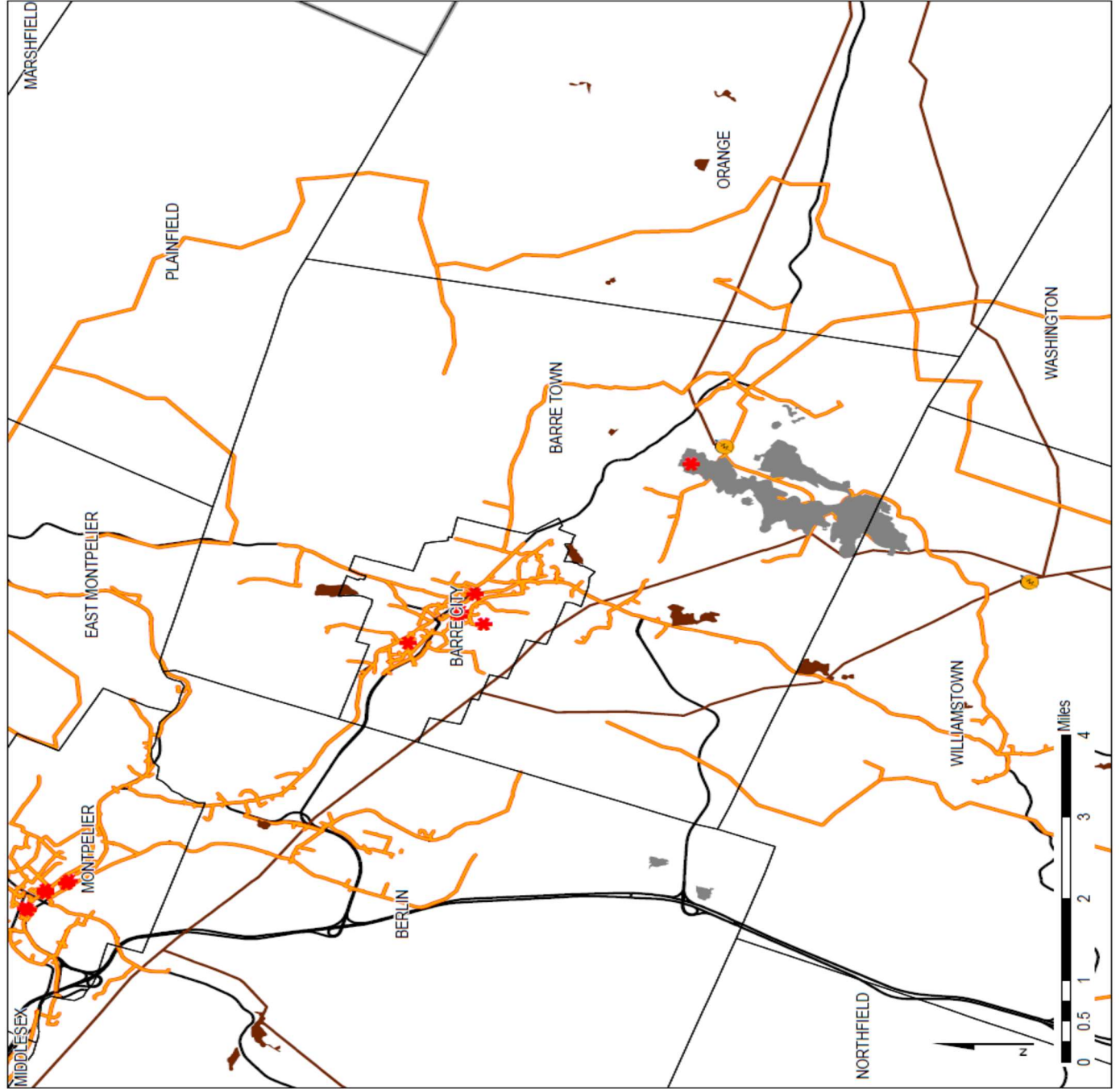
This map shows areas of resource potential for woody biomass, i.e., locations where forested areas are. This map also considers various other conditions, such as ecological zones, that may impact the feasibility of renewable energy/alternative heating source. These conditions are referred to as constraints. This map does not include areas where other types of biomass, such as biomass from agricultural residue, could be grown/harvested.

This map was created as part of a Regional Energy Planning Initiative being conducted by the Bennington County Regional Commission, and the Vermont Public Service Department.

Created: December 2016 by CVRPC GIS.



Central Vermont
Regional Planning Commission
Preferred Sites
BARRE TOWN



Data:
Brownfields, VT ANR, VCGI,
Sand and Gravel Pits, Quarries,
CVRPC, 2013 digitized from 1988 imagery.
This map was created as part of a Regional Energy Planning Initiative
being conducted by the Bennington County Regional Commission,
and the Vermont Public Service Department.
Created: November 2017 by CVRPC GIS.

