

# **PLYMOUTH TOWN PLAN**

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**The Plymouth Town Plan was prepared by the Plymouth Planning Commission  
with assistance from  
The Two Rivers - Ottauquechee Regional Commission  
Woodstock, Vermont**

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## I. INTRODUCTION

The Town Plan serves as a guide for the future growth and development of the land, public services and facilities of the community. This Plan is designed to assist town officials in exercising their duties while ensuring that the desires of Plymouth residents are considered when decisions are made.

Planning is a continuing effort and local planning is a vital and necessary function. It is through local planning that the individual needs of the community are met.

This Plan represents how the citizens of Plymouth feel about growth in their town. It also acts to influence, by means of the goals and recommendations set forth, what forms future growth will take.

The following are objectives of the Plan:

1. To preserve and enhance the special qualities and atmosphere of Plymouth as a traditional small rural community.
2. To provide a pleasant and convenient environment for the people of the town, including residential areas suited to their varied needs, business and consumer services to meet their wants, increased opportunities for employment within the town, and the proper level of public services such as fire protection, utilities, and recreation.
3. To protect the town's environmentally sensitive areas such as the lakes, rivers, streams, ponds, marshes, floodplains, slopes, ridgelines, wildlife habitat, and forests and to preserve open space.

Within the framework of these objectives the following planning policies are guides for general proposals for future growth in the town of Plymouth:

1. To protect and enhance the natural resources of the town for their best use for recreation, forestry, and agriculture.
2. To encourage the concentration of new residential development in areas served by existing town services.
3. To encourage, through multi-family and cluster development, the conservation of energy and the preservation of open space.
4. To encourage development of new service and commercial enterprises in appropriate locations to maintain the character of the town.
5. To encourage clean, small-scale commercial businesses.
6. To welcome and encourage citizen participation at all levels of the planning process.

## II. LAND USE

**Town Setting:** The Town of Plymouth comprises an area of 29,861 acres or almost 46 square miles (Listers' figure, 1/2/00). It consists of two physiographic areas separated by the north-south running valley formed by the Black River. To the west of this valley is a section of the Green Mountains, characterized by steep slopes and rugged terrain. To the east are intermountain valleys and low foothills, containing only a few peaks above 2000 feet.

**Land Use:** Table 1 and the attached Plymouth Land-Use Map indicate land use characteristics.

**TABLE 1**  
**LAND USE CHARACTERISTICS**

	<b>2018</b>
<b>Residential 1 (on – 6 acres)</b>	429
<b>Residential 2 (on + 6 acres)</b>	206
<b>Mobile Homes on rented land</b>	1
<b>Mobile Homes on owned land</b>	18
<b>Vacation Homes 1 (on &lt; 6 acres)</b>	49
<b>Vacation Homes 2 (on &gt; 6 acres)</b>	15
<b>Other (including condos)</b>	112
<b>Total Residences</b>	830
	<b>2018</b>
<b>Commercial Establishments</b>	40
<b>Industry</b>	1
<b>Public Utilities</b>	2

SOURCE: Vermont Department of Taxes.

Beginning in 2004, all real property in the local grand list books was reclassified as either homestead or nonresidential for tax purposes. Owners of homesteads are assessed at different rate than nonresidents by their towns or cities. A statewide education tax is applied to the two classes of property and adjusted for the common level of appraisal for each school district.

Between 1987 and 1999 the number of second homes increased by 23% from 427 to 529. The number of year-round residences increased between 1987 and 1999 by 63%, a figure that in many cases represents retired people who are now using their second homes as year-round residences. This situation appears to have leveled off since 1999. However, the ratio of second homes to year-round residences remains almost 4:1. Many unimproved lots are privately held by persons residing outside of Plymouth who intend to build at some future time.

There are four areas of relatively intensive settlement in the town. These are the village of Plymouth Union, the hamlets of Plymouth Notch and Tyson, and the Hawk Inn and Mountain Resort. These areas contain relatively high densities of single-family residences as well as most of the town's commercial enterprises. Another large concentration of single-family residences is in the southern part of the town around or near Lake Amherst and Echo Lake. The remaining residences are unevenly spaced along the town's road network.

Most of the town's commercial/retail establishments are local or tourist in nature and are located on or near the state highways. The town's two industries are the Plymouth Quarry (Markowski) and Plymouth Cheese. The latter is a year-round employer. Farm and Wilderness and Bethany Birches camps are seasonal employers also located within Plymouth.

More than 90% of the land in Plymouth is devoted to forest use. The largest single owner of forestland is the State of Vermont. Table 2 summarizes ownership by State Agencies of lands which are predominantly forested. In addition to these public lands, a total of 5,681 acres of privately held land are enrolled in the state's Current Use program, as of 2008. The Current Use program, also known as the Vermont Use Value Appraisal Program, allows landowners to pay taxes on open land based on the value of the land for farming or forestry. In Plymouth, Current Use saves these landowners nearly \$100,000 in taxes. The Nature Conservancy owns the 13 acre "Plymouth Caves" property, one of the state's foremost caves for hibernating bats, and has been involved in several other land conservation projects in Plymouth.

The Town of Plymouth has been negatively impacted by Vermont legislation on education funding. Property owners have seen taxes increase substantially during the last 10 years, without an increase in the level of services they receive. The Town of Plymouth has historically taken a very fiscally responsible approach to its education and municipal spending, striving for maximum value for every tax dollar collected. The enactment of Act 60 and Act 68 have required that the Town of Plymouth contribute to the education funds of other towns. Townspeople have supported efforts to send a message to State Government that the current methods for funding education are grossly inequitable.

**TABLE 2**  
**LAND OWNERSHIP BY STATE OF VERMONT**

**Agency of Natural Resources, Forest, Parks, and Recreation:**

Coolidge State Forest	6782.6 Acres	
Camp Plymouth State Park	295.0 Acres	
Miscellaneous Lots	<u>252.4 Acres</u>	
	<b>Total</b>	<b>7,330.00 Acres</b>

**Agency of Natural Resources, Fish and Wildlife:**

Amherst Lake Access	.18 Acres	
Echo Lake Access	.03 Acres	
Colby Pond Access	32.49 Acres	
Woodward Reservoir Access	1.47 Acres	
Arthur Davis Wildlife	2562.22 Acres	
Plymbsbury W.M.A.	288.00 Acres	
Tiny Pond Area	174.3 Acres	
	<b>Total</b>	<b>3,058.69 Acres</b>

**Agency of Commerce and Community Development  
Division for Historic Preservation**

East Mountain/Wilder Meadow Tracts	386.00 Acres	
Johnson Farm	138.00 Acres	
Blanchard Farm	41.8 Acres	
Smaller lots	<u>32.66 Acres</u>	
	<b>Total</b>	<b><u>598.46 Acres</u></b>

**Total all lands      10,987.25 Acres**

SOURCES: Agency of Natural Resources & Agency of Commerce and Community Development

The total State-owned acreage (10,987.25 acres) constitutes more than one-third of the area of the town of Plymouth. The Agency of Natural Resources plans to continue to manage its lands for their current uses of forestry, recreation, and wildlife management. The Division for Historic Preservation's management objectives for the Plymouth Notch Historic Site include ongoing operation as a State Historic Site, preservation of lands surrounding the village to maintain the rural character typical of Plymouth Notch during Calvin Coolidge's era, and the long-range possibility of reviving a small dairy operation.

Little land in Plymouth is now used for agricultural purposes. Isolated hayfields and pastures are found along the two State highways and Hale Hollow Road, around Plymouth Notch and Colby Pond, and in some upland areas.

The majority of land in Plymouth remains undeveloped. As such, the citizens and policy makers of the town have the opportunity to manage future growth to protect and enhance what we most value about our town.

### **Future Land Use**

Plymouth's year-round population has increased substantially between the last two Censuses, from 555 in 2000 to 619 in 2010. The number of vacation homes almost doubled between 1980 and 1990, indicating a significant increase in seasonal population. As the regional ski industry continues to expand and the town's natural and recreational resources continue to attract summer visitors, we need to carefully manage increased second home development.

Traditionally, Plymouth's land use pattern has consisted of small village settlements, including Hawk Inn and Mountain Resort, with high densities of residential and commercial uses, surrounded by sparsely settled forest and agricultural lands and pristine natural areas. This pattern of development is what we define as our town's rural character. In the past, this pattern has answered social and economic needs and allowed for the efficient provision of community services. We continue to appreciate the beauty of clustered village houses, isolated farms, and scenic mountain vistas resulting from these traditional land uses, and this Plan seeks to maintain its rural character and this pattern of development.

Many of Plymouth's residents are spread throughout the town, living along the network of mostly unpaved "back roads." It is the small, compact villages, the open fields and forest lands, the historic structures, and the many trails and ancient roads that define Plymouth's rural character. Maintaining the balance between Plymouth's villages and the residential development of the areas surrounding them is essential to maintaining the town's rural character. Home businesses and small commercial enterprises that can contribute to the town's rural character are not only welcome, but encouraged.

As our economy has shifted away from agriculture, increasing numbers of residents have entered the service sector or have gone beyond the town's borders to find work. The Town of Plymouth supports local employment and economic growth, particularly the growth of clean, small commercial uses in areas designated in this Plan.

Commercial operations catering to the public and light commercial enterprises are planned for existing village areas only. "Strip development" along roadsides outside these village areas shall not be permitted. Home occupations and small businesses may fit in rural residential areas with conditions that limit their impact on the surrounding areas. High density development is not possible in town at this time due to a lack of public sewer and water.

Residential development may be located in the Village, Vacation-Resort, Mountain- Recreational Areas, and the 2-, 5-, and 10-Acre Rural Residential Areas where topography and soils will allow, and shall avoid steep slopes and high elevations. Development on ridgelines shall not break the silhouette of the hill. The development of the largest, contiguous agricultural and forest areas is discouraged, while some small patches of current agricultural areas may be



suitable for low density development. The 10-Acre Rural Residential Areas are suitable for very low-density development and follow the existing Class 1, 2, and 3 roadways so no new public roads need to be built.

The very rural, essentially undeveloped areas designated in this Plan as the Conservation Areas are proposed to be maintained in their undeveloped state, hosting only small camps (defined as buildings that do not exceed 1,000 square feet in size and are not connected to the electrical grid), and any pre-existing housing units. Other significant natural and fragile areas in Plymouth (See Chapter VII) are not conducive to development due to the presence of steep slopes or that have very limited highway access are planned to have little development. These areas should instead be conserved for forest or watershed resources or should be used for recreational purposes.

A Future Land Use Map has been produced and is part of this Plan to illustrate the desired future land uses in Plymouth. The map can be found at the end of the Plan. To ensure that Plymouth’s landscape is protected for future generations, seven Land Use Areas and three Overlay areas have been established:

Future Land Use Areas

- ❖ Village Areas
- ❖ Vacation-resort Area (VR1)
- ❖ Mountain- recreation Area (MR1)
- ❖ 2 Acre Rural Residential Areas (RR2)
- ❖ 5 Acre Rural Residential Areas (RR5)
- ❖ 10 Acre Rural Residential Areas (RR10)
- ❖ Conservation Areas (CON25)

Overlay Areas

- ❖ Shoreland Overlay
- ❖ Coolidge Homestead Historic Overlay
- ❖ Flood Hazard Overlay

**Overall Land Use Policies**

1. It is a policy of the town to locate higher density mixed use development in the Village Areas.
2. It is a policy of the town to encourage both residential and non-residential development only in areas where adequate public services are available.
3. It is a policy of the town to protect and conserve rural areas and their natural resources by promoting conservation and sustainable resource management.
4. It is a policy of the town to preserve undeveloped farmlands and forest lands. Such tracts should remain predominately as undeveloped or limited development areas for the purposes of conserving existing resource values.
5. It is a policy of the town to ensure the future of and protect the following: forestry under sound silvicultural guidelines, wildlife habitat, unique plant or animal habitats, clean air, and the ability to see the night sky without the interference of bright lights. Wetlands and watercourses in general are afforded protection under Federal and State rules but should be given special consideration in the town's regulations.

6. It is a policy of the town to permit development in a way that sustains the town's rural character.
7. It is a policy of the town to consider scenic values in development and land use decisions.
8. It is a policy of the town to support existing forest and conservation programs.
9. It is a policy of the town that development will not have any negative effects on public or private water supplies.

**Land Use Regulations and Act 250**

Under Criterion 10 of Act 250, any proposed project must conform to all duly adopted local and regional plans. The law seeks to ensure that new development respects the wishes of Vermont citizens about the future of their town and region.

The following is a list of standards that the Town of Plymouth requires developers to meet for all land use proposals. All projects requiring an Act 250 permit shall conform to the following Standards. Conformance with these Standards is required for compliance with the Plymouth Town Plan under Criterion 10 of Act 250.

**Lot Layout Standards – All Uses**

1. Monotonous lot layout of equally sized and shaped lots, especially along a road frontage is discouraged.
2. The amount of frontage and building position shall be varied from lot to lot to avoid a suburban pattern of repeated houses or other buildings situated at or near the middle of adjacent lots one after another.
3. Creating more than one adjacent lot with a depth greater than four times its frontage (“spaghetti lots”) is discouraged.
4. Lot layouts should take advantage of, and preserve, desirable features, such as stone walls, hedgerows, fields, natural clearings, and land contours.
5. Avoid locating buildings at the top of ridgelines or at the brows of hills where land is open and sites would be highly visible from nearby public roads.
6. Locate buildings and other construction such that they will preserve natural or scenic features, such as bodies of water or historic resources.
7. Commercial uses should be located where they can be screened from neighboring properties.
8. Locate any noisy, toxic, or noxious uses away from public roads or neighboring properties (especially housing), and/or take all reasonable means to screen or eliminate any detrimental impacts of such uses. This provision does not apply to agricultural uses.

**Commercial Development Standards**

1. Construct buildings that are of the size, scale, and character of other buildings in the Area in which they are located.
2. Development shall be located in clusters set back from State or town roads.
3. Existing buildings or parts thereof should be reused for commercial development where feasible.
4. Large parking areas shall be located at the sides or rear of such buildings. Where feasible, share parking areas between adjacent uses.
5. Commercial signs shall be illuminated from above.

6. Share all curb cuts to State or town roads. Minimize paved or impermeable areas.

**Overall Land Use Recommendations**

1. For larger subdivisions, encourage allowing a rural version of cluster development, with shared access to open spaces.
2. Encourage burial of all new utility lines.
3. Encourage the preservation of stone walls and stone foundations.
4. Ask the State to monitor water quality in lakes, ponds and rivers for coliform pollution and to identify the source.
5. Allow future growth at a rate not greater than the town's ability to assume additional costs brought on either directly or indirectly as a result of that growth, and that is compatible with the town's character. Particular attention should be paid to road frontage for individual lots and to subdivision proposals.
6. The Planning Commission should encourage sustainable and productive forest lands.
7. Lot layouts should maintain trees and existing vegetation adjacent to State or town roads. A landscaped buffer (using native plants and trees) should be part of any new construction adjacent to State or town roads.
8. The Town of Plymouth should adopt a policy to discourage any derelict or abandoned buildings, deemed non-habitable; the specifics to be addressed in a Zoning Ordinance.

**Village Areas (R1)**

Areas of concentrated development -- Plymouth Union and Tyson -- are the focal points of the town, providing a sense of place or identity, a center for community interaction, and a contrast to the surrounding rural countryside. As the town grows, this system of villages must continue to fulfill these important functions.

The purpose of the Village of Plymouth Union is to serve as the town center, with the Town Building, inn (the Salt Ash), and commercial/retail establishments, allowing the highest density development of all land use areas in this Plan. As the town develops, intensive land uses should enable it to continue to function as the town's social center, protecting other lands in the town from unwarranted scattered development and helping prevent strip development along Route 100 and 100A. Tyson village is a smaller village than Plymouth Union and should continue to be composed of single family dwellings and a locally oriented store. The Echo Lake Inn and the Inn at Waters Edge are both located in Tyson village. Tyson contains an historic church as does the Coolidge Homestead Historic Overlay portion of Plymouth, which, it is hoped, will continue to serve an important community function.

High-density housing is encouraged in these villages, both traditional single-family dwellings and multi-family units. These areas are especially appropriate for multi-family workforce housing and senior housing.

**Goal**

1. To strengthen the existing 'sense of place' in Plymouth Union and Tyson villages by encouraging development as described above in these town centers.

**Policies**

1. It is a policy of the town to consider historical land use patterns and buildings in Plymouth’s villages when evaluating proposals for new construction.
2. It is a policy of the town to encourage high density in village centers consistent with those in traditional Vermont villages.
3. It is a policy of the town to allow for a diversity of uses within the town and encourage an increase in clean, small-scale commercial enterprises.
4. It is a policy of the town to maintain set backs in this Area.

**Standards**

1. Construct buildings that are of the size, scale, and character of other buildings in the Village Area.
2. Alterations of architecturally or culturally significant structures in an historic district shall maintain the original character.
3. Any development within Village Areas may have an impact on existing water supplies due to the limited space. Developers must prove that their development will not have any negative effects on public or private water supplies within this area.

**Recommendations**

1. Allow mixed uses, home occupations, home businesses, limited commercial uses and residential uses in village areas.
2. Allow higher density in village centers.
3. Institutional and civic land uses should remain in or adjacent to Village Areas. These uses include: post offices, public schools, banks, civic buildings, the Town Hall, town offices, and community centers.
4. Develop a town committee for economic development.

**1 Acre Vacation-Resort Area (VR1)**

Hawk Inn and Mountain Resort (HIMR) is the largest residential community in Plymouth. Situated half way between the two Villages, Tyson and Plymouth Union, it comprises nearly 300 lots, between 50 and 60 condominium units, the largest Inn in Plymouth, a restaurant, spa and numerous recreational amenities. Nearly all of the individual single family residential lots are between one and two acres in size. Most of the lots on the East side of Route 100, including the residential condominium units are served by one of the largest soil based community wastewater disposal systems in Vermont.

The purpose of a distinct land use district for Hawk Inn and Mountain Resort is to ensure that both the improved lots and those which currently do not yet have homes constructed are guaranteed to make improvements consistent with the conditions of existing Town and State permits.

High density housing is encouraged in the 1 Acre Vacation–Resort Area because the infrastructure for this use is already in place. This area is especially appropriate for residential

and commercial uses which cater to vacation and recreational opportunities for residents and visitors alike.

**Goal**

1. To ensure the density and established use patterns at Hawk Inn and Mountain Resort are consistent with the development as it has previously been approved and is currently being managed.

**Policies**

1. It is the policy of the town to consider the previously permitted density and land use patterns in the 1 Acre Vacation-Resort area when evaluating proposals for renovations, additions and new construction.
2. It is the policy of the town to encourage the resort ownership and owners of lots at Hawk Inn and Mountain Resort to develop those properties consistent with their own planning and development regulations, as long as those regulations conform to Plymouth zoning regulations.
3. It is the policy of the town to maintain setbacks in this Area which are consistent with those required in the resorts published covenants, architectural design policies and the planning and development regulations administered by Hawk Inn and Mountain Resort.

**Standards**

1. Construct buildings that are of the size, scale and character of other building in the HIMR area and consistent with their own architectural review committee administered by their planning and development regulations.

**Recommendations**

1. Allow limited commercial uses, residential uses, recreational uses, business and private functions and other uses consistent with the current management of this resort.
2. Continue to allow high density uses consistent with existing permits.

**1 Acre Mountain-Recreation Area (MR1)**

The ski area in Plymouth Union formerly operated as Round Top is now owned by Plymouth Notch, LLC and called “Plymouth Notch”. The previous owner, Plymouth Properties, LLC operated this ski area most recently and obtained State and local permits to expand the snow-making capability and to construct some residential units in the base area. These have not yet been constructed. Much of the lower portion of the ski area surrounding the base lodge has previously been designated in the Plymouth Union village land use area.

The purpose of establishing a distinct land use district for a portion of the ski area, much of which previously has been within the designated village district of Plymouth Union, is to provide for uses which are unique to a ski area and other uses dedicated to recreation.

Higher density housing is encouraged in the 1 Acre Mountain-Recreation area to concentrate building to the area close to the existing base lodge and the cluster housing already approved. The buildings and infrastructure can in that manner be sited on the flatter portion of the land and close to existing vehicular access and utilities. This leaves the higher ski terrain and steepest slopes, which are not easily accessed, to be used for skiing and other recreational uses.

**Goal**

1. To ensure the density and established use patterns of Plymouth Notch will remain consistent with the development as it has previously been approved and managed to promote this area as a viable recreational facility, primarily for skiing, which will be beneficial to the Town of Plymouth.

**Policies**

1. It is the policy of the town to consider the previously permitted density and land use patterns in the 1 Acre Mountain-Recreation area when evaluating proposals for renovations, additions and new construction.

2. It is the policy of the town to encourage the management and owners of the property and those with interests vested in the property to develop consistent with their own planning and development regulations, as those regulations conform to the Plymouth zoning regulations.

3. It is the policy of the town to maintain setbacks in this area which are consistent with those necessary for a higher density area and conform to the Plymouth zoning regulations.

**Standards**

1. Construct buildings that are of the size, scale and character of other buildings existing and approved in the Plymouth Notch Area.

2. Provide landscaping which will enhance the appearance of the high-density development where buildings are clustered closely together.

**Recommendations**

1. Allow limited commercial uses, residential uses, business and private functions and other uses consistent with the management of the Mountain-Recreation district as a recreational use with a concentration of residential buildings.

2. Continue to allow higher density uses consistent with existing permits and current land uses.

**2 Acre Rural Areas (R2)**

The 2 Acre Rural Areas border existing State and town highways and are primarily located around Plymouth’s two Village Areas. The 2 Acre Rural Areas include only that portion of the ski area lands in common ownership known as Round Top west of the Mountain –Recreation Area, the former gravel pit area north of Plymouth Union Village, a small portion of the Farm and Wilderness land north of Woodward Reservoir and two hamlet areas near Tyson Village. The purpose of the 2 Acre Rural Area is to allow for higher density development than can be accommodated in the other Rural Residential Land Use Areas in town. Land uses allowed in 2 Acre Rural Areas should only include residential, small commercial enterprises, home occupations, and light commercial, scaled to the Area. Much of the land in these Areas feature soil and slope conditions which will provide for easier installation of on-site wastewater facilities. Development in 2 Acre Rural areas will be limited by the capacity to accommodate safe septic systems.

**Goal**

1. To accommodate medium density development of a rural nature while maintaining the high-quality rural character of Plymouth.

**Policies**

1. It is a policy of the town to allow medium density residential and commercial uses that do not adversely impact the environment in the 2 Acre Rural Areas because they are nearer to Village Areas and existing areas of medium density residential and commercial uses such as Farm and Wilderness, the ski area formerly known as Round Top and Hawk Inn and Mountain Resort.
2. It is a policy of the town to maintain a pace of development that town institutions and our road system can sustain.
3. It is a policy of the town to require that density and placement of new buildings in subdivisions be compatible with desired land use patterns.
4. It is a policy of the town to deter "sprawl" by evaluating subdivision of land.
5. It is a policy of the town to promote creative land use which does not sacrifice value for landowners.
6. It is a policy of the town to maintain set backs in this Area.

**Recommendations**

1. Provide for medium density residential development with small commercial enterprises whose impacts are limited so that they do not detract from the rural nature of the area and are in keeping with residential development.
2. The town should consider adopting regulations that limit the impact of development on neighboring parcels.

**5 Acre Rural Residential Areas (RR5)**

The 5 Acre Rural Residential Areas are comprised of lands bordering existing Class 1, 2 and 3 roads that are not designated as Village, 2 Acre Rural Residential, or 10 Acre Rural Residential,

and are located outside of Conservation Areas. The purpose of the 5 Acre Rural Residential Area is to preserve the rural residential character of the town and allow for low density development. Land uses allowed in 5 Acre Rural Residential Areas should only include residential, home occupations, agriculture, forestry, and outdoor recreation. Occasional small rural enterprises may be permitted, provided they do not have an adverse impact on neighboring properties. Much of the land in these Areas feature soil and slope conditions which will provide for easier installation of on-site wastewater facilities. Development in 5 Acre Rural Residential areas may be limited by the capacity to accommodate safe septic systems.

**Goal**

1. To maintain the high-quality rural character of Plymouth, preserving exceptional scenic beauty and the many natural resources of the town while allowing for moderate growth.

**Policies**

1. It is a policy of the town to allow lower density residential uses in the 5 Acre Rural Residential Areas that do not adversely impact the environment and to discourage commercial uses.
2. It is a policy of the town to maintain a pace of development that town institutions and our road system can sustain.
3. It is a policy of the town to require that density and placement of new buildings in subdivisions be compatible with agricultural and silvicultural use and desired land use patterns.
4. It is a policy of the town to deter "sprawl" by evaluating subdivision of land.
5. It is a policy of the town to promote creative land use which does not sacrifice value for landowners.
6. It is a policy of the town to maintain set backs in this Area that are greater than those found in the Village and 2 Acre Rural Areas.

**Recommendation**

1. Encourage access for recreational activities on all land.

**10 Acre Rural Residential Areas (RR10)**

Plymouth's landscape is defined by the contrast between steep wooded mountains and narrow open valleys. Planning Commission surveys (1986, 1999, and 2009) found overwhelming consensus among residents on the importance of preserving Plymouth's open spaces and undeveloped slopes. The town's scenic rural character is prized by residents and visitors alike and is an important component of our tourist industry. The preservation of large forest tracts and of key agricultural lands is also important to the future of forestry and farming in our town.

The 10 Acre Rural Residential Areas are the groupings of larger undeveloped contiguous parcels of land in Plymouth that are located farther away from Villages and 2 and 5 Acre Rural Residential areas. The purpose of this Area is to allow for the development of single rural residences while maintaining open space, wildlife habitat, and timberland. Class 4 roads that serve these areas shall not be upgraded by the town.



**Goals**

1. To maintain our rural character as defined in this Plan.
2. To protect the environmental integrity of forests, fields, wildlife habitat, wetlands, flood plains, and surface waters.
3. To promote productive forest and farmland.

**Policies**

1. It is a policy of the town to allow residential uses in the 10 Acre Rural Residential Areas that do not adversely impact the environment and to discourage commercial uses.
2. It is a policy of the town to protect and improve water quality, wetlands, and watersheds according to policies set forth in the basin plans.
3. It is a policy of the town to encourage recreational opportunities that will not impact or affect the environmental and scenic quality of these areas.
4. It is a policy of the town to encourage sound silvicultural practices.
5. It is a policy of the town to encourage the use of small scale non-commercial renewable energy options in remote areas a great distance from existing utilities to power the scarce residences within this area in order to avoid the impacts of power lines.
6. It is a policy of the town to promote creative land use which does not sacrifice value for landowners.
7. It is a policy of the town to maintain set backs in this Area that are proportionally larger than those found in the 5 Acre Rural Residential Areas.

**Conservation Areas (CON25)**

This area consists of the publicly owned conservation lands and all lands exceeding 2,200 feet in elevation. The purpose of the Conservation Areas is to maintain land in its natural, undeveloped state. This area is proposed for 25 acre lots, and the Class IV roads that serve these Areas shall not be upgraded by the town.

Plymouth's Conservation Areas are those that are relatively undisturbed, consisting of large tracts of quality timber and serving as home for a variety of wildlife. Such areas of the community are currently not serviced and intentionally lack such facilities as maintained roads and utilities. For these reasons, the land in these Areas must be protected from development.

**Goals**

1. To maintain our rural landscape.
2. To protect the environmental integrity of forests, fields, wildlife habitat, wetlands, flood plains, and surface waters.
3. To protect productive forest and farmland.

**Policies**

1. It is a policy of the town to discourage development in the Conservation Areas.
2. It is a policy of the town to conserve the large undeveloped areas in Plymouth.
3. It is a policy of the town to protect water quality, wetlands, and watersheds.

4. It is a policy of the town to encourage recreational opportunities that will not impact or affect the environmental and scenic quality of these areas.
5. It is a policy of the town to conserve contiguous forestland and wildlife habitat.
6. It is a policy of the town to encourage sound silvicultural practices.
7. It is a policy of the town to encourage the use of small scale non-commercial renewable energy options to power the scarce residences within this area in order to avoid the impacts of power lines.
8. It is a policy of the town to allow only those recreational land uses that will not impact or affect the environmental and scenic quality of these areas.

**Shoreland Overlay**

The many lakes and ponds in Plymouth contribute greatly to the aesthetic and economic value of the town, making it a special place. Since preserving healthy and beautiful lakes and ponds is in the interest of Plymouth citizens and visitors, a Shoreland Overlay area is proposed that incorporates a 250-foot buffer from all shorelands, including Grass Pond.

**Goal**

1. To protect the beauty and environmental integrity of Plymouth’s lakes and ponds while encouraging their safe and responsible enjoyment.

**Policies**

1. It is a policy of the town to minimize lake-side development and retain a naturally vegetated shoreline.
2. It is a policy of the town to abide by Vermont’s Clean Water Standards and Shoreland Protection Act.

**Recommendations**

1. Initiate a public education campaign to inform people who fish, boat owners, and owners of lake cottages about the dangers of milfoil and other invasive aquatic plant and animal species, as well as best management for lawns to reduce nutrient/chemical contamination of fresh water.
2. Ensure that lakeside conversions of dwellings are having septic systems permitted by the State.
3. Consider requiring stream buffers in the overlay to ensure clean runoff into the lake.
4. Form a lakefront property owners association to monitor water quality in Plymouth’s lakes.

**Coolidge Homestead Historic Overlay**

The Coolidge Homestead Historic Overlay area consists of those buildings and the land at Plymouth Notch, and includes the Coolidge Birthplace and Homestead, Cilley Store, Wilder House Restaurant, Wilder Barn, and other structures.

**Goal**

1. To ensure the preservation of land and buildings within the Coolidge Homestead Historic Overlay area.

**Policy**

1. It is a policy of the town that any development in the Historic Overlay Area shall compliment the traditional configuration, design, scale, proportions, and streetscape that currently define this historic area.

**Flood Hazard Overlay**

In Plymouth there are lands adjacent to streams and brooks which are subject to occasional flooding. These flood-prone areas are natural extensions of these water bodies. They retain excessive amounts of water occurring as runoff during heavy rains and spring thaws, control the velocity of water flow during floods, and serve to trap sediment. Flood-prone areas are unsuitable for development for many reasons: there is a potential for danger to life and property, floods may cause the stream channel to move within the floodplain, and subsurface sewage disposal systems do not function properly when influenced by high water. Plymouth’s flood hazard areas have been mapped by the Federal Emergency Management Administration (FEMA), but with only limited information and are only approximate in location. The Town of Plymouth regulates flood hazard areas through use of an Overlay district.

**Goal**

1. To prevent flood damage and retain flood storage.

**Policies**

1. It is a policy of the town to preserve floodplains and associated risk areas in a state where they can handle flood flows without damage to property.
2. It is a policy of the town that only compatible land uses of recreation and open space should be permitted in flood hazard areas.
3. It is a policy of the town to allow rebuilding within the Flood Hazard Overlay.

**Recommendations**

1. The town should update its regulations for the management and protection of flood-prone areas for a 100-year flood.
2. The town should work with FEMA to do a more detailed study of its flood areas.
3. The town should determine areas subject to streambank erosion hazards in consultation with the state’s River Management Program and consider regulations for these areas.

### III. TRANSPORTATION

Outlined below is a breakdown of 2017 State and town highway mileage in Plymouth, followed by an explanation of the classification system. See also the attached Transportation map.

<b>Class I</b>	<b>State Highways</b>	
	Route 100A	4.76
	Route 100	9.73
<b>Class 2</b>	<b>Town Highways</b>	3.72
<b>Class 3</b>	<b>Town Highways</b>	36.89
<b>Class 4</b>	<b>Town Highways</b>	<u>23.94</u>
	<b>Total Mileage</b>	<b>79.04</b>

**Class 1** state highways are under the jurisdiction of the Vermont Agency of Transportation. They serve to connect larger population areas outside the town (such as Ludlow and Killington).

**Class 2** town highways serve as inter-town arterial roadways providing for through traffic. The Selectmen with the approval of the State Highway Board determine all Class 2 highways. Plymouth's Class 2 highways are the Kingdom Road, Buswell Pond Road (Crossroads to the Ludlow line), and the road that connects Plymouth Notch to 100A (Coolidge Memorial Road).

**Class 3** town highways are the many collector roads which serve to provide year-round public access. The Selectmen determine these highways after conference with the State Board. Class 3 highways must be negotiable, under normal circumstances, all seasons of the year by a pleasure car of standard manufacture. Minimum standards, as set by the state, include sufficient surface and base, adequate drainage, and sufficient width to permit winter maintenance.

**Class 4** town highways are all other town highways. These are all determined by the Board of Selectmen. Class 4 highways are not maintained during the winter months. The Selectboard and the Road Commissioner determine that summer maintenance is based strictly upon the availability of funds.

It is desirable to keep Class 4 roads open to four-wheel drive vehicles, horseback riding, logging vehicles, and fire-fighting equipment. An example of a Class 4 town highway is the Reading Pond Road across from Colby Pond.

The majority of the town's roads are Class 3 highways, which have been steadily improved to keep pace with the rapid increase in residential development over the last decade. Some residents have expressed their wish to keep the degree of improvements consistent with the level of traffic. There is concern with the high speeds that some people drive on the town's Class 2 and 3 highways, which are not posted. There is great appreciation of the scenic quality of our

Class 3 roadsides, and the town should seek to encourage preservation of roadside trees, etc., where they do not interfere with maintenance and public safety. There is a high level of satisfaction with the present quality of town road maintenance--snow plowing, grading, etc.

Both Route 100 and 100A have been the sites of serious accidents in recent years. Seasonally hazardous driving conditions are compounded by the high speeds at which many through drivers travel, particularly at peak periods during skiing season. In the warmer months, these same State highways are frequented by bicyclists, whose safety is also endangered because the roads are not designed for bicycle use.

People who live in Plymouth rely heavily on Routes 100 and 100A to commute to work and to shop. Those who live in the north end of town generally shop in Woodstock, West Lebanon, and Rutland; those in the south end of town are oriented towards Ludlow, Springfield, and Rutland.

**Air & Rail**

There are no rail lines or airports in Plymouth. However, commuter train options are available through Amtrak in White River Junction, Randolph, and Rutland. The nearest airports are in Rutland, Burlington, and Lebanon, New Hampshire.

No public transportation by bus. Bus service nearby in Bridgewater

Given the location of existing development, Plymouth's roads are essentially adequate to meet present needs. Traffic congestion is not an issue in Plymouth. Traffic safety is.

**Goals**

1. To improve the quality of Plymouth's transportation and road systems in order to promote safety and maintain the scenic quality of roads wherever possible.
2. To encourage vehicles using Plymouth's roadways to travel at safe speeds, so as not to endanger children, adult pedestrians, and animals, as well as other motorists. To encourage respect for speed limits, as posted.
3. To assure that all residents, whether they have personal transportation or not, have access to shopping, medical facilities, etc., as needed.
4. To encourage the Agency of Transportation to improve State Highways 100 and 100A to create safer driving and recreational biking conditions.
5. To ensure that future development does not unnecessarily or unreasonably endanger the public investment in the town and regional transportation systems, including highways, bridges, rail, bike and pedestrian facilities, public transit, and trails.
6. To minimize transportation energy consumption.
7. To encourage Plymouth residents and those passing through to respect speed limits as posted. Note: the State of Vermont determines speed limits.

**Policies**

1. It is the policy of the town that prior to a final decision to proceed with a major capital transportation project, policy makers first analyze the project against reasonable alternatives. In examining the alternatives, investigation shall focus on the environmental, energy, social, and investment costs and the extent to which each meets the goals and policies of this Plan.
2. It is in the policy of the town to maintain the town's current highways, bridges, and related facilities as necessary to ensure the current level of service.
3. The town, as written in 19 V.S.A. Section 310, is not obligated to maintain Class IV Highways, excepting bridges and culverts. It is the policy of the town that before it adopts a new road or upgrades an existing highway, the developers be responsible for the cost of improving and/or building the road to State specifications. Final decision regarding the nature of the improvement rests with the Selectboard, the Highway Superintendent, and the townspeople.
4. Given the interest in and benefits from biking, hiking, snowmobiling, cross-country skiing, and similar outdoor recreational activities, it is the policy of the town that, as an alternative to complete discontinuance of a highway, full consideration be given to retaining Class 4 roads for recreational use, or downgrading their status to a legal trail, thus retaining the public's interest in them.
5. It is the policy of the town that any changes to Class 4 roads or trails be approved by townspeople.
6. An integral scenic element of the rural countryside is the network of backroads comprising the town's highway system. These byways are both visually and economically important to the town. It is the policy of the town that if improvements are needed to accommodate increased traffic, the relationship of the road to the surrounding features of the landscape be fully evaluated.
7. Institutional and civic land uses should remain in or adjacent to the village area or designated areas adjacent to it. These uses include: post offices, public schools, banks, civic buildings, town offices, senior centers, and retail stores.
8. It is a policy of the town to support public transportation networks and facilities to serve residents, such as Park and Ride lots and ride sharing programs.
9. It is the policy of the town not to impede access of any town roads.
10. Highways, air, rail, and other means of transportation should be mutually supportive, balanced and integrated.
11. It is the policy of the town to avoid new, long, dead-end roads where site development is being planned.
12. It is the policy of the Town not to give up any class 4 roads or trails.

**Standards**

1. Road improvements to local roads shall only be conducted on roads leading into areas where the town desires to encourage development. By keeping remote areas less conveniently accessed, the town is establishing a clear standard on where future residential development is more appropriate.
2. The town shall control curb cuts to ensure the proper function and performance of a roadway. Concepts that shall be employed in evaluating developments are:
  - restricting or limiting the number of curb cuts per parcel or per linear feet of roadway;
  - ruling out direct access onto a primary road, if a reasonable alternative access exists via a secondary road or shared driveway;

- provide for separation between curb cuts and public road intersections to ensure efficiency and safety of a roadway; and
- consolidating or reconfiguring existing curb cuts or access roads to improve or maintain efficiency, safety, and the function of a roadway.

These standards shall also apply to private roads.

3. Where multiple site development is being planned, access management decisions shall:
  - require shared access and parking, whenever feasible;
  - require connecting roads between parcels or prohibit direct parking access from a parking space to an arterial or collector road;
  - encourage use of municipal parking areas or flexible parking standards (i.e. shared parking) to reduce the amount of parking required for individual developments;

**Recommendations**

1. Continue to support the Visiting Nurses Association, area senior centers, and other organizations that provide transportation and much-needed services for seniors without individual means of transportation.
2. Continue participation in the Regional Transportation Planning Program.
3. Revisit and tighten access management policies and standards in the Plymouth Zoning Regulations according to authority granted under 19 V.S.A. § 1111, Permitted Use of the Right-Of-Way, to ensure better control over developments potentially impacting the function and character of Plymouth's roadways.
4. The Town should encourage all recreational use of Plymouth roadways.
5. Encourage the road commissioner to follow culvert standards and line of sight requirements for driveway permits.

## IV. ECONOMIC DEVELOPMENT

### Present Day Economy

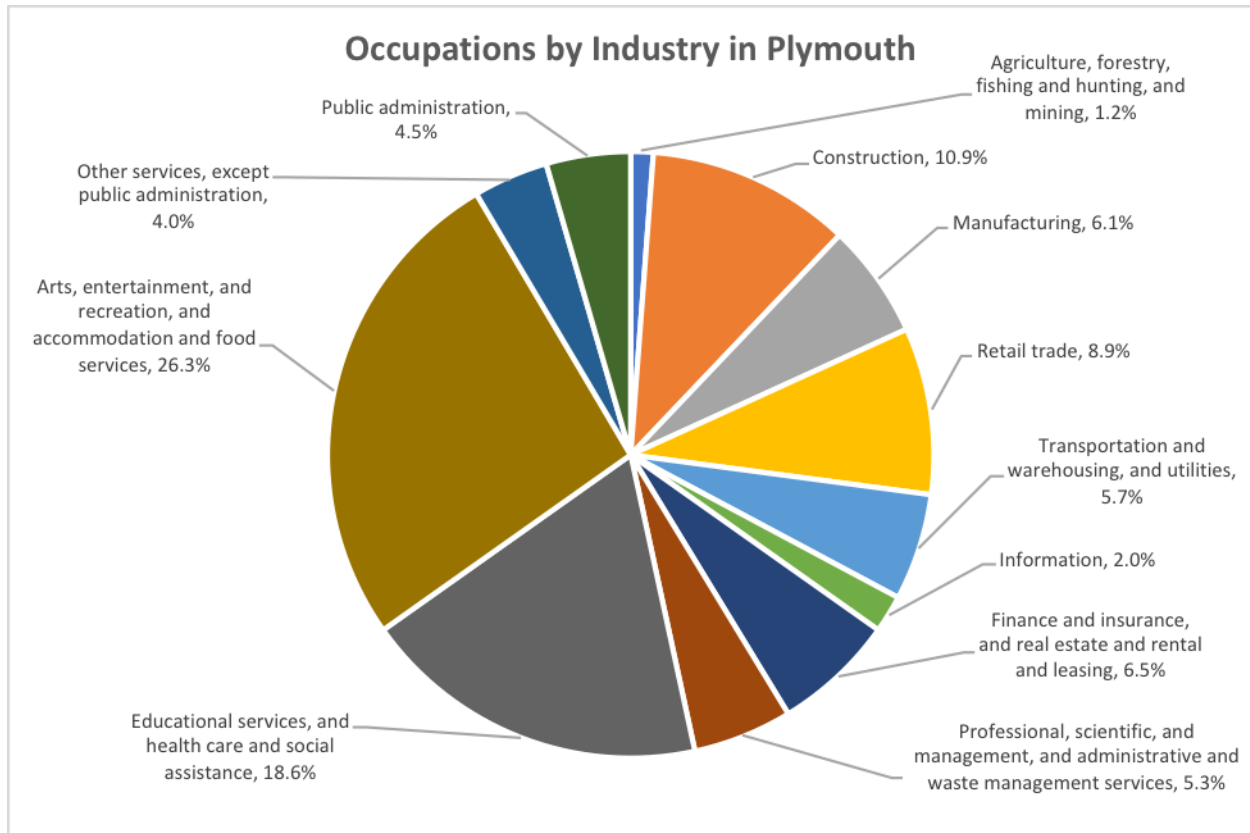


Chart 1: Occupations by Industry in Plymouth (Source: American Community Survey 2012-2016)

The above chart shows in which industries Plymouth’s workforce (247 people) are employed. The largest industry is arts, entertainment, recreation, accommodation, and food services (26.3%); followed by educational services, health care, and social assistance (18.6%). Construction employs 10.9%, while the remaining industries depicted each make up no more than 9% of the employment base. This data shows that Plymouth’s economy has greatly shifted away from agriculture and increasing numbers of residents have entered the service sector.

Plymouth does not serve as a major economic hub for employment or services. Many Plymouth residents have gone beyond the town’s borders to find work in surrounding towns such as Ludlow or Woodstock. Similarly, when seeking access to services, Plymouth residents often visit other towns, such as Hanover and Lebanon in New Hampshire.

Most of the town’s commercial enterprises are located in the village of Plymouth Union, the hamlets of Plymouth Notch and Tyson, and the Hawk Inn & Mountain Resort. Plymouth’s commercial/retail establishments tend to be local or tourist in nature and are located on or near the state highways. Plymouth is home to recreation and summer camps, such as Farm &



Wilderness. The town’s two major industries are the Plymouth Quarry (Markowski Excavating, Inc.) and Plymouth Artisan Cheese.

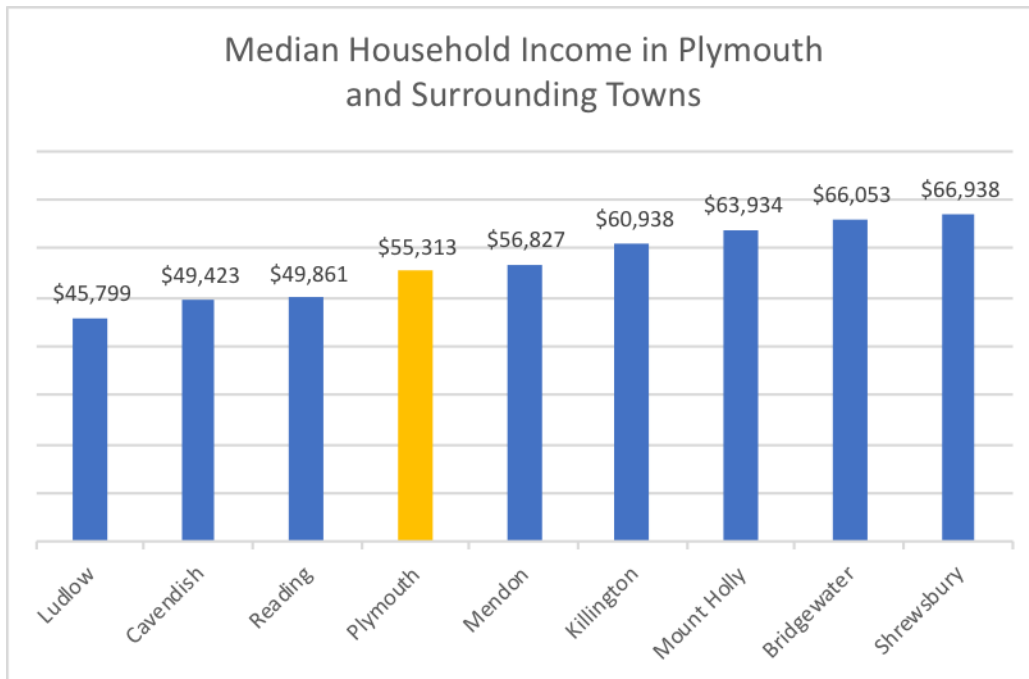


Chart 2: Median Household Income in Plymouth and Surrounding Towns (Source: American Community Survey 2012-2016)

Chart 2 above shows how Plymouth’s median household income (MHI) compares to that of its border towns. At \$55,313, Plymouth’s MHI is just below average for the area.

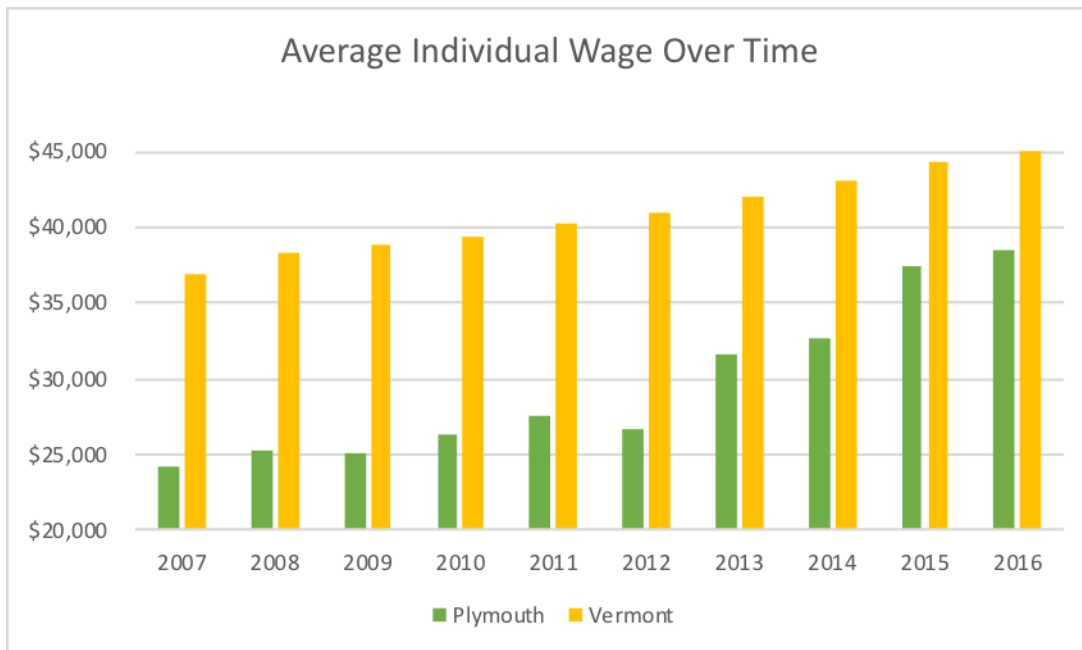


Chart 3: Average Individual Wage Increases Over the Past Ten Years in Plymouth Compared to the State of Vermont (Source: Vermont Department of Labor)

Chart 3 above shows how Plymouth's average individual wage has increased over the past ten years of available data, compared to the State of Vermont. Plymouth's average individual wage is increasing faster than the State's, but as of 2016 is still lower (\$38,478) than Vermont's individual wage (\$45,054).

There are some concerns about Plymouth's present-day economy. One concern is that too many people are going elsewhere for jobs, as there is a general lack of employment in town, and especially a lack of high paying jobs. Additionally, high land and housing costs make it expensive for people to live here.

### **Future Economic Development**

Residents value the rural character of the Town. Therefore, the types of businesses that the Town should encourage are those that will exist in harmony with the flavor and character of the Town. The downside to encouraging businesses to develop and grow within the village center is that they can put pressures on the Town that it may not be prepared to handle. The Pattern of economic development in Town should remain as it has historically been, with the bulk of the community's mixed commercial development located within the Village. Outside of the Village the types of commercial development that are appropriate change in nature. Locating primary retail establishments outside of the village would not be appropriate. Instead, businesses that locate outside the village should include secondary retail, light industrial, professional offices, small service establishments and home businesses based on their proximity to town services. The farther away from town roads and services, the lighter the type of commercial development should be.

### **Village designation**

Participation in the Vermont Village Designation Program provides benefits to businesses located within the designated boundary. This program offers tax credits for the revitalization of buildings within designated areas, which is beneficial to existing commercial landowners within the designated area and the designated village receives priority consideration for some state grants. Being a designated village supports the traditional Vermont development pattern of a compact village center surrounded by rural countryside, as well as the Town Plan's goals of continuing to support historical economic and land use patterns of Plymouth itself.

### **Capital Budget & Program**

State statute enables communities to create a Capital Budget and Program for the purposes of planning and investing in long-range capital planning. Although most communities have some form of capital account where they save money, many do not have a true Capital Budget and Program. A capital budget outlines the capital projects that are to be undertaken in the coming fiscal years over a five-year period. It includes estimated costs and a proposed method of financing those costs. Also outlined in the Program is an indication of priority of need and the order in which these investments will be made. Any Capital Budget and Program must be consistent with the Town Plan and shall include an analysis of what effect capital investments might have on the operating costs of the community.

Plymouth does not have a capital budget at this time.

**C. Goals, Policies, and Recommendations**

**Goals**

1. Encourage a strong and diverse local economy that provides satisfying and rewarding employment opportunities for residents while maintaining environmental standards.
2. Strengthen and maintain the town’s agricultural, forest and recreational economies and to ensure continuance of village and rural character.
3. Support the maintenance of existing businesses and the development of new businesses in Town including home-based businesses.

**Policies**

1. Cooperate with neighboring towns, regional planning commissions, and economic development groups to plan for and maintain a balance between the type and number of jobs created and population growth in the region.
2. Support the development of local enterprises that create markets for locally produced goods and services.
3. Encourage new business development in appropriate locations where services such as roads, fire protection and power supply are available or planned.
4. Support creation of regional economies that do not place unreasonable financial burdens on the taxpayers of Plymouth to support those economies.
5. Attract diverse and sustainable businesses in Plymouth which provide jobs and contribute to the small-town quality of life.
6. Continue to support enabling home occupations and home businesses to be developed or to continue.
7. Primary retail development shall be in designated Village Areas.
8. Prohibit development that has the effect of creating sprawl.
9. Continue to encourage agriculture-related small business.
10. Growth and development should not exceed the capacities of local facilities and services.
11. Encourage economic growth through adding new home-based businesses in town, possible primarily through expansion of high speed telecommunications services throughout town.
12. Support local employment and economic growth, particularly the growth of clean, low-impact commercial uses in areas designated in this Plan.

13. Support tourism in Plymouth.
14. The manufacture and marketing of value added agricultural and forest products are encouraged.

**Recommendations for action**

1. The Town should continue to support agriculture and forestry as desirable businesses and consider these lands as natural, scenic, recreational, and tourism resources.
2. The Town should support cultural, civic and educational organizations that benefit the Town and invigorate its economic climate.
3. The Town should consider applying for village designation for Plymouth Union, Tyson, and Plymouth Notch.
4. The Selectboard should consider developing a capital budget and program for town-owned infrastructure.

## V. UTILITY AND FACILITY PLAN

Public Facilities: Future versions of this Town Plan should include an estimated or approximate timeline for upgrades or replacements of major infrastructure, as well as a note on the prospective financing mechanism.

### Recreational Facilities

1. Coolidge State Park Campgrounds offer camping sites, motor and trailer sites, hiking, fishing and hunting on surrounding lands, both State-owned and private property. On-site water and sewage disposal are available for campers, also shower and toilet facilities.
2. Camp Plymouth on Lake Echo in Tyson is a recreation site offering rental cabins, boats, a swimming area, playground equipment, and picnic areas. A kitchen and large dining room may be rented for group use.
3. Woodward Reservoir has no public beach. Farm & Wilderness allows access to Plymouth residents to their beach on most summer weekdays after 3:30 p.m., and all day on weekends, unless otherwise noted. Visitors must sign a waiver available at the Main Office on Farm and Wilderness road open Monday-Friday 8 am – 4 pm. The State of Vermont maintains a public access for boats near the dam.
4. There are also boat launching/fishing access areas on Lake Amherst, Lake Echo, Lake Rescue, and Colby Pond offered by the State of Vermont.
5. Hawk Inn and Resort offers boating, swimming, and health club facilities to guests and the general public. Various forms of free entertainment are offered in the summer months at their bandstand.
6. The Farm & Wilderness Foundation is a non-profit organization offering 8 summer camps and programs for children and teens ages 4 through seventeen. The foundation serves over 600 campers with a long-standing commitment to accessibility, offering many financial aid options. Three residential camps and a day camp are located on the Woodward Reservoir. Three wilderness camps are located on, or close to, Lake Ninevah, and one teen program through-hikes the Long Trail from Massachusetts to Canada. Farm & Wilderness and the Ninevah Foundation jointly manage over 4,800 acres of land and water in Plymouth and Mount Holly for conservation. Farm & Wilderness and Ninevah trails are open most of the year for hiking and cross-country skiing.
7. The Ninevah Foundation is a conservation organization dedicated to promoting the wilderness character and tranquil nature of Lake Ninevah and over 3,000 acres of surrounding lands in Mount Holly and Plymouth. The Foundation conserves these lands for low-impact recreation, outdoor and environmental education, and wildlife habitat, including a critical wildlife corridor linking the northern and southern branches of the Green Mountain National Forest.

8. Bethany Birches Camp (BBC) remains at the service of local children and families. Plymouth town residents may utilize camp resources like the ice rink, playground, basketball court, hiking and ski trails, and 1/4 mile tube run among others. BBC resources may be used by residents anytime as long as there is no BBC programming happening. Bethany Birches Camp does three main activities: (1) Summer and winter programs for children and teens (more than 500 per year, most from VT). (2) Property rental to subsidize camper pricing. Any of the camp facilities may be booked for your own uses. (3) Fundraising so that all young people are able to attend regardless of financial ability.
9. Gold panning remains a small but viable recreational activity available to residents and non-residents. A stream alteration permit is required from the State for this activity, as well as permission from the property owner.
10. Former Round Top Ski area has previously provided area residents with ski opportunities. The ski area is in the process of rehabilitating its facilities and is open on a limited basis.
11. VAST snowmobile trails, biking on roadways, and the Catamount cross country ski trails are other recreational activities available.

**Medical Facilities**

The Town of Plymouth has no in-town medical facilities. There are health clinics in Woodstock and Ludlow and major hospitals in Springfield, Rutland, Windsor, and Lebanon, N.H. Ambulance service and advanced medical treatment by Emergency Medical Technicians is available from Ludlow and Woodstock. Several members of the Fire Department and private citizens have been trained to perform first aid, CPR, and other techniques to help stabilize a patient until medical assistance arrives.

**Utilities**

1. Electrical facilities. Plymouth has no local electrical generation, present or foreseen. Power needs are supplied by Green Mountain Power. Various power transmission lines feed necessary power requirements to both residences and businesses. A three phase electric distribution line runs through Plymouth Union from Killington to Hawk Mountain. Power from this line feeds to Plymouth Notch and Pinney Hollow. Sections of Tyson are powered by Ludlow Electric and portions of Pinney Hollow and Plymouth Five Corners are fed through Woodstock. Clearing and the upgrading of distribution lines in recent years has resulted in fewer power outages and more dependable power. However, some areas of the Town of Plymouth have poor power reliability.
2. VTEL and Ludlow Telephone Company provide telephone service. VTEL now offers digital subscriber line service in Plymouth. The upgrading of lines in recent years to cable has improved service and dependability tremendously.
3. Cable television is currently available to some residents of Plymouth through several providers.
4. The Town of Plymouth does not have at present nor does it foresee a need in the future for any storm drainage, public sewer system, charged public hydrant system, or public

water system. The rural nature of the town and the population density coupled with the town's topography and geology make it neither economically feasible nor reasonable to attempt such undertakings.

**Public Services**

1. Refuse Disposal: Plymouth belongs to the NH/VT Solid Waste Project for incineration of its refuse. The town sends two representatives to project meetings. Refuse pick-up is provided by an independent contractor. The contractor charges hauling fees according to the volume of each household's refuse. Private contractors provide dumpsters to various businesses and facilities in town for a fee. Solid waste facilities are deemed to be adequate to meet local needs.
  
2. The Fire Department is a volunteer organization funded in part by town taxes and by fund raising activities which include annual solicitations for donations from tax payers, barbecues, coin-drops, and by donations received for services performed. No members are paid for any time rendered. Fire response services are adequate to meet the town's needs. The Fire Department Station, located in the Town Offices Building on Route 100, contains the following equipment:

<u>Description</u>	<u>Year</u>	<u>Condition</u>
Tanker Freightliner 4,000 Gal.	2003	Excellent
Pumper 1000 G.P.M.	1980	Good
Ford Utility Vehicle	1997	Good
8 Scott Air Packs with 8 spare tanks Portatank - 1,500 Gal.		
Three portable pumps - 250 G.P.M.		
Full turnout gear for 20 men		
Miscellaneous items		

3. The Plymouth First Response Team is composed of volunteers who respond to vehicle accidents and other emergencies requiring first aid prior to the arrival of an ambulance and EMTs. Both the Fire Department and the First Response Team in Plymouth are benefiting greatly by completion and implementation of an Enhanced 911 system in Vermont.
  
4. Plymouth Press is the town's newsletter. It is published by volunteers online at [www.theplymouthpress.com](http://www.theplymouthpress.com)
  
5. Tyson Ladies Aid sponsors the Tyson Library, bazaars, rummage sales, and food sales to collect funds that are used to aid the various projects such as aid for fire victims, college scholarships, and aid to needy families.
  
6. Plymouth Historical Society holds meetings and field trips open to all who are interested in the town's history.

Emergency transportation is provided by ambulance services in Woodstock and Ludlow. At present there is not enough manpower for the First Response Team to provide the 24-hour coverage that would have to be provided if Plymouth had its own ambulance.

### **Buildings and Other Facilities Open to the Public**

1. Town Offices Building: The town building contains the town offices, a large public meeting hall, and the meeting room and garage bays of the fire department and road department. The structure was completed in 1988 and is in sound condition and provided with adequate parking. All town property should be open and available to the citizens of Plymouth with appropriate rules governing its use in place.
2. Post Office: The post office in Plymouth Notch serves the northern two-thirds of the town. People living in the southern part of town receive their mail through the Ludlow post office. People in the Hale Hollow area get mail through Bridgewater Corners. All roads in Plymouth have now been officially named for E-911 purposes.
3. Library: The Tyson Public Library is operated by the Tyson Ladies Aid Members. It is open seasonally on Saturdays and other days as scheduled. It provides a good cross-section of reading and educational material for all ages. Libraries in surrounding towns are also available for residents' use.
4. Churches: The Union Christian Church in Plymouth Notch has historical significance as the former church of President Calvin Coolidge. Tyson Congregational Church is open to the public and church services and pastoral care is available year-round.
5. Cemeteries: The town has four cemeteries: Plymouth Notch, Tyson-Pollard, Plymouth Kingdom, and Five Corners. There is also the small Archer family cemetery and a Revolutionary Soldier's cairn, both in Tyson. All are maintained without tax money. Other cemeteries located throughout the town include Captain John Coolidge's grave on Crown Point Road, the Unknown Soldiers grave on Unknown Soldiers Road, and a small cemetery at the end of Reggie's Road.
6. Historic Sites: The Plymouth Historic District is operated May through October by the State of Vermont, Division for Historic Preservation, and includes the Coolidge Birthplace and Homestead, Cilley Store, Wilder House Restaurant, Wilder Barn, and other structures. The Coolidge Foundation maintains the Union Christian Church and has offices and an archive in the Church basement. The Plymouth Cheese Factory is owned by the State of Vermont and leased to a business making curd cheese and also functions as a year-round tourist attraction adjacent to the Historic District.
7. Motels, Hotels, and Bed & Breakfasts:
  - Echo Lake Inn and Restaurant in Tyson
  - Good Commons at junction of Routes 100 and 100A
  - Hawk Inn and Resort on Route 100
  - Salt Ash Inn at junction of Routes 100 and 100A
  - Inn at Water's Edge, Tyson



8. Community Center: The community center is open to the public as a community activity center and includes childcare and pre-school.
9. Several other businesses are serving the public.

**Child Care**

In 2003, the Vermont Legislature added a thirteenth goal to Chapter 117. “To ensure the availability of safe and affordable child care and to integrate child care issues into the planning process, including child care financing, infrastructure, business assistance for child care providers, and child care work force development.”

Plymouth supports the private development of additional facilities to meet the needs of its residents. State data indicate that the most critical challenge facing the demand for child care infrastructure are the shortages in infant/toddler care, school age care, care for children with special needs, and care during non-traditional hours. According to the Vermont Department for Children and Families, the overall capacity in regulated child care can meet only 50% - 60% of the estimated need in Vermont. The population of residents under the age of 10 years in Plymouth (US Census 2010) was 43.

Table 3: Daycare Centers in Plymouth and Surrounding Towns

<b>Town</b>	<b>Registered</b>	<b>Licensed</b>
Plymouth	0	1
Killington	0	4
Bridgewater	0	0
Reading	0	1
Cavendish	0	1
Ludlow	0	2
Mount Holly	0	2
Shrewsbury	0	1
Mendon	0	0

Source: Vermont Department for Children and Families: Child Development Division, 2018

**Town Upgrades and Replacements**

In order of priority:

1. Continue to replace existing light fixtures with LED lights. (Low cost)
2. Replace existing appliances and utilities with more energy efficient models, as needed. (Medium cost)
3. Explore the addition of solar panels and heat pumps for the town municipal building to offset energy costs. (High cost)

These improvements will be financed through a combination of grant funding and capital budgeting.

**Disaster Prevention, Preparedness and Response**

The town has completed a Rapid Response Plan (RRP) that covers the procedures for Plymouth's response to a disaster. In brief, the Selectboard will formally declare a state of emergency in the event of a disaster that the Selectboard feels is beyond the town's scope. The town has an Emergency Management Coordinator and would be assisted by several people who have been identified in the RRP in coordinating the town's response to a disaster. In the event that emergency shelters are needed, the town has identified the Community Center building for such use.

Plymouth also has a Pre-Disaster Mitigation (PDM) Plan that identifies the hazards to which the town is vulnerable and measures to mitigate them. In the short term, the town should ensure that all new private roads and driveways are properly constructed so that they do not contribute to damage on town roads from runoff. The Selectboard should also review their codes and standards policy for improvements to transportation infrastructure to ensure that it is appropriate for the town and will serve the town well when applied by the Federal Emergency Management Agency following the next disaster. The proposed density, type and location of future land uses set forth elsewhere in this plan should take into account the predictable consequences of any additional buildings in the floodplain, on steep slopes or on inadequate roads that could further aggravate flooding or require increased efforts and expenditures by the town for emergency response.

**Goals**

1. Buildings: In general, all buildings, utilities, and facilities should be maintained on a regular schedule with energy conservation measures instituted to ensure that we are not postponing repairs today that will be more costly in the future.
2. Equipment: Continue efforts to maintain and replace equipment to ensure that all equipment and vehicles are in safe operable condition. Maintain procedures to purchase equipment and vehicles in the most economical manner.
3. Public Utilities: Maintain close communication with public utilities that provide electric power, telephone service, and television cable to coordinate projects including tree cutting, underground cable laying and installation of new utility poles and lights, to ensure that duplication of efforts and expenditures is avoided.
4. Increase accessibility for safe and affordable childcare.
5. Increase membership of emergency services.

**Policies**

1. The town supports the expansion of 3-phase power in all appropriate areas of the town to ensure that economic development opportunities are fully exploited.
2. The town supports the placement of utility lines under ground when costs are borne privately, or when supported by a town vote, with local public funding.
3. Encourage public investments in governmental facilities, services, and lands which support existing and future development within the village area and other designated growth areas.
4. Foster a partnership between public investment planning and implementation activities and the private sector in a manner that advances the goals and policies of this Plan.

5. Promote effective, efficient, and accessible public services, including child care, highways, and recreational facilities.
6. Ensure that the expansion or construction of new utilities and facilities do not impose an undue financial burden on town resources.

**Recommendations**

1. Given the large amount of trail land in the town, Plymouth should seek funding to conduct an inventory and to map all trails open to the public and shall publish the information for townspeople.
2. The town should work with the local State Park staff on recreation programs for all residents.
3. The town should create buffers around historic structures and properties, and Ancient and Class IV roads, and create voluntary guidelines for developers and landowners to protect these areas.
4. The town supports trash pickup as an option for residents and shall look toward more convenient and affordable solutions for waste disposal so as to encourage recycling and minimize illegal dumping.
5. The town seeks and supports last line identity for all residents of Plymouth as a result of previously conducted E-911 work.
6. The town should explore expanded mutual aid arrangements for additional services such as paving, plowing, mowing, and fire response.
7. Capital improvement plans and budgets are effective planning and fiscal management tools. The town is encouraged to use this tool. Periodic consultation with the Planning Commission on the land use implications of major capital investments is recommended.
8. Review zoning regulations and revise as necessary to address barriers to increasing child care capacity in Plymouth.
9. Consider seeking grant funds to assist with the development of childcare infrastructure.
10. Implement a policy to provide emergency service personnel with immediate accessibility by installing a Knox Box to all commercial buildings and residential dwellings equipped with an automatic dispatch notification of an alarm system activation.

## VI. TELECOMMUNICATIONS FACILITIES

Telecommunications have become increasingly important to the security and economic needs of residents and businesses in central Vermont. This trend will continue. It will play a key role in our region's economic future, creating new opportunities for the relocation and growth of decentralized business operations and reducing demands for travel by conventional modes. With an improved telecommunications infrastructure, large amounts of information can be conveniently moved over long distances at competitive rates.

The field of telecommunications is undergoing rapid change. Advancements in this technology have and will continue to impact growth in Plymouth. The implications for land use are significant, as this technology has enabled people to move into rural areas of the town and to "telecommute" to other remote or central offices more readily.

Under present standards, transmission towers are the dominant telecommunications facilities. As land uses, these towers have emerged as planning concerns. Towers may emit electromagnetic radiation, which may affect human health, can conflict with other forms of development, and raise issues of aesthetic impact. To ensure adequate transmission of signals in mountainous areas, towers and related facilities often times need to be confined to hilltops or high elevation points. Thus, due to their higher visibility from multiple vantage points, conflict with scenic landscapes has become an issue.

The Federal Communications Commission (FCC) retains jurisdiction over public airwaves and the telecommunications industry in general. Additionally, the Federal Aviation Administration (FAA) exercises control over the location and height of towers and similar structures to prevent interference with airport operations. Under Vermont law (24 V.S.A. Chapter 117), municipalities may require that certain standards be met prior to the erection of telecommunication facilities. Local bylaws may regulate the use, dimension, location, and density of towers, however, FCC rules are preemptive of local and State law where conflicts exist. In 1997, Act 250 jurisdiction was conferred by the State requiring a permit prior to the construction of a communications tower or similar structure over 20 feet in height.

According to respondents to the town's 2009 survey, the town should locate new cell phone towers, to improve local reception, at the Town Hall and on selected hilltops, as long as they are camouflaged.

### Goals

1. To preserve the rural character and appearance of the Town of Plymouth.
2. To protect the scenic, historic, environmental, and natural resources of the Town of Plymouth.
3. To provide standards and requirements for the operation, siting, design, appearance, construction, monitoring, modification, and removal of telecommunication facilities and towers.

4. To minimize tower and antenna proliferation by requiring sharing of existing communications facilities, towers and sites, where possible and appropriate.
5. To facilitate the provision of telecommunication services to the residences and businesses of the Town of Plymouth.
6. To minimize the adverse visual affects of towers and related facilities through careful design and siting standards.
7. To encourage the location of towers and antennas in non-residential areas and away from visually sensitive areas, prominent scenic areas, and historic areas.

**Policies**

1. The town encourages economic growth through adding new home-based businesses in town, possible primarily through expansion of high speed telecommunications services throughout town.
2. It is a policy of the Town to encourage the co-location of new telecommunications facilities on existing public structures such as the Town Hall, or on private structures. Other areas may be considered.
3. Encourage all forms of communication within the Town boundaries.

**Recommendations**

1. In order to minimize tower proliferation, it is the recommendation of the town that applicants exhaust all reasonable options for sharing space on existing towers prior to proposing new towers and related facilities. The principle of co-location is the favored alternative. In making such a determination on the feasibility of co-location, prospective developers shall make every effort to evaluate space available on existing towers, the tower owner's ability to lease space, geographic service area requirements, mechanical or electrical incompatibilities, the comparative costs of co-location and new construction, and regulatory limitations.
2. Existing wireless service providers shall be required to allow other providers to co-locate on existing facilities, subject to reasonable terms and conditions.
3. Some of the town's principal scenic resources are its ridgelines and mountainsides. These areas are significant contributors to the maintenance and enjoyment of rural character. These ridges are predominately undeveloped and provide an unbroken skyline viewed from the valley floor. It is the recommendation of the town that use of ridges for telecommunication towers and related facilities needs to be undertaken in a manner that will not detract or adversely affect these scenic values. Accordingly, protection of these areas from insensitive developments is a matter of public good. To minimize conflict with scenic values, facility design and construction shall employ the following principles:
  - a. be sited in areas minimally visible to the traveling public, from residential areas, historic buildings or sites, public use areas, and public outdoor recreation areas such as hiking trails;
  - b. be located in forested areas or be sufficiently landscaped to screen the lower sections of towers and related ground fixtures from public vantage points, such as trails, roads, or water bodies;
  - c. utilize materials, architectural styles, color schemes, mass, and other design elements to promote aesthetic compatibility with surrounding uses and to avoid adverse visual impacts;

- d. where construction of access roads is involved , they shall be situated to follow the contour of the land and to avoid open fields or meadows to minimize their visibility;
  - e. avoid peaks and ridges that are locally significant or regional focal points; and
  - f. use state-of-the-art camouflage techniques to mask the appearance of these towers.
4. Towers shall not be illuminated by artificial means and not display strobe lights, except when required by the FAA.
  5. The height for towers, antennae and tower-related fixtures shall not exceed twenty (20) feet above the average height of the tree line within the immediate vicinity of a wireless communication facility.
  6. Towers, antennae, and related fixtures that fall into disuse, or are discontinued shall be removed to retain the values set forth above. Local and State land use permits shall incorporate removal of inactive fixtures as a condition of approval.
  7. The recommendations of this section serve as a clear written community standard intended to preserve the aesthetics or scenic beauty of the Town of Plymouth. Accordingly, it is the intent that this section be utilized by the District Environmental Commission or the Vermont Natural Resources Board as part of an aesthetics analysis for all wireless communications facilities. These recommendations shall be used, however, not exclusively, to determine whether or not a project fits the context in which it will be located, is highly visible, and results in an adverse impact on scenic resources.

## **VII. NATURAL RESOURCES, SCENIC RESOURCES, and HISTORIC RESOURCES**

The following inventory of natural, scenic, and historic areas is included as part of this Town Plan because these particular resources have been singled out by the Planning Commission and townspeople as being of special significance. Careful consideration should be given toward preservation of all these "special places" in the overall planning program.

### **Natural Areas**

The Vermont Department of Fish & Wildlife has mapped significant natural habitat in Plymouth. The map shows winter deer range and rare plant, animal and natural communities and state natural/fragile areas (for example, the Plymouth Caves near Tinker Brook). With the exception of the Tyson area, the entire town of Plymouth contains the type of continuous and relatively remote forestlands that support cub-producing female bears. The southeastern corner of the town provides important year-round bear habitat.

The State of Vermont has wetlands maps that identify Plymouth's water-related features and rank them, indicating which areas are protected by State wetlands regulations. These wetlands are important to a variety of wildlife, including our growing moose population.

The Natural Resources Conservation Service has systematically mapped soils in Plymouth. Digital soil maps are certified (in final format no longer subject to change) and are also compatible with GIS projects. The town's narrow valleys provide little bottomland for farming. Some of our richest farmland is now occupied by Hawk Mountain Inn and Resort. There is no large-scale commercial farming in Plymouth today, but small-scale commercial crops include maple syrup, blueberries and other small fruits, fiddleheads, Christmas trees, and honey. Several people keep horses, poultry, etc. Many have substantial home gardens and orchards.

Plymouth has an abundance of limestone and gravel and has many historic lime kilns and quarries. Today the town has one active rock quarry and one gravel pit. The granite quarry in the Coolidge State Forest is currently inactive. People still pan for gold in Plymouth's streams.

Most large tracts of harvestable timber are on State lands. Logging practices are generally conservative in order to encourage regeneration of timber resources.

Agriculture has had an important role in shaping Plymouth's history and its landscape. The USDA's 2007 Census of Agriculture lists four operating farms in Plymouth. This plan recognizes the economic and social benefits of farming, local food production, and open space preservation, and therefore would like to see agriculture, at any scale, continue as an important part of the way of life in Plymouth. Since agricultural land use is limited in Plymouth, active management of forests is all the more important to maintaining our town's rural character.

### **Significant Natural and Fragile Areas**

An inventory of the natural features which comprise Plymouth that takes into account their value to the town is an important part of this town Plan. These are Areas that, because of their fragile nature, irreplaceable value, and vital function of maintaining the environmental and ecological health and quality of the town, require special conservation and protective measures. The nature and importance of these significant natural and fragile areas are described below, and in combination with the goals, policies, standards, and recommendations, constitute an environmental conservation policy for the town.

**High Elevations:** Areas above approximately 2500 feet in elevation are governed by unique environmental conditions. Rainfall is greater, air and soil temperatures are lower, soils are shallower, poorly drained, and nutrient poor, slopes are usually steeper, and there are fewer plant species. Steep slopes and increased rainfall make these areas vulnerable to erosion, and the few plant species regenerate slowly once disturbed. In the shallow, ledgy mountain soils, road and building construction are especially detrimental to natural water drainage and sewage disposal is especially difficult. The highest land use and greatest benefit of high elevation lands is as a source of abundant clean water. Mountain soils absorb large quantities of water which come from the high rainfall and fog moisture collections from forest trees. The water filters through the thin soil and adds to stream flows, springs, and eventually ground water supplies in the valleys.

**Steep Slopes:** On slopes greater than 25%, water runoff and erosion are accelerated. These processes hinder soils formation. When steep slopes are cleared for construction severe environmental damage can occur. The proper functioning of septic systems is hindered on slopes greater than 15%. In addition, development on steep slopes can be costly to the town in the maintenance of roads and construction of utilities, or when erosion causes increased sedimentation of streams and lakes.

**Shallow and Wet Soils:** In areas where the depth of bedrock or other impervious strata are shallow and wet, environmental limitations may apply. Shallow soils are also very susceptible to erosion and are slow to regenerate.

**Shorelines and Streambanks:** Our streams, ponds, and lakes play an important part in our recreational economy and are a potential source of water supply. The continued use of surface water is directly related to its quality.

Development must be set back sufficiently from shorelines and stream banks to avoid pollution from effluent seeping from septic systems directly into the water. Also, streams above 1,500 feet in elevation are considered to be "pristine waters" by the Water Resources Board and pollution of such streams is prohibited.

**Wetlands:** Wetlands are important as the spawning, breeding, and feeding grounds of a wide range of wildlife. They also absorb runoff during periods of flooding and provide a more constant supply of water. Plymouth's many types of



wetlands are identified on the wetlands map filed at the Town Offices, and are protected by State law.

**Floodplains:** These lands retain excess water during heavy rains and spring thaws, thus impeding the speed of water flow. They are unsuitable for development for many reasons: potential danger to life and property, harmful effects on channel capacity, and the failure of septic systems to function properly when influenced by high water tables. In addition, floodplains are usually locations of good agricultural land. In Plymouth, floodplains are protected by special flood hazard area zoning regulations.

**Goals**

1. To provide for the long term management of the natural areas and wildlife described in this plan.
2. To protect significant natural and fragile areas from environmental damage.
3. To ensure the town and the public do not incur costs associated with development in unsuitable areas.

**Policies**

1. It is a policy of the town to support the growth of agricultural businesses in Plymouth, such as the manufacture and marketing of agricultural products, and the use of locally-grown products.
2. It is a policy of the town to support the active use and management of forest lands by private landowners in Plymouth.
3. It is a policy of the town to encourage forest-based businesses in town.
4. It is a policy of the town to protect steep slopes and ridgelines from inappropriately sited development.
5. It is a policy of the town to protect scenic resources.
6. It is a policy of the town to support the use of its natural resources in a manner that does not have an adverse impact on the environment.

**Standards**

1. Steep slopes shall remain predominantly in forest cover. Development on these areas should be permitted only if it can be demonstrated that development will not be detrimental to the environment.
2. In areas where shallow or wet soils exist, State and Federal regulations shall apply.

**Recommendations**

1. Support the Vermont Nature Conservancy in their protection of the Plymouth Caves' bat population.
2. The town should support farmers markets, arts and craft fairs, and other events that promote Vermont made and/or produced products.
3. The town should protect the long-term viability of agricultural and forestry operations by maintaining a low housing density.
4. The Planning Commission should encourage the voluntary conservation of undeveloped lands.

5. The town's zoning bylaw should continue to ensure that development avoids building in significant natural and fragile areas or outstanding natural communities.

### Scenic Areas

When townspeople were asked what they find most scenic about Plymouth, their first response was most often, "everything." Indeed, Plymouth's scenic quality is one of its richest and most widely appreciated resources.

Personal definitions of scenic beauty vary, but most of us feel that beautiful landscapes are created by nature and man in concert. The automobile has shaped our vision of the landscape -- many of our favorite views are seen from roads. Residents particularly enjoy driving on Plymouth's back roads. We also enjoy the presence of wildlife -- moose, deer, bear, foxes, turkeys, and hawks -- within the landscape. Many of us, including the youngest person polled (age 8), enjoy seeing the large tracts of trees on Plymouth's steep undeveloped slopes.

Favorite scenic areas follow, listed in the order of their popularity:

1. Plymouth Notch Historic District - Most often mentioned were the beauty of this cluster of historic buildings and the views of East Mountain and the other slopes that surround it.
2. Route 100A corridor - Between Bridgewater Corners and Plymouth Union, this state highway follows a narrow valley that occasionally broadens out into pockets of farmland. The highway's many curves may be dangerous but they are also scenic -- people enjoy passing through the stretches of sunshine and shadow cast by the mountains. A favorite section is the steep portion that descends through the "Notch" into Plymouth Union.
3. Amherst and Echo Lakes - Long recognized for their beauty, these lakes are enjoyed by motorists, boaters, bikers, pedestrians, and the many people who take advantage of the facilities at the State Park and Hawk Mountain Resort.
4. Lynds Hill Road - There are several long vistas from this steep winding road, which extends to the southeast of the Historic District. Other favorite spots include the cemetery at its base and the Five Corners area.
5. Colby Pond - Located in Plymouth Kingdom, this pond and its surrounding fields seem like they are at the top of the world.
6. Kingdom Road - This road is a mixture of woods and fields leading from Tyson Village. It runs along Kingdom Brook and up through a ravine.
7. Messer Hill Road - This dirt road has views of woodlands, farmlands, and, at the upper elevations, long-distance views of mountains as far away as New Hampshire.
8. Woodward Reservoir and Black Pond - Bordering Route 100, these bodies of water, surrounded by mountains, are less developed than Amherst and Echo Lakes. Rustic buildings of the Farm and Wilderness Camps on Woodward Reservoir complement their natural settings.

9. CCC Road (Whetstone Brook Road) - Built in the 1930s by the Civilian Conservation Corps, this seasonal dirt road ascends a steep valley to the west of Route 100A. It is a favorite place of some of Plymouth's older residents as well as its snowmobilers.
10. Chapman Road - leading south from the Kingdom and coinciding in places with the Crown Point Military Road, this rural road is bordered by large maples and old farmsteads.

Again, this listing does not cover all the places that people find scenic in Plymouth, but it does describe the ones most commonly enjoyed.

### Goals

1. To preserve the town's scenic character, to be enjoyed in the present and in the future.
2. Recognize and encourage the many residents who voluntarily pick up roadside litter. Support annual "Green-up" days.
3. Take scenic areas into account when road improvements and new signage are planned. Where safety permits, choose wood and other unobtrusive materials for guard rail construction.
4. Recognize and encourage property owners who maintain lawns and fields, to perpetuate the pattern of alternating open spaces and forest that so many people find pleasing. Encourage timber management practices that create and maintain long-range vistas. Avoid clear-cutting and other unsightly timber management practices along scenic corridors.

### Forests

Healthy forests provide a significant number of benefits to our communities, including environmental benefits (such as clean water supply, clean air, mitigation against climate change, wildlife habitat, and biological diversity), and economic benefits (such as tourism, recreation, and the wood products industry).

Trends in forest health have changed over the past decade. In the 2013 US Forest Service's National Forest Inventory and Analysis Program report, figures indicated that since 2007 there has been a continuing, though gradual, loss of about 75,000 acres of forestland in Vermont. Developed land in Vermont increased significantly between 1980-2010 (67%). The pattern of development growth has led to significant forest fragmentation throughout the state.

### **Forest Fragmentation**

Forest fragmentation is the breaking of large, contiguous forested areas into smaller pieces of forest. For natural communities and wildlife habitat, the continued dividing of land with naturally occurring vegetation and ecological processes into smaller and smaller areas creates barriers that limit species' movement and interrupt ecological processes. Since the 1980s, Vermont has experienced "parcelization," which is the result of larger tracts of land being divided into smaller ownerships or land holdings. The more individuals that own smaller parcels of forest, the more likely that the land will ultimately be developed with infrastructure (such as roads and utilities) and buildings. The 2015 Vermont Forest Fragmentation Report identifies the following causes for this trend:

- Escalating land prices;

- Increased property taxes;
- Conveyance of land from aging landowners; and
- Exurbanization (the trend of moving out of urban areas into rural areas).

Forest fragmentation affects water quality and quantity, fish and wildlife populations, and the biological health and diversity of the forest itself. When many small habitat losses occur over time, the combined effect may be as dramatic as one large loss. Forest fragmentation can disrupt animal travel corridors, increase flooding, promote the invasion of exotic vegetation, expose forest interiors, and create conflicts between people and wildlife. Habitat loss reduces the number of many wildlife species and totally eliminates others.

To help mitigate the effects of human population growth and land consumption, many scientists and conservationists urge governments to establish protected corridors, which connect patches of important wildlife habitat. These corridors, if planned correctly, allow wildlife to move between habitats and allow individual animals to move between groups, helping to restore or maintain genetic diversity that is essential both to the long-term viability of populations and to the restoration of functional ecosystems.

Large portions of the Town of Plymouth have been conserved for their significant natural communities and important roles in wildlife habitat. There are major portions of the Town of Plymouth that serve as critical forest blocks and habitat connector areas in Plymouth that are the highest priority locations for protection where development and fragmentation should be avoided to protect ecological function.

- **West Coolidge State Forest Tinker Brook Natural Area, and Plymbsbury Wildlife Management Area:** The western portion of the Town of Plymouth features highest priority interior forest blocks, highest priority habitat connectivity, and significant natural communities. The Tinker Brook Natural Area is a 105-acre area that includes the Plymouth Caves, steep rock slopes, and lowland spruce-fir forest, which is an uncommon natural community in the State of Vermont. This forest block area also includes several natural communities that are rare in Vermont, including a seep, shallow emergent marsh areas, spruce-fir ledge forest, and a red spruce-hemlock stand.
- **Bear Mountain (3,080 feet) and Salt Ash Mountain (3,286 feet):** This high elevation area in the southwestern portion of Town consists of highest priority interior forest blocks and highest priority habitat connectivity areas. It features montane-spruce-fir forest and montane yellow birch-sugar maple-red spruce forest, which is a rare natural community in the State of Vermont.
- **Mt. Tom (1,981 feet), Old Notch (1,500 feet), Soltudus Mountain (2,158 feet), and East Mountain (2,246):** This area consists of primarily red pine forest and serves as highest priority forest block and connectivity between the eastern and western portions of Town.
- **East Coolidge State Forest, Slack Hill (2,174 feet), and Plymouth Town Forest:** This area in the northeastern part of town, largely comprised of conserved land, functions as a highest priority habitat connectivity area and also serves as a high priority interior forest block.
- **Blueberry Hill (2,245 feet), Arthur Davis Wildlife Management Area, and Plymouth State Park:** This area in the southeastern portion of Town functions as a highest priority interior forest block and highest priority connectivity block. The Arthur Davis Wildlife Management Area continues into the neighboring Town of Reading.

- **Mt. Pleasant (2,181 feet) and Wood Peak 2,142 feet):** This area provides a critical habitat area in-between the major throughways of Route 100A and Route 100. It serves as a highest priority habitat connectivity area and high priority interior forest block.

### **Wildlife**

Wildlife is one of the popular attractions to the area and provides some citizens of Plymouth with direct and indirect livelihoods from sports, tourism or direct harvest of wildlife. Additionally, the interconnection of wildlife with their environment has an impact on the natural environment.

Wildlife management requires management of human activities around animals as much as management of animals around human activities. Managing for specific species is not as desirable as managing for the entire ecosystem supporting the species.

Plymouth's fields, forests, wetlands and streams are home to a diverse and healthy wildlife population that includes bear, bobcat, moose, deer, otter, geese, ducks and mink, to name only a few. Nearly all open space provides habitat for game and non-game species. There are, however, some areas in Plymouth which provide critical habitat that should remain intact. These areas include wetlands, deer wintering areas, bear mast stands, and edge (the transition zone between two cover types, such as field and forest). Development or logging in or adjacent to these areas should consider wildlife implications during the planning process.

Wintering areas are an important habitat requirement for deer during the critical winter months when snow depth and climate are limiting factors to survival. Typically, these areas consist of mature softwood stands, at low elevations or along stream beds, which provide cover and limit snow depths. Southerly facing slopes are also beneficial due to good sun exposure and may be utilized even in areas of limited softwood cover. More specific factors, such as percent canopy closure, species of softwoods, and stand age, also figure into the quality of the wintering area.

Most important when considering development and its impact on wildlife is the concept of habitat fragmentation. Forests provide habitat to a diverse population of wildlife, which are negatively impacted when forested land is fragmented through development

### **Goals**

1. To maintain or enhance the natural diversity and population of wildlife, including natural predators, in proper balance.
2. To restore stable populations of endangered or threatened wildlife in appropriate habitat areas.
3. To maintain or improve the natural diversity, population, and migratory routes of wildlife.
4. To allow sport and subsistence hunting of ecologically sound intensities to provide continued success of the species.
5. To provide the community with access to quality forestland for recreational use.
6. Reduce the fragmentation of forestlands.

### **Policies**

1. Wildlife populations and natural diversity should be maintained or enhanced.

2. Long-term protection of natural resources, natural communities, habitat, and lands identified in this Plan as critical forest blocks and habitat connectors through conservation easements, land purchases, leases and other incentives is encouraged.
3. It is the policy of the Town to protect deer wintering areas from developments and other uses that adversely impact the resources.
4. Development other than isolated houses and camps shall be designed so as to preserve continuous areas of wildlife habitat. Fragmentation of wildlife habitat is discouraged. Effort shall be made to maintain connecting links between such areas.
5. Preference shall be given to development that utilizes existing roads and field lines.
6. The Forestry Management Plan shall be kept up-to-date in order to properly manage Plymouth's Municipal Forest.
7. New developments shall take reasonable steps to avoid disruption or loss of major identified wildlife corridor crossings.
8. The construction of utilities, roads, or other physical modifications in the priority areas identified in this plan as important forest blocks and habitat connectors is incompatible with this plan.
9. Subdivisions and other development on large lots shall minimize impacts on forestry potential and habitat values of undeveloped areas by concentrating development at the forest edge near other development and roads; shall use small lot sizes and shapes so that most of the remaining land is in a large undeveloped tract; shall minimize clearing forest; and shall avoid the creation of additional roads or power lines that would further future development into interior areas.
10. Encourage the use of sound forest and agricultural management practices according to the Vermont Department of Forests, Parks, and Recreation.

**Recommendations**

1. Encourage owners of necessary habitat for threatened species (see Appendix B, Vermont Fish & Wildlife Department, for listing of current threatened and endangered species of plants and animals) to contact the State for assistance in developing a management plan for these sites.

**Historic Areas**

Some four hundred years before Columbus "discovered" America, Native American people occupied agricultural villages in the Connecticut River Valley, including sites at Springfield and Windsor, Vermont. During hunting seasons they traveled up the Black River to traditional hunting grounds in Plymouth. Remains of their encampments are buried along the river and around old river headland areas such as Black Pond.

The first Europeans to see Plymouth were probably the men who constructed the Crown Point Military Road (1759-60), which crosses the southern part of Plymouth at the head of Lake Amherst. After the Revolution, settlers followed this same route. The archeological remains of Plymouth's first homes are along this corridor, in Plymouth Kingdom, Frog City, and the Four Corners area.

Because of its isolation and steep terrain, Plymouth's early growth was slow. Although the town had been chartered in 1761, by 1790 there were only 106 people living here. Most of the early settlers cleared land and established small diversified farms. Small mills were built along

Plymouth's many waterways. Plentiful local limestone was burned in kilns to produce lime on a commercial scale.

As the 19th century wore on, many farmers specialized in raising sheep. A marble works was operating on Lake Amherst by 1834. A blast furnace and iron ore mining operation opened in Tyson in 1837. Plymouth's population peaked in the 1840s at 1497, almost four times what it is today. The town contained 17 school districts, each with its own schoolhouse. A local gold rush in the 1850s saw the opening of several mines.

As in many Vermont towns, Plymouth's population began to decline after the Civil War. Many of the more remote farms were abandoned. Sheep pastures reverted to woods. Photographs from the decades around the turn of the century show deteriorated buildings that today are only cellar holes. By August 3, 1923, when Calvin Coolidge was sworn in at the family homestead by his father as the 30th president of the United States, Plymouth appeared to many as a small rural town that had been by-passed by progress. A New York Times article in 1926 noted that half of Calvin Coolidge's hometown visited him at the White House and then amazingly commented that the total Plymouth Notch population was 29.

As the birthplace of a president, Plymouth Notch became a popular tourist attraction. Over the years, the numbers of visitors have increased until today the Plymouth Notch Historic District is the second most visited State Historic Site in Vermont (after the Bennington Battle Monument). Tourism began here before the turn of the century, as summer visitors were attracted to Plymouth's scenic lakes and mountains. Many built lakeside cottages or converted old farmhouses to summer homes. Children came here to summer camp. Farmers took in summer guests to supplement income from what was, until well into the 20th century, essentially an agricultural economy.

Today Plymouth's economic base has shifted away from agriculture, small manufacturing, and extractive industries. Most of us no longer look on our village and hamlets as primary social and commercial centers. Yet in the midst of this inevitable change, we understand ourselves, in part, through our past. Our imaginations are sparked by stone walls running through the woods, visions of Native Americans fishing our streams, the old houses many of us live in. Through the planning process, we seek to integrate the physical remnants of our past into the present functioning of the town.

A list of types of resources follows:

1. Prehistoric archeological sites: There are two mapped prehistoric sites and many other areas likely to contain evidence of Native American culture. Particularly sensitive areas are found along the banks of the Black River and adjacent to old upland wetlands and headwaters such as Black Pond.
2. Historic archeological sites: To get an idea of the number of historic archeological sites in Plymouth, one can compare the 1859 map in Beers' Atlas with a current map. All the places -- farms, mills, stores, mines, etc. -- that do not appear on today's maps are archeological sites. Not all are of equal significance, however. Particularly important are sites relating to Plymouth's gold mining era and its industrial and extractive past. This includes Five Corners and parts of Tyson. The State has mapped ten early lime kilns in Plymouth and has listed the former Tyson Iron Company property in the State Historic

Sites and Structures Survey. A locally significant site is General Amherst's Revolutionary era encampment north of Lake Amherst.

3. National Historic Landmark: The Plymouth Notch Historic Site was named a National Historic Landmark in 1965. This is the highest status that can be bestowed on an American historic site.
4. Historic districts: Tyson & Plymouth Union are both eligible for listing in the State Historic Sites and Structures Survey.
5. Corridors: The Crown Point Military Road is an important early corridor. A sign at the Kingdom Cemetery points to an easy access point. The Crown Point Road Association sponsors hikes, maintains signs, etc.
6. Individual sites: Four properties, in addition to those already mentioned, have been recorded in the State Historic Sites and Structures Survey. These are the Judge Scott house, the Echo Lake Inn in Tyson, and the Julia Messer house in Plymouth Notch. Many more sites are eligible for individual listing.
7. Cemeteries: Plymouth has four large cemeteries, all of which contain graves dating back to the late 18th century. There is also a small family plot and a Revolutionary soldier's cairn. These have been mapped and described in the publication, Burial Grounds of Vermont (Bradford, Vt.: Arthur A. Hyde, c.1991).

**Goal**

1. To identify sites which are important in our past and to encourage their protection.

**Recommendations**

1. Encourage members of the Plymouth Historical Society and other interested local people to continue a comprehensive survey of our historic sites and structures. In addition to mapping and photographing each site, the surveyors might use the survey as a focus for interviews with long-time residents about the sites. Develop a program that would provide well-researched date markers to interested owners of historic structures.
2. Encourage appreciation of prehistoric and historic resources by our children by encouraging utilization of the Plymouth Historical Society's resources and programs.
3. Promote appreciation of Plymouth history through the publication of interesting, accessible, well-illustrated books and pamphlets (such as A Plymouth Album).
4. Map archeologically sensitive areas, and consider them in the local planning process.
5. Digging of archeological sites is not recommended. The potential of sites to yield information about the past through technologically advanced archeological methods is easily destroyed by "pot hunters" digging around for old bottles and arrowheads. State law prohibits the digging of archeological sites on state lands without state permission (Title 22 V.S.A., section 762 and 764). There are other ways to begin to locate and record sites. Suggestions follow.
6. Conduct interviews with knowledgeable local people to determine where Native American and other significant artifacts have been found or where long-vanished historic



sites were located. Record collections of artifacts. Record oral histories about the historic presence of Native Americans, about early industries, farms, etc.

7. Use maps, deeds, probate records, and other documentary evidence to research archeological sites (for example, Plymouth's gold mines).

**Air Quality**

Air quality is an important feature in our overall quality of life. Clean air contributes to our health and to clear skies and extended views. Plymouth is heavily forested with limited development, but air quality can be affected from vehicle emissions, heating sources, backyard burning, and dust from construction projects.

**Policy:**

1. Support state and federal programs directed at the reduction of air pollution and encourage enforcement of air-quality standards to prevent deterioration of the region's air quality.

**Earth Resources Extraction**

The use of local sand and gravel significantly reduces the cost of road maintenance within the Town and can also benefit the local economy. When proper erosion control and reclamation techniques are used, extraction of gravel and other minerals can have minimal impact on the environment. The land can later be returned to other productive uses.

**Policies:**

1. The Town discourages the unsustainable extraction of earth resources, including sand and gravel, as well as timber.
2. The extraction of earth resources, logging and forestry activities are to be limited to operations that do not conflict with the other goals, policies, or objectives of this plan.

**Recommended Actions:**

1. Potential sand and gravel reserves should be identified and set aside for future use.

## VIII. FLOOD RESILIENCE

### **Background**

Following the impact of Tropical Storm Irene in 2011, the Vermont Legislature added a requirement that all communities address flood resilience as part of their municipal plans. Interpreted broadly, “resilience” means that an entity—a person, neighborhood, town, state, region or society— when faced with a particular situation or event, has the ability to effectively return to its previous state or adapt to change(s) resulting from the situation or event without undue strain. As such, “resilience” is an overall preparedness for a future event. For the purposes of this chapter, flood resilience will mean the ability of Plymouth to effectively understand, plan for, resist, manage and, in a timely manner, recover from flooding.

### **Types of Flooding**

Generally speaking, there are two types of flooding that impact communities in the state of Vermont—inundation and flash flooding. Inundation flooding occurs when rainfall over an extended period of time and over an extended area of the river’s basin leads to flooding along major rivers, inundating previously dry areas. This type of flooding occurs slowly, but flood waters can cover a large area. Inundation flooding is slow and allows for emergency management planning if necessary. However, unlike during a flash flood, it may take days or weeks for inundation flood waters to subside from low areas, which may severely damage property.

Flash flooding occurs when heavy precipitation falls on the land over a short period of time. Precipitation falls so quickly that the soil is unable to absorb it, leading to surface runoff. The quick-moving runoff collects in the lowest channel in an area—upland streams, in small tributaries, and in ditches—and the water level rises quickly and moves further downstream. Flash flooding typically does not cover a large area, but the water moves at a very high velocity, and the flooding manifests quickly, making flash floods particularly dangerous. Due to the velocity of the water, a flash flood can move large boulders, trees, cars, or even houses.

The collecting of water in channels in steep areas also causes stream channel erosion, which can severely damage roads and public and private property. Fast moving water in the stream channel may undermine roads and structures and change the river channel itself, predisposing other roads and structures to future flooding damage. Flash floods can also mobilize large amounts of debris, plugging culverts and leading to even greater damage. In Vermont, most flood-related damage is caused by flash flooding and fluvial erosion (erosion of stream banks). Due to its topography, Plymouth is vulnerable to flash flooding and fluvial erosion.

### **Causes of Flooding**

Severe storms with particularly heavy precipitation have the ability to create flash flood conditions. However, over an extended period of time, severe storms may cause inundation flooding due to the cumulative effects of continuous rain, saturated soils, and a high water table/high aquifer levels.

Floodplains and river corridors fill an important need, as flood waters and erosive energy must go somewhere. Development in the floodplain can lead to property damage and risks to health and safety. Development in one area of the floodplain or river corridor can also cause increased risks to other areas by diverting flood flows or flood energy. Debris carried by the floodwater from one place to another also poses a danger. Flooding is worsened by land uses that create impervious surfaces that lead to faster runoff, and past stream modifications that have straightened or dredged channels, creating channel instability.

### **Historic Flood Events**

One of the worst flood disasters to hit the Town of Plymouth, as well as the overarching region and the State of Vermont, occurred on November 3, 1927. This event was caused by up to 10 inches of heavy rain from the remnants of a tropical storm that fell on frozen ground.

A more recent flood event that devastated the region and the state was the result of Tropical Storm Irene, which occurred on August 28, 2011. Record flooding was reported across the state and was responsible for several deaths, as well as hundreds of millions of dollars of home, road, and infrastructure damage. Due to the strong winds, some in an excess of 60 mph, 50,000 Vermont residents were initially without power, and many did not have electricity restored to their homes and businesses for over a week.

Tropical Storm Irene caused widespread damage to property and infrastructure in the Town of Plymouth due to an estimated 6-7 inches of rain that fell during the storm, some of the highest precipitation totals in Windsor County. It is thought that the flooding that occurred as a result of Tropical Storm Irene was close to or equal to a 500-year flood, or a flood that has a .2% chance of occurring every year. Much of Plymouth's road infrastructure was damaged by the storm, including Vermont Route 100, Vermont Route 100A, Kingdom Road, Hale Hollow Road, Patch Brook Road, Round Top Road, Grandview Lodge Road, Frog City Road, and Dublin Road. The county-wide damage for Windsor County totaled \$32.5 million. The storm damage for Plymouth totaled \$1,591,621.06 according to FEMA's public assistance database, which captures at least 70% of the total damage.

### **Flood Hazard and River Corridor Areas in Town**

There are two sets of official maps that govern development in floodplains in Vermont. They are the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRMs) and Vermont Agency of Natural Resource's River Corridor area maps. The FIRMs show the floodplain that FEMA has calculated would be covered by water in a 1% chance annual inundation event, also referred to as the "100 year flood" or base flood. This area of inundation is called the Special Flood Hazard Area (SFHA). FIRMs may also show expected base flood elevations (BFEs) and floodways (smaller areas that carry more current). FIRMs are only prepared for larger streams and rivers. Plymouth has FEMA FIRM maps that are used in the administration of the Flood Hazard Protection overlay in its Zoning Ordinance. FEMA FIRM Maps were last updated for the Town of Plymouth on September 28, 2007. The most recent flood insurance study was completed on September 28, 2007. FEMA FIRM Maps are available for the Black River, Tinker Brook, Buffalo Brook, a small portion of Lower Pinney Hollow Brook, and Echo Lake. Plymouth contains 384 acres of floodplain, with no mapped floodway, the deepest, fastest flowing area in a flood. The floodplain comprises 1% of the town.

Recent studies have shown that a significant portion of flood damage in Vermont occurs outside of the FEMA mapped areas along smaller upland streams, as well as along road drainage systems that fail to convey the amount of water they are receiving. Since FEMA maps are only concerned with inundation, and these other areas are at risk from flash flooding and erosion, River Corridor areas are often not recognized as being flood-prone. It should be noted that while small, mountainous streams may not be mapped by FEMA in NFIP FIRMs (Flood Insurance Rate Maps), flooding along these streams is possible, and such flooding should be expected and planned for. Property owners in such areas outside of SFHAs are not required to have flood insurance. Flash flooding in these reaches can be extremely erosive, causing damage to road infrastructure, threatening topographic features including stream beds and the sides of hills and mountains, and creating landslide risk. The presence of undersized or blocked culverts can lead to further erosion and streambank/mountainside undercutting. Change in these areas may be gradual or sudden.

Furthermore, precipitation trend analyses suggest that intense, local storms are occurring more frequently. Vermont ANR's River Corridor maps show the areas that may be prone to flash flooding or erosion, which may be inside of FEMA-mapped areas, or extend outside of these areas. In these areas, the lateral movement of the river and the associated erosion is a greater threat than inundation by floodwaters. The ANR mapped River Corridors accurately represent the area where rivers and streams will move over time to meander, and they depict areas that are at risk to erosion due to the river or streams' lateral movement. Elevation or floodproofing alone may not be protective in these areas as erosion can undermine structures. Rivers, streams, and brooks that have mapped River Corridors include the Black River, Buffalo Brook, Patch Brook, Reservoir Brook, Pinney Hollow Brook, Broad Brook, and Great Roaring Brook.

In the Town and Village of Plymouth, 36 total structures reside in the Special Flood Hazard Area, meaning they have 1% of flooding every year. These structures consist of 16 single-family dwellings, 16 camps, 3 mobile homes, and 1 commercial structure. If all of the structures in the Special Flood Hazard Area were damaged or destroyed in a flooding event, the damage would total approximately \$8,389,008.

Additionally there are 46 structures that reside within the mapped River Corridor. These consist of 36 single-family dwellings, 5 commercial structures, 3 camps, 1 educational structure, and 1 government building (the Town Office). If all of these structures were damaged or destroyed, the damage would total approximately \$10,719,288. In an effort to help reduce the risk to health, structures, and road infrastructure, it is important to restore and improve the flood storage capacity of existing floodplains and to increase the overall area for retention of floodwaters in Plymouth.

### **Flood Hazard Regulations**

The Town of Plymouth has a Zoning Ordinance that was adopted on May 20, 2013. The Zoning Ordinance includes a Flood Hazard Protection Overlay, which prohibits new principal structures and new net fill in Special Flood Hazard Areas and River Corridor Areas in Plymouth.

For more specific details about the Town of Plymouth's regulations towards frequently flooded areas and areas vulnerable to erosion, please refer to the Plymouth Zoning Ordinance. Copies of the Ordinance can be found at the Plymouth Town Office and the Two Rivers-Ottawaquechee Regional Commission website.

**National Flood Insurance Program (NFIP)**

Under the provisions of the National Flood Insurance Act (1968), the Federal Emergency Management Agency (FEMA) has conducted a series of evaluations and hydrologic engineering studies to determine the limits of flood hazard areas along streams, rivers, lakes, and ponds expected to be inundated during the 100-year base flood, meaning that the flood level has a 1% chance of being equaled or exceeded in any given year. The calculations do not take into account the impact of ice dams or debris, and may, therefore, underestimate the areas which are subject to flooding damage.

FEMA has prepared a Flood Hazard Boundary Map for the Town of Plymouth, which includes flood hazard areas for the Black River, Tinker Brook, Buffalo Brook, Echo Lake, and a small portion Lower Pinney Hollow Brook. This map is on file at the Town Office and at the Two Rivers-Ottawaquechee Regional Commission. It can also be found online through FEMA's website and the Vermont Agency of Natural Resources. Contact the Plymouth Town Clerk to determine if a proposed development is in the Flood Hazard Area.

FEMA also administers the National Flood Insurance Program, which provides flood hazard insurance at subsidized rates for property owners in affected areas. In order to qualify for federal insurance, towns must adopt and retain a bylaw to control land development within these areas. Minimum standards must be included and approved by FEMA. Coverage is only available to landowners if a town elects to participate in the program. The Town of Plymouth incorporates Flood Hazard regulations as part of its Flood Hazard Bylaw, and is recognized as a participating community in the National Flood Insurance Program, which it has been enrolled in since June 6, 1989.

**Promoting Flood Resilience:**

The following changes to the Flood Hazard Bylaw would help protect the citizens of Plymouth from further damages from a severe flooding event:

1. Require the elevation of existing structures in the Special Flood Hazard Area to be elevated 2 feet above base flood elevation.
2. The best and most appropriate uses within the Flood Hazard Area along rivers and streams are those that are recreational and agricultural (using Required Agricultural Practices). Minimizing development within these areas will help protect both public and private investments as well as the natural and scenic quality of Plymouth's waterways.

Revisions to Plymouth's flood hazard bylaw will require input from the community regarding the level of regulation it believes is necessary to protect citizens and their buildings from severe flood hazard events. Provided that all parts of the flood hazard bylaw continue to meet the minimum requirements of the NFIP, communities have a broad range of flexibility in regulating the flood hazard area.

**Non-regulatory approaches****Easements**

Plymouth could pursue riparian easements as a way to protect floodplain from development and preserve flood storage.

**Culvert Maintenance**

Plymouth maintains an up-to-date list of culverts and culvert condition, and completed a comprehensive culvert inventory in summer 2013. As part of this process, priority projects were identified and cost estimates were generated to prioritize culvert upgrades for damaged and undersized structures. Vermont Agency of Transportation Codes and Standards, which the Town of Plymouth adopted on February 18, 2013, require a minimum size of 18 inches for new culverts. The process of upgrading culverts is ongoing underway.

**Goal:**

1. Maintain and improve the quality of Plymouth's surface and ground waters.
2. To enhance and maintain use of flood hazard areas as open space, greenways, non-commercial recreation and/or agricultural land.
3. To ensure no net loss of flood storage capacity in an effort to minimize potential negative impacts. These impacts include the loss of life and property, disruption of commerce, and demand for extraordinary public services and expenditures that result from flood damage.
4. To allow Plymouth to be resilient in the event of a severe flood.
5. To protect municipal infrastructure and buildings from the potential of flood damage.

**Policies**

1. Use sound planning practices to address flood risks so that Plymouth's citizens, property, economy, and the quality of the town's rivers as natural and recreational resources are protected.
2. Plymouth prohibits all new net fill and construction of new principal buildings in mapped flood hazard areas and river corridors (*Mapped areas, unless corrected by FEMA*).
3. Limit permitted land uses within Plymouth's River Corridor Areas to non-structural outdoor recreational and agricultural uses due to the dangerous erosive risk in these areas.
4. Prohibit new commercial, industrial, and residential uses within ANR's mapped river corridor areas outside of designated village areas. New development within designated village areas should not be closer than current structures.
5. Move or abandon roads that often experience serious flood damage.
6. Design culverts and bridges, at minimum, to meet VTrans Hydraulics Manual, ANR Stream Alteration Standards, VTrans Codes and Standards. Maintain culverts to ensure they are effective during severe weather events.
7. Do not build Plymouth's emergency services, power substations, and municipal buildings in the Special Flood Hazard or River Corridor Areas.

8. Plymouth will maintain vegetated buffer strips in riparian zones bordering streams and rivers. Rock rip-rap and retaining walls should only be used to the minimum extent necessary and when bioengineering techniques may not be adequate to prevent significant loss of land or property.
9. Maintain Plymouth's upland forests and watersheds predominately in forest use to ensure high quality valley streams and to ensure that flood flows reduced.
10. All currently mapped and delineated wetlands which provide flood storage functions shall remain undeveloped. In the long term, restoration and enhancement of additional wetlands should be pursued in order to improve Plymouth's flood resilience.
11. After flood events, recovery and reconstruction within the river area should be managed according to the Vermont River Program's best practices in order to avoid negative impacts downstream.

**Recommendations**

1. All substantial improvements to structures should be elevated 2 feet above base flood elevation (BFE).
2. Plymouth should work with VTrans and the Regional Planning Commission on advocating for and improving the flood capabilities of state or town-owned transportation infrastructure.
3. Plymouth should continue working to update hazard mitigation plans and emergency preparedness and recovery procedures.
4. The Selectboard should continue to send a representative to regularly attend and participate in the region's Local Emergency Planning Committee (LEPC #12).
5. The town should continue to maintain and update town bridge and culvert inventories. This information should be used to develop a schedule to replace undersized culverts.

## **IX. EDUCATION**

In 2009, the Plymouth School Board voted to close its elementary school. Plymouth voted in April 2017 to join the Windsor Central Unified Union School District under Act 46. To provide public education for students in town, Plymouth makes a per pupil tuition payment to public schools in other communities where Plymouth students have chosen to attend. Students from grades 7-12 continue to be tuitioned to neighboring schools.

The school building, located on Route 100, was built in 1961 and consists of three rooms and one kitchen/storage room. An outside storage shed was added to allow for better use of limited space inside the building. This is now a town owned building and is used as a community center, as well as an emergency shelter.

The Plymouth Schoolhouse is a Center Based Child Care and Preschool Program. It is a licensed provider with a maximum capacity of 8 children. It was launched in 2015 and is currently the only licensed childcare provider in Plymouth.

Because Plymouth is a small rural community, adult residents seek their educational opportunities elsewhere, such as Community College of Vermont campuses in Rutland and Springfield. There are many other colleges and higher education institutions throughout Vermont and in neighboring states. One opportunity within Town is the Plymouth Community Center, which offers classes in various subjects such as fitness, art, first aid and CPR, cooking, driver safety, and more.

### **Goal**

1. To provide access to Pre-K, educational and vocational training opportunities sufficient to ensure the full realization of the abilities of all Plymouth residents.

### **Policies**

1. It is a policy of this Town Plan to advocate for the education of Plymouth students to ensure a healthy community.
2. It is the policy of the town to ensure sufficient and appropriate placement of students to meet their educational requirements.

### **Recommendation**

1. The Plymouth School Committee should create a committee to foster and maintain the ties between the community and school children.
2. The Town should explore the idea of town-provided transportation for school-aged children.



## **X. COMMUNITY HEALTH & WELLNESS**

### **Introduction**

The health and wellness of Plymouth's residents is of the utmost importance. Plymouth's vision for health, wellness and safety is that all citizens in the community have access to high quality, affordable, physical and mental health care through local providers; that employers and individuals support healthy lifestyles and environments; that the well-being of children is a central focus; that prevention, personal wellness and freedom from pain are strong areas of focus from birth to death; that domestic violence and substance abuse are unacceptable in our families and community; that the elderly and disabled citizens have adequate health and wellness support to remain in their homes and remain integrated in their community; and that all residents have access to prompt and effective services in the event of an emergency.

The Town of Plymouth seeks to elevate the vitality of its citizens by including a comprehensive element dedicated to health and wellness in its Town Plan. Although the Community Health and Wellness Element is not a state-mandated element, the Town believes that its inclusion in the Plan ensures that public health and wellness remains a top Town priority.

Many other elements of this Town Plan also have an impact on health, including preservation of green space; clean water; trails that encourage walking; and design of new development to promote human interaction, reduce the use of vehicles, and support local and healthy food.

### **Health Care Facilities**

Health care facilities are essential in the prevention, treatment, and management of illness, and in the preservation of mental and physical well-being through the services that they offer. Rural locations such as Plymouth are served by small facilities that can assist residents with general health care needs but are not suited for more complex acute care services that require specialized services and equipment. Plymouth is not home to any health facilities, but Plymouth residents can visit health care providers in nearby towns, including Mt. Ascutney Hospital and Health Center in Windsor, the Ottauquechee Health Center in Woodstock, Rutland Regional Medical Center, the Ludlow Health Center, Springfield Hospital, and Dartmouth Hitchcock Medical Center in Lebanon, NH.

### **Healthy Food Access**

Food access is not simply a health issue but also a community development and equity issue. For this reason, access to healthy, affordable, and culturally appropriate food is a key component not only in a healthy, sustainable local food system, but also in a healthy, sustainable community. Stores, farm stands and farmers markets, and community meals are all opportunities to create access to healthy foods.

### **Healthy Homes**

Housing is the best-known predictor of health. Lead exposure can lead to significant abnormalities in cognitive development; asbestos and radon exposure can increase the chance of developing lung cancer; uncontrolled moisture, mold, pests, and other triggers cause or exacerbate asthma and other respiratory dysfunction; inadequate heat can lead to use of inappropriate heating sources potentially resulting in fires or carbon monoxide poisoning; and poorly maintained stairwells and other structures can cause injuries. The risk of falls for older

adults is another healthy home concern, particularly when these adults are living in old housing stock that may have uneven floors, narrow stairs, or other potentially hazardous features.

### **Environmental Quality**

Safe air, land, and water are fundamental to a healthy community environment. An environment free of hazards, such as secondhand smoke, carbon monoxide, allergens, lead, and toxic chemicals, helps prevent disease and other health problems. Implementing and enforcing environmental standards and regulations, monitoring pollution levels and human exposures, building environments that support healthy lifestyles, and considering the risks of pollution in decision-making can improve health and quality of life.

### **Active Living & Active Transportation**

As the built environment has become increasingly car-centric, levels of physical activity have correspondingly declined. Reduced physical activity has resulted in population weight gains. To counter these trends, it is necessary to make communities more conducive to physical activity once again, particularly walking and cycling. Bicycles are used both for transportation and recreation. Bicycle transportation is used for work or conducting errands. Recreational users include local residents who see the health benefits of the sport and visitors who come to Vermont to experience the outstanding scenery. Walking is an important part of community life and, much like bicycling, actively contributes to the vitality of our roads, reduces our dependence on the automobile, and provides a healthy recreational opportunity.

### **Planning for Health**

A Health Impact Assessment is a systematic process that uses an array of data sources and input from stakeholders to determine the potential effects on the health of a population. HIAs provide recommendations on monitoring and managing those effects. HIAs are conducted before decisions are made, so that there is an opportunity to design or implement projects that maximize positive health outcomes. Vermont Department of Health Offices of Local Health may be able to assist Towns with HIAs.

Town Health Officers are given authority by the Vermont statutes to investigate and mitigate any potential or existing public health hazard in his/her town. The health officer conducts an investigation upon receipt of information regarding a condition that may be a public health hazard and enforces the rules and permits issued by the Vermont Department of Health. The Town Health Officer may be contacted through the Town Hall.

## **Goals, Policies, and Recommendations**

### **Goal:**

1. Promote health and wellness in Plymouth.

### **Policy of the Town to:**

1. Increase access to healthy foods by alerting town residents to organizations such as local CSAs, the Vermont Healthy Soils Coalition, local farmers' markets, and organizations that serve local residents in need, such as Black River/Good Neighbor.
2. Encourage affordable housing.
3. Minimize the risks to human health and the environment posed by hazardous sites.

4. Promote active transportation through walking and biking.
5. Improve parks, recreation facilities, and open spaces for accessibility and community mingling.

**Recommended actions:**

The town should

1. Promote and expand farmers markets and community gardens, encourage local gardeners to share their overabundance of summer produce by bringing their fruits and vegetables to a local site for distribution, and organize delivery to local residents who are unable to drive.
2. Work with local housing authorities to create a variety of housing types and maintenance options.
3. Protect water quality of rivers, streams, lakes, and wetlands.
4. Promote use of park and recreation facilities.
5. Consider accessibility when developing public spaces and recreational opportunities.

## XI. ENERGY

Energy use and generation plays an important role in the environmental, economic, and social well-being of our community. The continued use of petroleum-based fuels is causing negative impacts on the environment and contributing to global climate change, emphasizing the need to plan for energy conservation and switching to renewable energy sources. The global impacts of climate change including the destruction of ecosystems, sea level rise, and the increased intensity of droughts and severe storms, are already being observed. In Vermont, climate change is altering the composition of our forests, affecting the tourism economy, increasing the spread of invasive species and pests, and resulting in more damaging storms, floods and other severe weather events. Every effort needs to be made locally and globally to limit future damage and adapt to a changing reality.

While the Planning Commission recognizes that energy supply and demand are directed largely by economic forces at the state, federal, and international levels, how Plymouth plans for future growth can have an impact on how much energy is used in this community. The siting and design of buildings and the selection of heating systems can influence the efficient use and conservation of energy.

### **Projected Climate Trends in Vermont:**

#### **Warming Temperatures:**

Vermont’s temperatures are projected to rise by another 2 to 3.6 °F by 2050.

**Increasing Precipitation:** Largest increases precipitation will be in mountainous regions, and much of the precipitation will fall as snow in winter, then shift to rain in the next 50 years.

**Weather Extremes:** High nighttime temperatures, high temperature extremes and high-energy lightning storms will increase.

**Jet Stream effects:** Blocking of the jet stream from melting arctic ice will lead to prolonged periods of intense rainfall, drought, or intense cold.

Source: Vermont Climate Assessment.org

The state of Vermont strongly supports reducing its reliance on fossil fuels and securing energy independence by improving the energy efficiency of residential, business, and government buildings, and utilizing in-state renewable energy resources. The 2016 Vermont Comprehensive Energy Plan (CEP) describes the major factors of energy use by addressing the state’s energy future for electricity, thermal energy, transportation and land use. Through this process, the CEP set a long-term statewide goal of obtaining 90% of Vermont’s energy needs from renewable sources and eliminating our reliance on oil. Expanding upon the statutory goal of 25% renewable by 2025 (10 V.S.A. § 580(a)), the CEP established the following set of goals:

- Reduce total energy consumption per capita by 15% by 2025, and by more than one third by 2050.
- Meet 25% of the remaining energy need from renewable sources by 2025, 40% by 2035, and 90% by 2050.
- Three end-use sector goals for 2025: 10 % renewable transportation, 30% renewable buildings, and 67% renewable electric power.

“Energy” as used in this Plan and the CEP is not the same as electricity. Energy in this context refers to **all** forms of energy used by people.

Categorizing energy use is commonly broken down into four sectors: commercial (running machinery, heating and lighting), residential (mainly heating and lighting), industrial (process energy such as smelting or concrete production), and transportation (mainly gasoline and diesel).

As Plymouth continues to plan for the future, it is important that the town understands its current energy use and is able to set targets in order to reach the municipality’s and ultimately the state’s energy goals. Plymouth must plan on how it will reach the energy targets described in this chapter as well as provide a guide to renewable energy development in town.

**VERMONT ENERGY QUICK FACTS**

- One in six Vermont households uses wood products, such as wood pellets, as their primary heating source.
- Vermont produces less than 35% of the electricity it consumes and depends on power from the New England grid and Canada.
- In 2016, nearly all of Vermont's in-state net electricity generation was produced by renewable energy, including hydroelectric, biomass, wind, and solar resources.
- In the years 2011 through 2016, Vermont installed 59.2 megawatts of commercial-scale solar photovoltaic capacity, 26.8 megawatts in 2016 alone.
- Vermont has enacted the nation's first integrated renewable energy standard (RES), which makes utilities responsible both for supplying renewable electricity and for supporting reductions in customers' fossil fuel use.

Source: <https://www.eia.gov> - June 15, 2017

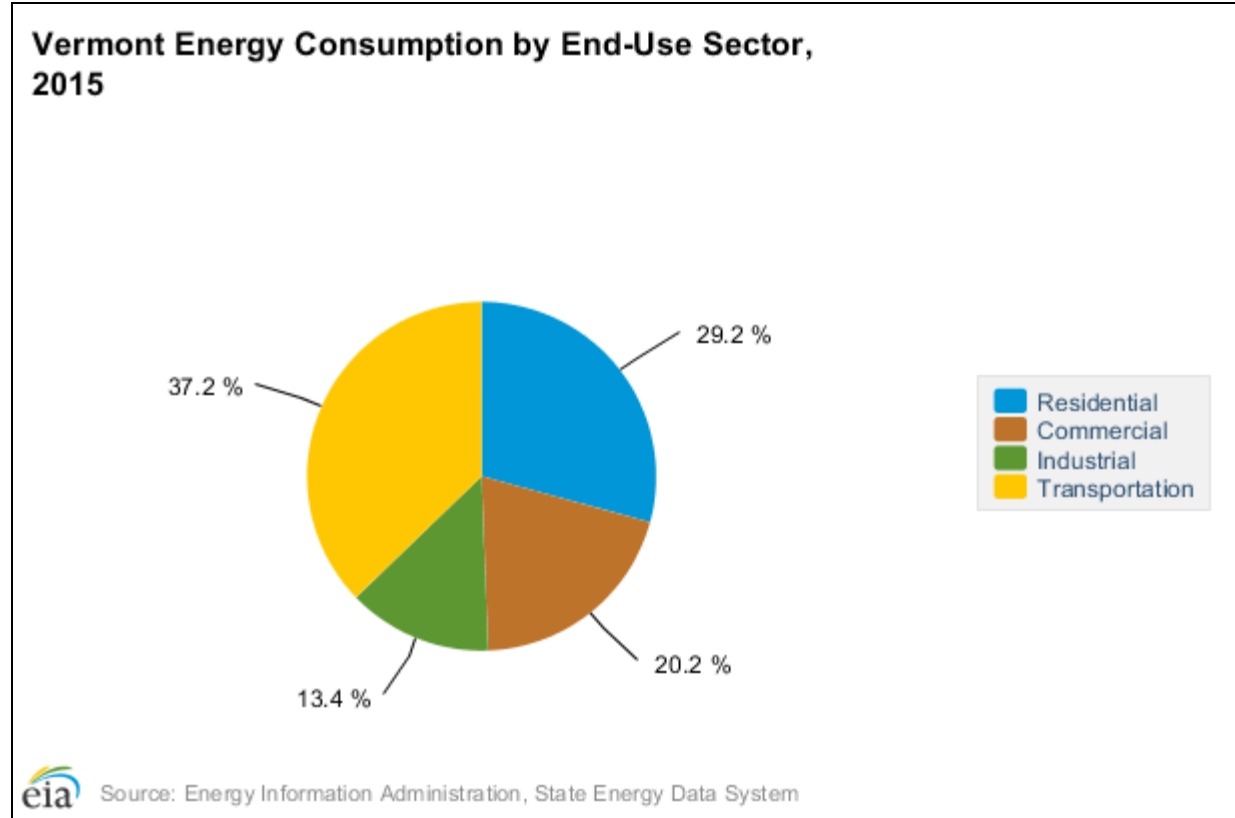


Chart 4: Vermont energy consumption by end-use sector

**Analysis and Targets**

**Electricity**

An energy use baseline is important to help plan Plymouth’s energy future. This section will provide background data on electricity use and renewable energy generation in Plymouth and provide electrical efficiency and renewable generation targets.

<b>Current Electricity Use (KWH)</b>	
<b>Sector</b>	<b>2016</b>
<b>Commercial &amp; Industrial</b>	1,860,718
<b>Residential</b>	5,689,280
<b>Total</b>	<b>7,549,998</b>

Table 4: The table above displays current electricity use in Plymouth. Data provided by Efficiency Vermont.

As more renewable energy generation is produced in Plymouth to meet the 2050 targets, Green Mountain Power will need to increase the pace of system-wide updates. These include line upgrades and storage technologies such as Tesla’s Powerwall battery system. Electric savings are possible through energy efficiency improvements. Gains in efficiency can be made through improved appliance standards, building energy codes, consumer purchasing decisions, and publicly funded programs. The table below identifies the electric efficiency improvement targets needed for Plymouth by 2050.

<b>Electricity Efficiency Targets</b>	<b>2025</b>	<b>2035</b>	<b>2050</b>
Increase Efficiency and Conservation	-0.6%	5.7%	9.9%

Table 5

*Note the decrease in the first target year. This plan encourages residents to conserve energy and switch to more efficient systems. This is due to LEAP modeling showing that efficiency trends are outpacing the electrification trends.*

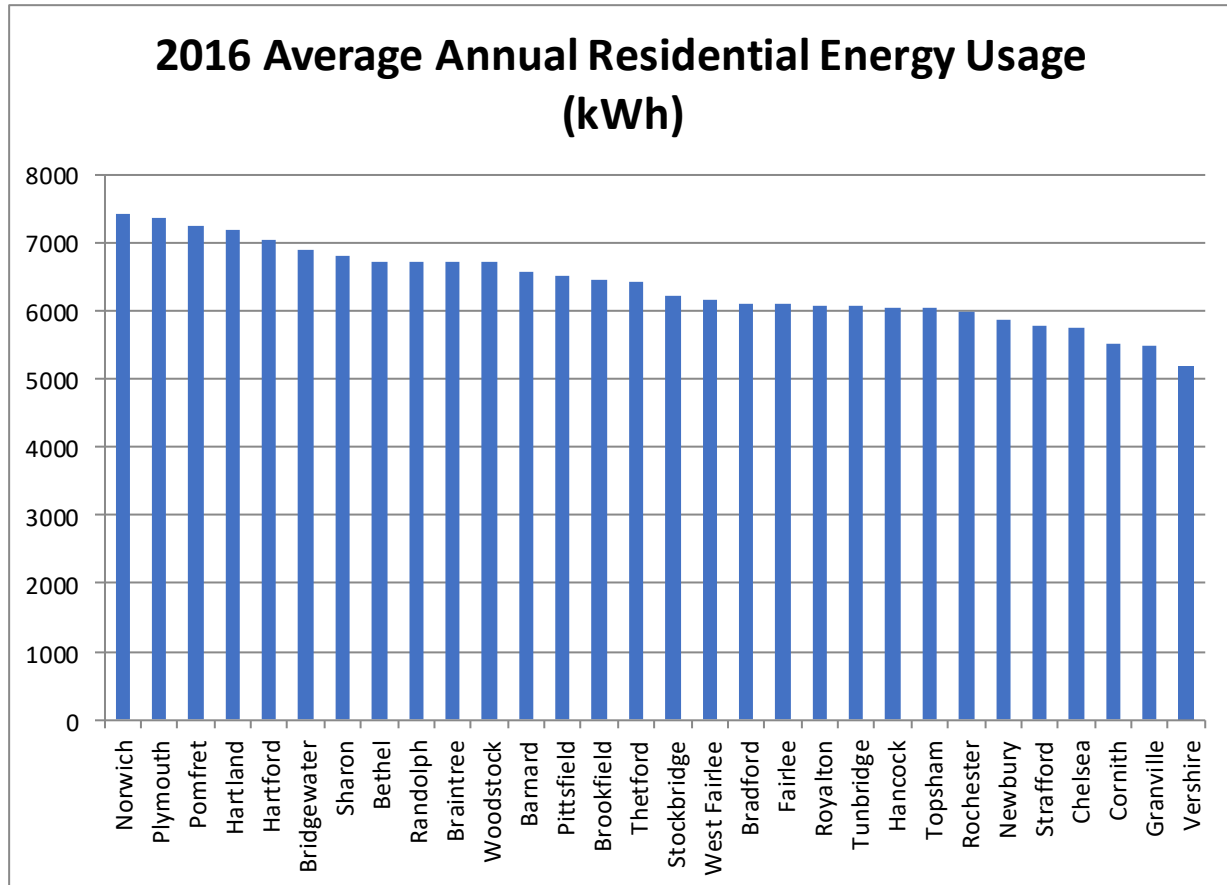


Chart 5: Note Plymouth has one of the highest average annual residential uses of electricity in the region at over 7,000 kWh. Source: Green Mountain Power

The Town of Plymouth can meet its local energy demand through conservation, lowering that demand, and then by working to meet the remaining need with local, renewable energy resources.

**Decreasing Energy Use by Changing Behavior**

Raising awareness of energy saving behaviors can reduce energy demand and can help residents and businesses save money. Examples include:

- Turning off lights when you leave a room.
- Using a programmable thermostat.
- Using a clothes line to dry clothes.
- Using cold water when doing laundry.
- Using a smart power strip or unplugging appliances when not in use.
- Combining errands to make fewer car trips.

**Decreasing Energy Use by Implementing Energy Efficiency**

Along with conserving energy, energy efficiency helps by ensuring that we use less energy to provide the same level and quality of service. Examples include:

- Conduct an energy audit to identify the most cost-effective ways to save energy.
- Implement the air-sealing and insulation recommendations of the energy audit, insulating attics, walls and basements with high R-value material.

- Using high efficiency windows.
- Installing energy efficient, Energy Star rated appliances such refrigerators, freezers, front loading washing machines, and heating systems without blowers.
- Using LED light bulbs
- Using solar or heat pump hot water heaters.
- Siting buildings to make use of existing wind blocks and natural cooling patterns derived from the landscape’s topography.
- Siting buildings with maximum southern exposure to capture passive solar energy.

**Renewable Energy Generation**

Renewable energy generation sources include wind, solar, hydroelectric, and woody biomass. Through information from the Vermont Department of Public Service (DPS), there are currently an estimated 25 solar sites in Plymouth that are producing 215,811 kWh of annual electricity generation.

The Two Rivers Ottauquechee (TRO) Region currently produces 88,588 MWh of renewable electric energy generation. All of the existing or permitted generation capacity as of 2015 was factored and pooled together for the region. Based on the regional share of the overall state population and the current renewable energy generation, the regional target is 349,307 MWh. Plymouth’s target for renewable energy generation in 2050 is between 3,457- 4,248 MWh. This information was generated based on data provided by the Department of Public Service and information developed by TRORC.

Renewable Generation Targets	2050
Total Renewable Generation Target (in MWh)	3,457-4,248

In order to meet the combined electrical efficiency and generation targets outlined above, residents will need to convert to more efficient technologies such as cold climate heat pumps, advanced wood heating, and electric vehicles. Targets are described in later sections for thermal and transportation sectors.

Renewable Generation Potential	MW	MWh
Rooftop Solar	0	354
Ground-mounted Solar	373	457,601
Wind	2,694	8,260,571
Hydro	0	60
Biomass and Methane	0	0
Other	0	0
<b>Total Renewable Generation Potential</b>	<b>3,068</b>	<b>8,718,585</b>

Table 6: Renewable generation potential in Plymouth

The Vermont Energy Atlas (<https://www.vtenergydashboard.org/energy-atlas>) is an online tool that can be used to gather information on existing and potential renewable energy resources by counties, towns, or individual parcels in the state.

**Solar** - Most locations in Vermont are capable of generating solar energy through photovoltaic panels or solar thermal systems. It is important to note that the renewable generation targets



cannot be attained from just rooftop solar. Installing ground mounted solar can help reach that target.

**Passive Heating and Lighting** – Good building and site design are essential to taking advantage of the sun’s energy through passive methods.

**Electricity Generation** – Decreasing costs of equipment have made solar electric generation systems more prevalent. Solar systems are no longer utilized exclusively by “off-grid” buildings due to net-metering availability. Systems that are net-metered are overseen by the Public Utility Commission (PUC) and are exempt from local permitting.

## **Wind Generation**

Similar to solar, wind energy is an intermittent resource and its generation fluctuates in response to environmental conditions. Wind can often generate power when solar is not generating, evening out the supply available to the grid. The amount of energy produced by a specific wind tower can depend greatly on location, height of the tower and proximity to other obstructions. Modern wind turbines have a 2-5 megawatt maximum capacity range. Most modern wind turbines have a higher “capacity factor” (the ratio of actual production to maximum possible production) than solar. There are multiple levels of potential wind energy generation, ranging from Class 1 (10-11 mph) to Class 7 (19-25 mph).

State law exempts commercial energy generation facilities from local land use regulations. Plymouth, therefore, may wish to establish development standards with which to review future wind generation proposals. Such standards could ensure that the environment and landscape would be properly protected against any adverse impacts. In general, developers should make every effort to minimize damage to important natural areas as identified in the Natural Resource section of this Plan. Additionally, wind facilities should be located as close to existing roads as possible to avoid the fragmentation of wildlife habitat, agricultural soils, and forestlands.

**Hydropower:** There are no hydropower facilities located in Plymouth. Advances in hydropower technology are making it increasingly viable for small-scale residential use. Micro hydropower has the potential to generate enough electricity to power a home, provided that the essential ingredients – water and vertical drop – are available. Hydro can be an excellent complement to a solar system because water flow is often greater during the winter season when solar is less effective.

## **Development and Siting of Renewable Energy Resources**

Energy generation in Vermont is subject to a number of different permitting requirements, most of which are limited to state level permitting. Towns are prohibited from regulating energy generation facilities for both residential and commercial projects. But there are two ways that the town can make its voice heard in the state review process: through the Section 248 process and through this municipal Plan. Towns are also empowered to craft a local bylaw with siting standards, though the siting standards cannot have the effect of prohibiting a certain type of renewable energy facility. Under the bylaw, towns make a recommendation to the Public Utility Commission (PUC) and do not issue a permit.

**Section 248**

Distributed power generation facilities, such as hydropower dams, fossil fuel plants, and wind power or solar systems owned by utilities, are subject to review and approval by the Vermont Public Utility Commission (PUC) (30 VSA §248). Under this law, prior to the construction of a generation facility, the PUC must issue a Certificate of Public Good. A Section 248 review addresses environmental, economic, and social impacts associated with a particular project, similar to Act 250. In making its determination, the PUC must give due consideration to the recommendations of municipal and regional planning commissions and their respective plans, unless these plans have been written to a higher standard, in which case they are afforded “substantial deference”. If this Plan receives a Certificate of Energy Compliance from the TRORC, then the Plan will be afforded “substantial deference.” For policies in Certified Plans cannot be ambiguous or optional, and they can’t be written in such a way that treats energy facilities differently than other types of development or that has the effect of prohibiting them. This Plan will therefore address these land uses and provide guidance to town officials, regulators, and utilities.

**For all commercial energy generation facilities, the following policies shall be considered:**

- 1. Preferred Locations:** The Town supports the placement of new generation and transmission facilities in the following areas
  - Preferred sites as identified in Part 5.103 of Vermont’s Net-Metering Systems Rule 5.100, including existing structures, parking lot canopies, brownfields, landfills, and the disturbed portion of a gravel pit or quarry.
  - Additionally, the Town, by joint letter of the Planning Commission and Selectboard, may designate a site as preferred if it is not visible in the growing season from town or state highways, is not actively in agriculture, and is not part of a priority or high priority forest block or habitat connector.
- 2. Prohibited Locations:** Because of their distinctive natural, historic or scenic value, energy facility development shall be excluded from the following areas:
  - FEMA Floodways
  - National Wilderness Areas
  - Class 1 Wetlands
  - Wind Development shall not occur at elevations above 2,000 ft
- 3. Constraint Areas:** All new generation, transmission, and distribution facilities shall be sited and designed to reasonably avoid or, if no other reasonable alternative exists, to otherwise minimize and mitigate adverse impacts to the following:
  - a. Historic districts, landmarks, sites and structures listed, or eligible for listing, on state or national historic registers
  - b. State or federally designated scenic byways, and municipally designated scenic roads and viewsheds
  - c. Special flood hazard areas identified by National Flood Insurance Program maps (except as required for hydro facilities)
  - d. Public and private drinking water supplies, including mapped source protection areas
  - e. Primary agricultural soils mapped by the U.S. Natural Resources Conservation Service
  - f. Agricultural Soils (VT Agriculturally Important Soil Units)
  - g. Protected Lands (Updated 07/26/2016 – State Fee Lands and Private Conservation Lands)

- h. Deer Wintering Areas (as Identified by ANR)
- i. Act 250 Agricultural Soil Mitigation areas (as Identified by ANR)
- j. ANR’s Vermont Conservation Design Highest Priority Forest Block Datasets
- k. Priority Forest Blocks – Connectivity, Interior and Physical Land Division (as Identified by ANR)
- l. Hydric Soils (as Identified by ANR)
- m. River Corridor Areas as identified by the Vermont Department of Environmental Conservation
- n. Class 2 Wetlands as indicated on Vermont State Wetlands Inventory maps or identified through site analysis
- o. Vernal Pools (as Identified by ANR or through site analysis)
- p. State-significant Natural Communities and Rare, Threatened, and Endangered Species

**Thermal**

Plymouth residents rely on a variety of heating sources including wood, fuel oil, propane, and natural gas. The variability in heating costs can pose financial hardships for residents. To help limited income residents with the costs of weatherization upgrades and heating costs, programs through Efficiency Vermont and Capstone Community Action agencies provide assistance (see sidebar.) There are several websites that can help homeowners make cost effective weatherization upgrades, including Efficiency Vermont ([www.efficiencyvermont.com](http://www.efficiencyvermont.com)) and Smarter House (<https://smarterhouse.org>).

The following two tables display the percentage of households and commercial buildings in Plymouth that would need to be weatherized by each of the target years to meet the goals. They also illustrate the electric efficiency needed for each target year to meet the goal.

<b>Thermal Efficiency Targets</b>			
	<b>2025</b>	<b>2035</b>	<b>2050</b>
Residential - Increased Efficiency and Conservation	33%	67%	100%
Commercial – Increased Efficiency and Conservation	6%	9%	18%

Table 7

<b>Thermal Renewable Energy Use Targets</b>			
	<b>2025</b>	<b>2035</b>	<b>2050</b>
Heating Renewables	50.5	62.8%	92.5%

Table 8

**Biomass** - The term ‘biomass’ refers to biologically-based feedstocks (that is, algae, food or vegetable wastes, grass, wood, methane, and much more). Biomass can be converted into an energy source to fuel vehicles (e.g. biodiesel), heat homes, or even generate electricity. Many Plymouth homes use biomass for primary or supplemental heating. According to the 2016 Vermont Comprehensive Energy Plan, those using wood for primary heating consumed about 4.8 cords in 2014-15, while those using wood as a supplementary source used 2.1 cords. In that same year, Vermont households burned about 126,000 tons of wood pellets, with primary-heat-source consumers burning 4.4 tons and supplementary-heat-source consumers burning 3.3 tons

for the season. A slight reduction in the number of cords of wood burned from 2007-08 data could be a reflection of Vermonters installing more efficient wood heating systems. A recent increase in the use of wood pellets illustrates a growing demand for wood resources as heating fuel.

### **Residential Building Codes**

New residential development in the State of Vermont is required to comply with Vermont Residential Building Energy Code (RBES). Commercial development is subject to similar code regulations. Some examples of the types of development the RBES applies to include:

- Detached one- and two-family dwellings.
- Multi-family and other residential buildings three stories or fewer in height.
- Additions, alterations, renovations and repairs.
- Factory-built modular homes (not including mobile homes)

In order to comply with the RBES, a home, as built, must meet all of the Basic Requirements and the Performance Requirements for one of several possible compliance methods. If the home meets the technical requirement of the Residential Energy Code, a Vermont Residential Building Energy Standards Certificate must be completed, filed with the Town Clerk of the community and posted in the home. Because there is no enforcement of the filing requirement at the state level, the community may want to consider innovative ways to encourage filing, such as requiring an additional fee with a building permit that would be reimbursed if an RBES certificate is filed. If a home required by law to meet the Residential Energy Code does not comply, a homeowner may seek damages in court from the builder. The RBES includes heating and cooling systems as well.

### **Making Changes and Implementing Solutions at the Municipal Level**

Through policy making, municipalities can set a clear example for townspeople and encourage sustainable behavior that will ultimately result in both energy and financial savings. Municipalities can implement policies that lower energy use by town staff and encourage greater energy efficiency. An Energy Efficient Purchasing policy could require energy efficiency to be considered when purchasing or planning for town investments. Purchasing Energy Star rated equipment is a well-documented way to increase energy efficiency. Devices carrying the Energy Star logo, including printers, computer products, and kitchen appliances generally use 20%–30% less energy than required by federal standards.

Towns can also implement policies that are designed to reduce wasteful energy practices. For example, the Town of Plymouth could create a policy requiring that town vehicles (such as dump trucks and other road maintenance equipment) not idle for more than a set period of time. Idling is an expensive waste of fuel, and a policy such as this could lead to energy substantial savings.

### **Auditing Municipally Owned Buildings**

Many towns in Vermont own buildings that are old and inefficient in many respects. For instance, older buildings often have insufficient insulation, wasteful heating and cooling systems,

and out-of-date lighting. These kinds of infrastructure problems result in higher energy use with the resulting cost passed onto taxpayers.

Municipal officials should consider conducting audits on additional town buildings in order to determine what improvements are necessary, and which projects would have the highest cost-benefit ratio in terms of energy and financial savings. The town of Plymouth continues to make improvements in the Town office by updating lighting to use more energy efficient bulbs and improving insulation within the building.

### **Capital Budget Planning**

Given the potential expense of energy efficiency improvements, it is essential to wisely budget town funding to cover these costs. State statute enables communities to create a Capital Budget and Program for the purposes of planning and investing in long-range capital planning. A capital budget outlines the capital projects that are to be undertaken over a five-year period. It includes estimated costs and a proposed method of financing those costs. Also outlined in the Program is an indication of priority of need and the order in which these investments will be made. Any Capital Budget and Program must be consistent with the Town Plan and shall include an analysis of what effect capital investments might have on the operating costs of the community.

When planning for routine major facilities investments, such as roof replacements, foundation repairs, etc., it is important to also consider making energy efficiency improvements at the same time. The cost to replace or renovate a community facility will only be slightly higher if energy efficiency improvements are done concurrently, rather than on their own.

### **Goals, Policies and Recommendations**

#### **Goals**

1. To promote the development of renewable energy resources and facilities in the Town of Plymouth to meet the energy needs of the community.
2. To reduce energy costs, the community's reliance on fossil fuels and greenhouse gas emissions that contribute to climate change.
3. To encourage a continued pattern of development and land use that is energy efficient.
4. To increase awareness and use of energy conservation and efficiency practices through educational outreach to the public.
5. To promote the construction of energy efficient residential and commercial buildings.
6. To bring municipal buildings to net zero energy use.
7. To increase public transportation opportunities throughout the community, including park-and-ride access, bus service, and biking paths.
8. To encourage the use of electric vehicles.

#### **Policies**

1. It is the policy of the Town to participate in the Public Utility Commission's Certificate of Public Good application process to ensure that local energy, resource conservation, and development objectives are identified and considered in future utility development.

2. It is the policy of the Town that any commercial energy generation facility proposed in Plymouth should be developed so as to avoid negative impacts on the rural character of the area in which they are proposed to be located. Developers should make all possible efforts to minimize damage to important natural areas as identified in the Natural Resource section of this Plan. Additionally, such facilities should be located as close to existing roads as possible to avoid any increase in the services provided by the town.
3. It is the policy of the Town that generation, transmission, and distribution facilities or service areas shall be encouraged only when they complement the recommended land use patterns set forth in this plan.
4. It is the policy of the Town to support the development and use of renewable energy resources including, but not limited to solar, biomass, micro-hydro and biofuels – at an appropriate scale; that enhances energy system capacity and security; that promotes cleaner and more affordable energy technologies; that increases the locally available energy options; and that avoids undue adverse impacts of energy development on the local community and environment.
5. It is the policy of the Town to promote statewide programs designed to make energy efficiency improvements affordable and likely to be implemented. Town officials will support efforts to educate homeowners and businesses about available resources for energy efficiency improvements.
6. It is the policy of the Town that rehabilitation or development of new buildings and equipment should use proven design principles, in compliance with Vermont Building Energy Codes, and practices with the lowest life cycle costs (cost of owning, operating, maintaining, and disposing of a building or a building system over a period of time).
7. Where land development or subdivisions are proposed, design plans shall reflect sound energy use minimization principles, such as solar and slope orientation and protective wind barriers. An example would be the cluster planning concept, which is an approach that encourages energy conservation and efficiency.
8. It is the policy of the Town that major public investments, such as schools, public recreational areas, and municipal facilities, as well as major commercial or residential developments need to be situated within or in close proximity the village, and shall utilize existing roads whenever possible.
9. It is the policy of the Town to reduce commuting, promote the development of broadband services, and to support energy efficient home occupations and small-scale home business.
10. It is the policy of the Town to promote energy efficient travel by encouraging walking, biking, carpooling, the increased use of public transportation, electric vehicles, telecommuting and home businesses.

**Recommendations**

1. The town should consider creation of an Energy Committee to assist the Select Board, the Planning and Zoning Commission, and local residents in working toward the goals and recommendations of this Plan.
2. The town should incorporate energy efficiency and weatherization projects into the municipal Capital Budget and Program.

3. The Town should consider municipal or community renewable energy generation to serve town facilities, with funding by third-party financing, municipal funds, bonds, grants and/or government incentives.
4. The Town should continue to develop facility maintenance, efficiency measures, and operations policies to maximize energy efficiency while maintaining comfort levels for employees and visitors.
5. The Town should investigate tax incentives that would encourage energy efficient siting of residences.
  
6. The Town shall require a properly filed Residential Building Energy Standard Certificate for all new construction and renovations.
7. The Town should support programs that help provide outreach and education to residents about ways to conserve energy and to facilitate the increased use of heat pumps and advanced wood heating.
8. The Town should pursue recreation paths, bicycle lanes and other Complete Streets projects to reduce local transportation energy use and promote healthy lifestyles.
9. The Town should install electric vehicle charging stations on municipally owned property when the need arises.

**Resources:**

1. 2016 Vermont Comprehensive Energy Plan:  
[https://outside.vermont.gov/sov/webservices/Shared%20Documents/2016CEP\\_Final.pdf](https://outside.vermont.gov/sov/webservices/Shared%20Documents/2016CEP_Final.pdf)
2. U.S. EPA – What Climate Change Means for Vermont:  
<https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-vt.pdf>
3. Vermont’s Changing Climate: [vtclimate.org/vts-changing-climate](http://vtclimate.org/vts-changing-climate)

## **XII. HOUSING**

The character of a rural Vermont town is significantly influenced by the quality, availability, and variety of its residential development. According to the 2010 Census, 66% of Plymouth's total housing units were vacant, and 93% of those vacant units were seasonal or recreational units. This means that 62% of Plymouth's housing stock is made up of vacation homes, which is a slight drop from 65% in the 2000 Census. The 2016 American Community Survey estimates show that single family homes continue to be the predominant housing type (79% of total housing units) in both the rural areas and village areas. The town also has several condominium dwelling units.

Housing affordability is an issue throughout the region. Pressures for vacation home development, while creating jobs and improved tax revenue sources for the town, have driven the prices of housing beyond what many residents can afford. The 2016 American Community Survey found that median gross rent in Plymouth was \$590/month and the median housing value was \$297,000. The ACS also found that in 2016, nearly 20% of Plymouth households had a total annual income under \$25,000 and 45% of households earned under \$50,000. Affordable housing is defined as that which a household making the county's median income could afford if no more than 30% of its income were spent on housing costs. For homeowners, housing costs include mortgage payments, taxes, etc. For renters, housing costs include rent and utilities.

A major function of local housing planning is to meet two community objectives - first, safe and affordable housing for its present and future population and second, suitable density and distribution of housing throughout the community. Growth in housing affects the Town's capacity to provide facilities and services to our Town and the character of the area. Housing built without adequate planning for schools, roads, and other public services can overburden the ability of the taxpayers to pay for these services and negatively affect the rural character of the Town.

### **Goals**

1. Encourage safe, sanitary, adequate, and affordable shelter for present and future populations.
2. Encourage suitable density and distribution of housing throughout the town, compatible with existing neighborhoods.
3. Encourage the preservation of historic structures in ways that appropriately serve the need for housing.
4. Encourage the creation of accessory dwelling units for providing additional affordable housing for the community.

### **Policies**



1. Ensure that the timing and rate of new housing construction or rehabilitation does not exceed the community's ability to provide adequate public facilities.
2. Keep housing affordable by planning for:
  - a. appropriately sized lots;
  - b. accessory apartments; and
  - c. clustered developments.
3. Encourage the provision of housing for special needs population, such as the elderly and the physically handicapped.
4. Encourage the provision of housing for low- and moderate-income residents.
5. Encourage and direct the location of future housing so as to complement existing or planned employment patterns, travel times, and energy requirements.
6. Work with businesses and non-profit housing corporations to help Plymouth better meet the demands for affordable housing.
7. New housing should be located near employment opportunities and coordinated with public facilities and utilities.

**Recommendations**

1. The town should work with other towns in the region and with community land trusts to develop housing that will meet the housing needs of low- and moderate-income residents.
2. The Planning Commission shall review the current zoning bylaws to determine whether or not they hinder the development of affordable housing in Plymouth, and to allow greater housing density in some areas that will allow development of housing affordable to working families.

### **XIII. ADJACENT MUNICIPALITIES AND THE REGION**

Seven towns, two of which share only a small segment of common border (Mendon and Killington), bound Plymouth. The five principal adjacent towns are Bridgewater to the north, Reading to the east, Ludlow to the south, and Shrewsbury and Mount Holly to the west. At this point, each of these towns except Shrewsbury has an "approved" Town Plan as per 24 V.S.A., Section 4350

Of these, the towns of Shrewsbury, Mendon, Killington, Ludlow, Mount Holly, and Reading implement their town plans using zoning. Bridgewater has no zoning bylaws. There are no incompatibilities between the proposed Plymouth town plan and the town plans of our neighbors. Most neighboring towns have similar goals and policies and similar land uses along the shared borders. Commercial areas in Ludlow are not right on the town line.

#### **Regional Planning Activities**

Plymouth is within the Two Rivers-Ottawaquechee Regional Commission. It is one of thirty municipalities that comprise the Region. The Region covers northern Windsor County, most of Orange County, the Town of Pittsfield in Rutland County, and the Towns of Hancock and Granville in Addison County. The Commission was chartered in 1970 by the acts of its constituent towns. All towns are members of the Regional Commission, and town representatives govern its affairs. One of the Regional Commission's primary purposes is to provide technical services to town officials and to undertake a regional planning program. As is the case in many areas of the State, the extent of local planning throughout the Region is varied. Some municipalities are more active than others. Thus, the level of services to each of the town's changes with time.

The Regional Commission has a Regional Plan in place, most recently readopted in 2017. This Plan was developed to reflect the general planning goals and policies expressed in the local plans. The Regional Plan is an official policy statement on growth and development of the Region. The Plan contains several hundred policies to guide future public and private development in the Region. Policies for land use settlement are identified. These areas are: Regional Centers, Town Centers, Village Settlements, Hamlet Areas, Rural Areas, Conservation and Resource Areas, and Interchange Areas. Although delineation of each land use is not precisely mapped or charted in the Regional Plan, policies for management of new development within these areas are substantially similar to those set forth in detail in the Plymouth Town Plan. The two Plans have similar policy statements regarding the need for development that does not overburden services. The Regional Plan shall be consulted as part of the planning process for the town.

Plymouth participates in the Two Rivers-Ottawaquechee Regional Commission which has a mandate to provide support and guidance for the town as plans are developed and rewritten. A member of the Plymouth Planning Commission serves as a Regional Commissioner, providing a liaison for regional issues. The increasing complexity of state, regional, and local planning makes the support services of the Two Rivers-Ottawaquechee Regional Commission essential.

**Goals**

1. To plan with neighboring towns to develop solutions to problems that transcend town borders.
2. To plan for harmonious development on a regional scale.

**Recommendations**

1. Continue participating in a Regional Planning Commission.
2. Exchange planning information and development trend data with neighboring communities.
3. Continue to send a representative from the Plymouth Planning Commission to act as a regional commissioner on the adopted regional commission board.

## XIV. IMPLEMENTATION

The Plymouth Town Plan's goals and recommendations can be adopted and implemented through procedures spelled out in the Vermont Planning and Development Act (24 V.S.A., Chapter 117).

1. Town Plan Adoption. Sections 4384 and 4385 of the Act describe the statutory procedures required for adoption of a town plan. In brief, the plan is prepared by the Planning Commission which, as a group, holds a warned public hearing on their proposal. Following this hearing, the Commission may make amendments before submitting the plan to the Board of Selectmen for their review and comment. At this point, the Selectmen are also free to make changes, but within a 30-120 day period, they must hold one or more public hearings, after public notice, on the proposed plan. Following the final public hearing, the Selectmen can vote to approve the plan but the plan is not adopted until voted on by Australian ballot. The document becomes effective immediately upon adoption by Australian ballot.
2. Town Plan Maintenance and Amendments. This plan will be effective for eight years from the date of adoption, after which time it shall expire. The town may, however, readopt the plan as expired or about to expire and therefore have it remain in effect for the next eight years. We may also choose to make amendments at any time before this date.
3. Tools for Implementation. The Planning Commission has several existing tools for implementing the Town Plan. These include the use of Zoning Regulations and the Official Town Map, as well as Flood Hazard Area Zoning Regulations. The Town Plan also provides important guidance whenever the town participates in Act 250 proceedings.

### Zoning Bylaws

Zoning bylaws are a commonly used method for guiding development at the local level. Zoning may regulate:

- Uses of land,
- The placement of buildings on lots,
- The relationship of buildings to open space, and
- The provision of parking, signs, landscaping and open space.

Plymouth has a zoning bylaw which establishes districts or zones that have a different set of uses, densities, and other standards for development. Zoning districts must be reasonably consistent with the Town Plan, and it is the responsibility of the Planning Commission to implement any changes to zoning that are proposed in this Plan.

## Flood Hazard Bylaws

Under Vermont law [24 V.S.A., Section 4412], the Town of Plymouth is able to regulate the use of land in a defined flood hazard area adjacent to streams and ponds. These bylaws have been established to ensure that design and construction activities within the limits of the 100 Year Flood Plain are designed so as to minimize potential for flood damage and to maintain use of agricultural land in flood-prone areas. As noted in the Natural Resources section of this Plan, property owners are eligible for federal flood insurance on buildings and structures at relatively low federally subsidized premium rates. However, such insurance cannot be obtained for properties in Plymouth unless the Town has in effect a Flood Hazard Bylaw which, at present, it has. The strengthening of Plymouth's Flood Hazard Bylaws has been suggested. It is the responsibility of the Planning Commission to implement any changes to Flood Hazard Bylaws that are proposed in this Plan

### Act 250

Since 1970, Vermont has had in place a statewide review system for major developments and subdivisions of land. Exactly what constitutes a "development" or "subdivision" is subject to a rather large and involved set of definitions. Generally, however, commercial and industrial projects on more than ten acres of land; construction of 10 or more units of housing; subdivision of land into 6 or more lots; construction of a telecommunication tower over 20 feet in height; and development over 2,500 feet in elevation qualifies.

Prior to these activities being commenced, a permit must first be granted by the District Environmental Commission. In determining whether to grant a permit, the Commission shall evaluate the project in relation to ten specific review criteria.

These criteria relate to the environmental, economic, and social impacts of the proposed project on the community and region. Parties to Act 250 proceedings include Plymouth, through the Planning Commission and Selectboard, the State, and the Regional Commission. One criterion that needs to be addressed is whether the project is in conformance with the Plymouth Town Plan. If a project were determined not to be in conformance with the plan, the District Environmental Commission would have a basis to deny a permit. As such, Act 250 reviews can take into consideration protection of those types of resources considered important to the well-being of the community. Accordingly, it is in the interest of the Town to evaluate Act 250 projects affecting Plymouth and to offer testimony, as appropriate.

For a Town Plan to be given serious weight under Act 250, the Plan must contain specific and unambiguous language. If a community is serious that a policy be recognized by the District Environmental Commission during Act 250 review, it must use firm language such as "shall" or "must" instead of "should" or "could". The Planning Commission has been selective about where strong language is used in policy throughout this document, as it is important to recognize that the Town Plan should have some flexibility. In instances where flexibility was not wanted, the Planning Commission wrote policy with appropriately strong language.

Continued participation in the regional commission will provide a forum for our input on issues that extend beyond town borders. Education is also an important tool. The more

citizens who are informed about and involved in the local planning process, the more likely that our goals for town planning will be achieved.

Respondents to the 2009 town-wide survey indicated that the town's Zoning Regulations should be updated to add clarity and to strengthen them in some areas. They expressed interest in changing the zoning districts to allow more development in villages and along major paved roads, and to allow for larger parcels and conservation districts. Survey respondents and participants in community workshops in 2010 also expressed interest in developing a subdivision bylaw.

### **Responsibility for Implementation**

In order to ensure that the policies of this Plan are implemented, it is essential to identify what Municipal Panel, organization or citizen is most suited to act on them. Throughout this Plan, the Planning Commission has identified recommendations for action and indicated who should be responsible for them. Generally, responsibility for implementation of the Plan falls to either the Planning Commission (in the case of implementing changes to land use regulations) or the Selectboard (in the case of implementing municipal policy). However, advisory committees as well as other community organizations could also have responsibilities for implementation.

In addition to assigning responsibility, the Planning Commission should also keep track of progress made toward implementing the goals, policies and recommendations of this Plan. This information will be useful to identify areas where additional effort needs to be applied to achieve implementation. It can also be used to describe how successful the community has been at implementation in the next iteration of this Plan, and to guide future policy.

### **Recommendations**

1. Town officials should try to ensure maximum citizen input into the adoption and implementation of the Town Plan by consulting residents prior to and during the updating of the plan, providing updates at Town Meeting, and encouraging them to attend public hearings through publication of notices in local newspapers,
2. The Planning Commission should update the town's Zoning Regulations to make them easier to interpret by residents and to ensure proper administration by town officials.
3. Update the town's Flood Hazard Area Zoning Regulations to incorporate changes in 24 V.S.A. Chapter 117, include previously omitted federal regulations and provisions, and make them easier to interpret and apply.
4. The Planning Commission shall evaluate the ability of town services and infrastructure to accommodate growth.