

SECTION 3. COMMUNITY PROFILE

energy supply and demand

Electricity. Green Mountain Power (GMP) is the utility provider of electricity in Barre City, as described in the Public Utilities chapter of this plan. According to their 2018 Integrated Resource Plan, it states that in 2017, natural gas-fired generation, nuclear, other low- or no-emission sources, and imported electricity (mostly hydroelectricity) provided roughly 99% of our region’s electricity. Our share of electricity generated by natural gas increased from about 14% in the year 2000, to over 40% in 2017. The remainder of our region’s energy supply comes from a combination of oil-fired, wind, hydroelectric and nuclear power sources, with nuclear the second-largest source at over 20%, despite the closings of nuclear power plants in Vermont and Massachusetts.



Figure 3-2. Annual New England Net Energy by Source²⁹

* Total does not equal 100% because of rounding.

** "Other" represents resources using a fuel type that does not fall into any of the existing categories and may include new technologies or fuel types without sufficient quantity to have their own category.

Source: Green Mountain Power 2018 Integrated Resource Plan – Regional and Environmental Evolution chapter

Table E-1 provides an overview of the current electricity consumption for residential and commercial uses in Barre City. This information is intended to provide a baseline of energy use whereby targets for conservation and efficiency will be based.

Table E-1 – Current Electricity Use by Sector

Use Sector	Current Electricity Use (in megawatts)
Residential	27,033
Commercial & Industrial	43,108
Total	70,141

Source: Efficiency Vermont

Space Heating. Most buildings in the city are heated with fuel oil, which is supplied by a number of private companies including three dealers located within the city. More than 70% of all Barre City residences, and more than 80% of owner-occupied homes, are heated with fuel oil, based on data from the Census Bureau. The remaining buildings are heated with propane, electricity or wood. Heating accounts for about half of the energy consumed in the average Vermont home.

Table E-2 provides an overview of the current fuel sources being used to heat homes in Barre City. The information comes from the 2015 U.S. Census Bureau’s American Community Survey. While there are some errors in the data, the information in Table E-2 notes that the majority of homes in Barre City are still using fuel oil as their primary source for home heating. Also, Table E-3 provides an overview of commercial heating. This information will provide the baseline for commercial efficiency targets in each of the three target years.

Table E-2 – Current Residential Heating by Fuel Source

Fuel Source	Number of Households	Percent of Households	Square Footage Heated	Total Annual BTUs (in billions)
Natural Gas or Propane	698	17.1%	837,832	50.3
Electricity	381	9.4%	414,576	24.9
Fuel Oil	2,744	67.5%	4,266,952	256
Coal	19	0.5%	37,696	2.3
Wood	141	3.5%	269,898	16.2
Other (includes Solar)	83	2.0%	136,228	8.2
No Fuel	0	0.0%	0	0
Total	4,066	100%	5,963,182	357.8

Source: U.S. Census Bureau – American Fact Finder – 2015

Table E-3 – Current Commercial Heating Energy Use

	Total Commercial Establishments	Estimated Thermal Energy Use per Commercial Establishment (Millions of BTUs)	Total Estimated Thermal Energy Use (Millions of BTUs)
Commercial Energy Use	444	593	263,292

Source: Vermont Department of Public Service & Department of Labor

Table E-4 identifies the percent increase in efficiency that would be needed in each of the target years (2025, 2035, and 2050) in order for Barre City to meet its residential and commercial thermal efficiency targets.

Table E-4 – Thermal Efficiency Targets by Target Year

	2025	2035	2050
Percent of Residential structures to be weatherized by Target Year	20%	42%	92%
Percent of Commercial structures to be weatherized by Target Year	22%	33%	61%

Source: Vermont Department of Public Service; Vermont Energy Investment Corporation – Long Range Energy Alternatives Planning; U.S. Census Bureau – American Fact Finder – 2015; Vermont Department of Labor

Fuel Supply. At any given time, local distributors of heating fuel and gasoline generally have only enough supply on hand to meet customer demand for a week or less, and are dependent on regular deliveries from interstate and international suppliers. If the supply chain were to be disrupted, local inventory would quickly be depleted.

Transportation. There are approximately 10 gasoline stations in Barre City that provide vehicle fuel. According to the U.S. Census Bureau’s American Community Survey (2005-2009), Barre City residents own more than 5,600 vehicles. Approximately 16% of city households do not have a vehicle (2nd highest percentage in Vermont), while around half own two or more vehicles. More than 80% of employed city residents drive alone to work, while only 1% take public transportation.

Fuel consumption related to transportation remains one of the largest uses of energy in Barre City. Table E-5 identifies the amount and cost of energy related to transportation for Barre City.

Table E-5 – Current Transportation Energy Use

Transportation Category	Municipal Data
Total Number of Vehicles	5,549
Average Miles Driven per Vehicle	12,500
Total Miles Traveled	69,362,500
Average Annual Gallons of Fuel Used per Vehicle	576
Total Gallons of Fuel Used per Year	3,729,167
Transportation BTUs (in Billions)	163
Average Cost per Gallon of Fuel	\$2.31
Fuel Cost per Year	\$8,614,375.00

Source: U.S. Census Bureau – American Fact Finder – 2015; Vermont Agency of Transportation

Information related to fuel switching to address transportation related energy needs will be discussed later in this section. Specifically, Table E-12 provides specific information regarding fuel switching for transportation related uses.

municipal energy use

City government has direct control over its energy use and reducing energy costs has a direct bearing on the municipal budget. One of the most direct public benefits of municipal energy efficiency initiatives (or the generation of below-market rate energy from renewable resources) is that the savings are passed on directly to taxpayers.

Barre City has begun to lead by example on energy efficiency and conservation by conducting energy audits of many city facilities and buildings. The city has been undertaking various recommended improvements to reduce municipal energy use. Energy efficiency upgrades were made at the BOR in 2011 with new energy efficient lighting, and the operating costs' savings are approximately \$4,000 per year. There were new chillers installed in the summer of 2019 for efficient ice making and cooling. In the Alumni Hall portion of the building, an air blower test was completed, that resulted in air sealing, insulation added in many locations of the building, and replaced several windows and doors. The need for a new boiler remains high on the list, and it is hopeful to have it replaced in 2020. The city anticipates replacing the inefficient lighting at the Auditorium in the next few years. City Hall just completed the installation of two replacement boilers for the hearing system in 2019, with other needs such as door and window replacement, HVAC duct work reviewed for efficiency and replacement as well.

Most streetlights in the city are owned by GMP and the city is charged a flat rate per light, irrespective of actual energy use. Many Vermont communities have substantially reduced electricity costs by surveying existing streetlights and making adjustments to their location and number to ensure public safety while reducing unnecessary nighttime lighting.

As part of the North Main Street reconstruction project, the utility-owned conventional streetlights were replaced with city-owned energy-efficient lights, and the Enterprise Aly and Keith Avenue

parking lots received new efficient lighting as well. Similar replacements are anticipated as the city moves forward with improvements to Merchants Row and other public properties. Replacing existing streetlights with new LED lights can reduce energy consumption from 25% to 75%, and the LED lamps last up to 10 times longer than conventional technologies. When the efficient streetlights are city-owned, the cost savings can flow directly to taxpayers.

Changes in energy costs from the 2014 Plan to 2018 as shown below, show reductions in electricity due to the Morrison Solar Farm’s reductions, City Hall’s boiler replacements, and the change in technology for vehicles.

There are a number of opportunities for reducing the amount of petroleum used to power the city’s vehicle fleet. Conventional vehicles could be replaced with vehicles that could use alternative fuels or blends, and/or more fuel-efficient vehicles. Fuel could be conserved by reducing the amount of time vehicles are left idling and by reducing miles traveled through improved routing, or combining or eliminating trips.

Figure 11. FY 2018 Municipal Energy Costs

	Electricity	Fuel Oil	Bottled Gas	Vehicle Fuel
City Hall	\$ 11,638	\$ 32,524		
Auditorium	\$ 17,483	\$ 16,391	\$ 342	
BOR	\$ 46,427		\$ 9,880	
Public Safety Building	\$ 25,629	\$ 631	\$ 18,681	
Public Works Garage	\$ 8,306	\$ 13,322		
Street and Traffic Lighting; EV Stations	\$ 137,903			
Water Filtration Plant	\$ 89,592		\$ 15,960	\$ 1,413
Wastewater Treatment Facility	\$ 123,307	\$ 56,247	\$ 41	\$ 4,397
Fire Department			\$ 44	\$ 16,684
Police Department				\$ 25,412
Street Department				\$ 42,973
Water Department	\$ 12,387	\$ 5,258		\$ 6,998
Sewer Department	\$ 3,111	\$ 1,299		\$ 5,165
Facilities Department	\$ 4,857	\$ 630		\$ 8,198

renewable energy resources

Renewable energy can be generated from sunlight, wind, water, organically derived fuels, including wood and agricultural sources, waste heat and geothermal sources. There are many opportunities within Barre City to generate renewable energy, particularly of a scale and type that can be incorporated into the city's higher-density built environment such as solar panels or geothermal systems.

It may be feasible to generate hydropower by re-tooling the infrastructure already in place in the city's rivers and at city-owned sites. Use of waste heat from industrial activities to generate electricity or provide space heating for nearby buildings may be feasible in Barre City. Additionally, the downtown business district may be a suitable location for district heating.

Solar. The potential to generate energy from wind is limited in Barre City, but solar power could be a feasible option, particularly for residences or when incorporated into the design of new or renovated buildings. Solar PV (which generates electricity) and solar thermal (which generates hot water) systems comprise the fastest growing renewable energy sector in Vermont, and there are many in-state incentives available to make these technologies more affordable for homeowners and businesses.

Barre City installed a five-kilowatt solar PV system with Novus Energy in 2016. The first site chosen within the City limits didn't work out due to environmental constraints, therefore, an alternate site within the Town of Barre was chosen. This solar array provides for energy return on the city's municipal buildings. The City has the option to choose a second site, based on the original contract with Novus, and once a site is located, the City should enact on the additional project.

Barre City also signed Resolution 2018-05 on April 24, 2018 joining the State of Vermont and other Vermont communities and businesses in the Vermont Climate Pledge Coalition to embrace sustainable land use and lifestyle principles and practices by encouraging the City to work with committees, third-party contractors and other organizations, along with the general public to minimize greenhouse gas emissions derived from city activities and spending.

Building and Site Design. Building and site design is an important factor in promoting passive solar. Buildings that are oriented close to true south (within 30 degrees) maximize available solar energy, as long as the solar radiation is not blocked. Through the placement of windows on the south wall, installation of thermal mass (such as concrete, brick, quarry tile, or water), and adequate insulation, as much as 60% of a building's space heat can be derived from the sun. Careful design and placement of windows can greatly reduce the energy required for daytime lighting.

Municipal building codes, zoning bylaws and subdivision regulations can all have a direct bearing on the promotion of solar energy through strategic siting, landscaping and building design and construction standards.

Hydro. Barre City owes its existence and location to the availability of waterpower, which was harnessed by early industries. While the city's rivers are no longer generating energy, that renewable resource still exists with potential to be used in new ways that are less disruptive to the natural environment.

The 2007 City of Barre Energy Recovery Study analyzed the feasibility of several low-impact hydroelectric energy recovery projects. As discussed in the Public Utilities chapter of this plan, the city completed work on one of the recommendations, the Nelson Street PRV project. The study also looked at various options for generating hydropower at the Dix and Lower Orange Dam/Reservoir, and concluded that 140,000 to 390,000 kilowatt hours of electricity could be produced annually, while maintaining the site's primary function as the municipal water supply. This could offset the approximately 660,000 kilowatt hours of electricity consumed at the city's water treatment facility each year. The projects would have a payback of 10 to 15 years, which could be reduced if the city obtained grant funding.

Geothermal. Energy can also be generated in urban settings through geothermal systems that take advantage of the relatively constant temperature below the frost line. During the winter, a heat pump extracts heat from water circulated through underground pipes to distribute throughout the building. The system is reversed in the summer, with the heat pump extracting heat out of the hot air in the building and sending warmed water into the earth to be chilled. The installation price of a geothermal system can frequently be greater than that of a conventional heating and cooling system, but the additional costs are typically returned in energy savings in five to ten years.

District Heating. As a dense urban center, downtown Barre City is a suitable location for district heating. District heating systems distribute steam or hot water to multiple buildings. In Barre City, this heat could be generated from a renewable source, like wood chips, or potentially by waste heat from industry. There are a number of potential locations that could be redeveloped for this use including the BOR property and the former coal-gasification plant on Williams Lane. Many district heating systems are also designed to be cogeneration plants that generate electricity as well as heat.

Renewable Generation. Table E-6 provides a list of the existing renewable energy generation by source in Barre City, and Table E-7 identifies the potential generation by source. This data has been developed based on a mapping exercise completed by the Central Vermont Regional Planning Commission. Specific resource maps are included at the end of this section, including locations of existing renewable generation.

Table E-6 – Existing Renewable Generation by Source

Source of Generation	Megawatts	Megawatt Hours
Solar	.4	488
Wind	0	0
Hydroelectric	.01	50.11
Biomass	0	0
Other	0	0
Total Existing Generation	.41	538.21

Source: Vermont Department of Public Service; Central Vermont Regional Planning Commission

As a reference, Table E-8 at the end of this section provides additional information on existing renewable generation.

Table E-7 – Potential Renewable Generation by Source

Source of Generation	Megawatts	Megawatt Hours
Rooftop Solar	6.29	7,709
Ground-mounted Solar	161.92	198,575
Wind	9.89	30,315
Hydroelectric	0	0
Biomass and Methane	Unknown	Unknown

Other	Unknown	Unknown
Total Potential Generation	178.09	236,599

Source: Vermont Department of Public Service; Central Vermont Regional Planning Commission

Table E-8 – Renewable Energy Generation by Target Year

	2025	2035	2050
Total Renewable Generation Target by Year (in megawatt hours)	14,563	23,302	58,255

Source: Central Vermont Regional Planning Commission

The targets outlined in Table E-7 are based on a share of the Central Vermont Region’s renewable generation target. This allocation has been provided based on a per capita basis. These targets represent the amount of renewable energy generation needed for Barre City to meet its portion of the Regional energy generation targets by 2050. Barre City should ensure that specific land use policies do not limit the ability for energy generation to fall below these targets.

Additionally, the potential generation identified in Table E-8 represent only a handful of options for renewable energy generation. For example, biomass and methane is listed as an unknown generation potential because these sources are not resource specific. That is to say, a district heat facility could be located in Downtown Barre City and provide a source of renewable heating to be applied towards the generation targets. Since biomass can be transported, the specific generation numbers are unknown, whereas wind and solar have specific conditions that need to be met and can be measured in order to have successful generation of those resource. Based on the targets in Table E-8 and the potential generation in Table E-9, Barre City has adequate resources available to meet their renewable generation targets. Specific maps related to potential energy generation and siting are included at the end of this section.

energy efficiency and conservation

Energy efficiency and conservation are critical components of solving current energy problems because it is more cost effective to reduce energy consumption than to produce more energy. Efficiency measures also have direct economic benefits to municipalities, residents and businesses by lowering energy bills. Improved efficiency is also an economic development strategy. Approximately 80¢ of every dollar spent on energy efficiency remains in Vermont, while approximately 80¢ of every dollar spent to purchase energy leaves the state.

Efficiency Vermont. Vermont was the first state in the nation to create a utility, Efficiency Vermont, to coordinate the state’s energy efficiency programs in 2000 (see the Public Utilities chapter of this plan). According to their data reports sent to the Central Vermont Regional Planning Commission, between the years 2016 to 2018, Efficiency Vermont had assisted 5,517 customers and completed 3,540 projects for commercial or industrial building owners in Barre City with efficiency improvements resulting in annual energy savings of almost 2900 megawatt hours of electricity. The utility had also worked with 572 residential property owners in the same timeframe resulting in efficiency improvements that save 4,150 megawatt hours of electricity each year. Based on this data coupled with Capstone Community Action’s weatherization program work, 575 housing units in the City have been weatherized and residential customers have collectively saved more than 7,500 MWH of electricity annually. In addition, the City’s businesses have completed projects saving more than 3,000 MWH of electricity annually. Assuming an annual average residential electric usage of 6,500

kwh (or 6.5 MWH), the total savings from Barre City (residential plus business) would be enough to power 1,615 homes per year.

Table E-9 – Annual Electricity Efficiency Targets – All Sectors by Target Year

	2025	2035	2050
Increased Efficiency & Conservation	1.5%	7.3%	15.2%

Source: Vermont Energy Investment Corporation – Long Range Energy Alternatives Planning

Weatherization Assistance. EnergySmart is a program of Capstone Community Action, located in Barre City (formerly Central Vermont Community Action Council), a Central Vermont institution that has been operating for more than 50 years. They are part of a large, stable organization that will be around for the long term. Because EnergySmart is a social enterprise of Capstone, they have a unique mission. The energy renovation work helps fund Capstone’s endeavors.

Capstone provides weatherization services free of charge to homeowners and renters (with landlord approval) who meet income and other qualifications. For qualified households, Capstone will conduct an energy audit of the home, assist the household with applying for free lighting and appliance upgrades (where applicable) from Efficiency Vermont, and provide renovation construction services from a qualified crew, including materials and supplies. Capstone also offers educational workshops designed to help homeowners understand the steps they can take to make their homes more energy efficient and trains homeowners to make efficiency improvements, which are open to all city residents. For more information, contact Capstone directly at (800) 639-1053, www.capstonevt.org, or contact the EnergySmart division directly at (802) 278-1833, www.energysmartvt.com.

Table E-10 identifies the percentage of renewable energy use for transportation and home heating by each target year. These percentages are targets for Barre City to use as it establishes policies to encourage the use of renewable energy in the transportation and thermal sectors.

Table E-10 – Use of Renewables for Transportation & Home Heating by Target Year

	2025	2035	2050
Transportation Renewable Use	9.6%	31.3%	90.2%
Home Heating Renewable Use	53.2%	66.9%	92.2%

Source: Vermont Energy Investment Corporation – Long Range Energy Alternatives Planning

Building and Site Design. Land use and development regulations can be used to promote greater energy efficiency through incentives or development standards. In addition, certificates of occupancy administered through zoning bylaws can be used to ensure compliance with state efficiency standards that have not been effectively enforced. Finally, municipal building codes may establish local efficiency standards.

Local Action. Several groups and organizations are working on energy efficiency and conservation efforts in Barre City including Capstone, the Barre City Energy Committee and ReSOURCE (Recycle North).

Fuel Switching. One way to help Barre City meet its renewable energy goals is by switching from fossil based fuels to renewable fuels. This includes thermal switching for residential and commercial establishments and switching to electric or biodiesel fuels for vehicles. Table E-11 identifies the number of new efficient wood systems and heat pumps for thermal heating by target year and Table

E-12 identifies the number vehicles that would need to utilize alternative fuels by each of the target years.

Table E-11 – Residential & Commercial Fuel Switching Targets for in Unit Systems by Target Year

	2025	2035	2050
New Efficient Wood Heat Systems	20	19	154
New Heat Pumps (in Unit)	413	1,067	2,020

Source: Vermont Energy Investment Corporation – Long Range Energy Alternatives Planning
U.S. Census Bureau – American Fact Finder – 2015

Table E-12 – Transportation Fuel Switching from Fossil Based Fuel to Electric & Biodiesel Fuels by Target Year

	2025	2035	2050
Electric Vehicles	277	3,293	6,575
Biodiesel Vehicles	831	1,540	2,498

Source: Vermont Energy Investment Corporation – Long Range Energy Alternatives Planning
U.S. Census Bureau – American Fact Finder 2015

Table E-13 provides information from the Energy Action Network related to existing renewable energy generation. This information is based on Certificates of Public Good that have been issued by the Public Utility Commission for renewable energy projects. It also may not be a complete picture of the existing renewable energy development in Barre City, but provides another set of data points to analyze. This information does not include solar for hot water heating, but that information is available from the Energy Action Network. This information should be compared and contrasted with the information in Table E-7.

Table E-13 – Existing Renewable Energy Generation Based on Certificates of Public Good

Category	Sub Category	Number of Locations	Electricity Type	Utility	Capacity kW
Solar	Roof-Mounted PV	88	Net Metered	Green Mountain Power	897,630
Solar	Ground Mounted PV	1	Group Net Metered	Green Mountain Power	23,389
Micro-Hydro	-	1	-	Green Mountain Power	14.3
Building Efficiency	LEED Certified Green Building	1	-	Green Mountain Power	-
Advanced Wood Heat (Biomass)	Community Scale Wood Heat	6	-	Various	-

energy siting and mapping

Barre City supports the responsible development of renewable energy generation throughout the City to meet the needs of its residents including all types and technologies that may be available.

In order to more specifically identify and plan for Barre City’s energy needs, information on siting of renewable energy has been developed including resource mapping. The following maps are provided to support the information included in Table E-7 related to potential development of renewable energy. These maps outline the resource area available in Barre City related to solar, wind, woody biomass, and hydroelectric resources. Additionally, maps

are included that identify constraints that have been identified by the State and the Region. These constraints are categorized as known and possible.

Known constraints are those areas where development of a renewable resources is very limited and therefore 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

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 (soils formed under conditions of saturation, such as flooding or ponding)
- Regionally or Locally Identified Resources

In addition to the items listed above, the Central Vermont Regional Planning Commission, through its Regional Energy Committee, has identified additional constraints to be included. 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 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

Further, Barre City has identified the following local constraints where development, including renewable energy, is not appropriate. These include:

- Areas with important natural, cultural or with scenic value
- Significant natural resource areas such as flood hazard areas, river corridors, high elevation protection zones and prime agricultural soils

Like the regional constraints, these areas will be noted as possible constraints to ensure further evaluation is considered prior to development in these locations. These constraints are noted on maps at the end of this section.

One additional constraint that was added by the Region is a limit on the overall height of wind generation facilities. Specifically, the CVRPC noted that the maximum height for wind generation would be 125 feet as measured to the hub (excluding blades). The CVRPC concluded that any wind facilities over 125 feet tall would be considered industrial scale. Through an analysis of resource areas and existing regional planning policies, there were no suitable lands to accommodate industrial scale wind generation over the planning horizon that was identified in the regional plan. This would still allow residential and commercial scale wind to be established but would limit the industrial scale development that could have greater impacts on the Region overall.

Barre City acknowledges the Regional limitation on the height of wind. Through its local planning priorities and discussions on siting, it may be determined that the City will support industrial scale wind in appropriate locations to meet the City's renewable energy needs or further limit the scale of wind generation consistent with the scale and size of other development options. This would be done through an analysis of available resource areas for wind compared to locations that the City has determined are appropriate for industrial scale development. If the City determines that industrial scale wind can be supported or should be further restricted, the conflict resolution policy that is outlined in the Central Vermont Regional Energy Plan will be followed to ensure that no adverse impacts to regionally identified resources or adjacent municipalities are identified. If through this evaluation it is determined that industrial scale wind can be accommodated or further restricted, the City may consider these options when appropriate.

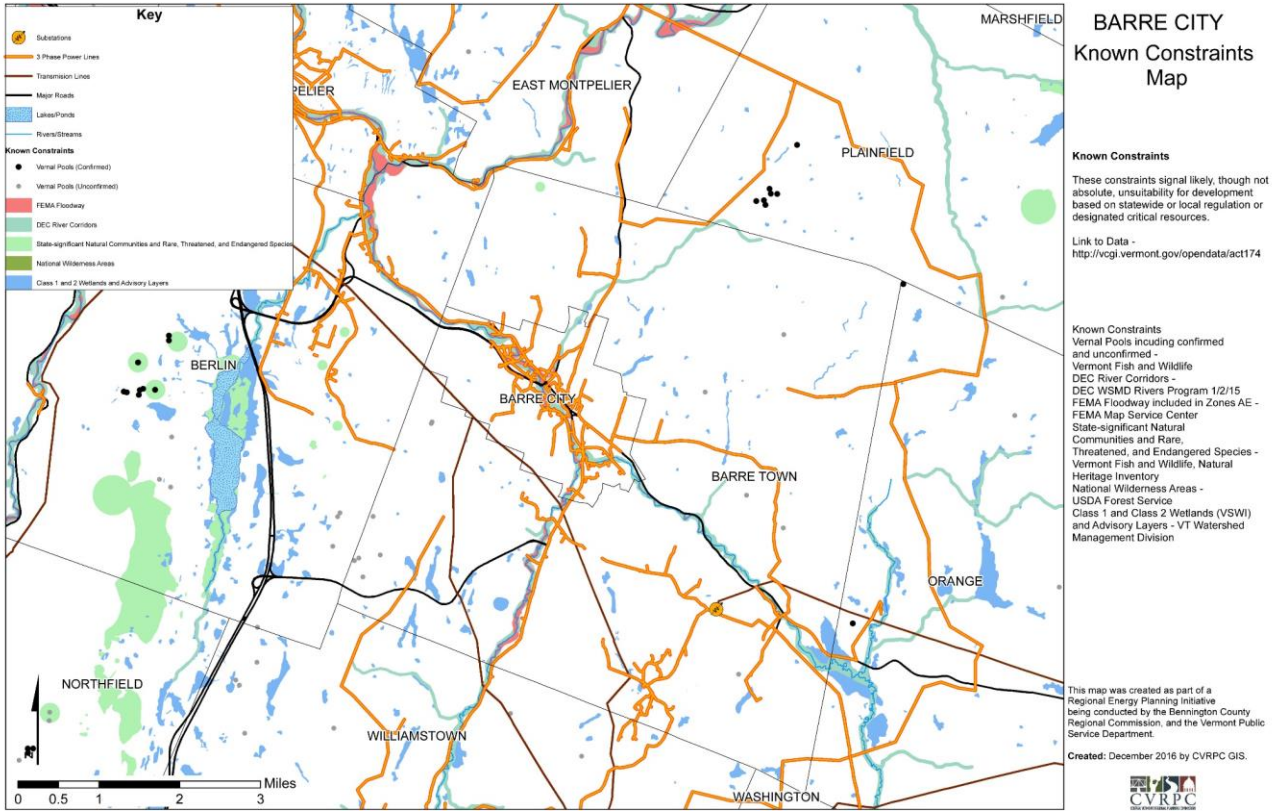
Additional information on the known, possible, and regional constraints, including sources of data and definitions, can be found in the Central Vermont Regional Energy Plan.

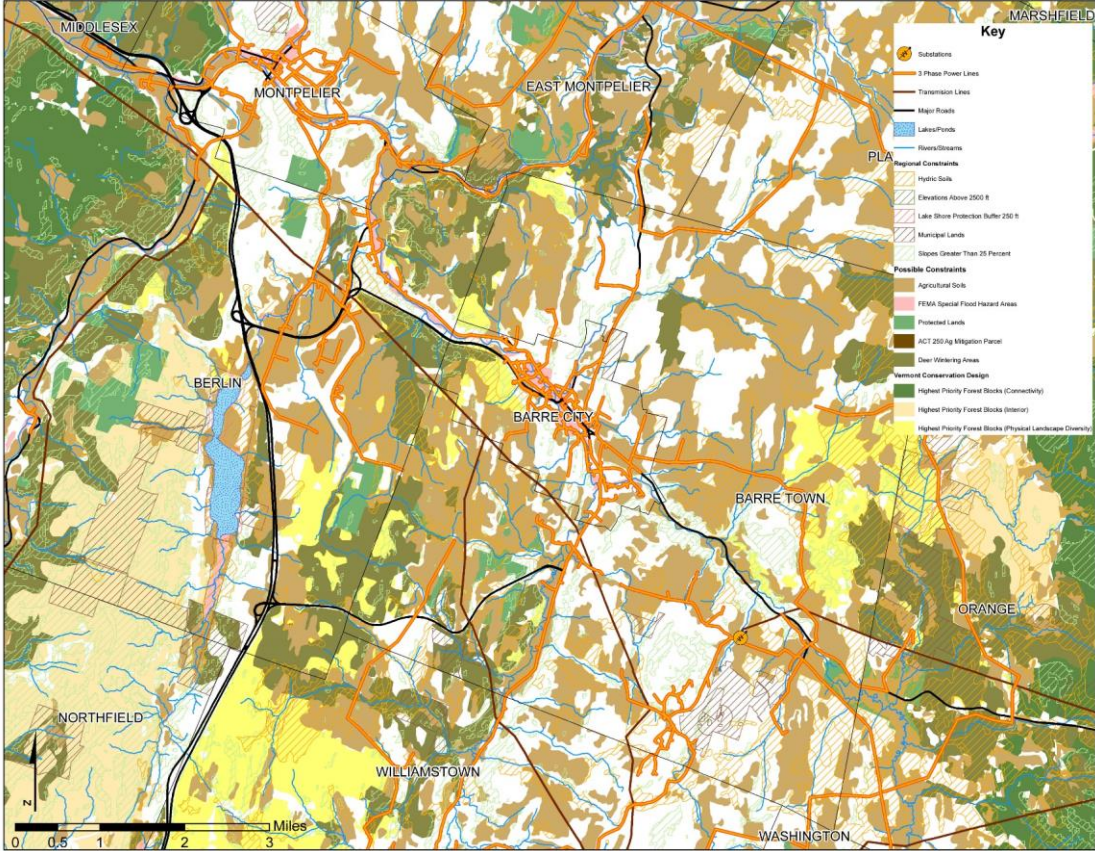
Finally, the state has identified preferred locations for the siting of renewable energy generation. These are areas where renewable energy generation should be considered first before identifying greenfields or agricultural areas. The statewide preferred locations include but are not limited to:

- Parking lots
- Gravel pits
- Brownfield sites as defined in 10 V.S.A. §66428
- Sanitary Landfills as defined in 10 V.S.A. §6602
- Rooftop installations

All of the preferred sites are included on the maps at the end of this section.

The information included in this section is a beginning and not the ultimate picture. As technologies change and development occurs, Barre City will explore ways to incorporate more renewable generation technologies into land development plans as a way to off-set the needs of local residents and businesses.





BARRE CITY Possible Constraints Map

Possible Constraints

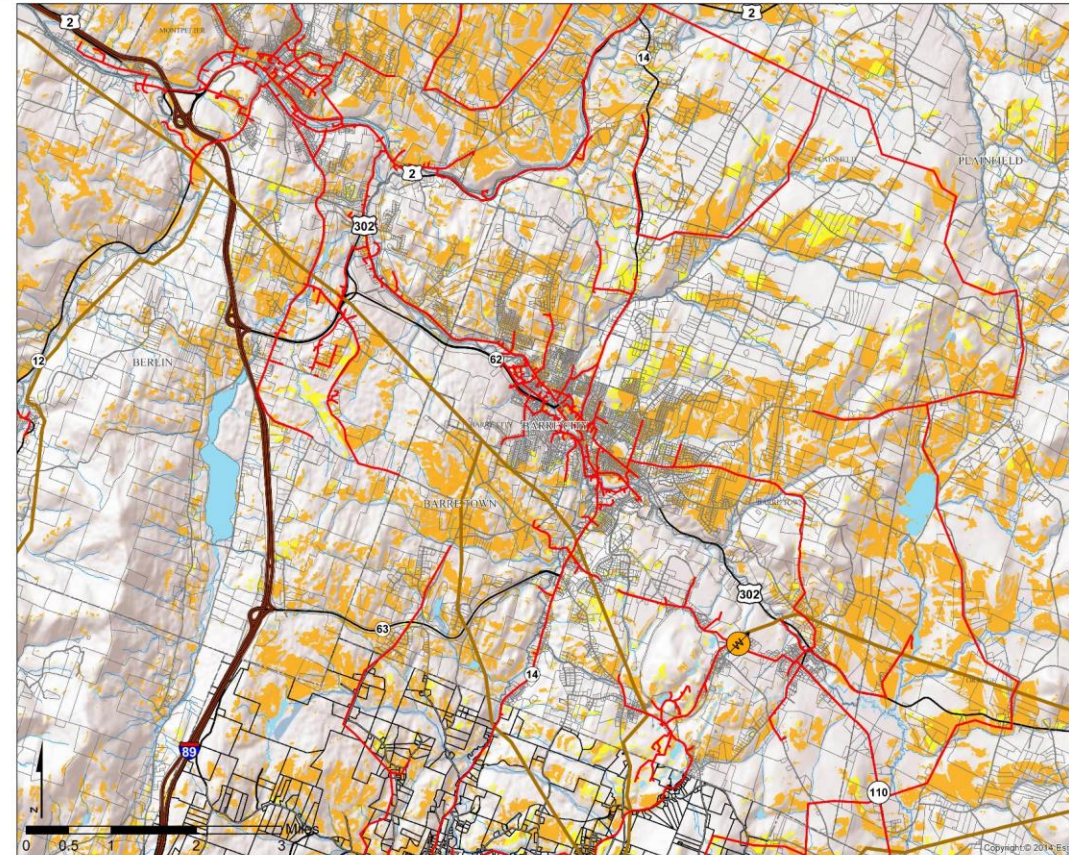
These constraints signals conditions that would likely require mitigation, and which may prove a site unsuitable after site-specific study, based on statewide or regional/local policies that are currently adopted or in effect.

Link to Data - <http://vcgi.vermont.gov/appendata/act174>

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 - VCGI
 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.



BARRE CITY Solar Resources Map

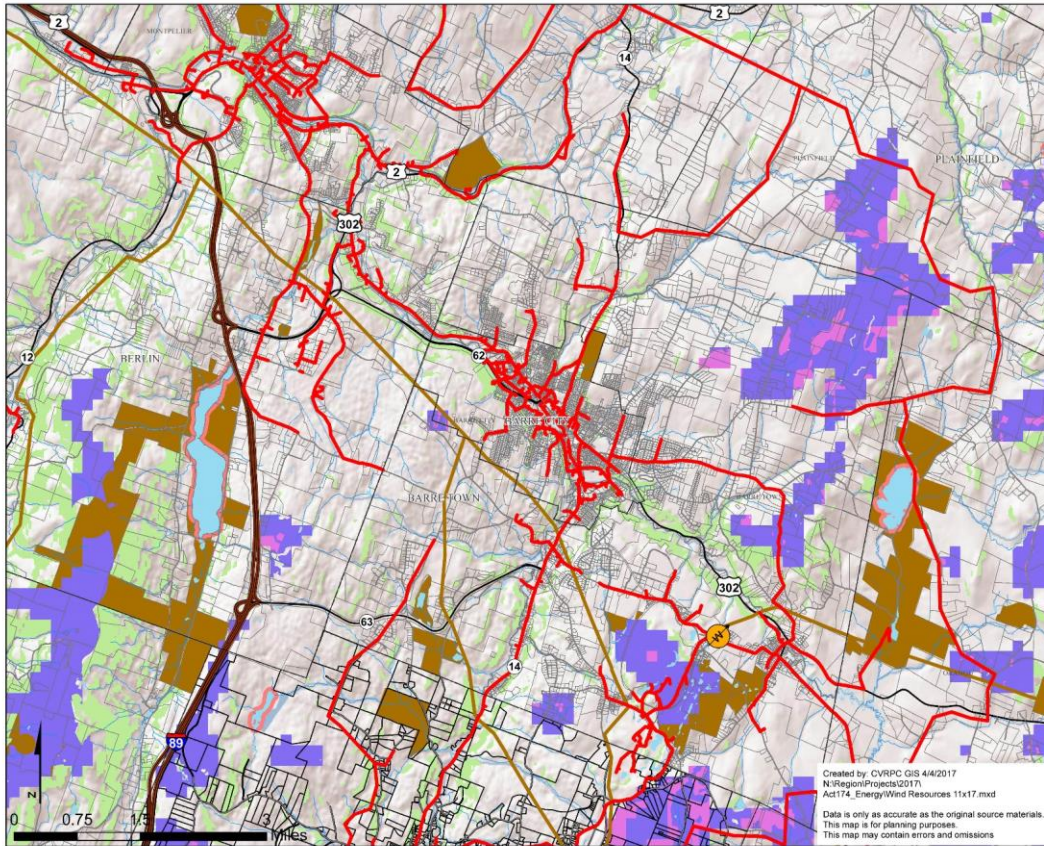
Legend

- Substations
- 3 Phase Power Lines
- Distribution Lines
- Solar Potential**
 - Prime (No Constraint)
 - Secondary (Possible Constraint)
 - Parcels
- Roads**
 - Interstate
 - US Highway
 - Vermont State Highway
 - Town Class 1-3
- Known Constraints**
 - Areas not shown on map
 - Vernal Pools
 - River Corridors
 - FEMA Floodways
 - Natural Communities & Rare, 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
 - Elevations Above 2500ft
 - Lake Shore Protection Buffer 250 Ft
 - Municipal Lands
 - Slopes Greater Than 25 Percent

Created by: CVRPC GIS 4/4/2017
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Data is only as accurate as the original source materials. This map is for planning purposes. This map may contain errors and omissions.

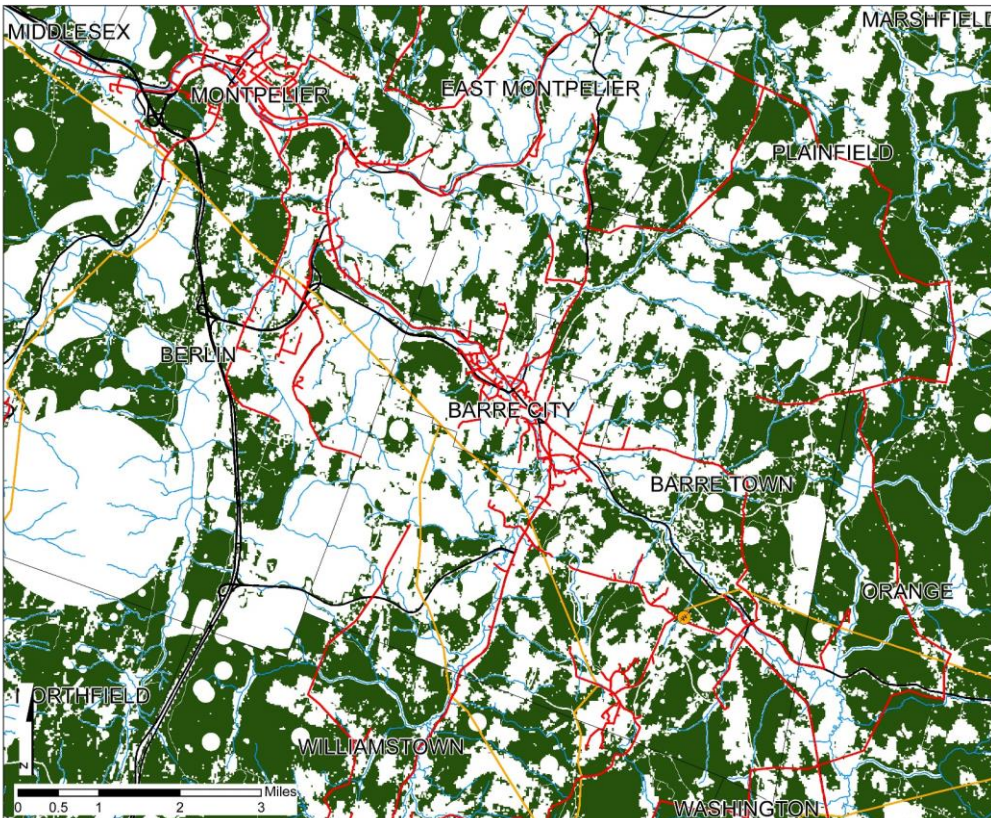




BARRE CITY Wind Resources Map

- Legend**
- Substations
 - 3 Phase Power Lines
 - Transmission Lines
- Wind Potential**
- Prime Wind (No Constraint) Hub Height (m)
 - Secondary Wind (Possible Constraint) Hub Height (m)
- 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
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 - Highest Priority Forest Blocks
 - Hydric Soils

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 Data is only as accurate as the original source materials.
 This map is for planning purposes.
 This map may contain errors and omissions



BARRE CITY Woody Biomass Resources Map

- Key**
- Substations
 - 3 Phase Power Lines
 - Transmission Lines
 - Major Roads
 - Lakes/Ponds
 - Rivers/Streams
 - Woody Biomass

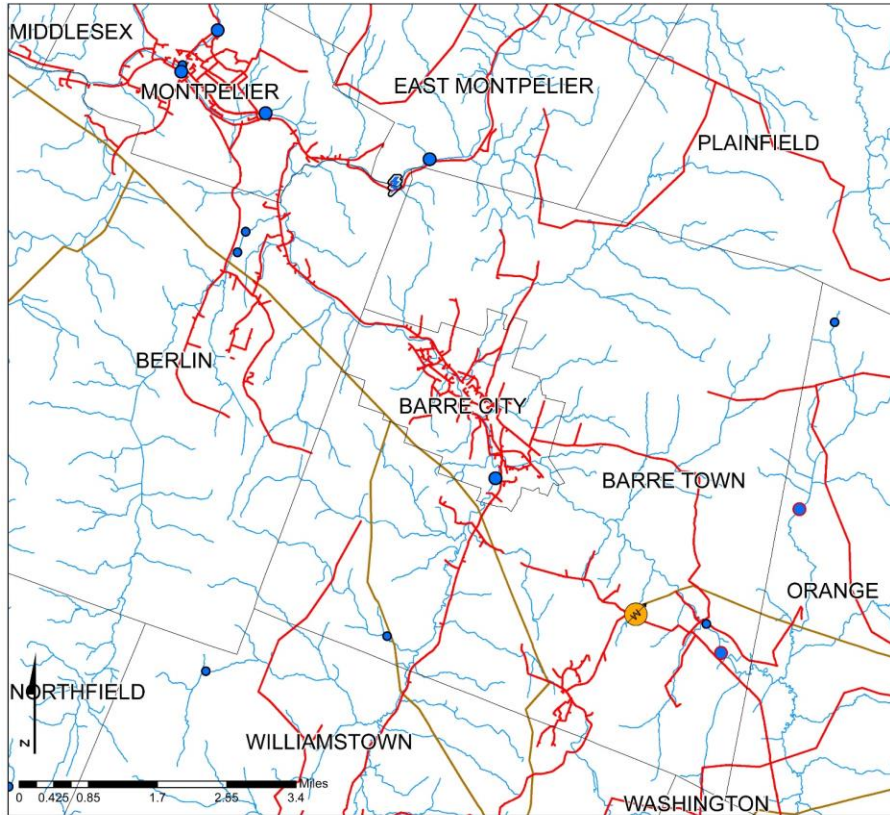
Methodology

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.

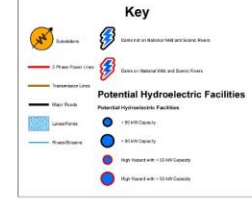
This map was created as part of a Regional Energy Planning Initiative being conducted by the Bennington County Regional Commission, and the Vermont Public Service Department.

Created: December 2016 by CVRPC GIS.





BARRE CITY Hydroelectric Resources Map



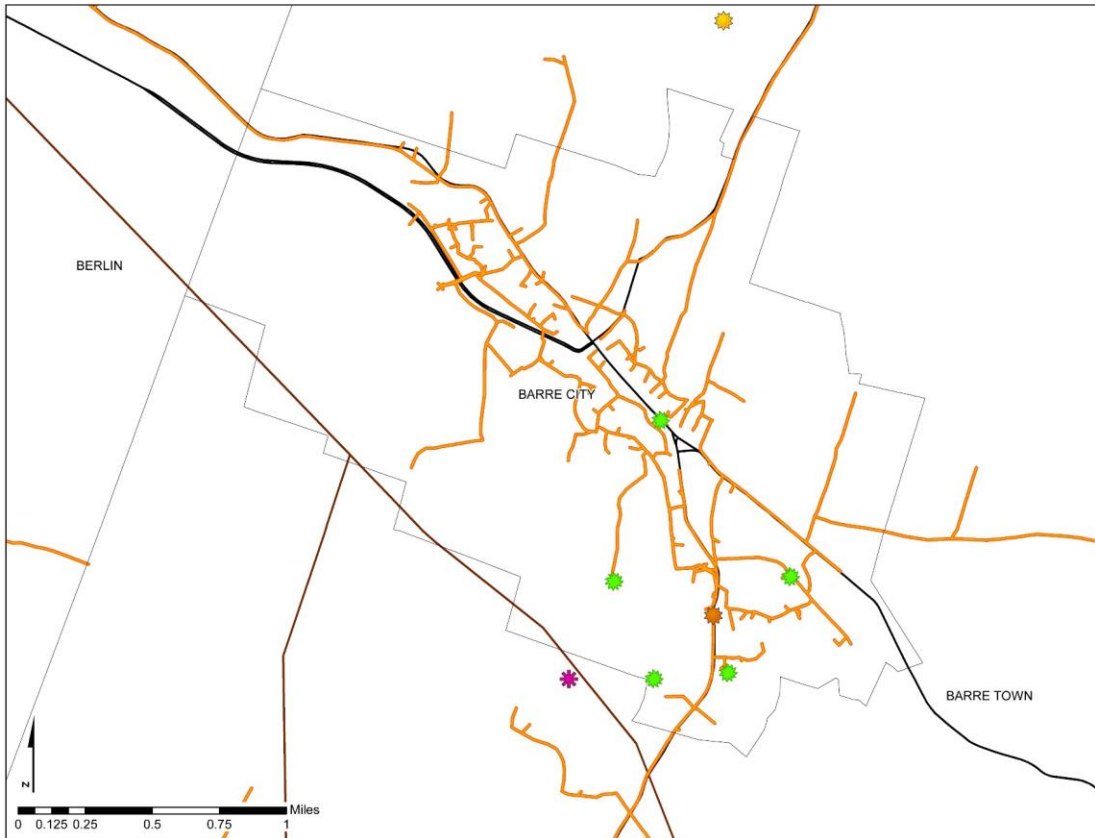
Methodology

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. 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.

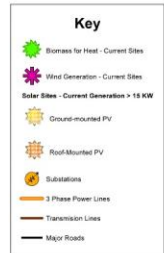
High hazard potential dams are those where failure or mis-operation will probably cause loss of human life. The other rankings were grouped together and their failure or mis-operation results in no probable loss of human life, but could cause economic loss, environmental damage, disruption of lifeline 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



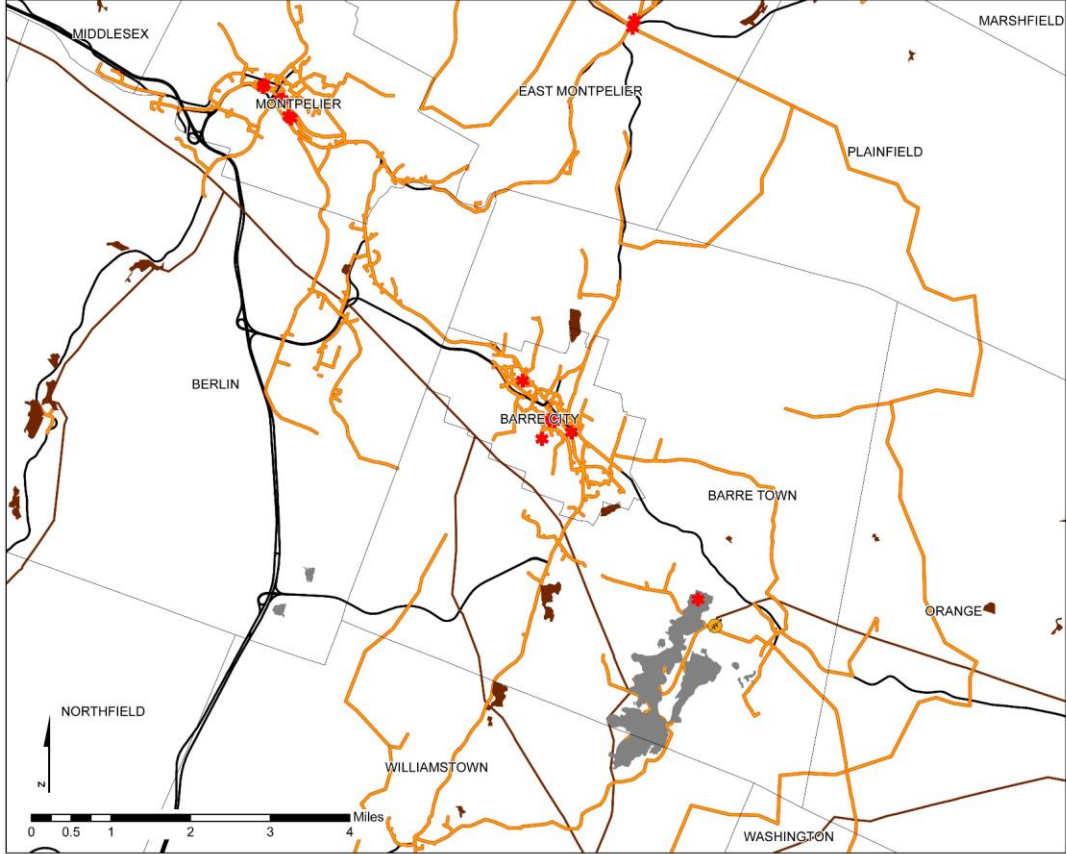
Central Vermont Regional Planning Commission Existing Renewable Energy Generation BARRE CITY



Data:
Wind and Biomass generation:
VT Energy Dashboard
Solar Sites: VT Energy Dashboard

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.

Central Vermont
Regional Planning Commission
Preferred Sites
BARRE CITY



Key

- Brownfields Sites
- Moretown Landfill
- Sand and Gravel Pits
- Quarries
- Substations
- 3 Phase Power Lines
- Transmission Lines
- Major Roads



Data:
 Brownfields: VT ANR, VCGI
 Sand and Gravel Pits, Quarries:
 CVRPC, 2013 digitized from 1998 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.

COMMUNITY SERVICES AND AMENITIES

city government

Barre City is governed by an elected City Council consisting of a mayor and two councilors from each of the city's three wards. The City Council is responsible for preparing the annual budget, approving all city expenditures, adopting city bylaws and ordinances, establishing city policies and priorities, and appointing various municipal officials and board members.

A City Manager, appointed by the Mayor and City Council, oversees the day-to-day administration of the city. The City Manager is responsible for hiring and supervising department directors and other city employees, negotiating city contracts, and making recommendations to the Mayor and City Council.

An elected City Clerk and Treasurer is part of the government, and is discussed below.

All other municipal government functions are carried out by city departments and their employees including:

- City Clerk/Treasurer's Office is the repository of all City records including deeds, mortgages, vital records, council meeting minutes and election results. This office is responsible for maintaining municipal records, issuing various licenses and permits, administering elections, collecting property taxes, maintaining financial records, and recording the minutes of City Council meetings. They also handle dog registrations and also processes vehicle registration renewals.
- The Finance Department pays all city bills, issues payroll checks, maintains payroll records, balances statements, and heads up the monumental task of preparing for the City's annual audit. They work closely with other departments in monitoring the hundreds of thousands of dollars in federal and state grants the City receives – both for the City and on behalf of other organizations.
- Buildings and Community Services Department is comprised of three small departments. The Cemeteries and Parks Department, the Facilities Department and the Recreation Department. The Cemeteries/Parks Department is responsible for the upkeep of the 3 cemeteries, and the city parks. The Facilities Department provides assistance to groups that rent the civic center facilities (Auditorium, Alumni Hall, BOR), including the set-up and custodial services for each event. They also are responsible for overseeing all city buildings and grounds owned by the City, and includes custodial and maintenance services for City Hall and the Public Safety Building, as well as a number of parks, recreation fields and playgrounds. The Recreation Department is responsible for recreational programming throughout the city and at city facilities, such as ice time, and individual rentals at Alumni Hall. Programs regularly occur such as open gym, open skating, weekly soccer, lacrosse, reading and science camps. The Recreation Department works in tandem with the Town of Barre for the annual east egg hunt.
- Planning, Permitting and Assessing Services was created in 2011 to serve as a one-stop location for all local permits by merging the former Building and Housing Department and

the Planning and Zoning Department. This department has an array of responsibilities including: issuing building, electrical, flood hazard and zoning permits; inspecting zoning projects for zoning certificates of compliance that were approved by the Development Review Board, rental registry billing, coordinating land use planning and community development efforts; grant writing; providing support for the city Planning Commission, Development Review Board, Housing Board of Review and the Energy Committee. The Assessing portion of the Department assesses all real property in the city for tax purposes, and maintains the Grand List and tax maps. The department is located in City Hall and employs a contract assessor who answers to the City Manager, an assessing clerk, a permit administrator and the director.

- The Fire and Emergency Services (EMS) Department consists of a full-time Fire/EMS Chief, a Deputy Fire Chief, the Fire Marshal, Code Enforcement officers, and numerous ranked individuals within the Fire service, all housed at the Public Safety Building. More information about this department is provided below.
- The Police Department consists of a full-time Police Chief, Deputy Police Chief, an Ambulance Billing Clerk, dispatchers, detectives and officers also housed at the Public Safety Building. More information about this department is provided below.
- Public Works Department is responsible for the maintenance and repair of city streets and sidewalks, storm sewers, water and sewer infrastructure, for the operation of the Wastewater Treatment Facility and the Water Treatment Facility, and the engineering and supervising of public improvement projects. See the Public Utilities and Transportation chapters of this plan for additional information related to this department.

Figure 12. City Budget Comparison Table

Fiscal Year	City Budget Raised by Taxes		GF % Change Year Over Year	% General Fund
	Actual	General Fund (GF)		
2010-2011	\$ 6,901,174	\$ 6,057,373	-	88%
2011-2012	\$ 7,322,815	\$ 6,360,414	5%	87%
2012-2013	\$ 7,583,505	\$ 6,583,204	4%	87%
2013-2014	\$ 7,859,035	\$ 6,912,334	5%	88%
2014-2015	\$ 7,977,083	\$ 7,001,682	1%	88%
2015-2016	\$ 8,058,262	\$ 7,230,415	3%	90%
2016-2017	\$ 8,567,000	\$ 7,535,299	4%	88%
2017-2018	\$ 8,578,932	\$ 8,042,467	7%	94%
2018-2019	\$ 8,636,586	\$ 8,114,194	1%	94%
2019-2020	\$ 9,078,512	\$ 8,494,111	5%	94%

Source: City Annual Reports and calculations by the Finance Director

public safety

Police Department. Barre City has a municipal police department that included 20 full-time and 9 part-time officers and 6 full-time and 1 part-time dispatcher in 2018, with one Outreach Specialist. The department’s operating budget in FY2017-18 was \$2.4 million, which included \$1.3 million in

salaries and \$178,000 in overtime pay. The Barre City Police Department responded to approximately 10,471 calls in FY2017-18.

While the total number of officers has somewhat increased from funding from outside sources, the department currently has fewer officers “on the beat” than it did 30 years ago because of prior budget cuts and the outside funded position being a non-patrol position. To be more proactive, the department believes the force would need to consist of 26 full-time officers. Such an expansion would result in an annual budget increase of \$552,000 in salaries not including additional costs for vehicles, equipment, uniforms and training.

The Bureau of Justice Statistics (BJS) 2007 Local Police Departments Report indicates that the national average officer-to-resident ratio for police departments serving a municipality of 2,500 to 9,999 residents was 2.5 officers per 1,000 residents. The Vermont average is 3.5 officers per 1,000 residents. That level of staffing would equate to a force of 22 to 31 full-time officers in Barre City. The 2007 BJS report states that the average operating budget for police departments serving a municipality of 2,500 to 9,999 residents was \$87,200 per sworn officer, which puts Barre City’s police budget in-line with that of similarly sized municipalities around the country.

The police department moved into the newly constructed Public Safety Building at 15 Fourth Street in 2006, which is shared with the Fire Department, vacating the space it had occupied in City Hall for more than a century. While the new building meets the present facility needs of the department, the initial building design was reduced by 5,000 square feet in order to lower construction costs and consequently has little room to accommodate future growth in the department’s space needs. Annual debt service for the Public Safety Building is approximately \$272,000 per year with approximately 8 years remaining.

As of 2018, the department had a fleet of 13 police vehicles. The department believes that its vehicles should have an average service life of six years, and so would like to replace two vehicles each year. In recent years, the department has not been able to maintain this replacement rate due to budgetary constraints. In 2018, the department had approximately five vehicles at least 6 years old.

Police Calls and Crime Rates. The number of police calls has been increasing slowly, but steadily in recent years. In the five-year period between FY2013 and FY2018, the number of calls increased by 20%. The general perception is that a significant percentage of police calls involve someone recently released by the state Department of Corrections, but there are also other factors leading to the increased number of calls such as the number of individuals with substance abuse and/or mental health issues living in our Community.

More than 75% of calls that the police department has responded to in recent years did not rise to the level of a crime. These included various types of citizen assistance, false alarms, and E911 hang-up calls, among others. A total of 315 crimes occurring in Barre City were included in the 2018 Vermont Crime Report, comprised of 70 violent crimes (homicide, rape, robbery, aggravated assault) and 245 robbery crimes (arson, burglary, larceny theft and motor vehicle theft). The city police department responded to more than 10,400 calls that year. The department is also responsible for administrative activities, and calls for service that are not criminal in nature. Between 2014 and 2018, our crime rates for violent crimes and property crimes have fluctuated greatly.

Property crime consists of arson, burglary, larceny theft and vehicle theft. Violent crime consists of homicide, rape, robbery and aggravated assault. State of Vermont statistics are based on 88 reporting

agencies throughout the State, including Barre City. These graphs show reported incidents, not cleared incidents by the enforcement agencies.

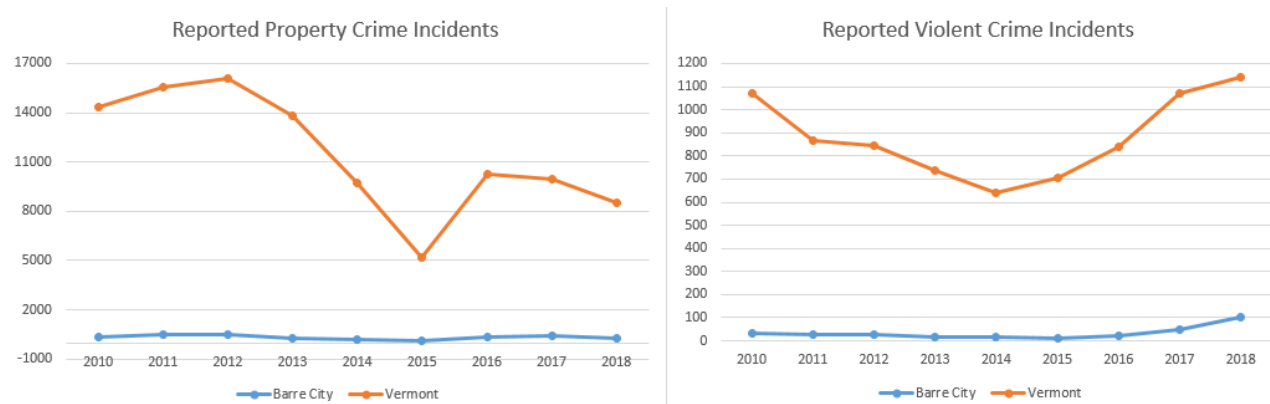


Figure 13. Crime Rates Tables
 Source: FBI Crime Data Explorer

Crime statistics vary greatly depending on the entity reporting them and the manner in which they are compiled. One thing that is consistent and a known number is calls for service, and Barre City Police Department’s calls for service are continuing to rise annually. This is reflected in a heavier case load for the Officers.

In the fall of 2018 we adjusted our table-of-organization to form a street crimes unit to address drug related criminal activity and this pro-active unit quickly showed its worth in addressing drug activity and drug related crimes.

We have also included the Community Outreach position in our budget (funded from outside sources prior to now) to assist and deal with individuals and complaints that are not criminal in nature and when people need assistance in accessing services through regular methods rather than utilizing the police.

Fire and EMS Department. Barre City has a municipally operated Fire and (Paramedic) Emergency Medical Service (EMS) Transport department. The department consists of a full-time Chief, Deputy Chief, and 16 full-time dual role Fire and EMS providers. We also maintain 5 paid on-call part-time employees. The department’s operating budget in FY18 was \$1.75M. This budget is offset by approximately \$671,000 in revenue from ambulance transports.

In FY2019 the Barre City Fire Department responded to 2,518 calls for service (1,990 Emergency Medical Services calls and 528 Fire calls). This is a slight decrease from FY2018 by 197 incidents.

The station is staffed by four shifts of 4 personnel available to respond at all times. When Fire or EMS are received, off-duty personnel are called in to cover the station to respond to simultaneous calls for service until the on-duty crew returns to the station.

Currently, the department has a fleet of 12 vehicles, including four fire apparatus, three ambulances, a utility truck and four staff vehicles.

Code Enforcement was incorporated into the fire department in 2012. Fire department personnel, including the Fire Marshal and the Electrical Inspector have been cross-trained as NFPA Certified

Fire Inspectors. They are responsible for fire prevention inspections to include: electrical, building and minimum housing. They inspect all rental properties and commercial establishments to ensure compliance with state law and city ordinances related to safety and health, and enforce most city ordinances.

Fire Responses. The City of Barre still continues to see a very active level of responses to fire based incidents. Barre is an old city and has a very diverse inventory of structures within the city limits. We are fortunate that many of the older structures related to the granite industry are sprinklered or otherwise protected by an alarm system. We also have a higher than average number of multi-family dwellings and apartment buildings. In FY2019, 30 of the fire responses were to structure fires.

EMS Responses. The number of EMS calls has been increasing steadily in recent years. This coincides with the aging of our resident population and other people with special medical needs living in our city. The lack of a national health care system also contributes to our high number of EMS responses due to the high number of residents who lack access to basic healthcare services.

Figure 14. Emergency Services Calls FY2014 - FY2018

	FY14	FY15	FY16	FY17	FY18
Police	8,589	8,503	8,984	9,435	10,471
EMS	2,256	2,147	2,188	2,558	1,900
Fire	613	592	527	565	528

Source: 2018 Annual Reports

Emergency Management. Emergencies and disasters are unpredictable, but through proactive planning and mitigation the danger, damage and disruptions from these events can be managed or minimized. Floods and severe weather occur quite regularly in Barre City. Many of the aspects of our close proximity to water and the emergencies which go with it are constantly monitored by emergency personnel. This includes the many rivers and streams which flow through our community to meeting with our state and federal partners about the failure and control of the East Barre dam.

Not surprisingly, flooding is the most commonly recurring hazard in Barre City. Our floodplain is highly developed and there are approximately 760 properties located within the 100-year floodplain. There are also properties outside the delineated floodplain that may be vulnerable to flood-related hazards.

As recently as 2015 and 2017 Barre City experienced devastating flood damage. In the previous two decades, flooding also occurred at least 9 other times. While the flood control measures that were put in place after the flood of 1927 and have reduced the severity of flooding in Barre City, the low-lying areas of the city still regularly flood with one to two feet of water during severe storms.

In recent years, more flooding damage has been a result of our stormwater drainage system's inability to accommodate surface run-off than of rivers and streams overflowing their banks.

On an annual basis, Barre City updates and approves its Local Emergency Management Plan (LEMP). The 2017 Hazard Mitigation Plan is incorporated by reference into this plan. Barre City also has adopted Flood Hazard Area regulations that meet the requirements of the National Flood Insurance

Program, which ensures that city property owners will be eligible for flood insurance and potentially federal assistance in event of significant flooding.

parks and recreation

Recreation. Barre City has a municipal Recreation Department within the Buildings and Community Services Department, and operates out of Alumni Hall. The department is responsible for the operation of the recreation facilities, and for offering a variety of year-round recreation programs for residents of all ages. The department's operating budget in FY 2017-18 was \$103,335. As a result of contributions from the Semprebond Fund, a number of playgrounds throughout the city have been upgraded with new equipment and other improvements in recent years.

The Recreation Department offers a range of programs throughout the year. The largest is the summer youth program based at Rotary Park where children can enjoy the pool (and take swimming lessons) and other facilities at the park. The program operates weekdays during the school summer vacation period, and serves lunch and a snack to the children. Various organized activities are scheduled for summer youth program participants. A number of private summer camps also use the pool at Rotary Park as part of their program. The municipal pool is currently undergoing a process to refurbish the existing shell of the pool, bring the chemical injection vault into an above-ground structure, and plans to add a splash park are being considered based on budget.

Many of the city's parks and recreation facilities serve not only city residents, but also to residents from surrounding communities. Generally, the Recreation Department's programs are designed to pay for themselves through user fees. The city earned about \$14,000 from admissions to the pool at Rotary Park. In addition, the picnic shelters in Rotary Park are rented weekends throughout the summer for parties, reunions, weddings and the like. Most programs have different fees for residents and non-residents. The city earned about \$165,000 in FY2017-18 from renting the BOR Shelter and another \$614,000 from the Auditorium.

At one time, Barre Town supported recreation facilities and programs in the city, which were then available to town residents on the same terms for city residents. There are few shared programs and coordination between the city and town, and the town has significantly reduced its financial contributions. Given the financial challenges faced by Barre City and its neighboring municipalities, coordinated recreation planning and programs between communities could result in more cost-effective programming, more varied programs and increased use of existing facilities. The Barre City Recreation Department should network with other communities and organizations to provide residents with access to more recreation opportunities.

The Recreation Department should work to respond to the city's changing demographics. While the number of school-age children and teens has declined in recent years, there appears to be a boost in the population of preschool-age children, which suggests that younger families are moving into the city. The department should look at programs and facilities targeted to these youngsters and their parents. The department is also seeing growth in the number of seniors. When upgrading neighborhood parks and playgrounds, the department should consider the needs and interests of older residents. The department has already begun to add benches to many of the parks, and wheelchair accessible swings.

Cemeteries and Parks. Barre City's Cemetery and Parks Department, which is charged with the operation and maintenance of three city-owned cemeteries and some of the city's parks. The department is based out of a facility at Hope Cemetery. The cemeteries include Hope Cemetery on Maple Avenue, Elmwood Cemetery on Washington Street, and St. Monica's Cemetery on Beckley Street; Hope and Elmwood Cemeteries continue to have lots for sale. The department also maintains City Hall Park, Currier Park, Dente Park, the Stonecutters Monument, and the Robert Burns Monument.

The Cemetery and Parks Department had operated as a separate entity with enterprise funds from lot sales and burial fees providing a bulk of the operating funds until 2011 when it became a city department. One of the reasons for that change was the ongoing decline in the department's revenue stream, which is largely due to more cremations and fewer entombments. At the same time, operating costs have continued to rise, making it difficult to sustain an adequate level of services and maintenance. In future years, funding for cemetery and park maintenance will likely need to be allocated to the department from the city's general revenues to supplement the income generated from these facilities.

Cemetery maintenance is particularly important in Barre City because Hope Cemetery is a showcase of the city's granite carving heritage. Many tourists visit Hope Cemetery annually to view the ornate and unique monuments created by generations of local artisans, and can do so by calling the Buildings and Community Services office. The Cemetery and Parks Department does generate some revenue by offering guided group tours of Hope Cemetery annually. Hope Cemetery is an unparalleled cultural resource that could be more effectively marketed as part of Barre City's efforts to attract visitors.

Education

Education. 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 City Elementary and Middle School (BCEMS), built in 1994 and located at 50 Parkside Terrace, is a modern, well-maintained Pre-Kindergarten through Grade 8 facility, that meets Vermont's Public School Approval (PSA) standards. Barre City and Barre Town share a common high school, Spaulding High School, built in 1964 and located at 155 Ayers Street. The Central Vermont Career Center, collocated with Spaulding High School, offers hands-on Career Technical Education (CTE) training programs for high school students and adults from throughout Washington County. Barre City, Barre Town, and Spaulding share a PreK-12 superintendent and central office, located at 120 Ayers Street. Several private schools help round out the choices parents have in the education of their children.

During the 2018-2019 year, under Act 46 of 2015 the Vermont State Board of Education implemented an Order to Merge that merged the Barre Town Elementary Middle and Elementary School, the Barre City Elementary and Middle School, Spaulding High School and the Central Vermont Career Center into one single unified school district effective July 1, 2019, titled the Barre Unified Union School District (BUUSD).

Because Vermont has changed its accountability system with the federal reauthorization of the Elementary and Secondary Education Act, from No Child Left Behind (NCLB) to the Every Student

Succeeds Act (ESSA), the state assessment reporting system has also changed. Accountability information for the Barre schools can be found at: <https://schoolsnapshot.vermont.gov/>.

Barre City Elementary and Middle School - With the passage of Act 166, the Universal Pre-Kindergarten law, enrollment for Pre-Kindergarten includes students who attend a qualified private provider 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 90. While some students are enrolled in private provider centers, the relatively large capacity of the public school PreK program keeps outside enrollment relatively small.

The charts below describe total enrollment over the last decade for BCEMS. Enrollment has fluctuated between the low and high 800's over these years.

PRE-SCHOOL TO GRADE 8 ENROLLMENT/COST PER PUPIL		
School Year	Student Body	Cost per Pupil
2010-11	876	\$9,818
2011-12	855	\$10,273
2012-13	861	\$10,960
2013-14	898	\$11,475
2014-15	895	\$11,362
2015-16	882	\$11,496
2016-17	875	\$11,862
2017-18	892	\$12,448
2018-19	898	\$12,995
2019-20	887	\$13,556
Total Change: 11		
Avg. 10 year cost per pupil: \$11,625		

56 percent of BCEMS students were eligible for free or reduced lunch in 2018-19 based on federal guidelines, which is a high percentage as compared to other Vermont schools. Because this exceeds the threshold for the Community Eligibility Provision, all students in the school actually receive a free breakfast and lunch. The school had 102 full-time teachers and a student-teacher ratio of 8.8, which is close to the Vermont average, in 2018-19.

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 a number of tuition students from surrounding towns. In recent years, improvements to the school include a renovated library, interactive boards in all classrooms, new uni-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		
School Year	Barre City Students	Cost Per Pupil
2010-11	376	\$10,153
2011-12	370	\$11,108
2012-13	395	\$11,580
2013-14	387	\$12,340
2014-15	397	\$12,448
2015-16	375	\$12,474
2016-17	382	\$12,892
2017-18	369	\$13,347
2018-19	357	\$13,352
2019-20	328	\$13,556
Total Change: -48		
Avg. 10 year cost per pupil: \$12,325		

Approximately 29 percent of Spaulding’s students were eligible for free or reduced lunch in 2018-19 based on federal guidelines, although high school students are historically under-reported. This does not meet the threshold for the Community Eligibility Provision. Spaulding High School had approximately 96 full-time teachers and a student-teacher ratio of 7.5 in 2018-19.

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

The collection includes over 62,000 physical titles, available throughout both locations or at a specific location by request. The staff of twelve are available to connect patrons to specific information in the library as requested. Additional titles are available with interlibrary loan services. The library 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 the 3-D printer, 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 libraries are open a total of 54 hours per week. The location on Washington Street is open Monday through Friday from 11 a.m. to 7 p.m., and Saturday 10 – 2, and the Mill Street location is open Tuesday and Thursday mornings from 9 a.m. to noon, and Sunday afternoon from 12 p.m. to 4 p.m. Aldrich hosts programs throughout the year, including two weekly Children’s Storytime programs, before open hours. These special events and library programs can be found at the website, www.aldrichpubliclibrary.org. The current list of trustees, employees, library policies, board meeting information and our strategic plan can also be accessed at the website.

As municipal supporters of Aldrich Library, all Barre City residents are eligible for a patron membership. Barre City contributes \$221,550, or \$25.59 per resident to the Aldrich Public Library. This meets 35.4% of the operating budget for Aldrich Library. Barre Town, user fees, fundraising activities, community groups, and investment returns complete the Aldrich operating budget of \$626,050.

history and culture

Barre City has a wealth of historic and cultural assets that express our community’s unique heritage. There are two National Register Historic Districts in the city, as well as a number of individually listed sites and buildings. Our downtown is home to a number of culture and arts institutions. Some of these include:

Barre City Hall and Opera House. The Barre City Hall and Opera House at 6 North Main Street across from City Hall Park is one of our city’s most impressive landmarks. Completed in 1899, the Neoclassical building represents an era when a city’s civic pride and economic prosperity was manifest by the construction of major public buildings. The building continues to function as it did a century ago when it first opened. Offices for City Hall occupy the basement and first floors, while the Opera House encompasses the upper floors.

When it opened in August 1899, the Opera House was considered the finest theater in Vermont. Today, that space is considered one of the best-preserved late-19th century small theater interiors in northern New England. The Opera House experienced a decline in use after World War I and eventually closed in 1940 for a period of more than 40 years. The Opera House reopened in 1982, although in need of much repair. It was renovated over the next decade, and reopened in 1993. Many of the original interior details remain including the original balcony and ornamented boxes, proscenium arch, art glass fanlight and pressed metal ceiling. The exterior of the yellow and red brick structure, like so many in Barre, features ornamental granite.

Old Labor Hall. A unique National Historic Landmark has been preserved in Barre City – the Socialist Party Labor Hall and the Union Bakery Building at 46 Granite Street. Located in what was Barre City’s Italian section, the Socialist Labor Party Hall is a two story flat-roofed brick structure with a gambrel-roofed single story rear hall. Its design reflects no particular architectural style, but its form does illustrate the building’s function as an assembly hall. The exterior is simply ornamented with Barre granite details. The most important of these is a carved medallion depicting an arm bearing a hammer, the symbol of the Socialist Labor Party, and the initials SLP.

Volunteers of the Italian community built the building in 1900 as a center for union activity, social events and community support. For nearly four decades, the hall was an epicenter of radicalism and reform. Internationally known political and labor leaders delivered impassioned speeches on

workers' rights and social policy. At a time when Vermont was solid Anglo Saxon, Protestant, Republican, and anti-union, Barre City was a hotbed of anti-establishment, anti-clerical, and anti-capitalist causes – anarchists, socialists, syndicalists, American Labor Party supporters, and Industrial Workers of the World (Wobblies) met at the Labor Hall. When the hall opened in 1900, there were 15 local unions and more than 90% of Barre's workers were union members. The Labor Hall held the offices and meetings of the Granite Cutters International Association, at the time the largest local union of granite workers in the country. For the Italian immigrant community, the Labor Hall was not only a community center, but the Union Cooperative Store was in the basement, and provided a source for Italian foods and ingredients. There was also a bakery and a laundry in the basement, as well.

The post-World War I “red scare” and the notorious trial of anarchists, Sacco and Vanzetti, in 1920 created a national paranoia that dampened the fervor of radical groups. The Labor Hall continued to function under socialist stewardship during the 1930's, although less vigorously, until 1936 when it was sold at auction to the Washington Fruit Company to be used as a warehouse and remained as such for nearly 60 years. A local bank foreclosed on the building in 1994 and a group of local residents, with the support of present-day labor organizations, mobilized to save the building. In doing so, they also revived the defunct Barre Historical Society, which is housed in the hall, and the building is used for community events and, once again, political meetings. The Bakery Building was renovated and finished in 2019, and now houses Rise-Up Bakery, offering fresh baked breads out of a wood fired oven during the week.

Studio Place Arts. The Barre Historical Society and a group of artists developed a plan to save the Nichols Block in downtown from demolition. After major renovations, the building re-opened in 2000 as Studio Place Arts, a community arts space. SPA has become an important regional resource for art making, learning and exhibition, and provides programs that attract people from around the region. SPA's mission includes providing a threefold benefit to the city – economic development, cultural enrichment and community service. Barre City is an ideal location for SPA because it is a city that has a rich cultural history tied to the granite industry and the many artisans who immigrated to the community from Europe to work carving granite. Historically, nearly all of the resource extraction, manufacturing jobs, and creative, skilled work in Barre City were connected to the local stone carving tradition. Resident artists have provided beautiful carvings in the last few years that are installed around the city. They include bike racks, of which one is installed near the Aldrich Library, carvings out in front of the SPA building, and a recent carving placed on the newly completed Pearl Street pedestrian way. These all can be seen while completing the “Art Stroll”, a guided tour of art installations throughout the City, and can be found on Studio Place Art's website.

Vermont History Center. In 2000, the Vermont Historical Society acquired the historic, former Spaulding School in downtown Barre City. They have renovated the building to house an exhibition space and administrative offices on the first floor. The building's second floor is the Leahy Library, a center for historical and genealogical research open to the public. The library contains a variety of resources documenting the history and people of Vermont, including a collection of books, pamphlets, letters, diaries, ledgers and scrapbooks dating from the 1770's to the present. Some of Vermont's earliest maps and planning documents are available at the library, as well as an extensive collection of photographs and broadsides. With a special interest in family history, the library has the largest printed genealogical collection in the state. The Vermont Archaeology Heritage Center which serves as the central warehouse for artifacts and archives of Vermont's past moved into the building in the 2017-2018 timeframe. And, the Vermont Department of Libraries moved to the History Center at approximately the same time, that supports libraries in Vermont as they work to insure access to quality information for all library patrons.

Vermont Granite Museum and Stone Arts School. The VGM (Vermont Granite Museum and Stone Arts School) is located on a 12-acre parcel of Route 302 at the northern gateway to the city. The museum is located in the Jones Brothers Company's original 25,000 square foot granite shed built in 1895 (the largest ever built at that time) and restored in 2002 by over 300 central Vermont citizens beginning in 1994.

The granite shed housing the museum is a long timber frame building, which is now supported by steel trusses and a new concrete foundation added during the 2002 renovation. The renovation also built a new exterior over the original, which allowed the building to be fully insulated while preserving the look and feel of the original raw interior timber frame and presenting the exterior as it would have looked originally. The main shed received a new concrete floor with heating and plumbing in 2016. A smaller, 1,600 square foot space extending off the shed was completed in 2008 to house research materials, an exhibit area, meeting room and class room. Part of the main shed houses a state-of-the-art stone carving facility that includes eight carving bankers, two sandblasting rooms and a 7.5-ton overhead crane.

VGM provides tours seasonally throughout the year, and welcomes camp, school, community and bus tour groups. It is a museum committed to providing engaging learning experiences for children, teens and adults. VGM can be rented for private, corporate and community groups for cocktail receptions, luncheons, dinners, meetings, seminars and even wedding receptions. They host a variety of events outdoors, and have installed the historic granite train engine on the grounds, along with the beautifully carved welcome sign at the edge of Route 302.

Barre Downtown Historic District. The Barre Downtown Historic District includes the area around Depot Square, Main Street and Washington Street, and west to the railroad. The commercial and public buildings that form the Barre Downtown Historic District reflect our city's rapid transformation in the 1880's from a rural farming community to an urban, industrial center.

With the arrival of the railroad, downtown was rapidly transformed from a small residential village to a streetscape of multi-story commercial, institutional, and industrial blocks. As a result, most buildings within the district reflect architectural styles popular at the end of the 19th century. The need for accomplished stone workers resulted in a wave of immigrants. In contrast to other Vermont communities, Barre was uniquely shaped by the variety of cultures, political ideas and traditions these immigrants brought with them. Their craftsmanship, as well as those of local artisans, is reflected in the quality and character of the historic district.

After a period of decline in the second half of the 20th century, the Downtown Historic District is enjoying a wave of renewal and reinvestment. Many of the buildings have undergone renovations fostered by federal historic preservation tax credits and strong local support for downtown revitalization. A walking tour of the district is available.

Currier Park Historic District. Currier Park Historic District includes the homes around Currier Park on Park Street, East Street, Academy Street and North Street. It is a well-preserved planned neighborhood dating from the late 19th and early 20th centuries. The land that now comprises the Currier Park Historic District was the last large farm adjacent to the central business district, known as Currier Farm. In 1883, Steadman C. Chubb began developing his land as a new residential neighborhood. He laid out streets and building lots, and donated a two-acre lot at the center of the neighborhood to the city to become Currier Park. Large lots front on tree-lined streets with frame homes built to uniform setbacks characterize the Currier Park Historic District. The large residences

surrounding the park were constructed for wealthy families prospering from the city's economic growth. Many have now been subdivided into multi-family buildings or converted to non-residential uses.

Wheelock Law Office. The historic Wheelock Law Office is a city-owned building at 135 North Main Street that has housed the Barre Senior Citizen Center from 1975 to 2014. The building was constructed in 1871 as a law office and courtroom and pre-dates the surrounding larger block buildings. The Wheelock Law Office is the only residentially-scaled building remaining downtown on North Main Street from the pre-railroad period when the street was a wide tree-lined thoroughfare flanked by imposing residences. Many of the building's original elements remain which characterize the Second Empire architectural style, including a slate mansard roof, projecting entrance tower, deep moldings, and arched and pedimented windows and doors. Although the building has undergone some significant alterations on the first floor, the second floor is still intact. Many small retail businesses have occupied the building throughout its history. Since 1975, it has housed the Barre Senior Citizen Center and an Antique and visitor center. In 2019, The Barre Partnership moved their offices to the front of the first floor space, and the City is working on filling the remaining rear portion of the building with a potential teen center.

Italian Baptist Church. The historic Italian Baptist Church at 10 North Brook Street is a unique example vernacular architecture built between 1906 and 1908. Designed by the church's first minister and built largely by volunteer labor from immigrant Italians, the result was an adaptation of Northern Italian Renaissance style churches. The monumental front on the building, almost entirely comprised of local granite, includes polished granite Doric columns and other granite elements include rusticated granite blocks, smooth granite panels for the walls, and decorative pilasters and frieze.

The Italian Baptist Church also speaks to the role religion played in the assimilation of new immigrants in America. The Baptist Association of Vermont established the church in the midst of the city's Italian neighborhood not only to attract new members, but also to assimilate immigrant cultures and values into American society. By World War I, many Italians immigrants had become Baptist churchgoers but by the 1930's the congregation had dwindled and the building became the meeting hall for a fraternal organization. Subsequently, the building housed other denominations and has been used as a commercial building.

Twing Gristmill. The historic Twing Gristmill is located at 450 North Main Street. The Hill-Martin Corporation used the gristmill for their business offices, and left the space in 2017. The building was built in 1844 as part of an industrial mill and iron castings complex. The brick gristmill, the only building to remain of the large complex, is representative of Barre's pre-railroad industries. For an industrial building, Twing's gristmill was unusually ornamented, especially the interior, with a double spiral staircase, paneled walls, marbleized columns, and wallpaper. Decorative granite trim was liberally applied to the exterior. By 1910, the building had become a storage house. In the late 1970's with virtually nothing remaining of the interior mechanical systems, the Hill-Martin Corporation undertook the rehabilitation of the mill for their offices. Many of the original interior details exist and were adapted into the office space. In the 1990's, other offices were using the space, and by the early 2000's, the buildings were vacant. A devastating fire to the gristmill occurred in 2018, and the owners are working to sell and/or renovate the property.

health and human services

Childcare. The 2018 estimated Census predicts 1,088 families in Barre City will have children under the age of 18; 47% of those families were married couples and 53% were single-parent families. The percentage of single-parent families in Barre City is much higher than in the state (34%) or county (35%). Of the nearly 600 pre-school age children living in Barre City according to the 2010 and 2018 estimated Census, 560 (95%) had all their primary caregivers in the workforce. There were also around 880 school-age children living in households where all their primary caregivers worked.

While more precise estimates of demand for childcare are not available, it is clear that many parents in the city need childcare services to allow them to work outside the home. There are also parents who are employed in, but do not live in, Barre City who want childcare that is located near to where they work. The availability of quality, affordable childcare is an economic development asset – as many employers recognize that without this service their ability to attract and retain employees will be reduced.

Vermont regulates both daycare centers/programs and home daycare providers, and childcare providers can seek various levels of accreditation as appropriate to the type of services offered. There were 5 licensed daycare centers/programs and 15 registered home daycare providers located in Barre City in October of 2019; the number of providers in the city fluctuates regularly, particularly the number of registered home daycare providers. The licensed daycare providers can accommodate approximately 200 pre-school and school aged children were reporting fewer than 10 vacancies, while the home daycare providers could have accommodated 22 additional children out of the almost 150 available slots in total.

Parents in Barre City seeking a childcare provider or related assistance can contact Child Care Support Services at the Family Center. Their staff can refer parents to childcare providers with openings, and help parents find financial assistance to make childcare more affordable for families. The center also offers support and training to childcare providers in the region.

Seniors. Barre City has a large population of seniors and is a regional provider of elderly housing with approximately 300 senior housing units. Approximately 20% of Washington County residents age 74 or older live in Barre City and those residents account for 5% of the city's total population. According to the 2018 estimated Census, there were 734 city residents age 65 to 74 and 461 city residents age 74 or older. Older residents, particularly the frail and elderly have a greater need for public services like healthcare, EMS and transportation, while more active seniors have leisure time to participate in community activities and enjoy public amenities like parks and recreation programs.

The BASC (Barre Area Senior Center), formerly located on North Main Street, is housed at 133 S. Main Street, fondly referred to as the Wall Street Complex, in which the BASC occupies one of the units. BASC provides seniors with a variety of social, educational and health-related activities. The center has approximately 385 members and is open weekdays from 9 a.m. to 3 p.m. A bequest in 2010 from the estate of Ronald York has allowed the Barre Area Senior Center to hire a full-time director. BASC offers lunch every Tuesday, along with arts and crafts, dance, fitness, singing, book discussion, genealogy and writing classes, board games and technology workshops.

There are also a number of nonprofit organizations working in Barre City that provide various services for older residents including:

- Project Independence is an adult day health services center that offers a program of services and activities designed to promote the health and well-being of frail elders and people with disabilities from a center at 81 North Main Street in downtown Barre City on weekdays from 7 a.m. to 4 p.m. The center serves up to 65 participants.
- Central Vermont Council on Aging (CVCOA) serves adults aged 60 and older living in Central Vermont, with 54 towns in several counties. assists more than 1,300 Barre City seniors annually with community and home delivered meals, health insurance counseling, transportation, family caregiver support and respite, companionship, help with household tasks, mental health services, and legal services.

Healthcare. Bare City residents can access a range of healthcare services within the city and neighboring communities including:

- The Central Vermont Medical Center (CVMC) is a member of the University of Vermont Health Network, and is located off Route 62 in Berlin approximately four miles from downtown Barre. it is the region's primary healthcare provider for the 66,000 people that live and work in the 26 communities of Central Vermont. CVMC includes a 122-bed hospital, which provides 24-hour emergency care, a full spectrum of inpatient and outpatient services, the National Life Cancer Treatment Center, 17 medical group practices (including several practices with offices in Barre City), and the Woodridge Rehabilitation and Nursing Home.
- The People's Health and Wellness Clinic, located at 553 North Main Street, provides primary care to uninsured and under-insured patients who could not otherwise afford healthcare services. The clinic is largely staffed by health practitioners from around Central Vermont who donate their services, and medical and nursing students volunteering as part of their studies. Barre City residents make more than 400 visits to the clinic annually, among the 44 towns that have been served.
- Central Vermont Home Health & Hospice, based in Barre Town, is a full-service, nonprofit Visiting Nurse Association that provides medically-necessary home health and hospice care to Barre City residents regardless of their ability to pay. The agency promotes general health programs in the community such as vaccinations, health screenings, workshops, clinics and caregiver support. Home care services included skilled nursing, home health aides, rehabilitation therapies, medical social services, long-term care services, homemaker service, respite care, private duty nursing, and hospice care for the terminally ill.