



12/16/2019

Windham Town Plan 2020

*Adopted by the Windham Selectboard
on 12/16/2019 at the Windham Town
Office*

Windham Town Plan 10/9/2019

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CHAPTER I - INTRODUCTION AND OVERVIEW

A. Objective of the Windham Town Plan

The Windham Town Plan provides for an understanding of where the Town came from, its current attributes and assets, and a clear direction that the property owners and residents of the Town desire to continue. It also provides planning approaches, Policies and in some instances standards to ensure that decisions made at the regional and state levels give proper consideration to and are compatible with our expressed wishes and intentions.

B. Statement of Policy and Purpose

There are many factors which contribute to the current status of our community. The rural character is exemplified in many attributes of the Town, such as the vast amount of wooded and undeveloped areas, streams, ponds, abundant wildlife, absence of bright lights, low volume of traffic, and very low ambient noise levels. Windham contains unique natural topographic features that have allowed historic settlement patterns to occur near its hills and ridges while respecting their special features and attributes. The housing has traditionally been single family structures, normally on one or more acres of land. The one-acre sites were concentrated in the village areas and in the development surrounding the vacation homes at Timber Ridge. The buildings themselves have tended to be two stories or less and be clustered in these areas. This results in the maximum amount of undeveloped land.

The Windham Town Plan reflects the Planning Commission's understanding of the trends and pressures affecting our Town and the prevailing standards of the property owners and voters of the Town. It is a blueprint to future growth and development of land. We commit to maintain Windham's natural resources and physical features and to preserve a community that is healthy and safe. Growth, which is good for the Town must not imperil or detract from the social, environmental, cultural, economic, health and aesthetic values of our rural community. The ability of taxpayers to support the Town on a sound financial basis must be taken into consideration. Guidelines and Policies set forth here within should be incorporated in our Zoning Bylaws. Refer to the Zoning Regulations for specifics; e.g., for Uses Prohibited see Zoning Regulations Section 20.

In order to attain these objectives, it is the policy of the people of the Town of Windham to:

1. Assure that the health, safety, education and housing needs of the community will be adequately fulfilled.
2. Encourage development that will ensure our social and economic wellbeing and preserve and protect our natural resources, land above 2000 feet in the Forest District, and headwaters.
3. Prohibit incompatible, uncoordinated, or uncontrolled development, which would result in adverse environmental impact, or undue increased in population which could cause unreasonable demands on the Town's ability to provide public services, or result in unsafe and unhealthy living conditions for the people of Windham.

4. Identify and conserve both natural and man-made resources that have significant value to the citizens of Windham, such as mineral deposits, prime agricultural lands, water supplies, forests, significant fragile natural resource areas, significant views, vernal pools, forest districts and public facilities and infrastructure.
5. Appreciate the headwaters contained within the Town, the value of headwaters to both the Town and the surrounding communities and the need to protect headwaters for present and future generations.
6. The Town should remain alert for indications of unsuitable growth and anticipate actions that will be necessary to address the impacts.

C. State Requirements

As required in the State Planning and Development Act (Title 24 V.S.A., Chapter 117), this Plan is based on several studies, including an analysis of current trends and probable social and economic consequences. Consideration was also given to population and employment characteristics, housing needs and types, patterns and rates of growth, efficient use of energy and development of renewable energy resources, classes of use of land, community finances, history, land suitability, and the location of future growth. The Plan contains all eleven required elements, addresses each of the goals stated in 24 VSA Section 4302, and is compatible with the Windham Regional Plan and with the approved plans of other towns in the region.

This Plan became effective upon adoption by the Selectboard after required public hearings held first by the Planning Commission and then by the Selectboard. As required by law, copies have been sent to bordering towns, the Windham Regional Commission, and the state Agency of Development and Community Affairs for review and comment and to any community or interested group or organization requesting a copy prior to the first hearing.

Under Vermont law, a town plan expires five years from the date of adoption. Thus, the Town of Windham must review its Plan, revise where necessary, and readopt or replace it every five years.

D. Role of the Town Plan

The Town Plan is a blueprint to both elected and appointed town officials, citizen boards, state and regional agencies, regulatory boards and commissions, developers, and residents in fulfilling the intended future condition of the Town. The Town Plan is not meant to discriminate for or against any segment of the Town's population, present or future, but rather to protect all citizens and allow for orderly growth. Under the State Planning and Development Act, a Town Plan also provides the policy foundation for implementing bylaws such as zoning. No bylaw or amendments thereto may be enacted unless the town has a duly adopted plan. Town Plans also serve as a source of information for which to pursue more detailed studies.

The Town Plan is unique in Vermont in that it also serves a role in state regulatory proceedings. For example, Act 250 requires development projects to conform to the Town Plan. Other state proceedings for utility and road projects must also consider the impact on the Town Plan.

Therefore, although the plan's recommendations may be for the long term, they shall also be used in a decision-making process at any time.

E. Interpretation of the Town Plan

Throughout the text of this Plan many of the policies and community action statements include imperative verbs. "Should" or "may" means that a requirement is encouraged but not mandated, whereas "shall" or "must" means that the Town intends that a requirement is accomplished. "Prohibited" means the subject is forbidden.

F. Organization of the Town Plan

The Town Plan is divided into chapters which contain descriptive material and policies concerning natural resources, energy, land use, community utilities/facilities and services, transportation, historic/recreational and scenic resources, housing and economic development.

Each chapter includes Policy Statements and in some instances standards which help define the direction the Town will take and Actions which provide the Town with steps which will make implementation of policies and standards possible.

CHAPTER II - COMMUNITY PROFILE

A. Historic Overview

The Windham School Club of 1967 prepared a document entitled “The History of Windham, Vermont,” by James H. Upham with a forward by Raymond A. Beardslee. “Excerpts from Historical Manuscripts written by Asahel Upham in 1902 and 1905.” The following is a further abstract of these histories.

This manuscript history of Windham, Vermont, unsigned and undated, has long been preserved among the records of the Town. It was found between the front cover and the flyleaf of Volume I of the land records when Harry Hall became Town Clerk in 1946.

The Town of Londonderry, which embraced Windham, was chartered by the State of New York on February 13, 1700. It contained 84,590 acres. The first settlers came in 1774, three of the first five settlers located in the Windham territory. They made a small clearance and prepared for their family to return the following year. They returned to Londonderry to spend the winter. The records note that the first log cabin was built and a sawmill located at so-called “Derry Pond.” Lumber for two houses was cut, but a fire destroyed the mill and lumber. Records of the settlements to 1793 are nearly all lost.

In 1795, a petition was presented to the Vermont Legislature to divide the Town of Londonderry to make a new town out of the eastern part. On October 22, 1795, an act passed in the legislature incorporating this new town of 16,870 acres which was called Windham.

In 1800, Windham had a population numbering 363. By 1810 the population had grown to 782, rising to 931 people in 1820. In 1830 the population was 847 and it continued to decrease to 757 in 1840 and 763 in 1850. During this period, the Town was dependent on its local merchants, sawmills, blacksmith shop, farming, grist mills, talc and marble mining, and sheep farming. The towns people begun building a Meeting House in 1802 and finished it in 1825. Today, this historic structure continues to satisfy the needs of the Town. Without easy travel modes, the Town was a typical rural area in which neighbors depended on each other. Several schools and churches were established.

The people of Windham encouraged education. Records show that the first formal school meeting was in 1796 in a log barn. In 1801, a decision was made to build a school. At 22 feet squared, the first school cost \$172.50. The record says, “It cannot be said that Windham has raised no literary men.” Let the record show “that 13 ministers went forth from the Town, and 2 physicians. Women, likewise, have furnished many teachers, missionary workers, writers who have graced the columns of literary periodicals.” Other school buildings followed.

A description of a “desirable town community” included these words:

“A town consisting of a due mixture of hills, valleys, and streams of water, well fenced and cultivated, the roads and bridges in good repair, decent inns for the refreshments of travelers and for public entertainment. Manufacturers of a suitable proportion of handicraft workman and two or three traders. A physician and a lawyer. A clergyman of good understanding, candid disposition and exemplary morals, not a metaphysical nor a polemic but a serious, practical

preacher. A school master who should understand his business and teach his pupils to govern themselves. A decent Musical Society, no intriguing politician, horse jockey, gambler, or sot. Such a situation may be considered as the most favorable to local happiness of any which the world can afford.”

It concludes further with:

“Nearly all have comfortable dwelling with the property enough to procure necessities and even some luxuries. We are shielded from many of the distracting elements and destroyer influences which are working the ruins of older towns. We are surrounded by fortifications (hills and valleys) which have been raised by the hand of the Almighty which will forever exclude the idea that our Town will become the theatre of railroad scenes or that she will be noted for Manufacturers. Her glory depends upon the general intelligence of her town’s people.”

B. Geographic Overview

The Town of Windham is comprised of three areas: North Windham, South Windham, and West Windham. The Town is in a north/south orientation, between Route 11 to the Northwest and Route 30 to the South. A road running north/south through Town provides the major access to and from the community. Route 121 runs east/west from Route 11 to Grafton along the northern part of the Town. Route 121 is blacktopped on the western portion and a gravel road to the east. The intersection of Route 121 and Windham Hill Road is locally known as Lawrence Four Corners.

The major entry and exit routes are steep inclines, rising to the Town centers. The Town is at a relatively high elevation (all of Windham is above 1,500 feet) but even so, the surrounding areas to the east and west of the Town centers are still at higher elevations, with settlement concentrated in the “valley” running north and south. The result of this geography is that the main concentration of homes is located along this corridor with the outlying areas concentrated into large woodland areas on high rising land, often with ledge rock subsurface.

The elevation of the land gives rise to several headwaters which flow downstream to join the larger tributaries. Several large in-stream ponds have been developed and were used for waterpower. There are also wetland areas, many resulting from beaver activity, which are still present today. The western part of Town rises sharply up Glebe Mountain.

While much of Windham had at one time been cleared to an open landscape, much of the land has returned to a forested state. There are deposits of talc and marble, which at one time were mined but these operations have since been discontinued. An area in the valley of West Windham has long been used for farming and is has been converted from milk production to orchards. Other suitable farm areas have been discontinued. A large potato farm was converted to a 9-hole golf course with a clubhouse during the 1960s and has since been expanded to 18 holes. Several other smaller farming operations are functioning in the town.

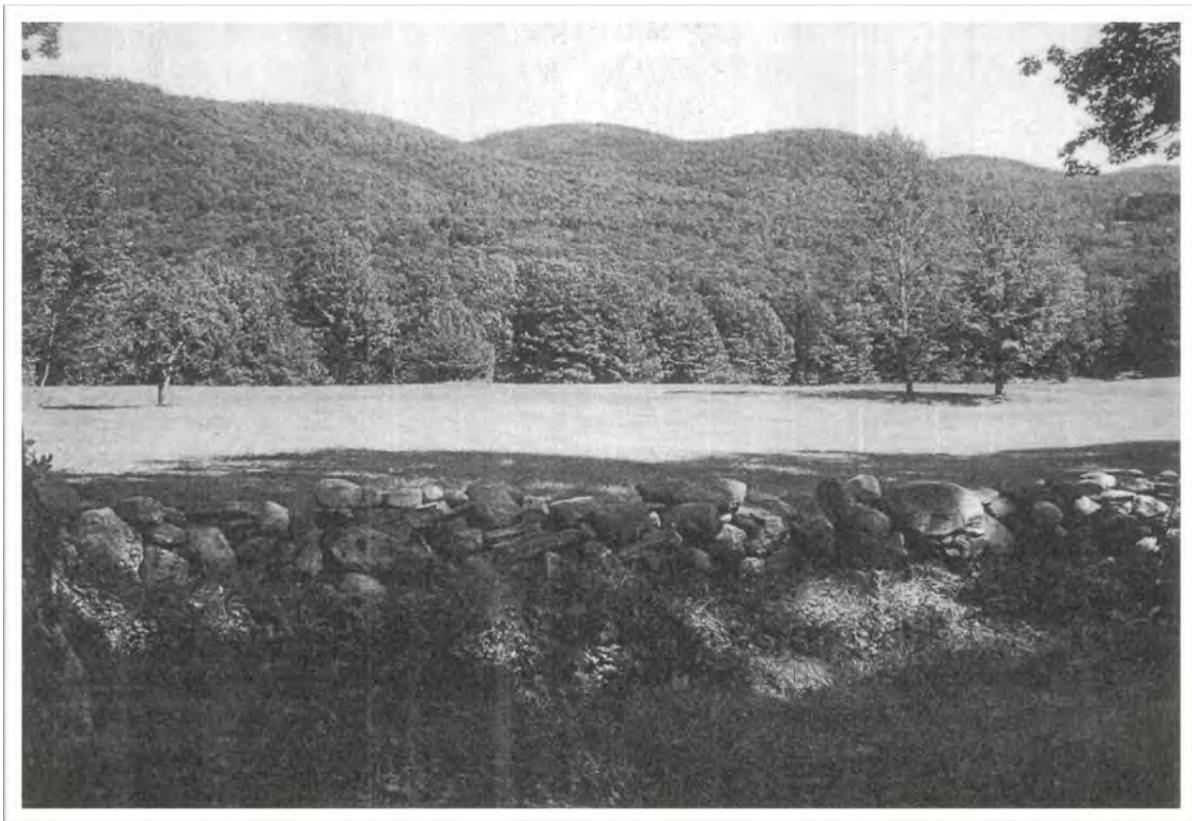
The topography of the Town does not lend itself to heavy through-traffic, nor does it attract large commercial or industrial development. A small private ski facility did operate in Windham during the 1960s and 1970s, however it has since been closed and most equipment associated with its operation has been removed.

C. Historic Registry

Windham Village received National Register of Historic Places designation in 1984. (ref. U.S. Dept of Interior – National Registry of Historic Places). Also, the Windham Meetinghouse and South Windham village are on the National Registry of Historic Places. The Nomination Form narrative for Windham includes the following fragments drawn from throughout the document; the full text can be found at <http://townofwindhamvt.com/local-town-information/town-history/>

“In general context Windham preserves much of its early character, unaffected by modern development. . . Overall, Windham is a rare and pristine place that has evolved to the present without losing its image of the past.”

“Well-preserved, wood frame, vernacular Greek Revival structures dating from the mid nineteenth century predominate and are positioned in a linear pattern amidst an environment of wooded and open hillsides and breathtaking views.”



Light House (#3); View looking east; Photograph

“It is distinguished by a large number of fieldstone terraces and fences and a number of impressive maple trees stand along the little traveled roadside.”

“Windham is fairly remote and isolated from the main developments of the lowlands surrounding it. The Town is thickly forested with both hard and soft woods spreading out over what were once open fields. A number of meadows remain open, however, particularly to the east of the district and do much to preserve the village’s early agricultural character.”

“Windham village is a rare and pristine example of an isolated, rural, nineteenth century hilltop village. (The Town of Windham has one of the highest altitudes of any locale in the state.) While similar Vermont villages have either been abandoned during the late nineteenth and early twentieth century’s and are now a collection of wooded cellars holes, or have suffered the detrimental consequences of the burgeoning tourist industry in Southern Vermont. Windham remains unaffected. Its small collection of vernacular Greek revival wood frame residences, later complimentary early 20th century residences, barns and a church and siting amidst a pastoral and wooded natural environment, honestly epitomize an historic northern New England agrarian village.”

Lucy Wood writing in Abbey Hemenway’s Vermont Historical Gazetteer in 1877 sums up Windham’s preceding pastoral years when she states: “There are few (in Windham) who are wealthy, and not many who are poor. They have enough to be comfortable and something to spare for the support of public institutions. There are few mechanics, but we live mostly by farming.” This description is truly reflected in the village buildings with their simple trim, and unpretentious appearance – “a rare symbol for the state and the nation of a golden, pre-industrial era.” “The town has been relatively free from 20th century intrusions.

D. Population

The 2010 US Census reported Windham with a population of 419 residents. The Town ranks as the fourth smallest town in the Windham Region, which encompasses 27 towns. Table 1 illustrates the decennial populations beginning in 1900. After experiencing a decrease of over 50% during the first half of the 20th Century, Windham began to experience population growth. From 1970-2010, Windham’s population has more than doubled.

Table 1: Windham Population Trends

<i>Year</i>	<i>Annual Population</i>	<i>Percent Change</i>
2010	419	28%
2000	328	31%
1990	251	13%
1980	223	28%
1970	174	29%
1960	135	-8%
1950	146	-20%
1940	183	-28%
1930	254	-3%
1920	261	-24%
1910	345	-3%
1900	356	-6%
1890	379	-29%
1880	536	-1.5%
1870	544	-20%
1860	680	-11%
1850	763	+8%
1840	757	-10.6%
1830	847	-9%
1820	931	+19%
1810	782	+83%
1800	427	NA

(Source: U.S. Census, UVM Center for Rural Studies)

Table 2: Windham Population Projection 2000-2015

<i>2000</i>	<i>2010</i>	<i>2020</i>	<i>% Change 2000-2010</i>	<i>% Change 2010-2020</i>
328	419	496	28%	18%

(Source: VT Department of Aging & Independent Living)

Windham's growth as compared with data from neighboring towns in Windham and Windsor Counties are shown in Table 3. Windham was the fastest growing town when looking at the percent change in the population, and all the neighboring towns but Chester had smaller increases in the actual population numbers than Windham. It should be noted that from 2000 to 2010 Windham's actual population growth was from 328 to 419, an increase of 28%. The decade from 1990 to 2000 had growth of 31% and from 2010 to 2020 is predicted to be 18.4%. In the absence of any real change in the commercial or industrial profile of the community over those 20 years, this cannot be considered the result of economic development. The fact is that Windham has attracted this growth by virtue of its quiet and pristine rural beauty. The growth has been due to a constant trend of seasonal homeowners becoming full time residents and to new landowners building permanent homes.

Table 3: Population Trends in Nearby Towns

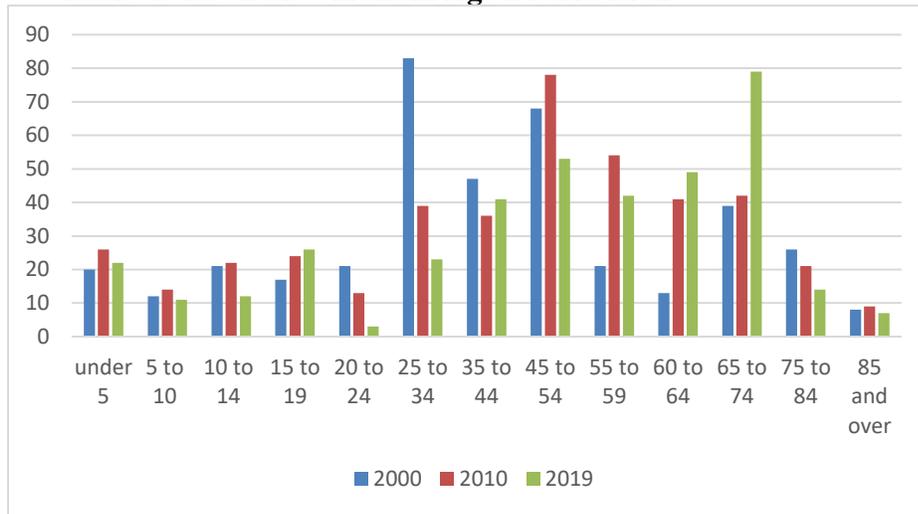
<i>Town</i>	<i>Census 2000</i>	<i>Census 2010</i>	<i>Predicted 2020</i>	<i>% Change 2000- 2010</i>	<i>% Change 2010-2020</i>
Windham	328	419	496	28	18.4
Londonderry	1,709	1,769	1,812	4	2.4
Jamaica	946	1,035	1,120	9	8.2
Townshend	1,149	1,232	1,282	7	4.1
Grafton	649	679	690	5	1.6
Chester	3,044	3,154	3,181	4	0.9
Andover	496	467	478	-6	2.4

(Source: 2000 & 2010 U.S. Census, UVM Center for Rural Studies,
VT Department of Aging & Independent Living)

The age distribution of Windham residents is changing over time shown in Table 4, reflecting two population trends. The more dramatic of the two is the aging of the Baby Boomer cohort, an unusually large segment of the United States' population who were born following World War II. They are now approaching the ages of 50 to 75. The years 2000 to 2010 have shown a marked increase in the number of residents aged 45 to 64. The second trend is the growing proportion of residents 65 years of age and over, which by 2020 may represent over 39% of the town's population. This number sure to grow significantly over time as the Baby Boomers continue to

age. Also evident in this data is the large decline in ages 20-34 segments.

Table 4: Town of Windham Age Distribution



(Source: 2000 & 2010 U.S. Census, UVM Center for Rural Studies, VT Department of Aging & Independent Living and 2013-2017 American Community Survey 5-Yr Estimates)

E. Housing

Windham had a total of 396 housing units in 2010. Table 5 provides a breakdown of the number of housing units by type existing in the given year. According to the US Census, over the last twenty years, Windham has consistently had more seasonal units than owner occupied units although the gap is closing. Annual Town Reports provide further evidence of the fact that most homes in Windham are for seasonal use. Table 6 shows the distribution of parcel types in Windham and the number of parcels with vacation homes have historically outnumber the number of parcels classified as residential. Data for 2012 indicates Windham is increasingly becoming a town of full-time residents.

By the 2013-2017 American Community Survey 5-Yr Estimates in 2017 of the 173 occupied housing units, 90% were owner-occupied, with the remaining 10% being renter occupied. The number of owner occupied and renter occupied housing figures indicate a decline from 2010 to 2017, although there is an was growth in the quantity of housing in the town. Overall from 1990 to 2017 there was an increase in seasonal housing.

Table 5: Housing by Unit Type

Unit Type	% Change		% Change		% Change	
	1990		2000		2010	2017
Owner Occupied	86	47%	126	33%	167	155
Renter Occupied	15	60%	24	-17%	20	18
Seasonal	198	-8%	182	9%	198	224
Vacant	35	-37%	22	-50%	11	10
Total Units	334	6%	354	12%	396	407

(Source 1990, 2000 & 2010 U.S. Census and 2013-2017 American Community Survey 5-Yr Estimates)

Table 6: Parcel Ownership

<i>Parcel</i>	<i>1997</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2012</i>
Residential	121	117	126	128	183
Vacation Home	209	226	222	225	183
Mobile Home	19	18	18	16	14
Woodland	152	144	143	143	132
Commercial	n/a	8	7	7	6
Farms	3	3	3	2	3
Other	17	7	7	7	-

(Source: Windham Town Plans and 2004 & 2012 Windham Town Report)

Windham is predominantly a community of single-family detached homes. Table 7 shows the number of housing units by the number of units in the structure.

Table 7: Number of Units in Structures

<i>Units in Structure</i>	<i>Actual Number</i>	<i>Percentage</i>
1-unit, detached	376	92.4%
1-unit, attached	1	0.2%
2 units	4	1%
3 or more units	5	1.2%
Mobile Home	21	5.2%
Boat, RV, Van, etc.	0	0%

(Source: 2013-2017 American Community Survey 5-Yr Estimates)

F. Economy

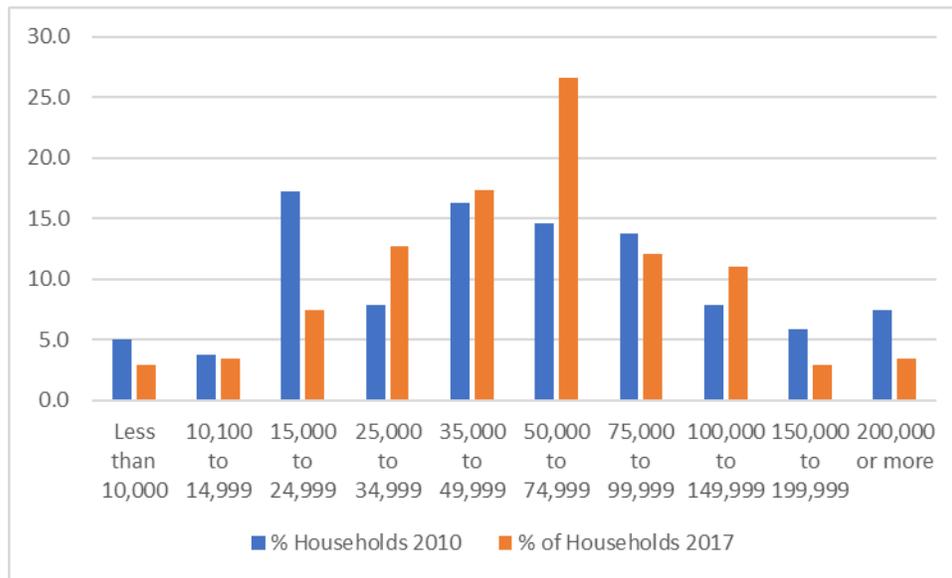
At the time of the 2013-2017 American Community Survey 5-Yr Estimates, 63% or 115 of the 184 Windham residents aged 16 and over were employed in the Windham county work force, compared to 178 in the 2000 Census, and 285 in the 2010 Census.

Windham residents are employed in a variety of industries. The 2000 Census indicated that the largest percentage (26%) of Windham residents were employed in the education, health and social service fields. For 2012, the Vermont Department of Labor reported a figure of 29%. (For further discussion of this subject see Chapter X of the Plan: Economic Development.)

The Vermont Center for Geographic Information’s website shows that the median household income in Windham, adjusted to 2009 dollars, rose from \$27,441 in 1979 to \$48,060 in 1989, then declined to \$40,141 in 1999, and rose back up to \$42,750 in 2009. The median income by the Source: 2010-2017 American Community Survey 5-Yr Estimates is \$58,750.

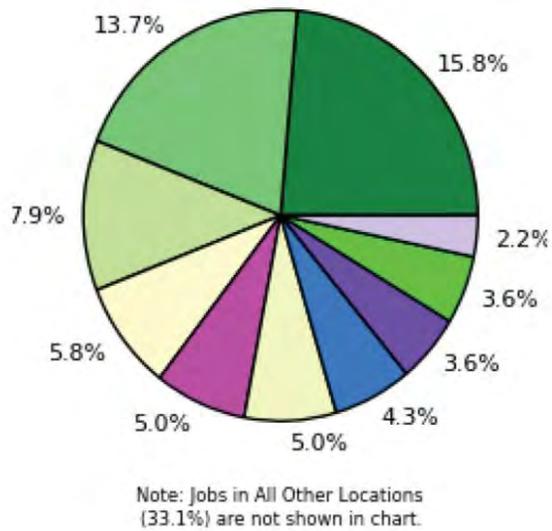
Table 8 shows in the 2010 estimates the greatest percent (17.2%) of Windham households earn between \$15,000 and \$25,000, and a larger percentage of households (44.7%) fall in the combined income brackets between \$35,000 and \$100,000. But in the 2017 estimates show a significant shift of the lower income bracket. There had been an increase in the number of residents falling below the poverty level, with 10% of Windham residents below the federally defined poverty status in 2009 compared to 6.3% of the population below that income level in 1990, but the data from the 2010-2017 American Community Survey 5-Year Estimates reveal a decrease to 4.8% of all families below the poverty level.

Table 8: Household Income in Windham 2017 inflation adjusted



(Source: 2010-2017 American Community Survey 5-Yr Estimates and 2006-2010 American Community Survey 5-Yr Estimates)

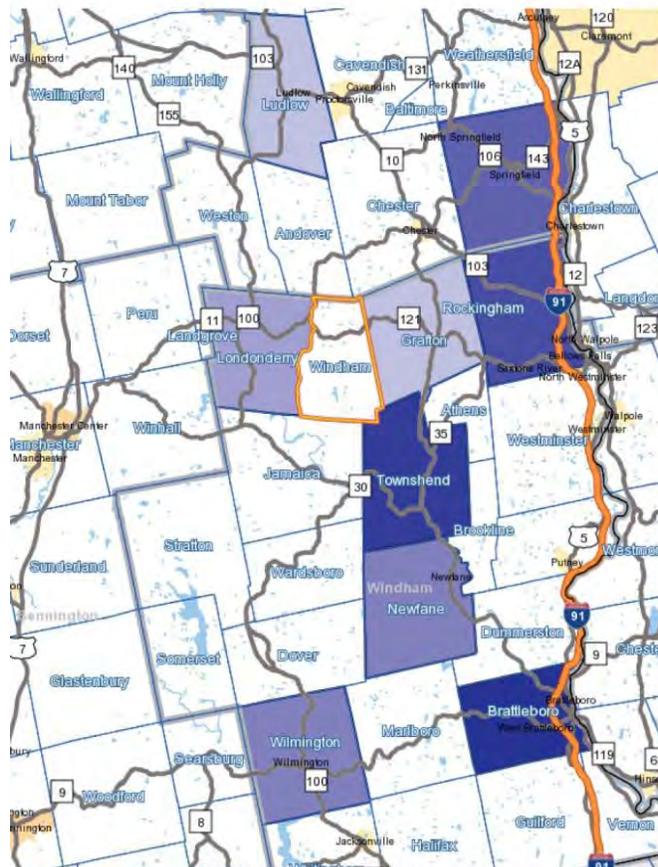
Figure 1: Place of Work (Source: US. Census)
 Percentage of Job Counts by Town, 2011



Legend

	Count	Share
All County Subdivisions	139	100.0%
Brattleboro town (Windham, VT)	22	15.8%
Townsend town (Windham, VT)	19	13.7%
Rockingham town (Windham, VT)	11	7.9%
Springfield town (Windsor, VT)	8	5.8%
Newfane town (Windham, VT)	7	5.0%
Wilmington town (Windham, VT)	7	5.0%
Londonderry town (Windham, VT)	6	4.3%
Grafton town (Windham, VT)	5	3.6%
Ludlow town (Windsor, VT)	5	3.6%
Rutland city (Rutland, VT)	3	2.2%
All Other Locations	46	33.1%

Job Counts on the Map by Town 2011



Legend

	22 Jobs
	19 Jobs
	11 Jobs
	8 Jobs
	7 Jobs
	6 Jobs
	5 Jobs
	3 Jobs

CHAPTER III - COMMUNITY UTILITIES, FACILITIES AND SERVICES

Community utilities, facilities and services are the infrastructure provided by the Town of Windham, or provided in cooperation with the Town, for the health, safety, benefit and enjoyment of the general public. These include municipal government facilities, emergency services, schools, solid waste disposal, and recreational facilities.

A. Town Government and Facilities

1. Government

The official business of the Town is conducted at the annual Town Meeting held in March and at occasional special Town Meetings. The three-member Selectboard conducts most of the regular business of the Town between Town Meetings. All elected officials are chosen by ballot and, except for education items which are voted on at the appropriate school district meeting, the other items on the Warrant are voted on at the Town Meeting. The Town functions through the active participation of its residents and volunteer groups. Residents serve on boards and committees. Various ordinances, bylaws and policies are in force in Windham, including, but not limited to the Zoning Regulation, Traffic Ordinance, Vicious Dog Ordinance, Winter Road Policy, Conflict of Interest Policy, and Rules of Procedure Policy. Also, in place is a Local Emergency Management Plan in accordance with the National Incident Management Plan.

2. Facilities

The following facilities are owned by the Town of Windham (see Utilities and Community Facilities Map for locations):

- **Town Office** - The Town Office is located on Windham Hill Road, adjacent to Windham Elementary School. It is a new building that was erected in 2001. It provides separate office space for the Town Clerk, the Listers and additional space for the Town Treasurer, which is shared with the Zoning Administrator, Planning Commission, Conservation Commission, and Zoning Board of Adjustment. The Town Office also has meeting space that is used by the various Town boards and committees.
- **Town Garage** - The Town Garage is located on Windham Hill Road. It houses the town highway maintenance equipment. A covered salt and sand shed are also located on the property.
- **Windham Meetinghouse** - The Windham Meetinghouse is located on Windham Hill Road. Built in 1802, the Meetinghouse contains the Town Hall which is owned by the Town and the Congregational Church. The Meetinghouse is in the Windham Historic District which is on the National Register of Historic Places.
- **Windham Town Library** - The Windham Town Library is located within the Windham Meetinghouse. The Library offers programming for both adults and children. Membership is free and books and videos are available for borrowing. It is open from 3-5 P.M. on Wednesdays. The Library offers many programs including reading group, strength building and excise classes and serves as a community

meeting place. In 2013, the library participated in a statewide grant program to bring high speed internet service to Vermont's schools and library at a reduced rate. This installation was a precursor to the entire community having high speed internet service. The Library internet and phone service is currently provided by VTel.

- **Town Cemeteries** - The Town maintains cemeteries, each under the supervision of a separate cemetery commission. There are four cemeteries in Windham: Center Cemetery, North Windham Cemetery, West Windham Cemetery, and Woodburn Cemetery.
- **Windham Elementary School** - The Windham Elementary School is located on Windham Hill Road. It serves Pre-Kindergarten through Grade 6 and has two classrooms, an auditorium, and offices.

3. Town Polices

Policy 1: Provide as efficient, effective, and convenient municipal services as is possible keeping within the financial capabilities of the Town.

Actions

1. Proactively assess the evolving needs of Windham concerning its current Utilities, Facilities and Services. Request the Windham Select Board appoint a committee to assess the changing needs of the Town as relates to the Windham Elementary School, Town Meeting House, Town Garage and Volunteer Fire Service.
2. Promote volunteerism and recruit to fill vacancies on Town committees as appropriate.
3. Continue to evaluate and strengthen local government with technical assistance from appropriate state and regional agencies.
4. Encourage the use of the Windham Elementary School facility by community groups.

Policy 2: Maintain library services.

Actions

1. Provide necessary funding to the Windham Library so that the Library can meet the State of Vermont's minimum standards.
2. Maintain a public access internet station at the Library.

Policy 3: Maintain funding for town garage equipment

Actions

1. Establish long term funding for future equipment needs and replacement.
2. Evaluate replacement of town garage

Policy 4: Maintain funding for the Meetinghouse

Actions

1. Establish committee for its utilization and funding.

B. Community Services

1. Solid Waste Disposal, Recycling, and periodic Hazardous Waste Removal

Windham is a member of the Londonderry Group Solid Waste District which includes the towns of Landgrove, Londonderry, Peru, and Weston. Town residents utilize the Waste Disposal Center in Londonderry located on Route 100 North.

Permits are obtained and fees are paid via tickets at the Waste Disposal Station purchased from the Windham Town Clerk, from clerk at the Londonderry Office and from the Londonderry hardware.

2. Education

Windham is a member of the Windham Central Supervisory Union and is also a member of the Leland & Gray Union. Middle and High School (grades 7 through 12) are provided at Leland & Gray Union High School which is in Townshend.

Windham Elementary School provides education for Pre-kindergarten through Grade 6. An addition to the school was completed in 1996. The population at the school over the last few years has generally remained between 14 and 19 students, but at times has been as many as 32. With no significant change in the student census projected, an expansion of the facility is not required.

3. Child Care

According to the 2002 Windham County Vermont Child Care Needs Assessment, Vermont has a large percentage of women in the workforce. If this trend continues it is possible that there will be an increased need in the community for childcare. As of September 2019, the Vermont Department for Children and Families website reported that there was no registered or licensed child care facility in the Town of Windham. Childcare facilities can be found in some of the towns that surround Windham including Grafton, Londonderry, Townshend, and Chester.

4. Senior Services

As a small, rural town, Windham depends on regional services to offer opportunities for its seniors. Some of the services that they can take advantage of including:

- i. **Meals on Wheels** – While there are no community dinners held in Windham, residents can take advantage of meals in the neighboring towns of Grafton, Londonderry, and Townshend. The Senior Solutions (Council on Aging for Southeastern Vermont) also coordinates home delivery of meals by using volunteer networks that bring the meal to the individuals.
- ii. **Transportation** - Local transit provided to those eligible by Southeast Vermont Transit(The Current) via Dial-A-Ride service. They provide transportation for Medicaid recipients; non-Medicaid medical transportation for life threatening conditions, and bus service for groups of people if 20% of the cost of the service is recovered from donations.
- iii. **Housing** - The Smith Haven Home in neighboring South Londonderry is the closest subsidized housing facility, offering 24 units for the elderly. The West River Valley Senior Housing complex in Townshend was completed in 2007 with 24 units in affordable housing and 28 units for assisted living. Several other senior housing opportunities are available within 25 miles of Windham.
- iv. **Other Support** - Senior Solutions also provides support services to seniors aged 60 years and older living independently. This organization can assist seniors in obtaining information on caregiver

support, nutrition and legal services, transportation, housing, as well as many other services.

5. Recreation

Windham's recreational resources are predominantly based on its natural resources. There is a playground and an adjacent area that can accommodate field games such as soccer at the Elementary School. Other recreational facilities include the Tater Hill Golf Club which provides 18 holes of golf. There are five major ski areas (Okemo, Magic Mountain, Bromley Mountain, Stratton Mountain, and Mount Snow) that are located within 35 miles of Windham. School children are accommodated at some of the ski areas. Other recreational activities include hiking, hunting, fishing, trapping, snowshoeing, camping, ice skating, and snowmobiling on VAST trails.

6. Fire and Emergency Services

The Town of Windham is served by a voluntary fire department located in North Windham. A two-bay garage houses equipment consisting of two fire trucks and a water tanker. The Windham Volunteer Fire Company is a member of the Keene Fire Mutual Aid. Both are volunteer non-profit organizations which are funded through donations and fundraisers. The Town is part of the Enhanced 911 state service. Emergency services in Windham are provided by the Londonderry Volunteer Rescue Squad, Inc and Rescue Inc in West Townshend.

Windham also supports a small Emergency Management team of volunteers whose role it is to stay informed about emergency management methods for situations other than structure and wildland fires. Their role includes keeping the Town's Basic Emergency Operating Plan (LEOP) up to date; seeing that appropriate training opportunities are made available to team members and town officials; communicating with Emergency Management counterparts in nearby towns and the region and informing the community members regarding emergency management resources. The designated Incident Command Center is the Town Office, and the Elementary School and Meeting House are both designated Red Cross Shelters. Windham was an early participant in the Red Cross Community Shelter Initiative and has a trained group of volunteers to open and manage a shelter if needed.

7. Police

Windham is served by the State Police and the Windham County Sheriff's Department which are on call for emergencies. In addition, Windham County Sheriff's Department is hired to provide road patrol throughout the town.

8. Health Services

Healthcare services are available in nearby towns. Medical care is usually obtained at one of the area facilities including Grace Cottage Hospital in Townshend or the Mountain Valley Medical Clinic in Londonderry. The Mountain Valley Medical Clinic part of Springfield Hospital is a that is supported by its own fundraising, volunteers, and community stipends and fees. Other health services in the area include the Visiting Nurses and Hospice of Vermont and New Hampshire(VNH) and the Health Care and Rehabilitation Services of Southeastern Vermont along with nearby regional hospitals in

Bennington, Springfield, Brattleboro, Keene, New Hampshire and Lebanon, New Hampshire. Ambulance service is provided by Londonderry Rescue Squad, Inc. and Rescue, Inc. in West Townshend.

9. Community Service and Education

The Windham Community Organization (WCO) provides financial and other assistance to families experiencing short term needs and sponsors activities and education to encourage a strong sense of community. The WCO sponsors a bi-monthly newsletter informing all residents and non-resident subscribers of Town activities. The newsletter includes public service announcements, local news, personal profiles of town residents, articles relating to Windham's history and a calendar of town events.

10. Public Utilities

Electric: Electric service in Windham is provided by Green Mountain Power (GMP). The Vermont Electric Power Company (VELCO) maintains a major transmission line that runs north to south through Town near Windham's boundary with Grafton.

Telecommunications: There are two different phone companies providing service to customers in town, Consolidated Communications (south of Windham Center and a few homes in northern Windham) and VTel, (Windham Center and North Windham.) Both companies provide phone and internet service with the installation of fiber optic cable or DSL lines. A variety of Vermont "last mile" programs should continue to provide for higher speed internet service and improved telephone service throughout the Town. The current situation of service – varies in different sections of town - with Consolidated Communications service having slower speed connections.

Cell Phone: There are some areas of the Town that can utilize cell phone communications, but due to the hilly contours of the Town, this is not available to all residents and visitors. Signal availability also varies by the service provider.

11. Town Policies

Policy 1: Maintain effective safety services.

Actions:

1. Continue to provide support to the Windham Volunteer Fire Company so that an effective fire protection and fire prevention system can be maintained.
2. Continue to work with neighboring communities and businesses as Rescue Inc to ensure adequate ambulance services for the Town.
3. Ensure necessary police services for the Town by periodically reviewing the police protection available to residents and traffic patrol on the roads by the Windham County Sheriff Department.

Policy 2: Provide quality education while keeping within the financial capabilities of the Town through the stewardship of the

School Board.

Actions:

1. Monitor population and school enrollment trends to address future needs in an efficient manner.
2. Plan cooperatively with the Windham Central Supervisory Union and Leland & Gray Union Middle and High School to prevent undue burdens on the schools and Town.

Policy 3: Support regional efforts to provide affordable childcare.

Action

1. Continue to allow state registered and/or licensed childcare facilities serving 6 or fewer children as a permitted use of a single-family home in accordance with state law.

Policy 4: Support the well-being and quality of life for seniors in Windham.

Actions:

1. Provide information to community members of services available to seniors.
2. Ensure that policies, regulations and ordinances are written to afford maximum protection of land values for all property owners.
3. Provide the community with information on services given by The Current on ADA service, Dial A Ride, and van or volunteer driver service for medical appointments, senior meals, and adult day care programs.

Policy 5: The development and provision of public and community utility facilities and services should be based upon projection of reasonably expected population increase and economic growth and shall recognize the limits of the town's human, financial and natural resources.

Actions:

1. Natural and cultural resource areas, as identified elsewhere in this Plan, shall be avoided in the location or routing of new power generation stations, distribution lines and phone lines and substations.
2. Advocate for increase in the quality and quantity of electric power supplied to the town.

Policy 6: The location of utility poles and transmission and distribution line routes shall be designed to minimize aesthetic impacts.

Actions:

1. Use of appropriate support structures, appropriate conductor colors for the background and direct burial is encouraged.

Policy 7: Advocate for communication and internet upgrades to the latest technology in Windham.

Actions:

1. Communicate to the Public Service Board expressing concerns over the level of service in Windham.
2. Impart great disappointment to the providers of the internet technology about the quality of the service to certain areas of town.
3. Work with the utilities providing electric power to maintain/upgrade lines that are sufficient to allow for connection of larger solar arrays.

Policy 8: Promote efficient and environmentally sound solid waste disposal and recycling.

Actions:

1. Support local recycling efforts, hazardous material collection, battery and electronics collection, etc.
2. Work with adjoining towns to provide improved disposal and recycling policies.
3. Participate in Green-Up Day.
4. Position recycling bins in all public buildings.

C. Local Emergency Planning

The Town of Windham supports emergency planning and disaster preparedness. Planning and preparedness may help reduce the risk to life and health, the damage to public and private property and the environmental damage that often occurs as a result of a disaster. This encourages the Town to prepare calmly and realistically for likely emergencies; to know the location of resources and equipment that will be needed; to inform residents of the potential dangers and the ways to avoid these potential dangers; and to quickly arrange for help when it is needed.

With the problems resulting from Tropical Storm Irene and other recent storms it is incumbent on Windham to better understand how our mountains and high elevations wetlands and waterways help to protect our settled communities from unnecessary flooding and other damage. Our Forest areas retain water and retard run off thus acting as a flood deterrent that prevents even greater stormwater runoff.

1. Hazardous Materials

The Federal Emergency Planning and Community Right to Know Act (EPCRA) requires that when certain quantities of hazardous materials are stored at a facility, they must be reported to state and local officials. According to the 2003 list of Vermont's Tier II sites, the Windham Mine, Hamm Mine, and Town Garage are listed as storing hazardous chemicals at such a quantity to require reporting to the State and local fire department. Information about EPCRA can be found here: <http://www.epa.gov/agriculture/lcra.html>)

2. Inundation Flood Hazards

Windham participates in the National Flood Insurance Program (NFIP). Maps published by the Federal Emergency Management Agency (FEMA) in 2007 show flood information for town,

including Flood Hazard Areas. These are defined as locations that have a 1% chance of flooding in any given year (i.e., they are expected to be inundated by a 100-year flood).

NFIP is a Federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between the Town and the Federal Government that states if a community adopts and enforces a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard

Areas, the Federal Government will make flood insurance available within the community as a financial protection against flood losses.

According to the Flood Hazard Area Maps, the middle and south branches of the Williams River, Saxtons River, and Burbee Pond have areas in the 100-year floodplain. Flooding is a serious problem in Windham. The Town experienced extensive public and private property damage as the result of significant flooding over the period of July 21 through August 18, 2003, resulting in approximately \$700,000 in damages. The storm all but destroyed Route 121 and was so significant that the Town had to obtain financial aid from a local bank in order to subsidize the repairs. This disaster was declared a federal emergency and federal funding was provided for road assessment and repairs. (\$834,874 was provided Windham.)

Extensive damage was done to Windham's roads and culverts in August 2012 during Tropical Storm Irene. The southern end of Harrington Road was destroyed and almost all town roads sustained some damage. Although Windham received all but 5% of the \$718,667 spent on recovery, we continue to seek grants to enable us to upgrade culverts and bridges in order to meet new state requirements.

3. Fluvial Erosion Hazards

In addition to inundation hazards, flooding can cause fluvial erosion hazards. While some flood losses are caused by inundation (i.e., waters rise, fill, and damage low-lying structures), most flood losses in Vermont are caused by "fluvial erosion," erosion caused by rivers and streams, which can range from gradual bank erosion to catastrophic changes in river channel location and dimension during flood events. The Vermont Agency of Natural Resources notes that NFIP "floodway" and "flood fringe" areas are often inadequate as an indicator of flood hazards, especially erosion.

Areas subject to fluvial erosion hazards, from gradual stream bank erosion to catastrophic channel enlargement, bank failure, and change in course, due to naturally occurring stream channel adjustments, can be identified and mapped in accordance with accepted state fluvial geomorphic assessment and mapping protocols. Windham should seek resources to determine fluvial erosion hazard areas associated with streams, such as the Williams and Saxtons Rivers, and augment the town's flood hazard area regulations to include fluvial erosion hazards. (For further information regarding management of area watersheds see River Corridor Plan for the Saxtons River Watershed, Sept 30, 2010 by Fitzgerald Environmental Associates and the Windham Regional Commission and Basin 11 Management Plan West River, Williams River, Saxtons River by Vermont Agency of Natural Resources, May 2008.)

There are open mine pits at the U.S. Talc/North Windham Talc Mine which have been subject to flooding. As a result of litigation among the current mine owner, the original Act 250 permit holder, the Town of Windham and one or more of its landowners, this hazard has been mitigated as of 2012. A state-of-the-art system for flood control and fluvial diversion has been installed and is monitored and maintained both physically and electronically to standards set by the State of Vermont Dam Safety Department.

4. Town Polices

Policy 1: Land subject to periodic inundation flooding and fluvial erosion hazards shall be limited to development which will not restrict, accelerate, or divert the flow of flooded waters and thereby endanger the health, safety, and welfare of the public during flooding.

Actions:

1. Continue to participate in the National Flood Insurance Program.
2. Work to identify fluvial erosion hazard areas and add protections for them to the existing (inundation) flood hazard area regulations.
3. Work to preserve forested areas at higher elevations to protect settled areas.
4. Ensure that new construction or development in the areas of possible flooding are in alignment with the latest Zoning Regulation Bylaws.

Policy 2: All new public and private roads and driveways shall be properly constructed so that they do not contribute to the damage of Town roads from run-off.

Actions:

1. Continue to enforce the Windham Road Ordinance.
2. Review the Ordinance and update as necessary.
3. Continue to upgrade the culverts and ditches on town road to the latest State standards.

Policy 3: The Town will actively pursue emergency preparedness.

Actions:

1. Annually update the Local Emergency Operating Plan (LEOP) for the Town.
2. Adopt an all hazards pre-disaster mitigation plan.
3. Maintain the generator supporting the town office, which is a Red Cross Emergency Command Center, and the school, which is a Red Cross Shelter.
4. Pursue funding for a generator for the Meeting House and Congregational Church, which is a Red Cross Shelter.

CHAPTER IV - NATURAL RESOURCES

A. Land resources

1. Forest Resources

Windham has abundant forest cover throughout the Town. The Town is fortunate that it retains several areas of large, unbroken forest. In 2001, Windham's citizens voted to amend the Windham Zoning Regulations to create four Forest zoning districts within the town. These areas are shown on the future land use map that is included in this Plan. It is the policy of the Town of Windham that land uses and development in these Forest Resource districts be limited to forestry, agriculture, recreation, and low-density residential uses, as specified in the zoning regulation. Commercial and industrial* uses other than those related to the foregoing are not permitted in the Forest districts. In the case of any ambiguity, State regulatory boards and commissions, including the Act 250 commissions, Public Service Board, Department of Public Service, Public Utilities Commission and other users of this plan, shall consider both the provisions of this Plan and the provisions of the Windham Zoning Bylaw when making determinations for the future use and

development of the lands within the Forest districts.

The Town's forestland is managed by private landowners. The Stiles Brook Tract, currently owned by Meadowsend Timberlands, is one of the largest contiguous, privately owned parcels of forestland in Windham County. The parcel contains approximately 3500 acres in Windham and 1500 adjoining acres in Grafton. It is currently managed for long term timber production.

Another accumulation of parcels on the west side of town totaling roughly the same amount is owned by The Nature Conservancy. With so much forest land in private ownership, the challenge for Windham and The Nature Conservancy is to ensure the health of its forest ecosystems, water quality, scenic views of land above 2000 feet , natural resources and wildlife while also sustaining the economic health of the forest industry.

With over 90% percent of the Town made up of forestland, careful consideration must be given to the sustainability of this resource in the town planning process. Further, it is important to note that as of 2013, 60% of Windham's land area is enrolled in Vermont's Use Value Appraisal Program. (see Table 9.) While it is important to track the resources or potential resources in each forest parcel, it is also critical to look beyond parcel lines and understand the forest landscape without divisions. Below are the important aspects that Windham's Town Plan is designed and written to protect:

- a. Wildlife Habitat - Diversity of forest type is essential in preserving wildlife habitats. It is important to evaluate existing wildlife habitats and to consider those in the forest planning process to avoid forest use conflicting with wildlife preservation. Special care must be taken to protect wildlife, including critical moose wintering areas, deer yards, bear and bobcat ranges, habitat of the endangered American Marten, beaver and other fur bearing animals, and a large number of upland songbirds, especially the endangered Bicknell's Thrush and other necessary wildlife habitat and endangered species. Knowledgeable hunters and wildlife professionals estimate that lands to the east of town contain more moose than any comparable area in Southern Vermont. Any development that endangers or adversely affects these and similar populations discussed in Paragraph A.5 is prohibited.

*(*Throughout this Plan a commercial operation is defined as an enterprise that is carried on for profit by the owner, lessee or licensee; and industrial uses are defined as the processing, treatment and/or conversion of raw or semi-finished materials into a different form or state, excluding forestry and agricultural goods raised on the premises.).*

- b. Recreation - Windham's natural environment is a tremendous resource in regard to outdoor recreation. Residents have enjoyed the use of forest land belonging to many private landowners. Recreational use requires tracts of connected land. Windham's forested land offers recreational opportunities such as camping, wildlife viewing, hunting, and fishing. Informal and formal trails

provide for camping, hiking, biking, skiing, snowmobiling, and other recreational pursuits.

c. Aesthetic Features - Scenic landscape is an important core resource for the town. Distance (foreground, middle, and background), topography (slope, peaks above 2000 feet, contrasts providing shape and texture), forest cover, forest districts, land above 2000 feet, special features, visibility and protective screening are features that are essential to the well-being of the Town and its residents and must be protected.

d. Forest based Industry - Windham has a sustainable forest resource which can and does provide quality forest products. A forest-based economy supports employment and provides landowners with financial returns through planned timber harvesting. These interests are promoted and protected in the Forest district areas, where prohibited activities include structures above tree height and/or tall enough to require FAA lighting, mineral resource extraction, and commercial and industrial wind towers and meteorological towers. See Zoning Regulations Section 204 for additional uses prohibited which are specifically authorized and incorporated within this Plan.

e. Forest fragmentation/Contiguous forest blocks – Windham’s contiguous forest habitat provides a significant contribution to the local community’s interests in its natural heritage, identity, and working landscape. These lands represent much of what makes life in this area unique and enjoyable. Identification and preserving larger blocks of forest is important in order to support viable populations of wide-ranging animals by allowing access to important feeding habitat, reproduction, and genetic exchanges. The forest blocks support the biological requirements of many plants and animals and serves as source populations for recolonization of nearby habitats that may have lost the original populations. Development that takes places within the forest blocks shall be located at the edges of the blocks to reduce fragmentation by roads and development. Forest blocks are important to maintain as the sources for water and air.

f. Habitat connectors/wildlife corridors – Development that takes places within a habitat connector that links patches of wildlife habitat within a landscape, allowing the movement, migration, and dispersal of animals and plants and the functioning of ecological processes permit the ease of movement by land or water. Connecting larger habitat is a value that accomplishes several important points. These areas allow plants, fish, and animals to colonize new habitat as climate change and other ecological fluctuations compel them to migrate. It allows movement to meet daily and seasonal changes for food, breeding, and across their range.

2. Agriculture

The US Department of Agriculture has identified soil types that are best suited to crop production based on soil quality, growing season and moisture supply. These areas, called prime agricultural soils, are likely to produce the highest crop yields using the least amount of economic resources and causing the least environmental impact. Windham has a very small area of prime agricultural soils, but its residents have been successful at farming on the secondary agricultural soils.

Windham allows agricultural activity in any part of Town. Although agriculture is not extensive in Windham, the remaining agricultural areas are important resources that serve many essential functions including providing local seasonal produce and planting materials; providing open space, serving as an educational resource, and contributing to the rural character of the Town.

The largest active farming operation in Windham is the Dutton Farm, which has been a dairy farm for several generations, encompassing 230 acres. The farm continues under family ownership and has been converted from dairying to the production of fruits and berries. Other small farming operations in Windham in 2019 include:

Table 8: All Farming Operations in Windham

Owner	Agricultural Products
Corriveau	cattle, chickens, hay
Dutton	fruits, berries, hay
Lemay	hay
Partridge	sheep, rabbits, horses
Pease	Christmas trees
Keilbock	pumpkins, potatoes
Merinoff	cows, bees, sheep, llama, poultry, exotic birds
Amsden	cattle

(Source: Windham Planning Commission)

3. Current Use Program

The Current Use Program (<https://fpr.vermont.gov/forest/managing-your-woodlands/use-value-appraisal>) was established by the Vermont Legislature in 1977 in recognition that the high tax burdens placed on farm and forest lands was contributing to the rapid development of prime agricultural and forest lands across the state. The Current Use program allows farm and forest lands to be taxed on their resource production rather than their value for development purposes. The program includes a Land Use Change Tax as a disincentive to develop land. For forest land to be eligible, participating owners must have a minimum of 25 contiguous acres to enroll in the program (not counting the 2 acres surrounding any dwelling) and must manage the forest land according to the provisions of a 10-year forest management plan. Agricultural land has a different set of eligibility requirements; however, the land must be at least 25 acres, not counting the 2 acres surrounding a dwelling.

Table 9 indicates that there were 53 properties enrolled in the Current Use Program in 2019 for a total of 11266 acres, over half of the Town’s acreage. Most of the land in the Current Use program is contained within the adopted Forest Zoning District, further supporting the desire to maintain these areas as rural and undeveloped.

Table 9: 2019 Use Value Enrollments in Windham

Number of Properties	Total Program Acres	Forest Acres	Agricultural Acres
55	11266	9231	311

4. Soils and Topography

Soils are one of the most important environmental factors that governs the use of land in rural areas. Soils are classified based on structure, form, composition, and suitability for various types of development. Four characteristics are of primary concern when doing land use planning: bearing capacity, erodibility, drainage, and resource value.

The Town's agriculture and forestry depends upon the availability of high-quality soils in large, adjoining parcels. The Windham County Soil Survey has ranked soils in Windham.

Approximately 1,130 acres are categorized as having important farmland soils with about 15 acres being ranked as prime soils. However, only 44% of the important farmland soils are located on lands that are classified as open. Most Windham's important agricultural soils are located along the Town's streams and brooks and major transportation routes, as shown on the Earth Resources Map.

Forestry soils are important to maintaining the forest and timber resources that are a part of Windham's identity. Many activities, such as timber harvesting, tree farming and maple sugaring, are dependent on the presence of quality soils. Using USDA Soil Conservation Service soil data, soils in Vermont have been assigned a productivity class for application in the state's Use Value Appraisal Program. Windham's soils are predominantly classified as Site I, the most productive sites. Table 10 shows the breakdown of the percent of land area by each forest productivity site classification:

Table 10: Forest Productivity Classes for Use Value Appraisal Program in Windham

Site Classification	Potential Productivity (per acre per year)	Percent of land area
Site I	>85 cubic feet	54%
Site II	50-85 cubic feet	37%
Site III	20-49 cubic feet	6%
Site IV	<20 cubic feet	3%

(Source: WRC GIS 2015)

The slope of the land is also an important determinant of development capability. Slopes of less than 8 percent are generally most suitable for building. The erosion potential of such slightly sloping land is low, its ability to absorb runoff is high, and soils are usually of adequate depth and composition for septic systems. Exceptions are extremely flat areas, some of which may be classified as wetlands, where drainage is poor. As slopes increase, the suitability of the land for development decreases. In areas of steep slopes, the velocity of runoff, and therefore the potential for erosion, increases. The ability of the soil to filter septic leachate is decreased.

Overcoming site constraints becomes increasingly costly. Slopes of 15 to 20 percent

present extremely significant constraints and under certain conditions may not be acceptable for certain types of development. Commercial and industrial development are prohibited on slopes exceeding 20%. (Refer to Slope Map in Chapter XIV)

5. Wildlife

Windham provides habitat for a wide diversity of plant and animal species. Windham's unfragmented forest land provides some of the most valuable wildlife habitat in the region. Fragmented habitat inhibits wildlife migrations to seasonal food sources, localized climate conditions (winter grounds), and habitat specific activities such as birthing young. Habitat Fragmentation can isolate breeding populations, prohibit sub adult dispersion and increase the impact of human interaction, all of which can seriously endanger specific species. Large blocks of habitat have an exponential benefit. One 1,000-acre tract is more productive than ten 100-acre blocks. A primary characteristic of habitat that is not fragmented is the absence of roads. Roads often are a barrier to wildlife movement and can be a cause of mortality. The impact of roads can vary with their type and intensity. A dirt road that is not maintained does not represent the same threat to wildlife as most paved highways for several reasons. Dirt roads tend to be narrower, necessitating lower speeds and lessening the chances of automobile-wildlife contacts. Narrow dirt roads in wooded areas also allow the tree canopy to extend over the road, thereby retaining a greater degree of forest cover and habitat for many species of wildlife, particularly birds. Although vehicle traffic is less of a problem on these smaller roads, any travel route subjected to frequent unnatural compaction has the potential to disrupt the balance between prey and predator species for whom ground surface composition is a vital part of species preservation. Careful consideration of road placement and configuration is therefore one of the most important steps that can be taken to safeguard significant blocks of wildlife habitat.

In addition to the large forest blocks, other important wildlife habitat areas include the woodland, wetland, and surface waters in and around Burbee Pond. Abundant wildlife has been sighted in this area including, but not limited to beaver, bear, deer, moose, otter, mink, fox, fisher, Canada goose, osprey, blue heron, red-tail hawk, bald eagle, cormorants, and American bittern.

6. Earth and Mineral Extraction

Windham has a history of mining activities with both talc and marble having been mined in the Town. Talc mining operations ceased in the mid-1980s. A green marble quarry, located at the end of Abbott Road and Wheeler Road, is also no longer in operation. Zoning regulations allow mineral resource extraction for personal or commercial use on a conditional basis subject to the conditions articulated in Section 205, 206 and 504.

Inactive talc mine sites continue to pose health and safety hazards, not only on the property, but for neighboring properties as well. Flooding from the open pits may pose serious problems. (Refer to Emergency Management Planning Chapter III for recent mitigation steps.) In addition, unsecured mine shafts and abandoned equipment must be addressed by property owners and comply with all applicable state and federal regulations.

7. High Elevation Landscape

Windham's lands with elevation above 2000 feet contribute significantly to the scenic landscape of the town. Parallel north- south ridges run almost the entire length of Windham. The main north-south road, Windham Hill Road, is in a high-elevation valley that runs between the two ridges. To the west of Windham Hill Road is Glebe Mountain which rises steeply in elevation. To the east of Windham Hill Road and south of Route 121 is a series of lower elevation hills that form a distinct horizon with many points of significant elevation and very steep slopes located in very close proximity to residences. (Reference Windham Settlement Graph below and Map 10 in Chapter XIV.) Both features, shown on the Utilities and Community Resources Map, form a forested backdrop for views from lower areas and provide high elevations for viewing distant ridges.

Settlement has occurred in harmony with this landscape. West Windham, South Windham, and Windham were settled on flatter terrain with views of the hillsides in the foreground.

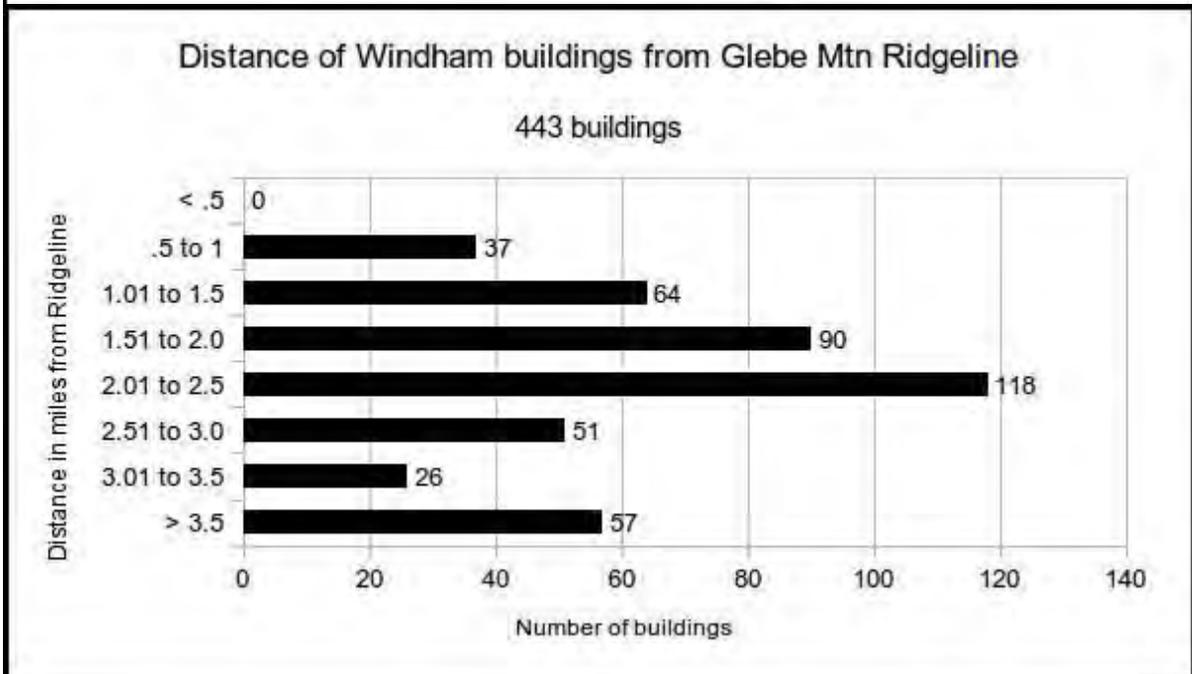
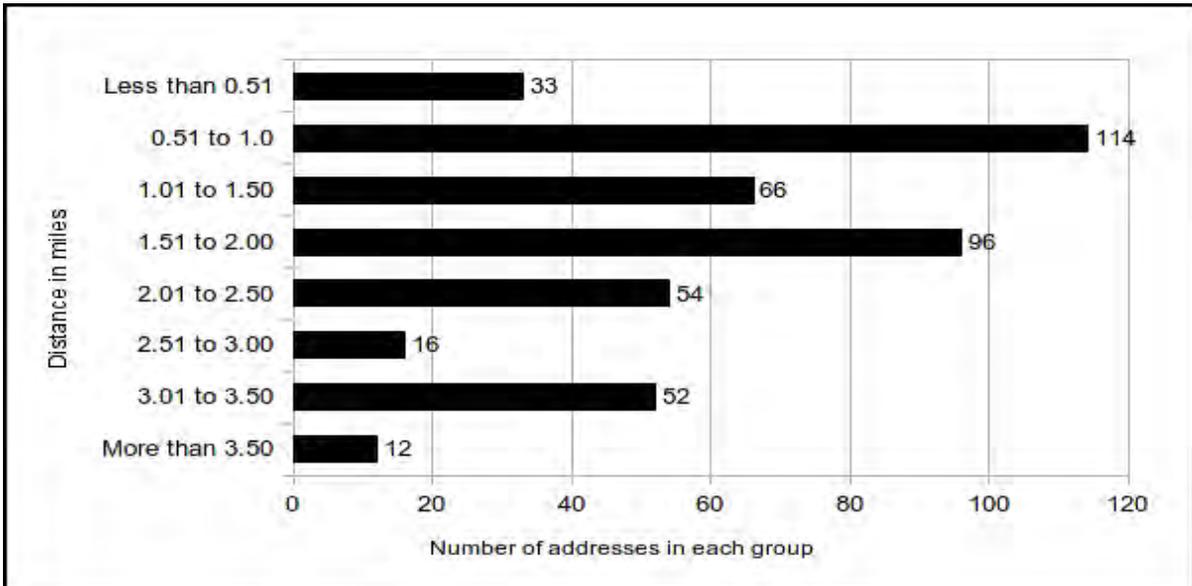
All of Windham sits at elevations of 1500 feet or above. To the west of Town, Glebe Mountain reaches to a peak of 2900 feet while the highest points to the east barely reach 2500 feet.

Traditional settlement has expanded along existing roads which are primarily located in the lower elevations but not far away from the various peak tops. The Windham Meeting House in the Hamlet has a geodetic marker of 2000 feet, which serves to emphasize that the difference between the highest elevations in Town and the settlement areas is much less than in most other mountain communities. The narrowness of the valley results in unique proximity of the settled areas to the steep slopes rising to the high points on either side.

The following two graphics give an appreciation of the number of residences in Windham at various distances from the highest points on the ridges east and west of Windham Hill Road. (For additional reference Map 10: Settlement Patterns Relative to Topography).

WINDHAM SETTLEMENT PATTERNS 2015

Distances of Windham buildings to the highest elevation points east of Windham Hill Road



Not only are these lands above 2000 feet highly visible from lower elevations in Windham, they serve an important ecological function as headwater areas. The cumulative effects of development in these sensitive areas (which include significant destruction of the scenic beauty of the community, degradation of water quality, increased downstream runoff and flooding problems, destruction of roads and bridges, loss of habitat linkages, and erosion) would have a substantial impact on the character and environmental quality of Windham and the Region. Consequently, these areas referred to in graphic #1 above have been included in the Forest District to limit development and prohibit all commercial and industrial use except that which is already permitted in the Zoning Bylaw. (See Zoning Regulations Section 207 for additional uses prohibited.)

8. Town Policies

Policy 1: Direct development away from unsuitable areas.

Actions

1. Prohibit development in areas where the topography and soil conditions may cause contamination of surface, sub-surface waters or wells or failure of waste disposal systems.
2. Prohibit development on slopes of 20 percent or greater.
3. Minimize areas of earth disturbance, grading, and clearing of vegetation on slopes over 15%. Evaluate erosion and sedimentation control measures in areas where development occurs on slopes over 8% during Site Plan Review.
4. Only proven technologies for stormwater mitigation will be allowed.
5. Further delineate lands above 2000 feet and other visible high-elevation areas requiring protection.
6. Prohibit visible development and permit only allowable activities within the High Elevation Resource Protection Overlay District.
7. Prohibit development in areas of wetlands and vernal pools.
8. Prohibit development in rare and irreplaceable natural areas, areas with necessary wildlife habitat and/or critical wildlife populations, and areas with endangered species. (Reference State Statute Title 10 Section 6086(a)(8)(A).

Policy 2: Enhance the economic viability of agriculture and forestry activity in Windham.

Actions

1. Maintain the purpose of the Forest District primarily for forestry activities.
2. Work with the Vermont Land Trust, or other appropriate non-profit organizations to encourage the voluntary protection of productive agricultural, forest lands and critical natural areas. Techniques such as conservation easements or donation of land should be actively explored.
3. Continue to evaluate timber harvesting practices during the site plan review process to ensure that natural resources, including surface waters, wildlife habitat, wetlands, vernal pools, shorelines, streams and stream banks are protected.
4. Continue to allow agriculture in all districts in Town.
5. Encourage participation in the Vermont Land Use Appraisal Program to support the viability and maintenance of farm and forest land.

Policy 3: Preserve and protect the natural scenic beauty and related natural resources in Windham.

Actions

1. Site buildings and structures below the elevation of 2000 foot in the Forest District so as not to intrude upon the skyline.
2. Enforce zoning regulations that have permitted and conditional use standards for the Forest District that are designed to prevent erosion and sedimentation associated with stormwater runoff, to ensure that new development in the Forest District is sited and landscaped in a manner which limits the visual impact in 2000 foot elevation development, and to avoid adverse impacts to natural resources, including water quality, headwater supplies, streams, wetlands and vernal pools
3. Support The Nature Conservancy in development of the plan for usage of the land they hold on Glebe Mountain.
4. Explore permissible ways of using the Stiles Brook land which will preserve and protect its scenic beauty and natural resources.

Policy 4: Preserve the contiguous forest blocks in Windham

Actions:

1. Conserve and provide stewardship of existing relatively large patches of contiguous forest habitat within the town .
2. Work with forest owners to maintain sustainable forestry practices.
3. Establish zoning to prevent forest parcelization leading to an increased forest fragmentation.
4. Work to inform landowners of value of contiguous forest.
5. Provide assistance to landowners for any resource conservation actions that are in keeping with town's conservation interests such as the creation of a conservation easement.
6. Promote landowners of greater than 27 acres to enroll in the Current Use program.
7. Prevent subdivision in the interior of large forested areas.
8. Educate landowners about COVERTS(Woodlands for Wildlife) program.
9. Develop a process/system for transferable development rights(TRDs) program for conserving contiguous forest.
10. Utilize the High Elevation Resource Overlay, the Forest District, the Resource Protection Overlay and the Forest Block maps to control development of the forest blocks and corridor blocks.

Policy 5: Preserve the wildlife connectors in Windham

Actions:

1. Require that development that takes place within a habitat connector that links patches of wildlife habitat within a landscape, allowing the movement, migration, and dispersal of animals and plants, and the functioning of ecological processes, be limited so it does not impede movement of wildlife by land or water.
2. Development that takes place within a habitat connector shall be located at the edges of the connector area in order to facilitate wildlife travel through the area. If there is no land that is practical for development outside the wildlife connector, the development's design must minimize impacts on the continued viability and use of the corridor.

B. Water Resources

1. Headwaters and Watersheds

Headwaters within the Town of Windham are critical resources to the Town and the region and are intended to be protected by this Plan and the Town's Zoning Bylaws discussed in Section 2 below.

A watershed, also known as a drainage area, is a land area which collects precipitation and contributes runoff to a receiving body of water or point along the watercourse. Watersheds are delineated by identifying the highest topographic points in each area and determining the direction in which water will flow from these points. Land uses within a watershed can affect water quality. Because the drainage area of any given water body may extend beyond the Town's borders, inter-municipal coordination of land uses is essential to ensure effective management and protection of the water resource.

Lands within Windham drain into the West, Williams and Saxtons Rivers watersheds, with sub-watersheds including Cobb Brook, Turkey Mountain Brook, Tannery Brook, Stiles Brook, Willie Brook, Howe Brook, Saxtons River headwaters, South Branch Williams River, and Middle Branch Williams River (see Map 3: Watershed Map). These three watersheds are identified by the state Agency of Natural Resources, for planning and management purposes, as Basin 11. In fact, Windham contains many of the headwater areas of this basin. The Agency of Natural Resources adopted a Basin 11 Management Plan (available at:

https://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/pl_BP_B11-13_2015.pdf)

This was developed through a public process that inventoried uses and problems and developed strategies for maintaining or enhancing water quality; identified strategies to remedy problems, and was supposed to assign Water Management Types to maintain or attain desired water quality, but that part of the project was not completed. The Agency of Natural Resources, however, has been given the authority to assign types to watersheds with the support of the Town Government.

(See discussion of the Tier system below.) Issues such as water quality, erosion control, stormwater runoff, deforestation and buffer loss, and flow regulation and flood control are addressed within the basin planning process.

2. Surface Waters

The surface waters and vernal pools of Windham include lakes, ponds, rivers, streams, and wetlands (see Map 4: Natural Resources Map and http://windhamregional.org/images/maps/watershed/region_waters_36x48.pdf) and represent a critical natural resource to the Town and its residents. Surface water resources serve many functions for a community and its region. Windham's surface waters provide for water storage, groundwater recharge and water supply which are critical to human and wildlife inhabitants of Windham as well as nearby towns.

Headwater streams and wetland areas are the birthplace of our surface water resources. They constitute the greatest percentage of total stream length in an undisturbed river system. They are vitally important for providing clean and cold water, habitat, and food control; however, they can only provide such services if they are protected from disturbance. Headwater streams offer the greatest opportunity for interaction between water and land; and it is with this interaction that numerous biological, chemical, and physical processes are constantly occurring to clean storm water runoff. These are the processes which are responsible for maintaining water quality downstream. Windham's location at the headwaters of many of the areas brooks and rivers means that each headwater watershed in Windham plays a very important role in determining the water quality in the downstream, lower elevation areas of Basin 11. The downstream water quality is established here at the headwaters in Windham. Of note is the Cobb Brook watershed, a Class A1 stream by recognition of the State of Vermont. In the 1991 decision to reclassify Cobb Brook, it was noted that the Cobb water quality was among the very highest in the state and the level of sedimentation was among the lowest of streams in the state. Turkey Mountain Brook includes a spectacular gorge on its way downstream to Jamaica and encompasses another notable resource in Windham, namely Burbee Pond. Covering 50 surface acres, Burbee Pond is a source of constant wildlife sightings of Bald Eagles, hawks, osprey, otter, beaver, blue heron, deer, moose, mink, ducks, and geese. It is also a popular canoeing and fishing location. The upper reaches of the pond offer diverse wetland habitat, which supports this rich diversity of wildlife. Other critical surface water resources include Saxton's River, South Branch of Williams River, Middle Branch of Williams River, Howe Brook, Wiley Brook, Stiles Brook, and Tannery

Brook.

The water quality of Windham's surface water is protected under the Vermont Agency of Natural Resources Anti-Degradation Implementation Procedure (<https://dec.vermont.gov/sites/dec/files/wsm/Laws-Regulations-Rules/AntiDegredationImplementationProcedure-Interim.20101012.pdf>).

The Policy establishes three tiers of protection for water resources. Tier I is described as the protection and maintenance of existing designated uses such as fishing, swimming, and/or aquatic biota, and the water quality supporting those uses. For all waters, a Tier I level of protection must be maintained and therefore existing uses may not be diminished. Tier II is a level of protection applied at locations where the quality of the water exceeds the applicable water quality standards, which is often the case in headwater stream and wetlands.

Any lowering of Tier II water quality is prohibited unless it is necessary to support important economic or social development. Tier III protection is offered for waters of the most exceptional value, as previously noted for Cobb Brook.

All headwater areas above 2,500 feet are currently afforded the highest level of protection as they are classified as A1 waters according to the Vermont Water Quality Standards. Many headwater seeps and 1st order streams exist at lower elevations. These headwater areas can be just as sensitive and valuable as headwaters above 2,500 feet but are not by regulation afforded the same level of protection by the ANR as those higher headwater areas. These lower elevation headwater areas may have water quality that is far greater than the minimum Class B standards and therefore the Town concludes they shall be afforded the higher level of protection. The Vermont Agency of Natural Resources now can reclassify waters provided the reclassification is supported by the Town and by scientific findings.

3. Wetlands

Wetlands are lands that are saturated with water at least part of the year and include marshes, swamps, sloughs, fens, mud flats, vernal pools, seeps, and bogs. Wetlands serve many critical functions for the Town. They store large quantities of water during periods of high runoff and gradually release water during low flow periods. Loss of the storage capacity will not only adversely affect stream behavior but will also increase floods and reduce stream flow during crucial low flow periods.

Wetlands are critical during periods of unusual behavior such as what we are seeing as a result of climate change. Wetlands are also significant for the maintenance of water quality. The biological activity of a wetland area enables the absorption and assimilation of nutrients and thus purifies, to some extent the water which is discharged. Wetlands are centers of ecological activity and support many kinds of wildlife and their habitat. Several state and federal laws also provide protection for wetlands including the US Army Corps of Engineers permits, Act 250, and the Vermont Wetlands Rules.

Windham has extensive wetlands providing the essential functions identified above. Some examples of the wetlands include the upper reaches of Burbee Pond, an extensive wetland complex which provides for diverse wildlife. Also, in Windham Center, an excellent chain of wetlands begins just north of the Village and stretches along the east side of Windham Hill Road all the way to Route 121. An active beaver population there maintains open water for wildlife and habitat like the Burbee Pond area.

There are also important wetlands to the east of Windham Hill Road in Howe Brook, Willie Brook, Stiles Brook, and Turkey Mountain Brook watersheds. Cobb Brook headwaters emerge on Glebe Mountain. In addition, east of Windham Hill Road and below the peaks that parallel it, there are significant wetlands to the south of the Meeting House. This collection of seeps, bogs, streams and beaver meadows (both active and inactive) drain southward through a low area that crosses several smaller private parcels in which these features are relatively undisturbed. The system crosses Windham Hill Road near Abbott Road and drains into Burbee Pond and continues into Turkey Mountain Brook.

These wetlands described above are likely to provide a high function and value for filtering water, providing flood control, recharging ground water, and mitigating erosion and sedimentation. It is likely many other high-quality wetlands exist within the Town which have not been formally mapped and assessed but which provide the functions identified above and deserve protection.

Many of Windham's significant wetlands are created, inhabited by and dependent on beavers. Beaver wetlands, or flowages, support a remarkable density and diversity of life. They provide sites for hunting, fishing, wildlife viewing and environmental education. Flowages also abate flood damage by acting like giant sponges, holding vast amounts of water during floods and then releasing it slowly over subsequent weeks. In the absence of beavers, dams' decay and wetlands eventually disappear and become forested. The Vermont Fish & Wildlife Department recognizes the value of beaver flowages for the variety of ecological benefits they provide. The cycle of beaver maintains an ever-changing diversity of habitat benefiting a whole host of species. For this reason, the Department strives to maintain beaver-influenced wetlands across landscape whenever possible.

Conflicts with beavers usually come in the form of clogged road culverts resulting in water encroaching on yards or roads. There are three ways of approaching the issue: trap and relocate the beavers, kill the beavers, or make use of high-quality flow-control devices. Well-built and designed flow devices are a superior tool for both ecological and economic reasons. The Beaver Deceivers (<http://www.beaverdeceivers.com/>) is in use in the outlet culvert in Burpee pond to control the beaver.

4. Flood Hazard Areas

The floodplains in Windham are primarily related to seasonal high-water flow in the middle and south branches of the Williams River and the Saxtons River. Floodplains are low-lying terraces adjacent to rivers and streams which are periodically inundated when swollen waterways exceed their bank-full capacities. Federal mapping indicates that floodplains exist in the central and northern portion of the Town. There are also areas along rivers and streams subject to risk of erosion, particularly in high flow events, known as Fluvial Erosion Hazard (FEH) Zones. These areas have been and are being defined through the State River Management Program protocols in cooperation with FEMA. State maps are not yet available for all towns due to lack of funding but remain a part of the goals of the River Management Program and could be released during 2014. Once defined, these areas should be included in the town's flood hazard area regulations to protect the public and the river corridor environment from adverse consequences of development there. A discussion of FEH Zones can be

found on the ANR Flood Ready site (<https://floodready.vermont.gov/>).

5. Groundwater

Groundwater is an extremely valuable natural resource in the Town of Windham because it provides the primary source of potable drinking water for residents. Groundwater is water that has infiltrated into the soil through sand, gravel, or rock. The area where groundwater is stored is called an aquifer. Groundwater occurring in fractured bedrock is highly susceptible to contamination. Failed or inadequately designed septic systems are potential sources of groundwater pollution. Aquifer recharge areas for Windham are not currently mapped. Regardless, it is important to note that the entire Town is an important groundwater recharge area for the Town and the region.

Of concern in Windham is the safety of groundwater supplies in the areas where the talc mines were operated. The network of mine shafts was extensive, and their exact locations are not well known. Since the closure of the mines, the water table has returned to a higher level, flooding the mine shafts. There remains a possibility that a water supply system might tap into one of the mine shafts and the water may not be potable. Any parcel of land with mineral rights has the potential to be impacted by an underground mine shaft.

A third area of concern is any development that requires significant blasting that could impact residential water supplies. Commercial and industrial development is prohibited that could affect groundwater supplies as a result of techniques including but not limited to blasting, drilling, and hydro-fracking.

In 2008 ground water protection waters in Vermont were strengthened when the legislature designated ground water as a public trust resource. The result of this designation is that ground water must now be managed for the benefit of all citizens. The 2008 law and the interim implementation procedure put forth by the Vermont ANR in 2011, proclaims that certain activities present a heightened risk to ground water quality and that changes must be made at the regulatory level to require applicants to clearly demonstrate proposed actions do not harm water quality. The Town of Windham fully supports the declaration of groundwater as a public trust and ANRs interim procedure to strengthen groundwater protections and make people accountable for damage to this critical public resource.

6. Surface Water Quality

There are several threats to surface water and ground water quality. The two main categories of pollution are point source and non-point source pollution. Point sources are those that can be traced to a specific source, such as a pipe or sewer outfall. Non-point sources of pollution are more diffuse in origin. They can include storm water runoff, septic system effluent, snow dumps, road salt, soil erosion, etc.

Water quality is greatly impacted by the presence of impervious surfaces that are associated with development. Impervious surfaces include buildings, paved roads, driveways, industrial platforms and parking lots. These surfaces reduce the natural infiltration of stormwater into the ground, thereby reducing the recharge of groundwater resources. Where increased imperviousness results in direct stormwater discharge into streams or rivers, the result is often the alteration of the natural flow of the stream, causing erosion and sedimentation, pollution, loss of aquatic wildlife

habitat, and increased flood hazards. The most significant and ongoing source of sediment discharge to streams and ponds in Windham is sand and gravel washed off gravel surfaced town roads. The erosion of road surface material into watercourses damages both the watercourse and the road and is wasteful of public funds. The material eroded into the watercourses must continually be replaced in order to maintain the road surface.

Often runoff from private roads and driveways is directed into the public road drainage system resulting in concentration and increased volume of runoff that contributes to erosion and flooding problems. In addition, inadequately maintained private driveways and road ditches and culverts are vulnerable to failure during storm events as available area for runoff is compromised and erosion results in instability of the traveled surface. In some instances, failure of private infrastructure propagates downstream to the public right-of-way resulting in much more significant and costly damages to this public infrastructure.

In 2013, the Lake Champlain Basin Program released a report on the effects of unpaved roads on Lake Champlain water quality. The report findings suggest that 31% of the annual average Winooski River suspended sediment load and 11% of the annual average phosphorus load can be directly attributed to the unpaved road network. In addition, the findings demonstrated that the magnitude of the erosion and pollutant production increased as road grade increased. In Windham, the higher-grade roads are more prevalent at the higher elevations.

Many new advances are occurring with how storm water is managed from developed sites. Green storm water infrastructure as defined by the Vermont Agency of Natural Resources is “a wide range of multi-functional, natural and semi-natural landscape elements located within, around, and between developed areas at all spatial scales.” Green stormwater infrastructure or GSI are Best Management Practice tools which can be used to effectively restore and maintain natural hydrologic processes when developing land. The core benefit of these systems is that runoff generated from development is infiltrated, evaporated or recycled rather than polluting downstream resources.

In 2014 the Vermont Agency of Natural Resources updated the release of the Green Infrastructure Strategic Plan for 2014-2019 (https://dec.vermont.gov/sites/dec/files/wsm/erp/docs/sw_gi_2014_2019_strategic_plan_final.pdf), which has the overarching goal of restoring and maintaining the pre-development hydrology of the State’s watersheds using GSI. Also, the Plan states that “municipalities understand the impacts of stormwater runoff and work to mitigate the effects.” Notably to accomplish this objective according to the Plan, the Town will regulate land use with an understanding of the impacts on water quality and natural hydrologic systems and should coordinate with the ANR for local GSI implementation. The Town of Windham recognizes the importance of GSI for preserving hydrology and protecting its sensitive water resources relative to the region’s watersheds. The Town supports ANR’s mission of promoting the use of GSI at the municipal level by informing its citizens, applying GSI to municipal projects, and requiring GSI implementation for development projects.

This advance in stormwater treatment has also spurred regulatory changes. The Vermont ANR updated the Vermont Storm Water Management Manual (“VSMM”), which was developed originally in 2002 to 2017 Vermont Stormwater Management

Manual Rule and Design Guidance

(https://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/Permitinformation/2017%20V SMM_Rule_and_Design_Guidance_04172017.pdf). The VSMM regulates the creation of impervious surfaces. New standards being discussed are focused on integrating infiltration based GSI requirements. The Town of Windham will stay abreast of changes in this area and modify its plan, policies, and zoning regulations as appropriate.

The Town of Windham is fully aware of the evolution of new regulations and scientific advancement in stormwater management. The Town understands many professionals including regulators at the State and Federal level are of the opinion that current techniques and regulations have not been adequate to preserve existing hydrological conditions. The Town supports the development and implementation of new GSI-based regulatory tools to better protect water resources.

Recent research has revealed new understanding of the effect of the loss of forest cover. Newly developed estimates suggest that water sinks into the soil under trees at 67x the rate at which it sinks into the soil under grass. Impermeable surfaces represent even starker contrasts. M.R. Marshall et al, 2013. *The impact of rural land management changes on soil hydraulic properties and runoff processes: results from experimental plots in upland UK. Hydrological Processes*, DOI:10.1002/hyp.9826. (<http://onlinelibrary.wiley.com/doi/10.1002/hyp.9826/abstract>)

7. Wastewater and Potable Water Supply

In 2019, the State passed new Wastewater System and Potable Water Supply Rules (<https://dec.vermont.gov/sites/dec/files/dwgwp/rorules/pdf/Wastewater-System-and-Potable-Water-Supply-Rules-April-12-2019.pdf>). As part of those rules, the State of Vermont has had the sole responsibility for issuing septic permits unless the Town of Windham decides to seek approval to be delegated that responsibility. As a part of the new rules, all permits, licensed certifications of design and installation, and installer certifications of installation related to the Wastewater System and Potable Water Supply Rules generated by the state will be required to be filed in the municipal land use records.

8. Culvert Design

Proper culvert design allows for passage of aquatic organisms and sediment through the culvert to maintain geomorphic equilibrium. Historically, stream crossing structures have provided a block to organism passage as perched structures that are disconnected from the stream channel. Further, inadequately sized structures do not allow for the passage of sediment and debris downstream causing the stream to aggrade or build up on the inlet end of the structure and to degrade or scour on the outlet end of the structure resulting in a loss of equilibrium. Current guidance including in the Vermont Fish and Wildlife Guidelines for the Design of Stream/Road Crossings for Passage of Aquatic Organisms (<https://vtfishandwildlife.com/sites/fishandwildlife/files/documents/Learn%20More/Library/REPORTS%20AND%20DOCUMENTS/AOP/AOP%202008%20WORKSHOP/VT06%20STREAM%20SIMS.pdf>) in Vermont provides technical standards for retrofit of existing culverts and the installation of new structures. The Town will support proper culvert design by following these procedures for municipal projects and requiring new development projects to follow the standards as well. Assessment

and retrofit of existing problem culverts will be completed as funding becomes available for such projects.

9. Buffers

Stream, lake, and wetland (including vernal pools) buffers provide many critical functions that serve to protect water quality, including the stabilization of banks and shorelines, shading, habitat, and filtration and infiltration of runoff and pollutants. To protect buffer zones during the development evaluation and permitting process, the document titled *Guidance for Agency Act 250 and Section 248 Comments Regarding Riparian Buffers*

(<https://anr.vermont.gov/sites/anr/files/co/planning/documents/guidance/Guidance%20for%20Agency%20Act%20250%20and%20Section%20248%20Comments%20Regarding%20Riparian%20Buffers.pdf>) provides technical guidance on determining the appropriateness of buffers widths depending on specific site conditions.

According to the policy, the State will recommend a minimum of 100-foot undisturbed vegetated buffer for lakes, and either 50 or 100 feet of undisturbed buffer for streams. In some instances, even greater buffer widths would be warranted for especially sensitive streams with 1.) the potential for significant lateral or vertical adjustment, 2.) significant wildlife travel corridors, riparian dependent species, and/or significant natural communities in close proximity, and 3.) site characteristic indicative of increased erosion risk and/or potential for overland flow of pollutants. In the Town of Windham for any development project a riparian management plan must be prepared by a development project applicant and approved by the Town. The Town supports the buffer policy and will require mandatory minimum buffers on streams, lakes, wetlands and vernal pools to the ANR standards at a minimum.

10. Town Polices

Policy 1: Maintain and enhance the chemical, physical and biological quality of Windham's surface and ground waters.

Actions:

1. Support the Agency of Natural Resources Green Infrastructure Strategic Plan by:
 - a. Evaluating a by-law within the Town regulatory framework to require GSI for new development projects and to integrate GSI such as rain gardens and filter strips at existing Town facilities.
 - b. Reviewing new development projects for jurisdiction under State Stormwater Operational standards and requiring that the terms of the permit, including the installation and maintenance of GSI systems, are complied with by the project owner.
2. Assess existing river crossing structures in need of repair and prioritize retrofit or replacement based on aquatic organism passage and sediment transport considerations depending on financial resources and Agency support.
3. The Town will request that the Vermont Agency of Natural Resources complete an assessment of high-quality water resources including streams, wetlands and vernal pools, especially in headwater areas, for additional protection through the Agency's reclassification program.
4. On-site septic systems are to be designed and then permitted by the State.
5. Use road maintenance methods and materials that will maintain or improve water quality, such as those described in the *Vermont Better Backroads Manual*.
<https://vtrans.vermont.gov/sites/aot/files/highway/2009%20Better%20Backroads%20Ma>

[nual.pdf](#)

6. Evaluate standards for town and private roads and driveways including minimum culvert sizing, culvert spacing, as well as roadside ditch construction and erosion control to reduce the energy and volume of runoff entering the public right-of-way thereby reducing the likelihood of erosion and sedimentation to surface waters.
7. Maintain the Forest District which prohibits commercial and industrial development in:
 - a. Headwaters and Watersheds of upland streams
 - b. Headwaters and Watersheds characterized by steep slopes and shallow soils
 - c. Areas supplying large amounts of recharge waters to aquifers.
8. Ensure all permits comply with the 2019 Wastewater System and Potable Water Supply Rules.

Policy 2: Preserve the natural condition of watercourses and their shorelines.

Actions

1. Devote lands within flood-hazard areas to agricultural, forestry, and open space uses. Windham has enacted a Flood Hazard Bylaw and should continue its enrollment in the National Flood Insurance Program.
2. Require that site plans identify all water features, including but not limited to rivers and streams, wetlands, vernal pools, and lakes and ponds. Use the Zoning Bylaw to require maintenance of undisturbed, naturally vegetated buffers sufficient to protect water quality and other natural resources. Buffer areas, including the depth and type of buffer, shall be shown on the site plan.
3. Require a riparian management plan for development projects and/or where sensitive streams including headwater areas are potentially threatened by development. In cases where buffers are comprised, the Town will institute a “no net buffer loss” standard, meaning that greater buffer areas must be preserved to compensate for areas lost.

Policy 3: Retain wetland areas and vernal pools and their buffers in their natural state for the provision of wildlife habitats, retention areas for surface runoff, recreation and resource value.

Action

1. Require independent field studies to identify and better understand and protect wetlands and vernal pools before permitting any development in forested areas involving or adjacent to wetlands or vernal pools.
2. Study the means and implications of reclassification of Windham’s critical surface waters described in Section 2 Surface Waters.
3. Create a subcommittee to inventory headwaters, wetlands and vernal pools and how the Town can ensure protection into the future.
4. Continue to improve zoning regulations to protect Windham wetlands to the minimum ANR standards.

Policy 4: Stay informed of new State and Federal data and mapping resources related to Flood Hazard Areas and work with downstream communities to mitigate possible flood hazards.

Action

1. Advise landowner with parcels in Flood Hazard areas of new regulations in the updated 2019 Zoning Bylaws.
2. Provide maps of flood hazard areas for easy access by the Zoning Administrator and those in the areas.
3. Utilize the Regional Floodplain Administrator for problems and concerns relating to

Flood Hazard areas.

Policy 5: Windham supports and encourages the use of flow control devices (“beaver deceivers”) in preference to extermination or relocation to maintain beaver flowages whenever the circumstances allow.

C. Air Resources

Windham’s air resources and air quality are generally good. There are no major noise sources so that the predominant sounds are natural. This contributes significantly to the high quality of life in Windham, as well as the health and the well-being of its residents. Air resources should be protected and improved to protect these values.

1. Air Quality

Windham air quality is impacted by local, regional and global pollutants. Windham is a rural community with few local air pollution sources. There are no industrial sources of air pollution, and minimal contributions from commercial properties.

While Windham’s air quality is considered high, some pollutants are emitted from home heating and vehicle transportation.

These same pollutants contribute to local and regional environmental problems, and on a global scale to climate change.

2. Noise - Introduction to Windham Noise Standards

Noise pollution tends to be a localized pollutant. As such, Windham has exceptional natural quiet. Commercial and industrial noise is very limited in Windham, with occasional forestry operations the only significant source of noise. Transportation related noise is also very limited, due to the lack of major highways and slower travel speeds. As a result, Windham’s acoustic environment is exceptionally pristine, particularly in the evenings, nighttime, and on weekends and deserves the most protection. In Windham, over large areas and for long periods of time, no anthropogenic noise can be heard. Quiet is a highly prized characteristic of rural residential life in Windham, allowing people to better experience nature and natural sounds, and to better enjoy their property without acoustic intrusion from the surrounding lands.

Property line noise standards are a common way to protect the acoustic environment, and provide more effective protection of soundscapes in districts, and not just around residences. Decibel based noise standards are also important for developers, so that they can know with certainty the design criteria they must meet.

In this Plan, Windham seeks to protect and preserve the full use and value of all residential, and potential residential, properties from encroachment by disturbing types and levels of noise. In order to protect all lands, a “property line standard” for noise and setbacks, which are used in noise regulations throughout the country, are used. This Plan also seeks to protect both health and aesthetics. We are mindful that the clinical definitions of the health hazards from sound are under investigation and remain epidemiologically unsettled. In addition, noise need not rise to the level of a proven health hazard to represent a significant deprivation of use and value in nearby properties.

The Plan has relied upon the World Health Organization Night Noise Guidelines to set noise and setback limits. Night Noise Guidelines recommends 40 dBA L_{night} outside to protect against sleep interference and health effects. The Plan has also relied upon the US EPA Levels Document recommendations adjusted using the correction factors in Table D-7. For Windham, that results in a recommended adjusted level that demonstrates noise will not exceed the 41 dBA Fast L_{max} daytime at the closest property line and 39 dBA Fast L_{max} nighttime.

In developing its noise standards, Windham has sought to implement levels which both correspond well with those recommended by scientists at the WHO and EPA, while recognizing that the metrics used by those agencies are not workable as enforcement conditions. Yearly or nightly average levels and background levels cannot be easily measured or enforced. In fact, even one-hour average levels are difficult to enforce because there can be significant contaminating background noise over one hour. Therefore, Windham has relied on a Fast L_{max} and minimum setbacks as the easiest and most cost-effective enforcement metrics and increased the criterion level to account for variations in noise levels that are masked by averaging.

Windham's Policies recognize that noise measurement and setback distance requirements must be used conjunctively to insure adequate protections. The Town also recognizes that noise monitoring can be prohibitively expensive particularly for small towns and individual property owners. The Town of Windham therefore requires that industrial wind generators, should they be installed anywhere within the Town, be placed at least 2,500 feet from property lines. The setback is designed to result in a similar noise level to the decibel standard, since noise decreases with distance. Most importantly the setback is easily measured, and compliance is easily insured. Turbines shall not be allowed or permitted unless applicant clearly demonstrates noise will not exceed the 41 dBA Fast L_{max} daytime at the closest property line and 39 dBA Fast L_{max} nighttime.

Finally, for noise sources that have a significant low frequency noise component, decibel level does not adequately reflect or predict health and well-being effects. Low frequency noise is of concern because it travels further and is not easily blocked by buildings. Therefore, it can have a greater impact on residents. The WHO noted this when they recommended lower thresholds for noises with low frequency components. In cases of low frequency noise, a lower criterion level shall be used. In arriving at these standards, the Town has reviewed a variety of publications including but not limited to the EPA "Levels Document"

(nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=20012HG5.TXT) and *A Brief Review of Wind Power in Denmark, Germany, Sweden, Vermont and Maine: Possible Lessons for Massachusetts* by Mill and Manwell, January 11, 2012. The latter is a condensed review of standards used in Northern European countries with decades of experience with policies designed to accommodate renewable generation facilities without doing harm to the population.

3. Town Polices

Policy 1: Protect Windham’s air quality by reducing current energy use and ensuring that new development does not degrade air quality.

Actions

1. Activate the Town’s Energy Coordinator and Conservation Commission to seek ways to utilize more sustainable, clean, local, small scale energy sources and reduce energy use in residential and town buildings by working in conjunction with the Energy Coordinator or Committee.
2. The Energy Coordinator and Conservation Commission should seek and apply for grants to reduce energy use at public facilities in Windham including the school, town office, library, Meeting House, and garage.

Policy 2: Protect the acoustic environment of Windham with noise standards enforced at or beyond the property line of the source.

Actions

1. Limit property line noise from sundown to sunup to 39 dBA Fast Lmax.
2. Limit source noise dBC Fast Lmax minus dBA Fast Lmax to less than 15 dB beyond the property line and inside homes, schools, and town offices and buildings.

Policy 3: Protect the health and well-being of all people residing in Windham or staying in Windham, regardless of the frequency or duration of their stay.

Actions

1. Prohibit noise that is plainly audible within a residential structure (one that is used for sleeping and is occupied either full or part time).
2. To control noise pollution, placement of commercial/industrial development facilities within the stated minimum setback requirements (see Energy Chapter V Community Standards) is prohibited.
3. Specific Community Standards for setbacks of wind turbines have been established (reference Energy Chapter Section D) and Section 505 of the Zoning Bylaws to protect properties against noticeable shadowing, shadow flicker and the risk of ice throw landing on neighboring properties or tower collapse affecting neighboring properties.

CHAPTER V - ENERGY

A. Introduction

Reliable, affordable, properly sited, clean and sustainable sources of energy are vital to Windham’s economy, social well-being and future development. The purpose of this chapter is to address these needs and to bring Windham’s plan into alignment with Act 174 and the current (2016) Comprehensive Energy Plan.

Under the Planning and Development Act (“the Act”; 24 V.S.A. Chapter 117) Vermont municipalities are authorized, but not required, to develop and adopt comprehensive municipal plans including an Energy Plan. Accordingly, Windham Vermont’s 2019 Energy Plan

includes an analysis of energy resources, needs, scarcities, costs and problems within the municipality, and statements of policy and standards for:

the conservation of energy, including programs, such as integrity standards for buildings, to implement that policy,
the minimum siting requirements for energy projects to protect our environment, the character of our community, and the health and safety of our residents.
promoting patterns and densities of land use likely to result in conservation of energy and promoting energy efficiency.
the development of appropriately scaled and sited renewable energy resources.

The State of Vermont created a Comprehensive Energy Plan (CEP) in 2011 which purports to examine all forms of energy usage and sets ambitious goals for the adoption of renewable sources for 90 per cent of the State's energy usage in all categories by 2050.

The core of the CEP is the belief that it is only by replacing our existing energy sources with energy from renewable sources that the State can make a contribution to the problem of Green House Gas (GHG) emissions and their effect on the global climate. Available information regarding the economic and environmental aspects of the plan makes it far from clear that these goals are either attainable or advisable, but for the State's CEP to be effective it is clear that the State and local communities must work together. Communities should appreciate that they play a major role in conserving energy, becoming more efficient, and providing the State with information and guidance on how to develop appropriately scaled and sited renewable energy resources within their community. It is with this vision that this Chapter is written – as a partner, and advisor to the State and an active player in reducing GHG's through a series of meaningful steps consistent with CEP with awareness and compliance with 24 V.S.A. § 4302.

In order for a community to plan usefully to make a positive contribution to this effort it is important to understand the components of the problem and the ways in which individuals, communities and states can make a difference.

1. Importance of Enhanced Energy Planning

Energy planning is important to Windham and its residents, since the Town is located at the highest elevation in of all towns in Vermont, and our Town is rich in resources, natural beauty, and history. We realize the importance of protecting our environment and to cherish and protect these resources for the future.

Windham is and will continue to be, very pro-active in the process of the State energy goals, as outlined in the 2016 Comprehensive Energy Plan, by continuing to enhance opportunities to create renewable energy sites, construction which encourages green development, promote transportation opportunities for carpooling and innovative vehicles, and availability to educate our residents in energy conservation. Though Vermont's energy transformation may take years to implement, it will enhance the vitality of the state and local economy by reducing money spent on fuels pumped, mined or generated elsewhere, improve our health through reduced emissions and increased bicycle and pedestrian mobility options, and improve the quality of our local and global environment through reduced greenhouse gas emissions. This robust energy plan is used as a tool to advance the economic and environmental well-being of Windham, thereby improving the quality of life for its residents. Furthermore, these energy goals will reduce Windham's vulnerability to energy-related economic pressures and, in the long-term, climate change-related natural disasters, and promote long-term community resiliency in a variety of contexts.

The estimated energy consumption in Windham, including residential, commercial and governmental use (for heating, electricity, transportation, etc.) is estimated to be \$1,343,570 per year (see *Energy Costs & Expenditures* section below for a break-down of this figure). Because a large majority of this energy is imported from outside the town and Windham Region, most of the money spent on energy does not directly benefit the local economy. Efforts to reduce the use of energy sources from outside the Town as well as shift reliance to locally produced energy can improve household financial security and strengthen the local economy.

From an environmental perspective, petroleum and other hydrocarbon-dependent energy is a significant cause of localized environmental damage where those fuels are produced and refined, and the emissions from their use is responsible for human-induced climate change, related climate-change disasters, and ecological degradation. Any efforts to reduce the use of non-renewable energy and shift to more environmentally-sound energy sources will benefit the town's environment.

While Windham can do little to shift the broader state or federal policies, we can influence energy use and production on a local level. In this energy plan, we hope to address Windham's local actions for increasing our energy efficiency and promoting renewable energy generation, and overall pathways to become more resilient.

2. Energy Definitions

Energy Conservation: Reducing energy use. This applies to measures, including changes in personal habits (e.g. turning off lights, driving less, improve insulation of homes and other buildings) that reduce the amount of energy consumed.

Energy Efficiency: Using less energy to perform the same functions and tasks. This applies to measures such as the use of new technologies (e.g. LED lights, energy efficient appliances and more efficient vehicles) that use energy more efficiently and reduce waste.

Net-Metered System: An onsite generating system for local use that is connected to the power grid. The state defines this more specifically as a facility for the generation of electricity that is of no more than 500 kW capacity, operates in parallel with facilities of the electric distribution system, is intended primarily to offset the customer's own electricity requirements, is located on the customer's premises, or for group net-metered systems, on the premises of a member of the group, employs a renewable energy source or is a qualified micro-combined heat and power system of 20 kW or less, that meets state definitions and may use any fuel source that meets air quality standards (30 V.S.A. 219a). Net metered systems are considered residential or small business applications and represent an example of community scale, decentralized or distributed energy generation.

Renewable Energy: (1) Energy available for collection or conversion from direct sun light, wind, running water, organically derived fuels and agricultural resources, waste heat, and geothermal sources. (2) Under the state's renewable energy programs, "renewable energy" means energy produced using a technology that relies on a resource that is being consumed at a harvest rate at or below its natural regeneration rate (30 V.S.A. 8002).

Residential: Small-scale renewable energy facilities most often consist of systems

such as those listed in the paragraph above and can range up to 15 kW in power.

Commercial/Industrial: These are energy systems that are greater than 500 kW. These are generally large-scale projects designed to generate profit for owner, lessee or licensee by sale of the output to or through public utilities.

3. Energy Goal

The overall goal of Windham's Energy Plan is to encourage the efficient use and conservation of energy in all categories (including transportation, heating and electricity) and the appropriate siting and development of appropriate renewable energy resources.

4. Plan Policies

Windham believes local energy planning is both relevant and important. While many energy issues are national or global in reach, local government has some control over its own energy consumption, and can lead by example to influence residents to be more aware of the ways to reduce energy use and costs, and to help develop local energy options, to the benefit of the entire community. The town is also in a unique position to understand, identify and protect our natural resources and land conservation opportunities (see Natural Resources Chapter IV) in the process.

Windham municipal plan policies and land conservation measures – as adopted Community Standards – provide the basis for local participation in state regulatory proceedings including Act 250 for energy facility development and Public Utility Commission (Section 248) hearings. Before the Public Service Board can issue a Certificate of Public Good (CPG), for most projects it must find that "the purchase, investment, or construction, with respect to an in-state facility, will not unduly interfere with the orderly development of the region, with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations of the municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality." 30 V.S.A. &248(b)(1)

The municipal plan also considers community participation in long-range state and utility energy planning, including the update of the following plans, as required under state law:

- **Vermont Comprehensive Energy Plan** updated every five years by the Department of Public Service.
- **Vermont Long Range Transmission Plan** updated every three years by the Vermont Electric Company.
- **Utility Integrated Resource Plans** prepared by utilities for review by Vermont PSB.
- **Vermont 20 Year Electric/Energy Plan** Detailed Goals, Policies, and Action Steps are provided in Section 13 below

5. Energy Coordinator / Energy Committee

Title 24 V.S.A. provides towns with the ability to appoint an Energy Committee or Coordinator. Consistent with this Title, Windham has appointed a Town Energy Coordinator responsible for developing and contributing to energy policy for the town and has created a Town Energy Committee to work in conjunction with its Planning Commission & Zoning Administrator. The Energy Coordinator is responsible for quantifying and tracking municipal energy consumption and recommending actions that the town and community should take to conserve energy (transportation, home heating and electrical usage), increase energy efficiency, promote local energy production from community-scale renewable resources, and to reduce energy costs and greenhouse gas emissions. The Energy Coordinator, in conjunction with the Town Treasurer or Assistant shall separately quantify and track energy consumption and recommend action for improved efficiency and conservation for town owned buildings, vehicles and equipment.

6. Energy Objectives

- To ensure the long-term availability of reliable, affordable, clean and safe energy supplies from a combination of utility-distributed sources and appropriately scaled community and residential systems
- To increase energy conservation and efficiency in home heating, transportation and electrical usage
- To promote the development of appropriate renewable energy resources in the Town of Windham to contribute to the energy needs of the community and region.
- To reduce energy usage and expenditures by residents through improved conservation and efficiency
- To reduce reliance on fossil and other polluting fuels, such as biomass for electric generation, and thereby reduce greenhouse gas emissions that contribute to climate change.
- To identify and limit the adverse impacts of energy development and use on public health, safety and welfare.
- To preserve the Town's historic districts and planned pattern of development, environmentally sensitive areas, and our most highly valued natural, cultural and scenic resources, consistent with related development, resource protection and land conservation policies.
- To identify, study and understand steps necessary to preserve and protect the Town and regional headwaters and water quality from negative consequences of new energy project siting such as pipelines, transmission lines, extraction processes and electric generation.
- Support the goals of Act 174 as defined in the Act.

7. Energy Planning

Windham actively supports partnerships, strategies, and state and federal legislation that will ensure the affordable and reliable production and delivery of electrical power to the community, in conformance with community goals, objectives and standards. It is our intent to work with utility providers, the Regional Planning Commission, the Department of Public Service and neighboring communities to plan for needed system upgrades and expansions to meet projected demand while protecting and preserving

the natural environmental characteristics of the town. The Town will participate in long-range energy planning and development, in cooperation with the Regional Planning Commission, the Public Service Dept. and neighboring communities, to ensure that local energy, resource conservation and development objectives are identified and considered in future energy initiatives including public utility or merchant power development.

Windham's Planning Commission believes that without widespread understanding of the issues, all renewable energy projects may be viewed uncritically as making positive contributions to society. However, not all energy projects, including Renewable projects, provide the same benefit(s) or present the same obstacles or impacts. With this understanding, we begin our planning by considering all renewables for the benefit(s) they potentially offer and the tradeoffs they may require.

Our plan requires us to apply our knowledge and understanding of the Town of Windham, its unique geographic features, critical natural resources and attributes to allow us to understand what may be best for Windham and its Region. The Planning Commission, in consultation with the Energy Coordinator, is responsible for preparing Community Standards for the siting and development of generation, transmission and substation facilities, for reference by facility developers and local property owners, and for consideration in Section 248 proceedings.

8. Energy Facility Development

The Planning Commission, in consultation with the Select Board, is responsible for the development of guidelines and standards to direct local participation in Section 248 proceedings for the review of public utility or utility scale merchant generation projects located in Windham or in neighboring communities which may affect the Town. The guidelines and standards reflect levels of participation or formal intervention in relation to the type, location, scale, and magnitude of a proposed project, and its potential benefits and impacts to the health and welfare of the community and its residents and property owners.

The municipality will participate in the Public Utility Commission's review of new and expanded generation and transmission facilities as necessary to ensure that local energy, resource conservation and development objectives are identified and considered in proposed utility development. This may include collaboration with other affected municipalities and the Regional Planning Commission for projects that may have significant regional impact. Long-Term Vision & Petroleum Dependence

There is a trend toward factoring the "societal costs" into the price of energy; society pays for health costs associated with pollution, environmental clean-up, military protection of petroleum sources, and the continued failure of the Federal government to address the disposal of radioactive wastes. And in the long- term, communities who depend on fossil-fuels are vulnerable to risks associated with their price and production volatility.

These challenges may significantly increase the cost of conventional energy sources within the next ten to twenty years. As a result, Windham will seek to establish reliable energy resources for townspeople and municipal operations, to hedge against the increasing volatility of hydrocarbon prices, and to reduce the environmental impact of

our energy use. The role of clean, alternative energy sources will be expanded and supported.

B. Current Energy Use

The following paragraphs describe Windham’s current estimated energy demand in detail. These current use estimations provide a starting point from which the town can develop informed energy policies that directly address its current context and opportunities going forward.

In order to provide a more accurate picture of the energy planning requirements in Windham, energy consumption, generation targets, and efficiency targets need to be broken down into three distinct energy sectors. Those sectors are electricity, transportation, and heating.

Chart 1 shows how energy consumed in the town is divided between these sectors. The sections below break down the calculations and describe the assumptions made to arrive at these final demand figures.

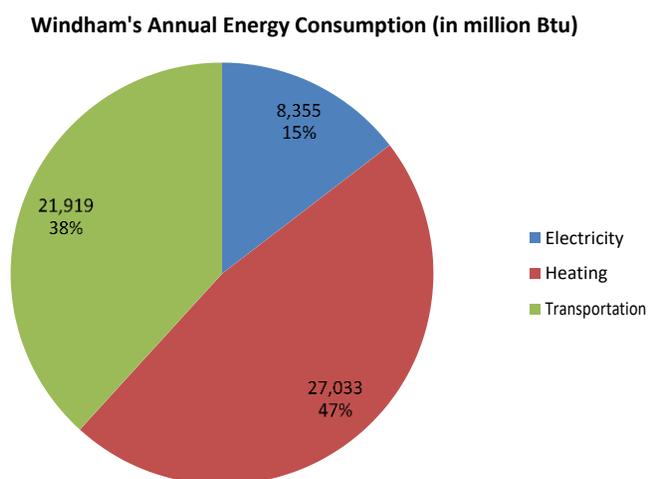


Chart 1: Annual estimated energy consumption across three sectors.

1. Current Electricity Demand

Windham’s electric energy supply comes from Green Mountain Power. In 2013, GMP projected multiple sources of purchased electricity to cover the State’s needs.

Electricity consumption data from Efficiency Vermont was produced for each town in the state and is the primary source of this information. This data set combines the energy supplied from all potential electricity providers to that town. It also separates the usage for both the residential and commercial or industrial sectors own (see Chart 2 below).

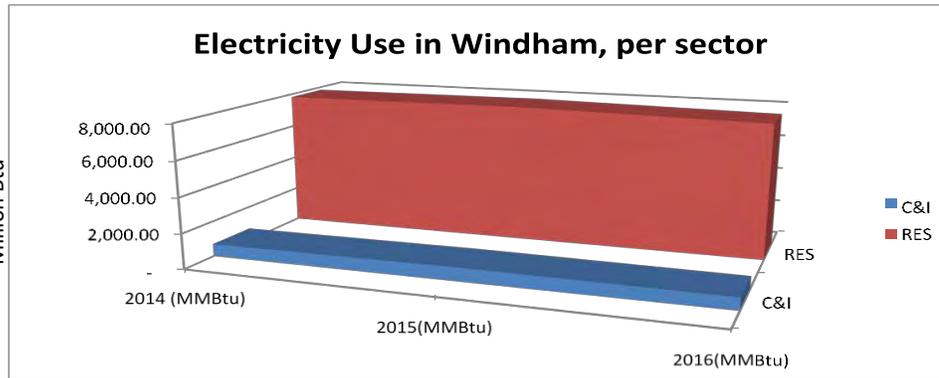


Chart 2: Electric Use in Windham (05359) per Sector

To translate this energy demand into dollar amounts, we can estimate a cost of \$0.1435 per kilowatt-hour (Vermont state average for electricity costs across all sectors in 2015). Based on the above data, residences in town paid almost \$351,358 in 2016 for 2,448,485 kWh. Commercial facilities paid just over \$28,459.64 dollars for their 198,325 kWh of electricity. *In Windham, electricity usage places the lowest energy cost burden on its homeowners and businesses.*

2. Current Transportation Use

According to 2010 U.S. Census Bureau data, Windham has 167 primary housing units, (not vacant or used for seasonal/recreational purposes). Based on that number of households, it can be estimated that there are 321 vehicles on Windham’s roads, which consume 684 gallons per vehicle of fossil fuel each year. To get this gallon/year rate, you multiply the number of vehicles (321) by estimated vehicle miles traveled (12,500) divided by average fuel economy (22) and remove 9% of usage because of ethanol in gasoline. Below is a table summarizing the averages and estimates used to arrive at the values.

167	Number of primary housing units.
321	Number of fossil-fuel burning light-duty vehicles (LDV).
12,500	Estimate of the average annual number of miles travelled by an LDV in the area (for Vermont as a whole, total vehicle miles traveled per registered vehicle was around 12,500. The vast majority of LDV in Vermont can safely be assumed to drive between 9,000 and 15,000 miles annually).
22	Estimate of the average fuel economy of fossil-fuel burning LDV fleet in the area, in miles per gallon (state-wide average fuel economy).
166,012	Estimated number of gallons of fossil fuel consumed annually, calculated from the values above less the 9% ethanol.
121,259	Number of Btu in a gallon of fossil fuel, computed as a weighted average of the individual heat contents of gasoline (95%) and diesel (5%).
21,521	This is the estimated total annual energy consumption of internal combustion vehicles in the area, in millions of Btu.

Table 1: Transportation Energy Consumption

To estimate the cost of this consumed energy, we assumed a cost of \$2.34 per gallon (Vermont state average in 2015). In Windham, consumers spent over \$388,984 on transportation related fuel costs alone.

3. Current Heating Demand

To account for the different building types and their respective uses, the following estimates divide thermal energy demand by either residential or commercial use (industrial building thermal demand is not included).

For residential buildings, it was assumed that average annual heating load of area residences is 110 million Btu, for both space and water heating (Vermont state average). With 167 primary housing units in the town, this arrives at an estimated 20,570 MMBtu annual total heat consumption.

Furthermore, census data also provides information on the home heating fuels used for both owner-occupied and renter-occupied housing units (both are considered “occupied”). Chart 3 below shows a combined total of owner and renter-occupied housing units and their fuel use.

For both housing unit ownerships, an estimated total of just over \$468,476 was spent in home heating (roughly \$439,267 from homeowners and \$29,210 from renters).

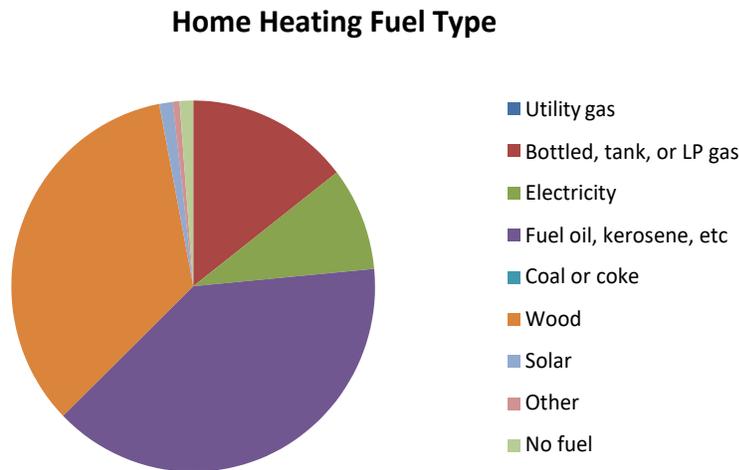


Chart 3: Home Heating Fuel Type

4. Total Energy Costs

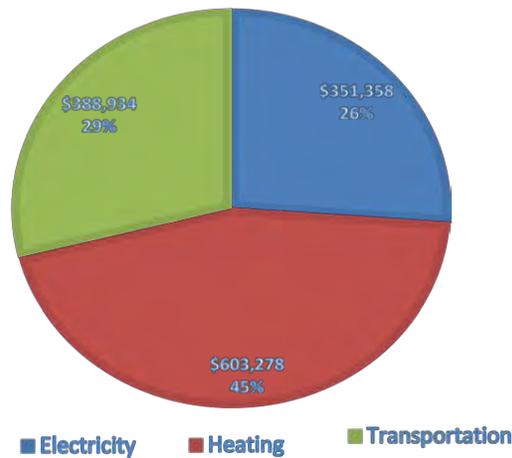


Chart 4: Annual Energy Expenditures

In summary, Windham pays a staggering amount in energy across the three use sectors. The total estimated cost to the town for electricity, heating, and transportation is roughly \$1,343,570 each year. There are real financial incentives for the town to move toward energy efficiency, on behalf of both the residents and its business owners (see section “4. Energy Scarcities, Challenges, and Strategies” of this plan for more detail about energy efficiency and conversion targets)

C. Resources, Constraints, & Potential for Energy Generation

Available energy resources within Windham are all renewable resources: wood, solar, hydro, and wind. In order to reduce dependence on conventional energy sources, of which the costs and availability are outside residents’ control (see the section above), the use and generation of alternative energy sources is encouraged.

Windham has prepared local guidelines for the development of renewable energy resources (including related access and transmission line extensions) for reference by utilities, developers and local property owners, and for consideration in state and local permit proceedings.

Windham has amended local regulations to allow off-grid and net-metered solar and wind systems as accessory uses in all districts in which structures are allowed, subject to specific use standards, and to incorporate district height and set-back waiver provisions for such facilities where appropriate. Development standards must be designed and enforced to address public health and safety, and potential adverse impacts to significant natural, environmental, historic and scenic features, public facilities, and neighboring properties and uses.

Each proposed project must be reviewed based upon location and impacts to the Town, our natural resources and our residents. Every attempt will be made to balance town policies to maximize the positive benefit(s) of appropriately scaled renewable energy with community attributes, values and natural resources consistent with 24 V.S.A. Section 4302 and the CEP.

The Town of Windham continues to support the development and use of residential and community-scale renewable energy resources including off-grid and net-metered wind and solar, biomass, micro hydro, geothermal at a scale that is sustainable. Any and all these approaches will enhance energy system capacity and security and promote cleaner, more resilient energy production.

The Windham Planning Commission has developed Community Standards for renewable energy projects that are intended to avoid and mitigate potential negative impacts of renewable energy. These standards are for municipal and Public Utility Commission (“PUC”) consideration and permitted residential and community-scale renewable energy projects and prohibit commercial/industrial-scale wind/solar development initiatives.

D. Renewable Energy Resources

1. Hydroelectric

Hydroelectric energy generation is one form of renewable energy. While Windham has abundant water resources, their potential to generate energy is limited because, as a headwater community, most of the streams are small and have low seasonal flows. The possibility of developing small “micro-hydro” systems may exist. Micro-hydro systems usually do not dam rivers or streams.

Their utility depends on the dynamic head, amount of water flow, and the efficiency of the turbine. In Windham, if this type of system is feasible, it would probably act to augment other

power sources. However, in addition to stream flows, cost and the effect of cold weather climate on the equipment will likely be deterrents to widespread usage of this type of renewable energy. (See Chapter IV Natural Resources for a more detailed discussion of Windham’s water resources and their protection.)

2. Solar Energy

Passive solar designs can reduce heating and electricity bills. No mechanical means are employed in passive solar heating. Instead, siting and design measures, such as south facing windows, open floor plans, and ventilation are used. Photovoltaic systems can be used to convert sunlight to electricity. These systems require equipment such as solar panels, a charge controller, batteries, and an inverter, which convert DC current into AC current for use in outlets for regular household appliances. Photovoltaic systems of up to 15kW or less are eligible for net metered electric rates after receiving a Certificate of Public Good. By special arrangements with the power company which may involve additional fees, larger systems can be constructed. (30 VSA Section 219a(h)(1)(E)). The Town of Windham supports the use of solar energy and encourages research and education on its use at both residential and community scales.

3. Wind Energy Systems

The Town of Windham is supportive of alternative and renewable energy sources, but as with other development, it must fit the scale, topography, settlement patterns and character of the Town. It must be sensitive to the impacts on neighbors and quality of life. It must not adversely impact the unique qualities of our high elevation resource

areas or of woodlands that accommodate healthy headwaters, a wide variety of wildlife and its habitat and other unique features. There are many ways, especially those involving energy conservation and efficiency, for the Town and its residents to make a positive impact on the larger environment without compromising the local environment and ecology or the health of our residents.

4. Individual Wind Energy Systems

Wind energy systems are beginning to be used as an energy source on a residential scale. There have been two individual wind energy systems in Windham; both are now inoperative. Towns may only regulate wind facilities that do not connect in any way to the public power supply.

Rural areas with low density residential development or working agricultural landscapes are the most appropriate places to locate individual wind systems. Their height and visual prominence make them incompatible with densely settled areas. Individual wind energy systems must be designed so that they are not located as a focal point in one of the designated scenic areas of Windham as listed and described elsewhere in this plan. The permitting of these facilities should be reviewed under the conditional use review process with additional safeguards specified in the Zoning Regulations. Refer to the Zoning Regulations for detailed requirements.

5. Commercial/Industrial Wind Energy Systems

Wind energy systems (wind farms) that are greater than 500 kW are defined as commercial/ industrial systems. These are large-scale projects with large or multiple turbines designed to generate electricity for sale to or through regulated public utilities in Vermont or elsewhere.

Windham has been studying commercial/industrial wind generation since 2004. Our 2008 Town Plan, re-adopted in Jan 2015, contains a prohibition against this form of development based on the unique topography and settlement patterns of our Town, our many years of research and knowledge and the support of the majority of our residents and property owners. In 2016 a referendum was held on a proposed commercial/industrial wind project proposed to be built on the Stiles Brook Tract in Windham and Grafton. The voters of Windham and Grafton rejected this proposal by a margin of approximately two to one. It is clear that a substantial majority of Windham residents do not support commercial/industrial wind development within Windham.

It is not our intention to address any landowner or project, but rather to extend and strengthen our published policy, which declares commercial/industrial scale wind development inappropriate for Windham for a variety of reasons. In addition to our unique relationship of settlement and topography those include but are not limited to the Town's statutory responsibilities under the law to protect and preserve the health and welfare of residents and property owners, the preservation of the unique aspects of our natural environment as well as the quality of life and the values, both material and social, that have characterized our Town for more than 225 years.

Industrial wind energy systems are inappropriate in Windham for a variety of reasons including the nearness of many probable turbine sites to historic settlement patterns; the presence of steep slopes (slopes of 20% or greater); the presence of wildlife and their critical habitat; the many fragile natural areas including wetlands and vernal pools; several listed high-elevation headwaters draining through rugged terrain; pristine views and natural quiet and darkness.

It is the policy of the Town of Windham that commercial / industrial wind energy systems as defined above and temporary meteorological towers proposed as precursors to such projects are prohibited throughout all of town as potentially hazardous to the health and welfare of its residents, incompatible with high elevation headwaters and not compatible with the town's vision of appropriate development, or its historic settlement patterns and for other reasons set forth in this section.

This policy is consistent with Windham's Zoning Bylaw as well as with the Town's written Community Standards. (See pages 62-67) Commercial/Industrial wind is neither a permitted nor conditional use in the Zoning Bylaw; as such it is specifically prohibited. In addition, Windham's high elevation resource lands - those most desirable for industrial wind energy development - are unique and contain many important natural resources and are among the most sensitive sites from a development perspective. For these reasons, these high elevation lands have been located in the Forest District where development is limited to agriculture; commercial forestry; forestry for research, education, and demonstration; and camps. Refer to the Zoning Regulations for details of permitted activities in Forest Districts and particularly in High Elevation Resource Areas within the Forest Districts.

If, contrary to the above, Commercial/Industrial Wind Energy Systems are permitted by the Public Utility Commission, they are subject to some of the same requirements articulated above plus some further specifics:

Turbines shall be set back according to the following required measurements:

- a. 2,500 feet from property lines
- b. 1,300 feet from transmission lines & poles, ski lift equipment & structures, camps, other turbines and public travel ways.

These setbacks are intended to accommodate the impact on the surrounding area of commercial/industrial wind turbines. Potential impacts include not just a falling tower, but ice throw, shadow flicker, noise, size of mounting pads, storm water runoff, access roads and lighting which are potentially harmful to the community and its residents. (Reference Natural Resources Chapter 4.)

- a. Turbine noise shall not exceed 41 dBA Fast Lmax at the property line during the day or 39 dBA Fast Lmax at night.
- b. Turbines shall not have lights.

If any application for a utility scale generation project should be filed with the PUC for any location in Windham, the Town will ask the Board to deny such requests and will in so doing refer to 30 VSA Section 248. Section 248 was written to enable public utilities to site and build needed generation and transmission facilities without having to meet all criteria of Act 250 – most particularly the portions dealing with the role of town plans.

In Section 248 proceedings, the Town requests that the PUC adopt Windham's Town goals and policies as criteria under which any such project should be judged. If we weigh and balance the goals of Title 24 of the Vermont Statutes Annotated, which have guided us in the writing of this plan, we must conclude that certain types of development cannot co-exist in a Town with Windham's goals, unique attributes and historic treasured patterns of settlement. Commercial/Industrial wind projects are

among those types of development and must not be sited within the town.

24 VSA Section 4302 (c)(5) charges towns to create plans that are written:

To identify, protect and preserve important natural and historic features of the Vermont landscape, including:

- a. Significant natural and fragile areas;
- b. Outstanding water resources, including lakes, rivers, aquifers, shore lands and wetlands;
- c. Significant scenic roads, waterways and views;
- d. Important historic structures, sites, or districts, archaeological sites and archaeologically sensitive areas.
- e. To maintain and improve the quality of air, water, wildlife and land resources.

Each of these sections represents important elements of Windham's vision of its future and this plan endeavors to set forth how they contribute to our vision for the Town and should be protected. It is the Town's position that Section 248 of Title 30 and Section 4302 of Title 24 – should be read together to give support and meaning to each in a reasonable and just manner so that statewide projects take into account town standards and prohibitions and consider the differences of each town when it comes to topography, settlement patterns, natural resources and other unique features of the town.

Further, any such development permitted by the PUC would be in direct conflict with the requirements of Act 171, which require towns to plan for the protection of forest blocks and habitat connectors. Windham's provisions for these requirements are provided elsewhere in this Plan. Windham contains two of the largest remaining forest blocks in Southern Vermont and it is the intent of this Plan to provide the required protections.

6. Wood

Wood is considered a biomass fuel and can be beneficial if used appropriately. The use of biomass fuel can replace or reduce the use of non-renewable fuels such as heating oil. When grown and harvested in conjunction with effective forest management plans, woodlots can provide an alternative fuel source for landowners, thereby decreasing dependence on non-renewable resources. While burning wood does create air pollution, wood-burning technology has improved, and emission requirements have been implemented. Windham supports the continued use of wood as a local thermal fuel source and encourages residents to use low-emission wood burning appliances.

Outdoor wood furnaces or boilers are gaining popularity across the country as a home heating method. These are free-standing combustion units located outside the home or structure that is to be heated. When used properly these systems can be a clean and economical way to heat a house and water. Nonetheless, concerns over the safety and environmental impacts of these heating devices, particularly the production of offensive odors and potential health effects of uncontrolled emissions exist. The State of Vermont does have regulations pertaining to these systems. (See Vermont Air Pollution Regulations, Section 5-204, Wood Stoves and Central Heaters (November 2016). The regulations contain specific requirements for setback from neighboring residences and stack height, depending on whether the appliance in question is considered Phase I, Phase II, or uncertified. Any installation shall comply with all

local and state regulations. A Zoning permit must be obtained.

E. Resource Mapping Process and Policy Tool

The suite of maps included with this Enhanced Energy Element were developed using state-wide GIS data that modeled resource potential for solar and wind energy, identified potential constraints on renewable energy development, and created an energy potential map.

This energy potential map provides energy planners and developers with a “coarse screen” method to roughly identify areas in Windham that may have energy generation potential. These maps are not siting maps, and further site analysis would need to be done to determine if a proposed generation facility is appropriate and comports with Windham’s Town Plan policies. Instead, these maps provide Windham planners with tools to develop sound and informed energy generation policies within this Enhanced Energy Element.

1. Solar Resource Maps

The solar resource maps for Windham show a significant available solar resource, with some overlap with constrained areas such as wetlands. The Town supports solar facilities that are properly sited, where the development conforms to the siting policies outlined in this Town Plan. Refer to the “*Energy Goals, Policies, and Action Steps*” section below for policy statements regarding solar generation.

Windham has mapped, in association with the Regional Planning Commission, those areas of the Town with the highest potential for siting small scale net-metered and off grid renewable energy systems, based on resource availability, technical siting requirements and the community's resource conservation, land use and development objectives. It has been determined that sufficient area is available to meet the renewable generation requirements as determined by the Regional Commission.

2. Wind Resource Maps

The wind resource maps for Windham show large areas of wind energy potential, however with significant overlap with constrained areas. The Windham Town Plan explicitly prohibits Commercial/Industrial wind facilities as described in detail in the Plan. Individual small-scale wind installations are a permitted use in all zoning districts within Windham except for the Hamlet and Historic districts. Refer to the “Energy Goals, Policies, and Action Steps” section below for policy statements regarding wind generation

3. Preferred Locations

The Town of Windham supports residential and community scale renewable energy generation facilities in a manner that comports with existing and proposed land use designations, does not adversely affect the landscape pattern or character of the Town, and supports positive community development. Generally, the Town promotes energy generation development in locations that are previously disturbed and do not offer significant opportunities for future development.

These areas would include:

- Rooftops
- Mines
- Quarries
- Historic impervious surfaces with no adverse ecological impact from development
- Brownfield sites
- Gravel pits
- Municipally designated “preferred sites”

All Municipally Designated Preferred Sites must meet the following criteria:

- Minimal impact upon agricultural use
- No disruption of wildlife travel corridors or living habitat
- Lack of impact upon the scenic resources of Windham as noted in the Town Plan
- No interference with riparian buffers
- Existing road structure suitable for installation and maintenance

In addition, Municipally Designated Preferred Sites must meet one, or more, of the following criteria:

- Town owned land, especially if it is cleared and has good solar orientation
- Proximity to 3 phase power lines to reduce utility infrastructure expansion
- Location near the end of utility distribution lines for grid support
- South facing slopes having low quality agricultural soils which allow higher density solar arrays
- Existing areas of open land such that deforestation would not be required

Extra consideration should be given to these under-utilized and previously disturbed areas that exist within the areas modeled to have prime resource potential (see Energy Maps), and do not conflict with existing and proposed designated land uses. Refer to the “Energy Goals, Policies, and Action Steps” section below for policy statements regarding preferred generation sites.

F. Existing Renewable Energy Generation

Windham currently is generating electricity from eleven renewable energy installations. With two ground mounted arrays, four rooftop installations, and four hot water systems, most of the generated electricity is from solar installations.

Existing Renewable Energy Generation (Standard 9A), Sheet "E. Data-DPS Existing Generation"		
Renewable Energy Type	MW installed	Annual MWh generated
Total solar installations.	0.033	43.15
Total wind installations.	0.005	10.00
Total hydro-electric installations.	(none)	
Total biomass installations.	(unknown)	
Other	(none)	
Total existing renewable energy generation:	0.038	53.15

Table 2: Existing Renewable Energy Generation

G. Areas Unsuitable for Renewable Energy Siting

As shown in the Known Constraints map, there is a suite of geographic characteristics that are deemed to exclude any energy generation development. They are mapped vernal pools, Class 1 and 2 wetlands, DEC River Corridors and/or FEMA floodways, and State-significant Natural Communities and Rare, Threatened, and Endangered species.

The Possible Constraints are a set of data layers that don't necessarily exclude energy development but give a signal to potential developers and planners that more site analysis may be required. These layers include hydric soils, FEMA Special Flood Hazard Areas, Protected lands, deer wintering areas, Vermont Conservation design highest priority forest blocks, and agricultural soils. If generation facilities are proposed in these areas, due diligence is required in the siting of those facilities to ensure there are no adverse effects on the landscape.

Aside from these state-identified constraints, the Town of Windham has determined that energy generation facilities are generally not compatible with the High Elevation Resource Overlay Districts outlined in the Land Use chapter of the Windham Town Plan, and include Resource Conservation and Flood Hazard Overlays. These areas are delineated as containing fragile natural areas that should be protected.

High-elevation sites above 2000 feet are especially fragile for a variety of reasons, particularly because they are the source of the headwaters for numerous streams and rivers. These areas are detailed on Map 18. Because development in these areas could enhance the possibility of increased runoff and flooding which would endanger the health and safety of residents in Windham and/or downstream communities, these areas are only appropriate for limited, low-impact development. Because installation and maintenance of solar arrays has a lighter impact than wind turbines, some small-scale (i.e. solely for on-site electricity consumption or net metered not to exceed 15kW capacity) and medium-scale (i.e. not to exceed 150 kW capacity) solar development may be appropriate, whereas anything more than small-scale (i.e. solely for on-site electricity consumption or net metered not to exceed 15kW capacity) wind development is not appropriate, and is therefore prohibited. Furthermore, medium-scale solar development above 2,000 feet shall be limited to areas that are already cleared, such as former ski slopes, in order to minimize the impact on fragile natural resources.

Similarly, energy generation within the Hamlets and Historic Districts should be very carefully sited so as not to conflict with the policies outlined within those land use districts.

H. Windham's Energy Targets and Conservation Challenges

The Windham region was given an overall renewable energy generation target, as determined by the Department of Public Service, based on its percentage of the state's population (which directly affects its share of statewide consumption). The Windham

Regional Commission (WRC) then determined energy generation targets for each of their member-towns, based on both the resource availability in town and its population. The resulting town generation targets are an average between those two characteristics. The resulting town generation targets are an average between those two variables.

Table 3 below shows the targeted percentage of consumed fuel sourced from renewable energy, across the three consumption sectors. This is in line with Vermont’s renewable energy goals outlined in the 2016 Comprehensive Energy Plan.

Use of Renewable Energy			
Sector	2025	2035	2050
Transportation (as a percentage of total Btu's consumed)	10%	31%	90%
Heating (as a percentage of total Btu's consumed)	56%	67%	93%
Electricity (MWh to be generated in town)	<i>See the “Energy Generation Targets” section below.</i>		
<i>The data above shows targets for the percentage of energy use coming from renewable sources for each sector at each target year. This was developed using information from the LEAP analysis (see sections below).</i>			

Table 3: Percentage use of renewable energy.

1. Energy Generation Targets

In Windham, it is estimated that 695 MWh of new renewable energy should be generated each year. This figure is an average of 458 MWh (based on the town’s share of the regional population), and 933 MWh (based on the percent of regional resource availability). This estimated generation target serves as a starting point from which the town can develop policy to address its energy needs.

To translate this figure into what kinds of installations would be required, 695 MWh of renewable energy each year would require a total of 535 kilowatts of solar photovoltaic installations (using the assumption that only solar energy would contribute to the overall energy generation target, not any other generations source).

Windham’s Energy Generation Targets at Benchmark Years	
This is the target amount of renewable energy generation in town by 2025 (25% renewables goal), in MWh.	193
This is the target amount of renewable energy generation in town by 2035 (40% renewables goal), in MWh.	309
This is the target amount of renewable energy generation in town by 2050 (90% renewables goal), in MWh.	695

Table 4: Renewable energy generation targets at 2025, 2035, and 2050.

Acres Available in Municipality for Energy Generation	
Total number of acres in town (from GIS analysis).	16,751
Total number of acres available for prime solar (with no state or local constraints).	589
Total number of acres available for residential wind (with no state or local constraints).	1,395
Total number of acres available for small commercial wind (with no state or local constraints).	832
Total number of acres available for utility wind (with no state or local constraints).	98

Table 5: Acres of available resource potential for different generation technologies.

Acres Needed for Municipal Energy Generation	
This is the estimated number of acres of land needed for solar installations to meet municipal targets.	4
This is the amount of land that should be identified in plans for solar installations (as a planning contingency).	32
For estimated solar generation, this is the percentage of land in town needed for installations (not accounting for potential rooftop solar).	0.03%
For estimated solar generation, this is the percentage of acres identified as prime solar resource needed in town for installations (not accounting for potential rooftop solar).	0.73%
This is the estimated percentage of the municipal target that can be met by rooftop solar on existing structures.	35%
This is the estimated amount of energy that can be generated from rooftop solar annually, in MWh.	241

Table 6: Acres needed for Windham to meet generation target.

On the landscape, this could mean that the town identifies 32 acres of solar-capable land. This is a very conservative figure; assuming that each megawatt of energy requires 60 acres (on average, solar installations produce a single megawatt over 8 acres equating to 4 acres of actual installations).

Using the 60 acres/megawatt energy production rate is for contingency; meaning that it reserves space for landowner, grid, or spatial constraints that may limit development. This ensures enough space would be delineated.

The tables also show that, in addition to demonstrating that only 0.73% of the modeled prime solar resource potential land area is needed for energy generation, it is

estimated that about 35% of Windham’s renewables target can be met by rooftop solar installations on existing structures. The table 6 above exemplifies that there is sufficient land within the Prime solar areas to meet the target generation. This will lead towards the Town incentivizing these types of installations, so as to minimize the amount of land area in town used for ground-mounted photovoltaic generation facilities.

If other renewable energy sources were to be used, this amount of solar photovoltaic installations would decrease.

Although renewable energy generation can occur in the town and supply its residents with reliable, affordable, and clean power, the town is challenged by the current amount of energy being consumed. In order to minimize the amount of energy generation required, the town must first develop strategies to reduce the amount of energy consumed.

2. Projected Energy Use: LEAP Model Results

To help inform the town’s policies on energy conservation measures, the town used guidance from the LEAP (Long-Range Energy Alternatives Planning system) model, conducted by the Vermont Energy Investment Corporation as part of the state’s comprehensive energy planning initiative.

The LEAP model is used to guide the state’s regions towards reducing the amount of greenhouse gas emissions, and consuming 90% renewable energy by 2050 (referred to as the “90x50” goal). To accomplish the state’s energy goals, there are several interim benchmarks built into the LEAP model which ensure a progressive pace in attaining that “90 x 50” goal.

The state energy goals are:

- Greenhouse gas reduction goals of 50% from 1990 levels by 2028 and 75% by 2050.
- 25% of energy supplied by renewable resources by 2025 (25 x 25).
- Building efficiency of 25% of homes (80,000 units) by 2020.

Incorporating those goals into the model produced energy generation, conservation, and fuel conversion targets for benchmark dates for all regions in the state and is informed by the region’s current energy profile. The WRC received the results from this model and was tasked with making those results relevant to its member-towns. The WRC therefore divided its region-wide benchmark targets among its towns based on their population (which is assumed to most directly impact the amount of energy the towns consume).

The following paragraphs, tables and charts show Windham’s LEAP model results, and how much energy could be conserved in order to reduce the burden of energy generation facilities in the region.

4. Residential Heating Conservation & Fuel Conversion

In order to determine how much energy would have to be conserved or how much fuel conversion to renewable energy, the LEAP model produced both a “Reference” and “90x50” scenarios. The Reference scenario is meant to depict energy use over decades if no major changes were made in our energy profile. It is the “business as usual” scenario. The “90x50” scenario shows one pathway that communities can adopt

in order to reduce greenhouse gas emissions, conserve energy, and generate renewable energy so as to meet the state’s goals. This pathway is translated to Windham’s use, and is shown below. It is another data estimate that serves to help inform the town to develop its own policies for energy conservation and fuel conversion.

Chart 4 below shows the LEAP results for Windham’s residential heating sector. In both the Reference and 90x50 scenarios, energy consumption is modeled to decrease (on account of technological improvements, building innovation, and home efficiency improvements).

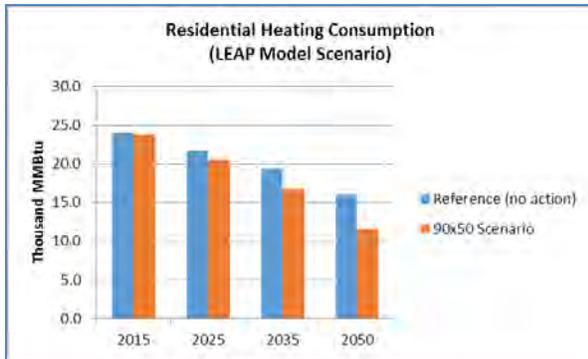


Chart 5

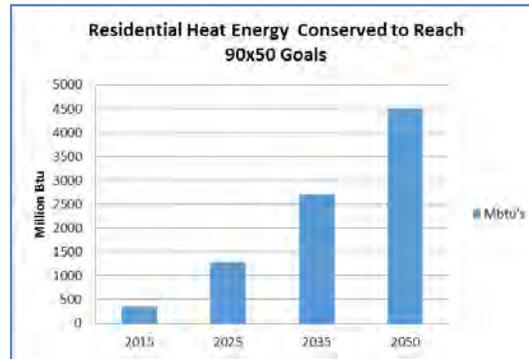


Chart 6

However, the 90x50 scenario shows a sharper increase in the amount of energy conserved in residential heating. Chart 6 shows how much energy should be conserved, through 2025, 2035, and 2050, to help the town arrive at these energy goals. Not only would energy need to be solely conserved by building efficiency measures, but fuel conversion to more efficient energy sources would be promoted.

To translate the above bar graphs into more meaningful and tangible data points for the Town, some estimates were made that provide a pathway to more energy conservation and efficiency over the target years of 2025, 2035, and 2050. Below in Table 7 is outlining the heating (or, “thermal”) efficiencies and building weatherization targets that could be made in Windham to meet these targets.

In order to attain the renewable energy goals, the following targets have been established for Windham for years 2025, 2035, and 2050.

Thermal (Heat) Efficiency Targets at Benchmark Years			
Use/Sector	2025	2035	2050
Residential thermal (increased efficiency and conservation): Percent of municipal households to be weatherized over benchmark years to meet efficiency targets.	9%	18%	37%
Residential thermal (increased efficiency and conservation): Estimated number of municipal households to be weatherized.	37	72	148

Commercial thermal (increased efficiency and conservation): Percent of commercial establishments to be weatherized over benchmark years to meet efficiency targets.	9%	16%	30%
Commercial thermal (increased efficiency and conservation): Estimated number of commercial establishments to be weatherized.	1	2	4

Table 7: Heat Efficiency Targets

The following Table 8 shows what kind of fuel conversions, for both residential and commercial buildings, could be made to meet the proposed targets. This also includes the increased use of new heat pumps.

Heating Fuel Switching Targets			
Use/Sector	2025	2035	2050
Residential and Commercial Thermal Fuel: Estimated new efficient wood heat systems overall (in units) in the LEAP 90x50 scenario (this includes both wood stoves and wood pellet burners for homes and businesses). <i>This number may decline over the target years, which indicates an overall trend toward energy conservation and building weatherizing, which reduces the demand on heating systems.</i>	110	105	105
Residential and Commercial Thermal Fuel: Estimated new wood pellet systems only (in units) in the LEAP 90x50 scenario.	19	21	26
Residential and Thermal Fuel: Estimated new heat pumps (in units).	34	67	95
Percent of heating fuel sourced by renewable energy.	56	67	93

Table 8: Heating Fuel Targets

The LEAP model created benchmark targets for commercial energy consumption, assuming a difference in residential and commercial energy needs and changes over time. Below in Charts 7 and 8 are the interpretations of the sector efficiencies over time.

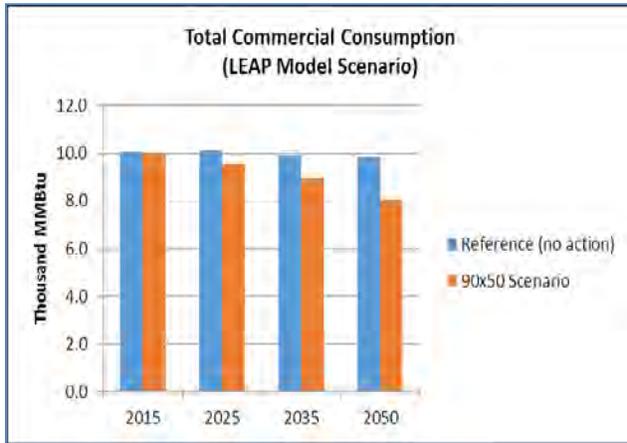


Chart 7

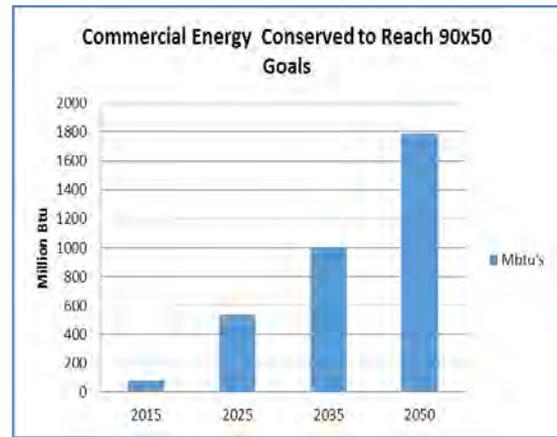


Chart 8

5. Transportation System Changes

The LEAP model created benchmark targets for both light and heavy-duty vehicles, assuming a difference in residential and commercial energy needs and changes over time. Below in Charts 9-12 are the two interpretations of these sector's efficiencies overtime.

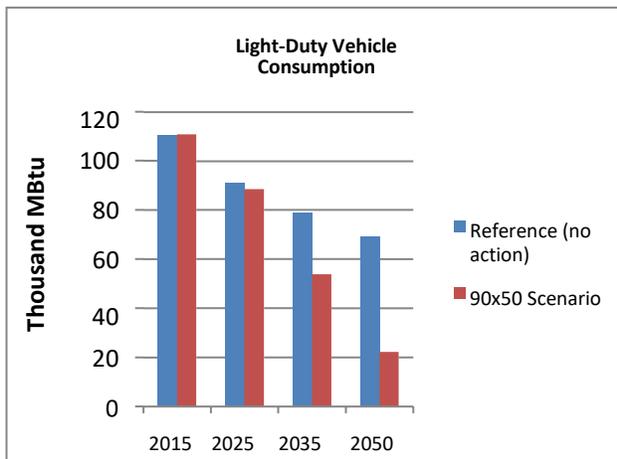


Chart 9

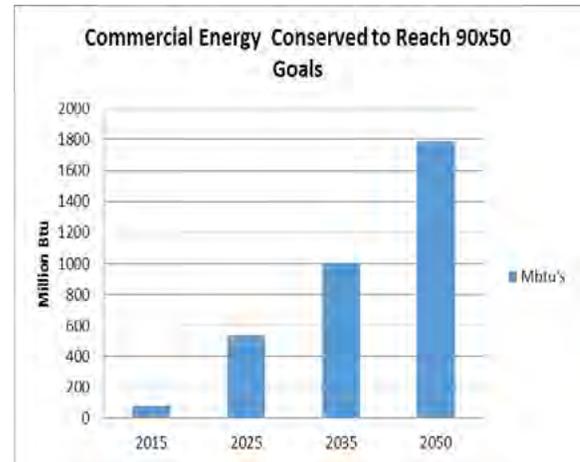


Chart 10

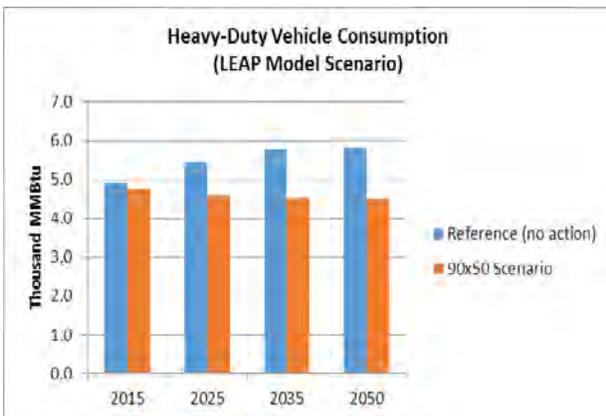


Chart 11

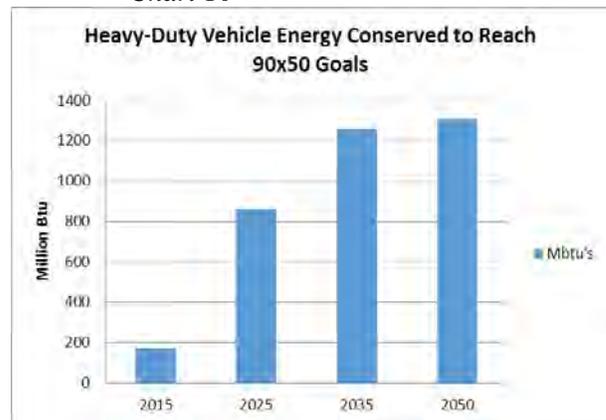


Chart 12

Light-duty vehicle consumption represents a larger portion of the total amount of energy consumed by the transportation sector, and there is a large amount of energy conservation required. The LEAP model projects much of this conservation of energy comes from the electrification of the vehicle fleet, especially as market demand changes and technology improves. This reduction in gasoline consumption and electrification of the car motor comes in addition to increased cluster developments and other land use changes that improve the efficiency of our community’s transportation network.

Transportation Fuel Switching Targets			
Use/Sector	2025	2035	2050
Transportation Fuel: Estimated number of new electric vehicles, in town.	24	166	351
Transportation Fuel: Estimated number of biodiesel-powered vehicles, in town.	36	69	119
Percentage Fuel sourced by renewable energy in the target years.	10	31	90

Table 9: Fuel switching targets for the transportation sector, across the benchmark years.

Heavy-duty vehicle energy consumption doesn’t show the same curves as per light-duty vehicles, since commercial applications for these vehicles isn’t anticipated to change as much. However, efficiency in this sector is achieved by changing the fuel type for these vehicles from diesel to bio-diesel.

6. Electricity Conservation

Over the benchmark years, electricity rates are anticipated to increase in the Reference scenario, due to a combination of more amenities, appliances, and motors being supplied by electric power, and an increase in the number of people using those products. The 90x50 scenario promotes electricity conservation in the form of energy-efficient appliances, lighting, and heating/cooling.

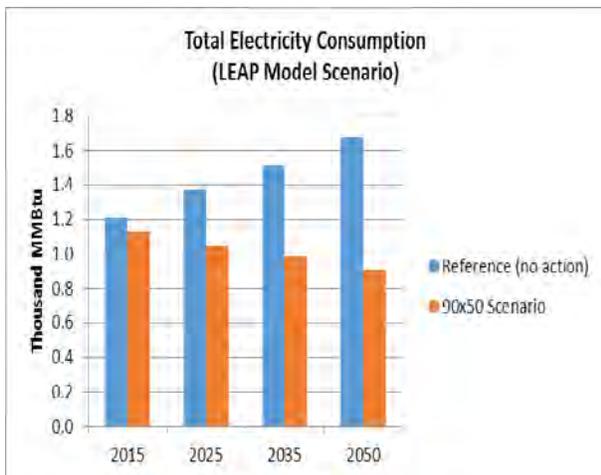


Chart 13

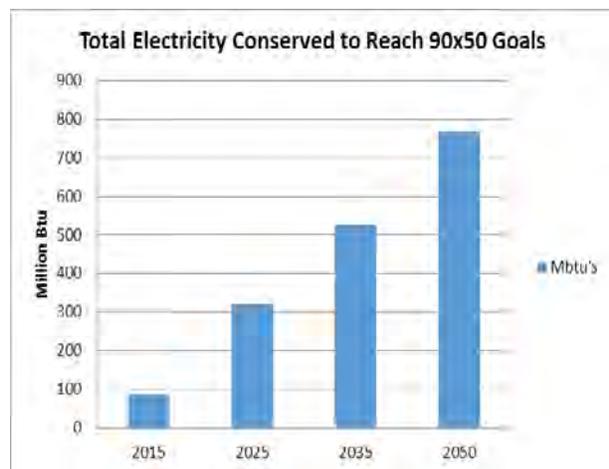


Chart 14

Efficiency Targets at Benchmark Years			
Use/Sector	2025	2035	2050
Electricity: Number of kilo-watt hours to be conserved, annually, over the target years.	742,100	1,212,700	1,773,800
Electricity: Percentage of number of homes and buildings that will have been upgraded with electric efficiency improvements.	42%	68%	100%

Table 10: Electric-sector efficiency targets across the benchmark years.

7. Conservation and Efficiency Strategies

With total energy expenditures in the town in excess of \$1.3 million per year there is considerable opportunity for savings from various energy conservation and improved efficiency measures. Because most of the energy use in Windham is for private uses (home heating, commuting, electric), savings would accrue primarily to residents. Public education is one of the most effective strategies to bring about savings through energy conservation and improved efficiency, though there are some specific policies that can also move the community in that direction.

Most new construction in Windham is required to meet or exceed the Vermont Building Energy Standards (for both residential and commercial buildings) through the use of insulation, heating systems, and weatherproof windows and doors. Current building codes provide basic energy efficiency requirements for buildings; however, technology advancements have generated higher standards such as net-zero energy construction standards in which buildings generate as much energy as they consume. Green construction and LEED Construction (Leadership in Energy and Environmental Design) standards promote the use of natural, recycled and durable building materials, as well as energy efficiency. These efficiency standards are also applied to landscaping, advocating for native plantings that are low maintenance.

The siting, design, and construction of buildings strongly influences the amount of energy needed for heating as well as the amount of electricity needed for lighting. Proper subdivision design, building orientation, construction and landscaping provide opportunities for energy conservation such as less vehicular travel, and by designs incorporating passive solar space and domestic hot water heating, natural lighting and photovoltaic electricity production.

Energy savings can be realized by retrofitting existing buildings with insulation, installing high-performance windows and doors to reduce heat loss, weather-stripping, replacing incandescent lights with fluorescent, and using energy efficient appliances. The following programs are available to residents of Windham:

- Southeastern Vermont Community Action(SEVCA): SEVCA is the service provider in Windham County that runs the Weatherization Assistance Program. Weatherization

services, which include an energy audit, diagnostic tests, analysis and installation measures, are available at no cost to income-eligible homeowners and renters. SEVCA is also available to help in the event of a heating emergency. They can help purchase oil, kerosene, propane or wood. In addition, they also work with electric companies in order to prevent disconnection and help negotiate payment plans.

- Efficiency Vermont: Efficiency Vermont is the State's provider of energy efficiency services. They provide technical and financial assistance to electrical consumers for the purpose of improving the efficiency of existing and new facilities.
- ENERGY STAR Home Rebates: Energy Star Homes meet strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and U.S. Department of Energy. Efficiency Vermont provides free financial, design, and technical to help build an ENERGY STAR qualified home. Benefits of being an ENERGY STAR home include financial incentives such as product rebates; utility savings; higher resale value; increased comfort and air quality; and other environmental benefits.
- Vermont Housing Finance Authority's Energy Saver Loan Program: Administered by Windham Housing Trust, this program offers low interest loan funding for homeowners for an energy audit and improvements specified in the audit.

Transportation-related efficiency strategies are a very significant part of Windham's efforts, since it represents a significant portion of the energy demand. Simple changes, such as ride-sharing, combining trips and using alternative transportation, will conserve fuel and reduce wear and tear and maintenance costs on individual vehicles. Fuel efficient and electric cars will use less gasoline and emit less pollution.

Effective land use planning can promote energy conservation. Targeting new development toward areas located close to the community's major roads and existing settlements will minimize the energy consumed by residents commuting and will reduce the energy required to deliver essential services to residents and businesses.

I. Energy Goals, Policies, and Action Steps

Goal 1: The Town of Windham will reduce total energy use by promoting energy conservation and efficiency measures and a shift toward renewable energy sources.

Policy 1.1: Encourage energy efficiency and conservation, and renewable energy generation by individuals and organizations through public education, awareness, and engagement.

*Action Steps:*1

1. The Energy Committee will organize at least one energy fair each year which will provide information to the public about efficiency, conservation and renewable sources of energy, as well as access to one or more vendors who offer services in those areas.
2. The Energy Coordinator and/or Energy Committee will provide information in the Town Office about energy assistance programs such as SEVCA and Efficiency Vermont.
3. The Energy Committee will post the minutes of all of its meetings on the town website.

4. The Energy Committee will occasionally publish information about energy efficiency, conservation and renewable energy in the *Windham News & Notes*.
5. The Energy Committee, when appropriate, will organize public information sessions about alternative energy sources, such as community solar projects.
6. The Energy Committee will explore the possibility of creating purchasing cooperatives for heating fuel and for weatherization upgrades.

Policy 1.2: Promote energy efficiency in new and existing buildings by supporting programs for insulation and weatherization, especially for low and moderate-income households.

Action Steps:

1. The Town will provide information about resources for building energy efficient homes and businesses, including The Vermont Residential and Commercial Building Energy Codes and LEED (Leadership in Energy and Environmental Design) standards.
2. The Town shall develop guidelines for energy conservation to be used in site plan or conditional use review. Whenever possible, development should be encouraged only in areas with characteristics most suitable for maximum energy conservation, including southern orientation and protective wind barriers.
3. Review current zoning bylaws to determine whether existing standards related to energy conservation and energy efficient site design and building construction area adequate. Revise, as necessary, to require optimum feasible energy reduction and efficiency.
4. Explore the creation of residential and commercial building efficiency ratings and ways to reward those who achieve the highest ratings.

Policy 1.3: Encourage the awareness and use of programs that decrease the use of fossil fuels for heating and promote the use of alternative and renewable fuels.

Action Steps:

1. Provide information to residents about programs and technologies that decrease dependence on fossil fuels for heating, including the Windham Wood Heat Initiative, geothermal energy, solar energy, small scale wind turbines, cold climate heat pumps, etc.
2. Promote the use of energy efficient light bulbs.
3. Promote awareness of the benefits of passive solar heating and enhanced insulation as effective tools for reducing the use of fossil fuels.

Policy 1.4: Demonstrate town leadership by making a commitment to energy conservation in the operation of municipal building, facilities and vehicles.

Action Steps:

1. Continue, as needed, energy audits of municipal buildings and publicize the results of the audits.
2. Develop facility maintenance and operation policies that maximize energy efficiency while maintaining comfort levels for employees and visitors. The policies could include building heating and air conditioning temperature guidelines, electrical equipment use guidelines, interior and exterior lighting guidelines, and the use of energy management devices, such as programmable thermostats, occupancy light sensors, smart strips and energy star appliances.
3. Continue, as needed, to improve lighting efficiency by retro fitting municipal buildings with energy efficient compact fluorescent or LED bulbs and fixtures, with the assistance of Efficiency Vermont and/or local utilities.
4. Investigate the use of the town web page and appropriate software programs to promote carpooling.
5. Develop municipal vehicle purchase, maintenance and use policies, including minimum fuel efficiency standards for new vehicles. Consider alternative-fuel vehicles as available and appropriate.

Goal 2: The Town of Windham will work to reduce transportation energy demand and single-occupancy vehicle use and encouraging use of renewable or lower-emission energy sources for transportation. Windham supports ongoing and collective efforts to reduce transportation energy demand, vehicle miles traveled, fossil fuel consumption and greenhouse gas emissions.

Policy 2.1: Encourage the increased use of public transit.

Action Steps:

1. Involve public transit companies and other providers in the Windham Town Energy Fairs.
2. Provide appropriate areas for public transit pickup.
3. Encourage public transit companies to provide routes near to Town.

Policy 2.2: Promote a shift away from single-occupancy vehicle trips.

Action Steps:

1. Examine feasibility of creating park-and-ride facilities on Route 11 and Windham Hill Road in South Windham.
2. Promote ridesharing programs and alternative modes of transportation at energy

fairs, through the *Windham News & Notes*, and in cooperation with Neighborhood Connections and the Windham Community Organization.

3. Promote the use of the [Go! Vermont](#) website for carpooling.
4. Partner with local and regional service agencies to explore establishing a volunteer driver program that offers rides for residents and opportunities to coordinate group travel.

Policy 2.3: Encourage, through transportation policies, opportunities for energy efficient alternatives to the automobile.

Action Steps:

1. Consider implementing improvements that encourage safe areas for public transportation and ridesharing.
2. Pressing internet access providers to improve access speeds will encourage telecommuting.
3. Encourage walking and biking/electric assist biking for short trips.
4. Provide bike racks at Town buildings.
5. Continue the Windham Town Energy Fair to provide education and outreach to residents concerning highly fuel-efficient and alternative powered vehicles.

Policy 2.4: Promote the individual use of electric vehicles, instead of fossil fuel consuming light-duty vehicles.

Action Steps:

1. Develop a plan for locating electric vehicle charging stations i.e. Town Office and Meeting House.
2. Continue holding Windham Town Energy Fairs with auto dealers showing energy efficient vehicles.

Policy 2.5: The Town of Windham will lead by example in terms of transportation-related energy use.

Action Steps:

1. Consider current and future technological advancements for fuel efficiency in town vehicles.
2. The Town shall encourage the posting of “No Idling” signs at public facilities.
3. Use the Town Energy Fair to promote better driver behavior to use less fuel per mile driven.
4. Promote good vehicle maintenance to decrease fuel consumption.

5. Work with local businesses and farmers to develop programs that support the local economy. For example, a "buy local" campaign, a local business directory, a farmer's market, or a vendor's ordinance – to increase the availability of locally produced energy, food, goods and services.

Policy 2.6: Encourage land use patterns that concentrate housing, work opportunities and social services toward the existing villages to conserve energy by placing less demand on transportation.

Action steps:

1. Encourage Planned Unit Developments to incorporate facilities for ridesharing.

Goal 3: Windham will promote appropriate land use patterns and development densities that result in the conservation of energy. (See the Land Use chapter of the Town Plan for an explanation of Windham's unique and historic settlement patterns, and for more related policies).

Policy 3.1: Direct development away from unsuitable areas and toward existing areas of settlement.

Action Steps:

1. Prohibit development in areas where the topography and soil conditions may cause contamination of surface, sub-surface waters or wells or failure of waste disposal systems.
2. Prohibit development on slopes of 20 percent or greater.
3. Minimize areas of earth disturbance, grading, and clearing of vegetation on slopes over 15%. Evaluate erosion and sedimentation control measures in areas where development occurs on slopes over 8% during Site Plan Review.
4. Lands 2000 feet in elevation or higher in Forest Districts shall be left in their natural condition, free from all development, including roads, building structures, utilities, wireless broadcast telecommunications facilities, and industrial wind turbines (except camps as provided for in Chapter IX of the Town Plan and subject to the conditions articulated in Sec. 201.7 of Windham's zoning regulations.)
5. Prohibit development in areas of wetlands and vernal pools.
6. Prohibit development in rare and irreplaceable natural areas, areas with necessary wildlife habitat and/or critical wildlife populations, and areas with endangered species. (Reference Title 10 Section 6086(a)(8)(A).

Policy 3.2: Support settlement in the town's hamlets and historic districts and support multifamily housing in all appropriate zoning districts.

Action Steps:

1. Promote housing development within the historic settlement areas of South Windham and Windham Center (designated as Hamlets in the Land Use Section of the Town Plan).
2. Promote historic preservation and development that enhances the historic resources

of Windham.

3. Encourage multi-family housing and Planned Unit Development in all suitable zoning districts through appropriate provisions in the Zoning Bylaws.
4. Continue to promote the Housing Rehabilitation Program and other options for owners to rehabilitate housing structures so that they are safe and sanitary and more energy efficient and can remain active in the town's housing stock.

Policy 3.3: Promote land use and conservation policies that maintain healthy forests which absorb greenhouse gases and provide a local source of fuel-wood.

Action Steps:

1. Maintain the Forest District for the purpose of protecting large contiguous forest land and natural and community value.
2. Work with the Vermont Land Trust, or other appropriate non-profit organizations to encourage the voluntary protection of productive agricultural, forest lands and critical natural areas. Techniques such as conservation easements or donation of land should be actively explored.
3. Continue to evaluate timber harvesting practices during the site plan review process to ensure that natural resources, including surface waters, wildlife habitat, wetlands, vernal pools, shorelines, streams and stream banks are protected.
4. Encourage participation in the Vermont Land Use Appraisal Program to support the viability and maintenance of farm and forest land.
5. Manage forestland intended for commercial biomass production in a manner that preserves critical forest habitat and long-term forest health.

Goal 4: Windham will locate areas appropriate for renewable energy generation based on resource potential and development constraints.

Policy 4.1: Support appropriate renewable energy generation in Windham, including bio-mass using local wood supplies, dispersed small-scale wind, solar and hydro-power sources.

Action Steps:

1. Support incentive programs for small-scale net-metering energy production and energy conservation for private use.
2. Support small-scale, residential and community wind and solar generation facilities where there are no adverse visual, ecological, or sound effects to nearby residences.
3. Support permit-able small-scale micro-hydro systems where there are no adverse effects on the geomorphic stability or ecological health of the respective water body.

Policy 4.2: Discourage overall any industrial-scale renewable energy generation.

a. Commercial scale solar installations may be considered when appropriately sited.

Policy 4.3: Encourage any potential commercial generation facilities to be within the areas deemed most suitable as described in Section 3 area, “Windham’s Preferred Locations”, and within the Energy Generation Potential maps, and maximize potential for those facilities in these preferred areas

Policy 4.4: When considering upgrades to or expansion of transmission infrastructure or 3-phase power lines, encourage the strategic development of energy generation facilities so that community centers and local businesses may benefit from the infrastructure upgrades, thereby maximizing positive community development overall.

Policy 4.5: Promote the siting of renewable energy generation facilities within compatible Land use districts and in such a manner that minimizes site disturbance and development, reduces impacts on local roads and infrastructure, and maximizes energy resource availability so as to provide the most benefit. Sites that minimize the amount of forest clearance necessary are preferred.

Policy 4.6: Encourage energy generation facilities in existing or prospective agricultural areas, where the energy generation installations conform to, compliment, or add value to the agriculturally-productive landscape or to the surrounding ecosystem services.

- Facilities that impair the agricultural value of the site are discouraged.
- South facing slopes having low quality agricultural soils which allow higher density solar arrays are desirable.

Policy 4.7: Discourage any renewable energy generation facilities in areas identified as unsuitable by the Town of Windham:

1. Within the Resource Overlay District, Historic Districts, and Flood Hazard zones as defined by FEMA maps
2. Fragile natural areas including land above 2,000 feet elevation in Forest District (subject to the exceptions set out under Policies 3.1 and 4.12.)
3. Other areas as determined by the Land Use chapter of the Windham Town Plan (Chapter IX).

Policy 4.8: Prohibit any renewable energy generation facilities in the designated Hamlet districts that do not conform to existing land use or landscape patterns, or do not conform to the character of the Hamlet. Note that residential solar is a conditional use.

Policy 4.9: Town of Windham will demonstrate leadership by example with respect to the deployment of renewable energy by promoting energy generation facilities on all town buildings and/or property, where appropriate, viable and feasible.

Policy 4.10: Protect the acoustic environment of Windham with noise standards enforced at or beyond the property line of the source.

Action Steps:

1. Turbines shall not be allowed or permitted unless applicant clearly demonstrates noise will not exceed the 41 dBA Fast Lmax daytime at the closest property line and 39 dBA Fast Lmax nighttime.
2. Limit source noise dBC Fast Lmax minus dBA Fast Lmax to less than 15 dB beyond the property line and inside homes, schools and town offices and buildings.

Policy 4.11: Protect the health and well-being of all people residing in Windham or staying in Windham, regardless of the frequency or duration of their stay.

Action Steps:

1. Prohibit noise that is plainly audible within a residential structure (one that is used for sleeping and is occupied either full or part time).
2. To control noise pollution, placement of commercial/industrial development facilities within the stated minimum setback requirements (see Energy Chapter V Community Standards) is prohibited.
3. Specific Community Standards for setbacks of wind turbines have been established (reference Town Plan pages 62-67) to protect properties against noticeable shadowing, shadow flicker and the risk of ice throw landing on neighboring properties or tower collapse affecting neighboring properties.

Policy 4.12: Lands 2000 feet in elevation or higher in Forest Districts shall be left in their natural condition, free from all development, including roads, building structures, utilities, wireless broadcast telecommunications facilities, and industrial wind turbines (except camps as provided for in Chapter IX of the Town Plan and subject to the conditions articulated in Sec. 201.7 of Windham’s zoning regulations.) The town prohibits any commercial or industrial operations on land above 2000 feet in Forest Districts other than forestry and will not support any commercial or industrial activity that exceeds the capacity of its public infrastructure, including emergency response assets.

Policy 4.13: The placement of utility line extensions above ground and roadside must be sited to provide maximum protection of Windham’s scenic resources.

Action Steps:

1. Require that electric poles that have been abandoned due to relocation or consolidation are removed from the landscape.
2. When relocating, upgrading, or establishing electric distribution lines, a review of operational maintenance, engineering design, direct cost, and visual impact should be undertaken to determine the appropriateness of the existing or proposed utility line location

J. Community Standards and Conditions for Energy Development

Purpose: The purpose of these municipal energy policies and standards is to promote

the development of appropriate small-scale renewable energy resources and energy facilities in the Town of Windham, while limiting the adverse impacts of such development on public health, safety and welfare, the town's historic and planned pattern of development, environmentally sensitive areas, and our most highly-valued natural, cultural and scenic resources – consistent with related development, resource protection and land conservation policies included elsewhere in this plan. These policies are to be considered in undertaking small-scale municipal energy projects and programs, in updating the Town's bylaws to address energy development, and in the review of new or upgraded energy facilities and systems by the Town and the Public Utility Commission under 30 V.S.A. § 248.

To the extent physically and functionally feasible, existing utility systems, including transmission lines, distribution lines and substations, shall be upgraded or expanded on site or within existing utility corridors before new facilities or corridors are considered.

The Town of Windham will endorse or permit the development and installation of small-scale energy facilities that conform to community energy facility development and siting standards through participation in Public Utility Commission (Section 248) proceedings or, where applicable, through local financing and incentive programs and regulations.

Public Health and Safety Standards Noise:

Noise generated by any energy facility, including wind energy systems, or by any other industrial or commercial facility or operation shall not exceed (a) 41 dBA Fast Lmax as measured at any property line, or (b) 39 dBA Lmax at night. (See Natural Resources Chapter 4.)

Shadow Flicker:

Wind energy facilities shall be sited or screened so that shadows cast by rotor blades will not result in shadow flicker on occupied buildings located within the viewshed of the project.

Lighting:

Energy facilities, including wind and transmission towers, are not to be artificially lighted.

Substation lighting should be the minimum necessary for site monitoring and security, should be cast downward, and must not result in light trespass or glare on adjoining properties.

Codes:

Energy facilities shall comply with all manufacturer specifications, state or industry safety and electric codes, and utility connection requirements. Documentation of code compliance may be required for facilities subject to municipal review

Height:

The maximum tower height for energy facilities including net-metered, or similar off-grid wind energy facility shall not exceed 120 feet in total height, as measured vertically from the ground to the rotor blade tip at its highest point with a maximum blade length of 20 feet.

Setbacks:

- All ground-mounted small-scale wind energy facilities must be setback at least 2 times the total facility height, as measured vertically from the ground to the rotor blade tip at its highest point, from all property lines, occupied buildings on adjoining properties, overhead utility lines, public and private rights-of-way and established trail corridors, unless easements are secured from adjoining property owners.
- Guy wires used to support wind towers are exempt from minimum district setback requirements, except they shall be set back at least 20 feet from all property lines.
- A building-mounted solar panel(s) must meet minimum setback requirements for the building on which it is mounted.
- Facility setback distances from property lines, or from occupied structures in existence at the time of application, shall be increased as necessary to mitigate identified public health and safety hazards or nuisances to adjoining property owners (e.g., noise, vibration, glare, shadowing and shadow flicker, ice throw).

Ground Clearance:

The blade tip of any wind turbine shall, at its lowest point, have a ground clearance of no less than 30 feet, as measured vertically from the ground to the tip of the rotor blade at its lowest point.

Access:

- Facility access shall be provided from existing access roads where physically feasible, and, where feasible and safe access roads and utility corridors shall be shared, to minimize site disturbance, resource fragmentation, the creation of additional edge habitat, and the introduction and spread of invasive exotic species.
- Public access to generation and transmission facilities, including substations, shall be restricted as necessary to protect public health and safety.

Burial:

Utility controls and onsite line connections shall be wireless or buried, except at the point of connection with distribution lines, transmission lines and substations.

Signs:

Energy facilities and structures shall not be used for display or advertising purposes. Signs, except for owner and manufacturer identifications and safety warnings, that exceed one square foot are prohibited on all facilities and structures.

Interference:

Facility operation shall not reduce or interfere with television, radio, telemetry, or other telecommunications signals, including public safety communications systems.

Decommissioning and Abandonment:

Generation facility permits or certificates must include provisions for system abandonment, decommissioning and site restoration. Refer to the Zone Regulations for detailed requirements.

Facility Siting Standards Hazard Areas:

With the exception of transmission and distribution lines, new energy facilities that are not attached to existing or permitted structures shall not be located in:

- Special Flood Hazard Areas (SFHAs), including floodways and floodway fringes

identified on Flood Insurance Rate Maps (FIRMs) for the town. Any allowed facility located within these areas must meet minimum National Flood Insurance Program (NFIP) requirements, as reviewed and permitted by the municipality or the state.

- Fluvial erosion hazard areas identified on Windham FEHA maps.
- Slopes, with natural (pre-development) grades of 20% or more.

Conservation Areas:

Energy facilities are to be sited to avoid where physically feasible, or to otherwise minimize encroachment and mitigate the adverse impacts of facility development on:

- Surface waters, wetlands, vernal pools and associated setback and buffer areas, as specified for all development under town bylaws.
- Primary agricultural soils as mapped by the USDA Natural Resource Conservation Service for the state.
- Significant wildlife habitat, including core habitat areas, and travel and migratory corridors, as identified from state inventories and data sets, local inventories, and site investigations associated with facility development.
- Onsite mitigation is required through a combination of facility clustering, relocation, buffering and permanent conservation easements. Mitigation to avoid flooding from storm water runoff will be limited to well proven, non-experimental technologies. Off- site mitigation measures should be required where on-site mitigation is not physically feasible.

(All of these topics are more fully developed in Chapter IV Natural Resources)

Land Conservation Measures:

Headwaters, Wetlands, Slopes, Vernal Pools, Agricultural Land and Open Space: (See Chapter IV Natural Resources)

Energy facilities, including solar arrays and other generation facilities, transmission and distribution lines, accessory structures and access roads shall be located on non-agricultural land or along field edges to avoid fragmentation of, and to minimize and mitigate adverse impacts to agricultural land and open fields.

- Forestland Energy facilities, including wind towers and other generation facilities, transmission and distribution lines, accessory structures and access roads shall be located along existing tree lines, or on otherwise disturbed forestland, as necessary to avoid the fragmentation of, and to minimize and mitigate adverse impacts to productive timber stands and critical forest habitat.
- Forestland intended for commercial biomass production must be sustainably managed and harvested in a manner that preserves critical forest habitat and long-term forest health.

Visual Impacts:

Applicants shall demonstrate through site planning, facility siting and proposed mitigation that the visual impacts of new and upgraded energy facilities will be minimized as outlined in the standards set forth below:

- All energy facilities and accessory structures are to be designed and constructed of materials, colors, and textures that blend into the surrounding natural or built environment to the extent feasible. Wind towers, turbines and blades shall be of a neutral, non-reflective and unobtrusive color (e.g., white, off-white or gray).
- Facilities are to be sited to outside of, or to the edge of scenic views or viewsheds

so that they are not a prominent focal point.

- The facility should not extend above the background horizon line as seen from populated areas.
- The facility should be screened from view by the use of existing topography, structures, vegetation or strategically placed tree, shrub and ground cover plantings that do not block distant views.

Designated Scenic Areas:

The documented historic, rural and scenic character of the following areas in the Town of Windham, its Hamlets and their environs shall be preserved under any form of new energy development. New energy facilities sited within or as viewed from these areas shall not create a significant physical, visual, audible, or historically incongruous or incompatible intrusion into these areas. New facilities, including generation facilities greater than 15 kW, substations and transmission lines, are specifically prohibited within or as viewed from these areas unless significant associated impacts can be avoided, for example through facility siting, screening or line burial.

- Designated historic districts, including the South Windham and Windham Central Historic Districts as described in the application filings for Historic Status.
- Windham has many significant and iconic views within the Town. (Please see Chapter VI Part C for an inclusive list.)
- Views from locally designated scenic roads, as listed under Chapter VI of the plan, or as subsequently designated by the Windham Select Board.

Historic Districts, Sites and Structures:

Energy facilities, including wind systems and solar photovoltaic (PV) or thermal panels, that are located in the town's two designated historic districts, or on properties with federal or state-listed historic structures, are to be sited in accordance with current Secretary of the Interior's Standards for Rehabilitation, and the following:

- The historic character of listed properties and structures shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be prohibited unless they are required for health and safety reasons, as certified by a Vermont professional historic preservation expert and a Vermont health official.
- Ground installations are preferred to roof-mounted installations on historic structures. Ground installations, to the extent functionally-feasible, shall be installed in locations that minimize their visibility, such as a side or rear yard, and be screened from view of public rights-of-way and adjoining properties.
- Roof-mounted systems may be placed on new construction, non-historic buildings and additions.
- Solar panels and other roof- or wall-mounted structures shall not be placed on primary building facades, including street-facing walls or roofs, unless there is no other suitable location on the site or structure.
- Roof- or building-mounted systems on an historic structure shall not physically damage the structure, alter its character-defining features, including existing roof lines or dormers, nor obstruct significant architectural features such as overlaying windows or architectural detailing. Attachment points must be minimized and allow for future system removal.
- Roof-mounted Installations are to be placed below and behind parapet walls and dormers, on rear-facing roofs, where feasible. Panels should be mounted flush

with and at the same angle as the existing roof surface and, on flat roofs, set back from the roof edge to minimize visibility. They should not be visible above the roofline of the primary facade. Panels and mounting systems must be compatible in color to established roofing materials to minimize their visibility.

K. Windham Conditions for Energy Development

If allowed to proceed through a Section 248 application for any utility scale energy generation project, the developer, operator, landowner and their heirs and assigns shall provide a contingency plan to the Town that outlines mitigation action, in the event of unforeseen and unacceptable negative impacts from the project to the town, region and the residents. Such a plan shall be based on before and after assessments of impacts, including, but not limited to, the following issues:

- Resident Health and Safety including but not limited to air and water quality and noise that any commercial/industrial wind development project may have on Windham residents and/or property
- Air and water quality and noise impacts, pursuant to standards set forth under Chapter IV Air and Noise quality.
- Height restrictions set forth in Chapter IV.
- Fair and adequate financial compensation to Windham residents and/or property owners whose health and welfare are negatively affected by any commercial wind development project, e.g., sound-related or other health-related problems.
- Cultural, historic, and aesthetic impacts
- Impact assessment on the effect wind turbines would have on Windham's Historic Hamlets if they were visible to these Historic Hamlets.
- Property rights and values impacts
- Fair and adequate compensation to landowners and homeowners whose property values are negatively affected (decreased) by any Commercial/Industrial wind development project
- Fair and adequate compensation to anyone in Windham or surrounding towns who depends on Windham's headwaters for their drinking water if they should become imperiled as a result of construction related to energy generation siting of any kind.
- Hazardous materials contingency plan(s)
- Supplemental fire and rescue resources in the event of catastrophe
- A wildlife habitat assessment, including assessment of impact to migratory, resident and breeding avian and bat populations, and mitigation plans, if necessary.
- A rare, threatened or endangered species assessment, and mitigation plans, if necessary.
- Shadow flicker analysis (see Community Standards pages 62-67)
- An impact assessment for wetlands, seeps, springs, streams, ponds, and vernal pools, and mitigation plans, as appropriate under local, state and federal rules and laws.
- A visual impact assessment, including pre- and post-construction photo simulations of the project as seen under leaf-off conditions during the day and at night.
- Alternative sites analysis of tower locations within the site considering all criteria in Chapter IV.

- Adequate financial surety, either in cash or letter of credit, to repair damage to town and private roads and to stabilize the entire construction site during and after construction of the project, shall be provided. The financial surety must be provided to the municipality in the event that the municipality needs to conduct work to secure or remediate the stability of the soil and vegetation on the site, including any town and access roads, during or after construction. The Select Board with the advice of the road commissioner and planning commission will oversee this assessment.
- Sufficient decommissioning funds, kept in an escrow account associated with the property that is separate from the developer's general accounts shall be provided, so that the site will be restored to natural conditions when the project ceases to operate for whatever reason.
- Financial assistance to the town to pay for the hiring of qualified engineering, environmental, and legal consultants to assist the Town in reviewing state-level applications and permits, establishing local revenue agreements, and participating in permitting processes, and any other scientific experts and/or specialists, as needed.
- Any other matter (s) that becomes apparent due to the location of such facilities.

In framing these issues, we are mindful that the PUC operates under Section 248. We are also mindful of Windham's unique topography, character, settlement patterns and natural resources, including much of the region's public water supplies. The Town is not suggesting that monetary payments are adequate to compensate it or its residents for the destruction of our unique qualities and settlement patterns or the health and safety of our residents or of those who rely on our critical resources.

CHAPTER VI - HISTORIC, RECREATIONAL, AND SCENIC RESOURCES

The cultural resources of Windham include, but are not limited to the important historical structures and archeological sites; outdoor recreational resources; and significant scenic lands, vistas, and viewsheds. These attributes are considered to be the very essence of Vermont and the reason why many people find Windham to be a desirable place to live. The loss of these special areas diminishes the community's identity and ignores the needs of future generations.

Therefore, the protection and enhancement of these shared cultural and natural resources are vital community standards.

A. Historic Resources

Windham has an abundance of historic resources which contribute to the Town character and quality of life (see Utilities and Community Resources Map). Places of historic interest located in Windham include:

Windham Village Historic District - The Windham Village Historic District

received National Register designation in 1984.

South Windham Village Historic District - The South Windham Village Historic District received National Register designation in 1988.

Windham Meetinghouse - The Windham Meeting House was built by subscription beginning in 1802. It was finished some years later. This clapboard building with a slate roof is a dominant visual landmark in Windham Village. Uses of the structure include the Congregational Church, Town Hall, the Windham Library, the Windham Summer Day Camp program and a variety of community classes. The Meetinghouse is located in the Windham Village Historic District.

South Windham Church - The South Windham Church (presently occupied by the Valley Bible Church) was built in 1825. This church is an example of vernacular Greek Revival architecture that uses both brick and clapboard on the exterior. The recessed arcaded wall treatment is found in many domestic building types built throughout Eastern Vermont as far north as Chester between the years of 1814 and 1830. This church is in the South Windham Village Historic District.

Town Cemeteries - There are four known cemeteries in Windham that are maintained by private and public funds. They are Center Cemetery, North Windham Cemetery, West Windham Cemetery, and Woodburn Cemetery.

Existing Stone Walls - Stone walls are part of the fabric that ties Windham's landscape to its past. They are remnants of the agricultural society and were most commonly used for the purpose of subdividing property (boundary markers, field subdivisions, and livestock enclosures). Windham's stone walls are a part of the town's heritage and sense of place. Most walls lie on private property.

As noted above, both South Windham Village and Windham Village are listed on the National Register of Historic Places. This is the official list of cultural resources worthy of preservation in

the United States. While listing on the National Register honors the property by recognizing its importance to the community, there are few restrictions on private property owners in place that help to preserve these important structures. The State of Vermont has authorized the creation of locally designated Design Review Districts and Historic Districts as regulatory tools in the zoning bylaw. The creation of an overlay district in the 2019 Windham Zoning Regulations will help protect the neighborhood and community character by encouraging sensitivity to the architectural and historic resources that exist.

1. Town Policy

Policy 1: Promote historic preservation and development that enhances the historic resources of Windham.

Actions

1. Promote grant opportunities, in cooperation with community organizations, to continue to protect and preserve Windham's historic resources.

B. Outdoor Recreational Resources

The natural recreational resources of Windham are its waterways and forests. These areas provide fishing, hunting, hiking, cross-country skiing, wildlife viewing, and other activities. VAST (Vermont Association of Snow Travelers) maintains a network

of trails that run through town. The Town recognizes the importance of the variety of recreational resources, natural and manmade that currently co-exists in town. Special attention must be given to the unpaved rural road system, wildlife habitats, and water features.

The lands surrounding Cobb Brook are designated a Class A1 Watershed by the state of Vermont. There are two large tracts of forest in Windham. The Meadowsend Timberlands, LLC, Stiles Brook Tract, is located on the eastern edge of Windham, has numerous snowmobile and biking trails running throughout it. The property formerly known as the McGraw Family Partnership, LP properties on the western edge of Windham, was purchased in 2019 by the Nature Conservancy and is currently under conservation.

The focus for Windham's recreational resources must be on the preservation of and access to the Town's natural environment. The Town should be alert to future or upcoming changes that would limit public access to these large recreational resources and be prepared to negotiate for mitigation for any loss of access.

1. Town Policy

Policy 1: Preserve Windham's natural environment for outdoor recreation.

Actions:

1. Retain all existing town roads in order to provide rights-of-way for public access to recreational activities.
2. Continue to provide for natural and community resource benefits by protecting large contiguous parcels of land in the Forest District.
3. Investigate ways to ensure continued public access to significant holdings of land that are in private ownership, including, but not limited to, negotiation for mitigation of any loss of access.

C. Scenic Resources

The scenic resources of Windham are numerous and varied. Together, they form the pattern that has come to be associated with Windham's landscape. There are numerous excellent views and vistas available from many points in Windham. The following is a partial list of the scenic landscapes and views that contribute to the cultural resources of Windham. (See Utilities and Community Resources Map)

- From Route 121 at Lawrence Four Corners looking south toward the Village encompassing the wetlands east of Windham Hill Road (TH #1) and the west facing ridge.
- The view from the Windham Center down the valley toward the south, east, and west.
- The view of Windham Center and its historic buildings from any direction.
- The view of Burbee Pond and the undeveloped high elevation forest lands east face of Glebe Mountain from the vicinity of Burbee Pond Road (TH #24) and West Windham Road (TH #20) looking west and north.
- The view looking south from Golding Road (TH #19) encompassing the West Windham Valley and distant ski areas.
- The view of the West Windham Valley including Cobb Brook from near the intersection of West Windham Road (TH #20) and Toad Road (TH #22)

- looking in any direction.
- The view across the same valley as above from Toad Road (TH #22) looking east over Turkey Mountain Ridge.
 - The view of South Windham Village from Windham Hill Road (TH #1).
 - The view of South Windham Village and surrounding farmland from Old Cheney Road (TH #25) looking east.
 - The view from Old Cheney road looking west toward Turkey Mountain.
 - The view from Center Cemetery looking east to the Stiles Brook Ridge and west to Glebe Mountain.
 - View from Tater Hill Country Club in all directions.
 - The view from Chase Road, including Smith Farm and Lemay Farm.
 - The view from Timber Ridge looking in all directions.
 - Views from elevation 2,000 feet and higher from the main corridors looking up, e.g., from Windham Hill Road looking north and south and from Route 121 looking east and west.
 - The view from White Road toward the south.
 - The view from Hitchcock Hill Road toward the south.
 - Numerous views of Glebe Mountain and Turkey Mountain from along Windham Hill Road, Abbott Road, Wheeler Road.
 - Views of Stiles Brook area from Ingalls Road, Old Cheney Road and Corn Hill and Old Farm Roads.

This Plan encourages the use of residential and community scale solar, but any larger projects, not specifically prohibited in the Plan, shall be adequately screened to protect and preserve scenic views and values.

Windham's wetlands and water bodies, as well as ridgelines and hilltops and their upper slopes, are visible for great distances and give the landscape form and coherence. Open meadowlands provide contrast with the predominant forests, reminding one of the agricultural productivities of the past. Structures such as industrial wind generation towers are aesthetically incongruous with the scenic landscape and are prohibited.

Light pollution or "sky glow" is a problem that is facing many rural towns. The overuse of lighting can be harmful to the character of a town. It can also be detrimental to road safety (through distraction and glare), energy conservation, and wildlife interests. Development in Windham has been overwhelmingly residential in nature. Nonetheless, appropriate lighting must be designed to prevent private and public nuisances and protect property value.

1. Town Policy

Policy 1: Protect and enhance Windham's Scenic Landscapes and Resources.

Actions

1. Lands 2000 feet in elevation or higher in Forest Districts shall be left in their natural condition, free from all development, including roads, building structures, utilities, wireless broadcast telecommunications facilities, and industrial wind turbines (except camps as provided for in Chapter IX Land Use.)
2. Preserve & protect Windham's Scenic Resources (inventoried on page 70)

- that represent the Town’s scenic and cultural resources.
3. Enact a telecommunications ordinance to minimize the visual impacts of communication towers through co-location, design, siting, and color choice.
 4. Encourage the donation or sale of easements to public and private natural resource/conservation agencies and organizations.
 5. Buildings and structures should comport to the size and scale of existing buildings and structures to protect the historic scale, natural landscape, and sense of community. Under no circumstances shall any building be greater than 60 feet high, and no structure shall exceed 100 feet high.

Policy 2: Protect scenic landscape resources from sky-glow.

Actions

1. Reduce light pollution by using fixtures that direct light below the horizontal plane, utilizing energy efficient lamps, and using light levels appropriate for the use of the property.
2. Communication and other high elevation towers must be designed and sited so that they do not require night-time lighting.
3. Illuminate structures and exterior areas only at levels necessary to ensure safety and security of persons and property.

CHAPTER VII - TRANSPORTATION

The public road network in Windham consists of town highways and roads (see Transportation System Map). Windham can be reached from Windham Hill Road which connects with Route 30 in West Townshend; Route 121 which runs east/west through Town and connects Windham with its neighbors Grafton and Londonderry; and from a small section of State Highway 11 which runs through the northwest corner of Town. Several smaller roads also enter Windham from neighboring towns.

The State of Vermont has developed a classification for Town Highway Mapping and Inventories, maintenance schedules, and State aid. Class 1 roads are those highways that are the responsibility of the town, but are also extensions of the state highway system. Class 2 roads serve as main corridors between Windham and other towns. Most Class 2 roads are paved. Class 3 roads are comprised of secondary town highways that are passable year-round by standard vehicles. Class 4 roads are all other town highways. Typically, Class 4 roads are seasonally functional for normal vehicular traffic and have a dirt surface.

The State of Vermont Highway Map classifies Windham’s public roads as follows:

Table 12: Mileage Summary of Town Highway/Roadway

<i>Class</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Total Mileage</i>
Town Roadways	0	9.2	22.8	1.1	33.1
State Highways					.4

Total					33.5
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(Source: State of VT Highway Map, 2009)

The Windham Highway Department maintains the roads within Town. There are two people employed by the Highway Department, including the Road Foreman. The section of State Route 11 that runs through Windham is the responsibility of the State’s District #2 personnel.

Many residents and visitors use the existing street system for walking, bicycling, jogging, and horseback riding.

Windham’s side roads off Route 121 and Windham Hill Road are narrow dirt residential roads. All are tree lined, often with canopies, and many have old stone fences adjacent to the roadway. They are not to be widened or straightened for any commercial purposes. Notwithstanding the prohibition of industrial scale wind development contained in the Plan, in the event of approval by the Public Utility Commission of an industrial scale wind development on the Stiles Brook Tract or Glebe Mountain, access to the site by large transport vehicles is prohibited on Class 2 and 3 side roads and permitted only off Routes 11 and 121.

A. Facilities and Equipment

The Town maintains its road equipment at the Town Garage located on Windham Hill Road. A covered salt and sand shed, built in 2000, is located on site. There is a reserve fund to assist in the planning for the purchasing of new equipment for the Highway Department.

Although some improvements have been made to the town garage in recent years, including adding a door and some insulation to the office area, the facility is not fully adequate. The building is in need of external paint. It would also be useful for a third bay to be added which is large enough to work on equipment indoors during cold weather. Additional insulation and space for a bathroom also would be helpful.

B. Road and Bridge Infrastructure

In 2003 and again in 2011 (Tropical Storm Irene) heavy flooding devastated many roads and culverts in Windham. Several of the Class 2 and Class 3 roads were washed out due to culvert inadequacy. Damaged or collapsed culverts have been replaced and one bridge replaced according to state mitigation standards. Roads and bridges are maintained according to established state standards in order to guarantee safe and efficient passage.

C. Local Roads Policies

The Selectboard is responsible for the maintenance and repair of public roads in Windham. It is the policy of the Selectboard to not take over new roads. In order for private roads or driveways to access town roads the Selectboard must issue an access permit. Applicants must adhere to driveway design standards which follow the State’s

recommended standards. www.aot.state.vt.usa/standards.

All Windham roads are built and maintained to the standards of the State of Vermont. Windham does not enforce design standards for private roads. The Selectboard authorizes the grading of Class 4 roads on a yearly basis and oversees the placement and maintenance of culverts throughout town. None of the roads in Windham have been designated for use by ATVs.

D. RSMS/Culvert Inventory

In 2012 the Windham Regional Commission assisted the Town with a culvert inventory and an associated map. Culvert locations are based on Global Positioning System (GPS) data. This inventory can serve as a helpful management tool to keep track of additions or deletions to the infrastructure and to plan for, and schedule, maintenance and repairs. Windham presently uses the Road Surface Management System, or RSMS, to develop and update an inventory of road surface conditions. This software is most helpful in prioritizing roadway surface improvement and paving projects.

E. Public Transit

Windham, being a rural town, does not have any mass transportation systems, however, transit service is provided by Southeast Vermont Transit. The Current, a division of SEVT based in Rockingham, provides regular bus service for 30 towns along the Connecticut River and in southern Vermont. SEVT also provides van service for disabled and elderly citizens and can help arrange volunteer rides to medical appointments. The Windham Congregational Church provides transportation to Windham residents for both medical, such as doctor's appointments, and non-medical reasons. The Londonderry Volunteer Rescue Squad is available for emergency medical transport. Windham has one certified first responder (EMT) and frequently publicizes the need for more.

F. Town Policies

Policy 1: Maintain a safe and functional public road system that respects the integrity of the natural environment.

Actions:

1. Enforce existing standards for road construction and maintenance. Continue to review sight distance when issuing access permits.
2. Shoulders should be widened when upgrading or reconstructing Windham Hill Road
3. New subdivisions shall not be permitted to have individual driveway access for each unit on a town highway. Collector roads or common driveways shall be constructed in order to prevent strip development.

4. Continue budgeting for highway department needs.
5. Periodically update the culvert inventory and conduct a road inventory.
6. The Town shall not take over private roads.
7. Consider reducing speed limits on Windham Hill Road in the Town Hamlets (South Windham and Windham Center)

Policy 2: The Town shall not discontinue any roads without first consulting the Planning Commission and Conservation Commission to make a finding that no public benefit exists.

Actions:

1. Research town roads and make a list of those roads which should be retained because a public benefit has been determined.

Policy 3: Protect the physical features that contribute to the scenic and rural character of roads in Town.

Actions:

1. Conduct an inventory of scenic roads in Windham and establish management guidelines to protect the distinctive features located in the right-of-way, such as road surface and width, canopy trees, and stone walls.

Policy 4: Support Vermont's Comprehensive Energy Plan and actively strive to meet the Transportation Fuel Switching Target goals for Windham under Act 174.

Actions:

1. Publicize community and public transit options available to Windham residents in the Windham News and Notes publication.
2. Encourage ride share and carpooling opportunities, and encourage the Windham Community Organization (WCO) to organize multiple shoppers to join together to make trips to distant shopping locations.
3. See Chapter V (Energy) of this plan for additional policies and action steps related to reducing Windham's carbon footprint due to transportation.

CHAPTER VIII - HOUSING

An adequate supply of year-round housing that offers varieties of size, cost, and location is essential to the economic and social health of Windham. Communities benefit when employees are able to live close to their workplace, young adults are able to buy or rent in their hometowns, and elderly residents are able to remain in the community where they have family, friends, and history. Also, housing represents an opportunity for Windham to practice and promote energy conservation and efficiency. The Town, working closely with the Energy Coordinator, will proactively promote information/education initiatives centered on conservation practices for home heating, transportation and electrical usage.

A. Existing Conditions

Windham is a quiet rural residential community. The 2010 Census reported that there were 501 total housing units broken down by category in the table below.

Owner Occupied Housing Units	234
Seasonal/Occasional Use	210
Renter Occupied Units	40
Vacant Units	17

Most new development has occurred along road frontage and has been built on a lot-by-lot basis as opposed to a large subdivision. Trends since 1990 include a substantial increase in year-round owner and renter-occupied units.

The rate of new housing construction has varied. Town records indicate that 4 zoning permits were issued for new houses in 2005. This compared to 9 zoning permits in 2004, 13 in 2003, and 3 in 2002. Since 2010, the rate has been relatively stable at 2-3 new home permits per year.

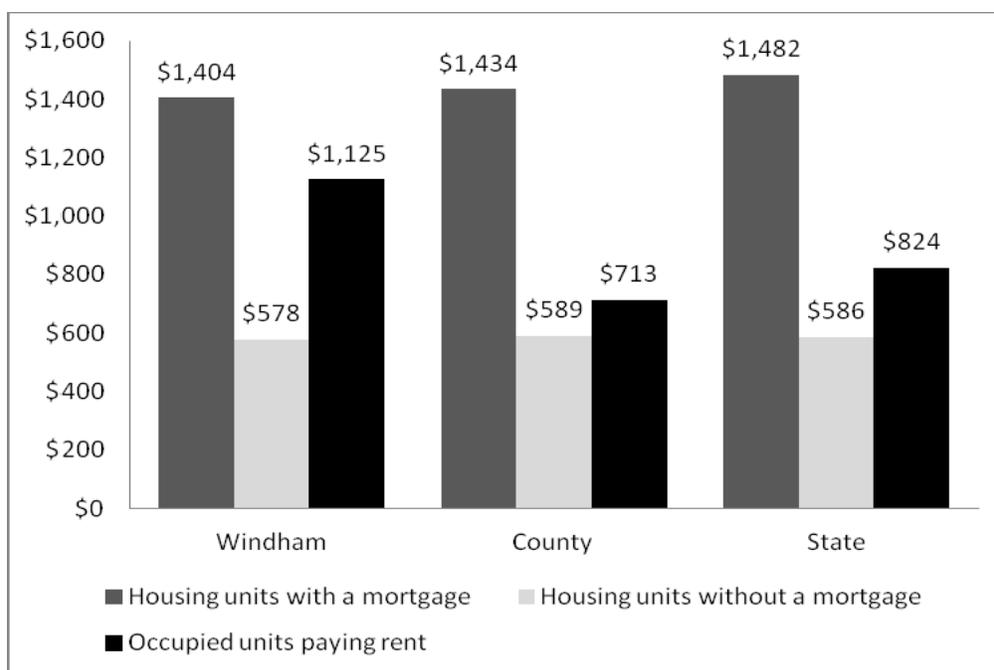
The town has a minimal supply of rental housing. Information from the 2010 Census showed that there were 40 occupied rental housing units at that time and 17 total vacant units. Based on a 2000 sample of 20 occupied rental housing units, all 20 units were single family homes. Forty-five (45) percent of the units were built prior to 1950 with none of the occupied rental units being constructed in the last 10 years. The Town's Zoning Regulations does provide for accessory units (also known as in-law apartments) to be constructed within or appurtenant to a primary single-family residence. Prior to 2005, these units were restricted to family members only; however, state law was revised to take away this requirement.

1. Special Needs Housing - The special needs population for the purposes of this plan includes single parent households, physically and mentally challenged persons, and the elderly. In addition to requiring certain services that differ from a typical single-family household (i.e., physical accessibility, assisted living), these groups tend to fall into a lower income category.

There is no project-based rent-subsidized housing available in Windham. This is housing in which the subsidy is attached to a particular unit. The neighboring towns of Londonderry and Chester both have subsidized elderly and disabled housing units.

2. Housing Affordability - Affordable housing is defined as housing that is owned or rented by its inhabitants whose gross annual income does not exceed 80% of the county median income and housing costs should be no more than 30% of a household's income. For rental housing this includes rent and utilities. For homeownership this includes mortgage (principal and interest), taxes, and property insurance. The median monthly housing cost for renters and homeowners in Windham is illustrated in Figure 3. Windham generally follows the trends that are occurring at both the state and county level.

Figure 3: Median Monthly Housing Costs in 2010



(Source: 2006-2010 American Community Survey 5-Year Estimates, Windham, 2008-2010 American Community Survey 3-Year Estimates, County & State)

According to Vermont Housing Data, from 2000 to 2004, housing values and prices increased in Windham as in the rest of Vermont as the median price of primary residences that were sold rose by nearly 200%. The Vermont Department of Taxes Property Transfer Return Report listed the median sales price in 2004 for a residential home on less than six acres in Windham as \$239,000.

Over the next several years, the median purchase price of a house in Windham has steadily declined, as shown by the following figures from the equalization study for Windham, Produced by the PVR department of The Vermont Department of Taxes:

- 2008 - \$235,786
- 2009 - \$232,929
- 2010 - \$181,179
- 2011 - \$198,000
- 2012 - \$192,816
- 2013 - \$160,000
- 2014 - \$115,000
- 2015 - No Data
- 2016 - \$163,750
- 2017 - \$165,000
- 2018 - \$165,000

From a high of \$235,786 in 2008, the median price dropped more than 30% to \$163,750 in 2016 and has leveled off at \$165,000 for the last two years. The significant drop in 2014 to \$115,000 is either an anomaly, or possibly an error in the recorded data, and there is no data available for 2015. Housing trends are cyclical in nature, and are often a reflection of the relative strength of the national and local economies. Strong, stable economic conditions and low interest rates

ordinarily translate into a correspondingly strong real estate market.

In 2002 the Vermont Housing Awareness Campaign stated, “ in order for housing to become more affordable, home prices would need to fall significantly, interest rates would need to stay low, and Vermonters would need to see increases in their income”. As we can see from the above data, housing prices have come down 30% over the last 10 years. Mortgage interest rates have been below 5% for a 30-year fixed mortgage for more than 5 years, and are presently at or near historic lows. However, wages for Vermonters have been very stubborn to rise, and is the one factor that has not really cooperated with what Vermonters and the Vermont Housing Awareness Campaign would like to see. Consequently, housing affordability remains an issue for many Vermonters.

Property tax is another important factor affecting housing affordability in Windham specifically, and in Vermont as a whole. Over the last 20 years the Education Tax has grown to the point where today it represents nearly 75% of the total Property Tax, and is the single biggest contributor to overall property tax increase. Property taxes for most Windham residents have increased 300 – 400% since 1999.

Reasonable home prices and property tax rates, as well as good education options are fundamental to attracting younger families to settle in Windham.

Housing affordability is in part addressed through the activities of non-profit agencies in the area. Windham and Windsor Housing Trust provides affordable rental housing to low- and moderate-income households, including families and individuals, persons with disabilities or special needs, and the elderly. The Trust can also provide income-eligible homebuyers with a subsidy towards the purchase of a qualifying home. In addition, homebuyers under this program have access to below market rate mortgages as well as financial assistance with closing costs. The Land Trust is committed to preserving the affordability of housing in perpetuity by conveying parcels of land to individual homeowners through long-term land leases. Southeastern Vermont Community Action Agency (SEVCA) provides referrals to area shelters, landlord lists, and assists individuals in completing applications for affordable housing possibilities.

Windham does have a Housing Rehabilitation Program. The program is designed to benefit elderly, handicapped, and income-eligible homeowners with rehabilitation activities. It is a revolving low-interest loan program. The Citizen's Advisory Committee administers the program and puts all interest and principle back into the fund to keep loans available in perpetuity. Applications are available at the town office.

B. Location of Residential Development

According to the Vermont Department of Aging and Independent Living, Vermont Population Projections 2000-2020 (August 2003), Windham was projected to have 416 people by 2020. In 2017 Windham’s actual population was at 487 according to the U.S. Census Bureau, so our population is already 17% higher three years before the 2020 projection. There is a sufficient amount of land that is not unduly steep (slopes of 20%

or greater) that likely has soil suitable for on-site wastewater management, and that is located outside of the Forest District to accommodate additional housing growth associated with the projected population growth.

There are certain locations that are more appropriate to handle residential growth than others (see the Future Land Use Section). Higher density residential development should occur in the historic settlement areas of South Windham and Windham Center. The Forest Districts are not appropriate areas for residential development because the purpose of these areas is to provide for forestry uses while protecting large, contiguous areas of timber and wildlife and water resources. Due to the remote nature of the Forest Districts, residential development in these areas may serve to increase municipal expenses and therefore is generally discouraged.

C. Future Housing Needs

Windham must continue to address the need for affordable housing in the town. As with other towns located near vacation and resort areas, the availability of affordable housing has become a problem for Windham. During the past 20 years, second home construction has boomed in this area, generally increasing the prices of real estate. Even when those second homes become available for year-round resident housing, many of them have been renovated or enhanced, and the eventual sale price is likely to be higher than a local family can afford. This imbalance makes it very difficult for local families to find adequate, affordable housing or land on which to build. An exception to this is Timber Ridge where high density ski resort seasonal homes are being converted to year-round residences and are relatively affordable.

In addition, the median age of residents of Windham is increasing. In 2010, the median age was 49.6, and in 2017, the median age is 56.1 (U.S. Census Bureau). To the extent that older people are able to live on their own and not need significant care, their housing needs are not significantly different than the rest of the community. There is a noticeable increase in the special needs of older people. The ability for an elderly person to stay in their home depends on connections to the community and available services.

D. Town Policies

Policy 1: Support a range of residential development to meet the diverse housing requirements of Windham, especially those of low and moderate incomes.

Actions

1. The Zoning Bylaws permit accessory dwelling units as required by state statute enacted. Make information available to the public so that homeowners are aware of their ability to create an accessory dwelling unit.
2. Make information available to the public so that homeowners are aware the Zoning Regulations conditionally permit multi-family housing in the Hamlet, Recreation/Commercial, and Rural Residential districts.
3. Support the efforts of non-profit housing organizations, such as Windham and Windsor Housing Trust, and private developers to implement

opportunities for affordable housing in Windham, including housing that meets special needs populations, such as the elderly or the handicapped.

Policy 2: Preserve the natural resources and rural qualities of Windham by siting new housing so as to respect the existing natural environment and preserve the greatest amount of open space.

Actions

1. Review Windham's existing Zoning Bylaw and make changes that encourage additional diversity of housing types including the following:
 - a. Promote housing development within the historic settlement areas of South Windham and Windham Center (designated as Hamlets in the Land Use Section of this Plan). Consider allowing smaller lot sizes to promote clustering and shared septic systems.
2. Encourage, through Planned Unit Development provisions in the Zoning Bylaw, creative site design which minimizes development costs while preserving natural resources and open land. Provide a density bonus in the Planned Unit Developments in the Zoning Bylaw.

Policy 3: Support homeownership and property upkeep efforts of citizens.

Action

1. Continue to promote the Housing Rehabilitation Program and other options for owners to rehabilitate housing structures so that they are safe and sanitary and more energy efficient and can remain active in the town's housing inventory.

Policy 4: Continue to promote the benefits of energy conservation & efficiency to preserve our environment among both new and current Windham homeowners and potential developers.

Action

1. Offer information in the Town Office pertaining to energy assistance initiatives e.g.; SEVCA and Efficiency Vermont (EfficiencyVermont.com)
2. Provide information on those initiatives in the Windham News and Notes community newspaper.

CHAPTER IX - LAND USE

A. Existing Land Use

Windham's patterns of land use are clearly defined by the Town's existing transportation network and elements of the natural environment. The Town is situated in a high mountain valley. A portion of the western edge of Town has substantial areas of level topography and areas that are dominated by shallow soils.

Development in Windham has been overwhelmingly residential in nature. Most of this residential development is located along Windham Hill Road or on unpaved secondary roads. It is generally characterized as scattered, low-density single-family development. There are pockets of more dense residential uses in Windham Center,

South Windham and near the former Timber Ridge Ski Area. Because residential properties in Windham do not have public sewer systems, residences tend to be located where soils are more suitable for individual wastewater disposal systems.

Other development in Windham consists of public and semi-public land uses and commercial uses. Public and semi-public land uses include schools, churches, and municipal government. With the exception of the Windham Elementary School, these uses are concentrated in the historic settlements of South Windham and Windham Center. A few commercial enterprises (bed and breakfasts, Tater Hill Golf Club) have been established in Town, though they are scattered and do not represent sufficient contiguous area to be considered as a separate existing land use for the purposes of this section of the Plan.

Forested land, most of which is undeveloped, is the predominant land cover in Windham. Overall, forested land covers nearly 15,610 acres, representing approximately 93% of the Town. Approximately 6% of land cover in Windham is classified as open space. These open spaces, some of which are in agricultural use, are primarily located along the roads of Windham, as shown on the Existing Land Use/Land Cover Map that is incorporated into this Plan. The Natural Resources chapter of this Plan contains a further discussion of forestry and agricultural uses in Windham.

B. Future Land Use Plan

The following land use districts shall provide the basis for municipal land use regulations. While the zoning regulations specify use and dimensional standards for each district, the Town Plan sets the foundation. The locations of the districts are represented on the Future Land Use Areas Map that is incorporated into this plan.

1. Forest

Windham has designated four Forest Districts. They are located in areas of steep slopes and contiguous forest. The land is characterized by the absence of development or improved roads. The following are the general description of the Forest Districts:

- the eastern slopes of Glebe Mountain and the Cobb Brook watershed
- the land area of the Stiles, Willie and Howe Brook watersheds that lie between Windham Hill Road and the Town's eastern boundary;
- the area located in between Popple Dungeon Road and White Road in the northeastern portion of Town; and
- the land around Turkey Mountain.

The purpose of the Forest Districts is to provide for forestry uses while protecting large, contiguous areas of timber and wildlife/natural resources. Appropriate uses in the Forest Districts include agriculture, commercial forestry, maple sugaring and other forest uses (i.e., education, research, etc.) and seasonal camps. Industrial and commercial uses (other than forestry) are prohibited on all land above 2000 feet in elevation in Forest Districts. Mineral extraction is permitted only for private, non-commercial, on-site use in designated portions of the Forest Districts. Uses such as single-family dwellings, and non-intensive recreation may be allowed on land below 2000 after careful review by the Windham Planning Commission to ensure that the viability of the timber resources or

wildlife habitats will not be jeopardized. See Zoning Regulations Section 207 for uses prohibited and Sec. 201.7 for permitted and conditional uses in High Elevation Resource Protection areas. The minimum lot size shall be 27 acres.

2. Hamlet

South Windham and Windham Center are classified as Hamlets. These two areas represent distinct nodes of development with the following elements that are characteristics of these historic rural settlements: residences, government services, small businesses, civic uses, and fairly dense development when compared to the rest of the Town. The purpose of the Hamlet is to continue the historic development pattern of Windham by encouraging high density and mixed-use development. The principles to be followed in the governing of land use in the Hamlet include:

1. Retain the mixed-use zoning that already exists in these areas;
2. Remove barriers to multi-family housing development in the Hamlets;
3. Encourage community-scale commerce, e.g., general store;
4. Provide for a balance of communal open space and structures; and
5. Preserve the historic character of the Hamlets.

Appropriate uses in the Hamlets include residential dwellings, home industries and businesses, personal services, and professional offices. See Zoning Regulations Section 207 for uses prohibited. Lot sizes should be small so long as the capacity of the soil to handle wastewater is not exceeded and the required well isolation distances can be met. The goal is to encourage a compact pattern of development in the Hamlet.

3. Rural Residential

The Rural Residential area comprises areas which are already committed to rural development, are easily accessible from the existing road system, or which appear capable of being developed at a low to moderate density. Some of the lands in the rural residential district have slight to moderate physical limitations to development.

The purpose of the Rural Residential areas is to accommodate low to moderate density development that is consistent with existing land uses and sensitive to the limitations of the land. Residential uses and accessory uses (including home businesses or industries) are permitted.

Multi-family housing increases Windham's mix of housing types and is supported in the Rural Residential area. Non-residential uses, including service businesses, professional offices, and inns are acceptable land uses for the Rural Residential area provided that such uses are planned to be relatively small in scale; are not primary or dominant uses in the area; do not unduly conflict with existing or planned residential, forestry, or agricultural uses; and do not unduly affect rural character. In order to prevent commercial development that may be inconsistent with the rural character, consideration should be given towards developing rural standards that deal with size, scale, and development standards (i.e., no lighting, limited parking, soft surfaces, visual screening, etc.). See Zoning Regulations Section 204 for uses prohibited. Road construction should be carefully planned so as to respect the natural environment and to promote the clustering of houses on appropriate sites. Long roads, whether public or private, should be designed to serve more than one property.

4. Recreation-Commercial

The Recreation-Commercial areas are comprised of lands within the former Timber Ridge Ski Area that were formerly occupied by the original base lodge, accessory structures, ski slopes, and parking areas, as well as the Tater Hill Golf Course and some of the adjacent parcels. The purpose of the Recreation-Commercial area is to allow the development of commercial recreation facilities and commercial enterprises that are ancillary to recreational uses. Compact development is desired in this area to protect open spaces and to prevent a linear pattern of development.

Appropriate uses include dense residential development and recreational facilities. Other uses such as personal service, retail stores, restaurants, and hospitality-commercial uses such as inns and bed and breakfasts may be allowed after further development review. See Zoning Regulations Section 204 for uses prohibited. The minimum lot size shall be one acre with a density of one dwelling unit per lot. Higher densities should be allowed for development of multi-family housing.

5. Resource Protection Areas

Resource Protection areas are defined as the areas with special natural resources that contribute to Windham's rural character. They include, but are not limited to, areas within the Rural Residential areas that contain productive farmland, wetland chains, and significant wildlife areas or crossings. Also included are the Town's scenic areas (Chapter VI part C) as well as fragile resources that are significant resources within the Town including lands above 2000 feet in elevation in Forest Districts, headwaters, watersheds and aquifers. In order to sustain Town and region's health and safety, and Windham's rural character, as well as fish and wildlife habitats, these landscapes must be preserved so that future generations can benefit from the natural resources environment that currently exists in Windham.

6. Town Policies

- Policy 1:** **Preserve the character, scenic landscape and environmental well-being of Windham through the designation of distinct zoning districts.**
- Policy 2:** **Preserve and protect Windham's headwaters and watershed areas as a high priority to help ensure the health and safety of the town and area residents.**
- Policy 3:** **Require that all development decisions, especially those involving land in the forest districts, at higher elevations and near surface water resources contain a review of possible stormwater runoff consequences for downstream settlements in Windham and neighboring Towns.**
- Policy 4:** **Regulate land use activities to ensure compatibility with the purposes of the districts.**

Actions

1. Maintain the Forest District for the purpose of protecting large contiguous forest land and natural and community value. To this end:
 - a. Consider whether future changes to the Forest District boundary are required.

- b. Maintain provisions in the Zoning Bylaw that limit permitted uses within the Forest District to agriculture, forestry, individual recreational hunting and fishing camps, seasonal or occasional use camps, and accessory uses to the permitted uses on the same lot.
 - c. Maintain an overall density of one unit per 27 acres.
- 2. Maintain the Hamlet Districts for the purpose of continuing the areas of historic, high density, mixed use development. To this end:
 - a. Consider whether future changes to the Hamlet boundaries are required.
 - b. Maintain a mix of the following or like uses in the Hamlet Districts: residential, personal service, professional offices, bed and breakfasts and inns, government/community services appropriate in scale.
 - c. Review site design, parking, lighting, setbacks and related standards for development within and create standards that will protect and enhance the scale, pattern and character of development that defines the Hamlets.
 - d. Maintain a maximum density of one unit per acre.
 - e. Investigate feasibility of putting sewer system in the Hamlet Districts to encourage business development.
- 3. Maintain the Rural Residential District for the purposes of encouraging low density development, encouraging continued agricultural and forest management, continuing the historic residential settlement pattern of Windham. To this end:
 - a. Continue to permit a mix of rural land uses, including agriculture, forestry, outdoor recreation, housing, and home businesses. Continue to conditionally permit a range of low-impact commercial uses such as retail, bed and breakfasts, inns, repair shops and other similar uses.
 - b. Evaluate the existing density of one unit per acre and lower the density if deemed necessary.
- 4. Maintain the Recreation Commercial District to promote development of commercial recreational facilities and support consistent uses around the Tater Hill Golf Course and the former Timber Ridge Ski Area.
 - a. Maintain a minimum lot size of 1 unit per acre (1/2 acre for planned unit developments).
 - b. Continue to conditionally permit a mix of commercial uses that include recreational facilities, garage and gas stations, restaurants, retail stores, and similar uses.
 - c. Consider amending the planned unit development standards to allow for greater density than 1 unit per acre.

Policy 5 Require that development projects integrate natural features and resources so that the losses of these are minimized.

Actions

- 1. Revise site plan review standards to ensure that overall site design is consistent with the purpose and character of the district within which a development is located. Standards and conditions should emphasize those considerations related to the internal layout of the site, the physical design,

- and the functional integration of the site with surrounding properties and uses.
2. Evaluate land uses that may require special considerations due to their scale, intensity or potential impact to neighboring properties or fragile features (e.g., timber harvesting, telecommunication towers, small-scale residential wind energy systems) and create specific performance standards that relate to site design and operation.

Policy 6: Encourage the maintenance of open land in order to provide a diversity of habitat.

Actions

1. Educate landowners about the purpose and provisions of the newly created High Elevation Resource Protection Overlay.
2. Site structures to fit into the natural characteristics of the land, maintain vegetative buffers along scenic roads and parcel boundaries, and site development on the edge, rather than in the center, of open fields.
3. In order to preserve contiguous forest blocks and maintain wildlife corridors, evaluate areas suitable to provide connections between the Forest Districts and inventory property owners' interest in including their land in a Forest District and/or working with the Vermont Land Trust or other organizations or agencies to preserve open space in perpetuity
4. Educate landowners on various ways to preserve scenic resources and open space.

Policy 7: Provide sufficient distance to development and populated areas to preserve and protect community health and safety, natural resources, fragile areas, ambient noise levels, air and water quality and property values.

Action

1. Any proposed development in the town shall be evaluated relative to the maps included in this Plan (Chapter XIV) with particular attention to those depicting settlement patterns relative to topography, steep slopes, watersheds, wetland and vernal pools, headwaters, earth resources, land use and view sheds.
2. Town Selectboard and Planning Commission will undertake educational and out-reach efforts with counterparts in downslope communities regarding the implications of any potential developments in Windham which will impact headwaters or watershed areas.

Policy 8: Investigate non-regulatory means of protecting natural and scenic resources, wildlife habitat and Recreational trails (VAST).

Action:

1. Investigate purchase of Meadowsend lands as a town resource or by organizations as the Nature Conservancy or Vermont Land Trust.

Policy 9: Revitalize existing farms.

Action:

1. Consider Tax credits for leasing land to bring it back into production.

Policy 10: Utilize the maps of forest blocks and habitat corridors to comply with Act 171.

Action:

1. Utilize the maps of the forest blocks and habitat corridors develop a future

CHAPTER X - ECONOMIC DEVELOPMENT

A. Objective

Windham's objective is to maintain and sustain its traditional, small-scale business orientation and residential community character while encouraging economic enterprises which are appropriate to those traditions.

B. Economy

Windham is a small, rural residential community comprised of 419 residents and 26 square miles and is one of the smallest towns in the Windham Region. The 2010 Census indicates

Windham's population has grown 28% since 2000. This growth is primarily due to conversion of part-time residents to full time and to the construction of a few new residences in recent years.

The town has long had a high percentage of second home to permanent residences. The 2010 Census reported approximately 198 seasonal homes and 167 owner-occupied, full time residences. There has been a 33% increase in the number of owner-occupied non-seasonal residences between 2000-2010.

The town is characterized by its remote geography, rugged terrain and high percentage of forest cover. These traditional aspects of Windham life encourage an emphasis on locally owned, independent small businesses. The 2010 Census shows 139 total workers, 93 (67%) of which work in one of 10 nearby towns while 18.6% of the town's workforce works at home.

Both Windham Center and South Windham at one time had small general stores, but both were closed by around 1950.

C. Commercial Businesses

Today Windham is home to a variety of small businesses including a bed & breakfast, property rentals, seasonal caretaking, electrical contracting, small engine repair and sales, carpentry services, home construction and remodeling services, house painting, timberframe construction and restoration, excavation services, landscape maintenance, floor finishing, plumbing, firewood, woodstove and chimney servicing, logging, forest management and professional water quality testing. If high speed internet can be made available throughout the entire town, other home-based businesses, including consulting in marketing and communications, recruiting, foreign language translation, website development, and telecommuting will become more likely. There is at least one artisan candle maker and a well-respected producer of hand-dyed wools from local sheep.

Tater Hill Golf Course, owned and operated by Okemo Mountain Resort, is an 18 (eighteen) hole public golf course with a pro shop and on-site restaurant. Tater Hill has been managed by Okemo Mountain Resort since 2004 and was recently expanded from 9 (nine) to 18 (eighteen) holes.

Timber Ridge (formally an independently owned, local ski area) has been closed as a commercial enterprise and is expected to maintain this status. Recently, however, they have begun to host an annual, charitable, musical event known as The Friendly Gathering Music Festival which attracts several thousand people. Since there are no

retail businesses in Windham there is little direct economic benefit to the town from such events, but the organizers have received the support of town officials in permitting and regulating the event; and there is some benefit to businesses in adjacent towns.

The town is in the process of assuming full ownership of the Meeting House now that it no longer is used by active church congregation. It remains to be determined whether the Meeting House can occasionally be used for commercial purposes. The future of the Windham Elementary School remains tenuous. Enrollment is low and although the town avoided a forced merger with a larger unified educational district this year, it is not clear that the school will be able to continue to operate independently. It is possible that the town will purchase the school if it ceases operation. Should that happen, the facility might be usable for some commercial purpose.

D. Farming

There are several small farm operations in Windham including: two commercial hay operations (Corriveau and Dutton), an apple orchard (Dutton), a small perennial nursery (Griffin), a sheep and cattle operation (Partridge) and a small cooperative dairy (Merinoff). As is typical in small, rural towns in the region, many households have vegetable gardens and chickens, and several families in town raise pigs for their own use. Windham has a demonstrated commitment to local agriculture as evidenced by the participation of its citizens, as both vendors and buyers, in the local farmers market in West Townshend and Londonderry.

E. Forestry

Although 95% of Windham's land area is forested and almost ten thousand acres are concentrated with two large owners, the economic impact on the town of forestry as an industry is difficult to measure. There is a total of 55 Windham properties enrolled in the State's Current Use Program in 2019 to help ensure responsible management of this resource.

One private enterprise and one private nonprofit conservation organization currently own and manage sizeable forested areas in the Town of Windham. These areas are owned, in absentia, by Meadowsend Timberlands LLC (referred to locally as the Stiles Brook Tract) to the East of town and The Nature Conservancy, which owns much of the land on Glebe Mountain to the West. Meadowsend Timberlands LLC is a New Hampshire company primarily engaged in the hardwood lumber industry and owns or manages other large tracts in Vermont and New Hampshire. Conservation and protection of the lands and waters entrusted to it is the main mission of The Nature Conservancy.

Vermont has no provisions at the town level for either permitting or reporting on logging activities in terms of the nature, volume or value of timber harvested. The County Forester gathers data which is summarized and reported on a county-wide basis. It appears that relatively little of the logging in Windham's woodlands is done by Windham residents. The direct economic impact of forestry as an industry is therefore virtually impossible for the town to accurately measure.

Windham values our heritage as a community rich in forest resources, and is committed to working with landowners to insure sustainable land and timber

management practices.

F. Town Policies

Policy 1: The town prohibits any commercial or industrial operations on lands 2000 feet in elevation or higher in Forest Districts other than forestry and will not support any commercial or industrial activity that exceeds the capacity of its public infrastructure including emergency response assets.

Policy 2: The town will encourage economic development activity that also will preserve the natural environment that has long characterized the area.

Actions:

1. Continue to encourage the startup and support of small businesses appropriate to the rural and isolated nature of the area.
2. Foster and encourage the development of cottage industries (home-based businesses) which are in keeping with and preserve the rural character of Windham and have no negative impact on its environment and infrastructure.
3. Identify and actively promote the opportunities for internet-based businesses and telecommuting services which can be made possible by the availability of high-speed internet.

Policy 3. The town will identify, publicize and support existing local businesses.

Actions:

1. Encourage Windham residents to support and participate in the West Townshend Market, which, although located in West Townshend, is owned by Windham landowners. The West Townshend Market has created a location where community baking and local farm produce are offered and where a small dairy co-operative is starting up. They also operate a popular thrift shop and host regular events.
2. Encourage the reissuance of the Windham Directory of Skills, Knowledge and Services available from residents and property owners. This is a means of letting residents know what services are available from members of the immediate community.

Policy 4: The Town will work actively to develop a vision for Windham's future which will include economic development that is scaled appropriately and protects the town's natural resources.

Actions:

1. Encourage the formation of a representative local task which will follow up on the work already begun on Community Values Mapping in conjunction with the VT Fish and Wildlife Commission. Articulate a vision of Windham's future which includes promoting Windham as a place friendly to entrepreneurs interested in creating businesses that harmonize with our Town Plan and community values.

Policy 5: All commercial and industrial development must adequately control its wastes, including noise and light pollution and stormwater runoff, relate satisfactorily to existing land uses, and not result in the degrading of valued views and vistas.

Actions:

1. Permit only types of economic development that protect and enhance the traditional assets of Windham. Development which will create excessive noise,

light pollution, large traffic volumes, and hazardous wastes or damage air purity and quality or degrade scenic views shall be prohibited.

CHAPTER XI - IMPLEMENTATION

The Windham Town Plan is a comprehensive guide concerning the manner in which the town wants to accommodate future growth as well as maintain the features that make the community special. Implementation of the Town Plan is a local responsibility and must be accomplished through a continued commitment on the part of the community. This Plan will be used to form the framework of the Planning Commission's work during the duration of the Plan.

Zoning regulations are the most common method of implementing and enforcing the policies and programs set forth in a town plan. This Town Plan provides direction for zoning changes and the Windham Planning Commission will evaluate these policies and recommendations to propose changes as necessary. We are mindful that it is State policy, that if an Act 250 commission in researching findings whether a proposed project is in conformance with a duly adopted local plan, finds applicable provisions of the Town Plan to be ambiguous, the district commissions, for interpretative purposes, shall consider bylaws, but only to the extent that they implement and are consistent with those provisions. For interpretative purposes, other state agencies such as the Agency of Natural Resources, Public Service Board, Department of Public Service, and VTrans, should also consider the Town bylaws if they believe there is any ambiguity in the Plan.

Many of the Actions are, in and of themselves, a way to implement this Plan. Furthermore, the Town will:

1. Participate in regional and state planning activities such as Act 250 hearings and Section 246 and 248 Public Service Board hearings.
2. Participate in any reclassification hearings involving waters in the Town of Windham.
3. Hold quarterly meetings of all town officers to facilitate communications on issues and matters of mutual interest.
4. Continue to maintain a central filing system for all town records and publish in one booklet all town ordinances, regulations and standards.
5. Plan in advance for the expansion or creation of those town facilities or services which will be required by future development.
6. Improve understanding of and compliance with town ordinances and regulations.
7. Continue education of the town officers through organizations as the VLCT.
8. Implement this plan by example.
9. Coordinate planning with surrounding towns.
10. Consider the Town Plan when designing public work budgets and capital improvements.
11. Encourage citizen involvement.
12. Continue to encourage participation in workshops and seminars to update and expand knowledge of all facets of town government.
13. Seek grants as a means for funding actions discussed in the Town Plan. State

funding opportunities include, but are not limited to, Municipal Planning Grants, Community Development Block Grants, VTrans Transportation Alternative Grants, and Vermont Recreational Trails Grants. In addition, there are several private foundations and federal government entities that finance projects.

CHAPTER XII - COMPATIBILITY WITH OTHER PLANS

Windham shares borders with the Windham County towns of Grafton, Jamaica, Londonderry, and Townshend as well as Andover and Chester in Windsor County. When Vermont's Growth Management Law, Act 200, was passed in 1988, Vermont set up a system for communities to work in concert with their neighbors, and with agencies of state government, to shape the future. This chapter seeks to examine the development patterns as proposed in the Windham Town Plan with those proposed in the neighboring Towns.

A. Compatibility with Neighboring Town Plans

1. Grafton

The entire eastern boundary is shared with the Town of Grafton. The Grafton Town Plan designates the area along the border with Windham as primarily Conservation lands with the area along Route 121 as Rural Residential. On the Windham side of the border, the land is designated as Forest with Rural lands along the Route 121 travel way.

2. Jamaica

The Town of Jamaica shares much of Windham's southern boundary. Windham Hill Road, Old Cheney Road, West Windham Road, and Under the Mountain Road lead into Jamaica. The Windham Town Plan designates three land use areas along the border: Rural Residential in West Windham and surrounding South Windham; Hamlet in South Windham; and Forest along Turkey Mountain. Jamaica has designated the area bordering West Windham and South Windham as Rural Resource with the remaining land area as Conservation. The Jamaica Town Plan describes Rural Resource as areas suitable for low-density residential development that protects the resource value of the land. Windham is advocating for denser development in the historic settlement area of South Windham.

3. Londonderry

Windham shares a boundary with Town of Londonderry to its west. Most of the boundary is dominated by Glebe Mountain ridgeline, which both towns value as a natural resource as well as a scenic resource. The area on Glebe Mountain has been identified by Londonderry as Resource Conservation the purpose being the protection of significant forest areas, scenic resources, headwaters and Class A streams and wildlife habitat at higher elevations. Further to prevent the development on ridgelines, steep slopes, and shallow soils and in areas with poor access to public roads, municipal services and commercial centers. Windham's designation as Forest is compatible with Londonderry's desired land use. Windham and Londonderry also share a boundary along Route 11. Some of this area has been designated as

Residential in Londonderry. Similarly, Windham has designated a portion of that boundary area as Rural Residential.

4. Townshend

The southeastern tip of Windham is adjacent to the Town of Townshend. The only road access directly from one town to the other is along Chase Road. Townshend has designated the area along the boundary as Resource Land. Windham has designated some of the lands as Rural Residential with a Resource Protection Area overlaying Chase Road. A portion of the land has also been designated as Forest.

5. Andover

The majority of the northern boundary of Windham is shared with the Town of Andover. Route 11, Howard Hill Road, and Christmas Tree Road travel into Andover. Andover has designated the lands bordering Windham as Forest, with the exception of the area around Tater Hill. Windham has designated a portion of the land surrounding the Tate Hill Golf course as Recreation-Commercial with the remaining lands as Rural Residential and Resource Protection Area overlay. The proposed land use designations recognize that commercial development has occurred in the Tater Hill recreational area of both Andover and Windham. Windham, in this area, is proposing to allow the development of commercial recreation facilities and commercial enterprises that are ancillary to recreational uses while at the same time advocating for compact development to protect open spaces and prevent a linear pattern of development.

6. Chester

A small area in the northeastern corner of Windham borders the Town of Chester. Popple Dungeon Road links the two towns. In Windham, this small area is designated as Rural Residential along Popple Dungeon Road with a small area designated as Forest. Chester has also designated the area along Popple Dungeon as Rural, recognizing the area as already having small residential parcels, but designates the balance as Forest recognizing the importance of contiguous forest areas for wildlife habitat as well as recreational use and encouraging development to be clustered to maximize forest preservation.

B. Compatibility with Windham Regional Plan

The Regional Plan is intended to provide guidelines for the planning and coordination of change and development which will, in accordance with present and future needs and resources, best promote the health, safety, and welfare of the citizens of the Region. The Windham Town Plan supports and complements the land use and development goals of the Regional Plan.

The 2006 Regional Plan identifies the “valley” lands as Productive Rural and Rural Residential lands. The Regional Plan categorizes the lands on the eastern slopes of Glebe Mountain, West Windham, Turkey Mountain, and the Stiles Brook tract along the eastern boundary of the Town as Resource lands. The Town believes that its proposed land uses are compatible with the Regional Plan.

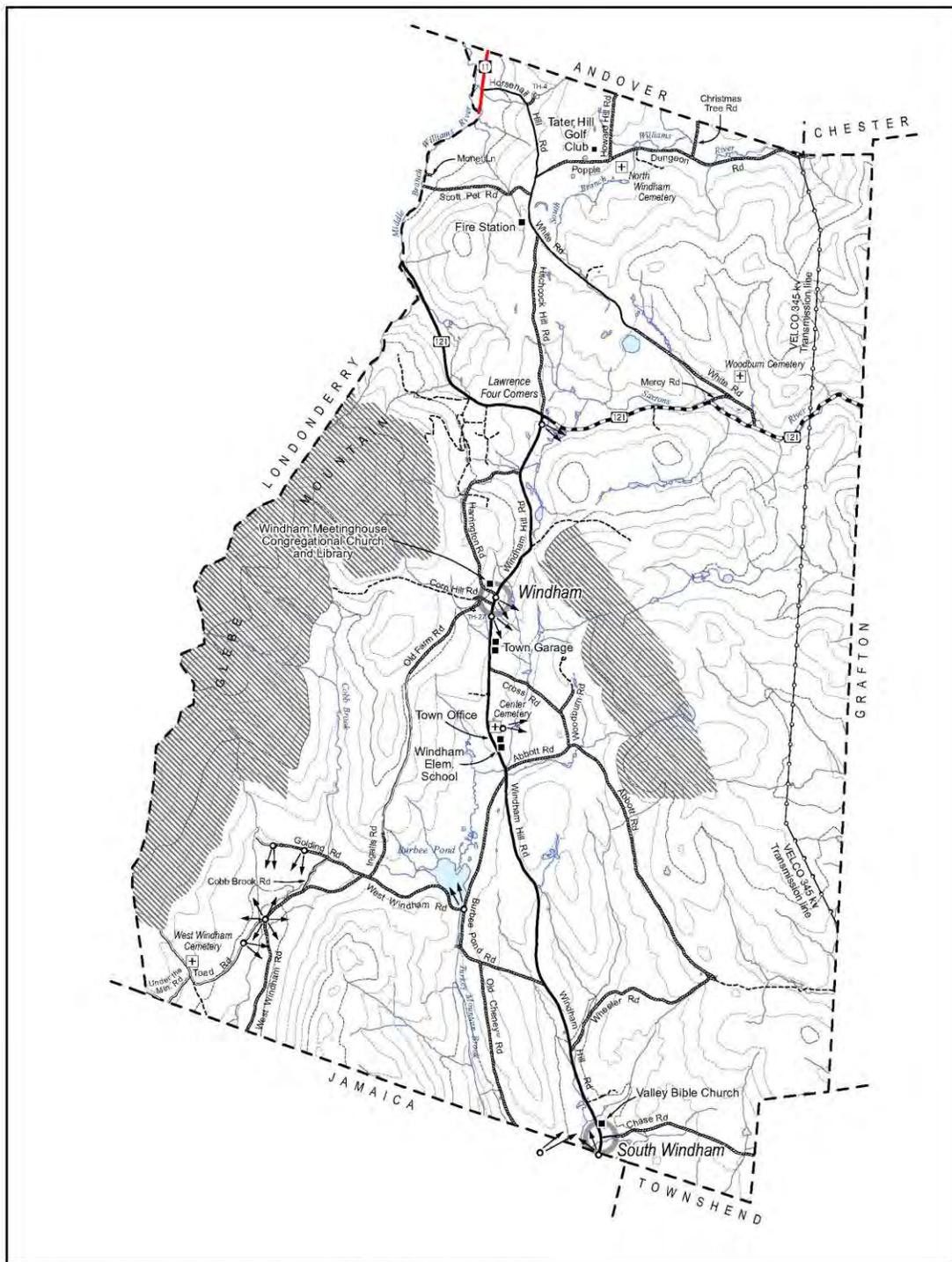
CHAPTER XIII - SEVERABILITY

If any provision or portion of a provision of this plan is held to be invalid or unenforceable, all remaining provisions, or portions thereof, and the application of such provisions shall not be affected thereby, and shall remain in effect.

CHAPTER XIV - TOWN PLAN MAPS

A series of maps has been prepared to assist planners, public officials and citizens to understand Windham and to assist in the planning process, and governmental and business decisions. These maps are for planning purposes only. The policies and actions, and associated narrative discussions in the body of the Town Plan prevail as the guidelines for the Town's future growth.

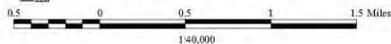
Map 1.	Utilities and Community Resources
Map 2.	Earth Resource
Map 3.	Watersheds
Map 4.	Natural Resources
Map 5.	Transportation System
Map 6.	Existing Land Use/Land Cover
Map 7.	Future Land Use
Map 8.	Streams and Wetlands
Map 9.	Steep Slopes
Map 10.	Patterns of Settlement vs. Topography
Map 11.	Possible Constraints for Energy Generation
Map 12.	Possible Constraints for Energy Generation 2 of 2
Map 13.	Known Constraints for Energy Generation
Map 14.	Solar Resource
Map 15.	Wind Resource
Map 16.	Solar Energy Potential
Map 17.	Wind Energy Potential
Map 18.	High Elevation Resource Protection Overlay
Map 19.	Resource Protection Area 1
Map 20.	Resource Protection Area 2
Map 21.	Zoning Districts
Map 22.	Forest Blocks and Connectors



Utilities and Community Resources

Town of Windham, Vt.

July 2007



- Cemetery
- National Register Historic District (not actual extent)
- Electric transmission line
- Scenic view
- Prominent ridgeline
- 100-foot contour (approximate)

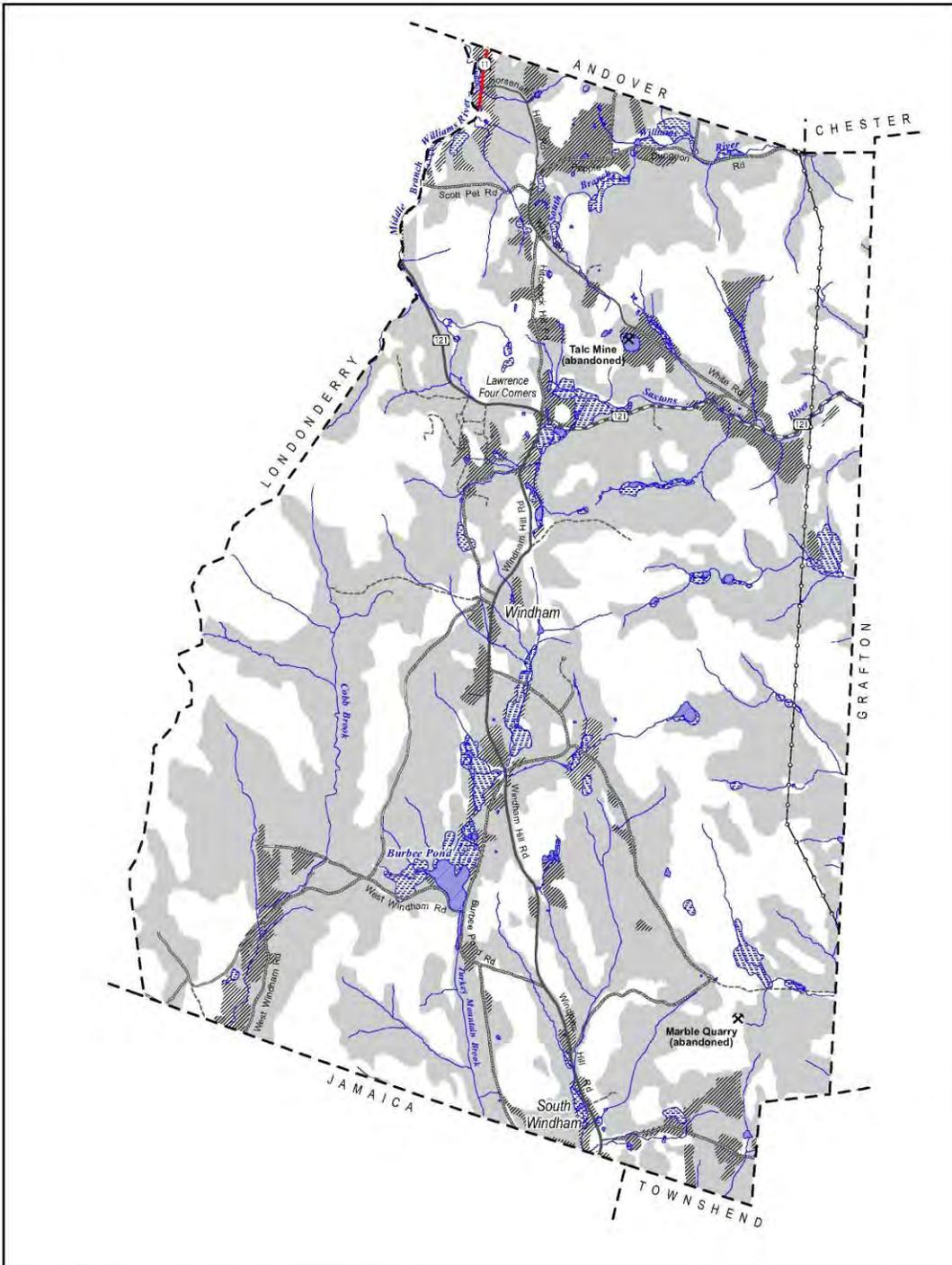
- Stream
- Lake or pond

Source:

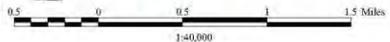
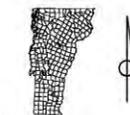
Community Resources were identified by the Windham Planning Commission and data created by WRC GIS staff using 1:5000 orthophotos, 1:25,000 USGS topographic maps, and Windham's GIS parcel data.

July 2007; C:\Town\Windham\TP_CommRes.mxd

Map 1 Utilities and Community Resources



Earth Resources
Town of Windham, Vt.
 March 2006



- Mine/quarry
- Important farmland soil (see data notes)
- Soil with Forest Productivity Class of Site I (see data notes)
- Wetland
- Stream/river
- Pond

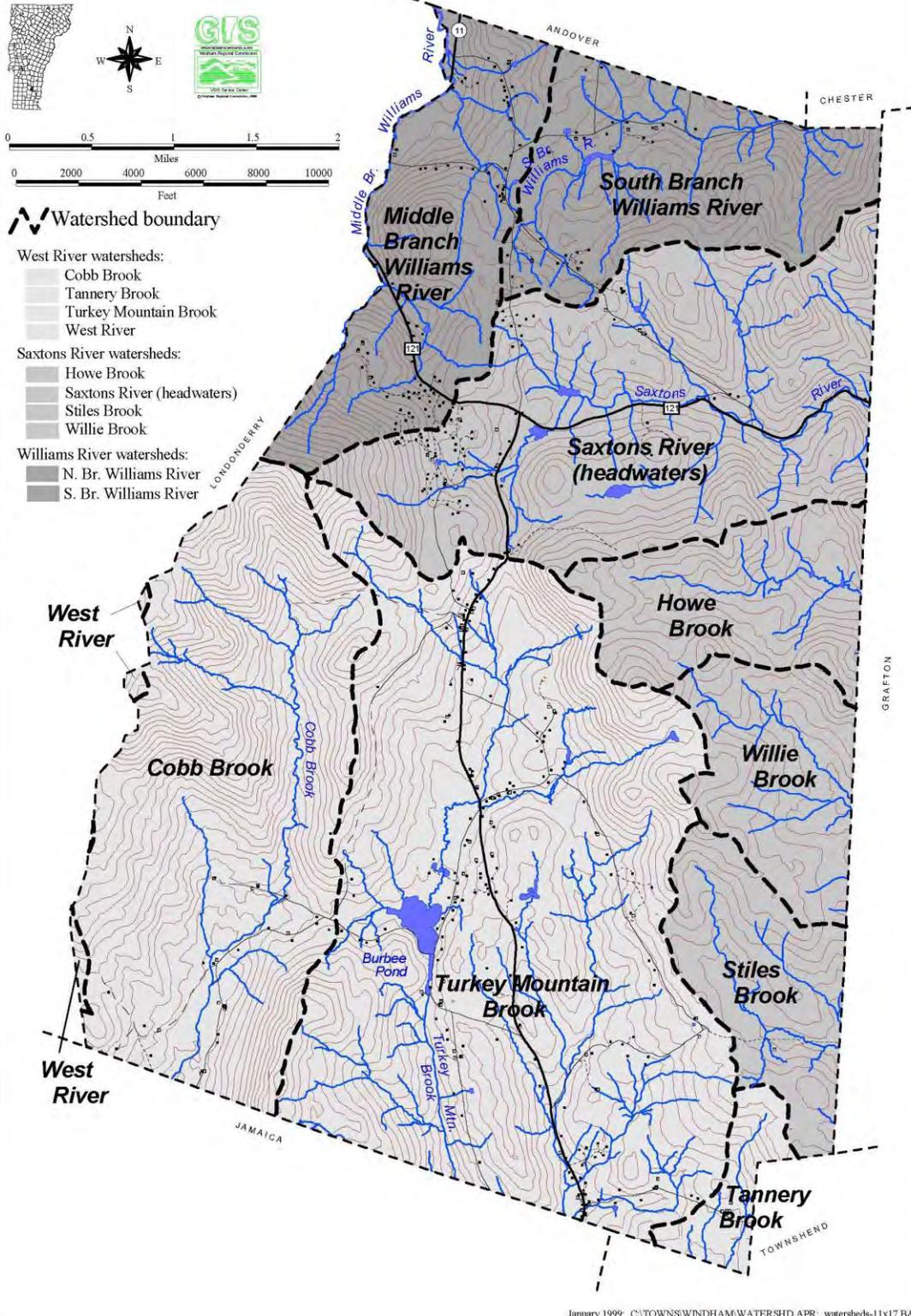
Sources and data notes:

- Soil data are from VGIS data and are based on the Windham County Soil Survey.
- Forest productivity classes are based on the productivity of the land for forestry. Each class includes a range of potential productivity per acre per year. Site I soils are the most productive at greater than \$3 cubic feet per acre per year.
- Important farmland soil delineations are derived from soils data. These soils qualify as Primary Agricultural Soils under Act 250.

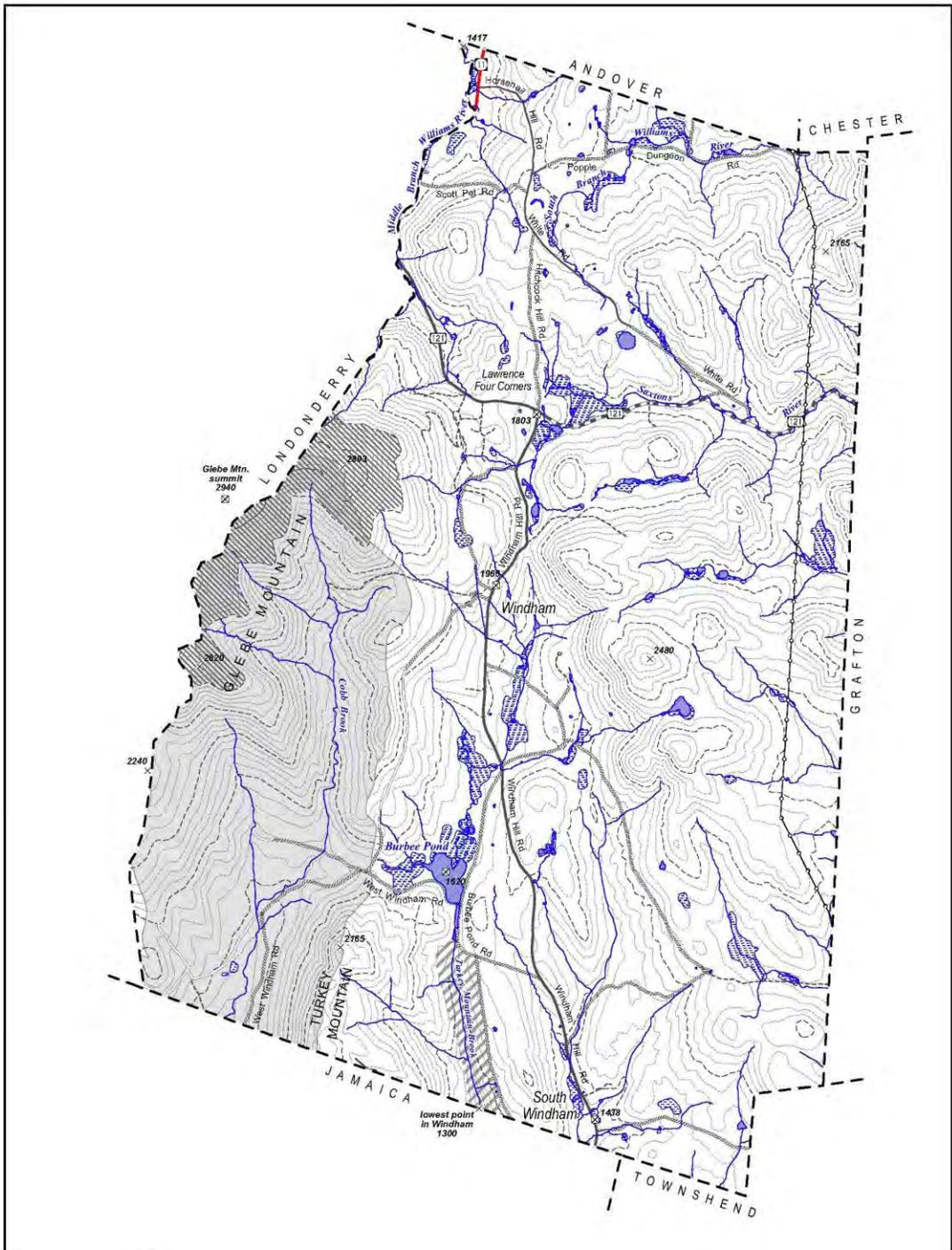
March 2006; C:\Town\Windham\TP_Earth_11x17.mxd

Map 2 Earth Resources

Town of Windham, Vermont Watersheds



Map 3 Watersheds



Natural Resources

Town of Windham, Vt.

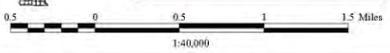
March 2006



- 1603 Bench mark or spot elevation in feet
- 2480 Elevation in feet, approximate (within 20 feet)
- 50-foot contour (approximate)
- Land over 2500 feet elevation
- Deer wintering area
- Class A(1) watershed (Cobb Brook)
- Wetland
- Stream/river
- Pond

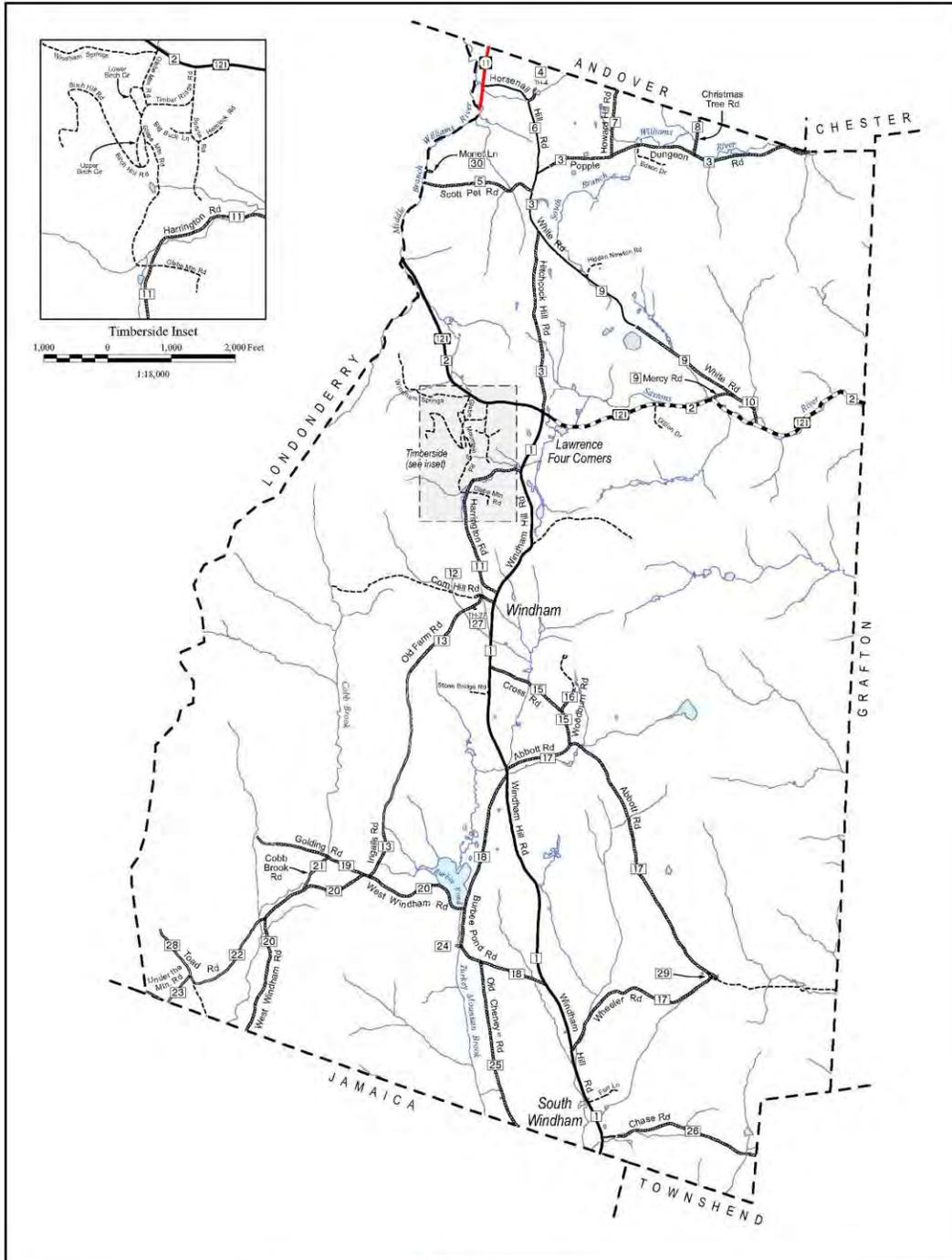
Source:

- Surface waters are from the Vermont Hydrography Dataset (VGS) data layer (SWaterways).
- The watershed of Cobb Brook is classified as a Class A watershed by VT ANR, Division of Water Quality. The watershed boundary was delineated and digitized by WRC staff using 1:25,000 USGS topographic maps.
- The wetlands shown are those included in the Vermont Significant Wetlands Inventory (VGSIS data layer VSWI), which depicts the approximate locations of wetlands that are generally 3 acres or larger in size.
- Deer wintering areas are taken from the VGSIS data layer DEERWN released in April 1997.
- Lands over 2500 feet in elevation were digitized by VTANR from 1:24000 USGS topographic maps.
- Contour lines were generated from USGS 1:24000 Digital Elevation Models by WRC. They are intended to portray the general topography of the area and should not be used to determine actual elevations.



March 2006, C:\Towns\Windham\TP_NatRes_11x17.mxd

Map 4 Natural Resources



Transportation System

Town of Windham, Vt.

March 2006



- State highway (paved)
- Class 2 town highway - paved
- Class 2 town highway - unpaved
- Class 3 town highway - paved
- Class 3 town highway - unpaved
- Class 4 town highway (unpaved)
- Town highway number
- Private road/drive
- Streams
- Lake or pond

Note: class 4 town highways may be impassable to automobiles

Sources:

Town highway data are from Vt. Agency of Transportation sources (VGIS data layer R3State) and were developed by digitizing 1989 1:5000 orthophotos and from GPS line collection for Enhanced 3-1-1. Data were corrected by WRC GIS staff in 2003 using digital orthophotos and information provided by officials from the Town of Windham.

Surface waters are from the Vermont Hydrography Dataset (VGIS data layer SWater). The dataset was generated at a scale of 1:5000 and was developed using digital orthophotos, topographic maps, color infrared, aerial photography and other ancillary data sources.

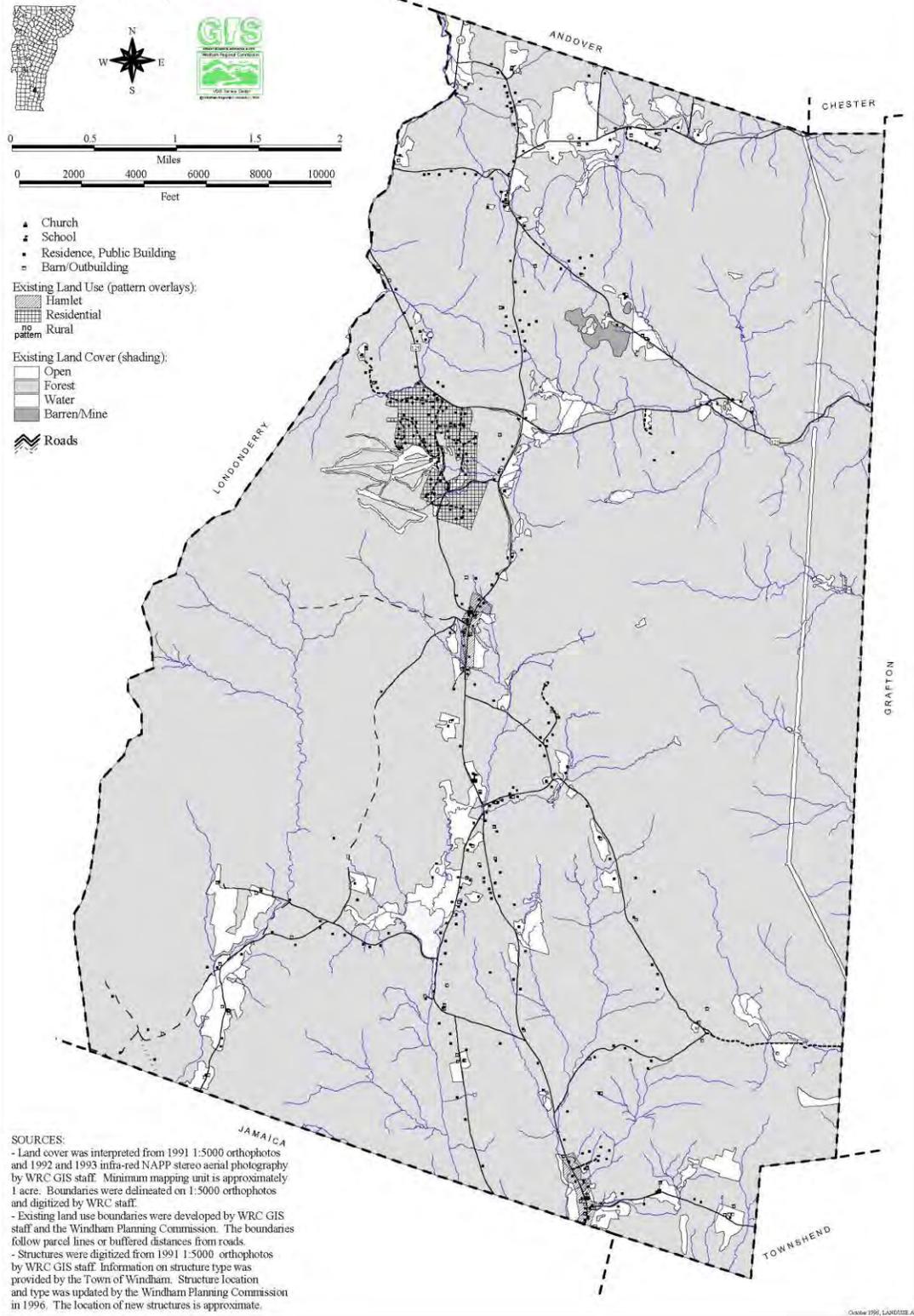


March 2006
c:\Town\Windham\Map\TP_Town_11x17.mxd

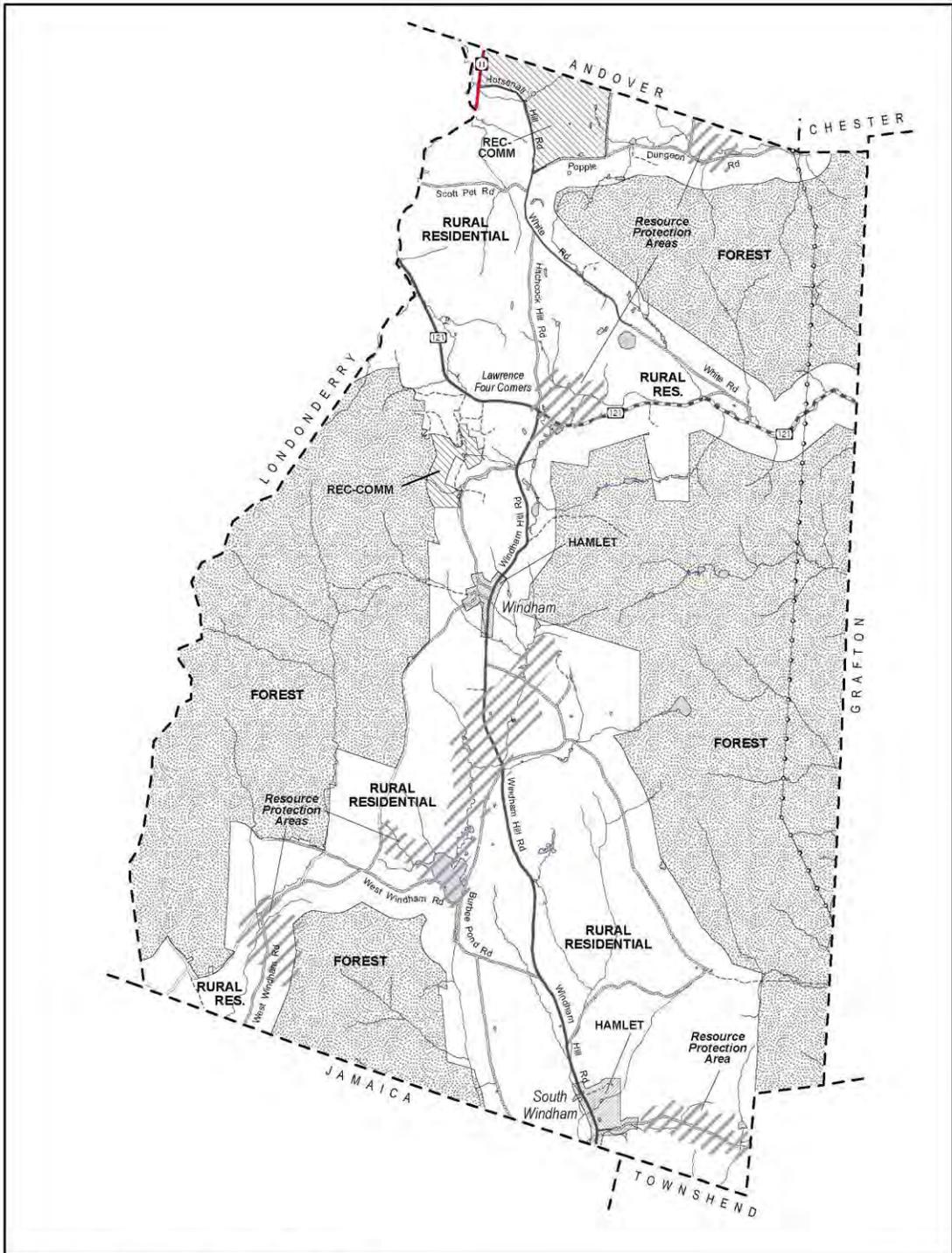
Map 5 Transportation System

Existing Land Use/Land Cover Windham, VT

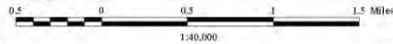
NOTES:
 - This map should be used for planning purposes and general reference only.
 - A large scale color version of this map is available at the Windham Town Office.



Map 6 Existing Land Use/Land Cover



Future Land Use Areas
Town of Windham, Vt.
 March 2006

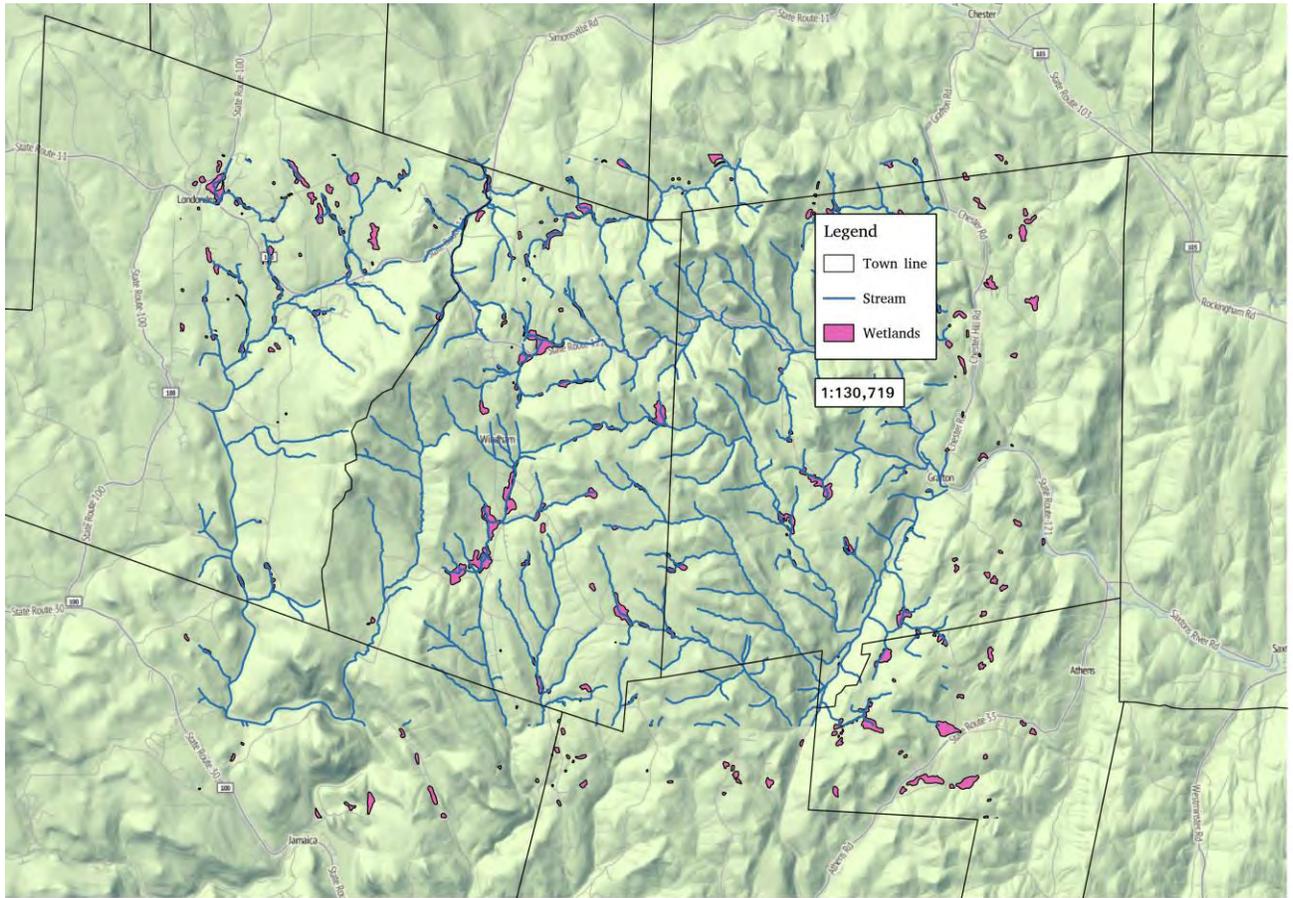


- Recreation-Commercial
- Hamlet
- Rural Residential
- Forest
- Resource Protection Area overlay

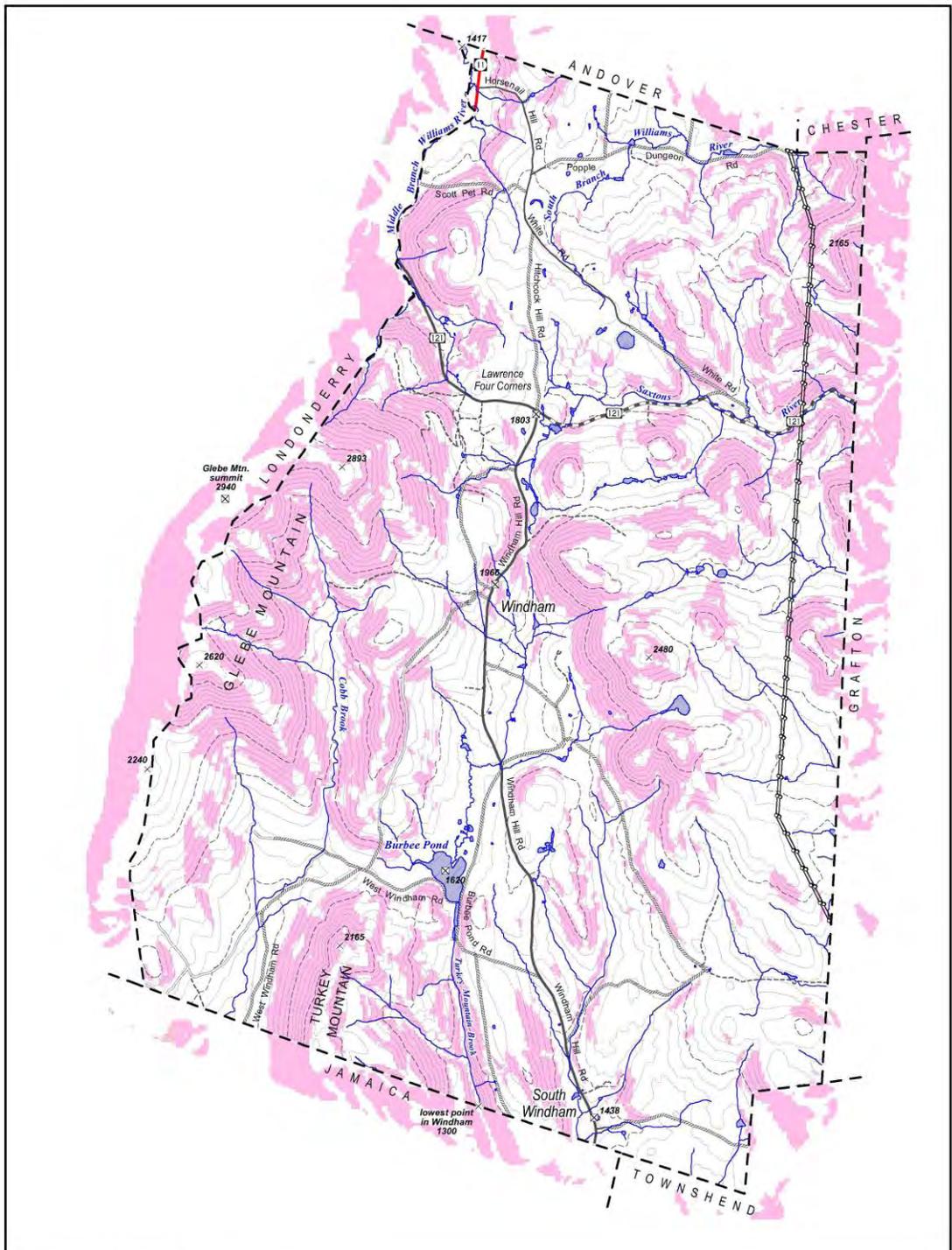
Source:
 Future land use areas were designated by the Town of Windham. Lines were created by WRC using existing roads and parcel data.

March 2006, C:\Town\Windham\TRP_FLU_11x17.mxd

Map 7 Future Land Use Areas



Map 8 Streams and Wetlands



Steep Slopes

Town of Windham, Vt.

June 2013

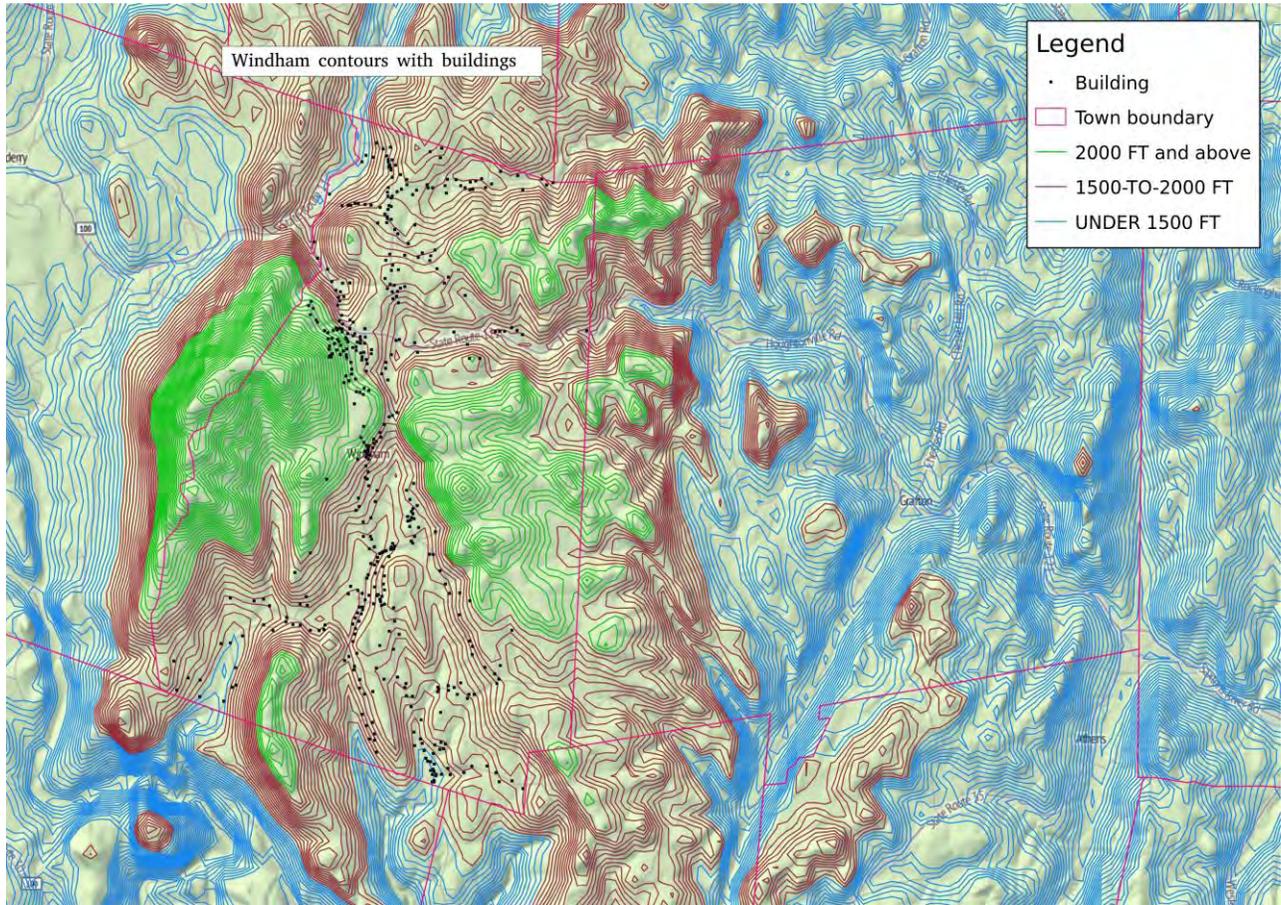
- less than 20%
- 20% and greater
- 1893 Bench mark or spot elevation in feet
- 2480 Elevation in feet, approximate (within 20 feet)
- 50-foot contour (approximate)
- Stream/river
- Pond

Sources:

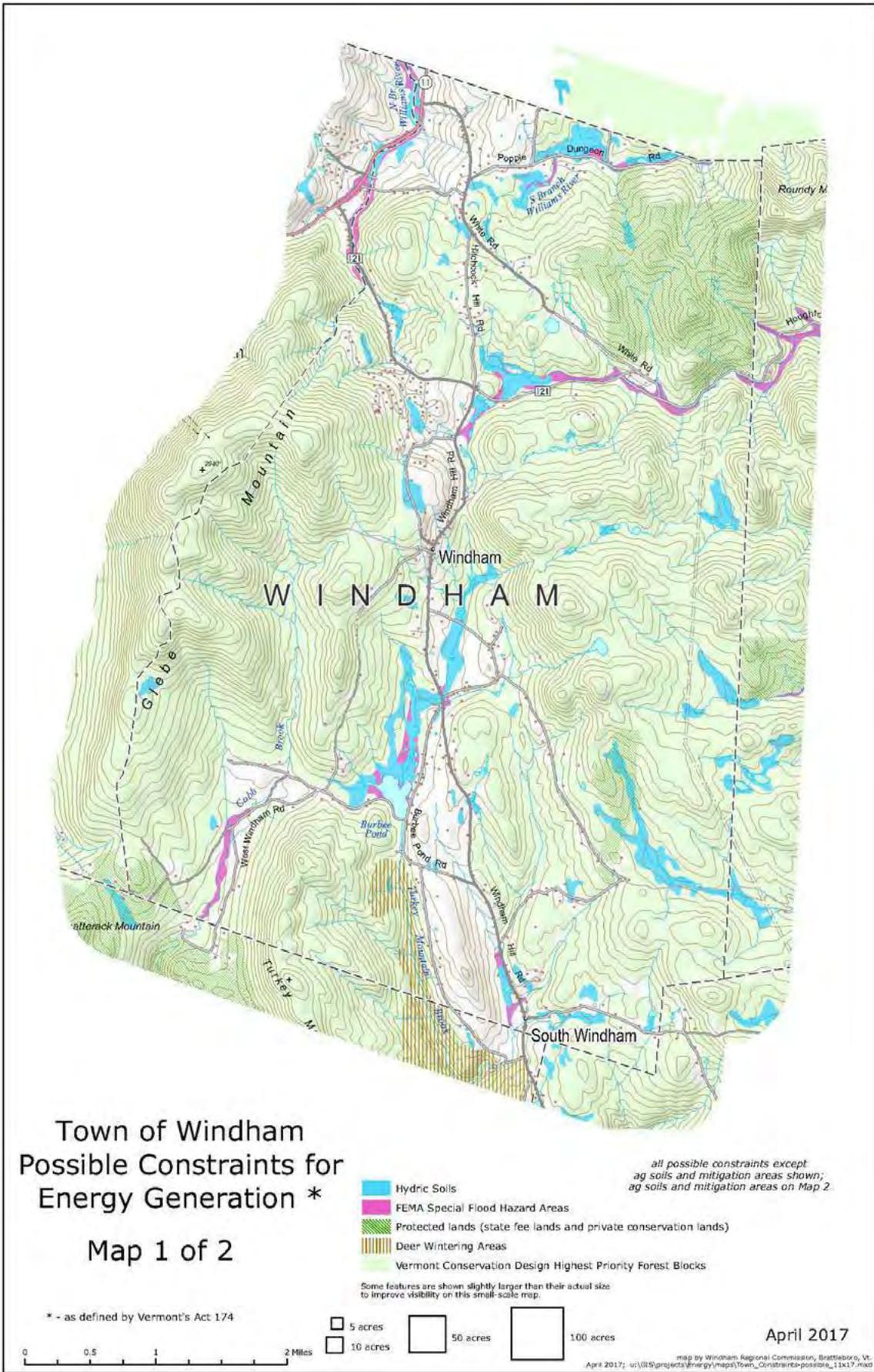
- The source of slopes derived from soils is GIS data based on the NRCS Windham County Soil Survey. Small portions of soil mapping units used to create the slope classes may contain slopes less than, or greater than, the stated slope class.
- The source of slopes derived from elevation data are USGS 1:24000 Digital Elevation Models.
- Contour lines were generated from USGS 1:24000 Digital Elevation Models by WRC. They are intended to portray the general relief of the area and should not be used to determine actual elevations.
- Elevation points were derived from USGS topographic maps.

March 2013; C:\Town\Windham\Slopes_11x17.mxd

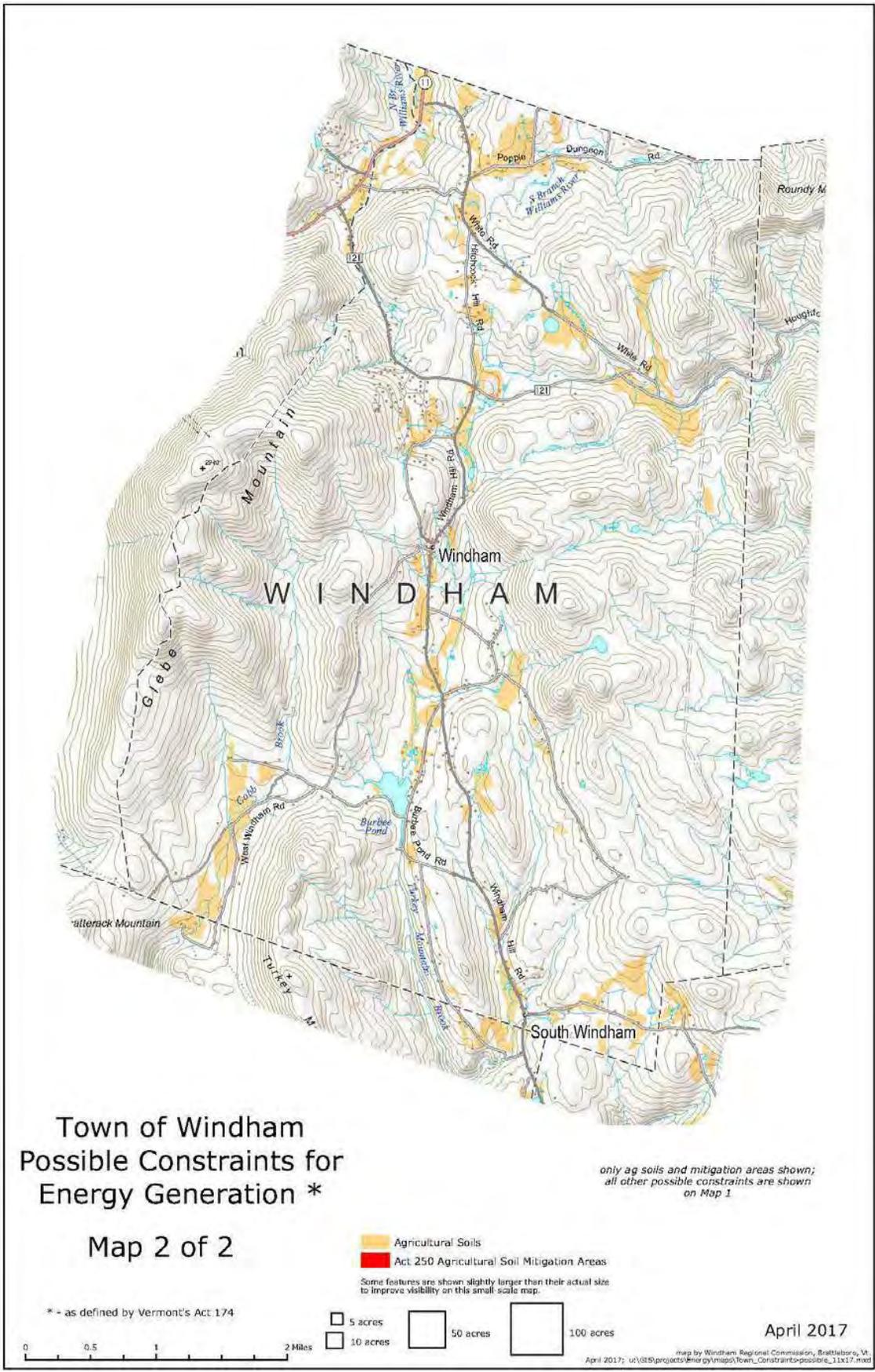
Map 9 Steep Slopes



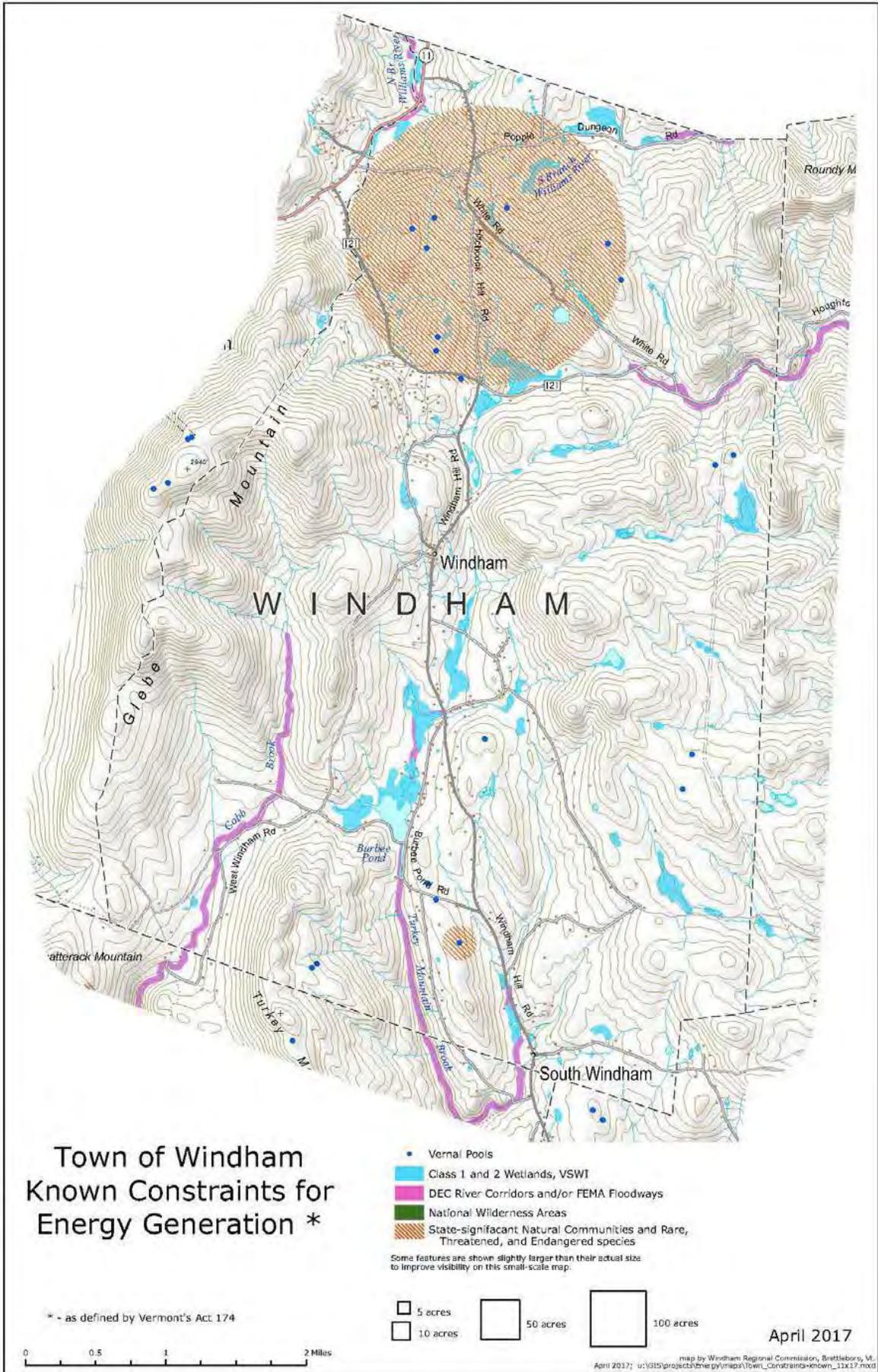
Map 10 Patterns of Settlement vs. Topography



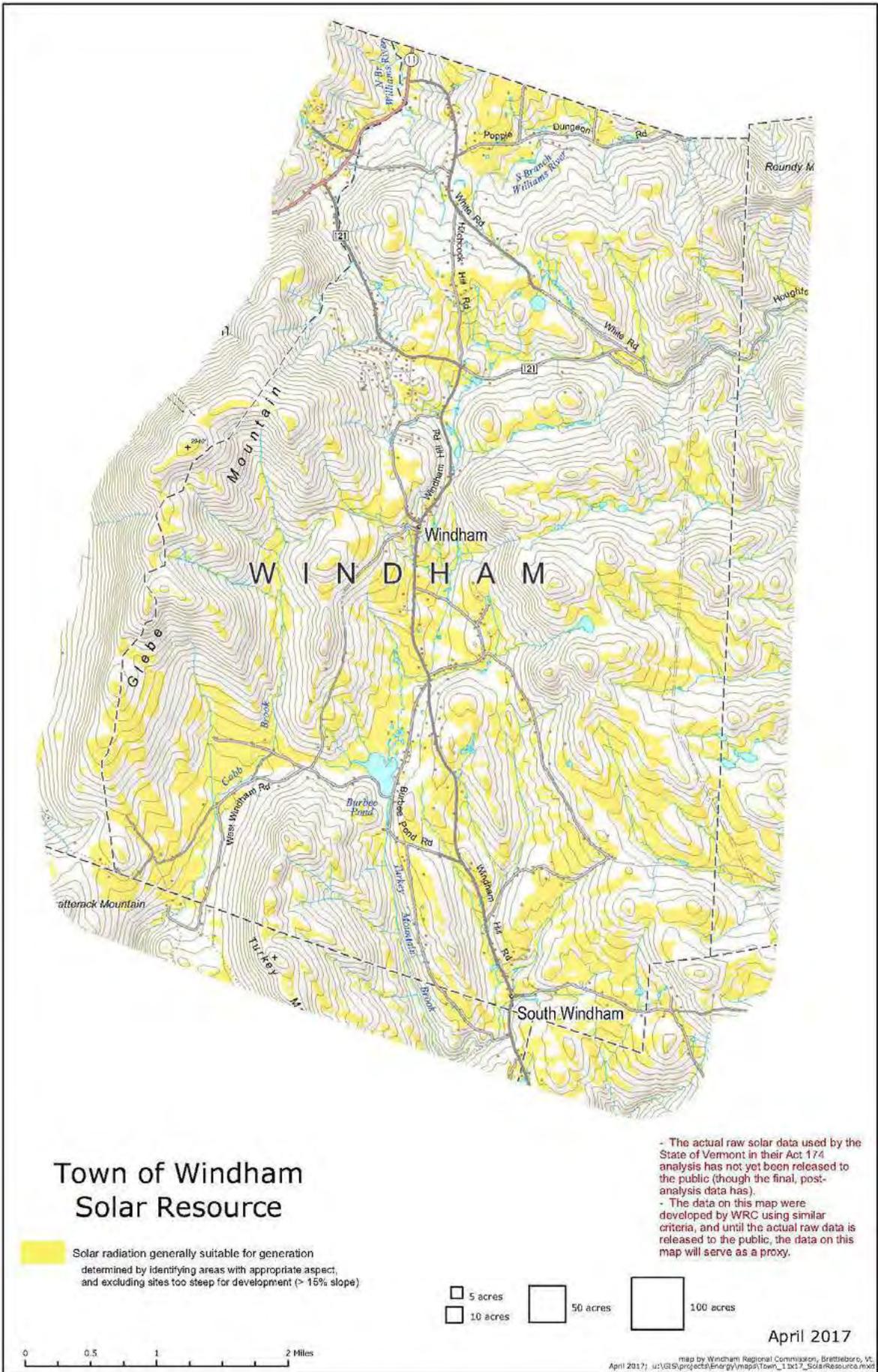
Map 11 Possible Constraints for Energy Generation 1 of 2



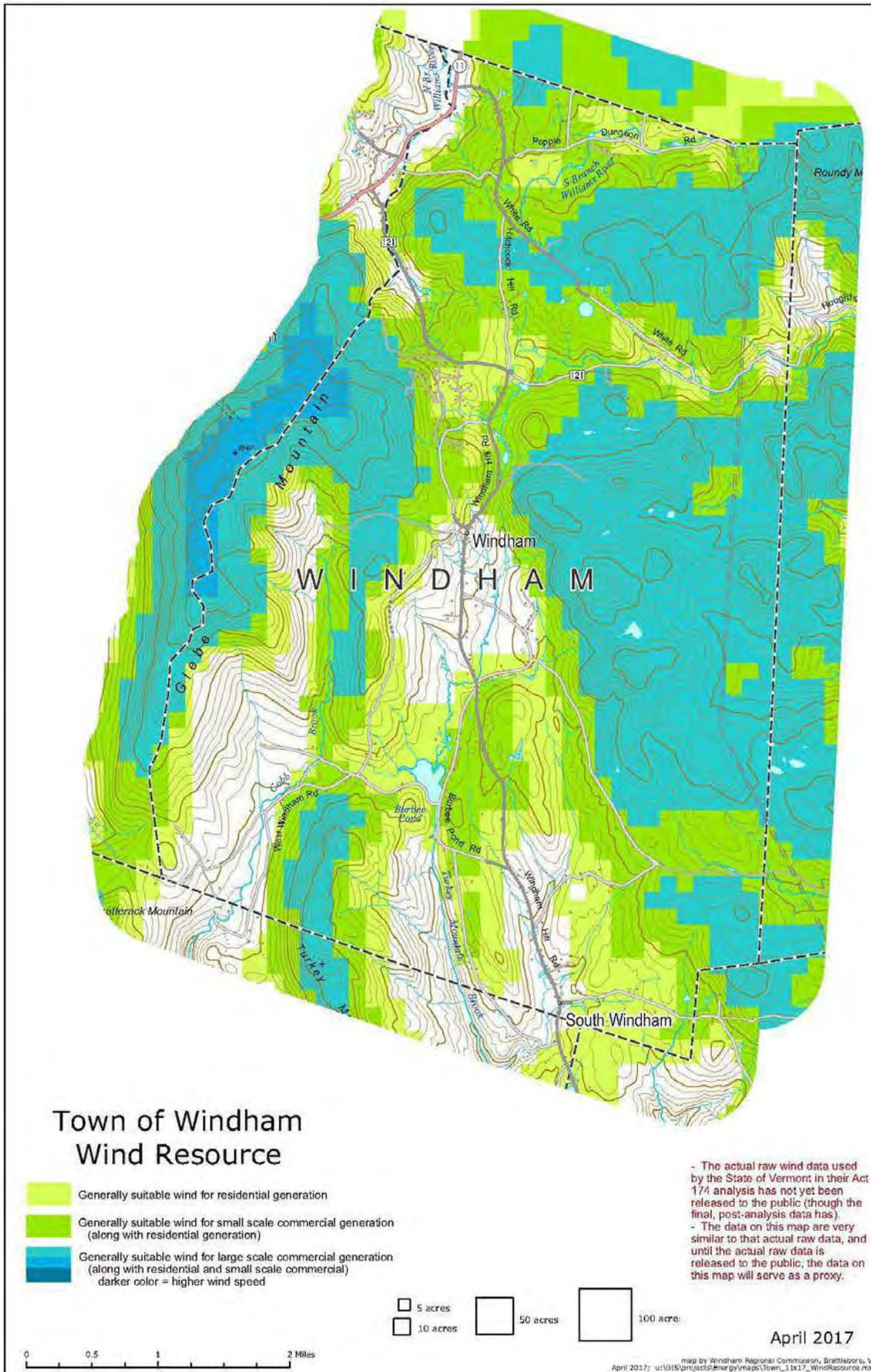
Map 12 Possible Constraints for Energy Generation 2 of 2



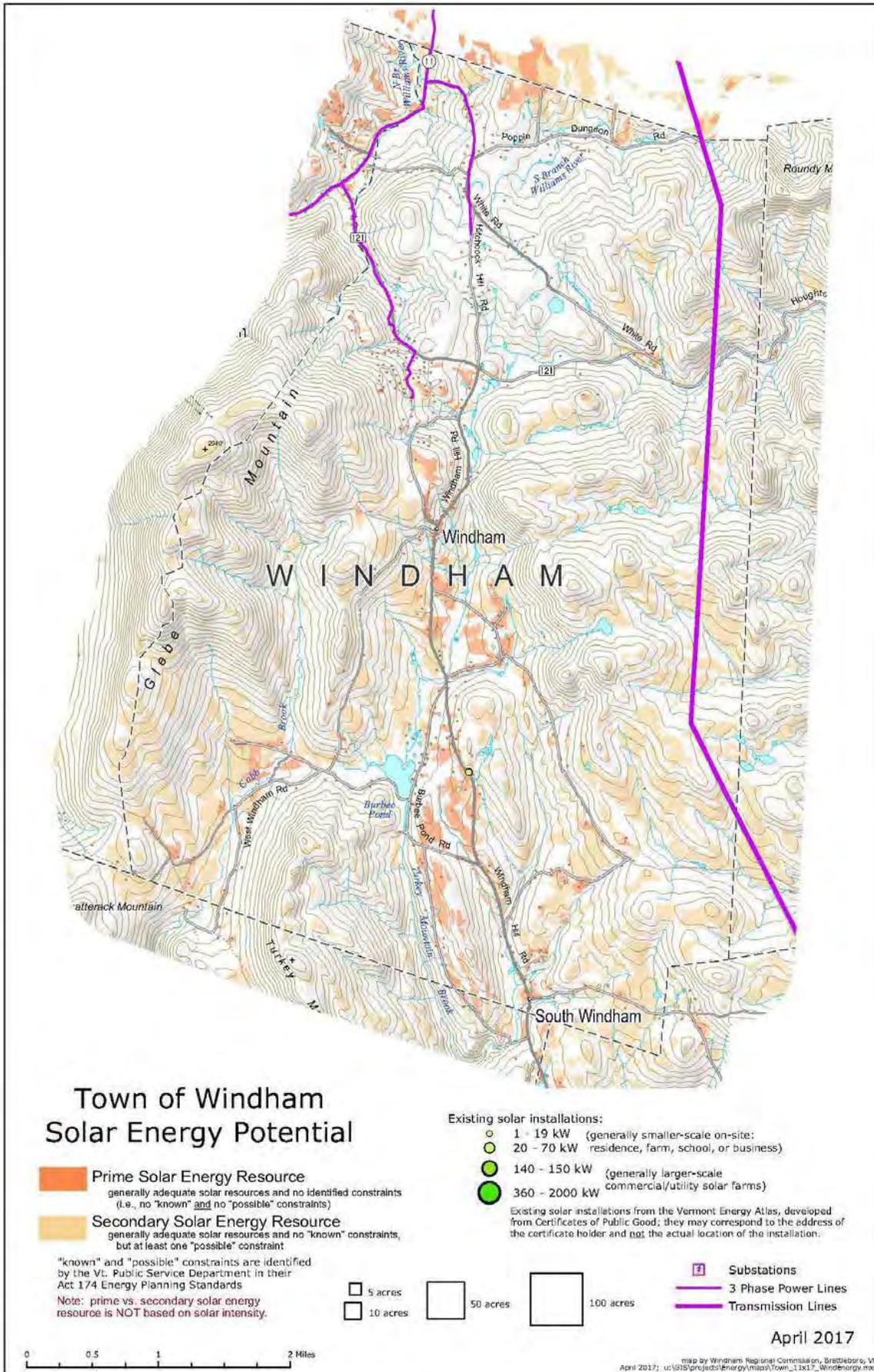
Map 13 Known Constraints for Energy Generation



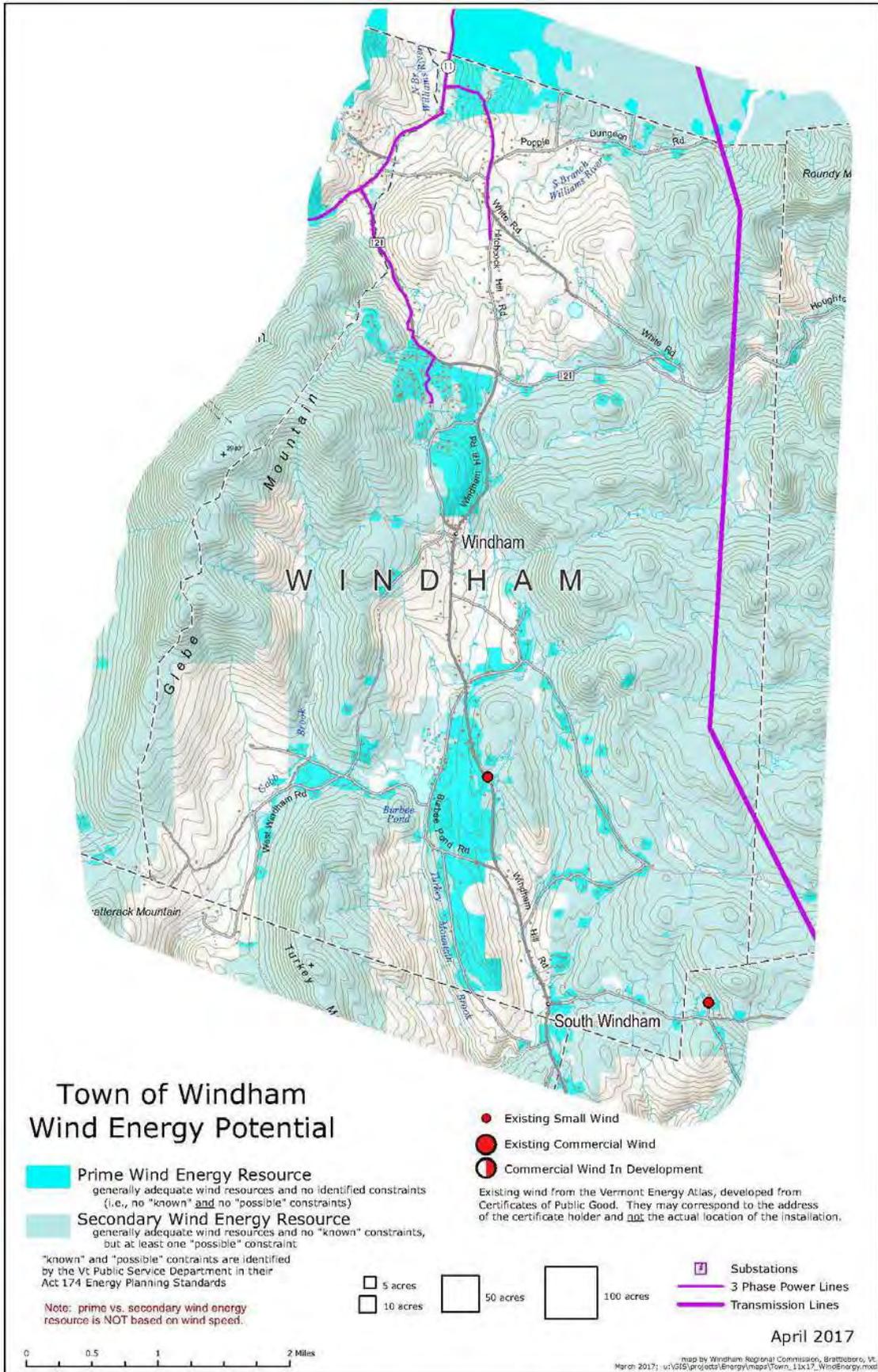
Map 14 Solar Resource



Map 15 Wind Resource



Map 16 Solar Energy Potential



Map 17 Wind Energy Potential

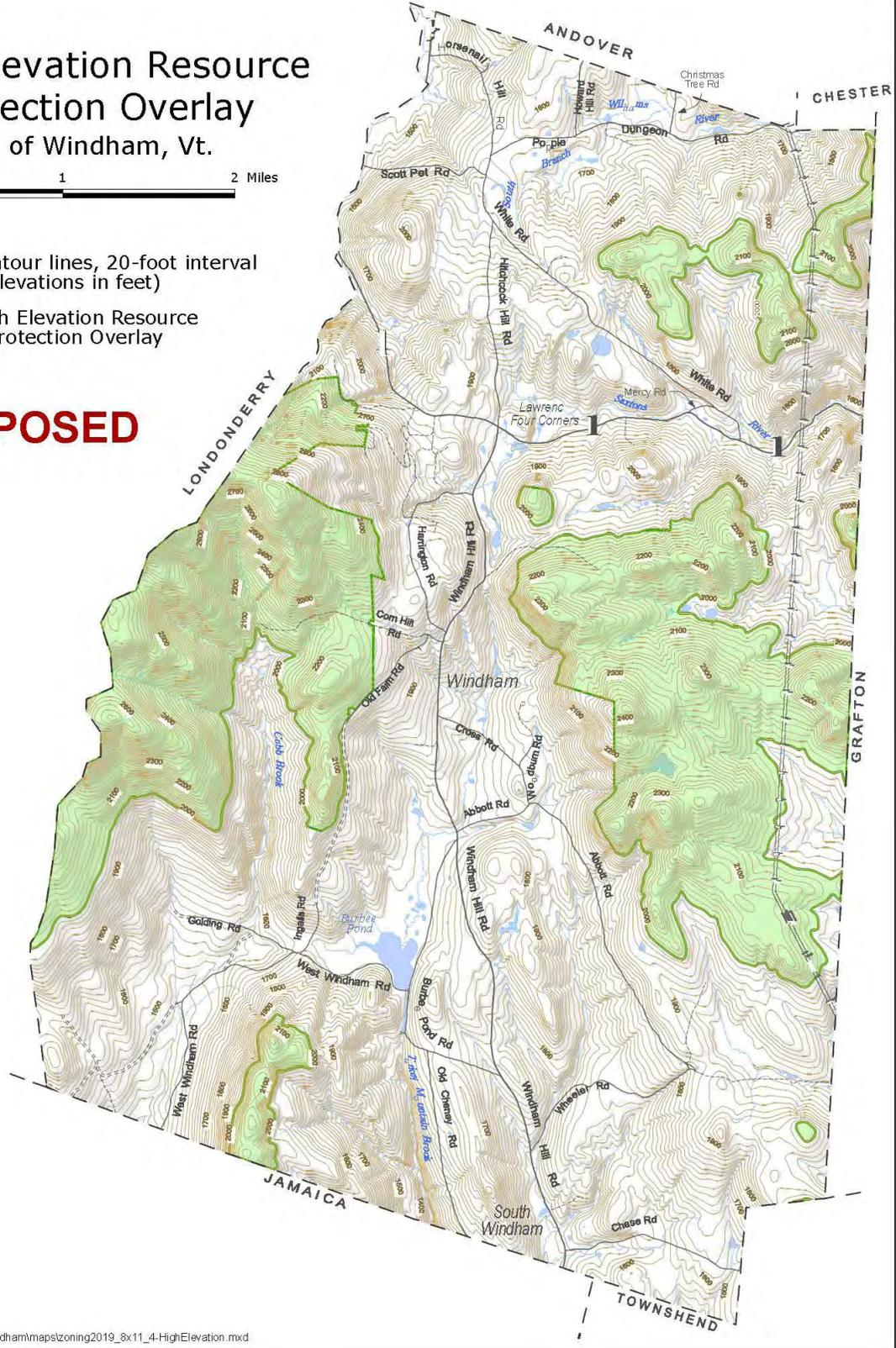
High Elevation Resource Protection Overlay

Town of Windham, Vt.

0 1 2 Miles

-  Contour lines, 20-foot interval (elevations in feet)
-  High Elevation Resource Protection Overlay

PROPOSED



July 2019, u:\GIS\Stowns\windham\mapstzoning2019_8x11_4-HighElevation.mxd

Map 18 High Elevation Resource Protection Overlay

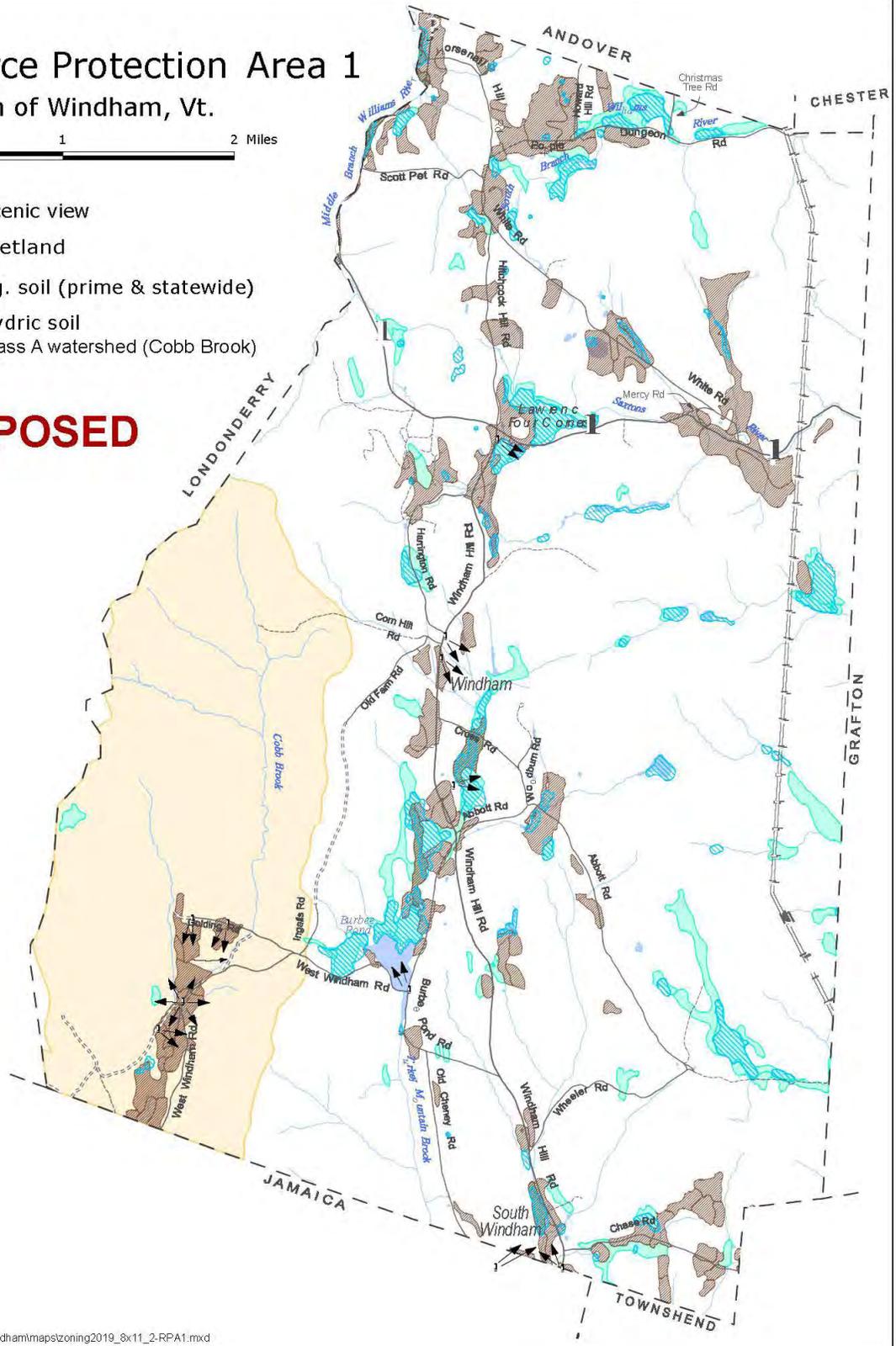
Resource Protection Area 1

Town of Windham, Vt.

0 1 2 Miles

-  Scenic view
-  Wetland
-  Ag. soil (prime & statewide)
-  Hydric soil
-  Class A watershed (Cobb Brook)

PROPOSED



July 2019; u:\GIS\towns\windham\mapstzoning2019_8x11_2-RPA1.mxd

Map 19 Resource Protection Area 1

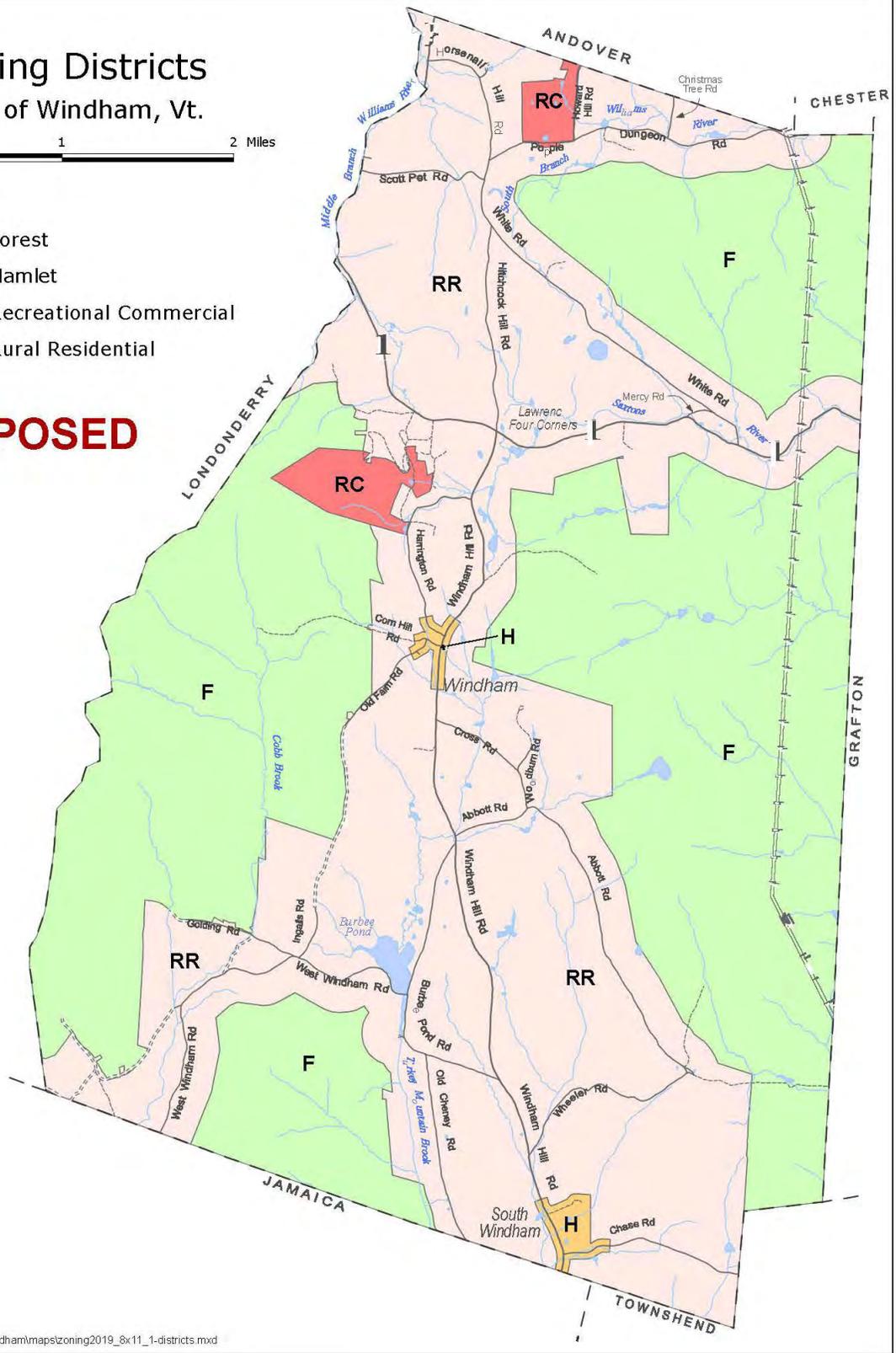
Zoning Districts

Town of Windham, Vt.

0 1 2 Miles

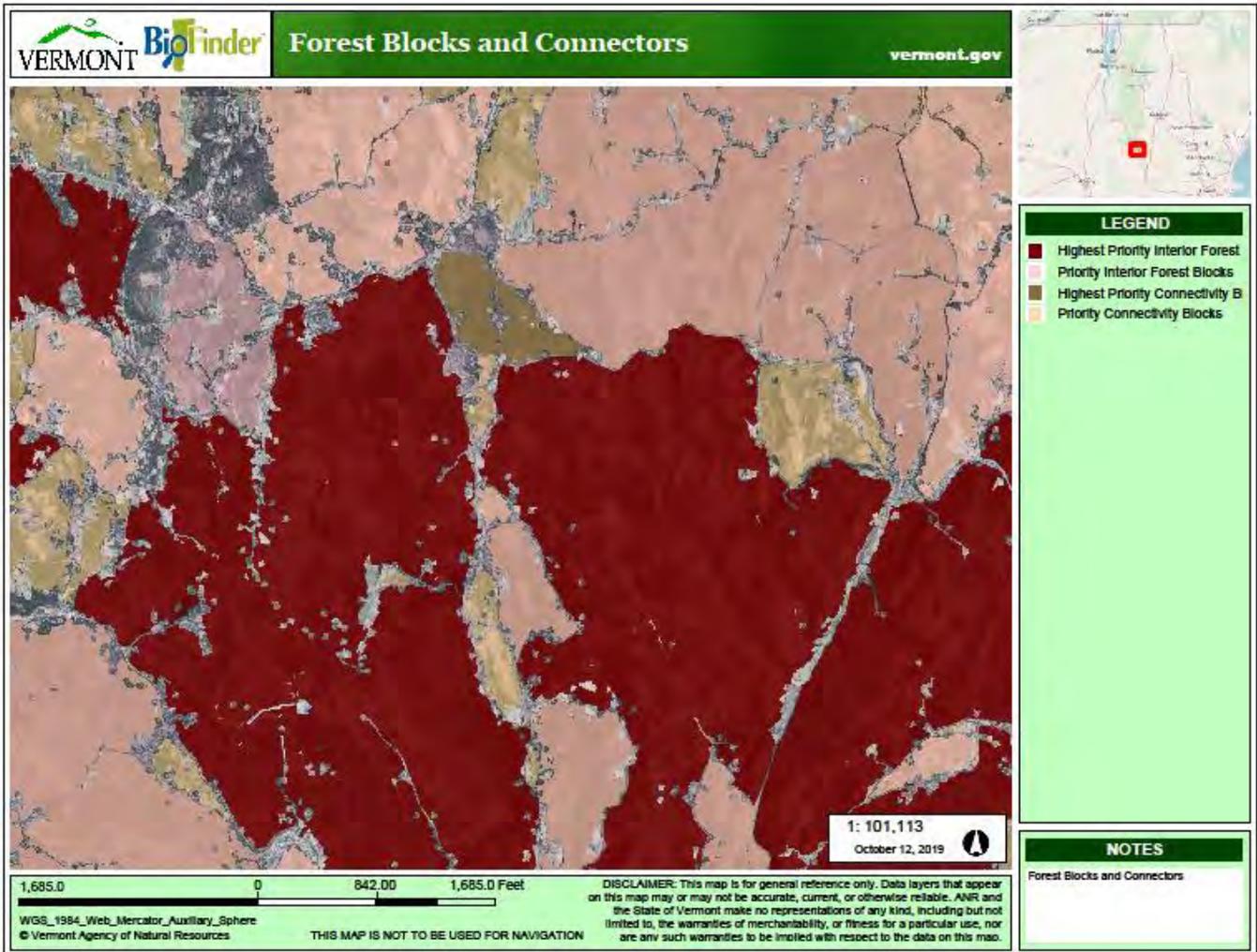
- Forest
- Hamlet
- Recreational Commercial
- Rural Residential

PROPOSED



July 2019; u:\GIS\towns\windham\maps\zoning2019_8x11_1-districts.mxd

Map 21 Zoning Districts



Map 22 Forest Blocks and Connectors